



THE 14TH SUSTAINABLE COLLABORATION IN BUSINESS,
TECHNOLOGY, INFORMATION AND INNOVATION

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**“Preserving the Sustainability of Business in
Accelerated Digital Transformation and Transition
Collide”**

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Jl. Telekomunikasi No.1 Bandung , Indonesia 40257

Website: scbtii.telkomuniversity.ac.id | Email : scbtii@telkomuniversity.ac.id

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Dr. Putri Fariska S.,Si., M.Si
Dr. Dwi Fitriзал Salim

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Rizky Pratama Hibatulah. Amd.Kom

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Editorial Address

Jln. Telekomunikasi, Terusan Buah Batu, Bandung 40257, Indonesia Telp: +62 22 7503621

Website: seb.telkomuniversity.ac.id

Email: seb@telkomuniversity.ac.id

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SCBTII 2023

“PRESERVING THE SUSTAINABILITY OF BUSINESS IN ACCELERATED DIGITAL TRANSFORMATION AND TRANSITION COLLIDE”

The COVID-19 pandemic had dealt a devastating blow to the SDGs, which were already off track before the pandemic forced the closure of schools, government services, and workplaces worldwide. The pandemic erased more than four years of progress in eradicating poverty and pushing millions into extreme poverty. On the other hand, digital transformation rapidly creates a world of ever-faster technological developments. In response, every business must think of itself as a tech business. Companies need to re-design their processes and ensure their people have the skills needed for a world where we increasingly collaborate and work alongside capable and intelligent machines.

Unfortunately, the war in Ukraine has accelerated the schism and confrontation between the major global powers. Another point of tension is the US–China relations joining the trade, technological, economic, and geostrategic competition. This year will be more significant. However, the world business before us is not divided into two concrete blocks. Instead, a full-scale reconfiguration of alliances is underway, which forces all other actors to reposition themselves about the new strategic competition dynamics and to seek out their own spaces in a global transformation. On the other hand, the green and the digital transitions, which seemed to work hand in hand toward building a more sustainable world, have collided.

Against this backdrop, as academic institutions, universities play an essential role in educating and providing professional human resources and conducting high-quality research that benefits humanity. However, universities must play a more significant role and be innovative and creative in engaging and supporting the development opportunities and consolidation of the global community. To embark on this role effectively, universities must always foster communication and discussion among academicians, scholars, practitioners, and policymakers under the Sustainability Development Goals (SDGs). Academia, Government, Business, and Communities must increasingly cooperate to achieve academic and research excellence and constructive solutions to current business and economic issues.

Sustainable Collaboration in Business, Information, and Innovation (SCBTII) 2023 is an international conference that brings together academics, professionals, entrepreneurs, researchers, learners, and other associated groups from all over the world that are interested in theories, as well as practices in the field of the digital economy for global competitiveness. This conference provides opportunities for presenters and participants to exchange new ideas and experiences, create research relationships, and find international partners for future collaboration to respond to economic, business, social, and technological development challenges successfully and effectively for better life and well-being.

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PREFACE

Good Morning, Everyone.

We gather here today with deep gratitude to Allah, the Merciful, whose grace and blessings have brought us together for the "14th International Conference on Sustainable Collaboration in Business, Technology, Information, and Innovation (SCBTII) 2023", with the theme of preserving business sustainability in accelerated digital transformation and transition collide.

First and foremost, **we sincerely appreciate** our esteemed keynote speaker, Bapak Dr. Sandiaga Salahuddin Uno, the Minister of Tourism and Creative Economy of the Republic of Indonesia.

We would also like to extend **our gratitude** to the esteemed speakers of the first-panel session: Prof. Dr. Hasan Dincer from Istanbul Medipol University (**Turkey**); Prof. Dr. Rossazana Bt AB Rahim from Universiti Malaysia Sarawak (**Malaysia**); Dr. M Budi Djatmiko, Chair of Indonesia Private University Association (Indonesia). For the second panel session, Prof. Dr. Najla Shafighi from BBW University of Applied Sciences (**Germany**), Dr. Michael Apiah Karikari from the University of Environment and Sustainable Development (**Ghana**), and Dr. Palti Marulitua Sitorus from Telkom University (**Indonesia**). We are truly grateful for the invaluable opportunity they have provided to learn and gain insights from their expertise and experiences.

SCBTII2023 serves as a pivotal platform to address these challenges head-on. The **125 papers** to be presented, representing academia from across the globe, signify our collective dedication to driving change and fostering sustainable business practices. With contributions from **12 local and 8 international universities and involvement from 8 (eight) countries**, this conference exemplifies the power of collaboration and knowledge exchange in shaping a better future. We want to thank all the esteemed **presenters and participants** of SCBTII 2023. Your presence here today signifies your commitment to advancing sustainable collaboration and innovation in business and information.

We extend our heartfelt gratitude to the School of Economics and Business (SEB), Telkom University (TelU), and our sponsors, **TELKOM INDONESIA, TELKOMSEL, and INFOMEDIA**, for their unwavering support in organizing this momentous event. Special thanks are to International and National University Partners, the Journal of Sustainability Science and Management (JSSM), and the Journal of Indonesian Economy and Business (JIEB).

We are confident that SCBTII2023 will be remembered as a catalyst for positive change, inspiring us all to create a lasting impact on business sustainability and our shared future. Together, we can transform challenges into opportunities and shape a world of balanced prosperity and responsibility. In closing, we wish you all an enjoyable and fruitful conference. May your experiences in Bandung be filled with warmth, camaraderie, and the rich Flavors of our local delicacies. **Let us forge ahead** with determination, courage, and a collective commitment to building a brighter and more sustainable **for future generations**.

Thank you so much and see you on 15th SCBTII 2024.

Suhail Kusairi, Ph.D.
Chairperson of the 14th SCBTII 2023

Keynote Speaker



Dr. Sandiaga Salahuddin Uno, B.B.A, M.B.A
Minister of Tourism and Creative Economy, Republic of Indonesia

Speakers



Prof. Dr. Hasan Dincer
Istanbul Medipol University
Turkiye



Dr. Michael Appiah Karikari
University of Environment & Sustainable
Development
Ghana



Prof. Dr. Najla Shafighi
BBW University of Applied Sciences
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Prof. Dr. Rossazana BT AB Rahim
Universiti Malaysia Sarawak (UNIMAS)
Malaysia



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Technology, Information and Innovation

The 14th International Hybrid Conference

July 27th-28th, 2023

"Preserving the Sustainability of Business in
Accelerated Digital Transformation and
Transition Collide"

CALL FOR PAPERS

The conference organiser humbly invites academicians, practitioners, scholars, researchers, policy makers to participate as presenter or participant in SCBTII 2023.

We also welcome and highly encourage postgraduate students to present their research proposal, literature review, or findings in this conference. Authors are invited to submit Papers/Posters for oral presentations in Physical (In-person) or Online.

MAIN TOPICS

- Accounting
- Digital Based Management
- Economics and Leisure Management
- Finance and Corporate Governance
- Strategy and Entrepreneurship
- Other related topics are also welcomed.

REGISTRATION FEE

	Physical (In-person) Conference	Online Conference
• Regular	IDR 3.000K* (USD 200)	IDR 2.000K* (USD 135)

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West Java, Indonesia

Registration and submission of the paper can be
made via online registration through this links:

<https://scbtii.telkomuniversity.ac.id/>

Cp: Eva: +62 822-9526-1863



Dr. Sandiaga Salahuddin Uno
Minister of Tourism and Creative Economy
Republic of Indonesia

SPEAKER

IMPORTANT DATES

- Abstract Submission Deadline
June 31th, 2023
- Abstract Acceptance Announcement
June 31th, 2023
- Full Paper Submission Deadline
July 10th, 2023
- Conference Fee Payment Deadline
July 10th, 2023
- Copying Conference Proceedings
July 17th, 2023
- International Conference D' Day
July 27-28th, 2023

ADVANTAGES

By attending 14th SCBTII 2023 as registered
presenter, participants will get:

- Material Hand Out via Email
- Proceeding SCBTII (ISSN)
- Certificate of Participant/Presenter
- The opportunity to enhance the research
collaboration with fellow researchers

Selected Papers will be published in the
following journals with additional fee (if
any) and standard review process:

- Proceedings Advances in Economics,
Business and Management Research
(AEBMR) - Atlantis Press
- Journal of Indonesian Economy and
Business (JIEB) - SCOPUS Indexed Q3
- Journal of Sustainability Science and
Management (JSSM) - SCOPUS Indexed
Q3
- Jurnal Manajemen Indonesia: SINTA 2,
Google Scholar, and DOAJ indexed



Prof. Dr. Hasan Dincer
Istanbul Medipol University
Turkey



Dr. Michael Appiah Karikari
University of Environment &
Sustainable Development
Ghana



Prof. Dr. Najla Shafiqhi
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Universiti Malaysia Sarawak (UNIMAS)
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TOPICS OF CALL FOR PAPERS

Digital-Based Management

Big Data and Data Sciences Data Mining
E-Business
E-Government E-Governance
Internet of Things ICT for Society
Human Computer Interaction Operations and
Quality Management Performance Management
Green Marketing Consumer Behavior

Finance and Corporate Governance

Corporate Finance
Capital Market and
Investment Financial
Technology
Market
Discipline
Behavioural
Finance
International
Finance Risk
Management
Market
Microstructure
Business Ethics
Corporate Social Responsibility Sustainability
Islamic Finance

Strategy, Entrepreneurship, Economics

Economics and Policy Studies
Start Up and Small Business Development Human
Capital and Talent Development Knowledge
Management
Strategic Management and Decision-Making
Innovation Management

Accounting

Financial Accounting
Accounting Information
System Managerial
Accounting
Capital Market
Public Sector
Accounting Islamic
Accounting in banking
Social Accounting

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RUNDOWN OF SCBTII 2023 (ONLINE CONFERENCE)

Thursday and Friday, July 27th - 28th, 2023

Thursday, July 27th, 2023		
Time (GMT +7)	Activities	Person in Charge
08.00 - 09.00	Open Registration and Protocol Preparation	Floor Manager : Programme Division
09.00 - 09.10	Greetings	MC: Muhammad Azhari, S.E., M.A.B
09.10 – 09.20	Indonesia Raya & Mars Telkom University	Host and Co-Host Floor Manager : Programme Division
09.20 - 09.30	Opening Remarks from Chairman	Suhal
09.30 – 09.40	Opening Speeches and Opening Ceremonial	Vice Rector IV of Telkom University: Dr. Rina Pudji Astuti
09.40 – 09.50	Greeting from Dean of Faculty of Economics & Business Telkom University	Dr. Ratri Wahyuningtyas
09.50 – 09.55	Photo Session	MC: Muhammad Azhari, S.E., M.A.B Logistic, Publication, Documentation Division
09.55 – 10.05	Opening Plenary Session and Announcing the Moderator	MC: Muhammad Azhari, S.E., M.A.B Moderator: Dr. Astric Krisnawati
10.05 - 10.25	1 st Panel Discussion of Invited Speakers	Speaker 1: Prof. Dr. Hasan Dincer (Istanbul Medipol university – Turkey)
10.25 – 10.45		Speaker 2: Professor Dr. Rossazana Bt Ab Rahim (Universiti Malaysia Serawak, Malaysia)
10.45 – 11.05		Speaker 3: Prof. Dr. M. Budi Djatmiko (Ketua Asosiasi PT Swasta Indonesia)
11.05 – 11.20	1 st Panel Discussion (Q&A)	Moderator & Invited Speakers
11.20 – 11.25	Announcing CV's Keynote Speaker	MC: Muhammad Azhari, S.E., M.A.B
11.25 – 11.45	Keynote Speech	Dr. Sandiaga Salahuddin Uno, B.B.A, M.B.A (Minister of Tourism and Creative Economy Republic of Indonesia)
11.45 – 12.00	Certificate of appreciation and photo session for Speakers & Moderator	Dr. Ratri Wahyuningtyas Logistic, Publication, Documentation Division
12.00 – 12.05	Closing	MC: Muhammad Azhari, S.E., M.A.B
12.05 – 13.00	Lunch Break	-
Parallel Session Schedule		
13.00 – 15.30	Presentations of Parallel Session	Call for Paper & Program Division
End of Parallel Session (Participants Join The Plenary Room)		
15.00 - 15.10	MC Open The 2 nd Plenary Session	MC: Muhammad Azhari, S.E., M.A.B Moderator: Dr. Ir. Nora Amelda Rizal, MM, MSAE
15.10 – 15.30	2 nd Panel Discussion of Invited Speakers	Speaker 4: Prof. Dr. Najla Shafighi (BBW University of Applied Sciences – Germany)
15.30 - 15.50		Speaker 5: Dr. Michael Appiah Karikari (University of environment & Sustainable Development – Ghana)
15.50 - 16.10		Speaker 6 : Dr. Palti MT Sitorus (Telkom University - Indonesia)
16.10 – 16.30	2 nd Panel Discussion (Q&A)	Moderator & Invited Speakers
16.30 – 16.45	Certificate of Appreciation and Photo Session for Speakers & Moderator	MC: Muhammad Azhari, S.E., M.A.B
16.45 – 16.55	Closing speech from Dean	
16.55 – 17.10	Announcement of Best Papers & Closing	MC: Muhammad Azhari, S.E., M.A.B
Friday , July 28th, 2023		
08.00 – 11.00	Collaboration Discussion – University Partnership	Faculty economy and Bussiness, Telkom University

RUNDOWN OF SCBTII 2023 PARALLEL SESSION

Thursday, July 27th, 2023

SCBTII 2023 PARALLEL SESSION						
ROOM FAS 1						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
	13.00	13.10	10	Session Chair: Dr. Brady Rikumahu, S.E., M.B.A. TULT Lt 15 FRI 1501 PIC: Nitha (MBTI)		
1	13.10	13.20	10	Andiswaaa Abongile Jiza, Forget Mingiri Kapingura (University of Fort Hare, South Africa)	Remittances and Financial Inclusion in the Southern African Development Community Region	902
2	13.20	13.30	10	Desiree Louise Hunter, Asrat Tsegaye, Forget Kapingura (University of Fort Hare, South Africa)	Manufacturing Industry Performance and Stabilization Policies in South Africa: Application of The Autoregressive Distributed Lag Model	838
3	13.30	13.40	10	Fauzan Khalil Ramadhan, Raden Aswin Rahadi (ITB)	Evaluation Of Critical Risk Factors in Private Equity/Venture Capital Industry In Indonesia	911
4	13.40	13.50	10	Zaenal Hediandah, Nora Amelda Rizal (Telkom University)	Is There Any Bubble in The Jakarta Islamic Index (JII), Bitcoin, & Gold, And How Is The Relationship Between Them To The Return Of The Jakarta Islamic Index (JII)?	831
5	13.50	14.00	10	Astrie Krisnawati, Puteri Balqis Salsabilla (Telkom University)	Financial Literacy and Pocket Money Towards Savings Behaviour: A Study On Generation Z In Bandung Raya	824
6	14.00	14.10	10	Rizki Kusuma Priyatna, Aldilla Iradianty (Telkom University)	Comparative Analysis of The Financial Performance Of Rural Banks In Bandung City Before And During The Pandemic	823
7	14.10	14.20	10	Deddy Firdaus, Dwi Fitrizal Salim (Telkom University)	How Do We Approach Validating the Intrinsic Value? Approaching To Validate the Intrinsic Value Of Sub Sector Energy Oil, Gas, And Coal As A Backbone Indonesian Export During A Pandemic And Global Crisis	849
8	14.20	14.30	10	Arlinton Hutapea, Dwi Fitrizal Salim (Telkom University)	Is The Tobacco Stock Still Relevant for Future Investment? Research On Indonesian Stock	852

SCBTII 2023 PARALLEL SESSION						
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No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
					Exchange Sub-Sector Tobacco 2017-2021	
9	14.30	14.40	10	Aneu Nafisatul Munawaroh, Dwi Fitrizal Salim (Telkom University)	A Potent Way of Valuing Stocks! Valuing Automotive and Component Sub-Sector Companies Listed On-Idx After the Covid-19 Pandemic	860
10	14.40	14.50	10	Siti Kurniasih, Dwi Fitrizal Salim (Telkom University)	Stock Valuation Using the Discounted Cash Flow (DCF) Method, Relative Valuation, Monte Carlo Simulation, And Investment Recommendations for Fish, Meat, & Poultry Sub-Industry Companies for The 2022 Projection	863
11	14.50	15.00	10	Fa'iq Ezza Sadewa (ITB)	The Impact of Environmental, Social, And Governance (ESG) Towards Corporate Financial Performance In The Energy Sector	926
12	15.00	15.10	10	Marlina Nur Lestari, Roni Marsiana, Anisa lisara, Ershanda Adhytia (Galuh University)	Analysis Of Bond Ratings At PT BRI (Persero) Tbk, 2011-2020 Period	862

SCBTII 2023 PARALLEL SESSION						
ROOM FAS 2						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
	13.00	13.10	10	Session Chair: Dr. Dini Wahjoe Hapsari, S.E., M.Si., Ak. TULT Lt 15 FRI 1502 PIC: Indri (Tk. Fisika)		
1	13.10	13.20	10	Amani Patrick Mbogella, Zuhura Mohammed Abdallah, Haji Hatib Semboja (Zanzibar University, Tanzania)	The Influence of Legal and Regulatory Framework On Performance Audit In Oil And Gas Sector In Tanzania	886
2	13.20	13.30	10	Nqobile Natasha Mpala, Forget Mingiri Kapingura, Aurelie Charles (University of Fort Hare, South Africa)	The Impact of Capital Flows on Economic Growth In The Southern African Development Community.	901
3	13.30	13.40	10	Azlia Sovni, Dwi Fitriзал Salim (Telkom University)	Stock Valuation Using Discounted Cash Flow Method with Free Cash Flow to Firm and Relative Valuation Approaches On State-Owned Construction Companies Listed On IDX For 2022 To 2026 Period Projection	879
4	13.40	13.50	10	Rizki Bunawan, Dwi Fitriзал Salim (Telkom University)	Share Valuation Using the Discounted Cash Flow Method with The Free Cash Flow To Firm And Relative Valuation Approach In The Media And Entertainment Sub-Sectors Listed At The Indonesia Stock Exchange For The 2022 Period Projection	882
5	13.50	14.00	10	Melanie Sri Handayani, Nurdin Sobari (Universitas Indonesia)	Factors Influencing the Intention to Invest In Sharia Peer To Peer Lending (P2PL)	829
6	14.00	14.10	10	Rafly Rahmadafa Syabani, Mursyid Hasan Basri (ITB)	Enhancing Pharmacy Inventory Management Efficiency: A Comprehensive Analysis of XYZ Hospital	898
7	14.10	14.20	10	Zahra Putri Endru Subekti, Mandra Lazuardi Kitri (ITB)	Financial Feasibility Study of Environmental Laboratory Establishment Plan at Foundation XYZ	899
8	14.20	14.30	10	Dhian Wahyuni, Mirza Aulia Nur Fajri, Aldini Fikhriaqli Fahrezi, Sri Rahmayani, Bintang Jaya Airlangga	Capital Market Reaction Analysis Before and After The Announcement Of The Indonesian-Japan Economic Partnership Agreement (IJEPA) At The Bali G-20 Summit (Empirical	877

SCBTII 2023 PARALLEL SESSION						
ROOM FAS 2						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
				(Telkom University)	Study Of Basic Materials Sector Companies)	
9	14.30	14.40	10	Fista Monica Deswanti, Dwi Fitrizal Salim (Telkom University)	Stock Valuation in Pharmaceutical Sub-Sector Companies Using Discounted Cash Flow And Relative Valuation Methods In 2022	870
10	14.40	14.50	10	Astrie Krisnawati, Adela Hasna Khairunnisa (Telkom University)	Demographic Factors Towards Financial Literacy: A Study on Teachers In Bandung Raya	825
11	14.50	15.00	10	Laila Nurjannah, Dwi Fitrizal Salim (Telkom University)	Valuation Of Basic Materials Sub Sector Companies Metal and Minerals Using Discounted Cash Flow And Relative Valuation Methods In 2022	871

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SCBTII 2023 Parallel Session						
ROOM FAS 3						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
	13.00	13.10	10	Session Chair: Dr. Irni Yunita, S.T., M.M. TULT Lt 15 FRI 1503 PIC: Elsi (Tk Fisika)		
1	13.10	13.20	10	Prisca Rudo Mukuya, Mingiri Kapingura (University of Fort Hare, South Africa)	Financial Development, Institutions, and Growth in The Southern African Development Community (SADC) Region	939
2	13.20	13.30	10	Jasmine Raudhatul Jannah, Kurnia Fajar Afgani (ITB)	Financial Feasibility Study of Pt XYZ's Plantation Construction Investment Project	928
3	13.30	13.40	10	Astrie Krisnawati, Annisa Aulia Rahmani (Telkom University)	The Determinants of Consumer Trust in Digital Banking Transaction Services: A Case Study of Livin' By Mandiri Users In Gen Z	934
4	13.40	13.50	10	Kevin Bernanda Bethran, Acip Sutardi (ITB)	ESG Score Impact on Indonesia Listed Firms' Financial Performance: Evidence from Sri Kehati Listed Firms During Pre-Pandemic Period	943
5	13.50	14.00	10	Muhammad Zem Kisralatifa, Tuntun Salamatun Zen (ITB)	Factors Affecting Parents Financial Planning on The Security of Their Children's College Funds. An Empirical Study of Students from Universities in Bandung	944
6	14.00	14.10	10	Mohammad Risyad Rachman (ITB)	Examining The Impact of Various Financial And Market Ratios On Return On Equity (Roe) In Publicly Listed Non-Financial Firms In Indonesia: A Firm Size Perspective	947
7	14.10	14.20	10	Farrell Justin Wismanto, Mandra Lazuardi Kitri (ITB)	Optimal Capital Structure of PT Tbs Energi Utama TBK	952
8	14.20	14.30	10	Daffa Radhya Ravenska, Atika Irawan (ITB)	Feasibility Study of Housing Project PT Alfarisi Quadra Sejahtera	955
9	14.30	14.40	10	Muhammad Alvino Nurfalah (ITB)	Determinant Factors of Credit Risk In Indonesian Conventional Bank	962
10	14.40	14.50	10	Sri Rahayu, Fadhila Regita Ardyanti (Telkom University)	Sustainability Reporting Disclosure: Evidence from Energy Sector Companies Listed on The Indonesia Stock Exchange	976
11	14.50	15.00	10	Sri Rahayu, Lenirra Indri Supriatna (Telkom University)	Enterprise Risk Management Disclosure: Evidence from Banking Companies Listed On The Indonesia Stock Exchange	980

SCBTII 2023 Parallel Session						
ROOM FAS 4						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
	13.00	13.10	10	Session Chair: Dr. Galuh Tresna Murti, S.E., M.Si., Ak. TULT Lt 15 FRI 1506 PIC: Aini (MBTI)		
1	13.10	13.20	10	Portia Korlekie Teye (University of Environment and Sustainable Development, Ghana)	Energy Literacy and Energy Savings Behaviour: A Model of Contingent Effects of Energy-Related Values and Attitude	994
2	13.20	13.30	10	Nur Halifah Mohd Ibrahim, Nizam Ahmat (UMT)*	Exchange Rate Volatility Impact Between Malaysia and Major Exporter Partners	873
3	13.30	13.40	10	Izhari Mawardi (Trisakti)	The Impact of Electricity Rate Policy On Indonesia's Macro Economic Indicators	876
4	13.40	13.50	10	Nurhayati Nurhayati, Eleonora Sofilda, Muhammad Zilal Hamzah (Trisakti)*	Sustainable Development Index In Indonesia Period 2015-2020	865
5	13.50	14.00	10	Jeremy Ezechiel Jethjehian, Achmad Herlanto Anggono (ITB)	The Influence of Financial Literacy And Behavioral Biases On Bnpl Users Of Generation	1048
6	14.00	14.10	10	Michael Samuel Aquila (ITB)	Optimal Capital Structure Analysis of Pt Triputra Agro Persada Tbk	990
7	14.10	14.20	10	Yyun Yuningsih, Brady Rikumahu (Telkom University)	Stock Valuation of Companies In The Consumer Cyclical Industrial Sector Of The Retailing Sub Sector Uses Discounted Cashflow Valuation Method With A Free Cash Flow To Firm Approach And Relative Valuation Methods After The Peak Of The Covid-19 Pandemic.	1040
8	14.20	14.30	10	Hesty Ratnasari, Brady Rikumahu (Telkom University)	Optimal Capital Structure Analysis on Aggressive and Moderate Expansion Strategy to Increase Shareholder Value, Case Study on Hospital Industry in Indonesia 2017- 2021	1041

SCBTII 2023 Parallel Session						
ROOM FAS 4						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
9	14.30	14.40	10	Nora Amelda Rizal, Aziza Nur Fatiha (Telkom University)	The Effect of World Crude Oil and Natural Gas Price Fluctuations On Credit Risk	1092
10	14.40	14.50	10	Muhammad Farhansyah Mondari, Putri Fariska (Telkom University)	The Effect of Monetary Policy News and Economic Uncertainty On Microblogging Sentiment Investor	1045
11	14.50	15.00	10	Reynaldo Mulya, Mandra Lazuardi Kitri (ITB)	The Accuracy of Relative Valuation Methods In Assessing Coal Production Firm's Value In Indonesia	984
12	15.00	15.10	10	Sri Rahayu Fitriani, Brady Rikumahu (Telkom University)	Stock Valuation Using Free Cash Flow to Firm (FCFF) And Relative Valuation (RV) In The Cement Industry For Projections On 2019 And 2021 Due To The COVID-19 Pandemic	1039

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SCBTII 2023 PARALLEL SESSION						
ROOM IBM 1						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
	13.00	13.10	10	Session Chair: Ratih Hendayani, S.T., M.M., Ph.D		
				TULT Lt 15 FIF 1510		
				PIC: Rafat (MBTI)		
1	13.10	13.20	10	Shreyansh Umesh Sagare (BBW University of Applied Science Berlin Germany)	Sustainable Brand Extensions of Fast Fashion Brands; The Influence on Parent Brand Attitude	840
2	13.20	13.30	10	Trisna Guruminda (Telkom University)	Product Preference Analysis of Low Multi-Purpose Vehicle Using ToPIC Modeling	828
3	13.30	13.40	10	Irfan Faris Rudiana, Rifki Abdul Malik, Nina Herlina, Alni Juniarti (Galuh University)	Determination Of Voluntary Taxpayers: The Role of Mediating Trust in Authority	851
4	13.40	13.50	10	Ahmad Syahrulzi, Alfian Alfian (Lambung Mangkurat University)	Factors Affecting the Effectiveness of Management Information Systems for Business Licensing Services In The South Kalimantan Province	853
5	13.50	14.00	10	Ravanell Avaryl, Nurrani Kusumawati (ITB)	Factors Affecting Skincare Purchase Intention During E-Commerce Live Streaming	855
6	14.00	14.10	10	Claresta Gianto, Liane Okdinawati (ITB)	Reducing Waste in Coated Kraft Paper Production at CV. MXX By Adopting Lean Operation Method	856
7	14.10	14.20	10	Trracy Hutagaol, Dr. Achmad Herlanto Anggono (ITB)	Factors Influencing QRIS Feature Acceptance in Bandung Using the Extended UTAUT2	857
8	14.20	14.30	10	Ahadi Andrian Wibowo, Arviansyah Arviansyah (Universitas Indonesia)	The Effect of Factors in The Extended Unified Theory Of Acceptance And Use Of Technology (UTAUT2) Model On The Level Of Use, Customers Satisfaction, And Customers Loyalty Of Mobile Banking Users	858
9	14.30	14.40	10	Nayla Nurhaliza, Annisa Qastharin (ITB)	The Influence of Social Commerce Marketing on Generation-Z Compulsive Buying Behavior	918
10	14.40	14.50	10	Ingggrid Angelique Sirait, Mustika Sufiati Purwanegara	Analyzing Perspective Customer Towards Slow Fashion	919

SCBTII 2023 PARALLEL SESSION						
ROOM IBM 1						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
				(ITB)		
11	14.50	15.00	10	Faizal Haris Eko Prabowo, Risna Kartika, Iwan Setiawan, Indy Insanul Mutmainnah (Galuh University)	The Impact of Electricity Rate Policy on Indonesia's Macro Economic Indicators	1032



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SCBTII 2023 PARALLEL SESSION						
ROOM IBM 2						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
	13.00	13.10	10	Session Chair: Dr. Maya Ariyanti, S.E., M.M. <hr/> TULT Lt 16 1604 <hr/> PIC: Fahrizal (MBTI)		
1	13.10	13.20	10	Shubham Lad (BBW University of Applied Science Berlin Germany)	Impact of COVID-19 on Inventory Management in E-commerce Industry	869
2	13.20	13.30	10	Dinda Maharani Widyaputri (ITB)*	Smart Retailing: A Study Regarding The Purchase Intention Of Beauty Products Vending Machine	924
3	13.30	13.40	10	Fauriza Aishafahana, Nurrani Kusumawati (ITB)*	Factors Influencing Consumer Purchase Decision In Buying Local Shoes Pilot Case : Mks' Shoes	932
4	13.40	13.50	10	Mukarto Siswoyo, Acep Komara, Dedi Muhammad Siddiq, Abidin Abidin, Zulfaizah Farahiyah, Azis Husen (Universitas Swadaya Gunung Jati)*	Penta Helix Model And Collaborative Network Orientation In Developing Reservoir-Based Tourism In Indonesia	1029
5	13.50	14.00	10	Setiyani Setiyani (Universitas Swadaya Gunung Jati)*	Middle School Student Numerical Literacy Through The Application Of E-Learning On Numbers	1042
6	14.00	14.10	10	Amanda Lyra Kalista Sahab, Fitri Aprilianty (ITB)	Developing Luxury Branding Digital Strategy for Body Care Brand in Indonesia: A Study Case Of Brand "W"	892
7	14.10	14.20	10	Nicole Olivia Usman, Fitri Aprilianty (ITB)	Developing UI/UX Website Design for Tourism Industry in Indonesia: A Case Study of Loocale	893
8	14.20	14.30	10	Johanna Maranatha, Mursyid Hasan Basri (ITB)	Analysis Inventory Management for Pharmaceutical Medical Disposable in XYZ Hospital	895
9	14.30	14.40	10	Anjani Uswatun Hasanah Wahyudi, Achmad Fajar Hendarman (ITB)	Relationship Between Artificial Intelligence Technology, Knowledge Sharing, And Digital Leadership Styles Towards Generation Z Individual Innovativeness During the Internship Period (MBKM Internship Program)	900

SCBTII 2023 PARALLEL SESSION						
ROOM IBM 2						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
10	14.40	14.50	10	Dita Komala Putri, Eleonora Sofilda, Dini Hariyanti (Trisakti)	Information Technology Innovation Transformation Policy Impact On Service Improvement Intellectual Property	968
11	14.50	15.00	10	Andika Maulana Somantri, Heppy Millanyani (Telkom University)	Factors Affecting Tourist Intention to Revisit: Awareness, Image, Tourist Motivation and Word of Mouth	1015



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SCBTII 2023 PARALLEL SESSION						
ROOM IBM 3						
No	Start	End	Duration	Presenter Name	Paper Title	Paper ID
	13.00	13.10	10	Session Chair: Heppy Milanyani, S.Sos., M.M., Ph.D. TULT Lt 15 FTE 1514 PIC: Annisa Salsabila (MBTI)		
1	13.10	13.20	10	Elan Pradana Surya Tanari, Fitri Aprilianty (ITB)	Developing Marketing Strategies for Early Stage Social Media Start Up In United States: A Case Study Of My Carousel App	921
2	13.20	13.30	10	Catherine Tarida Hananaek, Mursyid Hasan Basri (ITB)	Analysis Of Medicine Waiting Time at XYZ Hospital In Bandung	923
3	13.30	13.40	10	Indrawati Indrawati, Afrafara Syadza Syivana, Subhash K.B. Pillai (Telkom University)	Measurement Of E-Wom, Brand Image, Halal Product Image, Purchase Intention, And Purchase Decisions Variables	930
4	13.40	13.50	10	Indrawati Indrawati, Firly Assyifa Camilien, Subhash K.B. Pillai K.B. Pillai (Telkom University)	Measurement Of Variables To Predict Purchase Decisions Toward Halal Product: Study At Inglot	933
5	13.50	14.00	10	Fitria Nur Indriani (ITB)	Exploring Potential Factors on The Purchase Intention Of Battery Electric Vehicles (Bevs) Among Millennials To Expand Market Share In Automotive Industry	942
6	14.00	14.10	10	Hana Aqila (ITB)	Public Acceptance and Use Of Jaklingko Application In Jakarta Metropolitan Area (Jabodetabek)	945
7	14.10	14.20	10	Celta Amadea Saputra, Nurrani Kusumawati (ITB)	Marketing Strategy Analysis and Development Of X-Camp (Xl Axiata Iot Innovation Center)	948
8	14.20	14.30	10	Yugo Ardiatika (ITB)	The Application of Supply Chain Risk Management Assessment In Small- Scale Fisheries In Bangka Belitung, Indonesia Using Probabilistic Risk Analysis (Pra) Method	954
9	14.30	14.40	10	Daniel Tansil, Ira Fachira (ITB)	The Impact of Product Review Videos (Communication Style) On Youtube Towards Generation Z Perceived Transparency And Credibility In Electronic Product Purchase Intention	960

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Reducing Waste in Coated Kraft Paper Production at CV. MXX by Adopting Lean Operation Method

Claresta Gianto¹, and Liane Okdinawati²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

This research presents a study focused on reducing coated kraft paper waste at CV. MXX through the adoption of lean operation methods. The objective of this research is to find the root cause of the high waste percentage in CV. MXX production process and suggest the appropriate solution for waste reduction. The problem faced by CV. MXX has a high waste rate in the production process. According to the CV. MXX owner's observation, waste product in CV. MXX has reached a staggering 9% of the total production volume. This number is relatively high, as it can reach up to 7 tons of waste daily, which translates into IDR 64,000,000 of loss value. This research adopts a mixed-methods approach, combining quantitative data analysis and qualitative observations. Statistical Process Control (SPC) charts are utilized for quality measurement then further analysed with the rule of seven for control charts. The data collection indicates that the waste generation is triggered by unstandardized operations, lack of quality control, and large product variability. Overall, this research is expected to give sustainable suggestions in the effort of waste reduction, production efficiency, product quality, and staff involvement in waste reduction initiatives. Based on the analysis, this paper suggests increasing control in product quality by establishing a formal and systematic Standard Operating Procedure (SOP), also an additional monitoring phase in every major production stage.

Keywords: Lean Operation, Waste Reduction, SPC, Rule of Seven, SOP

I. INTRODUCTION

Kraft paper is thin cardboard with excellent tear resistance and strength. Primarily used in the packaging industry, it is usually coated or laminated in polyethylene (PE) or commonly known as plastic that adds water-resistant value, which increases its durability and versatility. The market of coated kraft paper packaging was valued at \$4.1 Billion in 2022 and is expected to expand at the rate of CAGR 4.8% from 2022 to 2029, reaching \$5.98 Billion by 2029 (Data Bridge Market Research, 2021). Some drivers in the global coated kraft paper industry include increased demand in the packaging industry, food sector, and gift wrapping.

However, kraft paper that has been coated with polyethylene (PE) cannot be recycled continuously. Although coated kraft paper is non-eco-friendly, the industry keeps growing at a significant rate, reaching a CAGR of 4.8% from 2022 to 2029, greater than the general kraft paper industry itself (CAGR of 3.5%) (Maximize Market Research, 2021). This fact shows that increasing efficiency in the coated kraft paper production and production process is vital since reducing the waste in coated kraft paper production is directly proportional to reducing non-biodegradable waste. Moreover, an increase in production efficiency is highly regarded by the production company itself. As a company with perfect market competitiveness, cost leadership becomes one of the most important aspects to gain dominance in the market (Chen et al., 2022). Cost leadership is often achieved through continuous improvement (Kharub, et al., 2019), as companies strive to improve processes and reduce costs to offer lower prices to customers.

CV. MXX is a small-medium company that operates in the field of packaging goods, specifically in coated kraft paper that is mainly used for food packaging. As a business with intense market competition, CV. MXX has the objective to persist in the business and the vision to be top of mind for coated kraft paper producers. In order to realize their objectives, CV. MXX has to consistently deliver the best-value products while maintaining sufficient profit margin for the company's growth. Every day, the company can produce up to 115.000 kilos of ready-to-use coated kraft paper products. This is equal to around 12,500,000 pieces of paper that are valued at over IDR 1,041,000,000 in sales.

As quoted from CV. MXX owner distress, CV. MXX faces the problem of production error that leads to a high amount of production waste. Minor yet continuous errors in the production process identify the waste problem in CV. MXX. CV. MXX's owner admitted that the factory workers often mistakenly place the paper sheets so that the final cut is smaller than it should be. For that reason, as a follow-up initiative, factory workers often intentionally cut the paper bigger than it should be and then do the cutting process again so that the paper is at the correct size. CV. MXX waste problems fall in the waste products category. According to a statement from the

owner, the amount of waste reached 8%-9% of total production. This number is relatively high according to the CV.MXX owner, as it can reach up to 7 tons of waste daily, which is valued at around IDR 64,000,000. Production waste will disrupt the company's goal of profit maximization; therefore, the company management is eager to reduce the error and waste level to thrive in the market.

II. LITERATURE REVIEW

Coated Kraft Paper Production

The term "Kraft" was used after the German term "Kraft" which means strength. Nowadays the paper is often modified by coating and bleaching process to comply with customer demand on packaging aesthetics and functionality (Deshwal et al., 2019). In the coated kraft paper production process, quality control is important. Various tests are performed to make sure the paper meets the required standards. The standards included basis weight, thickness, coating, gloss, and smoothness (Madeira et al., 2018).

Lean Method

One of the most effective strategies to improve process capability, reduce defects, and eliminate waste is lean manufacturing. Lean producers aim for perfection, meaning no waste, no faulty components, no inventory, and only value-added activities. Seven categories of waste, which include overproduction, queues, transportation, inventory, motion, overprocessing, and defective products were identified by Taiichi Ohno. (Heizer et al., 2017).

DMAIC

From an industry perspective, DMAIC is the most successful framework to be used in implementing lean operations. Studies have shown that Six Sigma can help companies achieve significant improvements in areas such as increased profitability, quality improvement, and increased efficiency (Yadav et al., 2019). The Six Sigma tool complemented by the DMAIC framework enables a systematic approach to process improvement to identify and eliminate the root causes of defects (Eshraghi, 2020). The DMAIC framework consist of the following stages:

1. Define: It is used to pinpoint the project objective and provide a target for improvement by observation and deciding the most appropriate project scope (C.R. & Thakkar, 2019). The defined objective must be SMART and researchers should identify the process problem, owner, stakeholders, and customers at this phase (González, 2016).
2. Measure: This phase is mainly focused on collecting and analysing data. All processed data must illustrate the real situation in the field (NEDRA et al., 2019). One of the most effective and dependable tools for measuring in a comparative term is by using the statistical process control (SPC).
3. Analyze: In this stage, researcher look at issues that arise from a variety of elements, including people, equipment, materials, work practices, the environment, and measurements made to minimize the number of faulty products that are produced (Ishak & Elizabeth Zalukhu, 2020).
4. Improve: It is utilized to create and put into action a solution to the issue. During this phase, it is necessary to outline any potential obstacles in executing the improvement(s) (Kumar et al., 2021). In a research study in Peru, one of the tools utilized for improvement is the 5S (Seiri, Seiton, Seiso, Seiketsu and Shitsuke) method. 5S combined with work standardization is an effective method to reduce production waste (Kaneku-Orbegozo et al., 2019).
5. Control: This stage includes process standardization using standard operating procedures (SOP) and work instructions (WI) (Rahman et al., 2018). The standard operating procedure is an implementation of the work standardization which was mentioned in research by (Kaneku-Orbegozo et al., 2019), which will work effectively with the 5S method implemented in the Improve phase.

Standard Operating Procedure

The standard operating procedure is a formulation of rules, assignments, evaluation, and follow-up processes that reduce process waste and unnecessary redundancy (Manich, 2015). However, the implementation and efficiency of SOPs can be affected by a number of variables, including the SOPs' accessibility and clarity, the staff's training and adherence, and their capacity to adapt to changing conditions (Eshraghi, 2020).

III. RESEARCH METHODOLOGY

To fulfil the research purpose in a qualitative and quantitative manner, researcher will start with problem identification, followed by gathering relevant theoretical foundations, data collection, data processing, and end with a conclusion and recommendation. Figure 1. Research Method Diagram is a diagram that represents the research methodology.

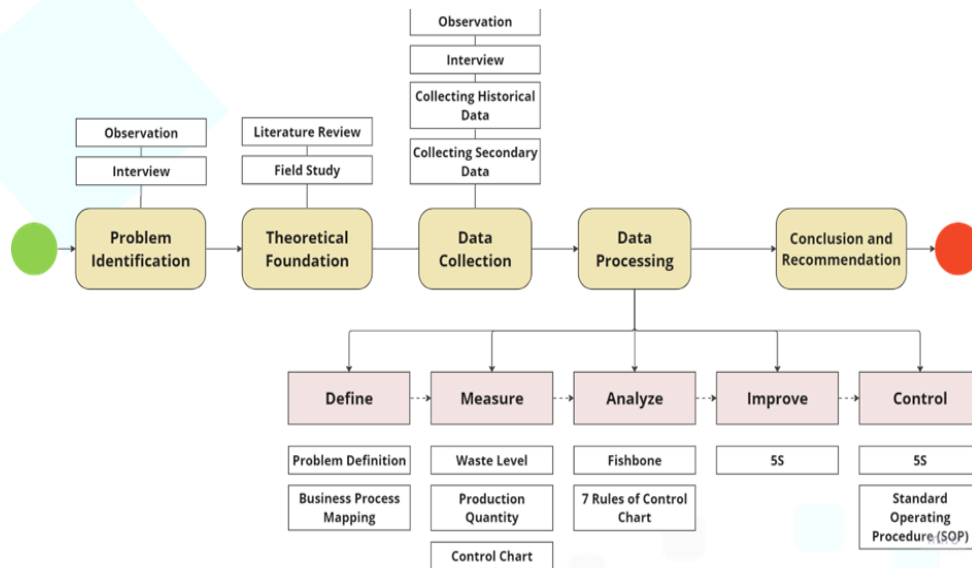


Figure 1. Research Method Diagram

IV. RESULT / FINDING

Define

The type of waste in CV. MXX which the researcher aims to reduce falls into the waste product category, referring to the mentioned problem statement by the CV. MXX Director herself. Moreover, the waste product of CV. MXX is further segmented into several types of waste, namely plastic pellets, paper tubes and uncoated kraft paper, sack, bagor sack, and coated kraft paper waste.

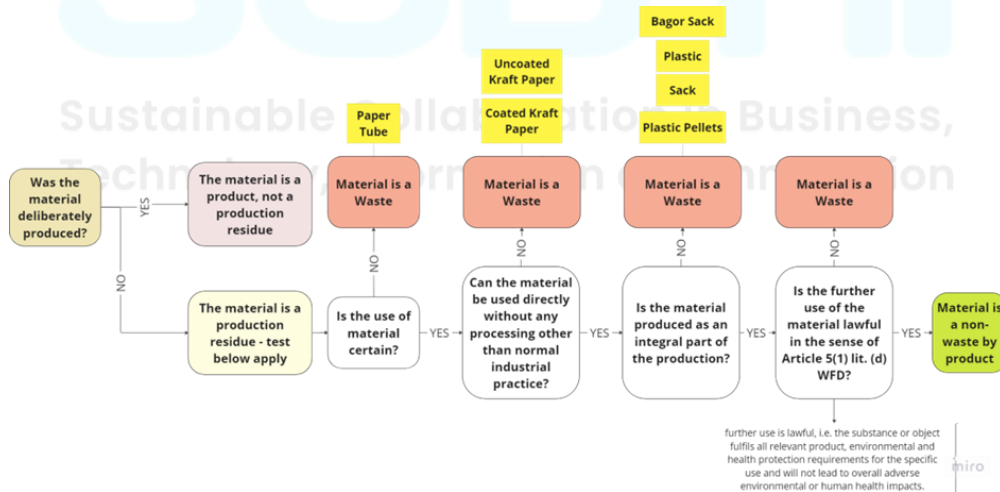


Figure 2. CPA Decision Tree for By-Product Test

Can be observed in Figure 2. CPA Decision Tree for By-Product Test that all seven types of products can be regarded as production waste. Furthermore, the researcher measures the waste distribution from each of the waste segments. Table 1. Type of Production Waste in CV. MXX measures the data of CV. MXX production waste in 6 months period (July-December 2022).

Table 1. Type of Production Waste in CV. MXX

Types of Production Waste in CV. MXX		
Type of Waste	Weight (kg)	%
Plastic pellets	4,143	0.29%
Paper tube and uncoated kraft paper	139,010	9.72%

Sack	12,086	0.84%
Bagor Sack	639	0.04%
Plastic	489	0.03%
Coated kraft paper waste	1,273,950	89.07%
Grand Total	1,430,317	

Type of Production Waste in CV. MXX

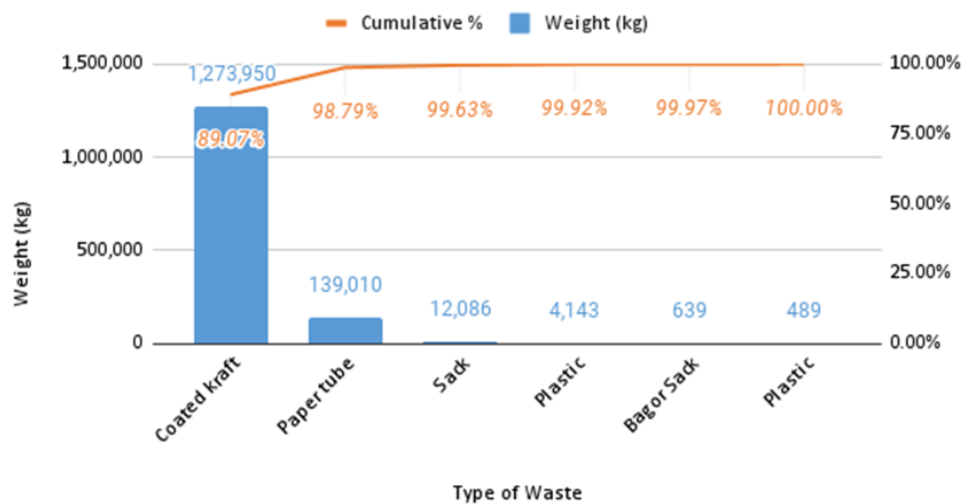


Figure 3. Pareto Chart for Type of Production Waste in CV. MXX

The coated kraft paper waste contributes to almost 90% of the total production waste. The Pareto chart results evidently align with the Pareto 80-20 rule, which states 20% of causes account for about 80% of the consequences for many outcomes. For that reason, researcher construct a business process mapping to map this 20% of causes that generates more than 80% of production waste in the facility.

Process Mapping

After identifying that coated kraft paper waste account for almost 90% of the overall production waste, researcher construct a process mapping to map where in the production stages the coated kraft paper waste is generated. The process mapping for CV. MXX production process starts by identifying the major stages and subprocesses. Since the research is focused on the waste analysis of CV. MXX production process, researcher maps the waste generated in every major stage of the production flow. Figure 4. Process Mapping of CV. MXX Coated Kraft Paper Production Process visualizes the process mapping of CV. MXX coated kraft paper production.

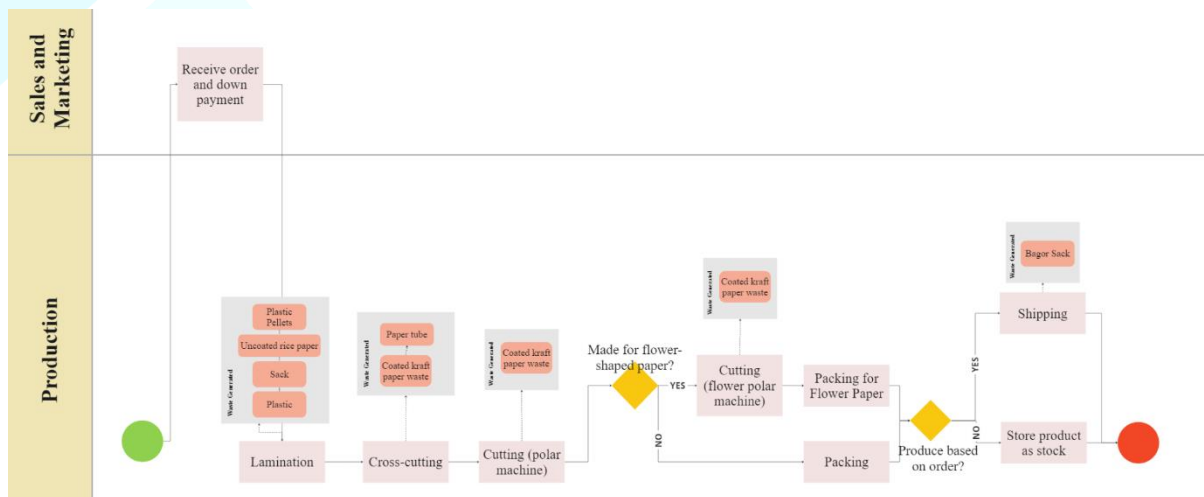


Figure 4. Process Mapping of CV. MXX Coated Kraft Paper Production Process

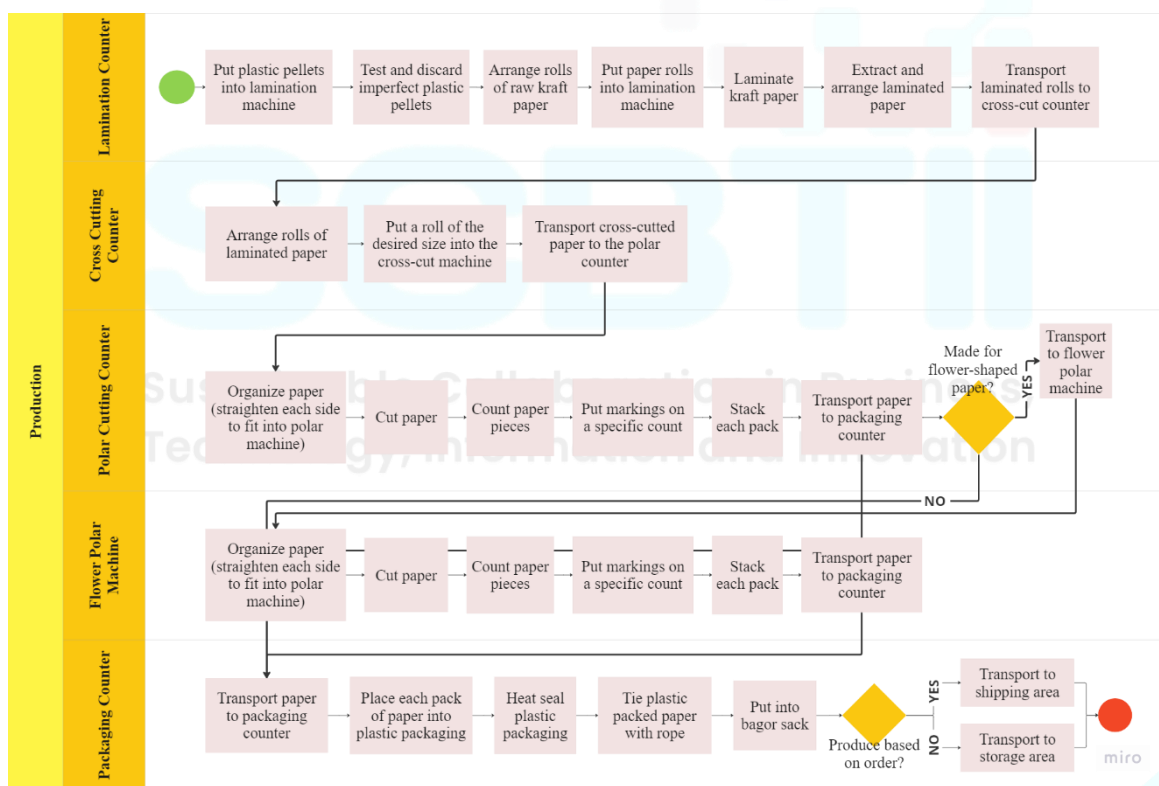


Figure 5. Sub-Process Mapping of CV. MXX Coated Kraft Paper Production Process

Based Figure 5. Sub-Process Mapping of CV. MXX Coated Kraft Paper Production Process, there are six main stages of the production process, namely:

1. Lamination: The lamination stage includes coating kraft paper with PE coating by laminating machine. The portion of all the waste combined contributes to around 10% to the overall weight of waste products.
2. Cross-cutting: The paper is trimmed and cut into specific dimensions based on customer requirements or predetermined sizes. Operators will input the desired size into the machine system and the machine will cut accordingly. To get the desired outcomes, a number of settings are set during the cutting process. The cutting speed, blade pressure, cutting depth, and blade sharpness are some of these factors. Errors that occur in the cross-cutting stage are fatal because it will lead to error in the following stage (polar cutting).
3. Cutting (polar machine): In the polar machine, cross-cutted kraft paper is being cut into smaller pieces. Big paper sheets that come with 28 standard sizes are further cut into various sizes according to customer order. For orders in rectangular or square shapes, papers from the cross-cutting phase only have to undergo one polar cutting. Meanwhile, for orders in flower-shaped pieces, kraft paper must undergo two

polar cutting phases. There are 3 standard sizes for these flower papers and 13 sizes for the rectangular coated kraft paper.

4. Packing: Packing involves organizing the packaged sheets into appropriate units or transportation and handling. Kraft paper is packaged into clear plastic packaging and sealed with a heat or impulse sealer. The plastic packaging is printed with information and brands in accordance with customer requests.
5. Shipping or Storing: After going through the packing process, the paper is either shipped to buyers or stored as stock.

Measure

The Measure phase focuses on thorough data collection and analysis techniques in order to gain precise and trustworthy data regarding trash quantities, varieties, and sources. Researcher establish defined goals and certain metrics for measuring waste, such as weight, volume, or percentage, and other factors that relate to waste generation.

Products Variation

In lean manufacturing principles, product variation is one of the main causes of waste generation (Heizer et al., 2017). Based on the company's historical data there are 295 product variants the company produces. These variants are differentiated by the product size, brands, and content (pieces per pack). Meanwhile, differentiated by only size, there are 28 variations in the cross-cutting stage and 16 variations in the polar-cutting stage.

Waste Level

Table 2. Waste Level

Waste Level		
	Weight (kg)	Sales Price / kg
Total Coated Kraft Paper Production	13,581,094	Rp9,820
Total Coated Kraft Paper Waste	1,273,950	Rp750
Waste level	9.38%	

Waste level = $(\Sigma \text{Coated Kraft Paper Production Volume}) / (\Sigma \text{Coated Kraft Paper Waste Volume})$

Table 3. Waste Quantity and Production Amount

Waste and Production Amount			
Month	Waste SUM of QTY (KG)	Production SUM of QTY (KG)	%
7	198,310	2,217,574	8.94%
8	184,170	2,036,298	9.04%
9	219,610	2,328,417	9.43%
10	248,040	2,437,781	10.17%
11	215,190	2,350,417	9.16%
12	208,630	2,210,607	9.44%
Grand Total	1,273,950	13,581,094	9.38%

The waste value is the highest in month 10, reaching 248,040 kg of waste product. In the same month, the waste percentage was also the highest. Following month 10, waste percentages decline but not consistently. The lowest waste percentage is in month 7, reaching 8.94%, amounting to 198,310 kg.

One absolute factor that contributes to the total coated kraft paper waste is the paper-cutting margin. In the cross-cutting section, kraft papers are cut into big sheets and transported to be cut into smaller pieces in the polar cutting section. The cutting margin represents the distance between the actual cut and the intended dimensions of the paper.

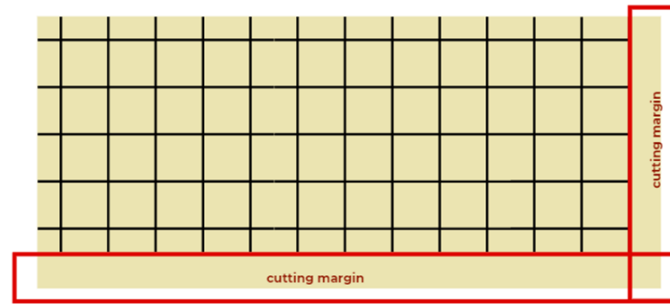


Figure 6. Illustration of Paper Cutting Margin

Table 4. Waste from Paper Margin Distribution

Cross-cut size (cm)	Cross-cut Area (cm ²)	Polar Size	Σ Plano (ply)	Polar Area (cm ²)	Output (pcs)	Max Amount	Margin	Waste (cm ²)	Σ Waste (cm ²)	Σ Waste (kg)	%
110x108	11880	25x25	17000	625	19.008	19	0.068	42.5	722500	10.8375	0.0051%
		27x27	2690200	729	16.2962963	16	0.356296296	259.74	698752548	10481.28822	4.8973%
110x112	12320	27x27	70400	729	16.89986283	16	0.959862826	699.74	49261696	738.92544	0.3453%
		25x25	9000	625	17.76	17	0.82	512.5	4612500	69.1875	0.0323%
111x100	11100	25x25	7500	875	13.32	13	0.38	332.5	2493750	37.40625	0.0175%
111x105	11655	25x35	93400	972	12.33333333	12	0.393333333	382.32	35708688	535.63032	0.2503%
111x108	11988	27x36	32422920	999	12	12	0.06	59.94	1943429825	29151.44737	13.621%
		27.5x37.5	56250	1031.25	11.62472727	11	0.684727273	706.125	39719531.25	595.7929687	0.2784%
111x112	11988	30x40	6240	1200	9.99	9	1.05	1260	7862400	117.936	0.0551%
		28x28	914250	784	15.85714286	15	0.917142857	719.04	657382320	9860.7348	4.6074%
111x120	13320	30x40	35400	1200	11.1	11	0.16	192	6796800	101.952	0.0476%
114x108	12312	28x38	46890	1064	11.57142857	11	0.631428571	671.84	31502577.6	472.538664	0.2208%
114x112	12768	24x35	750	840	15.2	15	0.26	218.4	163800	2.457	0.0011%
		28x28	3600	784	16.28571429	16	0.345714286	271.04	975744	14.63616	0.0068%
114x120	12768	28x38	20417705	1064	12	12	0.06	63.84	1303466287	19551.99431	9.1356%
		30x38	2078100	1140	12	12	0.06	68.4	142142040	2132.1306	0.9962%
118x108	12744	27x27	1102230	729	17.48148148	17	0.541481481	394.74	435094270.2	6526.414053	3.0494%
		27x36	27440990	972	13.11111111	13	0.171111111	166.32	4563985457	68459.78185	31.987%
118x111	12744	27x37	1026275	999	12.75675676	12	0.816756757	815.94	837378823.5	12560.68235	5.8689%
		27x27	15820	729	17.96707819	17	1.027078189	748.74	11845066.8	177.676002	0.0830%
118x114	13452	30x38	5280	1140	11.8	11	0.86	980.4	5176512	77.64768	0.0363%
118x117	13806	30x39	8750	1170	11.8	11	0.86	1006.2	8804250	132.06375	0.0617%
118x120	14160	30x40	50160	1200	11.8	11	0.86	1032	51765120	776.4768	0.3628%
120x100	12000	20x20	5250	400	30	30	0.06	24	126000	1.89	0.0009%
		25x25	335650	625	19.2	19	0.26	162.5	54543125	818.146875	0.3823%
120x102	12240	25x34	25500	850	14.4	14	0.46	391	9970500	149.5575	0.0699%
		25x35	7250	875	13.98857143	13	1.048571429	917.5	6651875	99.778125	0.0466%
120x105	12600	24x35	1900940	840	15	15	0.06	50.4	95807376	1437.11064	0.6715%
		25x35	159500	875	14.4	14	0.46	402.5	64198750	962.98125	0.4499%
120x108	12960	27x27	7500	729	17.77777778	17	0.837777778	610.74	4580550	68.70825	0.0321%
120x111	13320	30x37	161550	1110	12	12	0.06	66.6	10759230	161.38845	0.0754%
120x112.5	13500	27.5x37.5	7409790	1031.25	13.09090909	13	0.150909091	155.625	1153148569	17297.22853	8.082%
		28x38	239230	1064	12.68796992	12	0.747969925	795.84	190388803.2	2855.832048	1.3344%
120x114	13680	28.5x40	29820	1140	12	12	0.06	68.4	2039688	30.59532	0.0143%
		30x38	1722250	1140	12	12	0.06	68.4	117801900	1767.0285	0.8256%
120x117	14040	30x39	5412750	1170	12	12	0.06	70.2	379975050	5699.62575	2.6631%
120x118	14160	30x40	18150	1200	11.8	11	0.86	1032	18730800	280.962	0.1313%
120x120	14400	20x20	76950	400	36	36	0.06	24	1846800	27.702	0.0129%
125x100	14400	30x40	10801625	1200	12	12	0.06	72	777717000	11665.755	5.4508%
		25x25	1394835	625	20	20	0.06	37.5	52306312.5	784.5946875	0.3666%
125x102	12750	25x34	3513500	850	15	15	0.06	51	179188500	2687.8275	1.2559%
125x105	13125	25x35	5889750	875	15	15	0.06	52.5	309211875	4638.178125	2.1672%
Grand Total										214,020.53	100%

Output (pcs) = cross cut area ÷ polar area

Max Amount = roundup(cross cut area ÷ polar area)

Tolerance = 6%

Margin = output - max amount + Tolerance

Waste (cm²) = margin × polar area

ΣWaste (cm²) (x1) = waste × ΣPlano (n)

Average paper weight per area = 0.000015 kg/ [cm] ^2

ΣWaste (kg) = x1 × 0.000015 kg/ [cm] ^2

% = (%n) / (Σ%)

Assuming that all paper products are cut into rectangular or square pieces, can be observed from Table 7. Waste from Paper Margin Distribution, the total waste generated from rectangular and squared paper cutting margin reaches 214,020.53 kg, which contributes to 16.8% of the total coated kraft paper waste.

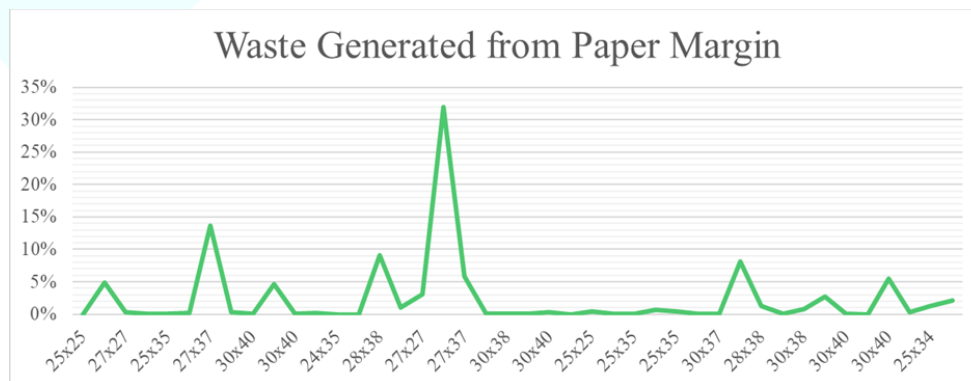


Figure 7. Waste from Paper Margin Distribution Line Chart

The highest contributor is paper size 27 x 36 cm with 31.98% contribution of the total waste from paper cutting margin. Followed by paper sizes 27 x 37 cm, 28 x 38 cm, and 27.5x37.5 cm which in total contribute to 62.8% of the total waste from the paper cutting trims. This means that 25% of paper sizes contribute to more than 60% of waste generated by cutting margins. However, the highest cutting margin contributor per sheets of paper is generated by the paper sizes in Table 4.9 Product Size and Cutting Margin.

Table 5. Product Size and Cutting Margin

Plano Size (cm)	Polar Size (cm)	Margin (cm2)
110x112	27x27	0.959862826
111x112	28x28	0.917142857
118x108	27x37	0.816756757
118x111	27x27	1.027078189
118x114	30x38	0.86
118x117	30x39	0.86
118x120	30x40	0.86
120x102	25x35	1.048571429
120x108	27x27	0.837777778
120x112.5	28x38	0.747969925
120x118	30x40	0.86

Related to the paper cutting margin, the flower-shaped paper must go through two cutting phases instead of one. From the company standard, the flower-shaped paper will have an additional 20% cutting margin. Flower-shaped paper comes in three standard sizes, which are 25 x 25cm, 27 x 27cm, and 28 x 28cm. Based on the data from Table 5. Product Size and Cutting Margin, the additional margin from polar cutting which generated flower-shaped products amounts to 18,461.57 kg. Adding up the total waste product from the standardized cutting process in the polar section, researchers measure a total of 232,482.10 kg of coated kraft paper waste. This contributes to 18.2% of the total coated kraft paper waste.

The company set the standard cutting margin to be 3% for squared and rectangular-shaped paper, and 23% for flower-shaped paper. The 23% margin results from a 3% cutting margin when the paper is cut into squares and an additional 20% margin when the paper is shaped into flower shapes. These cutting margin tolerances arise from the polar cutting machine requirements. If all paper sizes are restricted to this cutting margin tolerance, the waste level can fall to 3.75% of the overall production.

Waste Value

Known variables:

Average paper weight per area (x1) = 0.000009002491761 kg/ [cm] ^2

Average price per area (x2) = Rp 0.08840675584 / [cm] ^2

Average price/kg = x2/x1

= Rp 9,820 /kg

Waste sales value = Rp 750/kg

Table 6. Sales Value of Coated Kraft Paper Waste vs Marketed Products

Month	Waste (kg)	Product value	Waste sales value	Loss value/month	Loss value/day
7	198,310	Rp1,947,454,573	Rp148,732,500	Rp1,798,722,073	Rp59,957,402
8	184,170	Rp1,808,596,181	Rp138,127,500	Rp1,670,468,681	Rp55,682,289
9	219,610	Rp2,156,625,984	Rp164,707,500	Rp1,991,918,484	Rp66,397,283
10	248,040	Rp2,435,815,805	Rp 186,030,000	Rp2,249,785,805	Rp74,992,860
11	215,190	Rp2,113,220,461	Rp161,392,500	Rp1,951,827,961	Rp65,060,932
12	208,630	Rp2,048,799,595	Rp156,472,500	Rp1,892,327,095	Rp63,077,570
Average					Rp64,194,723

Product value = Σ Waste (n) \times Average price/kg

Waste sales value = Σ Waste (n) \times Waste sales value

Loss value / month = Product value - sales value

Loss value / day = Loss value / month \div 30

Coated kraft paper waste value in the market is Rp 750/kg, meanwhile the market value for usable kraft paper is Rp 9.820/kg. Researcher calculate the loss value from waste generation by subtracting the usable value and the waste value. Can be observed in Table 6. Sales Value of Coated Kraft Paper Waste vs Marketed Products, CV. MXX experienced up to Rp Rp70,539,365 each day from their product waste, with an average of Rp 64,194,723 loss value per day.

Control Chart

The control chart utilizes the waste quantity data of CV. MXX in the scope of 6-month data (July-December 2022). Researcher utilize X-bar control charts to monitor process performance in continuous data. From the historical data, researchers divide the data into 32 sub-groups with four samples in each sub-group. 32 sub-groups are chosen based on the 6-month historical data, where waste output on a specific day was recorded, and there are 4 batches of production each day.

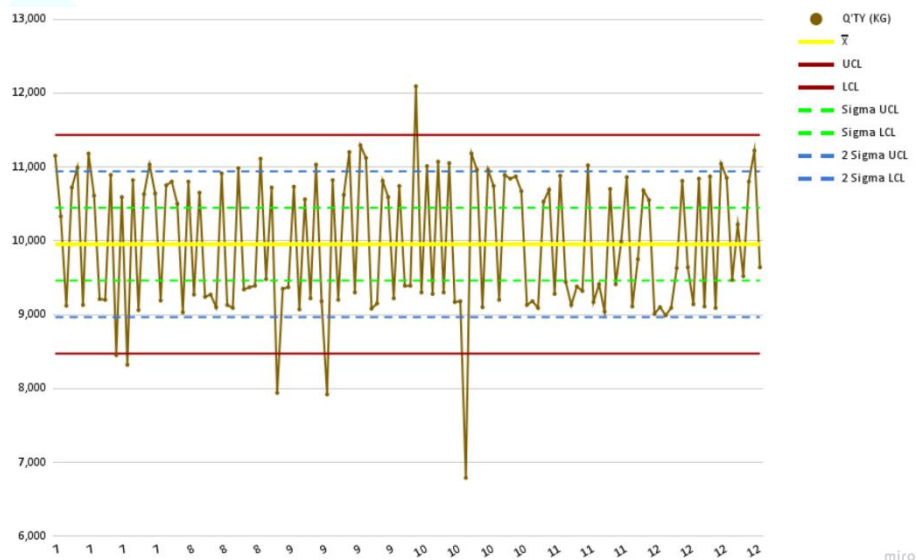


Figure 8. Control Chart of CV. MXX Waste Output

There are 32 days in the time interval that are suitable for the control chart measurement. The following describes the details of the control chart:

Observation in Sample (n) = 4

$A_2 = 0.729$

$$\begin{aligned}\bar{\bar{X}} &= (\sum \bar{x})/k \\ &= 9,953\end{aligned}$$

$$\begin{aligned}UCL &= \bar{\bar{X}} + (A_2 * \bar{R}) \\ &= 11,433\end{aligned}$$

$$\begin{aligned}LCL &= \bar{\bar{X}} - (A_2 * \bar{R}) \\ &= 8,473\end{aligned}$$

The UCL and LCL measured above indicates 3 sigma (σ) limits of the control chart. Meanwhile the sigma and two sigma limits are identified by dividing the 3σ margin. Researcher found the $2(\sigma)$ limit of; UCL = 10,939 kg and LCL = 8,966 kg, meanwhile the σ limit of; UCL = 10,446 kg and LCL = 9,459 kg. With the established measurement, researcher can visualize the trend of CV. MXX waste level over time.

Analyze

The Analysis stage of this research will examine the Analyze stage and clarify important analytical techniques and procedures used to identify opportunities for process optimization and waste minimization. In this stage, researcher will analyze the control chart utilizing 7 rules of the control chart. At the end of the Analyze stage researcher will construct the fishbone diagram to find the root cause of the problem that was previously calculated in the Measure stage.

Control Chart Analysis

Gaining an understanding of process variation and locating possible waste reasons requires the use of the seven rules of control charts. These seven rules in control chart analysis assist in identifying patterns or data points that dramatically differ from predicted behavior, suggesting the possibility of unique causes that call for additional research. If one or more of the seven indicators above are identified, the process visualized in the control chart will be described as out of control.

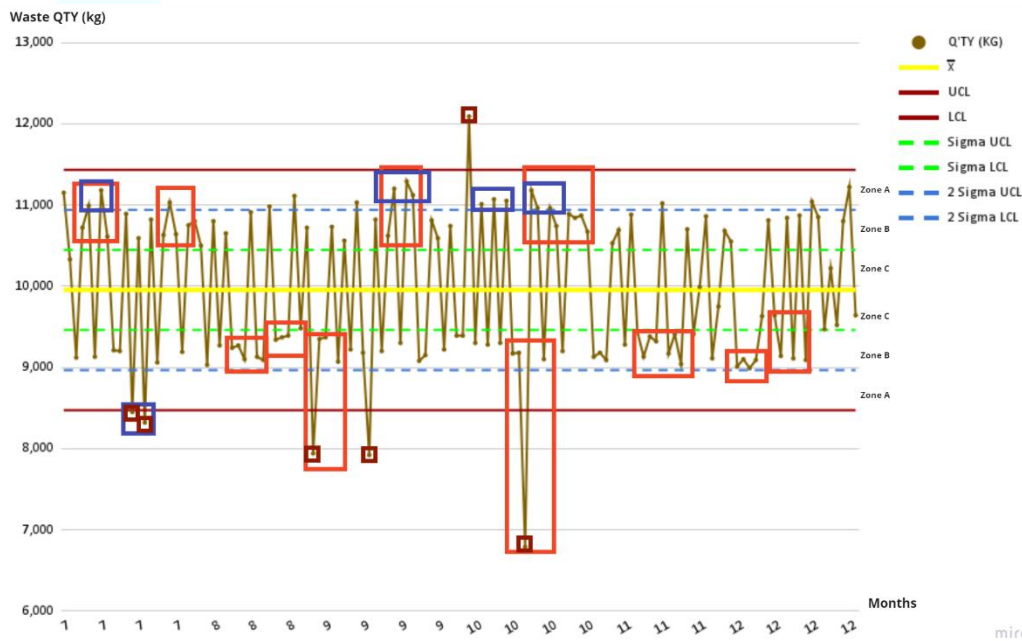


Figure 9. Control Chart of CV. MXX Waste Output Analysis

Measurement:

Observation in Sample (n) = 4

$$A2 = 0.729$$

$$\bar{\bar{X}} = (\sum x) / k$$

$$= 9,953$$

$$UCL = \bar{\bar{X}} + (A2 * R)$$

$$= 11,433 \rightarrow 3\sigma$$

$$LCL = \bar{\bar{X}} - (A2 * R)$$

$$= 8,473 \rightarrow 3\sigma$$

$$2\sigma UCL = 10,939$$

$$2\sigma LCL = 8,966$$

$$\sigma UCL = 10,446$$

$$\sigma LCL = 9,459$$

Figure 9. Control Chart of CV. MXX Waste Output Analysis indicates the process in CV. MXX is out of control. This conclusion is derived from the alignment with rules 1, 2, and 5 from the 7 rules of control chart. Rectangular marks on the chart indicate deviation in the data which makes the overall process considered out of control or unstable. The maroon-colored marks indicate the alignment with rule 1, while red-rectangular marks for rule 2, and blue-rectangular marks for rule 5.

Rule number one states that if a data point falls outside the three-standard deviation (σ) limit, there is a significant variation in the process. There are 6 points that fall outside the 3σ control limit, with one point indicating a sudden increase in waste and five points indicating a sudden decrease in waste. Traced back from the company's historical data, the sudden increase in waste happened in month 10, where production amounts are the highest, reaching up to 2,437,781 kg compared to the average monthly production amount of 2,263,516 kg. Waste level is also the highest in month 10, reaching up to 10.17%. Researchers analyze whether this waste fluctuation has any correlation with paper waste from trimmings or margin. Papers sizes with highest cutting margin are listed in Table 5. Product Size and Cutting Margin, evidently these paper sizes production quantity is the highest in month 10. Therefore, it can be formulated that the company needs to pay great attention to these particular paper sizes and implement an effort to reduce waste generated from cutting margins.

Table 7. Total Production of Paper Sizes with Highest Cutting Margin

Month	UK. Plano (cm)	UK Polar (cm)	Total (kg)	Grand Total (kg)
7	111x112	28x28	13622	19,061
	120x112.5	28x38	5439	
8	111x112	28x28	19068	22,178
	120x102	25x35	710	
	120x112.5	28x38	2400	
	111x112	28x28	14909	
9	118x108	27x37	25197	49,235
	118x114	30x38	3435	
	120x112.5	28x38	5694	
10	111x112	28x28	11642	62,359
	118x108	27x37	34644	
	118x120	30x40	6288	
	120x105	25x35	1621	
	120x108	27x27	742	
	120x112.5	28x38	5380	
	120x118	30x40	2042	
11	110x112	27x27	6985	22,472
	111x112	28x28	10263	
	118x111	27x27	1736	
	118x117	30x39	1020	
12	120x112.5	28x38	2468	35,195
	111x112	28x28	16932	
	118x108	27x37	13575	
	120x112.5	28x38	4688	

Table 7. Total Production of Paper Sizes with Highest Cutting Margin depicts that Month 10 contributes to 62,359 kg or 30% of the production amount. Paper sizes in Table 7. Total Production of Paper Sizes with Highest Cutting Margin have mandatory trimming or cutting margin at 0.75-1.05 [cm] ² /paper sheets. When all the paper cutting margin is as high as 1 [cm] ² /paper sheets, waste level can reach up to 2,020,980.27 kg, which is at 158% the current waste level. Therefore, regulation or standardization to reduce waste amount from cutting margin is essential.

Furthermore, rule number two suggests that four out of every five consecutive data points are outside the one sigma limit. There are around 12 cases that depict this trend in the control chart, those cases spread rather evenly from month-to-month, indicating the need to examine some of the existing procedures and implement remedial measures to cut waste or deal with the root cause. Finally, according to rule number five, the process is out of control because there are two out of three consecutive points that fall beyond the 2σ limit. When two out of three data points are outside of the two sigma bounds, the process is more variable than is normal. CV. MXX facilities may experience higher waste levels as a result of this increased variability. This analysis validated that the company's existing product variability is in fact a problem that needs to be tackled to minimize the overall waste level, currently at an average of 9.39% of the total production volume. Regular monitoring and analysis of the control charts can help track the effectiveness of these measures and provide insights for further enhancements.

Fishbone Diagram

The fishbone diagram is utilized to analyze and determine the underlying reason of the problem, which has previously been calculated in the measure phase. The primary problem statement "High Waste Rate in CV. MXX Production Process" is shown in the diagram's center or fish "head". The diagram is divided into broad divisions, or "bones," which stand in for various waste-causing factors.

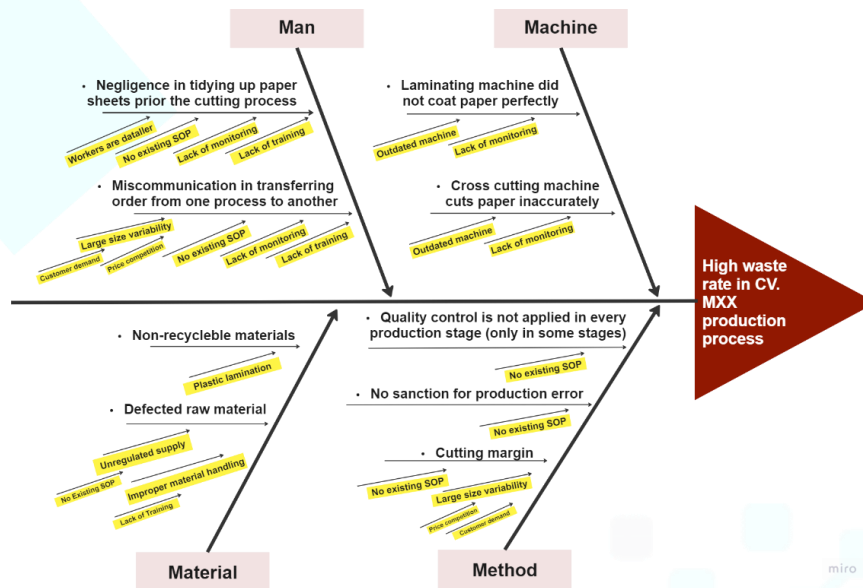


Figure 10. Fishbone Diagram of CV. MXX Waste Problem

The branches of the fish emphasize some factors that contribute to the waste level. The information is determined based on qualitative data obtained from interviews, discussions with some of the company's key stakeholders and staff members, and observation. The production flow will be described as "Method", human error as "Man", machine error as "Machine", and finally material handling error as "Material". One branch emphasizes the "Material" component and is added by observing historical data and also interview findings.

Material

Coated kraft paper that is not perfectly coated with plastic lamination, will be discarded and directly contributed to the measured waste level. Considering that the problem happens nearly on a daily basis, it is important for all stakeholders in the production facility to address this issue in order to realize the waste reduction effort. CV. MXX did not have the capacity to recycle this waste product, therefore any coated kraft paper waste brings less to no economic value. CV. MXX does sell coated kraft paper waste to a nearby factory, however, as can be seen in Table 6. Sales Value of Coated Kraft Paper Waste vs Marketed Products, the value of coated kraft paper products significantly drops.

Method

Another branch focuses on the "Method" element, suggesting that some factors included in the waste generation are not applying quality control in all production stages, no sanction for production error, and cutting margins. Based on the process mapping in the Define stage and data from interviews quality control or monitoring is only applied in the polar cutting phase. This lack of monitoring or quality control is present because there is no standardized and formal SOP in the company. All quality standards are based on common understanding and past experience from senior workers. CV. MXX has not applied any sanction whenever their workers perform a production error. This issue is also related to the absence of standard operating procedure (SOP) in the company. Finally, based on the control chart and measured data, paper cutting margin became a methodical issue in the company. The paper cutting margin is triggered by market competition and customer demand. Some customers are more sensitive than others, so that the company purposefully adds the additional cutting margin in as precaution in case any error occurs, they will still be able to fix it by trimming some of the paper margin. However, this action is not standardized, therefore it contributes consistently to waste generation.

Man

The "Man" division emphasizes how employees' behaviors contribute to waste production. Higher waste levels are attributed to factors such as workers' negligence in tidying up paper sheets prior to the cutting process and miscommunication in transferring order. The worker's negligence is caused by lack of monitoring, lack of training, absence of standard operation procedure (SOP), and the fact that most workers are dataller or daily workers. This problem was mentioned frequently during interviews, as one of the major causes of process efficiency that lead to waste formation. Moreover, miscommunication in transferring orders is fatal, because admittedly, this is one of the main causes of a production error. Miscommunication can be caused by several factors, which are lack of training, lack of monitoring, no existing standard operating procedure (SOP), and product variability.






Machine

The fishbone diagram also has a branch for "Machine," recognizing the possibility that old or broken machinery could contribute to waste production. The extended branch in this section emphasized two factors, namely, imperfect coat by the laminating machine and inaccuracy in the cross-cut machine. As mentioned previously in the "Material" branch, imperfect lamination can lead to waste generation. This problem can be caused by two root causes, which are outdated machines and lack of monitoring. However, researcher did not find any complaint regarding outdated machinery in the lamination process. Therefore, lack of monitoring is most likely the underlying cause for this machine related problem.

Improve

In this stage, researcher will examine the waste reduction initiatives by highlighting essential improvement strategies, techniques, and concerns to provide a sustainable and applicable solution for the company by using the 5S analysis. However, the Improve phase will only analyse the Sort, Set in order, Shine, and Standardize phase of the 5S method, while the Sustain part will be discussed in the Control stage. This is because the Improve stage will focus on proposing systematic solutions to the company, as mentioned in the research structure and methodology. Based on the analysis and measurements that have been done earlier, below are the proposed solutions for CV. MXX to reduce its waste level.

Table 8. Proposed Solution

Problem	Solution	 Sort	 Set in Order	 Shine	 Standardize
1. Miscommunication in transferring order 2. Cutting Margin 	Pro-Trim	Sort product sizes with excessive cutting margin and high production complexity.	Implement clear labeling and signage for all product type according to different handling for each product type	Remove product that are produced from paper sizes: -110x112cm (27 x 27 cm) -111x 112 cm (28 x 28 cm) -118x108 cm (27 x 37 cm) -118x111 cm (27x27 cm) -118x114 cm (30x38 cm) -118x117 cm (30x39 cm) -118x120 cm (30x40 cm) -120x102 cm (25x35cm) -120x108 cm (27x27 cm) -120x112.5 cm (28x38 cm) -120x118 cm (30x40cm)	Standardize size variation, limit to 3% margin for rectangular and square shaped paper and 20% for flower-shaped paper.
1. Worker's negligence 2. Improper material handling	MXX Training Program	Select expertise that requires training	Establish training schedule, arrange facilities, standardize training procedures	Layoff underperforming employees	Formulate standard that indicated whether an employee is eligible for work
1. Worker negligence 2. Miscommunication 3. Imperfect lamination 4. Machine inaccuracy	MXX Monitoring	Sort activities that require intensive monitoring	Arrange workstations and equipment, define data gathering tools and metrics	Remove unnecessary items that complicate the monitoring process	Create KPI and sanction to workers that preforms below standard
1. Worker negligence 2. Miscommunication 3. No quality control 4. No sanction 5. Cutting margin	MXX SOP	Define areas that require formal SOP	Organize SOP repository, cross-referencing and linking, provide user guideline	Add or remove processes based on the existing, non formal SOP	Create formal document for SOP <i>miro</i>

Pro-Trim

"Pro-Trim" is a solution that aims to trim or reduce CV. MXX product variety, this solution is proposed to tackle the root cause of large product variability previously mentioned in Figure 4.9 Fishbone Diagram of CV. MXX Waste Problem. Below is the elaboration for "Pro-Trim" solution:

Sort: Sort product sizes with an excessive cutting-margin quantitative manner while analyzing processes with high production complexity in a qualitative manner.

Set in Order: Implement clear labelling and signage for all product types according to different handling for each product type. In order to reduce miscommunication and production error, managers should categorize and establish standardized labelling for different product types. The determinant of product type can be in terms of size, content, and brand.

Shine: In the Measure stage, researcher have found paper sizes that generated the most production waste. For the shine stage of this solution, researcher suggest removing product that are produced from paper sizes:

-110x112cm (27 x 27 cm)

-111x 112 cm (28 x 28 cm)

- 118x108 cm (27 x 37 cm)
- 118x111 cm (27x27 cm)
- 118x114 cm (30 x 38 cm)
- 118x117 cm (30 x 39 cm)
- 118x120 cm (30x40 cm)
- 120x102 cm (25x35cm)
- 120x108 cm (27x27 cm)
- 120x112.5 cm (28x38 cm)
- 120x118 cm (30x40cm)

Standardize: The company should standardize size variation by limiting the cutting margin to 3% for rectangular and square-shaped paper and 20% for flower-shaped paper. This standardization will be consulted continuously with the company Marketing Manager to avoid conflict with the market demand.

MXX Training Program

"MXX Training Program" solution aims to improve staff skills and knowledge regarding waste reduction techniques. The training program will be implemented during the initial stages of employee recruitment, where they will be accompanied by seniors and trained according to the standardized procedure. Below are the steps to implement the "MXX Training Program":

Sort: select expertise in the production process that requires training. In CV. MXX, major stages in the process, such as lamination, cross-cutting, polar cutting, and packing, should be provided with proper training.

Set in order: implement personalized training for each new employee. The company should establish training modules and key performance metrics that will be tested during the program. Moreover, the company should also set training schedules by making a timetable that specifies the dates, times, and lengths of each module or training session. Inform participants of the program in advance to assure their availability and dedication. Moreover, arranging training facilities and standardizing the training procedures become a part of this process.

Shine: to increase workforce quality, undisciplined, underperforming and uncommitted employees should be lay off.

Standardize: formulate a standard that indicates whether an employee is eligible for work. Standardization makes the training process more efficient and guarantees uniformity.

MXX Monitoring

"MXX Monitoring" solution is intended to enhance visibility, identify sources of waste, and enable data-driven decision-making for waste reduction efforts. Based on the fishbone diagram, this solution solves the root cause of some problems occurring in the facility, namely, workers negligence, miscommunication, improper laminating process, and inaccuracy in the cross-cutting phase. Below are the steps to implement "MXX Monitoring":

Sort: three major processes, namely the lamination, cross-cutting, and polar-cutting require intensive monitoring, while final quality control to ensure quality and conformity with customer order is suggested in the packaging process.

Set in order: in the set-in order phase, the company should arrange workstations and equipment in the facility in a way that promotes efficient workflow and minimizes unnecessary movement for ease in monitoring. Also, the tools and metric in data gathering are also essential to be defined beforehand.

Shine: remove unnecessary items that complicate the monitoring process and also remove variation from processes by taking action to any process error that is visible during the monitoring phase.

Standardize: creating KPI and sanctioning workers that perform below standard. The monitoring system needs to be supported by proper training and resources and integrated into everyday operations.

MXX SOP

"MXX SOP" solution strives to establish a formal, precise, detailed, and practical standard operating procedure. In the current state, the standard operating procedure is communicated informally from seniors to junior workers. This cannot ensure that all of the junior workers receive the same instruction, let alone expect them to repeat the "correct" process over time. Therefore, the formal standard operating procedure is essential, especially for a company with this production scale and sensitivity to inefficiency. Below are the steps to create "MXX SOP":

Sort: raw material handling, machine operation, quality control, maintenance, waste management, and any other vital procedures that cause waste production may be included in these processes. All the major processes of CV. MXX should be included in the SOP, especially the cutting and laminating process.

Set in order: In this phase the company should also organise SOP repositories, cross-referencing and linking, and provide user guidelines.

Shine: Add or remove processes based on the existing, non-formal SOP. Review the SOPs that have been prepared in-depth. Include all necessary parties, such as process owners, operators, quality assurance staff, and management, to confirm the precision and thoroughness of the procedures.

Standardize: Create formal documents for SOP in the form of business process mapping or working instruction. The process flow, necessary resources, equipment setup, safety precautions, quality checks, and waste reduction recommendations should all be well-defined. Make sure the instructions are clear and easy to understand while remaining detailed.

Control

Establishing control plans that specify the actions, responsibilities, and processes necessary to maintain waste reduction programs is one of the main goals of the Control stage. These plans serve to ensure that workers continuously follow the enhanced processes and standard operating procedures (SOPs) created during the Improve stage.

Table 9. Action Plan for Control



Pro-Trim	MXX Training Program	MXX Monitoring	Weekly SPC	MXX SOP
Input standardization to SOP as a guideline for coordination between production and marketing department.	Establish SOP for continuous training program	Create schedule and standard for monitoring purposes	Integrate weekly SPC in training program and SOP	Create performance report and update SOP annually <small>miro</small>

Standard Operating Procedure

SOPs offers a standardized list of directions and principles for carrying out duties. They make sure that procedures are followed precisely, minimizing variation and fostering uniformity in the calibre of outputs or results. All of the proposed solutions, namely Pro-Trim, MXX Training Program, MXX Monitoring, MXX SOP, and the additional control program, which is Weekly SPC, have to be formally standardized to maintain control. For the solution “Pro-Trim” the standard sizes in Table 10. Standard Sizes should be integrated in the SOP as a guideline for the sales and marketing team to offer to customers.

Table 10. Standard Sizes

Plano Size (cm)	Polar Size (cm)	Plano Size (cm)	Polar Size (cm)	Plano Size (cm)	Polar Size (cm)
110x108	25x25	114x108	28x38	120x100	20x20
	27x27	114x112	24x35		25x25
111x100	25x25		28x28	120x102	25x34
111x105	25x35		28x38	120x105	24x35
111x108	27x36	114x120	30x38		25x35
	27x37	118x108	27x27	120x111	30x37
	27.5x37.5		27x36	120x112.5	27.5x37.5
	30x40	125x100	25x25	120x114	28.5x40
111x120	30x40	125x102	25x34		30x38
		125x105	25x35	120x117	30x39
				120x120	20x20
					30x40 <small>miro</small>

Moreover, if the company wants to add a new size, the margin limit should be at 3% for square and rectangular-shaped paper and 20% for flower-shaped paper. Assuming that after implementing the solution, if coated kraft paper waste will only be generated from cutting margin tolerance, the total waste level will be at around 3.75%. This means a 5.64% reduction in the original waste level.

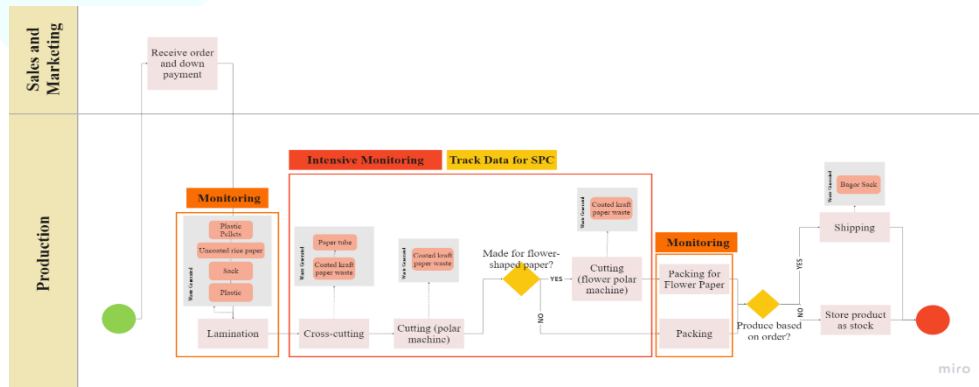


Figure 11. Renewed Process Mapping

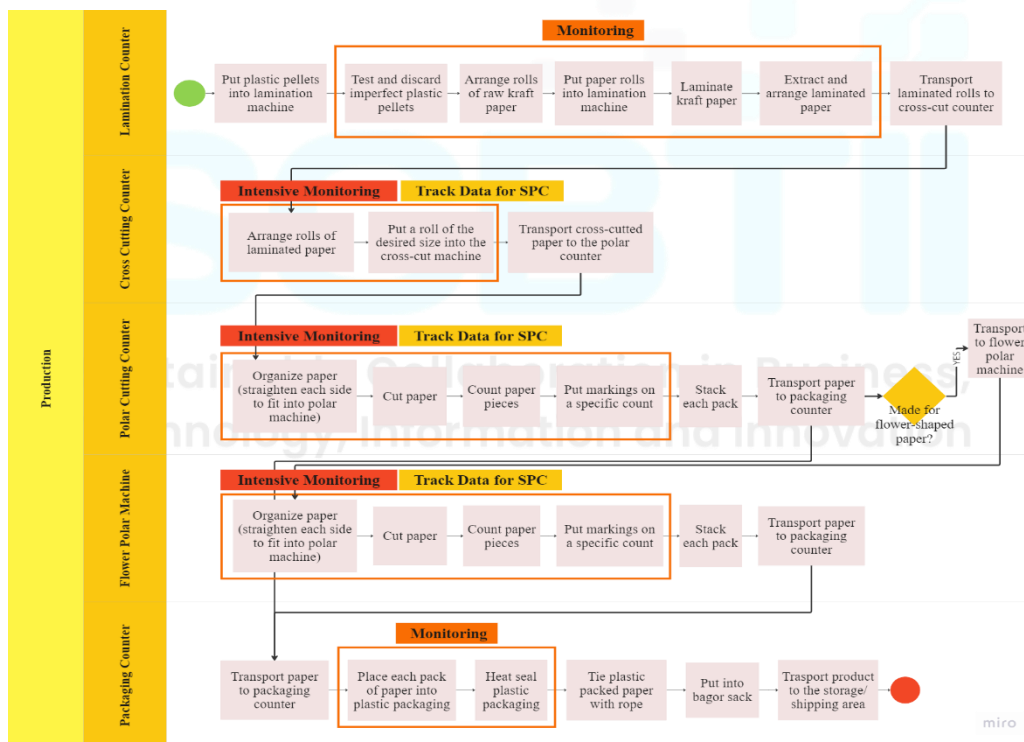


Figure 12. Renewed Sub Process Mapping

Figure 11. Renewed Process Mapping visualizes the company's major business process, while Figure 12. Renewed Sub-Process Mapping provides a more detailed visualization for every major stage of CV. MXX production process. The difference between intensive monitoring and monitoring is in the key metric that has to be monitored. Intensive monitoring will refer to the existing standard operating procedure, making sure that everyone is doing the process according to the standardized procedure, measuring data for statistical process control (SPC) purposes, and identifying negligence in any of the subprocesses. This means the person in charge of the monitoring process will be taking notes of data that need to be analyzed by SPC. Meanwhile, for the monitoring process taking part in the lamination and packaging counter, the supervisor will only monitor standardized processes for quality control.

Monitoring and Weekly SPC

Utilizing statistical tools, SPC tracks process variability and looks for any notable departures from desired standards or specifications. First, the company should sort the data that needs to be collected. In the scope of reducing operational waste, waste quantity and cutting margin data sets should be collected and analyzed continuously to prevent production inefficiency and waste cumulation. After determining the data needed to be collected, managers should define the control chart parameter and establish the tools that are going to be used for

data measurement and analysis. This included standardizing the process by setting a schedule for the control process, appointing a person in charge (PIC) for data collection and analysis, and also creating the standardized notation template. Notation templates are important to ensure the data collected is valid and reliable, therefore can be analyzed in a timely manner. Finally, after analyzing the data, managers or supervisors will identify an out-of-control process and take the action needed to solve problems in the specific area.

Eventually, the monitoring stage will ensure all proposed solutions will focus on waste product reduction without generating other inefficiency or waste in the production process through planning and collaboration. In the initial stage, the monitoring process will include observation to analyze how the monitoring system affects all waste categories and getting input from stakeholders and staff. Moreover, employees should receive thorough training on waste reduction, including information on the advantages of monitoring programs. The company will encourage participation from staff members by involving them in the process of identifying waste locations and developing monitoring mechanisms. Employee empowerment will guarantee that the monitoring project is in line with their regular tasks and promotes their active involvement in waste reduction initiatives.

V. DISCUSSION

This research was based on the problem of the high waste level in CV. MXX, as mentioned by the company's Director herself. The objective of this research is to find the underlying cause of waste product generation in CV. MXX along with providing systematic solutions and recommendations which will lead to a reduction in the company's waste level. The basic framework for this study is the DMAIC (Define, Measure, Analyze, Improve, and Control) methodology. In the Define phase researcher identifies coated kraft paper waste as the main source contributor of production waste and it is produced in the polar and cross-cutting phase. Moreover, in the Measure phase researcher identify the actual waste level in the company, some size variation with large cutting margin which contributes to the waste level, and control chart measurement to be further analysed in the following stage of the DMAIC analysis. Furthermore, in the Analyze stage, the research findings identify out-of-control processes from SPC analysis which suggest that the production process in the company is not yet stable. The analysis found that 18.2% of the total waste volume was contributed by the paper cutting margin and the rest of 81.8% was from production error which root cause identified in the fishbone diagram. Moreover, the Improve stage propose Pro-Trim, MXX Training Program, MXX SOP, and MXX Monitoring solution to manage identified problem from fishbone analysis and measurement. Finally, the control phase suggests standardization and continuous monitoring to sustain all of proposed solutions mentioned in the Improve stage.

VI. CONCLUSION AND RECOMMENDATION

The analysis has revealed that significant variability in size, an absence of formal standard operating procedures (SOP), inadequate monitoring practices, insufficient training protocols, and the utilization of outdated machinery are the primary factors responsible for the high waste level in CV. MXX production facility. Moreover, based on the analysis and findings of this research, the researcher proposed four appropriate solutions for CV. MXX to reduce the level of production waste, especially coated kraft paper waste. The four appropriate solutions are Pro-Trim, MXX Training Program, MXX Monitoring, and MXX SOP. First, the "Pro-Trim" solution suggest to remove ten product variance with highest cutting margin per paper sheets, namely product size: 110x112cm (27 x 27 cm), 111x 112 cm (28 x 28 cm), 118x108 cm (27 x 37 cm), 118x111 cm (27x27 cm), 118x114 cm (30 x 38 cm), 118x117 cm (30 x 39 cm), 118x120 cm (30x40 cm), 120x102 cm (25x35cm), 120x108 cm (27x27 cm), 120x112.5 cm (28x38 cm), and 120x118 cm (30x40cm) for the purpose of reducing coated kraft paper waste originating from paper cutting margin and avoiding potential upsurge of waste level. Second, the "MXX Training Program" will provide personalized and standardized training for all employees in major production processes, namely lamination, cross-cutting, polar cutting, and packaging. Third, the "MXX Monitoring" provides additional monitoring stages in the business process, which include monitoring, intensive monitoring, and tracking data for SPC purposes. And finally, the "MXX SOP" will establish a formal, documented, and standardized procedure for ensuring control and sustainability for all the solutions provided.

Recommendation for the company lies in the Control phase of the DMAIC framework. All of the proposed solutions, namely Pro-Trim, MXX Training Program, MXX Monitoring, MXX SOP, and the additional control program, which is Weekly SPC, have to be formally standardized to maintain control in the long run. Standard sizes should be integrated in the SOP as a guideline for the sales and marketing team to offer to customers and the margin limit should be regulated, to be at around 3% for square and rectangular-shaped paper and 23% for flower-shaped paper. Moreover, monitoring and training programs must be established with formal KPI, metrics, planning, and standard operating procedure (SOP) to prevent the generation of another type of waste in lean production.

Further Research

The future research can fill the gap in the current research and limitation by conducting long term impact assessment, cost benefit analysis, process integration and optimization, supply chain optimization, and environmental impact assessment. The long-term assessment can be done by extending the time frame of the research to assess the long-term impact of waste reduction initiatives, while the cost benefit analysis can provide a more detailed study which explores the cost-effectiveness of the waste reduction efforts. Moreover, future

research can analyze the entire value chain and explore the process integration of lean manufacturing principles with the existing tools and methodologies. Finally, future research can also investigate the impact of supply chain optimization with the involvement of external parties and assess the environmental impact of waste reduction initiatives in the coated kraft paper facility or similar industry.

Implication

Theoretical Contribution

The study shows how the DMAIC technique, which was first created for quality improvement in manufacturing, may be applied to the area of waste reduction in a coated kraft paper or any kraft paper facility. This demonstrates the DMAIC framework's adaptability and broadens the scope of its applicability. Additionally, it emphasizes the framework's adaptability and broadens the scope of its use. By transforming theoretical ideas into practical waste reduction measures, the research study contributes to bridging the gap between academic research and practical application. It provides knowledge that practitioners, managers, and decision-makers in the coated kraft paper operations or similar operational process can apply to foster knowledge transfer and encourage the implementation of successful waste reduction techniques.

Practical Contribution

The internal team of the company is the target audience for the research's practical contribution. To support waste reduction initiatives and boost operational efficiency, the research provides tangible, sustainable, and practical solutions to the actual problem that occurs in the facility. The research helps the internal team identify the root causes of product waste in the kraft paper by applying the DMAIC methodology. The DMAIC technique supports the idea of continuous improvement, where it highlights the significance of understanding waste reduction as a continuous process rather than a one-time effort. Moreover, the result of the analysis will provide direction to the internal team for creating and preserving SOPs specifically for waste reduction efforts. SOPs make certain that procedures are followed consistently, enhance process management, and allow team members to transfer information correctly.

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Developing Strategy To Increase The Number Of Followers Of XI Axiata B2b Social Media

Judith Johannah¹, Fitri Aprilianty²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

Social media platforms now serve a broader range of functions, and companies have recognized the immense opportunities it offers. It has become essential channels for businesses to inform others about the latest updates, especially considering the dynamic of the corporate environment. Social media has become crucial for businesses to share updates, and XL Axiata, a major Indonesian telecom company, uses Bestie Konter as its platform. However, Bestie Konter faces challenges in reaching all retail outlets, resulting in potential misinformation. This research proposes general marketing strategies, both offline and online, to increase social media awareness and follower count on Bestie Konter's Instagram, YouTube, and TikTok accounts. The study will employ surveys and interviews with retail outlets that follow Bestie Konter and those that do not. The strategies will primarily focus on raising awareness to increase follower numbers. The findings will serve as a benchmark for other telecom companies aiming to enhance their social media presence in a B2B context.

Keywords: Awareness Strategy, Bestie Konter, Marketing, Social Media, XL Axiata.

I. INTRODUCTION

With globalization that happens in the world, these days social media have become part of human life. With this shift, there is a new development in the process of gaining information for everyone, not only customers but also businesses. Social media has become one of the media where companies share information that hopefully should be understood by their target market. These media are used to build awareness, gain information about products, collect customer feedback, and many more (Agnihotri, 2017, 147). Based on the statistical data of Smart Insights, more than half a percentage of the world's population (59%) have used social media in January 2023. XL Axiata is one of the largest telecommunication companies in Indonesia currently developing specific social media to approach its retail outlets to share information regarding products and programs. Reselling XL Axiata's goods is the responsibility of the retail outlet. With the distribution of retail outlets in all regions in Indonesia and with limited time and place, using social media is meant to keep outlets in the retail sector informed about the most recent programs that XL Axiata has so that they can share it with their customers. There are approximately 60.000 retail outlets that register in the data of the company; however, the data of social media still do not reach the exact same number that it should be. One of the examples is on Instagram @bestie_konter, XL Axiata has successfully gained 27.300 followers on their account. Based on the findings, from 27.300 followers, Bestie Konter only has 4.46% real followers and 95.54% are fake/inactive followers. From that, the company has a large gap in followers that should be increased to reach the real target of 60.000 real followers of retail outlets. This research focuses on finding marketing strategies through offline and online activation that can be done by XL Axiata that focus on awareness steps to increase the number of followers in Bestie Konter's social media.

II. LITERATURE REVIEW

XL Axiata started its journey known as PT Excelcomindo Pratama Tbk in 1996 which made it become the first private company in Indonesia. This company focuses on creating innovation in telecommunications to help customers have an easier life. In this research, the author uses the external and internal analysis of the industry which are PESTLE Analysis, Porter Five Forces, Competitor Analysis, Benchmarking Content Analysis, and Social Media Analysis. It resulted that the telecommunications industry in Indonesia is influenced by several factors. Businesses in this industry must understand and adapt to these factors to succeed in the dynamic and rapidly evolving market.

The Pestle Analysis reveals that XL Axiata's presence on social media is a favorable option due to the significant opportunities in the economy sector and the limited competition it faces. The Covid-19 pandemic has also resulted in increased internet and social media usage, making these channels more familiar to everyone. By establishing a communication channel with its target market, the company can effectively showcase the unique selling proposition (USP) of its products and compete with other telecommunication companies, despite the high market competition. Examining Porter's Five Forces, the author gains new insights indicating that XL Axiata currently holds a profitable position, with more power to make decisions regarding suppliers and market

dominance. However, the company still has limited power in setting prices for customers. XL Axiata has diversified its brand portfolio based on different target markets, but it should be concerned about the threat of substitutes, as customers can easily switch to other companies' products. In the competitor analysis and benchmark analysis, the author focuses on analyzing the three largest telecommunication companies in Indonesia. In conclusion, the social media presence of Bestie Konter is a favorable choice, as it is more active compared to its competitors' social media accounts, specifically for B2B accounts. Additionally, retail outlets not only sell products from XL Axiata but also benefit from the integration of information provided by social media. Consequently, these outlets are more likely to collaborate with XL Axiata.

Bestie Konter, the social media for XL Axiata's retail outlet, is a platform to inform updated information and do entertaining programs focusing on retail outlets by utilizing Instagram, TikTok, and YouTube. The Instagram account has 27,600 followers and focuses on challenges, giveaways, product information, and programs for retail outlets. The TikTok account creates humorous videos and showcases programs and product information. The YouTube channel features programs like podcasts, humorous discussions, and visits to retail outlets. Retail outlets, including frontliners and business owners, play a crucial role in selling XL Axiata's products and interact actively with customers. They benefit from purchasing product packages at lower prices and earning profits through successful sales.

III. RESEARCH METHODOLOGY

This research was conducted using a mix method that consists of qualitative and quantitative analysis. It conducted to give in-depth analysis from the perspectives of retail outlets.

Problem Tree Analysis

Before conducting the data collection, in the literature review, the researcher used the external and internal business framework to understand the business environment such as PESTLE Analysis, Porter Five Forces, Competitor Analysis, Content Benchmarking Analysis. Then, through that analysis, there are some cause and effect that the author proposed using problem tree analysis which can be seen below:

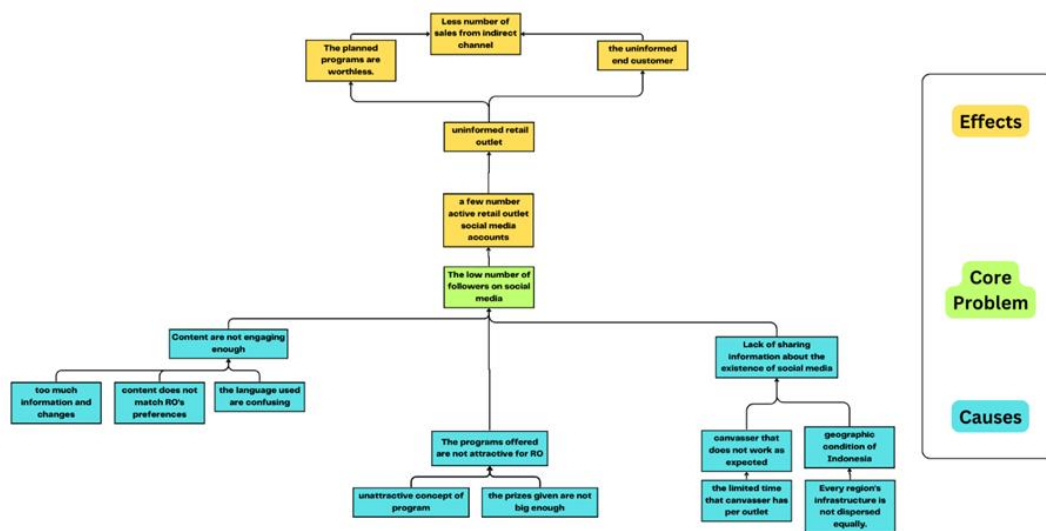


Figure 1. Problem Tree

Qualitative

Firstly, the author uses qualitative data using the unstructured method by interviewing in total 5 samples of retail outlets that follow social media of Bestie Konter and the non-followers of Bestie Konter. In this step, the author analyzes three factors that have been estimated using the problem tree framework which are retail outlet awareness, retail outlet needs and wants, and flow of information. To analyze the data, this research was conducted using one of the grounded theories by Corbin and Strauss (M. Corbin & Strauss, 1990) which is Open Coding.

This method helps to identify concepts and patterns regarding the 3 factors in the data based on the word by word that said by the respondents.

Quantitative

After conducting the qualitative data analysis, the hypothesis of the problem in the problem tree is validated that there is a gap between the retail outlets that follow Bestie Konter and the one who don't receive information. Thus, to validate that there is not only a small number of retail outlets that experience the same problem, the quantitative research method is conducted. The purposive sample is chosen because of the limitation to reach all the retail outlets based on the region. The number of samples is determined by using Slovin's Formula for a population of 60.000. It resulted in 382 retails as the number of targeted respondents.

Finite population:
$$n' = \frac{n}{1 + \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2 N}}$$

where

- z** is the z score
- ε** is the margin of error
- N** is the population size
- ĥ** is the population proportion

Figure 2. Slovin's Formula

Monthly Social Media Report

To complete the findings of survey and interview, the author also used the internal data to see the effectiveness of retail outlets interaction with the social media of Bestie Konter. The colors that dominate in this account are blue and purple, which are the colors of 2 brands under XL Axiata, XL and Axis.

To build a causal relationship with retail outlets like best friend, the team decided to create a call "Mimtie" for social media admin of Bestie Konter. The comment feature that is owned is also active with comments from retail outlets. Bestie Konter is a friendly call for the retail outlet of XL Axiata. Thus, the branding of XL Axiata in these social media is to become equal and have close relationships with retail outlets. With that, all social media accounts that the XL Axiata develops use words in casual and slang conversations without following the proper guidelines. The branding of Bestie Konter is giving additional profit called "Cuan" for retail outlets. It can be seen through their program names and captions that use "Cuan" in their name. 3 social media accounts that Bestie Konter has are YouTube, TikTok, and Instagram.

Bestie Konter's Instagram account has 27,600 followers and features challenges, giveaways, product information, Instagram live sessions, and programs for retail outlets. On TikTok, humorous videos follow trends and depict relatable retail activities. YouTube content includes a podcast, humorous discussions, and quizzes. Bestie Konter actively engages retail outlets through entertaining and informative content on these platforms.

IV. FINDINGS AND DISCUSSION

While some outlets are aware of the social media accounts, a significant number still do not follow them, indicating a knowledge gap. The canvasser and regional teams play a crucial role in informing outlets about Bestie Konter's social media, but their efforts alone may not be sufficient to reach all outlets. Most likely it's because not all retail outlets are visiting the RO in a fix schedule and the limited time of canvasser must explain too much of the program in one visit. The flow of information primarily relies on the XL Axiata team's regular visits and word of mouth among outlets.

Economic benefits, specifically the cuan rewards, are a significant driver for engagement. Outlets prioritize programs that offer higher cuan rewards and are easy to participate in. They also value fast response times, interactivity, and clear information. Additionally, outlets expressed a desire for new and unique program concepts, more challenges, and a larger cuan. They also appreciate educational content and visuals that are attractive and aligned with trends.

To improve awareness, the marketing strategy should focus on targeted efforts to reach outlets that are not following Bestie Konter's social media. Communication channels like Axiapp and SiDOMPUL can be utilized to share information effectively as it is one of the mandatory things used in the process of buying and selling

products by retail outlets, it is now successfully used by almost 70% of retail outlets. The strategy should also explore new program concepts, increase the frequency of challenges, and deliver visually appealing content.

The survey also provides valuable insights for improving Bestie Konter's social media strategy. Feedback from the retail outlets suggests that increasing the number of cuan rewards, ensuring faster response times, and improving interactivity with the audience are areas that require attention. Additionally, providing clearer information and exploring new and unique program concepts are important for enhancing the social media presence of Bestie Konter.

XL Axiata provides various information channels for retail outlets, including social media, canvassers' visits, Axiapp, SiDOMPUL, and phone chips. While some retail outlets rely more on information provided by canvassers, those following Bestie Konter's social media find it helpful as a reminder for programs and products. However, there are complaints about the limited knowledge of canvassers regarding XL Axiata's programs. Retail outlets that have not followed Bestie Konter's social media express interest in it but cite lack of familiarity with social media and limited usage as potential challenges. Those following Bestie Konter's social media appreciate the opportunity to connect with other outlets and exchange information. The preference for Instagram as a social media platform is highlighted. Retail outlets following Bestie Konter mention the importance of engaging content, rewards, and convenience. They find the language used on social media easier to understand and relatable, although occasional confusion arises. Retail outlets appreciate the entertainment value, challenges, and creative opportunities provided by Bestie Konter's social media presence. They emphasize the need for transparency in challenge criteria and express a preference for funny, relatable content, challenges, quizzes, and vlogs.

Based on the analysis above, In April, 55 contents were posted on Instagram, while in May, the number decreased to 47. Impressions, reach, engagement, profile visits, and followers significantly decreased compared to April. The number of followers decreased by 2 in May. The decrease in followers was attributed to the inactivity of some retail outlets' social media accounts, resulting in their automatic deletion by Instagram. The highest engagement rate on Instagram was achieved through a giveaway campaign in April and a quiz campaign in May. The engagement level for these posts was 0.51%. However, the engagement rate did not reach the ideal range of 1% to 5%. The report suggests improving the engagement rate through enhanced strategies. On TikTok, there was an increase in viewers and followers for Bestie Konter's account. The content with the highest number of viewers was related to the "Berkabar" program, while the lowest viewership was for a video about the "Grebek Konter" program during Ramadan. The report emphasizes the need to diversify content and incorporate trending videos and songs on TikTok to attract more viewers. Bestie Konter's YouTube viewership primarily consists of individuals aged 25-34, with a dominant male audience. One video achieved a high click-through rate (CTR) of 11.7%, which is considered high compared to the average CTR of YouTube videos (2% to 10%). The video discussed tips and tricks for retail outlets. The report suggests diversifying content and incorporating trending elements to improve CTR and increase viewership.

Tabel 1. Summary of Bestie Konter social media

Category	Instagram	YouTube	TikTok
Audience	Dominated by Men. 25-34 years old	Dominated by Men. 25-34 years old	Dominated by Female
Location	Jakarta (the highest)	There is no specific region in the result	Jakarta (34.2%) and Surabaya (31.9%)
Types of Content	Product information, Online Program Activation, Live IG, and Quiz/Challenge	Grebek Konter, Podcast, Tutorial Videos, and Drama Konter, YouTube Shorts	Promotion Video, Meme, Tutorial Videos, Short Summary Videos from YouTube and Challenges

Most Favorite Programs	Challenge program	Drama Konter, Berkabar, Tutorial Videos	Meme, Short Videos Summary
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SWOT ANALYSIS

Through the external analysis, the writer can summarize the strengths and weakness that XL Axiata has. On the other hand, internal analysis use to determine the opportunity and threat for XL Axiata in the telecommunication industry in Indonesia. Thus, it summarizes into table below.

Tabel 2. SWOT Analysis

Strength	Weakness
<p>S1 - It is one of the largest telecommunication companies in Indonesia.</p> <p>S2 - XL Axiata has the second largest subscriber in Indonesia, with 57.9 million subscribers in 2021.</p> <p>S3 - In January 2022, Indonesia has approximately 175.4 million users of internet. (Kemp, 2020)</p> <p>S4 - There are more than 160 million users of social media by January 2020 in Indonesia. (Kemp, 2020)</p> <p>S5 - The social media of Bestie Konter is one of the most active social media for retail outlets rather than other competitors.</p> <p>S6 - Retail outlets that have followed Bestie Konter feel that the presence of this account and programs are beneficial for them to gain additional profit and understanding the information from XL Axiata.</p> <p>S7 - The number of prizes that are offered is the main factor that successfully increasing the interest of retail outlets to participating in existing programs.</p>	<p>W1 - The promotion for the retail outlets of XL Axiata is much the same as what other competitors did.</p> <p>W2 - The variety of products and fast-paced product development can create miscommunication to retail outlet.</p> <p>W3 - The unwell manage of social media followers.</p> <p>W5 - Some contents that have been uploaded are not interactive enough.</p> <p>W6 - The performance of canvasser in educate the retail outlet still uneven for each region area of XL Axiata.</p> <p>W7 - The need of Bestie Konter to create more creative programs that can increase the interest of retail outlets because it is too formal.</p> <p>W8 - The low number of followers for Bestie Konter is because retail outlets do not know the information regarding Bestie Konter.</p> <p>W9 - There are complaints from followers Bestie Konter that the language used are sometimes confusing.</p>
Opportunity	Threats
<p>O1 - Government is now focus on build a better infrastructure in Indonesia and developing digital infrastructure to support the establishment of telecommunication network.</p> <p>O2 - The high demand of internet and social media in Indonesia.</p> <p>O3 - Most of the social media from other competitors is presence but not regularly active compared to Bestie Konter</p> <p>O4 - Bestie Konter received good feedback from retail outlets on its challenge programs in Instagram and Drama Konter also Berkabar in YouTube and TikTok.</p> <p>O5 - The audience of Bestie Konter are mostly dominated by men in age 25 - 34 years old.</p> <p>O6 - The existence of Axiapp and SiDOMPUL as one of the</p>	<p>T1 - The high competition within the telecommunication company in Indonesia.</p> <p>T2 - Telecommunication companies are popular with their heavy marketing competition within the company.</p> <p>T3 - Not all regions in Indonesia have adequate and well-performed infrastructure to support the telecommunication product.</p> <p>T4 - Indonesia's geographic condition creates the inequality in providing comprehensive information to retail outlets.</p> <p>T5 - The other brand in telecommunication industry also tries to develop and be presence in social media for retail outlets</p> <p>T6 - The retail outlet desires content that is more engaging and informal, not necessarily always focused on program and product</p>

mandatory applications to sell for retail outlet. O7 – There are 89.6% of the respondents that do not follow Bestie Konter is interest to follow the social media accounts after being explained. O8 – The existence of Bestie Konter can create a community within retail outlets of XL Axiata	information. T7 – Some retail outlets are depending on the information coming from canvassers because it can be contacted personally
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After analyzing the SWOT analysis, to define the solutions that can be obtained to solve the problem, the author uses TOWS Analysis. This framework is a tool to help in generate strategies based on the SWOT analysis by connecting the relationship between the internal and analysis data (Nugraha & Aldianto, 2012). Based on the definition, the TOWS analysis of Bestie Konter can be seen below.

Table 3. TOWS Analysis

INTERNAL	TOWS ANALYSIS	EXTERNAL	
		Opportunity	Threat
	Strength	<ul style="list-style-type: none"> o Through social media of Bestie Konter, retail outlets not only help in receive newest update but also create community. 	<ul style="list-style-type: none"> o Even if the competition of industry is high and some company try to develop social media also, XL Axiata has the most active B2B social media account for retail outlet
	Weakness	<ul style="list-style-type: none"> o The activeness of Bestie Konter can help the flow of information from company to retail outlets. o The lack of awareness among retail outlets regarding Bestie Konter's social media presence can be aided by promoting Bestie Konter's social media through Axiapp and SiDOMPUL. 	<ul style="list-style-type: none"> o The followers of Bestie Konter feel that the content that have posted too formal and not creative yet interactive enough. o The needs of retail outlet to have a real time response if there is problem.

V. CONCLUSION

The phenomena that happens in Bestie Konter social media that does not reach the specified number of followers should create a big problem for the company. The impact on XL Axiata and its retail outlets has highlighted the existence of a gap that needs to be addressed. The proposed solution will primarily focus on raising awareness about the Bestie Konter social media platform, as research indicates a lack of knowledge among retail outlets regarding its existence.

From the data that has been received, then the team categorizes the retail outlet based on the experience that they have regarding the program and product that XL Axiata has. There are 3 types of categories which are:

a) *RO not active.*

They are a group of retail outlets that are already active in selling the products of XL Axiata but still not join and do not know the program that was established for retail outlets.

b) *RO active but not join program.*

They are a group of retail outlet that has download the Axiapp and SiDOMPUL, already know the existence of the social media, but still do not join the program for retail outlets.

c) *RO active participants.*

They are a group of retail outlets that have followed the social media of Bestie Konter, actively use Axiapp and SiDOMPUL, and actively join the retail outlet program.

Thus, there are three solutions proposed by the author to solve this problem to increase the awareness of social media presence of XL Axiata. In addition, there are also supporting programs that can be implemented to maintain the followers of Bestie Konter.

1. Pasukan Edukasi Bestie (Pasdutie)

Pasukan Edukasi Bestie, also known as Pasdutie is a group of individuals responsible for providing education to retail outlets with the scope of retail program only. The concept is similar to the sales team of XL Axiata, but the focus of this team is to educate on the SiDOMPUL application, Axiapp, and, most importantly, Bestie Konter. This strategy is implemented based on interviews conducted with one of the Retail Outlets (RO) who does not follow Bestie Konter behavior that mostly relies more on traditional or offline sources, which is canvassers. However, not every region has good communication flow with canvassers as it is stated on the weakness of this company. Therefore, the aim is to increase the number of Active Participants among ROs with the implementation of Pasdutie. The allocation of Pasdutie members will be based on the House of Sales distribution in each region. Each region's House of Sales will be assigned one Pasdutie member. In addition to their role in educating and providing information about XL Axiata's retail program, they are also responsible for reviewing and assessing the understanding of retail outlets during their visits.

Another notable example of a successful retail company in raising awareness through sales is Avon. Avon, a beauty brand, adopts a conventional sales approach by employing female representatives who operate within specific regions. With a presence in numerous countries, Avon boasts a vast network of over 50 million salespeople. One of the key contributors to their achievement is the provision of training and online learning platforms from YouTube. By implementing this strategy, Avon has effectively generated substantial revenue, amounting to \$180 billion (Jefferson, 2021).

To enhance the effectiveness of this program's planning, Trade Marketing collaborates with the Digital and Conventional Promo team to gather data on the existing House of Sales in various regions that will be visited.

Table 3. The Timeline of Pasdutie

Timeline Pasdutie												
	June				July				August			
Activity	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4

Request location to DCP team												
Request names of Pasdutic team to Arina												
Training Session												
Implementation												

The preparation of this training session will be held in Week 4 of June and the actual training will be held in the first week of July. The training will be conducted online through zoom meetings and there are several topics that mandatory to be discuss such as:

- a. Soft Skill: Communication
- b. Company Profile
- c. Cuan Summary: Product highlights based on its unique selling point
- d. Complaint/Feedback Handling: Understanding customer needs and giving feedback
- e. Competitor Survey: Product and service differences with other telecommunication companies
- f. Proficiency & Assessment: The final test for every RO regarding all the topics that have been discussed in the training. If the retail outlet can pass the minimum score, only then can they become Dubes and visit the retail outlets. Aside from training, each of Pasdutic will also provide by a file consist of videos that explained each of the topics of training. So that the Pasdutic can recheck and understand the information carefully.

2. Duta Bestier

Duta Bestie is a program that continues from the Pasdutic program. Duta Bestie is a selection process for representatives of retail outlets in each region to become ambassadors for other retail outlets in that area. Pasdutic will play a role in selecting potential representatives who can be appointed as Duta Bestie by the XL Axiata team based on their visits during the Pasdutic program. Duta Bestie's role is to serve as the “right hand” of Bestie Konter, actively inviting and regularly informing retail outlets about the newest updates from XL Axiata. This information distribution will be done both online, using the social media platforms of the retail outlets, and offline. This is made possible because it is evident from the opportunity that the retail outlets are acquainted with each other both online and in person, within their own region and other regions. With this strategy, the relationship between XL Axiata and the retail outlet community becomes closer and easier to share information.

According to Patterson (2022), in 2021, a significant majority (90%) of successful buyers in the business-to-business (B2B) sector were motivated to make purchases based on peer recommendations. Red Bull, a prominent and renowned retail company, has also implemented similar programs by selecting ambassadors from the community to disseminate information to their peers. Red Bull has partnered with over 4,000 college students, known as Student Marketeers, who distribute Red Bull products to fellow students both online and offline, promoting product awareness. This approach reflects the company's understanding of the product's usefulness within the community (Huhn, 2023).

The selection process for Duta Besar will take place after the candidate data has been provided by Pasdutic. Subsequently, the selection process will mainly be conducted online, such as through interviews. For each challenge undertaken by the Duta Bestie candidates, they are required to upload it on their personal social media accounts, and it will also be documented on the Bestie Konter social media. This is also done as a means of raising awareness and gaining recognition from other retail outlets. The Duta Bestie will not only actively share information from their personal social media, but they will also have the opportunity to participate in their own programs, such as:

- a) Tak Kenal Maka Tak Cuan

A program by Bestie Konter where the Duta Bestie will conduct live Instagram sessions with Bestie Konter's followers. The Duta Bestie will be given the opportunity to provide tips and tricks to enhance profits for retail outlets.

b) Dubes Talkshow

This program is a podcast that will be conducted on the Bestie Konter's YouTube channel. The host and Duta Bestie will engage in relaxed discussions, sharing Duta Bestie's experiences in the selection process and other interesting experiences.

For the selected Duta Bestie, which amounts to 30 individuals, they will receive a monthly payment of Rp2,500,000 and could go on vacation with the XL Axiata team in a program called "Seharian Bareng Bestie". With such significant benefits, it is hoped that more retail outlets will be motivated to become Duta Bestie for the next quarter.

Table 4. The Timeline of Duta Bestie

Timeline Dubes												
	July				August				September			
Activity	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Name submitted by Dubes												
Submit Data by RO												
Mission 1 and 2												
Interview with XL Axiata internal team												
Announcement												
"Seharian Bareng Bestie"												

3. Multi Channel Broadcast

Based on interviews and survey data, the selection of social media platforms such as Instagram, YouTube, and TikTok is appropriate because many retail outlets are already familiar with these platforms. However, due to the lack of awareness among retail outlets about these social media accounts, it is important to utilize the platforms that they commonly use to obtain information. Therefore, the researcher suggests that the Trade Marketing team use three types of media for broadcasting or reiterating information about ongoing programs or products. These three media types are Axiapp, SiDOMPUL, and WhatsApp.

Topshop, a UK-based company, exemplifies the utilization of multichannel marketing to enhance its social media presence. Previously, the company launched a campaign to promote its latest catalog for London Fashion Week. Strategically placed billboards near Topshop stores encouraged people to open #LFW on their social media platforms, promising pop-ups of catalog showcasing outfit recommendations (Kalwani, 2021). This campaign resulted in an impressive 75% increase in overall product sales and earned Topshop the Digital Marketing Campaign of the Year award in 2015 at the B&T Retail Week Tech and eComm Awards (Nosto, 2023).

Axiapp and SiDOMPUL are good choices because active ROs and ROs who are active but not yet part of a program are already aware of and using these tools. WhatsApp is suggested based on interviews with several retail outlets that find the information shared in retail groups helpful in staying updated with XL Axiata's information. When there is an ongoing program, it is recommended to conduct simultaneous broadcasts on all three media platforms. This is done because there is currently no valid data indicating which application is most used by retail outlets. Therefore, the aim is to achieve higher and more targeted awareness.

4. Supporting Strategy

While increasing awareness of Bestie Konter's social media through the programs, there are also recommended strategies that can be implemented to enhance the interest of retail outlets (ROs) in continuing to follow the social media content.

- Active in Instagram Live.

According to the feedback provided by the retail outlets during the interviews, it turns out that many of them find the use of the Live Instagram feature appealing. The utilization of live features on various social media applications is also a growing trend among businesses to increase the relationship with its audience. Fast Company serves as an instance of a company that incorporates Live Instagram into its B2B operations by extending invitations to clients and followers for their product launch campaigns (Segura, 2021). Live Instagram is considered captivating because retail outlets can visually and directly interact with the XL Axiata team, making the information-sharing experience more exciting. Moreover, according to data, the majority of customers (82%) prefer viewing live content as opposed to regular posts (Segura, 2021). With the comment feature available on Live Instagram, XL Axiata can also observe responses from retail outlets and engage in direct question-and-answer sessions. Furthermore, through Live Instagram, XL Axiata can invite selected retail outlets to exchange experiences with other retail outlets.

- Create more fun and casual content.

Based on the complaints and suggestions from the retail outlets that have been following Bestie Konter's social media, many of them feel that the content has become "too serious" because the challenges and quizzes primarily focus on product information only. They hope that Bestie Konter can also provide more entertaining content alongside the product information. One example is by incorporating content related to the lives of the retail outlets, such as discussing inside jokes or anecdotes that are unique to their experiences as retail outlets. Below are the example of content that can be benchmarked by the company to create more casual and fun content for retail outlets.

Table 5. The Timeline of Duta Bestie

CONTENT PILLAR OF BESTIE KONTER			
Types	Platforms	Content	Description
<i>Interactive</i> = Program that can creates a two way communication within RO-RO or Company-RO	Instagram Story	QnA with Bestie Konter	RO can ask anything through question box in one specific day that will be answered using videos by interanal team of XL Axiata

<p><i>Emotional</i></p> <p>= Program that can build a strong feeling and close relationship for RO</p>	TikTok and Instagram Reels	A Day as Retail Outlet	An episode of explaining what activities and things that needed in a daily life of Konter
<p><i>Educative</i></p> <p>= How Bestie Konter can share knowledge of product and programs to RO</p>	Instagram Feeds	Program and Product Knowledge through Quiz	Description of official key visual from brands with creative editing
<p><i>Inspiration</i></p> <p>= Programs to aspire and keep motivates RO for each quarter</p>	YouTube	Bincang RO	A program where chosen RO being interviewed in their retail store every week

- Responsive social media admin.

Based on the survey data and questionnaires, it is evident that many retail outlets rely on the presence of canvassers because they have the personal contacts, allowing them to directly reach out to canvassers in their respective areas when they face confusion or difficulties. Therefore, if there is a shift in the channel for information dissemination to Bestie Konter's social media, it is expected that the social media admin can promptly respond to the challenges and inquiries from the retail outlets. By doing so, the relevant information can be received by the retail outlets, benefiting both the outlets and their customers.

VI. LIMITATION & FURTHER RESEARCH

The scope and object of this research is to analyze the social media of Bestie Konter using the data of Retail Outlets in Indonesia through April 2023 – May 2023 of XL Axiata that has been managed by the Trade Marketing team. The strategy proposed will be covering the awareness step, to increase the number of followers. The research will be conducted between January 2023 and June 2023.

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Developing UI/UX Website Design for Tourism Industry in Indonesia: A Case Study of Loocale

Nicole Olivia Usman¹, Fitri Aprilianty²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

With the rapid advancement of technology, a considerable number of start-ups are emerging in Indonesia with digital tourism as the fifth most prevalent industry among the start-ups. Concurrently, the platform business model has gained prominence in the digital tourism industry, and Loocale is one of the companies that has tap in this business model. As the utilization of business platforms such as websites and applications become increasingly popular, the demand and development of user interface (UI) and user experience (UX) have witnessed significant growth. As a new start-up in this industry, Loocale is striving to enhance its user base and user retention on their website. However, their current UI/UX faces several issues, including error and a lack of features. Subsequently, this study aims to analyze and develop UI/UX website design for Loocale to achieve its goal, becoming the leading hub and equally developing Indonesian local tourism. This study will include several recommendations for Loocale's UI/UX website design based on market preferences, utilizing insights derived from data collection. The research will utilize qualitative approach, primarily employing semi-structured interviews with Loocale's internal team and potential target market.

Keywords: Digital Tourism Startup, Loocale, User Interface, User Experience, Website Platform.

I. INTRODUCTION

Research Background

According to Databooks, Indonesia has emerged as a hub for start-up companies, with a total of 2,346 start-ups in 2022, ranking fifth globally in terms of the number of start-ups established (Annur, 2022). Furthermore, as of 2022, there are 13 unicorn start-ups based in Indonesia, two of which operate in the travel and tourism industry – Traveloka and Tiket.com (Dewi, 2022). This highlights the significant potential of travel and tourism in Indonesia, which accounts for 5% of the country's GDP (PWC Indonesia, 2022) and explains digital tourism prominence as the fifth most prevalent industry in the percentage of start-ups in Indonesia by business field (Dihni, 2022).

An example of approach on digital tourism in Indonesia is the rise of the platform business model, defined to be a new business model that leverages technology to establish an interactive ecosystem where individuals, groups, and resources are connected, resulting in the creation and exchange of significant value (Parker et al., 2016). One of the businesses that jumped into this industry is Loocale, an emerging digital tourism start-up in Indonesia that seeks to promote equal development of various tourism destinations throughout the country. The company has positioned itself as an active participant in the growing digital tourism industry in Indonesia, with a particular focus on supporting the growth of local communities.

Loocale is currently in the process of developing its website that functions as a platform to connect with its customers. Based on Creative Faze (2018), there are several important things to note in developing a successful website, including navigation, brand consistency, and lastly reading patterns and SEO. Both navigation and design patterns are crucial components of user interface (UI) and user experience (UX), two critical aspects of website development. The concept of UI/UX shares a close association with usability since it's a part of ISO/IEC 25010, a standard for software quality model (Nugraha & Fatwanto, 2021). User Interface according to Joo (2017) is defined as a mechanism where a user and system interact with one another through the use of commands or techniques, enabling the user to operate the system, input data, and access its contents. User Experience, on the other hand, involves all impacts that materialize prior to, during, and after the utilization of a product, system, or service. These effects are inclusive of but not limited to the user's emotions, belief system, behaviours, and achievements (Nugraha & Fatwanto, 2021).

Creating a well-designed website followed by a great UI has become notably important in recent times due to the rising reliance on the internet for carrying out various tasks. This is primarily caused by how UI acts as a bridge between the user and the website, allowing them to connect and interact; thereby serving as an interactive platform facilitating the interaction between users and machines. A good website design not only has the potential to optimize website success, but also enhances several consumer dimensions, such as information gathering, revisit intention, trustworthiness, and overall performance. (Turumugon & Baharum, 2018). Though website UI design tend to be designer-oriented in the past, researchers proved how significant users' opinions and viewpoints are in the creation of website design with users' satisfaction and revisit intention in mind (Noori et al., 2016, cited in Turumugon and Baharum, 2018).

Business Issue

Loocale's website is currently still in the Minimum Viable Product (MVP) stage, implying that it only provides enough features to function for early users (ProductPlan, 2023). Loocale's team intends to launch the website as soon as possible, with the intention of further improving it based on feedback from the early adopters. Although several main features are available, such as the feature to write and interact with posts, discover new destinations, and explore popular topics, many other features are not yet functional. These include Loocale's about page, which shows an error sign when opened, as well as unresponsive buttons, among other issues.

Additionally, Loocale's current website causes challenges for first-time visitors, as its features require users to log in first. Popular topics feature also does not display real-time information, and one of the most critical issues is that there is an error where users cannot upload posts and photos when accessing the website through a PC. Moreover, the website has not been optimized for mobile, which makes the display shown in the mobile version is cropped and not user-friendly.

The inconvenience caused during the website's MVP stage may lower Loocale's user experience and satisfaction, which could affect user's revisit intention and number of acquired users. Therefore, Loocale must address these issues as soon as possible in order to attract and retain users. Thus, this study is done by the researcher with the purpose of analyzing the proper UI/UX website design for Loocale to increase its number of users.

Final Project Objective and Benefit

The aim of this study is to propose UI/UX website design for Loocale to meet the users' needs, preferences, and attract more users. By improving the website's UI/UX design and functionality, the website will be able to increase user satisfaction and overall experience.

Research Scope and Limitation

This research paper aims to examine Loocale's internal management team and potential target market on Java Island. The study will collect data from March 2023 to June 2023. The primary objective is to propose suggestions for the development of Loocale's website's user interface and user experience design, which will only be valid until its completion. It is essential to note that this paper only addresses the version of user interface and user experience design of the website within the data collection period (Minimum Viable Product stage) and does not cover other aspects of the business. In addition, these recommendations are subject to limitations as they have not undergone validation through market testing or extensive evaluation by Loocale's internal team. The research will utilize qualitative approaches for data collection and analysis, with a focus on conducting in-depth interviews and customer journey mapping. Ultimately, Loocale's management team will decide whether or not to implement the proposed plan based on their assessment of the research findings.

II. LITERATURE REVIEW

Company Background

Following the outbreak of the pandemic in 2020, the travel and tourism industry in Indonesia experienced a significant decline. However, with the improving conditions, the government has been encouraging people to travel again as an effort to revitalize the country's tourism industry. Loocale, an all-inclusive platform that connects travelers with tourism industry workers, particularly those with minimal exposure, has emerged as a catalyst for change in line with the government's plan. In 2022, the platform started the brand from Instagram as a platform with the goal of equally developing Indonesian local tourism.

Loocale is on its way to establish the brand as a social media platform that foster the tourism community, providing an opportunity for like-minded travelers to exchange stories and experiences. The platform also offers tourists the chance to explore Indonesia's hidden and unexposed destinations while connecting them with local tourism stakeholders who are passionate about showcasing the best of their destination. Their current target market includes Gen-Y (early workers) and Gen-Z (college students). Despite the long-term plan of targeting both local and foreign tourists visiting Indonesia's tourist destinations, Loocale is presently focusing to grow in the local market due to feasibility and resource constraints. This approach also aligns with their objective to motivate local tourism providers to enhance their competitiveness and quality, which in turn will increase the number of tourists, generate income, and promote equality for the locals.

To increase user acquisition, Loocale has been building a community and a website as a platform. The brand yearns for the growth and thriving of Indonesia's tourism industry and its stakeholders, such as local tourist guides, accommodations, and travel agents. Furthermore, Loocale aims to invite fellow Indonesians to realize the potential of the diverse and vast tourism destinations that Indonesia. Through its actions, Loocale is expected to positively impact the growth of Indonesia's tourism, aiding in local income distribution and growth. Thus, Loocale's growth is crucial for the long-term recovery and development of Indonesia's tourism industry.

Business Environment

In order to further analyze the factors needed for developing UI/UX suggestion for Loocale, this study evaluates Loocale's business environment using external and internal analysis. External analysis will utilize PESTLE analysis and competitor analysis, whereas the internal analysis will use in-depth interview with Loocale's internal team. Below are the findings obtained from the preceding frameworks:

PESTLE Analysis

According to Perera (2017), PESTLE analysis is a situational analysis tool that is commonly used for business evaluation purposes and is considered one of the most utilized models for assessing the highly dynamic external business environment. This model is also useful for identifying opportunities and threats towards the company, which subsequently helps in conducting SWOT analysis.

This tool will help the researcher to grasp a better idea of the external environment surrounding digital travel and tourism industry in order to propose the most fitting recommendation for Loocale's UI/UX website design. Through this analysis, the researcher will assess the Political - Legal, Economic, Social, Technological, and Environmental factors correlated with Loocale, digital travel and tourism industry, start-ups, and market preferences in UI/UX.

Table 1. PESTLE Analysis

Political - Legal	Economical
<ul style="list-style-type: none"> O - Health protocols & mobility restrictions are lifted O - Local and foreign tourists are urged to travel within the country by the government O - ± 13 trillion rupiahs are allocated to accelerate digital infrastructure in several priority destinations O - Sandiaga Uno encouraged investors to invest in Indonesia's tourism destinations 	<ul style="list-style-type: none"> O - Indonesia's economic growth & GDP has started to establish, led to high purchasing power O - Lower inflation rate in 2023 T - Overall consumer spending is expected to decline O - Travel, lodging, and vacations ranked 1st in the splurging category
Social	Technological
<ul style="list-style-type: none"> O - Strong resurgence in domestic travel activities 	<ul style="list-style-type: none"> O - Covid-19 has accelerated technology adoption & reliance

O - Emergence of phenomenon, such as "revenge travelers", "hidden gem", and "staycation"	O - Increase in mobile phone & internet penetration in Indonesia
O - Gen-Y and Gen-Z primary source for traveling information is digital media	T - The start-up market in Indonesia is now saturated
O - Gen-Z utilizes various platform simultaneously to facilitate planning & comparison	O - Rising demand & development of UI/UX
T - Many established competitor platforms	
Environmental	
O - Indonesia possesses abundant biodiversity & natural landscape	
T - Global climate change & urbanization caused negative impact towards Indonesian tourism	

Competitor Analysis

Whilst competitor analysis is a narrower term compared to competitive analysis, the two strategic management terms are often used interchangeably. Zahra & Chaples (1993) present a comprehensive definition of competitive analysis, describing it as the process through which a company strives to define and comprehend its industry, identify its competitors, assess the strengths and weaknesses of its rivals, and anticipate their future actions.

The ultimate objective of competitive analysis is to get a deeper understanding of the competitive forces existing within an organization's specific competitive environment. By undertaking this analysis, organizations can gain valuable insights into the dynamics of their industry, enabling them to make well-informed strategic choices and effectively position themselves within the market (Adom et al., 2016; Zahra & Chaples, 1993).

While Looocale does not have a direct, head-to-head competitor in Indonesia, it operates in a competitive landscape where several startup competitors and established global companies exist within the same industry. Some notable competitors in this space include Atourin, Pandoooin, Google Review, and TripAdvisor. Further details about Looocale's competitor can be found in Table 2 below.

Table 2. Competitor Analysis

Brand	Product	Platform	Available Features in Website
Atourin	Multifunctional platform that serves as a one-stop platform for all travel-related needs in Indonesia, from planning to booking.	<ul style="list-style-type: none"> Instagram & TikTok Website Application 	<ul style="list-style-type: none"> Trip planning Tour packages Experience and attraction packages Review packages Explore (itinerary made by other users, destination, attraction, tour guide, tourism village)
Pandoooin	One stop tour solution that provides open trip package and other experience ticket across Indonesia.	<ul style="list-style-type: none"> Instagram & TikTok Website 	<ul style="list-style-type: none"> Tour packages Experience and attraction packages Personalized trip Trip story Articles
Google Review	A user-generated content platform and feature provided by Google that allows individuals to share their opinions, experiences, and feedback about businesses, services, and products.	<ul style="list-style-type: none"> Application (Google Map) Website 	<ul style="list-style-type: none"> Write reviews and give rating Integrated with Google Map to search and guide to destination Sorting review Photo and video attachment User points, award, and level system Translated review Q&A Like review Popular times Location information
TripAdvisor	Popular online travel platform that provides reviews, recommendations, and bookings for hotels, flights, and experiences.	<ul style="list-style-type: none"> Instagram & TikTok Website Application 	<ul style="list-style-type: none"> Write reviews and give rating Trip planning Hotel search and booking Experience and attraction packages Travel forum and community Vacation Rental (space, car, etc.)

Loocale	Current: Platform, media, and community for travel enthusiast	<ul style="list-style-type: none"> • Instagram & TikTok • Website 	Travelers' choice awards per category <ul style="list-style-type: none"> • Write posts (experience, story, or recommendation) with photo attachment • Like, comment, and share post • Explore (place, category)
	Ideal: All-inclusive platform to connect travellers with people who work in the tourism industry	<ul style="list-style-type: none"> • Whatsapp Group (Community) 	

In addition, in relation to Loocale's competitor, this study will analyze each of their UI/UX website design. The researcher will employ a combination of observation, exploratory testing, and the utilization of flowcharts to enhance the understanding of the user experience (UX) offered by each website.

Based on BrowserStack, Visual GUI testing, also known as graphical user interface (GUI) testing, is a valuable approach to verify an application's functionality and graphical user interface. This method not only facilitates a clear and concise representation of the user interface but also enhances the ease of designers, developers, and stakeholders in comprehending and collaborating on the design and functionality of the product. Additionally, GUI testing guarantees the consistency of the user interface across various operating systems and verifies the proper functioning of all graphical elements, aligning them with predetermined expectations. Visual GUI testing is divided into several types with each of it serving different purposes: layout testing, compatibility testing, usability testing, and visual design testing (Kitakabee, 2023). Components or topic covered in each testing are shown in Table 3.

Table 3. GUI Testing Type Description

Types of GUI Testing	Description
Layout Testing	Verification of the arrangement and placement of GUI elements, such as buttons, text fields, and menus. The primary objective of this testing approach is to ensure the accurate positioning of these elements, thereby fostering a visually appealing and user-friendly layout.
Compatibility Testing	Ascertain that the application remains accessible to a wide range of users, while concurrently ensuring the consistency of the visual aspects of the GUI across diverse platforms.
Usability Testing	Validate the usability of GUI elements and ensuring seamless interaction between users and the application. This testing process confirms that buttons, menus, and other GUI elements function correctly, enabling users to navigate through the application with ease, efficacy, and precision.
Visual Design Testing	Verification of the aesthetic appeal of the application's visual design, in adherence to the predetermined visual standards set by the esteemed development team. This includes evaluation of elements such as colors, fonts, and the visual style of the application in general, ensuring the delivery of a visually appealing and gratifying user experience.

Moreover, visual design holds an important role in UI/UX implementation as it is essentially the process of crafting the visual and aesthetic qualities of a user interface. Quoted from Laws of UX, users believe that the more aesthetic a design is, the more usable it is (Laws of UX, n.d.). As visual design is crucial to develop a good UI/UX, the visual assessment of Loocale and its competitors' website will be detailed according to these components: information hierarchy, color theory & application, typography, effects, spacing, and layout & visual composition (Lawrence, 2022). The following is the UI/UX competitor analysis summary of Loocale:

Table 4. GUI Testing Result Summary

Brand	Layout	Compatibility	Usability	Visual Design
Atourin	Medium	Medium	Medium	Medium
Pandooiin	High	Medium	High	High
Google Review	High	High	High	High
TripAdvisor	High	High	High	High
Loocale	Medium	Low	Low	Medium

The key findings derived from Loocale's competitor analysis are as follows:

1. The focus of Atourin and Pandooiin is not primarily on the review aspect. They mainly allow users to review products after making a purchase on their platform, which means not everyone can share their experiences on these platforms. This presents an **opportunity** for Loocale to differentiate itself by providing a platform where users can share their experiences more broadly.
2. When comparing Atourin, Pandooiin, Google Review, and TripAdvisor to Loocale, it is evident that the former are more established platforms. This is resulting in higher usability with a wider range of features

and a lower error rate. This poses a **threat** to Loocale as it currently has low usability and less working features in its platform.

3. Other competitors of Loocale have relied on its users to report or give feedbacks through platform like WhatsApp. Loocale, on the other hand, operates within WhatsApp for its community, which poses as a **threat** and provides an **opportunity** at the same time because Loocale hasn't implemented it but if they do, they could gather feedback from early adopters to further improve the platform.
4. Most of Loocale's competitors have products available for purchase on their platforms. However, Loocale is currently focusing on user acquisition and has not yet introduced any products for sale. This indicates an **opportunity** for Loocale as the company is taking a different approach and is in the process of establishing its user base before expanding its offerings. Loocale could also implement this business model in the next stage of their business.

Overall, Loocale has opportunities to differentiate itself by providing a platform for sharing experiences, utilizing WhatsApp for feedback collection, and focusing on user acquisition before introducing products for purchase. However, it also faces challenges in competing with more established platforms that offer a wider range of features. These findings provide valuable insights for Loocale's business strategy and potential opportunities for growth and differentiation in the competitive landscape.

Internal Analysis

Loocale is a newly established digital travel and tourism start-up that aims to provide a range of services to local individuals and professionals within the tourism industry. Despite being in the early stages of development, Loocale has successfully formed partnerships with over 50 tourism providers, demonstrating its ability to collaborate with key stakeholders in the industry. The company operates with a flat organizational structure, which promotes effective communication and teamwork, but also poses a challenge in terms of workload for its human resources.

Loocale's value proposition revolves around media promotion services, connecting local guides with travelers, providing a social media platform for sharing travel experiences, and fostering a community of like-minded travelers. However, at present, Loocale is only implementing the third and last aspect of its value proposition, as its product is still under development. Competitors in the local market include Atourin and Pandooin, but Loocale aspires to become a platform akin to Airbnb or Couchsurfing, serving as an intermediary connecting service providers with users.

Loocale engages with its community primarily through the WhatsApp platform, fostering more intimate and personalized interactions. While this approach serves as a strength, the company still faces challenges in terms of limited awareness and user acquisition. Loocale has implemented a Minimum Viable Product (MVP) stage for its website, but certain functionalities are not fully optimized for mobile users, leading to issues and poor customer experience. This, in turn, negatively impacts user retention and acquisition.

Despite its limited user base, Loocale has already fostered a distinct culture among its users, encouraging organic and interactive engagement. However, the company faces obstacles in terms of investment and human resources. Limited funding hinders the development of the website and the addition of more features, while the reliance on part-time staff members affects the speed and efficiency of website development. Loocale recognizes the need for additional human resources, particularly experts in website development, to enhance its structure.

Loocale actively seeks investors to support its future plans. The company also acknowledges the lack of a committed mentor who can provide constructive feedback. Moving forward, Loocale plans to target specific communities and expand its network of tourism service providers to acquire and retain users. The ultimate goal is to improve user satisfaction and create a thriving platform for travelers.

III. RESEARCH METHODOLOGY

A. Problem Analysis

The external analysis, comprising a PESTLE Analysis and Competitor Analysis, together with the company internal analysis of Loocale, has revealed several weaknesses and threats. These factors will inevitably influence Loocale's target market preferences regarding UI/UX website design. To gain a deeper understanding of these weaknesses and threats, a problem tree analysis was conducted. Problem tree serves as a universal heuristic tool for identifying, prioritizing, and visually representing problems. It functions by illustrating a structured scheme of problem causes and effects, with its roots addressing the core problems and its branch symbolizing the consequences resulting from the problem (Vesely, 2008). By utilizing the problem tree, researchers can systematically analyze and understand the relationships between various elements, facilitating a comprehensive assessment of the problem and its implications.

B. Data Collection and Analysis

This study employs qualitative approach which involves the collection and analysis of non-numerical data with the aim of gaining insights and understanding. This approach focuses on investigating specific groups or areas in order to delve into the richness and depth of subjective experiences, perceptions, and meanings (Crossman, 2020).

The qualitative method of choice in this study is in-depth interviews, which will be conducted with Loocale's internal team and potential target market. These interviews will be conducted synchronously, utilizing both face-to-face and Zoom interviews based on the prevailing circumstances. This approach allows the researcher to observe and interpret social cues, such as intonation and body language, exhibited by the participants. Furthermore, it facilitates obtaining immediate and direct responses from the participants without any delays. (Opdenakker, 2006).

In-depth Interview Method

In-depth interview is one of qualitative research method characterized by conducting intensive individual interviews with a limited number of participants. This approach aims to explore the participants' viewpoints, insights, and experiences pertaining to a specific idea, program, or situation (Boyce & Neale, 2006). This method is widely employed in survey designs and has various approaches, ranging from completely unstructured, where participants have the freedom to discuss any relevant topics, to highly structured, where participants are constrained to responding to direct questions (Fox, 2009). Semi-structured interviews, also referred to as semi-standardized interviews, offer a higher level of adaptability as they involve the utilization of a predefined topic and open-ended questions. These provide participants with the freedom to express their experiences and thoughts while also allows the exploration of unexpected answers and issues (Berg, 2001; Bridges et al., 2008).

To obtain a comprehensive view of the company, purposive sampling is used; thus, in-depth interviews will be conducted with both Loocale's internal team and potential target market. The Chief Marketing Officer of Loocale, who possesses extensive knowledge of the brand's marketing, website, and overall operations, will be interviewed to gain valuable internal insights. Furthermore, interviews will be conducted with several potential target markets of Loocale until data saturation is reached. Loocale's potential target market are those within the age of 16-35 years old and interested in travel and tourism.

In preparation for the interview session with Loocale's potential target market, a preliminary step involves notifying the respondents to explore and familiarize themselves with Loocale's website. This allows them to gain firsthand experience and insights into the platform prior to the interview. By doing so, the researcher aims to gather comprehensive data and insights that will contribute to a thorough understanding of both Loocale's internal dynamics and the market preferences of its target audience, which will help the researcher align the suggested UI/UX website design with the preferences and expectations of the corresponding stakeholders. This approach ensures that the researcher can provide relevant and tailored recommendations to enhance the user experience and meet the needs of Loocale's intended user base effectively. The interview questions are presented in Table 5 and Table 6.

Subject to Interview: Adella Izdhiharnada N. – Chief Marketing Officer of Loocale

Table 5. Interview Questions for Chief Marketing Officer of Loocale

Variable	No	Questions
Interviewee Profile	1	What is your role in Loocale and what is your responsibilities as a CMO?
	2	What is the current condition of Loocale overall?
	3	What stage is Loocale in right now? What kind of strategy planned for Loocale going forward?
New Insights in (Company General)	4	What is Loocale's current competitor? Is there any similar business model or any benchmark for Loocale?
	5	What is the value proposition that the current Loocale offers that differs Loocale from other tourism company?
	6	What are the problems faced by Loocale in general as of now?
New Insights (Company's Website)	7	As Loocale is currently developing its website, what are the milestones and what are the plans for Loocale's website in the future?
	8	What are the value propositions offered by Loocale's website? What can make potential users to use Loocale?
	10	What are the problems during the development of Loocale's website? How does the Loocale team tackle the said problem? Which ones succeeded and which ones failed?
	11	What is needed to further develop the website and tackle the existing problem?
	12	Who is Loocale's target market and potential user?
	13	So far, who are the users of Loocale's platform? What kind of feedback received from the users?
	14	What kind of improvements can be made for Loocale's website?

Subject to Interview: Potential Target Market of Loocale

Table 6. Interview Questions for Potential Target Market of Loocale

	No	Questions
Customer Persona	1	Name
	2	Age
	3	Domicile
	4	What motivates you to travel? (e.g., hobby, stress release, self-discovery, business)
	5	Where do you frequently visit? (e.g., within the country, overseas – Europe, Australia, America)
Actions, Touchpoints, Emotions, Pain Points (Customer Journey)	6	Please explain the process how you access Loocale's website sequentially! (Ask follow up questions if needed)
	7	What are the pros and cons in each stage of the process? How do you feel about it? (Pain point and gain point)
	8	What do you think of Loocale's UI/UX? (Additional follow-up question: Is it easy to use? Have you faced any difficulties?)
	9	Based on your experience, will you revisit Loocale's website? What are the factors that you consider to revisit/ not revisit Loocale's website?
New Insights (Customer Preferences)	10	Tell me 3 features in Loocale's website from best to least favorite!
	11	What do you want to keep and/or eliminate from Loocale's website to improve your experience?
	12	What kind of improvement do you think can be made for Loocale's website? (e.g., visual, features, UI)

The acquired data from the in-depth interviews will be processed using coding method, enabling the researcher to attain profound, comprehensive, and thorough insights into the data. Furthermore, this analysis method will enhance accessibility, retrievability, and transparency, shedding light on the development of the findings derived from it (Skjott Linneberg & Korsgaard, 2019). According to Saldaña (2013), coding involves the process of assigning names or labels to the data, categories, and properties. In addition, Glaser (1978) recommends line-by-line approach to coding with the objective of avoiding the researcher's preconceptions (Urquhart, 2017). The labeled interpretations or variables used in the analysis are derived from the statements provided by the respondents and the elements of customer journey map.

Table 7. Open Coding Variables

Color Numbers	Variables
1	New Insights
2	Customer Persona
3	Actions
4	Touchpoints
5	Emotions
6	Pain Points



Figure 3. Color Code

New Insights

Marketing insights encompass curated sets of data that offer marketers significant information regarding the desires and requirements of their brand's target audience. Distinguishing itself from conventional data science, marketing insights regard the numerical data not solely as raw figures, but rather as representative indicators that unlock valuable understandings and perceptions (Indeed Editorial Team, 2022).

Customer Persona

According to Lemon & Verhoef (2016), customer persona is defined as a partially fictional portrayal of the perfect customer, constructed through a combination of market research and actual customer data. Initially used primarily in user-centered design, personas have increasingly found application in brand management and customer experience design. These personas center around a specific customer segment, aiming to uncover essential characteristics of the average customer within that segment, including their needs and experiences.

Actions

Hunt (2023) on Deliverable UX breakdown the components of customer journey map, and one of it is actions which is narrations of the specific activities undertaken by the Persona during each distinct phase, thereby facilitating the attainment of their predetermined goals.

Touchpoints

Every place where the interaction between business and customer happens is often referred as touchpoints (Craig, n.d.). Touchpoints are closely related with actions and commonly used alternatively; however touchpoints may be included in actions but some actions might direct the customer to somewhere without the company's touchpoint (Hunt, 2023).

Emotions

Throughout the customer journey, emotions serve as a discerning tool, effectively highlighting and accentuating the remarkable aspects of an individual's experience in each stage or phase of the journey. These emotions are visually represented on a customer journey map through the use of an emotion graph. The emotion graph functions as a means of visualizing customer sentiment, explicitly capturing the emotional states experienced by customers at each interaction point. To visually depict these emotions, emotion icons or emoticons, which are pictorial representations of facial expressions denoting specific emotional states, such as a 'smiley face' emoticon symbolizing happiness, are employed. Furthermore, emotions on the customer journey map are effectively conveyed through the incorporation of customer verbatim comments. While the emotion graph relies on visual storytelling techniques, verbatim comments employ the customer's authentic voice, words, and expressions, encapsulating and summarizing the collective perspective of customers (Allwood, 2021).

Pain Points

A study conducted by (Salminen et al., 2022) explain the concept of pain point as discernible problem encountered by customers of a company, which can be effectively addressed by the company itself. The study highlights that criticism aimed at the company, lacking actionable insights, does not qualify as a genuine pain point. However, a complaint directed towards the company that specifically highlights a problem related to the

customer's experience with its products or services is considered a valid pain point. the company can address is considered as a pain point. Another research by (Brenda & Permadi Iskandar, 2019) characterizes pain points as instances within a customer's journey that results in frustration, emotional discomfort, irritation, or inconvenience.

A. *Customer Insight*

To get a comprehensive understanding on Loocale's target market UI/UX preferences, obtaining the customer insight is crucial. Customer insight, alternatively referred to as consumer insight, is the understanding and portrayal of customer data, behaviors, and feedback, drawn as conclusions. These insights serve as actionable motive behind customers' desires and necessities, thereby facilitating the enhancement of product development, customer support, and features expansion (Sachs, 2019). Meanwhile, consumer insight is defined by Maulana (2009) as the process of acquiring a deeper understanding of the underlying background, thoughts, and behaviors of a consumer in relation to a product and its advertising communication, in a holistic manner. Based on those definitions, customer insight not only studies the target's behavior, attitude, etc. that are associated with a product, but also the intention, process, motivation, and the background behind it.

A study by Janiszewska (2013) mentioned how consumer insight is typically found in individual statement, often quoted, that can be found through close observation or directly listening to their opinions. Developing consumer insight requires establishing a deep relationship with representatives or members of the target group. This involves understanding and uncovering the genuine motivations or reasons behind their attitudes and behavior.

Consumer insights comes in various types, including but not limited to sales and support trends, customer behavior, and demographics. These insights can be obtained through various sources and methods, such as focus group discussions, customer feedback, surveys, and the study and analysis of customer data (Maza, 2023). Additionally, in-depth interviews can be utilized as another effective means to collect consumer insights data. In the context of this study, the findings will be presented in the form of a customer journey map, given the close relationship between UI/UX website design and the user's journey.

Customer journey map portray a framework outlining the trajectory followed by a typical customer as they navigate through various touchpoints associated with the company. Potential shifts in the customer's attitudes and emotions towards the company will be depicted within each touchpoint (Craig, n.d.). According to Marquez et al. (2015), the map was developed to visualize the user journey from start to finish on a task with the aim of comprehending the different stages, steps, and touchpoints that users encounter while completing the task. Through customer journey mapping, customers' experiences and emotional responses could be addressed specifically at each stage of their journey. Moreover, customer journey mapping could also help this study highlights the opportunities, pain points, and calls to action from a user perspective in using the service.

In accordance with Deliverable UX, a customer journey map comprises several components: persona, scenario, expectations or goals, phases, thoughts and emotions, actions, and opportunities (Hunt, 2023). On the other hand, CareerFoundry states that customer journey map's components consist of persona info, objective, stages and goals in each stage, touchpoints, customer feedbacks (emotions, level of satisfaction, quotes or questions), pain points, and improvement opportunities. According to various sources discussing customer journey mapping, it is evident that there is no universally fixed set of components. Therefore, in this research, the researcher will adapt and modify the components of the customer journey map based on the specific requirements and objectives of the study.

Through research on customer insights, Loocale can acquire a comprehensive understanding of the user's perspective, encompassing their sentiments towards the website, and unveil the underlying motivations driving their behaviors. This invaluable information empowers Loocale to identify and address user pain points, thereby enhancing the current UI/UX website design.

IV. RESULT / FINDING

Problem Tree Analysis

Through the problem tree analysis, it becomes evident that one of the primary concerns faced by Loocale is the unoptimized UI/UX design of its website. This issue stems from the main cause, namely hindered web development, which is further influenced by other underlying factors such as insufficient investment and the absence of a dedicated mentor capable of providing constructive feedback on its current Minimum Viable Product (MVP) as stated in the internal analysis. As a result, these factors give rise to several effects, such as error features, lack of features available for use, poor user experience, low customer satisfaction, lack of user retention, and lack of user acquired.

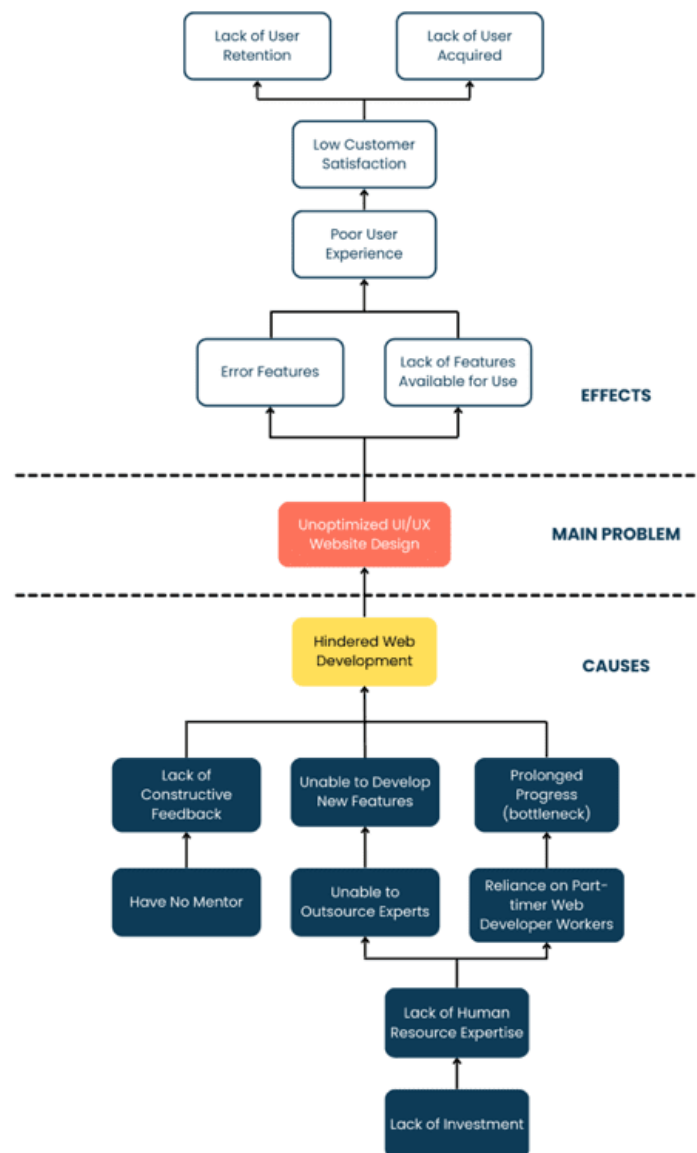


Figure 4. Problem Tree

Data Result

Interview Result with Chief Marketing Officer of Loocale

The interview results obtained in the preceding section will be subjected to analysis through open coding. The individual interviewed for the internal team is Adella Izdhiarnada N., Chief Marketing Officer of Loocale and

one of Loocale co-founders. Due to its relatively limited human resources as a startup, she is responsible for Loocale's marketing and involve in the company's business development. In her role as CMO, she primarily oversees all aspects pertaining to users, including but not limited to social media presence and user acquisition. Based on the open coding analysis of the in-depth interview with Loocale's CMO, valuable new insights have been obtained and will be incorporated into the SWOT analysis. Table 8 presents the insights derived from Loocale's internal team, as shown below.

Table 8. New Insights from Loocale's CMO

New Insights	SWOT Analysis
Loocale plans to develop new features	Strength
Development of new features is hindered by lack of budget	Weakness
Loocale is affiliated with Kemendes	Opportunity
Future plan for Loocale's platform will guarantee customers' safety and comfort	Strength
Loocale will enhance its website layout by creating different dashboard for users and partners	Strength
Loocale recognizes the importance of receiving genuine critiques and constructive feedback from a broader user base	Strength

Interview Result with Potential Target Market of Loocale

The interview sessions conducted with Loocale's potential target market have yielded valuable insights in the form of suggestions and feedback, providing a comprehensive understanding of the company's strengths, weaknesses, opportunities, and threats. The customer journey map section will further elaborate on the customer insights. The following section presents the key insights gathered from the interviews with Loocale's potential target market which will be integrated in the SWOT analysis.

Table 9. New Insights from Loocale's Potential Target Market

New Insights	SWOT Analysis
The occurrence of errors during the sign-up process	Weakness
Low website's usability and compatibility	Weakness
Sort and filter feature would make it easier for the users to find the information they need	Opportunity
Notice for any error and features in development could prevent users' misunderstanding	Opportunity
The addition of an automatically generated itinerary feature for specific destinations can offer users a convenient and time-saving solution for trip planning	Opportunity
By integrating maps into Loocale's website, Loocale could enhance user convenience and facilitate seamless navigation	Opportunity
Loocale should prioritize developing its website for mobile version to tap into the growing number of mobile users	Opportunity
Implementing a reward or level system for users could improve user engagement and loyalty	Opportunity
Follow system between users should be developed and implemented on Loocale's website	Opportunity
The welcome page is unattractive, unnecessary, and confusing	Weakness

Customer Journey Map

In accordance with the preceding chapter, the forthcoming analysis will involve the customer insights derived from in-depth interviews conducted with potential target market individuals of Loocale. These insights will be subjected to analysis using open coding method. Subsequently, the obtained findings will be visually presented in the form of a comprehensive customer journey map. The research aims to capture the perspectives and experiences of five carefully selected respondents, identified as JR, NA, MFA, EV, and PV, who fit in the characteristics of Loocale's potential target market. Remarkably, all of these respondents fall within the age bracket of 16 to 25 years and show a profound interest in travel and tourism.

Figure 3 and Figure 4 depict the customer journey maps of Loocale's customer personas, specifically detailing their experiences when exploring Loocale's website and its various features. To enhance clarity and capture key distinctions, the customer journey maps are divided into two personas based on the devices used by

the respondents. This division is essential as it uncovers significant difference in their actions, touchpoints, insights, and pain points throughout the journey.

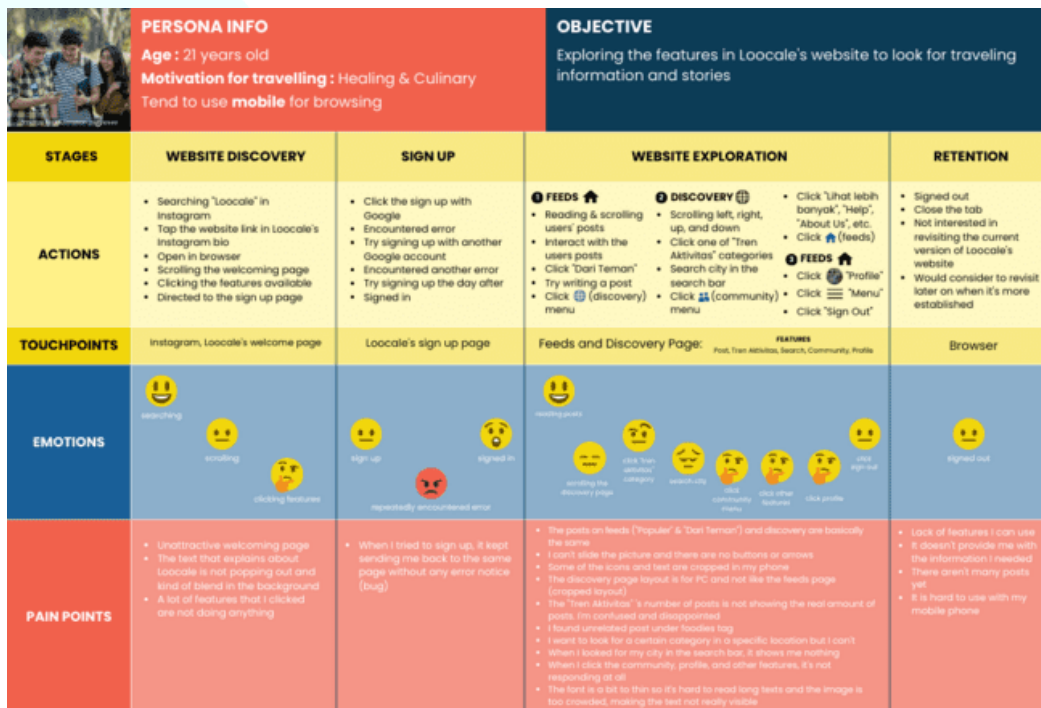


Figure 5. Customer Journey Map Mobile

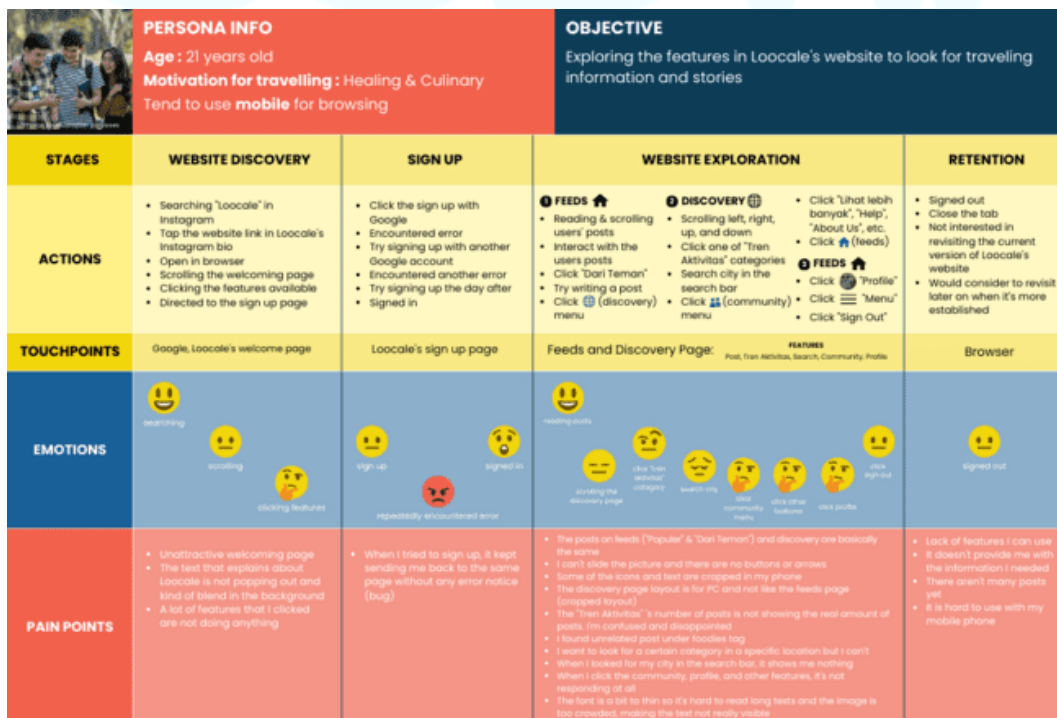


Figure 6. Customer Journey Map PC

By separating the customer journey maps based on device usage, a comprehensive understanding of the unique experiences and challenges encountered in different devices can be attained. This approach enables Loocale to address specific needs and tailor its offerings accordingly, ensuring a more personalized and optimized user experience.

Overall, the customer journeys of the two personas exhibit significant similarities, with differences specifically during the website discovery and website exploration stages. Mobile users, in particular, tend to discover the Loocale website by initially searching for its Instagram profile and subsequently clicking on the website link provided in the bio. On the other hand, PC users directly search for Loocale's website through search engines such as Google.

Furthermore, another distinguishing factor is the distinct layout of the mobile version of Loocale's website. While the website's discover page remains optimized for the PC version, the mobile layout presents certain challenges and issues, which are prominently highlighted in the pain points section. This discrepancy in layout and functionality led to numerous complaints and feedback from users, underscoring the need for addressing and resolving these concerns.

B. SWOT Analysis

A SWOT analysis serves as a valuable tool for evaluating various aspects of a business, encompassing its strengths, weaknesses, opportunities, and threats. By recognizing both internal and external factors crucial to achieving a business's objectives, SWOT analysis distinguishes between controllable internal features and uncontrollable external factors. Furthermore, through conducting an analysis that combines assessments of strengths, weaknesses, opportunities, and threats, the SWOT framework facilitates the identification of viable alternative options for a business (Benzaghta et al., 2021). This study aims to utilize a SWOT analysis as a comprehensive framework to consolidate the findings from previous internal and external analysis, thereby identifying and summarizing the strengths, weaknesses, opportunities, and threats associated with Loocale.

Table 10. Loocale's SWOT Analysis

Strengths	Weaknesses
S1 – Good communication and strong teamwork	W1 – Lack of features available
S2 – Established partnerships with over 50 tourism providers	W2 – Insufficient investment for operational
S3 – Organic interaction between users	W3 – Lack of expert in website development
S4 – Cultivating closer and more personalized interaction through its community	W4 – Reliance on part-time workers, often results in moderate outcomes and prolonged project timelines
S5 – Capable human resources	W5 – Lack of awareness from the customer
S6 – Loocale plans to develop new features	W6 – Unoptimized UI/UX
S7 – Future plan for Loocale's platform will guarantee customers' safety and comfort	W7 – Development of new features is hindered by lack of budget
S8 – Loocale will enhance its website layout by creating different dashboard for users and partners	W8 – The occurrence of errors during the sign-up process
S9 – Loocale recognizes the importance of receiving genuine critiques and constructive feedback from a broader user base	W9 – Low website's usability and compatibility
	W10 – The welcome page is unattractive, unnecessary, and confusing
Opportunities	Threats
O1 – Growing travel intention among Indonesians	T1 – Established competitors overshadow Loocale
O2 – Emergence of travel trends such as work from anywhere (WFA), staycation, revenge travel, and hidden gems	T2 – Established competitors have more features and higher platform usability
O3 – Rising familiarity and usage of digital media and technology among Gen-Y and Gen-Z in Indonesia	T3 – Saturated market due to the influx of emerging startups
O4 – Advancements in UI/UX development and their positive impact on businesses	
O5 – Loocale differentiate itself by providing a platform where users can share their experiences more broadly	
O6 – Loocale is affiliated with Kemendes	
O7 – Sort and filter feature would make it easier for the users to find the information they need	
O8 – Notice for any error and features in development could prevent users' misunderstanding	
O9 – The addition of an automatically generated itinerary feature for specific destinations can offer users a convenient and time-saving solution for trip planning	
O10 – By integrating maps into Loocale's website, Loocale could enhance user convenience and facilitate seamless navigation	
O11 – Loocale should prioritize developing its website for mobile version to tap into the growing number of mobile users	
O12 – Implementing a reward or level system for users could improve user engagement and loyalty	
O13 – Follow system between users should be developed and implemented on Loocale's website	

V. DISCUSSION

Business Solution

The previous chapter has already highlighted the main problem faced by Loocale, which is unoptimized UI/UX website design that can be attributed to the hindered web development. Consequently, recommendations are necessary to address this issue and enhance the website.

In the pursuit of developing the UI/UX website design for Loocale, the researcher has discerned its weaknesses and threats, which must be overcome through the implementation of identified strengths and opportunities. Hence, the researcher proposes several recommendations and improvements for the UI/UX website design of Loocale as follows:

1. Introducing New Features for Enhanced User Experience
2. Implementing Notifications for Ongoing Feature Development and Error on Loocale's Website
3. Enhancing Cross-Device Compatibility to Improve User Experience on Various Platforms
4. Simplifying User Onboarding

The thorough examination of Loocale's strengths, weaknesses, opportunities, and threats from the SWOT table in the previous chapter has served as the foundation for formulating the recommended Loocale's UI/UX website design approach.

Introducing New features for Enhanced User Experience

Loocale's website is currently in the Minimum Viable Product (MVP) stage where the website offers only the base features required for its functionality. Through customer journey mapping and insights gathered from Loocale's internal team, the researcher has identified various pain points and suggestions provided by users in accordance with **Loocale's website development plan to develop new features (S6)** to enhance their experience on the website. Below are the proposed features for Loocale's website:

1. Floating Whatsapp Button

As one of the strengths identified during the interview with Loocale's Chief Marketing Officer, **Loocale acknowledges the significance of receiving genuine critiques and constructive feedback from a wider user base (S9)**. Consequently, the implementation of this feature will enable Loocale's users to report any errors, bugs, dysfunctions, or provide feedback concerning their experience on the Loocale website. This feature will serve as a direct channel for users to reach out to Loocale's customer service.



Figure 7. Floating Whatsapp Button Feature

The inclusion of reporting and feedback mechanism allows Loocale's users to actively contribute to the improvement of the platform, thus enhancing user satisfaction and enabling Loocale's development team to address these concerns promptly, thereby improving the overall functionality and reliability of the platform. In addition, facilitating direct communication between users and Loocale's customer service, the platform demonstrates its commitment to addressing user concerns and actively engaging with its users. To facilitate user convenience and encourage reporting and feedback throughout every stage of their journey on Loocale's website, this feature will be accessible on all pages. This aims to simplify the process for users who wish to report issues or provide feedback, ensuring that they can easily access the reporting mechanism regardless of the page they are currently on.

Sort and Filter

According to the the customer journey map, a pain point is identified related to users' difficulty in searching for specific categories in particular locations. Implementing a filter feature enables users to refine their search based on location. Additionally, users have suggested the inclusion of sort features in the "Tren Aktivitas" section. Therefore, aligning with how **sort and filter feature would make it easier for the users to find the information they need (O7)**, These features will be incorporated into the discover section of the website, allowing users who are exploring the website to find the specific information they need more easily and efficiently.

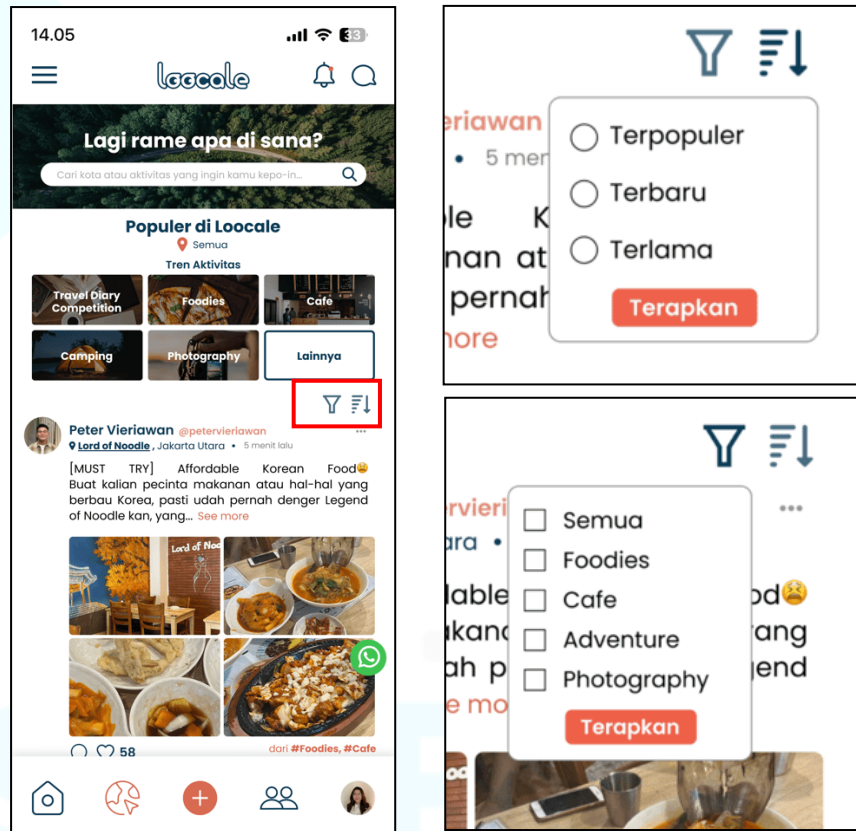


Figure 8. Sort and Filter Feature

The sort feature plays a crucial role in enhancing the user experience on the website. The sort feature enables users to arrange posts based on two criteria: popularity and recency. Sorting by popularity enables users to view the most popular posts, providing them with valuable insights into trending topics or highly regarded content. Sorting by recency allows users to access the latest or oldest posts, ensuring they stay up-to-date with current information.

In addition to the sort feature, the website will also incorporate a filter feature. This functionality empowers users to refine their search results by selecting specific categories. By enabling users to filter posts based on their chosen categories, it will ensure a more targeted and personalized browsing experience. Users can easily focus on posts that aligns with their interests and preferences, leading to greater satisfaction and efficiency.

Integrated Maps

Moreover, while conducting the interviews, multiple users expressed their preference for clickable destinations, prompting the inclusion of integrated maps on the website which could enhance user convenience and facilitate seamless navigation (O10).

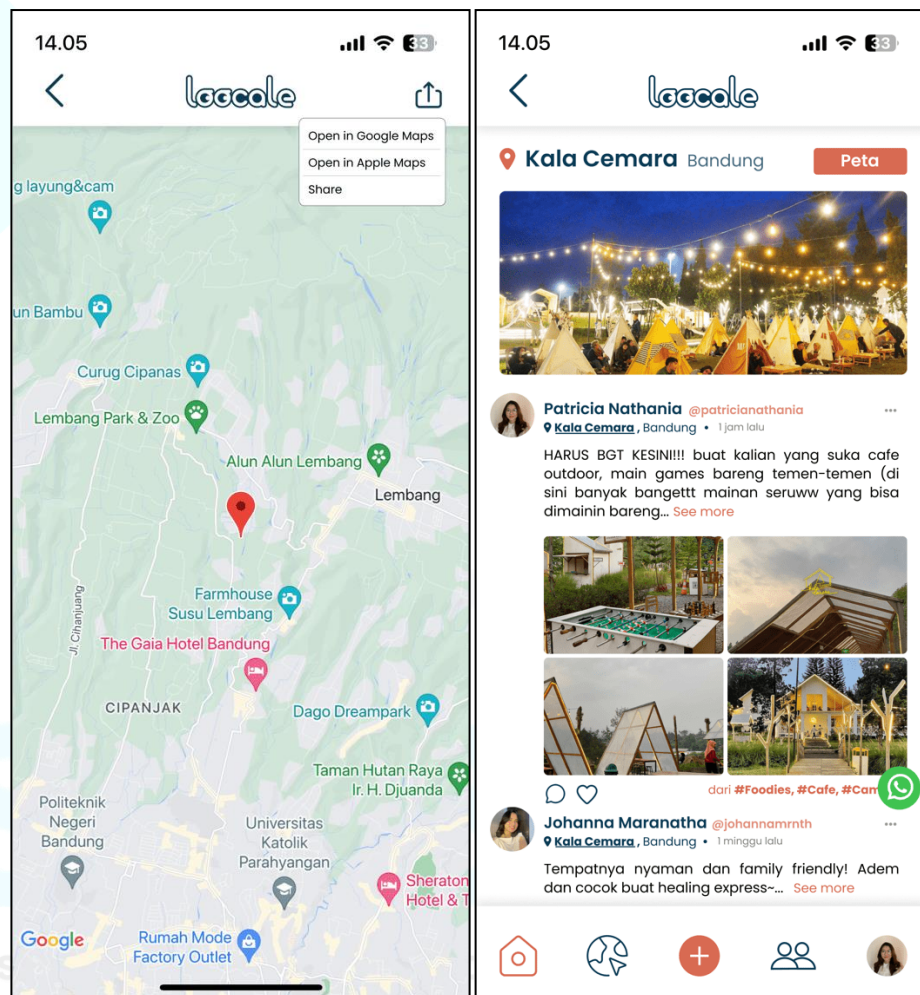


Figure 9. Integrated Map Feature

The integration of maps into Loocale’s website presents numerous advantages, such as:

1. The inclusion of maps provides users with a visual representation of destinations. It allows them to gain a better understanding of the geographical context and location of various tourist spots, landmarks, or attractions.
2. The interactive nature of maps facilitates seamless navigation. Users can get directions easily to the location they intend to using extended map application. Especially in Loocale, where there might be a lot of hidden gem destinations – less visited destination – direction to the location will assist the user in plotting routes, calculating distances, and identifying the best routes to reach their desired destinations.
3. By integrating maps into the website, users will be conveniently spared from manually navigating to separate platforms to search for locations. Instead, they can simply click on the desired location within the website and be directed to the corresponding maps. This streamlined process reduces the number of actions required by the user and enhances overall efficiency.

Additionally, by making the destinations clickable and direct the users to other posts from the same destination, it offers additional information about the location and users can access detailed address, posts, and photos. This feature allows the users to gather more insights about the location and make well-informed decisions.

Follow System

Based on interviews conducted with both Loocale's internal team and potential users, it is evident that there is an unanimous agreement that **follow system between users should be developed and implemented on Loocale’s website (O13)**. Loocale has already planned to develop this feature and it is also in accordance with the interests and expectations of potential users.

Through the implementation of this feature, it is anticipated that it will cultivate a sense of community and stimulate active user participation, thereby enhancing user engagement. Additionally, the follow feature will empower users to tailor the content and posts they encounter, aligning them with their individual preferences and contributing to a more personalized and gratifying user experience. Furthermore, it will facilitate the establishment of connections and networking opportunities among the platform's user base. By allowing users to follow and engage with individuals who share similar interests, this feature will foster collaborations, discussions, and the exchange of ideas. This sense of community-building will not only enhance user retention but also foster a vibrant and interactive platform ecosystem.

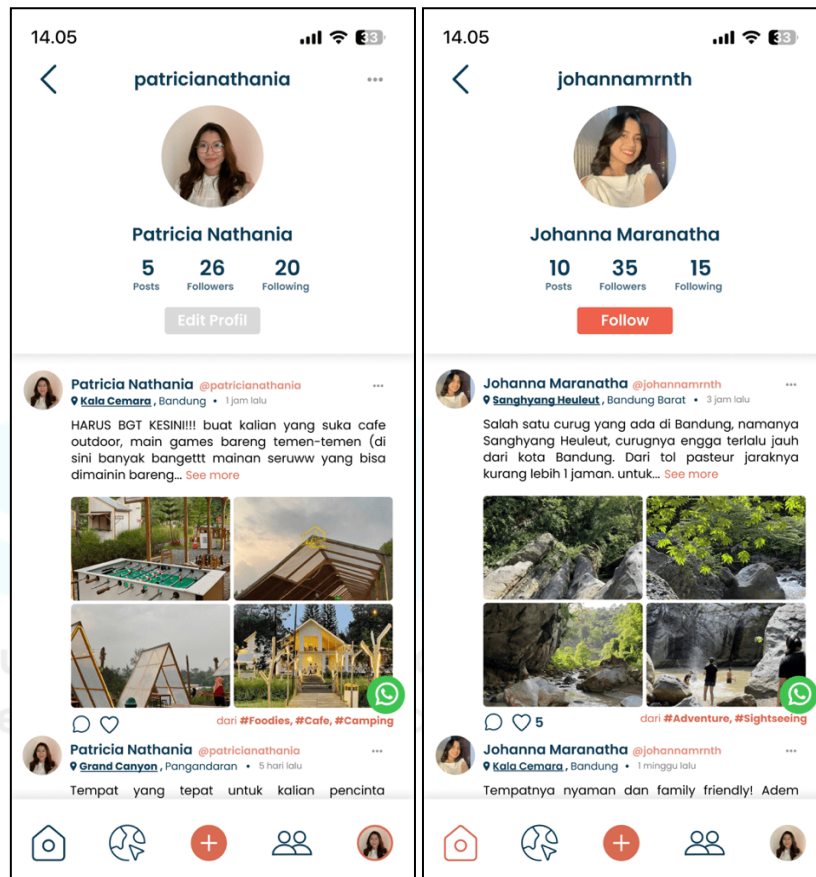


Figure 10. Follow Feature

C. Implementing Notifications for Ongoing Feature Development and Error on Loocale's Website

In line with the emerging opportunity to **address users' confusion and prevent misunderstandings, it is crucial to provide clear notice for errors and features that are still under development (O8)**. This will also clarify **the occurrence of errors during the sign-up process that user experience on Loocale's website (W8)**. Based on the customer journey map, users have expressed their frustration with the inability to sign up and the repetitive redirection to the sign-up page without any indication of errors. Additionally, users have complained about unresponsive features or buttons, assuming they are bugs or error.

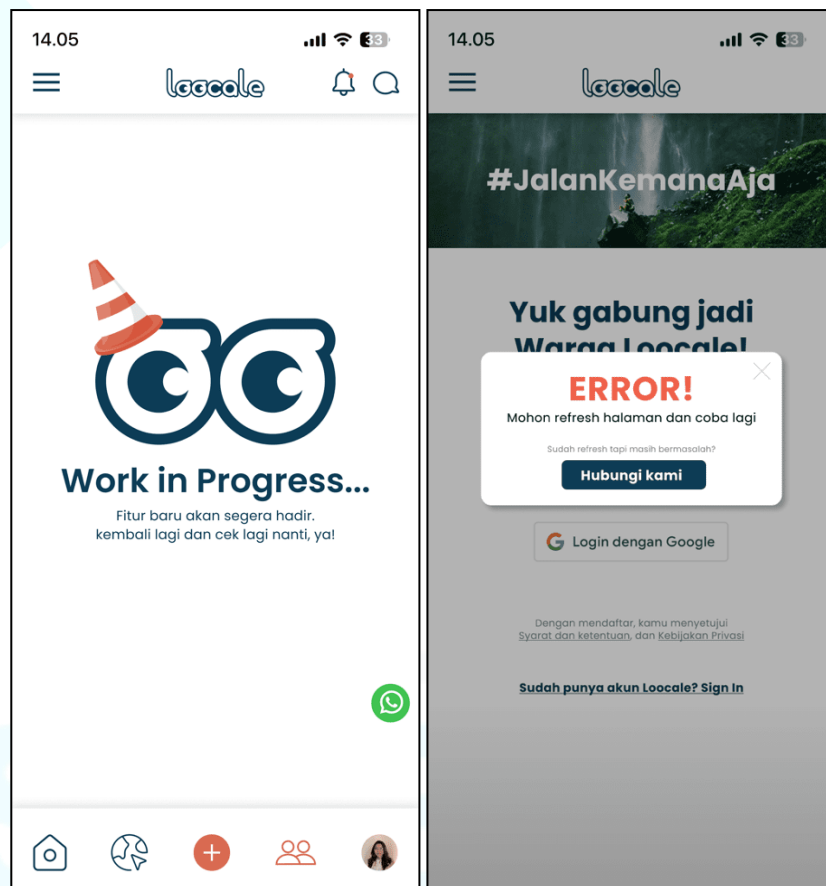


Figure 11. Error and Under Development Notice

By implementing a solution that effectively addresses these concerns, Looocale can align itself with the identified opportunity and mitigate potential misunderstandings among its users. The prompt notification of errors encountered during the sign-up process, coupled with the provision of informative error messages, will enable users to resolve issues or seek assistance from Looocale's customer service more efficiently. Furthermore, the implementation of concise and helpful error notices will clear any misunderstandings regarding unresponsive features or buttons, clarifying that these issues are a result of ongoing development efforts rather than bugs. Transparent communication about errors and the progress of ongoing development activities fosters a sense of engagement and trust between Looocale and its user base.

D. Enhancing Cross-Device Compatibility to Improve User Experience on Various Platforms

Based on the customer journey analysis, it is apparent that several respondents who accessed Looocale through their mobile phones have expressed a common concern regarding the suboptimal experience on the discover page. Users have noted that the current layout of the mobile version of the discover page appears to be designed for PC and laptops, resulting in a cropped look that aligns with the identified weakness of **unoptimized UI/UX (W6)** and **low website's usability and compatibility (W9)**. Thus, **Looocale should prioritize developing its website for mobile version to tap into the growing number of mobile users (O11)**. Additionally, other issues such as cropped text or icons have also been reported by users, highlighting the need for mitigation in this solution.

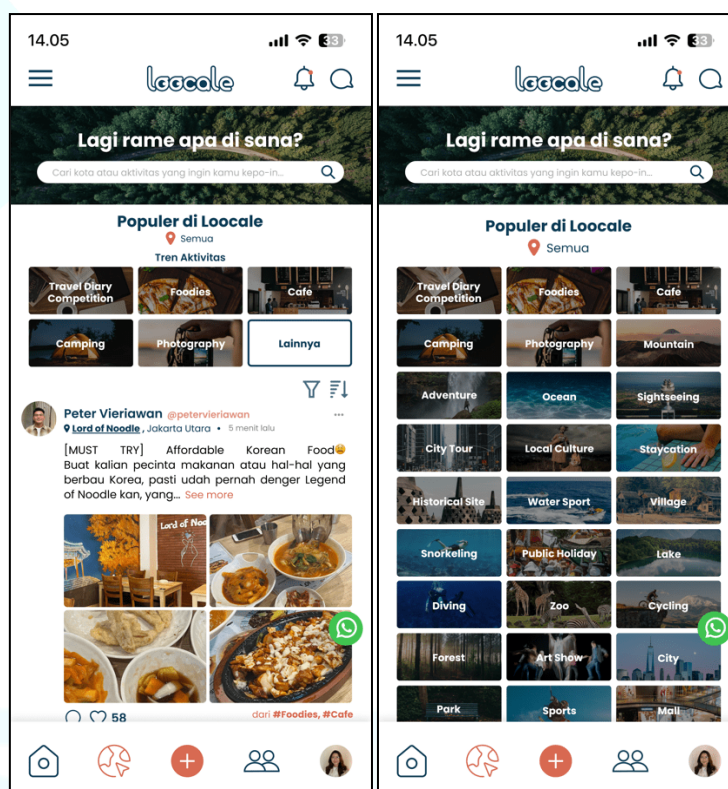


Figure 12. Optimized Discover Page UI/UX for Mobile Layout

Optimizing the discover page for mobile devices is essential to ensure a seamless user experience for those accessing the platform via smartphones. This solution involves making adjustments to the layout, text, and icons to accommodate smaller screen sizes, facilitating easy navigation and readability. By adapting the design elements to fit mobile screens, Loocale can create an interface that is visually appealing and eliminates the cropped look that users have reported.

Moreover, this optimization will increase the accessibility of the platform, catering to a larger user base. With the continued growth of mobile usage, prioritizing the needs of mobile users is crucial for Loocale to effectively engage and retain a wider audience. By providing a well-optimized mobile experience, Loocale can ensure that users can easily access and interact with the platform's content and features, regardless of the device they use.

Another advantage of implementing UI/UX website optimization for mobile devices is the ability to deliver a consistent experience across different devices. By maintaining a unified design and user interface across platforms, Loocale strengthens its brand identity and professionalism. Consistency in design and functionality fosters a sense of trust and familiarity among users, reinforcing Loocale's commitment to delivering a high-quality user experience.

D. Simplifying User Onboarding

Based on the pain points identified in the customer journey, users have expressed confusion when encountering the welcome page of Loocale. **The welcome page has been deemed unattractive, unnecessary, and confusing (W10)**, thereby impeding users from proceeding further and potentially leading to their withdrawal from the platform. Moreover, users are unaware of the differences in content, appearance, and features between the welcome page and the website after signing up. To effectively tackle this, it is imperative to eliminate the welcome page and transform it into a banner, aligning with the suggestion provided by the respondents. By implementing this solution, users will have the opportunity to preview Loocale's website and explore its features without the need to sign up initially. This change aims to simplify the user onboarding process and provide users with a clearer understanding of the platform's offerings before committing to creating an account.

Additionally, the conversion of the welcome page into a banner effectively communicates important information without disrupting the user flow. This banner can be strategically positioned to provide relevant details, such as a brief overview of the platform's features or any promotional announcements, while maintaining the focus on the main content of the website. It could also incorporate compelling calls-to-action (CTA) to encourage user engagement and interaction. The mobile version will use pop up banner, meanwhile for the PC and laptop versions of Loocale, the traditional banner format will be used. This standard banner will be integrated seamlessly into the website's layout, ensuring it complements the overall design and does not hinder the user experience.



Figure 13. Pop Up Banner

VI. CONCLUSION AND RECOMMENDATION

The output of this research is UI/UX website design recommendation for Loocale aimed at addressing the primary issue of an unoptimized UI/UX on Loocale's website. Based on the findings, the researcher proposes several recommendations to solve the problem, which are as follows:

1. Introducing New Features for Enhanced User Experience
2. Implementing Notifications for Ongoing Feature Development and Error on Loocale's Website
3. Enhancing Cross-Device Compatibility to Improve User Experience on Various Platforms
4. Simplifying User Onboarding

These recommendations are planned to be implemented simultaneously in July 2023 as part of Loocale's UI/UX website design development. By implementing these recommendations, the researcher aims to enhance Loocale's user experience and address the pain points identified during the research.

The findings derived from this research carry significant implications for the advancement of Loocale's UI/UX website design. By implementing the proposed recommendations and exploring alternative UI/UX layouts, it is anticipated that the overall user experience for potential users of Loocale will undergo substantial improvement. As a result, Loocale is expected to attract a larger user base and achieve higher user retention rates. Furthermore, the impact of this research extends beyond Loocale itself, as it stands to benefit other startups operating within

the same industry. By offering a comprehensive problem-solving approach encompassing problem analysis, identification of root causes, and the development of alternative strategies to address pertinent issues, this research makes a valuable contribution to the field of management science. Essentially, it serves as a practical guide for businesses engaged in problem-solving research, providing a framework for effective and efficient problem resolution.

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Marketing Strategy Analysis and Development of X-Camp (XL Axiata IoT Innovation Center)

Celta Amadea Saputra¹, Nurrani Kusumawati²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

X-Camp is the first IoT innovation center and open laboratory in Indonesia, owned by PT XL Axiata. After maturing its R&D stage, X-Camp has challenging obstacles as it enters the commercialization phase and struggles to establish its brand due to an unprepared environment in Indonesia. Some further research and deeper analysis are required for their sold IoT solutions to be recognized and generate more pre-orders (PO), thus resulting in a higher rate of income. To boost customer readiness, an effective method should be devised and implemented so that X-Camp can increase brand awareness before moving on to brand recognition. This research seeks to identify a probable target market and the most effective marketing plan for increasing consumer purchasing interest. The author first analyzes the internal environment and the external environment using marketing tools. Through interviews with targeted potential consumers, past clients, and the core staff of X-Camp, including department heads and senior specialists, the qualitative research technique understands the inside and outside of the organization comprehensively. After obtaining all information, the purpose of establishing a strategy is to raise awareness through a variety of marketing approaches. Strategy execution can take several forms, including the use of promotional techniques. The insight of this research would help X-Camp by providing marketing initiatives to increase brand awareness, influence prospective customers' buying intentions through effective GTM tactics, and escalate current business readiness or the next step in sales. With the results obtained, this study can help IoT solution provider companies to give better service.

Keywords: Brand Awareness, Go-To-Market Strategy, IoT Innovation Center, Purchase Intention, Target Market.

I. INTRODUCTION

Technological developments have transformed the telecommunications industry around the world. The user's switch to OTTs (over-the-top) resulted in a reduction in traditional MNO (mobile network operator) services such as domestic phone calls, SMS messaging, and long-distance calls, along with an unfavorable rise in data traffic (Minges and Kelly, 2018, cited in Awwad, 2021). The growth of data traffic in Indonesia is increasing every year, but it is not directly proportional to the increase in the income of telecommunications operators. Proven by the data from Mirae Asset Sekuritas Indonesia Research (2020), the global telecommunications sector is generally facing challenges from a financial perspective.

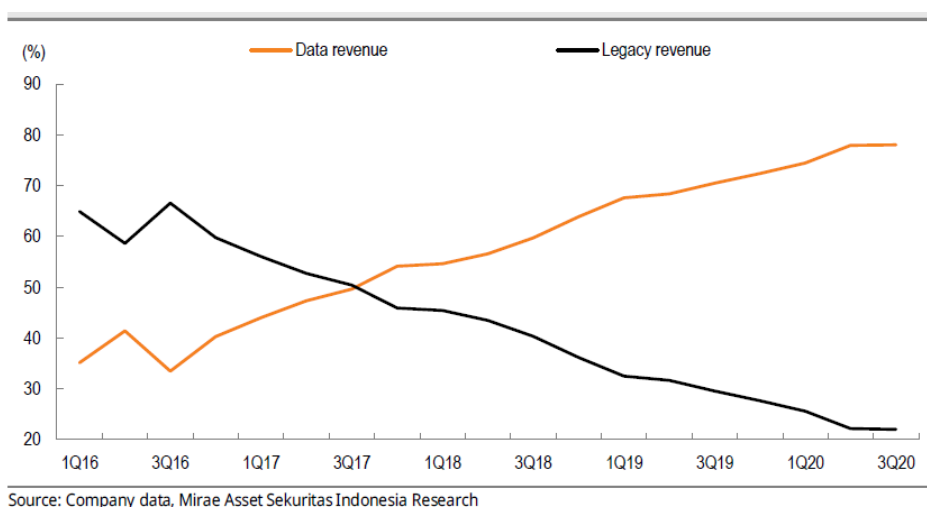


Figure 1. Industry's Data and Legacy Revenue Contribution (Mirae Asset Sekuritas Indonesia Research, 2020)

Reflecting on those changing trends, especially in Indonesia, operators must find other ways to survive. Utilizing Industrial Revolution 4.0 technology, the Internet of Things is one of the best approaches to

accomplishing it. According to the data taken from ASIOTI (2019), by 2022, it is predicted that there will be 400 million IoT devices with a market share of up to Rp444 trillion in Indonesia. The "4IR" has the potential to transform not only industry but also many aspects of human life. 4IR includes a variety of advanced technologies, for instance, AI, the IoT, wearables, advanced robotics, and also 3D printing (Raharjo, 2020). In line with the Government's plan to launch the National Initiative "Making Indonesia 4.0", PT XL Axiata Tbk is willing to contribute significantly to the implementation of this national program. Currently, XL already has an "IoT Innovation Center" called X-Camp to become the main accelerator that drives the IoT ecosystem in Indonesia. Based on internal data from X-Camp (2022), they will do a B2B approach to sell those solutions, but only 2 of 21 products have been secured by our customers who pre-order them thus far.

Since its establishment in 2018, the "IoT Innovation Center" called X-Camp, has pursued its main focus of finding out how to build a sustainable IoT ecosystem. It is not an easy task to be able to escalate the growth of the IoT in Indonesia. Based on the senior employees' and managers' statements in X-Camp, they still have a lot of work to do in order to concentrate on the appropriate market. X-Camp, which prioritizes product customization, is still unsure about what sort of product to create to meet and satisfy market demands. There is relatively little information available on the Indonesian market's readiness for IoT products, thus, X-Camp must discover more about consumer preferences, particularly when it comes to businesses that may require IoT devices' assistance to speed up productivity or business operations. Their commercialization effort is still far from ideal and perfect conditions. This case study will be conducted with the primary objective of finding out the market potential and interest of IoT products in Indonesia, thus resulting in the best-fit go-to-market strategy (GTM) for X-Camp. This research will help X-Camp by choosing and emphasizing the most suitable marketing solutions for them.

II. LITERATURE REVIEW

Company Profile

On October 6, 1989, XL Axiata (henceforth shall be referred to as "the Company"), was established under the name of PT Grahame Metropolitan Lestari, as a general trade and service company. The Company then entered the telecommunications sector in 1996 upon receiving its GSM 900 operational license. From then on, the Company became the first private company in Indonesia to provide cellular phone services. The Company changed its name to PT Excelcomindo Pratama in 1995, through a Memorandum of Understanding with the Rajawali Group and three foreign investors (NYNEX, AIF, and Mitsui). The Company has a vast network and a range of services as one of Indonesia's top cellular telecommunication companies. Some of the services that the Company provides for retail and corporate customers include data, voice, SMS, and other value-added cellular telecommunication services. In order to demonstrate its commitment to the Internet of Things (IoT) industry, XL Axiata developed the X-Camp IoT Innovation Hub in 2018. In line with the expanding demand to facilitate various individual and commercial operations, IoT is one of the digital technologies that XL Axiata believes has significant potential over the next three to five years. The effective operation of X-Camp started in the middle of November 2018. There are other amenities within, including a workstation where developers can work on developing IoT product prototypes up to small-scale production versions. Also, there are areas and resources for user experience testing. Not to mention, X-Camp has facilities for presenting its IoT solutions and goods, as well as a place for stakeholder discussions. The only IoT Lab in Southeast Asia that is a member of the GSMA Lab Alliance is X-Camp. The potential of local resources, especially those from colleges, will be actively developed by X-Camp.

Company Vision and Mission

1. XL Axiata's vision is to become the "Number One Converged Operator In Indonesia".
2. XL Axiata's purpose is "We bring the world closer in a simple way for a brighter life".
3. X-Camp's vision is to become the home of sustainable IoT business in Indonesia by providing Indonesian IoT and AI Startups the Incubation Program, Enterprise Engagement and Talent Capability Development (IoT Academy).
4. X-Camp's mission is to accelerate the development of the IoT ecosystem in Indonesia where IoT players (startups, students, developers, and makers) could develop their products through a testbed facility, product development, business incubation, financing and networking program.

Business Product/ Services

XL Axiata established and committed to simplifying our life #JadiLebihBaik through its product and service to consumers, business partners, and small-medium enterprises. In order to achieve the said purpose, the Company may carry out its main business activities including telecommunications business activities, other monetary intermediaries, wholesale, programming activities, computer consulting and other related activities, computer consulting activities and computer facilities management, information services activities, also the other management consulting activities.

Organizational Structure

X-Camp as the IoT Innovation Center of XL Axiata is a part of Technology Directorate, Technology Strategy and Assurance Division, also under New Ventures and Technology Incubation Department. The Head of X-Camp supervises 4 employees in total, who hold the roles and responsibilities of New Ventures Development, New Ventures and Portfolio Management, and Technology Incubation as well.

Business Model Canvas

Given the internal data from X-Camp itself, while the core management team was establishing the IoT Innovation Hub of PT XL Axiata Tbk, all of them were also creating a proper Business Model Canvas (BMC) to represent the whole model that will be implemented by X-Camp in a long period of time. The BMC can be seen as follow:

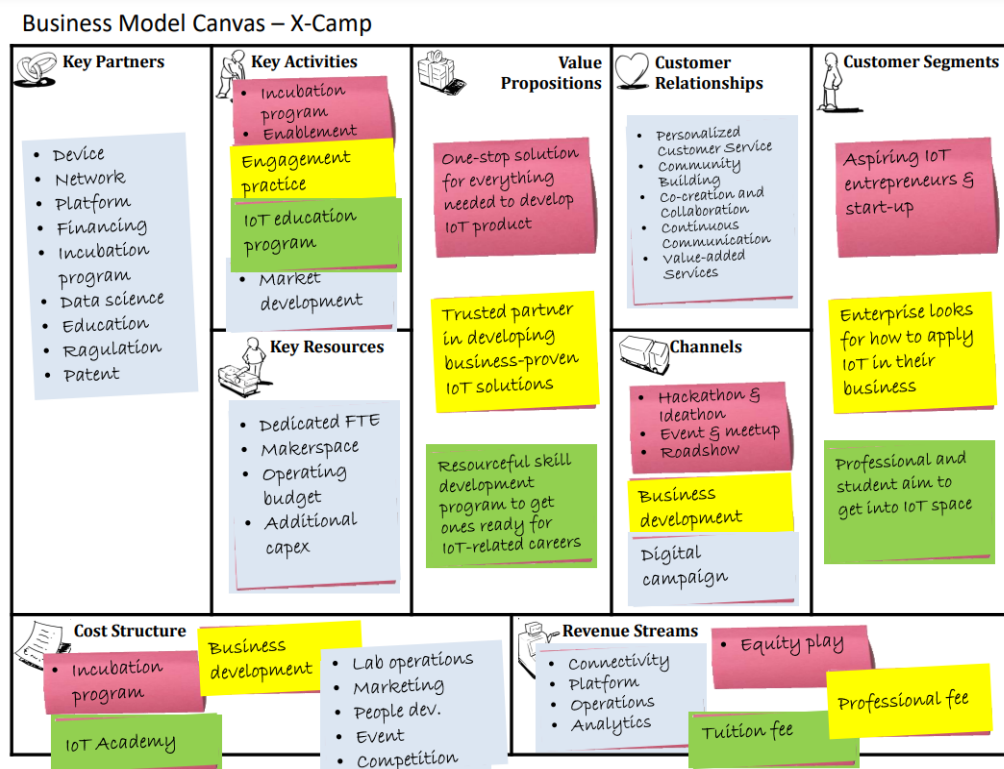


Figure 2. Business Model Canvas of X-Camp (X-Camp, 2022)

According to Chesbrough and Rosenbloom, a business model is a tool that enables one to identify an answer that can be made into a product (Chesbrough & Rosenbloom, 2002).

Business Environment

Based on the Business Model Canvas that has been explained and illustrated before, the writer will conduct further analysis to find out whether the whole BMC has been carried out successfully within the X-Camp system or not. The analysis results will also be validated directly to the internal and external parties in Chapter 4 later on, thus resulting in new insights to revise the initial BMC of X-Camp. The Business Model Canvas may need several adjustments according to the gap that the writer will find out more afterwards. This analysis will also be divided into 2 parts, the internal analysis (using Marketing Mix 4Ps Analysis) and also external analysis (using PESTEL details and Porter's Five Forces). The writer will mainly use observations and several tools to complete those business environment analysis since the writer often visits X-Camp on a daily basis. Afterwards, all findings are concluded into X-Camp's SWOT analysis and this summary will be the basis for the writer to move forward towards the data collection and analysis process in Chapter 4 with its main purpose of validating all weaknesses found in Chapter 2.

SWOT Analysis

Brian Hill states that the management team determines the internal and external factors that will impact the performance of the business through the SWOT analysis process. SWOT analysis is carried out as part of the broader corporate planning process, which also includes setting financial and operational objectives for the coming year and developing strategies to reach them (Hill, 2019). Meanwhile, Neil Kokemuller says that in order to evaluate the strengths, weaknesses, opportunities, and threats facing their business, business owners perform a SWOT analysis. The SWOT analysis can be used to its maximum potential when you comprehend how the four components interact, even though each of the four analysis elements provides insights on its own. (smallbusiness.chron.com)

Table 1. Summary of SWOT Analysis

<u>STRENGTHS</u>	<u>WEAKNESSES</u>
S1 – Strategic Location S2 – Experienced Team S3 – Partnerships and Extensive Network S4 – Strong Parent Company S5 – State-of-the-Art Facilities and Innovative Solutions S6 – Personalized Approach and Customizable Product S7 – Strong Brand Image	W1 – Low Customer Readiness on the Adoption of IoT Products W2 – Dependence on Parent Company and Partners W3 – Lack of Developing Brand Awareness on Social Media W4 – Limited Staff and Service Offerings W5 – Lack of Digital Marketing Implementation W6 – Limited Geographic Presence and Customer Base W7 – Lack of Attention to Quality of Work W8 – Target Market has not been Defined Clearly W9 – Talent Acquisition and Retention W10 – Lack of Knowledge to Customer's Point of View(s) (Wants and Needs) W11 – Lack of IoT Products Marketing Methods W12 – Limited Brand Recognition W13 – Regulatory Environment
<u>OPPORTUNITIES</u>	<u>THREATS</u>
O1 – Growing IoT Market/Demand for IoT Solutions O2 – Government Support and Initiatives O3 – Emerging Technologies O4 – Strategic Partnerships O5 – International Expansion and Emerging Markets O6 – Diversification	T1 – Competition T2 – Economic Instability T3 – Rapid Technological Advancements T4 – Regulatory Changes T5 – Cybersecurity Threats

TOWS Matrix

TOWS matrix can be defined as a framework for developing, comparing, deciding on, and accessing business strategies. It is an acronym that stands for Threats, Opportunities, Weaknesses, and Strengths. It investigates a business from a marketing and management standpoint (Harappa Education, 2021).

These strategic alternatives can be divided into 4 categories, including:

1. SO or Maxi-Maxi strategy utilizes internal strengths to optimally use external opportunities available to an organization
1. ST or Maxi-Mini strategy maximizes the strengths of a business and minimizes the threats using those strengths
2. WO or Mini-Maxi strategy's aim is to minimize weaknesses of an organization and maximize opportunities
5. The WT strategy, also known as the mini-mini strategy, aims to minimize threats and weaknesses

Table 2. TOWS Matrix Analysis of X-Camp

IFAS Internal Factor Analysis Summary	Strengths (S)	Weaknesses (W)
EFAS External Factor Analysis Summary	<ul style="list-style-type: none"> ● S1 – Strategic Location ● S2 – Experienced Team ● S3 – Partnerships and Extensive Network ● S4 – Strong Parent Company ● S5 – State-of-the-Art Facilities and Innovative Solutions ● S6 – Personalized Approach and Customizable Product ● S7 – Strong Brand Image 	<ul style="list-style-type: none"> ● W1 – Low Customer Readiness on the Adoption of IoT Products ● W2 – Dependence on Parent Company and Partners ● W3 – Lack of Developing Brand Awareness on Social Media ● W4 – Limited Staff and Service Offerings ● W5 – Lack of Digital Marketing Implementation ● W6 – Limited Geographic Presence and Customer Base ● W7 – Lack of Attention to Quality of Work ● W8 – Target Market has not been Defined Clearly ● W9 – Talent Acquisition and Retention ● W10 – Lack of Knowledge to Customer's Point of View(s) (Wants and Needs) ● W11 – Lack of IoT Products Marketing Methods ● W12 – Limited Brand Recognition ● W13 – Regulatory Environment
Opportunities (O)	SO-Strategy	WO-Strategy
<ul style="list-style-type: none"> ● O1 – Growing IoT Market/Demand for IoT Solutions ● O2 – Government Support and Initiatives ● O3 – Emerging Technologies ● O4 – Strategic Partnerships ● O5 – International Expansion and Emerging Markets ● O6 – Diversification 	<ul style="list-style-type: none"> ● (S3-O4) Raise the number of sales partners who are categorized as "masters" of IoT because they are people who focus/understand IoT very well while still having to sell IoT products/solutions, thus they can also become the most promising leads for X-Camp (those who are aware of and understand IoT well enough that X-Camp does not need to create awareness again to produce purchase intention) ● (S6-O1) Focus on and emphasize that X-Camp is helpful and problem-solving as the most focused provider 	<ul style="list-style-type: none"> ● (W1-O4) Hold various training and workshops that are more practical in advance for ordinary people ● (W3-O1) Supply all of XL's inventions' industrial quality and shown in the onsite office ● (W5-O3) Begin using digital ads to segmentation targets since X-Camp will be able to target audiences based on age criteria, place of work, and so on ● (W8-O2) Target specific markets in the form of B2B and B2G (smart building, agricultural, and smart city) ● (W12-O1) Act on

	of IoT solutions and superior in terms of technology and innovation	behalf of XL because it can become a very impactful and useful Unique Selling Proposition (USP)/Unique Value Proposition (UVP)
Threats (T)	ST-Strategy	WT-Strategy
<ul style="list-style-type: none"> • T1 – Competition • T2 – Economic Instability • T3 – Rapid Technological Advancements • T4 – Regulatory Changes • T5 – Cybersecurity Threats 	<ul style="list-style-type: none"> • (S2-T1) Change and overhaul its recruitment process and pattern, which must be made more stricter and, most importantly, target talents who have the passion to work hard and devote everything, as well as feel challenged to be able to do more, rather than focusing solely on CVs and length of experience 	<ul style="list-style-type: none"> • (W6-T2) Target market niches because many individuals are unaware of the potential of a niche market that turns out to be quite huge • (W7-T1) Add success stories and generating benefits that have skyrocketed • (W7-T3) Add more internal human resources as permanent employees in non-technical sections with market and business development backgrounds • (W10-T1) Conduct more thorough studies and analysis to gain reliable data from real customers

III. RESEARCH METHODOLOGY

Problem Analysis

A cause-and-effect diagram, often known as a "fishbone" diagram or also known as an Ishikawa diagram, can aid in brainstorming to find potential causes of a problem and in categorizing ideas. A fishbone diagram is a graphic representation of cause and effect. Some of the weaknesses and threats affecting X-Camp that have been analyzed based on business problem study utilizing PESTLE, Porter's analysis, and company's internal analysis must be re-validated and re-confirmed directly from relevant informants. This will be a reiteration process to strengthen the writer's data. Hence, using a fishbone analysis, this study determines the fundamental cause of X-Camp's ineffective GTM strategy, which resulted in low purchase intention of X-Camp's IoT products. The assessment is based on a comprehensive SWOT analysis described in Chapter 2 in order to identify root causes.

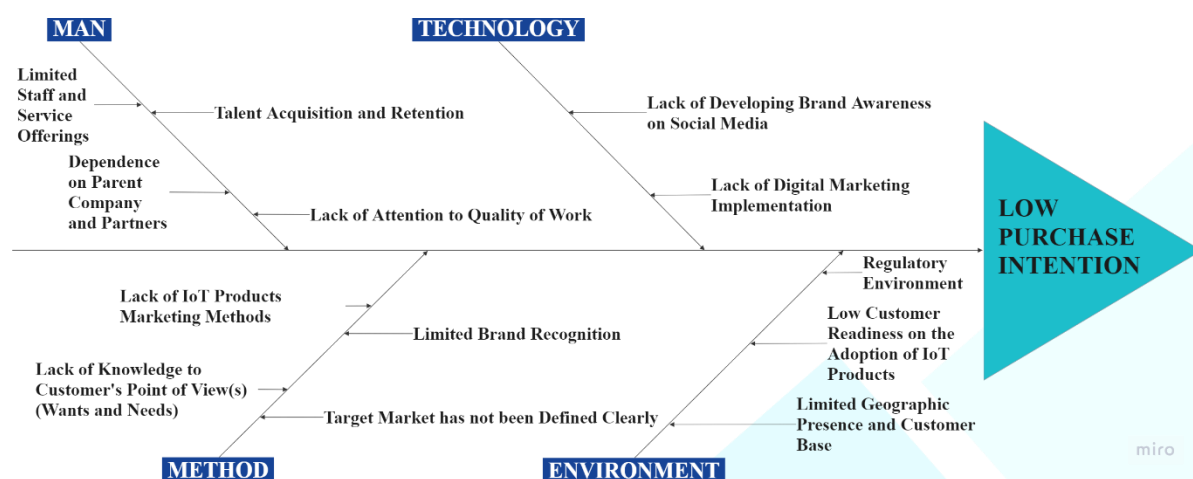


Figure 3. Fishbone Diagram of the Determinants of Low Purchase Intention towards X-Camp's IoT Products

If we compare X-Camp's establishment with its parent company, X-Camp is a newcomer to the IoT business, competing against local IoT solution providers and telecommunications companies. Indonesia has a very poor recognition of IoT products' value, and a stable ecosystem has not yet been formed today, thus there is a poor awareness of the usefulness of IoT devices. By addressing these issues, X-Camp must establish a high brand awareness and choose appropriate target markets to focus on. The strategy must be appropriate to be accepted by markets that are ready for the presence of IoT.

Research Design

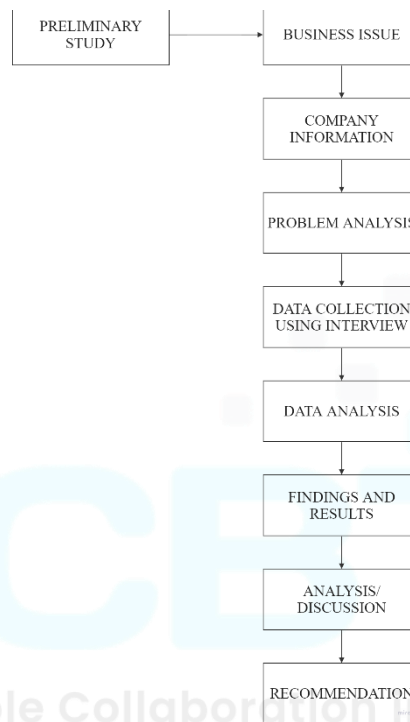


Figure 4. Research Design

The figure depicts the full research process, which will involve explanatory research to investigate phenomena and concerns related to X-Camp's marketing strategy and whether it has an impact on customer purchasing interest. This study will analyze qualitative data using interviews with the X-Camp founders on the company's internal operations. Then, after collecting those crucial qualitative data, the writer will process it using the qualitative approach, which is the triangulation method by comparing several data from direct observations, interviews, and literature reviews. In this study, the author will also utilize data analysis to conduct a second interview regarding the experience, personality, contentment, and loyalty of former clients who used X-Camp IoT goods. In addition to prior clients, potential B2B clients will be asked about their desire, needs, wants, and readiness for the introduction of IoT devices. After managing the data, the researcher will receive the outcomes and discoveries from the data, which will be analyzed and discussed.

Research Approach

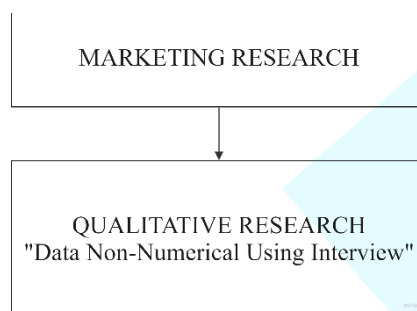


Figure 5. Research Approach

The author selected to do research in the field of marketing for this study, and the author will employ two research approaches. The author will employ a qualitative technique in the first stage, conducting interviews and processing data using a manual coding system. This qualitative method seeks to comprehend the company's internal issues. Researchers used structured interviews in this example from X-Camp. In a structured interview, interviewers ask a sequence of pre-set questions that all of them have been prepared beforehand, thus, the direction of the conversation has been clearly set and defined from the very beginning (Opdenakker, 2006). The results of the discussion will be on target and solid as well. Structured interviews always succeed in providing us with a better and much more thorough understanding of the entire topic. Despite the reliability, the best thing about a structured interview is that it can expand the line of questioning. The respondent can give us much better and detailed responses. Structured interviews are beneficial when gathering thorough and detailed information from a not-so-large number of respondents or interviewees. Based on those reasons, this interview type is suitable for getting extensive information regarding X-Camp's marketing and sales efforts.

IV. RESULT / FINDING

Interview

The author only chooses these informants below due to their relevant roles/positions within X-Camp who will be able to answer specific questions prepared by the author based on their experiences and knowledge. Interviews with the X-Camp team as an IoT expert were undertaken to acquire a better grasp of the company's present internal condition and future aspirations. This interview activity was based on the fishbone analysis of the company's difficulties.

The people interviewed are:

- Novi Arian - Head New Ventures & Technology Incubation (Head and Co-Founder of X-Camp)
- Varid Airlangga - New Ventures Development of X-Camp
- Erdis Irwandi - New Ventures & Portfolio Management (Co-Founder of X-Camp)

X-Camp is a new entrant in the IoT business that must compete in today's market. In order to deliver effective marketing, X-Camp must be client centered/customer-oriented, so the author conducts customer analysis by conducting interviews with the IoT experts, covering both past and prospective X-Camp clients. This activity is conducted to acquire a basic overview of X-Camp's client segments and to find opportunities that can be leveraged by X-Camp based on the responses or expectations of the respondents. As a result, X-Camp will develop a suitable strategy based on insights into the ready market. For the past clients, the writer can only choose 2 informants to be interviewed further since X-Camp has only sold 2 IoT products to 2 clients so far. For the potential ones, the writer chooses the other 2 informants since they come from different industries and the writer requires deep insights from business owners/entrepreneurs who have been aware of X-Camp's presence as an IoT solution provider.

The people interviewed are:

- **Buyer of XinergiS - Yunus (Facility Management of PT XL Axiata Tbk)**
Respondent was taken from X-Camp data which shows that this respondent has pre-ordered one of the IoT products made by X-Camp, XinergiS. The purchasing purpose is to monitor energy consumption in all XL regional offices throughout Indonesia. The investment fee spent can be categorized into high, approximately hundreds of millions of rupiah for 8 regional offices in total.
- **Buyer of La-Leur - Ria (Owner of PT Xabyandra Kaysankara Aldana (XEKAR))**
Respondent was taken from X-Camp data which shows that this respondent is one of X-Camp's sales partners who has pre-ordered one of the IoT products made by X-Camp, La-Leur. The purpose of this sale is to generate profit as an IoT solutions seller as well.
- **Untouched High-Tech Industry 1 - Taufik (Investor and Owner of CV. Arumi Farm)**
Respondent was taken from X-Camp data which shows that this respondent is an owner and an investor of his own family business (chicken farmer in Sulawesi) who has been engaged once by the management team, thus has known a glimpse about X-Camp's products, also their functions. The respondent has asked several questions to X-Camp regarding his needs that can be possibly answered by PoultryX made by X-Camp. However, the respondent has not pre-ordered or closed any deal yet.
- **Untouched High-Tech Industry 2 - Abel (Co-Founder of Mitra Akuakultur Indonesia)**
Respondent was taken from X-Camp data which shows that this respondent is a business owner (seafood supplier in Bandung, West Java) who has been engaged once by the author as the Market and Business

Development intern at X-Camp, thus has known a glimpse about X-Camp's products, also their functions. The respondent has asked several questions to X-Camp regarding his needs that can be possibly answered by the presence of X-Shrimp or other products made by X-Camp. However, the respondent has not pre-ordered and closed any deal up to this moment although the interest has been there already.

As an outcome, this type of interview is ideal for getting detailed information about suitable target markets and marketing efforts in X-Camp.

List of Questions

The author designs this questionnaire based on 13 root causes in the fishbone analysis. All questions listed below will cover all uncertainties and confusions. Each problem category (method, technology, environment, and man) has been adjusted to be answered by certain person who is completely in charge of this area.

Table 3. List of Questions

METHOD	Novi Arian - Head New Ventures & Technology Incubation (Head and Co-Founder of X-Camp)
Lack of IoT Products Marketing Methods	<ol style="list-style-type: none"> 1. What is the X-Camp's concept? 2. How is the positioning that X-Camp has established at this time? 3. What benefits does X-Camp provide to its clients? 4. So far, how has the audience reacted to/perceived X-Camp as an IoT innovation hub? What do potential clients like about X-Camp? What customers don't like about X-Camp? 5. How has X-Camp found customers so far? 6. What marketing strategies have been implemented? What is the marketing strategy so far? 7. Is there already a Public Relations (PR) or Business Engagement Specialist representative at X-Camp who interacts with customers? 8. How can X-Camp motivate customers to buy its products? 9. What has been done by X-Camp to manage partnerships with external parties? 10. Which strategies for marketing work and which do not? Is the organization seeing any difficulties in implementing its marketing strategies? What exactly are they?
Target Market has not been Defined Clearly	<ol style="list-style-type: none"> 1. Has X-Camp done any consumer grouping? What criteria were used to group them? How does X-Camp determine customer segmentation? Who is the X-Camp target market? 2. What does X-Camp consider in determining its target market? 3. Are there more profitable target markets? Why? Are they more likely to understand the value of using IoT/AI products? 4. What factors must be considered for X-Camp's segmentation to be effective? 5. Does X-Camp thoroughly understand and recognize what kind of target customers need those kinds of products which are offered by X-Camp? 6. Has X-Camp found out the target customers that are ready for IoT/AI products implementation?
Limited Brand Recognition	<ol style="list-style-type: none"> 1. How do you feel X-Camp's existing brand recognition compares to its IoT innovation competitors? 2. What factors, in your opinion, have led to X-Camp's low brand recognition? 3. Do you believe X-Camp could execute any specific efforts to increase brand recognition? If so, what exactly are they? 4. How crucial do you believe brand recognition is for X-Camp's long-term success, and why?
TECHNOLOGY	Varid Airlangga - New Ventures Development of X-Camp
Lack of Developing Brand Awareness on Social Media	<ol style="list-style-type: none"> 1. How can X-Camp help to raise brand awareness? Is X-Camp on social media? 2. What kinds of advertisements does X-Camp run on social media?

	<ol style="list-style-type: none"> 3. What social media does X-Camp use? 4. What kind of image does X-Camp want to build? 5. Which channel/media should be used for promotion? How far has the promotion progressed? 6. What initiatives has X-Camp made to increase brand exposure on social media? 7. Is there any special concept created by X-Camp for content on social media? 8. Does the concept created by X-Camp fit the market? 9. Does X-Camp have a certain schedule for posting content on social media? 10. How does the content uploaded by X-Camp affect the sales of IoT products made by X-Camp?
Lack of Digital Marketing Implementation	<ol style="list-style-type: none"> 1. Does X-Camp do online sales with digital marketing? 2. Does X-Camp have its own challenges in doing digital marketing? 3. Can the digital marketing strategy carried out by X-Camp have an impact on sales?
ENVIRONMENT	Erdis Irwandi - New Ventures & Portfolio Management (Co-Founder of X-Camp)
Limited Geographic Presence and Customer Base	<ol style="list-style-type: none"> 1. How does X-Camp's limited geographical presence and customer base affect the company's ability to compete with other industry IoT innovation hubs? 2. What initiatives can X-Camp take to broaden its regional presence and customer base while maintaining high quality and customer satisfaction? Are there any possible risks or problems that should be considered while expanding the customer base into new regions? 3. Is there any proof that X-Camp's restricted geographical presence has hindered the company's ability to attract and retain outstanding talent?
Regulatory Environment	<ol style="list-style-type: none"> 1. How does X-Camp deal with the IoT industry's tricky regulatory environment? Have you encountered any difficulties in this regard? 2. How does X-Camp manage the risks of regulatory changes or noncompliance? Are there any plans in place to deal with unexpected regulatory challenges?
MAN	Erdis Irwandi - New Ventures & Portfolio Management (Co-Founder of X-Camp)
Dependence on Parent Company and Partners	<ol style="list-style-type: none"> 1. Is there any evidence that X-Camp's reliance on its parent company or partners has delayed X-Camp's growth or development? 2. How does X-Camp manage its ties with its parent company and partners to ensure that the required resources and assistance are always available? 3. Is there any future intention and steps to lessen X-Camp's reliance on its parent firm or partners? If so, could you please describe them? 4. How does X-Camp's reliance on its parent firm and partners affect its culture and working environment? 5. Can you describe any initiatives or efforts X-Camp has taken to reduce its dependence on its parent company or partners, if any?
Lack of Attention to Quality of Work	<ol style="list-style-type: none"> 1. Does X-Camp have a specific employee performance appraisal framework? 2. Are there any X-Camp employees who don't give maximum performance? How to fix it? 3. Are there any certain KPIs related to the sales targets to be met by employees?
Talent Acquisition and Retention	<ol style="list-style-type: none"> 1. Can you describe the current recruiting and hiring procedure at X-Camp? Do you believe the approach is successful in drawing satisfactory candidates as needed? 2. What are some of the most difficult problems X-Camp faces in terms of maintaining talent, in your opinion? Is there anything in particular that X-Camp could improve in order to retain more suitable employees? 3. Do you believe that X-Camp's current employee benefits package is competitive enough to attract and retain top talent, especially millennials? If not, what modifications would you make to make it more appealing?
Limited Staff and Service Offerings	<ol style="list-style-type: none"> 1. How does the business's limited workforce and service offerings affect its capacity to meet the needs and desires of its clients and customers? 2. Have you come across any instances where X-Camp's limited staff and service offerings resulted in delays or issues in completing projects or delivering products/services? 3. What efforts has X-Camp made to solve the employee shortage? Are there any intentions to hire more people in the near future? If so, could you please detail the hiring process? 4. What steps can X-Camp take, in your opinion, to optimize the impact of its limited staff and service offerings while

	maintaining a high level of quality and customer satisfaction?
METHOD	Target Customer - Have been engaged with X-Camp (Past Clients)
Lack of Knowledge to Customer's Point of View(s) (Wants and Needs)	<ol style="list-style-type: none"> 1. What industry does your company/organization specialize in? 2. What size is your company/organization based on its employee number? 3. What are your roles and responsibilities within your company/organization? 4. What is the typical approach that you go through as a business that needs assistance with IoT devices to find the suitable IoT product that you desire until the purchasing process is finally completed? Do you rely on Google when searching for information about early brand exposures, Word of Mouth (WoM), social media, or something else? 5. Why did you prefer X-Camp compared to other solution providers? 6. What makes X-Camp different from the other competitors that attract you the most to buy their products (unique selling point/unique value proposition)? 7. Do you consider customization as one of X-Camp's attractiveness that made you buy the products? 8. After pre-ordering and being willing to spend a lot of money on X-Camp's products/solutions, do you think that a brand's image impacts a lot on customer purchase decisions? 9. Does the solution offered by X-Camp answer your business issues well (problem-solution fit)? 10. Do you think X-Camp still gives you a reasonable price, if we compare it with the benefits and values that you will get continuously? 11. Do you agree that X-Camp uses credible experts/staff to answer your business concerns and fulfil your needs? 12. Do you agree if information related to products/services offered by X-Camp has been presented (in detail) and updated on the official social media also website? Why? 13. After using IoT products made by X-Camp, is there any room for improvement that should be considered in order to improve their quality? 14. After going through a whole experience with X-Camp (consultation, negotiation, product development, etc.) to finally reach a pre-order stage, which part do you think is necessary for them to keep, and which part do you think is not? 15. In your opinion, what kind of suitable strategy is the most effective to be implemented by X-Camp to be able to gain a lot of pre-orders? 16. As the clients of X-Camp, can you give me an honest opinion/real testimony about X-Camp?
METHOD & ENVIRONMENT	Target Customer - Have not been engaged with X-Camp, but they know X-Camp as an IoT Innovation Center, a part of PT XL Axiata Tbk (Potential Clients)
Lack of Knowledge to Customer's Point of View(s) (Wants and Needs)	<ol style="list-style-type: none"> 1. What industry does your company/organization specialize in? 2. What size is your company/organization based on its employee number? 3. What are your roles and responsibilities within your company/organization? 4. What is the typical approach that you go through as a business that needs assistance with IoT devices to find the suitable IoT product that you desire until the purchasing process is finally completed? Do you rely on Google when searching for information about early brand exposures, Word of Mouth (WoM), social media, or something else? 5. Have you used IoT/AI products to support your business performance before? If so, how much did you spend to buy or rent them? 6. What is the most essential factor to consider when selecting an IoT products/solutions provider? 7. What are the main features to look for from an IoT product/solution? 8. Do you agree that IoT products also offer business solutions, such as additional profit, additional revenue streams, cost savings, and increased productivity? 9. In your opinion as a part of a business entity, what business solutions or values are interesting to offer? 10. What type of offer do you like if you get IoT products from an IoT solution provider? 11. If you rent a type of IoT product, what is the estimated monthly fee that you think is reasonable for a customized solution made by X-Camp, PT XL Axiata Tbk? 12. If there is a promotion from an IoT solution provider, which form is more desirable? 13. What purchasing method do you prefer most for an IoT product? Is it outright selling (<i>jual putus</i>), rental (<i>sewa</i>), co-development, revenue/profit sharing scenario, or else? 14. What is the most used/viewed online marketing advertising media?

	<ol style="list-style-type: none"> 15. What is the preferred source of information for building trust in a brand? 16. What platforms should an IoT innovation center have? 17. Do you prefer using IoT/AI products for conducting your operational business process or doing it manually without additional IoT support? 18. What type of customer service system do you prefer? (Email marketing, call center, live chat, WhatsApp, office direct visit) 19. When purchasing IoT products, does the brand's name become one of the most important aspects that you prioritize? 20. Based on your own experience and point of view as an entrepreneur, which target market will be satisfied by these kinds of IoT/AI products?
<p>Low Customer Readiness on the Adoption of IoT Products</p>	<ol style="list-style-type: none"> 1. When running a business, do you really understand what your company needs? Is the application of IoT products recognized as necessary? 2. In your opinion, how far can IoT be involved in your business processes so that it can help improve performance? 3. Have you ever made an effort to find out what benefits X-Camp actually offers because you feel you need help from IoT solutions? 4. Up to this moment, are you and your company still confused about whether your business needs help from the presence of an IoT product or not? 5. In terms of purchasing intention, are you and your company ready to issue investment fees in terms of purchasing IoT products? 6. From your internal company perspective, are internal resources practically ready to apply the new system and adopt IoT, both from the human resources, operational, financial aspects, as well as SOP changes to avoid chaos and waste of money?

Coding for Customers (Past Clients)

Based on the interview results with X-Camp's past clients, they mainly specialized in the telecommunication and IoT industry. ^[1] The size of their organizations tends to be small due to the low number of employees. ^[2] The interviewees' roles and responsibilities are as the decision maker or the leader of their respective teams. ^[3] They explained that the typical approach that they underwent as a business that needs assistance with IoT products to find the suitable ones was to directly approach X-Camp as their top-of-mind since they have worked in XL Axiata before and know exactly about X-Camp's capabilities in the IoT field. ^[4] After further explanations, it can be concluded that they prefer X-Camp compared to the others due to the X-Camp's proven IoT solutions and its flexibility, also customizable prototype according to customer's needs. ^[5] X-Camp's unique selling points are the fact that X-Camp is still a part of XL Axiata who has a very strong brand recognition within the market and is the first and the largest IoT lab in Southeast Asia. ^[6] They both agree that customization is one of X-Camp's attractiveness that has become a very crucial aspect which can differentiate X-Camp from other competitors. ^[7] After buying X-Camp's IoT products, they think that the XL brand name is a significant aspect that has added value towards their products, however, they also still need to educate people, especially in the B2B market, about IoT to increase brand awareness. ^[8]

For the problem-solution fit part, the solutions offered by X-Camp have mainly answered their issues well since their customization, ability to provide real-time data for risk management and efficiency are very helpful. ^[9] Related to the price offered, the worthiness of automation depends on various factors including the availability of after-sales support and the customer's understanding of the value that IoT products can bring. ^[10] All of them agree that X-Camp has used highly skilled and agile experts who fulfil their needs well, especially for the technical requirements, however, the non-technical aspects such as after-sales service and user experience can still be improved. ^[11] X-Camp's social media and website need further development since they can be powerful marketing tools if they are utilized properly. X-Camp needs to improve its visibility and presence, possibly through references or more active marketing efforts by XL Axiata. Moreover, X-Camp should include past success stories in their website and use more simple words/languages within their contents. ^[12] They mention several rooms of improvements for X-Camp, for instance, X-Camp should improve its after-sales service, maintenance, and brand awareness in both internal and external aspects. Furthermore, X-Camp's prototypes can be advanced to an industrial grade level, which will be more presentable and serve as a showcase for XL's innovations. ^[13] The helpfulness and problem-solving skills of X-Camp should be maintained and prioritized, but they also need to improve its internal brand awareness and collaboration, as well as explore more cost-effective models for maintenance to solve the after-sales service issue. ^[14] In order to gain more PO, X-Camp must increase

collaboration with different departments and teams within XL, showcase and promote the product, and also provide training so that X-Camp can raise awareness among employees and create new revenue streams. ^[15] Overall, on average, they give X-Camp a rate of 8.5 out of 10 remembering its bright future and significant potential for XL Axiata in terms of revenue, despite the ecosystem not being fully established yet. ^[16]

Coding for Customers (Potential Clients)

The respondents are all business owners coming from livestock and agriculture sectors. ^[1] Based on their employee numbers, the company sizes are still relatively small to medium size. ^[2] Their roles and responsibilities within the companies are to be the active shareholder or one of the owners of those businesses themselves. ^[3] When searching for information about early brand exposures of an IoT device, they rely on a community discussion/forum in a specific field/industry or the word of mouth from their friend/relative. ^[4] Due to some challenges, there is currently no application base for both of them that is being used for IoT. ^[5] For them, the most essential factor to consider when selecting an IoT solution is regarding the technological specification that affects the performance and productivity, and also the cost/investment fee. ^[6] The main features to look for from an IoT product are their humidity and temperature control, automated feeder, and a dashboard to monitor in order to achieve a high level of productivity. ^[7] They agree that IoT products also offer business solutions, particularly in improving cost efficiency and minimizing human error, resulting in increased productivity. ^[8] In their opinion as a business entity, the interesting values to offer are to be able to integrate manual tools with IoT applications, thus reducing the need for human labor, increasing cost efficiency, also enabling the monitoring and control of various parameters remotely. ^[9]

They prefer a proper offer which also provides maintenance since it is urgently needed when selling technology and calculating cash flow/return on investment (ROI). ^[10] If they are about to rent X-Camp's customized IoT products, the estimated monthly fee, and the willingness to pay level that they think is reasonable will depend on how big the impact and the potential ROI is to determine whether it is worth pursuing or not. ^[11] It is not about the discount that matters, but users are more interested in the product's longevity and reliability. Continuous service and maintenance are essential for IoT products to be successful in the market. ^[12] The purchasing method for IoT products that they prefer are either renting scenario or co-dev (community development) since they make more sense for their business financial condition as they don't always need it and their needs change frequently due to the nature of their business. ^[13] The most viewed online marketing advertising media are the ones in Facebook as the primary social media platform used by people, especially for buying and selling products in rural areas. ^[14] For building trust in brand, advertising on social media platforms such as Instagram, TikTok, Facebook, and Twitter can be equally trusted depending on its respective majority of certain audiences' characteristics, however, if the product is expensive and high-risk, it is better to buy it from a reputable source or make sure that it is licensed by the government, such as through a trade fair or exhibition. ^[15] Social media presence and an official website that contains video tutorials and success stories from past clients are essential for business in building trust and convincing consumers to buy the product. ^[16] They obviously prefer IoT as a cost-efficient solution for owners since in the long run, as a business grows in scale, it becomes increasingly difficult to manually manage everything and automated record-keeping becomes necessary. ^[17] It will be more professional if X-Camp has physical representative offices and conducts personal approaches for the customer service systems. ^[18]

When it comes to purchasing IoT products, the significance of brand identity and reputation management is high in the success of a business. If a brand is well-known and widely used, there is no doubt that the product is good, and the buyer will choose it over other brands. ^[19] The potential target markets in niche areas are often overlooked, whereas focusing on these markets can provide significant opportunities for businesses and be more effective than targeting larger corporate clients. ^[20] When running a business, they understand that IoT can provide valuable insights for businesses, but one of the main challenges is that many players in the industry may not be familiar with IoT technology, especially those in remote areas. Therefore, the readiness and knowledge of the players are essential factors to consider in the successful implementation of IoT technology. ^[21] By using real-time data analysis and monitoring, the time and effort spent on their tasks can be significantly reduced and prevent losses. ^[22] They were introduced to IoT technology through a friend but found that the cost of implementing it was very high, and therefore did not make sense for their business, thus they need physical interaction with the

IoT product before purchasing it with a high investment fee. ^[23] Up to this moment, they are sure and welcome to try new products and are willing to be a test subject (PoC). It's important for them to understand the function of the product before considering its high price. ^[24] They are willing to invest in IoT products if the cash flow of their business is sufficient, the investment does not require an initial investment, and only if it is valuable. ^[25] From their internal company perspective, implementing IoT in a rural area requires extensive training for human resources who are not ready yet. This is a challenge for X-Camp to ensure that their human resources are competent enough to handle IoT. ^[26]

V. DISCUSSION

Qualitative Analysis

The author will examine the analysis of the issues mentioned in the previous chapter as well as the collecting of data using qualitative approaches in this discussion chapter. The author uses multilevel interviews as a means-end technique in their qualitative data collection and analysis. In order to identify more precise and reliable root causes, the author will employ a triangulation approach to process the results of the qualitative data. This information was gathered by the author starting with the findings of the observations and interviews that were performed both in person from the office where the author often works (headquartered at the XL Axiata Tower in Jakarta) and online via Zoom meetings.

Four external respondents and three internal interviewees who provided responses pertinent to the author's findings were also reached. The data generated from the qualitative method is saturated enough to get a monotonous answer where the answers from the responses are more or less similar and discuss the same keywords. Moreover, for the requirements to involve potential clients, not many people are acknowledged enough about the presence and function of X-Camp yet. As well as for the past clients, unfortunately, up to this moment, X-Camp has only generated 2 PO(s) from 2 buyers. Thus, there are only several key informants who are considered suitable to give relevant data for the author regarding X-Camp's IoT products. The data from 7 significant representatives, in the author's opinion, is sufficient to examine the variables influencing consumer interest in IoT products.

Respondent Information Profile from Qualitative Method

With the help of a qualitative methodology, the author chooses respondents who fit the profile of X-Camp's target market, such as business owners and entrepreneurs who are typically in charge of making purchasing decisions for their organization or company's IoT products. In order for the respondents to have a basic understanding of X-Camp and provide responses that are in line with the author's preferences, the author additionally selects respondents who have some connection to X-Camp through occasions held by X-Camp or who have even been approached directly by a member of the X-Camp team. Most respondents live in the Jakarta and Bandung areas, and the author also selected respondents whose companies have the capacity and potential to purchase IoT devices from X-Camp. The author also includes the previous X-Camp clients to evaluate more in-depth insights and actual testimonials.

Data Source Triangulation

The data source triangulation method, as previously noted, will be used to validate this qualitative study using findings from direct observations, interviews, and literature studies. The researcher can compare the facts and results from these three studies to see if they are similar. As a result, the researcher can assume that the interview results are valid and reliable enough to be employed in this study.

Table 4. Data Triangulation Result

Primary Constraints	Observation	Interview	Literature Review
Low Customer Readiness	✓	✓	✓
Dependence on Parent Company	✓	X	X
Low Brand Awareness	✓	✓	✓
Limited Staff and Service Offerings	✓	X	X
Lack of Digital Marketing	✓	✓	✓
Limited Geographic Presence	✓	✓	✓
Lack of Attention to Quality of Work	✓	✓	✓
Undefined or Unclear Target Market	✓	✓	✓
Talent Acquisition and Retention	✓	✓	✓
Lack of Knowledge to Customer's PoV(s)	✓	✓	✓
Lack of Marketing Methods	✓	✓	✓
Low Brand Recognition	✓	✓	✓
Regulatory Environment	✓	X	X

The interview findings and direct observations show that the respondents' statements are mostly compatible and in sync with the author's observations while working in X-Camp regarding the weaknesses, problems, and gaps discovered there. As previously stated, the author triangulates data sources to validate the interview findings. Afterwards, in the next sub-chapter, the researcher will provide all business solutions towards those 10 validated root causes while comparing and strengthening the findings of the interviews again with information from books and journals that support the same conclusions.

Business Solution

A number of solutions are required to address the issues that lead to X-Camp's lack of purchases after examining the underlying causes. The ideal answer that best suits the circumstances at X-Camp will be investigated in more detail in this chapter. This method is therefore thought to be effective in identifying the problems outlined in the earlier chapters. To provide a more reliable strategy for X-Camp, the suggested methodology was developed using a variety of alternate trade settings. According to the preceding chapter, the main reason for the X-Camp problem is tied to X-Camp's blurry target market and potential leads. X-Camp's present, ineffective, and unsuccessful marketing strategies also become the main struggles. There are 13 main barriers, with man, technique, technology, and environment as the fundamental root reasons. However, 10 primary constraints are largely responsible for the root causes. After reconfirming those 13 weaknesses found in the prior SWOT analysis, the author decided to put these 10 main obstacles as the ones that are the most frequently mentioned by the credible sources during the interview process. Table 5 displays the primary constraints and root cause of X-Camp's issue. Meanwhile, Table 6 represents the 10 business solutions that have been made according to the TOWS matrix in Chapter 2 to solve those 10 gaps found as the critical root causes.

Table 5. Root Cause and Primary Constraints Table

Root Cause	Primary Constraints
Unclear Potential Target Market and Ineffective Marketing Strategy	Low Customer Readiness on the Adoption of IoT Products
	Lack of Developing Brand Awareness on Social Media
	Lack of Digital Marketing Implementation
	Limited Geographic Presence and Customer Base
	Lack of Attention to Quality of Work
	Target Market has not been Defined Clearly
	Talent Acquisition and Retention
	Lack of Knowledge to Customer's Point of View(s) (Wants and Needs)
	Lack of IoT Products Marketing Methods
	Limited Brand Recognition

Table 6. Business Solutions Table

1	Hold various training and workshops to "create" needs	W1-O4
2	Boost exhibitions and seminars to show on-the-shelf products	W3-O1
3	Start using digital ads to target audiences based on certain criteria	W5-O3
4	Target potential market niches with personal approach	W6-T2
5	Add business engagement specialist who approaches new leads	W7-T3
6	Target specific markets in the form of B2B and B2G	W8-O2
7	Change and overhaul its recruitment process and pattern	S2-T1
8	Conduct more thorough studies and analysis from customers	W10-T1
9	Raise the number of sales partners who are the "Masters" of IoT	S3-O4
10	Act on behalf of XL Axiata as their impactful and useful USP	W12-O1

To solve the root cause, researcher will propose 6 solutions to X-Camp:

1. Enhance Content Strategy for Beginners: Introducing IoT for Dummies
2. Improve Website Presence:
 - Emphasize X-Camp's Correlation with XL Axiata
 - Create “Client Success Stories” Section
 - Add Demonstration Videos/Tutorials for Using IoT Products
3. Offer Free Proof of Concept (PoC)
4. Provide After-sales Service and Maintenance
5. Strengthen Internal Support by Collaborating in Various Use Cases
6. Focus on Rental and Co-Development Scheme

The summary of SWOT analysis from Chapter 2's Table 1 and summary of gaps analysis from Chapter 4's data collection served as the foundation for developing these solutions.



Table 7. Proposed Solutions for X-Camp

No	Proposed Strategy	Reasoning
1	<p>Enhance Content Strategy for Beginners: Introducing IoT for Dummies</p>	<ol style="list-style-type: none"> <li> <p>1. Clarify Brand Identity One of X-Camp's weaknesses is they are having less attractive contents in social media since they consider all readers/followers as IoT masters. By enhancing the content strategy, X-Camp can effectively communicate its core purpose and differentiate itself from being perceived solely as a research institution. Clear and targeted messaging will help establish a stronger brand identity, ensuring that the market understands the true value and offerings of X-Camp as an IoT solutions provider.</p> <li> <p>2. Emphasize Product Functionality and Benefits The content strategy should emphasize the practical features, advantages, and real value that X-Camp's IoT devices can provide to clients. X-Camp can increase interest and engagement from its target audience by highlighting how the solutions solve specific challenges and deliver actual advantages.</p> <li> <p>3. Consistent and Varied Content Improving the consistency and variety of content is crucial to maintain audience engagement. X-Camp should develop a regular posting schedule and ensure a diverse range of content formats, such as videos, infographics, and articles, to cater to different learning preferences and capture the attention of a wider audience.</p> <li> <p>4. Engage Recognition and Leads The content strategy should aim to increase brand recognition and generate leads. X-Camp can achieve this by creating compelling content that encourages interaction, such as asking questions, soliciting feedback, and initiating discussions related to IoT. Engaging with the audience at different stages of their decision-making process can nurture leads and move them closer to making a buying decision.</p> <li> <p>5. Simplify Language and Messaging To effectively reach X-Camp's target market, which primarily consists of older decision-makers in the B2B sector, the language and copywriting style should be simplified. Avoiding overly technical or jargon-heavy language and focusing on clear explanations and practical examples will help ensure that the content is accessible and easily understood by the intended audience.</p> <li> <p>6. Minimize Misleading Information X-Camp should revise its content to minimize any misleading understanding about its collaboration with universities and events. Clear messaging should differentiate X-Camp's role as an IoT</p>

		<p>solutions provider rather than being solely associated with research or academic activities.</p> <p>7. Target IoT Beginners The content strategy should cater to IoT beginners and present information in a way that is easily digestible for those who have little to no prior knowledge of IoT. The content should be created with the assumption that it will be viewed by IoT "dummies," ensuring that it is beginner-friendly, relatable, and focuses on building a foundational understanding of IoT concepts.</p>
2	<p>Improve Website Presence:</p> <ul style="list-style-type: none"> • Emphasize X-Camp's Correlation with XL Axiata • Create "Client Success Stories" Section • Add Demonstration Videos/Tutorials for Using IoT Products 	<p>1. Establishing Brand Association Another root cause that can be solved by implementing this solution is regarding X-Camp's MVP website's UI/UX. By creating a strong connection between X-Camp and its parent company, XL Axiata, through the website, it enhances the brand association and provides credibility and trustworthiness.</p> <p>2. Addressing Customer Concerns Incorporating client success stories and demonstration videos/tutorials helps address potential customer concerns about the usability and effectiveness of IoT products, giving them a clear picture of how the products can be utilized and the benefits they offer.</p> <p>3. Enhanced Credibility and Trust Client success stories serve as testimonies and honest reviews, which Indonesian consumers highly respect. X-Camp can influence purchase intent by showing genuine customer experiences.</p> <p>4. Improved Customer Engagement The inclusion of demonstration videos and tutorials on the website enhances customer engagement by providing visual and practical guidance on using IoT products. This interactive approach helps potential customers understand the products better and increases their interest and confidence in making a purchase.</p> <p>5. Increased Website Traffic and Visibility By optimizing the website with informative and engaging content, including client success stories and demonstration videos/tutorials, X-Camp can attract more visitors and improve its search engine ranking. This, in turn, leads to greater visibility and exposure to potential customers.</p> <p>6. Meeting Customer Information Needs Many customers conduct preliminary research on IoT through search engines (most of them use Google), and a well-designed website with professional UI becomes the initial point of contact. By providing comprehensive information and valuable content, X-Camp can fulfill customers' information needs and position itself as a reliable source of IoT knowledge.</p> <p>7. Differentiation and Competitive Advantage Client success stories and demonstration videos/tutorials distinguish X-Camp from competitors by demonstrating its practical use and success in real-life circumstances. This distinction can provide X-Camp with a competitive advantage in the market and attract more potential clients.</p>
3	<p>Offer Free Proof of Concept (PoC)</p>	<p>1. Overcoming Customer Doubts Based on the interview results, X-Camp still has a weakness on its expensive PoC cost. Offering a free PoC eliminates client scepticism and uncertainties when considering investing in IoT solutions with a large upfront cost. Allowing potential</p>

		<p>consumers to trial the items without making a financial commitment lowers their perceived risks and encourages them to investigate the benefits and value of the solution.</p> <p>2. Building Trust and Confidence Providing a free PoC demonstrates X-Camp's confidence in its IoT products and showcases its commitment to customer satisfaction. This builds trust with potential customers, as they perceive X-Camp as a company that stands behind its solutions and is willing to prove their effectiveness.</p> <p>3. Enhanced Customer Engagement A free PoC engages potential customers more actively, allowing them to experience the benefits and capabilities of IoT products firsthand. This hands-on experience increases their understanding, interest, and confidence in the solution, making them more likely to move forward with a purchase or partnership.</p> <p>4. Minimizing Financial Barriers Customers are often hesitant to commit to a purchase of IoT solutions because they are unsure of their applicability for their business. By providing a free PoC, X-Camp lowers the price barrier and allows businesses to evaluate the solution's fit inside their processes, increasing the possibility of conversion.</p> <p>5. Leveraging PoC as a Sales Tool A successful PoC serves as a persuasive sales tool, as it demonstrates the practical value and benefits of the IoT solution in a real-world setting. It allows potential customers to witness the positive impact on their business operations, making them more inclined to pursue further negotiations and project collaborations.</p> <p>6. Expanding Customer Base By offering a free PoC, X-Camp can attract a wider range of potential customers who may have been hesitant due to financial concerns. This expands the customer base and increases the opportunity for successful conversions and long-term partnerships.</p> <p>7. Increasing Competitive Advantage Providing a free PoC sets X-Camp apart from competitors who may charge for similar services. It positions X-Camp as a customer-centric company that prioritizes customer experience and aims to establish long-term relationships, giving them a competitive advantage in the market.</p>
4	<p>Provide After-sales Service and Maintenance</p>	<p>1. Addressing Customer Concerns In order to increase and maintain good awareness on the X-Camp brand, offering after-sales service and maintenance can alleviate customer worries and fears about potential failures or difficulties in using IoT products. This support reassures customers that they will receive assistance and solutions in case of any issues.</p> <p>2. Enhancing Customer Satisfaction Providing comprehensive after-sales service demonstrates a commitment to customer satisfaction. It shows that X-Camp values its customers beyond the initial purchase and aims to ensure their long-term success with the IoT solution. This enhances the overall customer experience and builds customer loyalty.</p> <p>3. Ensuring Optimal Performance To perform well, IoT equipment frequently requires regular maintenance and updates. X-Camp can help customers address technical issues, optimize their usage, and make essential upgrades by providing after-sales assistance. This guarantees that consumers continue to get the most out of</p>

		<p>the IoT solution.</p> <p>4. Empowering Customers By guiding and updating customers on using the IoT technology, X-Camp empowers them to go beyond basic usage and explore the full potential of the solution. This leads to improved cost-efficiency and increased productivity, as customers learn to optimize the technology to meet their specific needs.</p> <p>5. Overcoming Technical Challenges IoT technology can be complex, especially for customers in remote or less technologically advanced areas. By offering post-purchase guidance and assistance, X-Camp helps customers overcome technical challenges and provides ongoing support, ensuring they can leverage the benefits of IoT without feeling overwhelmed.</p> <p>6. Competitive Advantage Providing after-sales service and maintenance sets X-Camp apart from competitors who may neglect or lack such support. This establishes X-Camp as a reliable and trustworthy partner, giving them a competitive edge in the market and attracting customers who prioritize comprehensive support.</p> <p>7. Long-Term Partnerships By nurturing a relationship with customers through after-sales service, X-Camp fosters long-term partnerships. Customers appreciate the ongoing support and guidance, leading to repeat business, referrals, and potential upselling opportunities in the future.</p>
5	<p>Strengthen Internal Support by Collaborating in Various Use Cases</p>	<p>1. Internal Awareness and Understanding Based on the SWOT analysis, one of its powerful strengths is related to its reputable parent company name. Thus, X-Camp should prioritize internal support by increasing knowledge and understanding of its products and solutions inside XL Axiata. Many internal divisions now have little knowledge of X-Camp other than the availability of meeting venues. X-Camp may educate internal stakeholders about its solutions by partnering with different divisions, ensuring they understand the value and potential uses of its products.</p> <p>2. Leveraging Internal Expertise XL Axiata's internal divisions possess valuable expertise and insights that can contribute to the development and refinement of X-Camp's products. By collaborating with non-technical divisions such as CorpComm, MarComm, and Sales, X-Camp can tap into their knowledge and experience to identify new use cases and revenue streams. This collaboration can result in innovative solutions and enhance the overall quality of X-Camp's offerings.</p> <p>3. Internal Promotion and Advocacy Engaging internal divisions as collaborators and promoters of X-Camp's products can significantly boost its brand awareness and reputation within the organization. By showcasing successful collaborations and use cases, X-Camp can encourage internal stakeholders to become advocates for its solutions, leading to increased adoption and utilization.</p> <p>4. Revenue Generation Collaboration with other departments opens the door to new use cases and potential revenue streams for X-Camp. For example, if a different business within XL Axiata places billboards or massive advertisements on highways, IoT technology can be used to properly measure traffic statistics. This new use case can be developed into a</p>

		<p>portfolio offering and marketed to the advertising sector, providing X-Camp and the firm with a new cash stream.</p> <p>5. Strengthening Cross-Divisional Relationships Collaborating within XL Axiata fosters stronger relationships and synergy among different divisions. By engaging with non-technical divisions and working together on projects, X-Camp can build a culture of collaboration, innovation, and shared success. This can lead to more effective cross-departmental teamwork, knowledge sharing, and future collaboration opportunities.</p> <p>6. Internal Pride and Ownership Strengthening internal support and collaboration generates a sense of pride and ownership among XL Axiata employees. By involving different divisions and showcasing the positive outcomes achieved through collaboration with X-Camp, employees are more likely to feel connected to the success of the organization and actively support its initiatives.</p> <p>7. Maximizing Existing Resources Collaborating with internal divisions allows X-Camp to leverage existing infrastructure, systems, and processes within XL Axiata. By integrating IoT solutions into these resources, X-Camp can enhance efficiency, optimize operations, and deliver greater value to the organization. This approach maximizes the utilization of internal assets and reduces the need for external partnerships.</p>
6	<p>Focus on Rental and Co-Development Scheme</p>	<p>1. Flexibility for Customers Remembering X-Camp's weakness where they are lacking knowledge of customer preferences/perspectives, based on the data gathered, this solution is found out as more reasonable by customers. Offering rental and co-dev schemes provides flexibility for customers who may not want to make a long-term investment in purchasing IoT products. This allows them to adapt their IoT usage according to their evolving needs, such as when they require temporary solutions or anticipate changes in their business operations.</p> <p>2. Mitigating Uncertainty By providing rental options, X-Camp addresses customer concerns about the future direction of their business. Customers may hesitate to make a significant investment in IoT equipment if they are uncertain about their long-term requirements. The rental scheme allows them to use the equipment without committing to a substantial upfront cost.</p> <p>3. Demonstrating Value and Impact Customers may be unsure about the actual impact and benefits they will receive from using IoT products. Through a rental or co-dev scheme, X-Camp can allow customers to experience the technology firsthand, showcasing its value and potential impact on their operations. This helps build trust and confidence in the effectiveness of the IoT solution.</p> <p>4. Continuous Revenue Stream X-Camp can produce continual revenue streams rather than depending primarily on one-time sales by offering rental possibilities. This provides a consistent stream of income and enables for long-term business viability. Furthermore, it allows for the possibility of upselling or cross-selling additional services or products during the renting duration.</p> <p>5. Overcoming Cost Concerns</p>

		<p>IoT technology is often perceived as expensive. By providing a rental option, X-Camp addresses cost-related concerns and makes IoT more accessible to a broader range of customers. This can attract businesses that may have budget constraints or are hesitant to make large upfront investments.</p> <p>6. Market Differentiation Emphasizing rental and co-dev schemes differentiates X-Camp from competitors who primarily focus on selling IoT products. This unique approach positions X-Camp as a flexible and customer-centric provider, catering to diverse customer needs and preferences. This differentiation can attract customers looking for more flexible options in adopting IoT technology.</p> <p>7. Enhanced Customer Relationships By engaging in co-dev schemes, X-Camp can collaborate closely with customers to develop tailored solutions that align with their specific requirements. This partnership approach fosters stronger customer relationships, as X-Camp becomes an integral part of the customer's IoT journey, providing ongoing support and customization.</p>
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VI. CONCLUSION AND RECOMMENDATION

As an innovation hub within a large telecommunications parent company, X-Camp operates in a very unique industry: IoT/AI. Nowadays, few individuals in Indonesia comprehend the true definition of IoT, as well as its broad knowledge of the potential value/benefits supplied. Thus, to join the market, X-Camp must first establish a strong brand awareness, particularly among customers in Indonesia, so that X-Camp can be recognized and accepted as a top-of-mind market player. It is impossible for X-Camp to upgrade its brand recognition without having a solid foundation, which is the awareness itself that must be prioritized.

The impact of internal and external elements on X-Camp's effectiveness in developing and implementing the correct marketing plan is significant. For instance, X-Camp's internal factors are very determinant, such as having good product quality and customizable products that are different from on-the-shelf products made by other IoT Hubs, having well-experienced experts who are very focused on their respective fields, and having a comprehensive portfolio that has the competence to provide quality content and can attract customers. Furthermore, besides the internal factors, external environment conditions are also giving a significant impact towards the bright future of X-Camp, including the eternal support from the government, growing technology advancements, and promising trends within the IoT industry.

So, the author can conclude that X-Camp is currently still targeting all market segments without any specific criteria due to the blurry landscape and very low customer readiness in Indonesia towards the implementation of IoT products as business solutions. Despite most of the target markets who turn out to be not ready yet to adopt this new technology, X-Camp should start to specify its target markets who are more likely to be ready and have an interest in IoT products made by X-Camp by conducting an active approach to B2B and B2G, especially for the matters of agriculture, smart building, and smart city development. According to the internal data, they are the top three industries who have more knowledge, readiness, and interest in IoT products made by X-Camp. Those chosen target markets can be classified as follows:

- **Demographic information:** older millennials and generation Xers who are middle to upper-class, including business owners, entrepreneurs, or the decision makers within certain companies
- **Psychographic information:** people who value cost efficiency, productivity, or other business values, and are willing to improve performance by learning to adopt new technological advancements
- **Geographic information:** people who live in the JABODETABEK rural and urban areas with their respective industries, especially smart building/city and agricultural
- **Behavioral information:** people working in/owning a business who budget for monthly R&D and operational expenses

After redefining those more specified target markets above, moving on to the right marketing strategy to promote X-Camp's brand awareness, it can be concluded that X-Camp has not implemented the right marketing strategy

to promote X-Camp's brand awareness since the engagement is still quite low and resulting in no potential leads attracted from social media. Therefore, X-Camp should remodel its content planning/concepting by changing its deliverables, fixed uploading schedules, and languages to illustrate the advantage of investing in X-Camp's products more effectively.

In order to attract their target market, according to the data, X-Camp should communicate and give more emphasize on several keywords through their promotional efforts, especially for their contents uploaded in social media, such as its willingness to listen, trusted experts, customized products, and credible parent company's brand name. Furthermore, in the future time, they need to add success stories and tutorial videos on official website, end-to-end support, free PoC, and after-sales services as the aspects that can influence the potential customer to have more interest in buying X-Camp's IoT products. If so, the market will not wrongly perceive X-Camp only as a research institution anymore. Otherwise, X-Camp can be seen beyond expectation as a trusted solution provider who is capable of escalating business value or performance and giving something meaningful for the decision makers and entrepreneurs within clients' companies.

The implications of this research are that it will help to shape X-Camp's future marketing strategy and contribute to the growth of telecoms companies, notably IoT Innovation Centers. If X-Camp implements the results of this research, they will be able to improve their focus to target niche market and increase engagements with new leads. After boosting X-Camp's brand awareness through implementing solutions proposed by the author, the customers' interest, desire, and willingness to buy towards X-Camp's IoT products will follow accordingly. X-Camp's brand can be seen as more attractive by the public. By the end of the day, after renewing its commercialization process, the amount of PO, revenue, and profit will also be increased due to the right GTM strategies intended to the right target market as well.

The research promotes business science by providing comprehensive problem-solving methodologies and improving problem-solving skills. It improves strategic decision-making, stimulates industry collaboration, and provides a competitive advantage in the IoT market by finding efficient marketing strategies. This study explains how IoT Solution Providers are beginning to showcase their brands and commercialize IoT/AI products to boost the purchasing interest of their potential clients and to recommend techniques that should be applied. X-Camp and XL Axiata can enhance their marketing approach, accelerate business growth, and establish a strong presence in the IoT industry by considering these adverse effects. In other words, this research can be beneficial to business; conduct problem-solving research correctly.

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Enhancing Pharmacy Inventory Control System at XYZ Hospital

Rafly Rahmadafa Syabani¹, Mursyid Hasan Basri²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

One of the Most vital in hospitals is pharmacy. Pharmacies must procure and manage various medicines and supplies properly, correctly, and efficiently. Efficient operation of the pharmaceutical supply chain is vital to reduce hospital costs and enhance the customer experience amid escalating expenses. This study examines how XYZ Hospital's pharmaceutical product overstocking and understocking affect customer service. Based on the preliminary analysis, the XYZ Hospital are still highly invested in providing exceptional service, which often leads them to prioritize customer satisfaction over meticulous inventory management. XYZ Hospital pharmacy logistics staff interviews and secondary data from August 2020 to April 2023 hospital documents are used in the study. This study uses continuous review policy to determine inventory status by comparing actual and estimated inventory levels. Cycle counting, based on ABC classification, is used for daily verification of inventory records to enhance productivity and reduce inefficiencies. Based on the data analysis, between the actual and estimated average inventory level 79% of the product was categorized as overstock with amount of Rp 577.531.168, Given these findings, it can be concluded that our initial findings are in line with the theoretical results. Thus, XYZ Hospital may consider implementing several theories because it has the potentially improve their revenue by saving the cost with amount of Rp Rp 570.195.996. although, all of these are purely theoretical calculations that need adjustments to their direct implementation, with this research we can find things that can be improved in XYZ Hospital to be more efficient and effective.

Keywords: ABC Analysis, Continuous Review Policy, Cycle Counting; Hospital, Inventor, Pharmacy, Supply Chain.

I. INTRODUCTION

In Indonesia's healthcare industry, the quality of healthcare services has been a longstanding concern. Despite various efforts by the government and private sector, the healthcare system still faces numerous challenges, resulting in inadequate access to quality healthcare for many Indonesians. One critical area that requires attention is pharmaceutical inventory management in healthcare providers. Pharmaceutical services play a crucial role in healthcare providers by ensuring the availability of essential medications and improving patient outcomes. However, ineffective inventory management systems can lead to various issues, including frequent stock-outs of vital medications, overstocking of non-moving items, increased inventory management costs, and low service levels. These challenges can impact the quality of patient care and overall healthcare delivery.

XYZ Hospital, like many others, faces difficulties in managing its pharmaceutical inventory. This includes inadequate methods for determining when and how much to order, resulting in overstock and understock conditions. Furthermore, the lack of accurate inventory records exacerbates the problem. In order to optimize performance, it is essential for XYZ Hospital Pharmacy to implement an effective inventory management system. Implementing an appropriate inventory management system can provide numerous benefits. It allows for better tracking of inventory, timely ordering, determination of optimal order quantities, and maintenance of optimal inventory levels. By addressing overstock and understock conditions, the hospital can improve service levels, reduce costs, and enhance patient safety and satisfaction.

This study aims to analyze the current inventory management practices in XYZ Hospital Pharmacy and propose a more effective system. The research will investigate the average inventory level comparison between the existing and proposed inventory management systems. It will also evaluate the impact of the proposed system on cost efficiency and provide recommendations to enhance inventory control efficiency and productivity.

This study aims to address three research questions related to XYZ Hospital Pharmacy's inventory management system. The first question compares the average inventory level between the current system and the proposed system, seeking to determine the impact of the proposed system on inventory levels. The second question

focuses on the cost efficiency of the proposed system, analyzing its financial implications and whether it leads to cost savings for the pharmacy. Lastly, the study explores measures that XYZ Hospital Pharmacy should undertake to improve inventory control efficiency and productivity. By evaluating the existing processes and identifying areas for improvement, actionable recommendations can be provided to enhance inventory management practices. Overall, this study seeks to provide valuable insights to XYZ Hospital Pharmacy, aiding them in making informed decisions and improving operational efficiency in inventory management. By addressing these research questions, this study aims to contribute to the knowledge on pharmaceutical inventory management in healthcare providers. The findings and recommendations will assist XYZ Hospital Pharmacy in resolving inventory management challenges and improving overall performance, thereby enhancing the quality of healthcare services provided to patients.

II. LITERATURE REVIEW

Healthcare Supply Chain Management

Supply Chain Management (SCM) involves integrating business processes from suppliers to end-users, delivering valuable goods, services, and information (Lambert et al., 1998; Cooper et al., 1997). In the healthcare industry, SCM differs from manufacturing due to factors such as customization of services, consumer participation, and process uncertainty (Mathur, 2004). While initially focused on reducing costs through the supplier side, recent studies emphasize considering all stages of the supply chain to achieve cost reduction, revenue increase, and maintain quality care (Simchi-Levi, 2002). Technologically enabled solutions, such as e-procurement, radio frequency identification (RFID), and barcoding, play a crucial role in improving healthcare SCM (McLaughlin & Hays, 2008). RFID technology holds promise in healthcare, although cost and return on investment (ROI) considerations need to be addressed. Implementing value stream mapping and applying Lean Six Sigma methodologies can help justify the cost of RFID implementation and minimize uncertainty regarding ROI (Kumar, 2009). By leveraging these technologically enabled solutions, healthcare institutions can optimize their supply chains, reduce costs, and enhance the quality of care provided to patients.

Inventory Control Techniques

The goal of inventory management is to achieve a balance between the investment in inventory and the level of customer service. To ensure adequate stock levels, various techniques are employed such as safety stock, reorder point, replenishment policy, economic order quantity, and average inventory level. These methods will be further discussed in the following sections (Hafnika et al., 2016).

Continuous Review Policy

Chopra and Meindl (2013) explain the continuous review policy as real-time inventory monitoring and ordering when inventory reaches the reorder point (ROP). It helps identify the appropriate reorder point and safety inventory level, allowing for flexible timing of replenishment orders based on demand fluctuations. Implementing this policy requires inventory monitoring technology. Ma and Lei (2013) highlight the benefits of a continuous review policy, including real-time inventory updates and accurate accounting calculations. However, the implementation may incur higher costs due to the need for additional personnel for inventory monitoring, there are several calculations needed on the continuous review including EOQ, Safety Stock and Reorder Point

1. Economic Order Quantity (EOQ)

The main objective from these techniques is to make sure the right amount of stock is ordered and solves the problem about blockage of funds and extra storing cost, decreasing the inventory cost for example purchasing cost, holding cost, order cost, and shortage cost (Poswal et al., 2022). The formula of the EOQ is

$$Q^* = \sqrt{\frac{2DS}{H}} \quad (1)$$

Where

D : Annual demand

S : Cost per order (IDR)

H : Holding cost

2. Safety Stock

Safety stock refers to inventory that is kept on hand to avoid stockout and backorder scenarios (Rădășanu, 2016).

$$SS = Z\alpha\sigma L \quad (2)$$

Where:

$Z\alpha$: Safety factor with service level α

σL : Standard deviation of demand during lead time

3. Reorder Point

Reorder point define as strategy of minimum amount of inventory required for a product that signals to placing an order (Amirrudin et al., 2023).

$$ROP = (LT \times d) + \text{Safety Stock} \quad (3)$$

Where:

LT = lead time (unit is in days)

D = daily demand

Periodic Review Policy

The periodic review policy, as described by Chopra and Meindl (2013), involves conducting inventory checks at fixed intervals and adjusting order quantities based on fluctuations in demand. The review interval, denoted as T, determines the time between orders. This method is preferred by retailers as it eliminates the need for constant inventory monitoring. However, accurately determining inventory levels can be challenging for businesses with high sales volumes (Ma & Lei, 2013). Implementing periodic review policies can lead to positive outcomes such as reduced time for inventory analysis (Ma & Lei, 2013).

Average Inventory Level

The term "average inventory level" (AIL) was defined by Chopra and Meindl (2013) as the "average inventory held in a warehouse due to overproduction or a company's purchase of inventory in larger quantities than the customers' demand." Cycle inventory is another name for the concept of "average inventory level." The AIL is also referred to as the cycle inventory since it is the outcome of the certainty in demand and lead time. The AIL may be derived by dividing the lot size by two and adding the safety stock to this number. This strategy results in the generation of AIL in a unit, which, when multiplied by the selling price, can be used to establish the cost of the product (Chopra & Meindl, 2013).

ABC Classification

The ABC Inventory Analysis is a method used to effectively manage inventory levels by categorizing items based on their annual dollar volume (Teunter et al., 2010). This approach divides inventory into three classes (A, B, and C) based on value, enabling businesses to streamline the organization and administration of inventory with a large number of stock-keeping units (SKUs) (Teunter et al., 2010).

The primary objective of the ABC Analysis is to prioritize high-value inventory items over low-value ones. Class A items, representing only 15% of total inventory items, have a high annual dollar volume and account for 70% to 80% of total dollar utilization (Chopra & Meindl, 2013). Class B items have a moderate annual dollar volume, account for 30% of total inventory items, and contribute to 15% to 25% of total dollar usage. Class C items have a modest annual dollar volume, make up around 55% of all inventory items, but only contribute to 5% of total dollar usage (Chopra & Meindl, 2013).

Table 11. ABC Classification Framework

Class	Volume	Value
A	15%	70% - 80%
B	30%	15% - 25%
C	55%	5% - 10%

Source: Chopra & Meindl, 2013

The ABC Inventory Analysis allows businesses to manage inventory more effectively by focusing on the most significant items and placing less emphasis on the less significant ones (McLaughlin & Hayes, 2008). It provides a classification system that streamlines inventory organization and administration, particularly for businesses with a large number of distinct items or stock-keeping units (SKUs) (Teunter et al., 2010). By implementing the ABC Analysis, businesses can ensure appropriate inventory levels, maintaining sufficient quantities of high-value items while minimizing stock of low-value items to meet customer demand (McLaughlin & Hayes, 2008).

Cycle Counting

Maintaining accurate inventory records is crucial for businesses to avoid stockouts, lost sales, increased costs, and decreased productivity. Cycle counting is a technique used to ensure inventory accuracy by regularly counting a subset of inventory. It offers benefits such as identifying record discrepancies, reducing stockout risks, improving accuracy, and enhancing productivity (Chase & Jacobs, 2014). There are various cycle counting methodologies, including random sample, ABC, process control, opportunity-based, transaction-based, and location-based counting (Rossetti & Kurgund, 2001). ABC cycle counting stratifies inventory into three categories (A, B, and C) based on value. Class A items are crucial, counted frequently (e.g., monthly), while class B items are less significant and counted less frequently (e.g., quarterly). Class C items are the least significant and counted infrequently (e.g., every six months) (REM Associates, 1999). By implementing the ABC classification method, businesses can prioritize the most vital inventory items and ensure their regular counting. This approach enhances inventory accuracy for critical products, reduces costs, and allows businesses to focus on items that significantly contribute to their bottom line. The equation to calculate the number of items that need to be checked daily is

$$\text{Daily check Item} = \frac{\text{Quantity of Each Class}}{\text{Scheduling Policy of Each Class}} \quad (4)$$

III. RESEARCH METHODOLOGY

In this phase, the Author will discuss the research methodology employed in the study. The methodology can be divided into several stages, with this study focusing on five key stages - problem identification, literature review, data collection, data analysis, and conclusion & recommendation. These phases are essential in ensuring the successful completion of the study, with each stage contributing to the overall research process. By following these stages, the researcher can identify the research problem, conduct a comprehensive literature review, design an appropriate research plan, collect relevant data, analyze the data, and ultimately present their conclusions and recommendations based on the findings

The initial phase of the research involved problem identification, which was done by evaluating the efficiency of the inventory management system and assessing the inventory condition at the Hospital Pharmacy. The author collected inventory and sales reports, calculated the Average Inventory Level (AIL), and compared the actual and estimated levels. The identified problem was overstock and understock due to an unclear inventory policy at the pharmacy. In the literature review phase, the author reviewed theoretical foundations from various sources related to healthcare supply chain management, inventory management, and inventory control techniques in pharmacy. The research design phase included illustrating the research process with a flowchart diagram and providing a detailed description of the problem-solving methodology. The research process involved defining the problem, reviewing relevant literature, designing the research, collecting and analyzing data, and concluding with recommendations.

Data collection involved gathering primary data through interviews with the pharmaceutical logistics team and secondary data for historical analysis. The secondary data included inventory data, sales information, purchase prices, and procurement parameters. Data collection involved three types of data. Firstly, monthly inventory data for fast-moving pharmaceuticals and consumable medical supplies between August 2022 and April 2023 were used to compute actual inventory levels in IDR. Secondly, daily sales information from August 2020 to April 2023 was converted to weekly data for the last 30 weeks to determine the average weekly demand for

each product. Finally, purchase prices in IDR were collected to estimate the Average Inventory Level (AIL) in IDR.

The data analysis phase focused on quantitative methods and utilized a continuous review policy for inventory management. Calculations such as economic order quantity, safety stock, reorder point, average inventory level, ABC analysis, and Cycle Counting were performed using Microsoft Excel. The analysis aimed to optimize inventory levels and improve service levels. The conclusion and recommendation phase summarized the findings derived from the data analysis and provided recommendations for improving the inventory management system at XYZ Hospital Pharmacy. These recommendations included implementing ABC analysis, cycle counting, and guidelines for managing a large inventory.

IV. RESULT / FINDING

Sales Data Analysis

The analysis of data sales is in line to calculate proposed management system by applying a continuous review policy. This approach involved a comprehensive evaluation of various factors, including the calculation of Calculate Average and Standard Deviation, establishing safety stock, determining the appropriate reorder point. Calculations were conducted for all inventory items, but table 2 presenting results for the top 10 selected items.

Table 12. Calculated AIL Estimated Data

ITEM	AVG	STDEV	Safety Stock	DL	ROP	EOQ	AIL (UNIT)	Price	AIL (RUPIAH)
FG TROCHES TAB	164	66	58	23	81	152	134	IDR 1.417,00	IDR 189.628
ONDANSETRONE TAB 8 MG OGB DEXA	71	96	84	10	94	79	123	IDR 2.300,00	IDR 283.832
ACETYLCYSTEIN CAP 200 MG MAHAKAM	80	82	72	11	84	126	136	IDR 1.000,00	IDR 135.593
TRICHODAZOL TAB 500 MG	43	63	55	6	61	71	91	IDR 1.700,00	IDR 153.915
PANTOPRAZOLE INJ 40 MG HJ	7	10	9	1	10	5	11	IDR 55.000,00	IDR 624.168
BISOVELL FC TAB 5 MG	30	-	-	4	-	35	-	IDR 5.000,00	-
TAXEGRAM INJ 1 GR	8	11	9	1	10	3	11	IDR 14.000,00	IDR 1.589.209
ACPULSIF TAB 5MG	19	44	39	3	42	30	54	IDR 950,00	IDR 228.023
NIFEDIPIN TAB 10 MG	42	36	31	6	37	196	129	IDR 220,00	IDR 28.439
NATRIUM BICARBONAT TAB 500 MG	49	47	41	7	48	351	216	IDR 80,00	IDR 17.317

Actual Inventory Data Analysis

The analysis of data inventory is calculating the stock inventory data that the author has collected between April 2022 and April 2023. The data was an actual data that inventory hospital has been count with their own method of counting, so there are no pattern or method of inventory counting in the data. The calculations were performed for all items within the inventory, this research specifically focuses on the analysis and presentation of results for the 10 selected items. This calculation outcome is the average of the inventory actual stock and the actual AIL.

Table 13. Calculated AIL Actual Data

ITEM	AVG of Stock	Price	AIL (RUPIAH)
FG TROCHES TAB	306,1	IDR 1.417,00	IDR 433.736
ONDANSETRONE TAB 8 MG OGB DEXA	171,1	IDR 2.300,00	IDR 393.497
ACETYLCYSTEIN CAP 200 MG MAHAKAM	342,1	IDR 1.000,00	IDR 342.061
TRICHODAZOL TAB 500 MG	140,0	IDR 1.700,00	IDR 237.980
PANTOPRAZOLE INJ 40 MG HJ	16,4	IDR 55.000,00	IDR 900.629
BISOVELL FC TAB 5 MG	0,0	IDR 5.000,00	-
TAXEGRAM INJ 1 GR	11,9	IDR 146.250,00	IDR 1.737.225
ACPULSIF TAB 5MG	57,3	IDR 4.200,00	IDR 240.771
NIFEDIPIN TAB 10 MG	96,9	IDR 220,00	IDR 21.329
NATRIUM BICARBONAT TAB 500 MG	200,3	IDR 80,00	IDR 16.027

Comparing Estimated and Actual AIL

In the next stage of inventory management, the actual average inventory level (AIL) is compared to the ideal average inventory level to identify any differences. These differences help categorize items into understock, normal, overstock, deadstock, or new medicine. Understock refers to products with AIL lower than the estimated

AIL, while overstock refers to products with AIL higher than the estimated AIL. An acceptable range is set for products to be categorized as normal, with an AIL Gap of 1% to 10%. Deadstock refers to products that have been on hand but unsold for the previous twelve weeks or three months. New medicine refers to products that have recently appeared in demand data but were not present in the initial data. The GAP is calculated by subtracting the Actual AIL from the Estimated AIL in terms of price. Table 4 provides examples of Estimated AIL, Actual AIL, GAP, and status.

Table 14. Compared AIL Between Actual and Estimated

ITEM	AIL (ESTIMATED)	PRICE (ACTUAL)	GAP	GAP%	STATUS
FG TROCHES TAB	IDR 189.628,00	IDR 433.736,00	IDR 244.108,03	129%	OVERSTOCK
ONDANSETRONE TAB 8 MG OGB DEXA	IDR 283.832,00	IDR 393.497,00	IDR 109.665,83	39%	OVERSTOCK
ACETYLCYSTEIN CAP 200 MG MAHAKAM	IDR 135.593,00	IDR 342.061,00	IDR 206.467,96	152%	OVERSTOCK
TRICHODAZOL TAB 500 MG	IDR 153.915,00	IDR 237.980,00	IDR 84.065,52	55%	DEADSTOCK
PANTOPRAZOLE INJ 40 MG HJ	IDR 624.168,00	IDR 900.629,00	IDR 276.460,88	44%	DEADSTOCK
BISOVELL FC TAB 5 MG	-	-	-	-	NEW MEDICINE
TAXEGRAM INJ 1 GR	IDR 1.589.209,00	IDR 1.737.225,00	IDR 148.016,36	9%	NORMAL
ACPULSIF TAB 5MG	IDR 228.023,00	IDR 240.771,00	IDR 12.747,93	6%	NORMAL
NIFEDIPIN TAB 10 MG	IDR 189.628,00	IDR 433.736,00	IDR 244.108,03	-25%	OVERSTOCK
NATRIUM BICARBONAT TAB 500 MG	IDR 283.832,00	IDR 393.497,00	IDR 109.665,83	-7%	OVERSTOCK

Table 15. Gap Calculation

Status	Total items	Sum of GAP	Percentage
DEADSTOCK	250	IDR 83.088.413,54	17%
NEW MEDICINE	2	IDR 227.500,00	0,14%
NORMAL	16	IDR 767.174,80	1,11%
OVERSTOCK	1142	IDR 577.531.168,35	79%
UNDERSTOCK	37	-IDR 7.335.172,15	3%
Grand Total	1447	IDR 654.279.084,54	17%

ABC Classification

To improve inventory management at XYZ Hospital, ABC classification is being implemented to prioritize high-value items and reduce costs associated with low-value items. The volume-based ABC classification was performed on the medicine inventory products, considering only the products categorized as normal, understock, overstock, and new medicine. Out of the total of 1,197 medicines, the data was sorted based on average annual sales, and class A was defined as the top 15% of items with the highest sales, class B as the next 30% of items, and class C as the remaining 55% of items. This classification allows for the identification and prioritization of high-value items in the inventory management system.

Table 16. ABC Classification Which is Volume-Based

CLASS	NUMBER OF ITEMS	% VOLUME ITEMS	VALUE
A	180	15%	IDR551.000.353
B	359	30%	IDR272.255.407
C	658	55%	IDR69.426.822

The next classification is Value based calculation; the data used was the same as the volume-based classification. Thus, the different is, the value-based classification was the classification criteria. For the class A

criteria has a high annual dollar volume which responsible for 80% of total dollar utilization (Chopra & meindl, 2013). Class B has a moderate annual dollar volume and spends 15% of total dollar usage. Class C has a modest annual dollar volume, may account for only 5% of all dollar usage. So, the ABC classification based on Value is:

Table 17. ABC Classification Which is Value-Based

CLASS	NUMBER OF ITEMS	VALUE	% INVENTORY VALUE
A	384	IDR713.810.073	80%
B	375	IDR134.193.370	15%
C	438	IDR44.679.138	5%

Cycle Counting

The pharmacy at XYZ Hospital does not have a clear inventory recording policy. Instead of using a consistent method, they rely on conventional valuation techniques, which results in inconsistent inventory recording patterns. To overcome this problem, cycle counting techniques can be applied. Class A goods must be counted monthly or every 24 days, Class B goods quarterly or every 72 days, and Class C goods are counted twice a year or every 144 days. This will ensure accurate inventory recording and prevent inaccuracies caused by inconsistent recording procedures. The following is a cycle counting table for volume-based followed by value-based.

Table 18. Cycle Counting for ABC Classification Volume-Based

CLASS	VOLUME	Cycle Counting Policy	Daily Check Item (Round up)
A	180	Each month (24 working days)	8
B	359	Each Quarter (72 working days)	7
C	658	Each Semester (144 working days)	4

Table 19. Cycle Counting for ABC Classification Value-Based

CLASS	VOLUME	Cycle Counting Policy	Daily Check Item (Round up)
A	384	Each month (24 working days)	16
B	375	Each Quarter (72 working days)	5
C	438	Each Semester (144 working days)	3

V. DISCUSSION

Comparison Analysis

From the calculation in the previous part, the Author found that, during the April 2022 to April 2023 period, XYZ Hospital had an average inventory level of approximately Rp 1.075.817.712 for medicines (excluding medical disposable products). The inventory was categorized as follows: 79% overstock products, 17% deadstock products, less than 0% new medicine products, 3% understock products, and 1% normal products. By implementing a new inventory management system with a continuous review policy, the pharmacy could save around Rp 570.195.996. This represents approximately 53% of the actual inventory value. figure 1 bellow and table 5 show the current inventory status of XYZ Hospital.

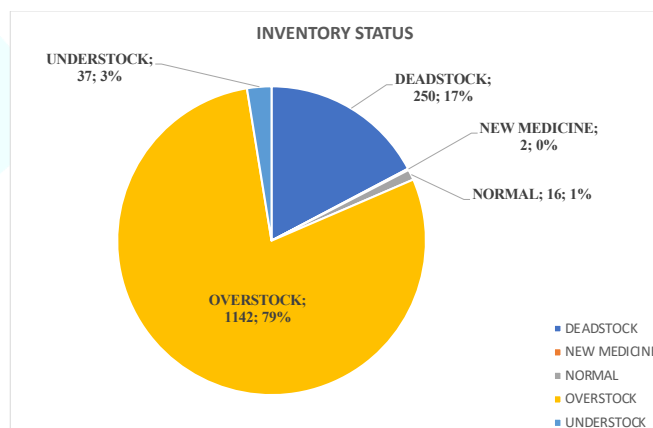


Figure 14. Inventory Status

ABC & Cycle Counting Analysis

Based on the volume-based calculation, the author found that Class A, representing 15% of the total items, accounted for approximately 67% of the total average annual sales. The total quantity of Class A items was 180 products, and their product's total value was Rp 551.000.352. Class B, representing 30% of the total items, corresponded to approximately 33% of the total average annual sales. The specific quantity of Class B items was 359 products, and their product's total value was Rp 272.255.407. Class C, representing 55% of the total items, accounted for approximately 8% of the total average annual sales. The exact quantity of Class C items 658 products, but their product's total value was Rp 69.426.82. In accordance with the cycle counting for volume-based ABC classification shown in Table 6, the hospital pharmacy must record the pharmaceutical products as 18 distinct items per day.

Based on the value-based calculation, the author found that for Class A, which represents 80% of the total inventory value, it corresponds to approximately 32% of the total average annual sales. The total number of items listed in Class A was 384 units, with an inventory value of Rp 713.810.073. For Class B, which represents 15% of the total inventory value, it corresponds to 31% of the total average annual sales. The total number of items listed in Class B was 375 units, with an inventory value of Rp 134.193.370. Finally, for Class C, which represents 5% of the total inventory value, it corresponds to approximately 37% of the total average annual sales. The total number of items listed in Class C was 438 units, with an inventory value of Rp 44.679.138. In accordance with the cycle counting for Value-based ABC classification shown in Table 7, the hospital pharmacy must record the pharmaceutical products as 24 distinct items per day.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

The study analyzed the performance of inventory management at XYZ Hospital and identified several significant conclusions. Firstly, the average inventory level (AIL) indicated an imbalance in pharmaceutical inventory, with most products categorized as overstocked (79%), deadstock (17%), or understocked (3%). This highlights the need for an effective inventory management strategy to optimize the system and ensure accurate inventory records. Secondly, implementing a continuous review policy with a 99% service level could potentially lead to significant cost savings, estimated at approximately Rp 570.195.996 or 53% of the actual inventory value. This finding suggests the importance of establishing efficient inventory policies and procedures to enhance cost-effectiveness and achieve optimal inventory levels. Lastly, the study recommends implementing a continuous review policy with a high service level to address inventory imbalances and improve overall inventory management at XYZ Hospital. Additionally, prioritizing inventory record accuracy and utilizing cycle counting as an alternative to physical inventory management can optimize inventory control and reduce the need for extensive product inspections. The study also conducted an ABC analysis to simplify daily management based on volume and value classifications. By incorporating these recommendations, XYZ Hospital can enhance operational efficiency, improve patient care, and achieve cost-effectiveness in pharmaceutical inventory management.

Recommendation

From the conclusion, the Author offers several recommendations to the XYZ Hospital Pharmaceutical team to develop a new and improved inventory management system. Firstly, it is recommended to implement a

new inventory management system that incorporates a continuous review policy with a service level of 99%. This system aims to optimize inventory control and reduce unnecessary costs by leveraging the Economic Order Quantity (EOQ) technique. By accurately calculating the optimal order quantity based on factors such as annual demand, holding cost, and setup cost, the new system can enhance cost-effectiveness and minimize excess inventory. Additionally, integrating a reliable information system with an alert mechanism for reorder notifications will enable timely replenishment, minimize stockouts, and improve overall operational efficiency. Secondly, the implementation of the ABC classification system based on inventory value is recommended. This classification system allows for the identification of critical items and the prioritization of inventory management efforts. By analyzing sales data and categorizing items into different classes based on their value, XYZ Hospital Pharmaceutical can allocate resources effectively and streamline inventory control. The ABC classification system, when integrated with cycle counting, can further enhance inventory management, minimize stockouts, and improve operational efficiency. Lastly, ensuring record accuracy is crucial for efficient operations. Implementing the cycle counting technique for inventory documentation is recommended. By dedicating a responsible individual to record each item daily and maintaining meticulous record-keeping, the pharmacy can improve efficiency and accuracy in inventory management.

Additionally, for future research, should focus on three key areas: reassessing holding costs incurred by the hospital to gain insights into the financial implications on inventory management; conducting a comprehensive study on the practical application of VEN (Volume-Effectiveness-Normalization) analysis for medical disposables inventory management at XYZ Hospital to optimize inventory levels and supply chain performance; and investigating alternative strategies for determining the minimum order quantity (MOQ) to enhance inventory control practices.

In summary, these recommendations aim to enhance the overall efficiency and effectiveness of inventory management at XYZ Hospital Pharmaceutical. By implementing a new inventory management system, applying the ABC classification system, and prioritizing record accuracy through cycle counting, the hospital can optimize inventory control, reduce costs, minimize stockouts, and improve operational performance. It is important to note that practical adjustments and additional data may be required for implementation, but these recommendations serve as a foundation for improving inventory management at XYZ Hospital.

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Developing Marketing Strategies for Pharmaceutical Company in Indonesia: A Case Study of PT. XYZ Indonesia

Findyta Manziline¹, Fitri Aprilianty²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

Pharmaceuticals are a promising industry in Indonesia. The government also has added the pharmaceutical and medical device industries as priority sectors to carry out the Making Indonesia 4.0 program in response to the rising demand. One form of product sold by pharmaceutical companies is FSMPs, which are foods that are specially formulated to meet the medical needs of a particular individual. Between 2022 and 2030, the global market for food designed for special medical purposes (FSMP) is projected to experience a compound annual growth rate (CAGR) of 6.5%. As one of the pharmaceutical products whose marketing regulations are strictly regulated by the government, there are certain challenges that will require multistakeholder attention in a coordinated way to overcome. This makes it distinct from marketing efforts for other consumer products. This study will collect marketing insights through a qualitative approach using in-depth interviews. Remarkably, this research found 3 competitive marketing strategies that suitable for FSMPs needs to focus on their marketing efforts through healthcare business partners by adhering to ethical marketing practices, aligning with Indonesia's regulatory framework, and building strong relationships with healthcare providers and stakeholders. This study makes an original contribution to the existing literature on pharmaceutical marketing in Indonesia, offering a practical guide for PT. XYZ and other pharmaceutical companies operating in the region.

Keyword: Dietary Needs, FSMPs, Healthcare Marketing, Medical Nutrition, Pharmaceutical Industry.

I. INTRODUCTION

Research Background

The pharmaceutical industry in Indonesia holds great promise, with the government recognizing it as a priority sector within the Making Indonesia 4.0 program to meet the growing demand (Ministry of Investment, OSS, 2021). According to Statista (2022), revenues generated by manufacturing pharmaceutical products and preparations in Indonesia have been steadily increasing between 2012 and 2024. This upward trend is expected to continue, and it is projected that by 2024, the revenue from manufacturing basic pharmaceutical products and preparations in Indonesia will amount to approximately 9.99 billion U.S. Dollars.

Pharmaceutical companies engage in selling a type of product known as FSMPs. These are foods that have been specifically developed to address the unique medical requirements of individuals, and they are referred to as Foods for Special Medical Purposes. Healthcare professionals commonly utilize FSMPs as well. However, in ASEAN member states like Indonesia, Malaysia, Singapore, and others, there is still a need for further clarification regarding the FSMP category, despite some initial regulatory efforts being undertaken. In accordance with BPOM regulations in Indonesia, processed FSMPs are defined as PKMK, which stands for "processed food that is specially prepared or formulated for managing the dietary needs of individuals with specific diseases or disorders" (Ruthsatz, et al., 2022).

PT. XYZ, a multinational pharmaceutical company, offers a diverse range of FSMPs products. Their factory manufactures and sells various medicinal products, such as Infusion/Injection Fluids and Ethical Drugs, along with nutritional products for special medical purposes and medical device products. Given the high demand and fierce competition in the pharmaceutical industry, it becomes crucial for researchers to develop effective marketing strategies to enable companies to compete successfully in the market. The marketing and sales performance of PT. XYZ, a reputable company in the industry, has witnessed a noticeable decline over the past few quarters. Despite having a strong market presence and a history of successful product launches, the recent

downturn has raised concerns among stakeholders. To address this issue, this paper aims to develop competitive marketing strategies and investigate the underlying factors that have led to the decline in PT. XYZ's marketing and sales performance.

Business Issue

In recent times, the marketing strategy for FSMP products has primarily relied on a limited approach involving medical representatives. This approach involves visiting hospitals, clinics, and other healthcare facilities to educate healthcare professionals about the products and build relationships with them. Through these interactions, the aim is to gain recommendations for patients who require such products.

Frontier Research conducted a survey aimed at developing a concept known as the "Top Brand Index." This index seeks to understand brand performance through comprehensive research. The assessment of brand performance is based on various indicators, including Mind Share, Market Share, and Commitment Share. Mind Share measures how effectively a brand establishes itself in customers' minds within a specific product category, while Market Share indicates the brand's strength in the market and its alignment with customer purchasing patterns. Commitment Share evaluates the brand's ability to foster customer loyalty and drive future repeat purchases. Frontier independently conducts the survey and selects the recipients of the Top Brand Award based on the survey results (TBI).

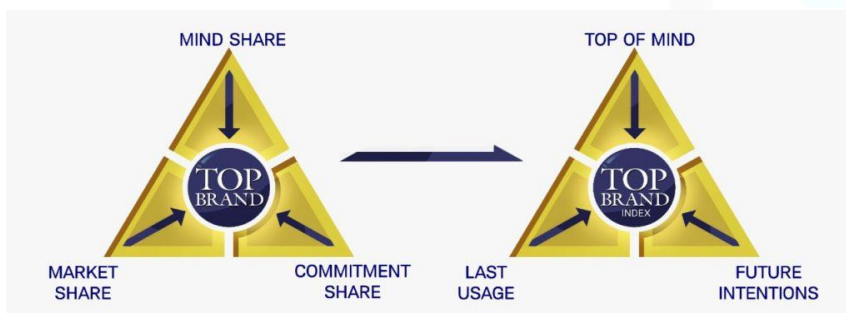


Figure 1. Parameters in Measuring Brand Performance for Top Brand (Top Brand, 2022)

The most recent Top Brand Index survey conducted in 2023 indicates that PT. XYZ Indonesia's pharmaceutical brand, specifically their FSMPs product line, did not achieve significant awareness within the brand category.

Brand	TBI	
Anlene	50.80%	TOP
HiLo	25.10%	TOP
Entrasol	8.30%	
Produgen	5.00%	

Figure 2. Top Brand Index 2023 (Top Brand 2023)

Marketing Manager of FSMPs products at PT. XYZ, provided information stating that the company's marketing strategy has not been effective in the past year, resulting in a decline in marketing and sales performance. There was a decrease of 6-10% during Cycle 1, 2, and 3 in 2022. This decline can be attributed to the transition of Covid-19 from a pandemic to an endemic state, which may have impacted overall performance. Consequently, considering PT. XYZ's current strategy and market conditions, it is crucial to develop an alternative approach to enhance brand awareness and boost product sales.

Unit or Brand Analyze on Business Project

The focus of this study is to enhance brand awareness and sales performance of PT. XYZ's FSMPs product line.

Final Project Objective and Benefit

The aim of this research is to formulate a competitive marketing strategy for the advancement of PT. XYZ's food supplements for medical purposes. The expected outcome is to improve brand awareness and drive sales growth.

Research Scope and Limitations

This research will primarily examine the internal management of PT. XYZ, the company's business partners, and the consumers of PT. XYZ products.

1. Research will focus only on PT. XYZ's competitive marketing strategy
2. The research will be conducted from January 2023 to June 2023.

II. LITERATURE REVIEW

Company Background

PT. XYZ was founded in 1974 as a pharmaceutical company through a Joint Venture with XYZ Pharmaceutical Co., Ltd., based in Japan. Since then, PT. XYZ has continuously expanded its business diversification, not only within Indonesia but also on an international scale. They have expanded their production capabilities by exporting products to various countries including Hong Kong, Singapore, Malaysia, Myanmar, Vietnam, Philippines, Mongolia, Sri Lanka, Thailand, India, and Egypt. Over the course of several decades, PT. XYZ has established its position as a leading player in the Infusion Solutions sector. PT. XYZ produces a wide range of sterile formulations intended for intravenous use. PT. XYZ provides various Food for Specialized Medical Purposes (FSMPs), which serves as a supplementary nutritional product for individuals who require additional calories, struggle with malnutrition, digestive disorders, or are unable to consume food orally and rely on tube feeding.

Business Environment

- External Analysis

Conducting an external analysis allows businesses to identify and adapt their products and strategies to effectively address the demands and requirements of the business environment. This study employs various tools such as PESTLE analysis, Porter's Five Forces analysis, and competitor analysis to assess the impact of the broader business environment on the company. By utilizing these analytical methods, the study aims to gain insights into how the company is influenced by external factors and competitors.

- PESTLE Analysis

A PESTLE analysis examines the significant external factors (Political, Economic, Sociological, Technological, Legal, and Environmental) that impact an organization and serves as the 'climate' component during the situation analysis phase of the marketing planning process in prioritizing business activities to achieve specific marketing objectives within a defined timeframe (CIPD, 2023). Macroeconomic variables are classified into six different interdependent categories such as Political - Legal, Economic, Sociological, Technological, and Environmental.

Political – Legal

The government's new policy of exempting imported items from import customs and taxes to combat the COVID-19 pandemic also can lower the price of raw materials and production costs, for commercial actors in the pharmaceutical industry, taxes and subsidies have been loosened this could be **opportunity** for the company to reduce costs. Other than that, there is supervision of processed food advertising regulations issued in, Peraturan Badan Pengawas Obat dan Makanan (BPOM) Nomor 6 Tahun 2021 Tentang Pengawasan Periklanan Pangan Olahan it is explained that PKMK products in Indonesia are prohibited from being advertised in any mass media except in specific health related media and the distribution permission holder must receive the information before it is published in the form of an advertisement. Departing from this information, regulation can be a **threat** to PT. XYZ because of the limited distribution of advertisements in the advertising media channel.

Economic

According to Badan Pusat Statistik (BPS), the first quarter of 2022 saw IDR 59.88 trillion in gross domestic product (GDP) for the chemical, pharmaceutical, and traditional medicine industries at constant prices (ADHK). When compared to the same quarter the year before, the industry's GDP nonetheless increased by 6.47% (year on year/yoy). Even so, GDP growth in the conventional medical, pharmaceutical, and chemical sectors slowed down

from the previous three months. Moreover, the industry's GDP shrank by 8.28% in the fourth quarter of 2021. (yoy). Due to the slowing down of the Covid-19 pandemic in Indonesia, the performance of the chemical, pharmaceutical, and traditional medicine industries is also slowing down. This finding can potentially become a **threat** from an industrial economic perspective for the company.

Sociological

Indonesia is the largest pharmaceutical market share in the ASEAN region, reaching 27.8% of the total ASEAN market share. Some nations, such as Singapore, Malaysia, and Thailand, are ruled by multinational corporations from abroad. Given that pharmaceuticals (medicines) are a crucial necessity with a high level of urgency, the demand for pharmaceutical items will rise in lockstep with population growth and be unaffected by ebbing economic conditions in a nation. The trend in the total market share of the pharmacy industry in Indonesia, which increased from Rp. 65.9 trillion in 2016 to Rp. 88.36 trillion in 2019, demonstrates the rising demand and use of pharmaceuticals. This is a result of the Indonesian population's growing knowledge of the value of health and the need for medications (Kementerian Perindustrian, 2021). From this information it can be seen that the growing knowledge trend of the Indonesian population which is more focused on the importance of health can be an **opportunity** for the company as a business in the health sector

In addition, Indonesia's per capita drug consumption is one of the lowest among ASEAN nations, it is predicted that Indonesia still has room for growth in the pharmaceutical industry. In addition to having low purchasing power, Indonesia has a different pattern of drug use than other ASEAN nations, which contributes to the country's low drug use per capita. For instance, the pattern of drug consumption in Malaysia tends to favor patented medications. Patented medicines cost far more than branded generic medicines. This condition could be a **threat** for PT. XYZ.

Technological

In the contemporary digital age, technology plays a vital role in shaping the business practices of pharmaceutical enterprises. The industry heavily relies on technological interventions in diverse domains such as drug development, production, and marketing, allowing for significant transformations. This is particularly relevant in the area of pharmaceutical sales, where increasingly stringent regulations, policies, and obstacles associated with pharma-to-physician interactions pose distinct challenges. As the intricacies of pharmaceutical sales become more intricate, there is an increased dependence on innovative technologies in the daily operations of sales representatives (Nandwana, 2023).

According to research conducted by Gupta (2023), telehealth use is expected to be 38x more used than pandemic. In addition, the use of hybrid telemedicine also makes it easier to communicate between healthcare professionals and patients. Departing from these data, it can be seen that health technology that has innovated into telehealth can be an **opportunity** for companies to facilitate their sales through online health platforms, which have a positive trend.

Environmental

Business entity engaged in industrial activities as defined in Article 1 number 7 of Law Number 5 of 1984 concerning Industry ("Industrial Law"). Industrial companies have an obligation to prevent environmental damage and pollution as stipulated in Article 21 of the Industrial Law. As a result of government and ministry policy obligations, PT. XYZ is able to conduct environmental CSR activities in the surrounding area of its factory, which can then become an **opportunity** for the company to gain a positive impression from relevant stakeholders.

The capacities of technology and human resources are the key barriers to the development of medicinal raw materials in Indonesia. Given the lack of support from the upstream chemical industry, the independence of medicinal raw materials is currently still being implemented in Indonesia with great difficulty. This is because there are still very few medicinal raw materials, especially synthetic products (derived from chemicals), produced in Indonesia. With the limitations of medicinal raw materials, this is a **threat** to PT. XYZ in terms of the availability of production materials.

- Porter Five Forces Analysis

Porter Five Forces framework allows organizations to obtain not only a glimpse of the industry at a particular point in time, but a view of the dynamics of the industry and potential changes in the future (Bruijl, 2022). Through its analytical approach, the five forces framework enables businesses to identify and evaluate the key forces that impact their competitive landscape, allowing them to develop informed strategies and make more informed decisions.

Bargaining Power of Buyers

As stated from Kementerian Perindustrian (2021), The COVID-19 pandemic that began in early 2020 has increased the need for specific pharmaceutical products such as supplements and vitamins in general, so that the pharmaceutical industry that plays in this sector has gained considerable growth. This growth is evident in the Gross Domestic Product (GDP) of the Chemical, Pharmaceutical, and Traditional Medicine Industry, which recorded the highest growth among 15 other industry groups in 2020. However, FSMPs products are products that are quite differentiated compared to other types of pharmaceutical products and users of FSMPs products whose market is specifically for people with special medical needs. In addition, substitute products are not widely sold in the market. Therefore, it can be seen that bargaining buyer power is **low**.

Bargaining Power of Suppliers

Dependence on imported raw materials, about 60 percent of which are imported from suppliers from China, has even reduced the production of Indonesia's pharmaceutical industry by 60% in May 2020 (Kementerian Perindustrian, 2021). Refer to limited medicinal raw materials, especially synthetic products (derived from chemicals), produced in Indonesia. Suppliers with significant bargaining power can exert influence over buyers by augmenting prices, diminishing the quality of goods, and curtailing product availability so it can be concluded that the bargaining power of suppliers of this industry is quite **high**.

Threat of New Entrants

The emergence of new rivals in a market can pose a threat or lead to a decrease in the market share and profitability of established competitors, thereby necessitating adjustments to prevailing price levels or product quality. According to Ruthsatz, et al (2022), various countries have regulations regarding medical food/FSMP that share common elements to cater to the requirements of different stakeholders. Manufacturers, on the other hand, rely on clearly defined regulations that establish eligibility criteria for patients with certain diseases, specify standards for Good Manufacturing Practices (GMP), and outline any necessary registration or approval procedures. Therefore, the ability of new entry to enter the pharmaceutical industry, specifically FSMPs, is quite difficult so that the threat of new entry is **low** due to several things such as accessing distribution channels is difficult, factory location development is an issue, complex product formulations, and restrictions regulated by government policy.

Threat of Substitutes

According to BPOM RI (2020), In the pharmaceutical industry, FSMPs products have specific types, including FSMPs for people with diabetes, FSMPs for chronic kidney disease patients, FSMPs for chronic liver disease patients, FSMPs for nutritional support for undernourished or malnourished adults, FSMPs for patients with inborn errors of metabolism, and FSMPs for ketogenic diet. There are several alternative products available in the FSMPs industry, although few possess equivalent characteristics. Consequently, if customers are unable to obtain the desired product from one company, they may seek alternative products from other companies. The threat level of substitute products or services in this industry is low, as the limited availability of alternative options for customers may lead them to switch to another brand.

Industry Rivalry

In the pharmaceutical industry, there exist several comparable competitors to PT. XYZ in terms of size and strength. As per information provided by the Ministry of Health, up until 2021, in pharmaceutical industry there were a total of 241 pharmaceutical manufacturing companies, 17 pharmaceutical raw material companies, 132 traditional medicine companies, and 18 natural product extraction companies. Additionally, numerous companies vie with PT. XYZ in the same market by offering similar products with slight innovation in their product formulations. As a result, the level of competitive rivalry in this market can be considered **moderate**.

Table 1. Porter Five Forces Analysis Summary

Competitive Force	Threat to Industry Profitability		
	Low	Medium	High
Bargaining Power of Buyers	X		
Bargaining Power of Suppliers			X
Threats of New Entrants	X		

Threats of Substitute	X		
Industry Rivalry		X	

From previous analysis it is apparent that three out of the five competitive forces demonstrate the attributes of an attractive industry such as bargaining power of buyers, threats of new entrants, and threats of substitutes. However, the remaining two forces are incongruous with the features of an attractive industry such as bargaining power of suppliers and industry rivalry. Through previous analysis, researcher can deduce that the pharmaceutical industry specifically for FSMPs is expected to be an **attractive** industry.

- Competitor Analysis

According to Indeed (2023), a competitor analysis entails the comprehensive evaluation of the strengths and weaknesses of rival entities. Such an analytical endeavor facilitates the establishment of a comparative assessment between one's own business and its counterparts operating within the same market domain. Essentially, this process entails gathering pertinent intelligence regarding the most prominent competitors of a given organization with the ultimate objective of enhancing its operational efficacy and strategic position.

Table 2. Competitor Analysis Summary

Brand	Product	Price	Place	Promotion	Customer Target
Brand P by PT. XYZ	Daily protein intake in the form of FSMPs powdered drinks to overcome protein energy deficiency and help accelerate healing.	Rp10.900 - Rp24.800/ sachet	Distribution strategy: Hospital, Clinic, Pharmacy	User recommendation and prescription, product knowledge through booklet	People recovering from illness who need high protein (ex: people with postoperative care, athlete, pregnant women)
Peptisol by Kalbe	FSMPs products in the form of powdered drinks for health conditions that need high protein support.	Rp89.635/ 3 sachets	Distribution strategy: Hospital, Pharmacy, Online Pharmacy Platform (GoApotik, Halodoc, Klik 24)	Instagram educational content, User recommendation and prescription, product knowledge through booklet	People recovering from illness who need high protein (ex: athlete, pregnant women)
Ensure by Abbott	Additional nutritional drinks specially formulated for adults to meet daily nutritional needs.	Rp20.000 - Rp25.000/ sachet	Distribution strategy: E-commerce (Shopee, Blibli, Lazada Tokopedia), Hospital, Clinic, Pharmacy, Online Pharmacy Platform (GoApotik, Halodoc, Klik 24)	Online Customer Care, Free sample, Voucher Discount	Adults who want to meet daily nutritional needs (ex: people with malnutrition)
Nutrinidrink by Nutricia	Special diet food for children aged 1-12 years containing 300 kcal/200 ml of energy for health needs and to help children's needs.	Rp31.450/ sachet	Distribution strategy: E-commerce (Shopee, Tokopedia), Hospital, Pharmacy, Online Pharmacy Platform (GoApotik, Halodoc, Klik 24)	Educational Infographic through website	Children aged 1-12 years who are underweight
Pediasure by Abbott	Powder drink as nutritional support for children growth and	Rp9.500/ sachet	Distribution strategy: E-commerce (Shopee, Tokopedia), Hospital, Pharmacy, Online Pharmacy	Home delivery service, Loyalty	Children with eating problems aged 1-10

Brand	Product	Price	Place	Promotion	Customer Target
	companion to heavy meals.		Platform (GoApotik, Halodoc, Klik 24)	program giveaway	years who are underweight.

After conducting competitor analysis, the following information can be concluded:

1. PT. XYZ products has an affordable price compared to its other competitors (Opportunity)
2. Brand P has narrow channel distribution through hospital, clinic, and pharmacy compared to other brands that already tap in to the online pharmacy platform (Threat)
3. Compared to other competitors that use several promotions, promotions effort carried out by PT. XYZ have absolutely no presence on social media except for the company's website (Threat)

Internal Analysis

In contrast to another enterprise of commensurate scale, the marketing department of PT. XYZ is relatively diminutive in size. The marketing unit's hierarchical structure is horizontal, featuring only a limited number of managerial tiers. Such an organizational design fosters collaboration among team members and facilitates unimpeded access to higher echelons of management, should the need arise. Nonetheless, given the limited dimensions of the marketing sections. This form of department can be a **weakness** for the company because of the limited distribution of tasks.

To execute its marketing endeavors, PT. XYZ tends to rely predominantly on business-to-business (B2B) marketing approaches that conform to the Ministry of Health's regulations, which allow marketing only through specific healthcare media. Thus far, the company's marketing strategy has leaned heavily on medical representatives to serve as intermediaries in disseminating information about FSMPs to healthcare professionals. The limitations of this delivery media can also be a drawback for the company because the delivery of product information is limited so that if it is not accompanied by a strategy to deal with it, it will increasingly become a **weakness** for PT. XYZ.

According to initial interview with Marketing Manager of PT. XYZ, the company has carried out several marketing efforts such as:

1. Round Table Discussions

Roundtable discussion is a discussion that aims together with health workers who are product recommenders to introduce product knowledge and map the needs of related healthcare services. This activity is carried out 3 times in a 1-year period.

2. Medical Discussion Webinars

Health webinars that invite health experts according to the topics discussed, in these webinars PT XYZ gets benefits in the form of logo placement and adlibs. This activity is carried out once every 3 months.

3. Sponsorship Support

Sponsorship support is done in terms of scientific support. Support for scientific needs is carried out according to the needs of HCPs and considers the effectiveness of funds.

With these 3 marketing strategies, PT XYZ achieved a growth of 35% in the 2021-2022 period. Of all the marketing that has been done, the most successful marketing strategy to do is to approach the user which is healthcare professional since they will be liaison in order to convey product information directly to consumers. Therefore, a more frequent strategy is to visit sales channels such as hospitals, clinics, and pharmacies by conducting product presentations to users. Therefore, the strategy that they do more often is visiting sales channels such as hospitals, clinics, and pharmacies by conducting product presentations to users.

In terms of internal management, the marketing department has the support of the finance department which is its own **strength** for marketing execution with an adequate budget. In order to establish external partnerships

and execute its marketing plan, PT. XYZ has allocated a specific budget of IDR 1,000,000,000 for the span of one year. According to Minieri's (2022) findings, a company seeking to sustain its present revenue levels may find it adequate to devote 5% to 10% of its sales towards advertising. However, if the company desires rapid expansion, a more substantial allocation, potentially exceeding 20% of sales, may be necessary. The precise proportion required will depend on the specific industry and nature of the business under consideration.

In addition, the HR department within the company also has a support role, namely they provide training for their Medical Representatives to develop knowledge and communication during the probation period. This training is very useful because later the medical representatives will really need good communication skills to deal with other business representatives to establish cooperation. By having a training program from the Human Resources Department, this will be a **strength** for the company because it has company representatives with good skill preparation.

III. RESEARCH METHODOLOGY

Problem Analysis

Drawing on external analysis such as PESTLE, Porter Five Forces, as well as internal analyses including company internal analysis, this study identifies several weaknesses and threats impacting PT. XYZ. Through the use of problem tree analysis, the underlying causes of the company's ineffective marketing strategy in Indonesia were mapped. According to ODI (2009), Problem tree analysis also known as situational analysis or problem analysis, is a structured technique that aims to identify solutions by visualizing the relationships between the causes and effects of an issue. This method is similar to a mind map, but with a more systematic approach.

This analytical process involves three distinct stages: firstly, the identification of the negative facets of a current situation alongside their corresponding causes and effects, which is then mapped out in a problem tree; secondly, the inversion of the identified problems into objectives that are then arranged hierarchically in an objective tree; and finally, the determination of the project's scope through an analysis of strategies (Dillon, 2019).

Data Collection and Analysis

Data collection refers to the diverse techniques employed to acquire information pertaining to specific variables of the study, with the ultimate objective of utilizing them during the data analysis phase (Taherdoost, 2021). In this case study, the researcher will employ the interview methodology as a data collection method to gather data from selected sources. Within the realm of data analysis, a series of steps or procedures are employed to aid the researcher in identifying pertinent patterns or valuable insights crucial to the research endeavor, thereby enabling the formulation of well-founded conclusions. (Jankielewicz, 2022). Moreover, open coding will be taken in order to analyze the obtained data.

Qualitative Approach

Qualitative research refers to the investigation of phenomena, encompassing their characteristics, diverse expressions, contextual aspects, and various perspectives through which they can be understood. However, it does not focus on determining the extent, frequency, or establishing a linear cause-and-effect relationship between phenomena (Busetto & Gumbinger, 2020). At its essence, qualitative research involves posing open-ended questions that cannot be easily quantified, focusing on understanding the processes and reasons behind phenomena rather than seeking numerical responses (Tenny & Brannan, 2022). This type of approach will help researcher to obtain deeper insight regarding PT. XYZ.

- *Interview Method*

This study also used non-probability sampling with the technique of purposive sampling in selecting informants. Refer to Nikolopoulou (2022), in qualitative and mixed methods research, purposive sampling is a frequently employed technique wherein the researcher exercises their discretion in identifying and selecting individuals, cases, or events that are deemed most suitable for providing comprehensive information in alignment with the study's objectives.

Since the information needed is very focused and can only be obtained through specific parties such as internal management, product channel distribution partners, and patients who use products from PT. XYZ. Departing from these considerations, researcher will use qualitative approach with purposive sampling techniques in gathering data.

The methodology of in-depth interviewing represents a qualitative approach to research, wherein a limited number of individuals are subjected to comprehensive individual interviews in order to delve deeply into the unique viewpoints and understandings of the participants regarding a specific concept, program, or circumstance (Boyce & Neale, 2006).

There are 4 different interview sessions. The first is an interview session with PT. XYZ Marketing Manager, the second is an interview session with PT. XYZ's Medical Representatives, the third is interview with Healthcare Provider Representatives, and the last interview will be conducted with FSMPs Customers.

The following interview questions are presented in Table 3, Table 4, Table 5, and Table 6.

Interviewee: Marketing Manager of PT. XYZ

Table 3. Interview Questions for Marketing Manager of PT. XYZ

	No.	Question
Company in General	1.	What is the organizational structure of PT. XYZ? Maybe from the ranks of the BoD and existing departments
	2.	What types of products are produced by PT. XYZ?
	3.	How do you view PT. XYZ's PKMK products (Brand P-E, Brand P, Brand N-M, Brand B-MF) as a brand?
	4.	Who are PT. XYZ's direct competitors?
	5.	What are the characteristics that customers like from PT. XYZ's products?
	6.	What are the characteristics that customers don't like about PT. XYZ's products?
	7.	What are the obligations of each PT. XYZ Brand in dealing with customer complaints?
Marketing	1.	What is the main marketing objective of PT. XYZ especially for PKMK products (processed food for special medical) and what marketing efforts have been implemented so far?
	2.	What is the penetration target of PT. XYZ's PKMK products?
	3.	Who are the target markets for PT. XYZ's PKMK products?
	4.	So far, what has been the most influential marketing effort for PT. XYZ?
	5.	How does the brand get new customers? And what is the marketing approach for this PKMK product?
	6.	How does the company retain existing customers to date?
	7.	Which marketing methods are proven to be the most effective and which are the least effective among the marketing effort strategies that have been implemented?
	8.	What competitive advantages does it offer compared to its competitors?
	9.	How much is PT. XYZ's current marketing budget?
Social Media Marketing	1.	What are the social media marketing strategies that have been implemented so far?
	2.	What kind of image do PT. XYZ in building social media?
	3.	Are there any obstacles faced by companies in carrying out social media marketing strategies?

Interviewee: Medical Representatives of PT. XYZ

Table 4. Interview Questions for Medical Representatives of PT. XYZ

	No.	Question

General Product Knowledge	1.	What types of products are produced by PT. XYZ?
	2.	How do you view PT. XYZ's PKMK products (Brand P-E, Brand P, Brand N-M, Brand B-MF) as a brand?
	3.	Who is PT. XYZ's product direct competitors?
	4.	What are the characteristics that customers like from PT. XYZ's products?
	5.	What are the characteristics that customers don't like about PT. XYZ's products?
	6.	What are the obligations of each PT. XYZ Brand in dealing with customer complaints?
Marketing Approach to Reach Healthcare Providers	1.	How to approach candidates who will become distribution partners or product recommenders of PT. XYZ?
	2.	What is the flow of cooperation with healthcare providers in entrusting PT. XYZ's FSMPs products?
	3.	Which strategies have been used are most efficient or contributes more in collaborating with healthcare providers?
	4.	Which strategies have been used are less efficient in collaborating with healthcare providers?
	5.	How much is the budget allocated to promote PT. XYZ products through healthcare providers?
	6.	Are there any obstacles faced by medical representatives in carrying out the B2B marketing approach to healthcare providers? such as hospital, clinic, pharmacy?

Interviewee: Healthcare Provider Representatives of PT. XYZ

Table 5. Interview Questions for Healthcare Provider Representatives

Questions
1. As a healthcare professional, what is your role in recommending FSMPs products?
2. How did you obtain FSMPs product information?
3. What are the efforts made by representatives of FSMPs product companies in establishing cooperation with healthcare providers?
4. What kind of cooperation with companies is preferred for healthcare representatives in marketing their products?
5. Have you ever participated in a program supported by an FSMPs company?
6. Do you think the delivery of medical representatives had a big influence on your decision to recommend FSMP products? Why?

Interviewee: FSMPs Consumers

Table 6. Interview Questions for FSMPs Consumers

Questions
1. Why do you want to buy FSMPs products?
2. Where do you usually buy FSMPs products?
3. Are there any specific reasons when buying FSMPs products?
4. Who is your recommender when buying FSMPs products? (e.g., doctor, nutritionist, physician)
5. How did the recommender deliver the FSMPs product recommendation to you?
6. What kind of recommendation makes you trust the brand of FSMPs products that you will buy?
7. Are there any promos or programs that you have received from FSMPs products?
8. What promos would you consider interesting in purchasing FSMPs products?

Interview Analysis

The data obtained from the in-depth interview undergoes analysis employing an open coding methodology. Coding refers to the systematic practice of assigning labels and organizing qualitative data to identify distinct themes and examine the interconnectedness among them (Medelyan, 2023). The labelled interpretations employed in this study were formulated through an examination of the keywords identified within the responses provided by the participants. The table below showcases the distinct colors employed to represent different categories and codes. In the qualitative data analysis process, open coding is essential during the initial phase. Subsequently, axial coding and selective coding techniques are employed as exemplified by Corbin & Strauss (1990).

Table 7. Open Coding

Color Numbers	Variables
1	Pharmaceutical Marketing Insights

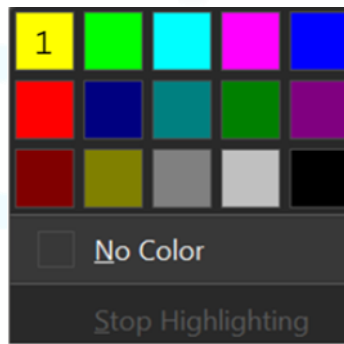


Figure 3. Color Code

According to JLI (2019), Pharmaceutical marketing encompasses a range of informative and persuasive endeavors aimed at effectively meeting the identified needs of patients in a profitable manner. It focuses on the marketing aspect from an industrial standpoint, considering the perspective of pharmaceutical brands, promotional practices, and how prescribing behavior among physicians can influence the overall impact.

Marketing insights are a consolidated set of data that equip marketers with crucial information concerning the preferences and demands of the particular group of people that a brand serves (Indeed, 2022). Marketing insights act as the authentic element that sets a brand apart within the competitive marketplace, they are firmly based on prevailing market needs, validated through customer feedback, ultimately generating a strong inclination among potential customers to establish business connections with us (Cortez, 2018).

IV. RESULT / FINDING

Problem Tree Analysis

The assessment, which draws upon both internal and external analysis, forms the foundation for identifying the root cause of the issue, as depicted in Figure 4 below.

Through a root cause analysis of the aforementioned factors, it was concluded that the primary concern afflicting PT. XYZ is the ineffectiveness of its marketing strategy. This arises from three prominent causes, such as:

1. Struggling to generate fresh marketing content
Proof of this cause can be found in Chapter 2 – Business Environment (Political – Legal) and Internal Analysis.
2. Never implemented an Integrated Marketing Strategy
Proof of this cause can be found in initial interview with Marketing Manager PT. XYZ.
3. Tendency to rely on marketing approach through medical representative
Proof of this cause can be found in initial interview with Medical Representative of PT. XYZ.

Subsequently, these factors have engendered various consequences, are as follows:

1. Lack of sales channel
2. Left behind from industry competitors
3. Lack of advertisement & campaign
4. Lack of brand awareness
5. Absence of social media presence
6. Lost opportunities to engage with potential customers
7. Profit loss

Sustainable Collaboration in Business,
Technology, Information and Innovation

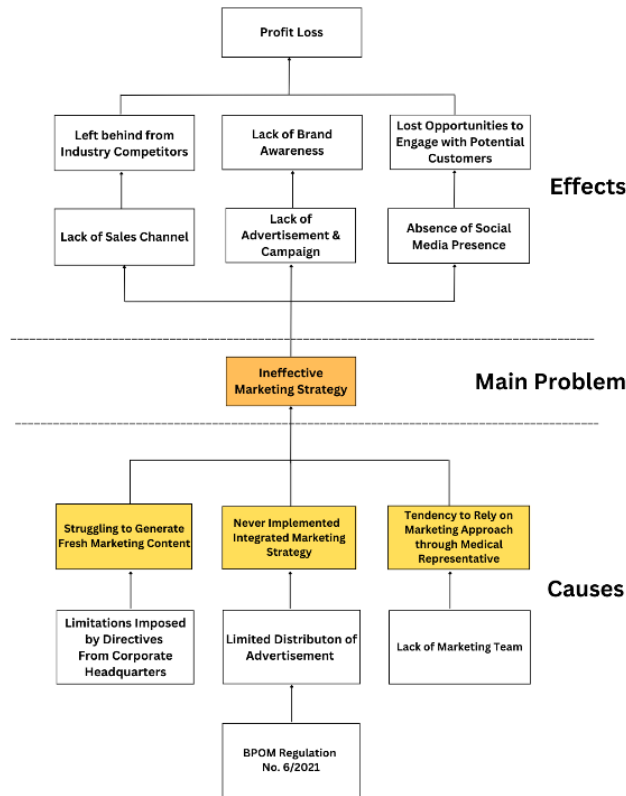


Figure 4. Root Cause Analysis

Interview Result

New insights were derived from the open coding analysis of the interviews conducted with different informants. These valuable insights, which will be subsequently integrated into the SWOT Analysis, are presented in Table 7, Table 8, Table 9, Table 10

Table 7. New Insights from Marketing Manager of PT. XYZ

New Insights	SWOT Analysis
With a niche market PT. XYZ focuses its marketing strategy on approaching through HCPs.	Opportunity
Being a well-known brand in the pharmaceutical industry and having good marketing performance while still complying with applicable regulations is the goal of PT. XYZ	Strength
The form of content that PT. XYZ wants to highlight is the benefits of product through its formula and the healthcare educational content.	Strength

Table 8. New Insights from Medical Representatives

New Insights	SWOT Analysis
Consumers can remain interested in the product because of the good product formulation and practical packaging.	Opportunity
Maintaining cooperation with HCPs will have a positive impact on healthcare services to allow products in.	Opportunity
The absence of digital effort of PT. XYZ from their online catalog and authorized stores.	Weakness

Table from

Business Partner

9. New Insights

New Insights	SWOT Analysis
The form of cooperation that healthcare professionals are interested in recommending FSMPs products is cooperation in the form of scientific support.	Opportunity
Products that have not been evenly distributed even though it is a determining factor for product recommendations.	Weakness
Medical representatives should not only partner with specific health workers but are expected to cover all elements of the healthcare services	Opportunity
Providing product samples is preferred by health professionals as a form of learning the product before recommending it to patients	Opportunity

Table 10. New Insights from FSMPs Customers

New Insights	SWOT Analysis
Consumer would still buy the product according to the recommender's advice	Opportunity
Promo programs such as bundling, and discounts are more attractive to consumers than cashback. However, their purchasing decisions rely on HCPs as recommender.	Opportunity
Difficulty for consumers to find trusted products other than in clinics and hospitals	Weakness

SWOT Analysis

SWOT analysis is a technique used to evaluate both internal and external factors that influence the growth of a business. By conducting a SWOT analysis, enterprises can assess their strengths and weaknesses, explore potential opportunities, and identify potential threats (Dilfuza Ilhomovna, 2021). SWOT analysis used for this study will provide valuable insights that will inform the formulation of effective marketing strategies tailored to PT. XYZ's specific needs and objectives in the pharmaceutical industry of Indonesia.

Strengths

The SWOT analysis will identify the internal strengths of PT. XYZ. PT XYZ has a marketing support budget that is sufficient to develop an appropriate marketing strategy. In addition, the benefits of marketing support with healthcare professionals will also be developed to establish relationships. Having strict internal regulations and complying with government regulations will be a reference in the future strategy of PT. XYZ.

Weaknesses

The analysis will also highlight the internal weaknesses of PT. XYZ, such as areas where the company might be lacking compared to its competitors. These issues are related to marketing channel limitations, sales channel, and absence of digitalization of product promotion needs.

Opportunities

External opportunities that can positively impact PT. XYZ's marketing strategies will be identified through the SWOT analysis. These include factors including regulatory changes, CSR initiatives, emerging trends in consumer preferences, untapped markets, and demand for product knowledge for HCPs. By recognizing these

opportunities, the paper can suggest strategies that capitalize on market trends and customer needs, allowing PT. XYZ to expand its market share and increase its sales.

Threats

The SWOT analysis will uncover external threats that may hinder PT. XYZ's marketing and sales performance. These threats include intense competition from other pharmaceutical companies, economic fluctuations affecting consumer spending, evolving regulations, and public health concerns. Understanding these threats will help the paper propose contingency plans and risk mitigation strategies to safeguard PT. XYZ's business interests and navigate potential challenges.

Researcher succinctly outline the internal and external factors impacting firm performance, particularly with regard to marketing endeavors. Table 11 presents the SWOT analysis that highlights major strengths, weaknesses, opportunities, and threats of PT. XYZ.

Table 11. SWOT Analysis Summary

<p><u>STRENGTHS</u></p> <p>S1 – Support of marketing budget per cycle IDR 1,000,000,000 for the span of one year. (Internal Analysis)</p> <p>S2 – Acquiring marketing support from healthcare industry professional and professional organization such as IDI and PERSAGI. (Internal Analysis & Interview with Healthcare Business Partner)</p> <p>S3 - Good product formulation compared to other competitors. (Interview with Medical Representatives & FSMPs Consumers)</p> <p>S5 - Being a well-known brand in the pharmaceutical industry and having good marketing performance while still complying with applicable regulations is the goal of PT. XYZ. (Interview with Marketing Manager of PT. XYZ)</p> <p>S6 - The form of content that PT. XYZ wants to highlight is the benefits of product through its formula and the healthcare educational content. (Interview with Marketing Manager & Medical Representatvies of PT. XYZ)</p>	<p><u>WEAKNESSES</u></p> <p>W1 - A tendency to rely on marketing through the Medical Representative channel. (Internal Analysis)</p> <p>W2 – Can not tap into social media marketing due to company and government restrictions. (Interview with Marketing Manager of PT. XYZ)</p> <p>W3 – Difficult to generate fresh marketing due to advertising restrictions. (Interview with Marketing Manager & Medical Representatives of PT. XYZ)</p> <p>W4 – Lack of product availability with authorized distributors on online platform channels. (Interview with FSMPs Consumers)</p> <p>W5 - Products that have not been evenly distributed even though it is a determining factor for product recommendations. (Interview with Healthcare Business Partner)</p> <p>W6 - Difficulty for consumers to find trusted products other than in clinics and hospitals. (Interview with FSMPs Consumers)</p> <p>W7 - The absence of digital effort of PT. XYZ from their online catalog and authorized stores. (Interview with Medical Representatives)</p>
<p><u>OPPORTUNITIES</u></p> <p>O1 - The government's new policy of exempting imported items from import customs and taxes to combat the COVID-19 pandemic. (PESTLE – Political)</p>	<p><u>THREATS</u></p> <p>T1 - Peraturan Badan Pengawas Obat dan Makanan (BPOM) Nomor 6 Tahun 2021 Tentang Pengawasan Periklanan Pangan Olahan that regulate limited distribution</p>

<p>O2 – Company’s CSR initiative to gain a positive impression from relevant stakeholders. (PESTLE – Environmental)</p> <p>O3 - Growing knowledge trend of the Indonesian population which is more focused on the importance of health. (PESTLE – Sociological)</p> <p>O4 – Positive telehealth trends after pandemic. (PESTLE – Technological)</p> <p>O5 - With a niche market PT. XYZ focuses its marketing strategy on approaching through HCPs. (Interview with Medical Representatives)</p> <p>O6 - Consumers can remain interested in the product because of the good product formulation and practical packaging. (Interview with Medical Representatives)</p> <p>O7 - Maintaining cooperation with HCPs will have a positive impact on healthcare services to allow products in. (Interview with Healthcare Business Partner)</p> <p>O8 - The form of cooperation that Healthcare professionals are interested in recommending FSMPs products is cooperation in the form of scientific support. (Interview with Healthcare Business Partner)</p> <p>O9 - Medical representatives should not only partner with specific health workers but are expected to cover all elements of the healthcare services. (Interview with Healthcare Business Partner)</p> <p>O10 - Providing product samples is preferred by health professionals as a form of learning the product before recommending it to patients. (Interview with Healthcare Business Partner)</p> <p>O11 - Consumer would still buy the product according to the recommender’s advice. (Interview with FSMPs Consumers)</p> <p>O12 - Promo programs such as bundling, and discounts are more attractive to consumers than cashback. (Interview with FSMPs Consumers)</p>	<p>of advertisements in the advertising media channel. (PESTLE – Legal)</p> <p>T2 - Limited distribution of advertisements in the advertising media channel. (PESTLE – Legal)</p> <p>T3 - Many businesses engaged in specialized medical products due to limited advertising rules and channel platforms that are allowed to sell products. (Porter Five Forces – Industry Rivalry)</p> <p>T4 – Slowing down performance of the chemical, pharmaceutical, and traditional medicine industries. (PESTLE – Economic)</p> <p>T5 - Indonesia's per capita drug consumption is one of the lowest among ASEAN nations (PESTLE – Sociological)</p>
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Overall, the SWOT analysis will be instrumental in providing a comprehensive overview of PT. XYZ's current position in the Indonesian pharmaceutical market. From several factors that have been identified from SWOT Analysis, researcher also could identify the areas where PT. XYZ can leverage its strengths and opportunities, as well as the areas where it needs to address weaknesses and mitigate threats. Subsequently, researcher will further analyze the strategic implications and implementations for PT. XYZ in the next chapter.

TOWS Analysis

Based on the previous SWOT analysis, the TOWS matrix can be utilized to generate strategic alternatives and formulate specific strategies. This structured framework aids in recommending strategies that align internal and external factors, enhancing decision-making and planning processes. The resulting TOWS in Table 12 outlines the strategies identified.

Table 12. TOWS Analysis

Strength – Opportunity (SO)	Weakness – Opportunity (WO)
<ul style="list-style-type: none"> HCPs Community Marketing <p>Utilize marketing support from healthcare industry professional such as professional organization (S2) and cooperation with HCPs to have positive impact on healthcare services to allow products in and cover all elements of the healthcare services (O7, O9)</p> <p>Take the advantage of support of marketing budget per cycle (S1) to have better scientific cooperation and product knowledge experiences (O8, O10)</p> <ul style="list-style-type: none"> Educational Content <p>Develop marketing performance while still complying with applicable regulations (S5) by highlighting product formula and healthcare educational content (S6) and expand company's CSR initiative information to gain positive impression from relevant stakeholders (O2).</p>	<ul style="list-style-type: none"> Educational Content <p>Address company struggle to tap into social media marketing and generate fresh marketing content due to advertising restrictions (W2, W3) by expanding distribution of company's CSR information (O2) to create positive image.</p> <ul style="list-style-type: none"> Digitalization of Product Promotion Needs <p>Overcome the lack of product availability with authorized distributors on online platform channels (W4), consumer difficulties to find trusted products other than in clinics and hospitals (W6), and absence of digital services (W7) supported by the data of telehealth have positive trends after pandemic (O4).</p>
Strength – Threat (ST)	Weakness – Threat (WT)
<ul style="list-style-type: none"> Educational Content <p>Adhere to the limited distribution of advertisements in the advertising media channel (T1) by highlighting benefits of product through its formula and healthcare educational content (S6).</p> <ul style="list-style-type: none"> Digitalization of Product Promotion Needs <p>Utilize support of marketing budget per cycle (S1) and implement digital catalog strategy to overcome threat of limited ditribution of advertisement in adverstising media channels (T2).</p>	<ul style="list-style-type: none"> Educational Content <p>Overcome the company doubt to tap into social media marketing due to company and government restrictions (W2) and generate fresh marketing content (W3) by creating educational content that still adhere with Peraturan Badan Pengawas Obat dan Makanan (BPOM) Nomor 6 Tahun 2021 Tentang Pengawasan Periklanan Pangan Olahan that regulate limited distribution of advertisements in the advertising media channel (T1).</p> <ul style="list-style-type: none"> Digitalization of Product Promotion Needs <p>Address the consumer difficulty to find trusted products (W6) of absence in digital efforts of online catalog and authorized stores (W7) through digitalization of product promotion needs considering limited distribution of advertisement in adverstising media channels (T2).</p>

V. DISCUSSION

Business Solution

In developing marketing strategies specific to companies in the pharmaceutical industry that have various rules in organizing their marketing efforts, the researcher has also identified several possible opportunities and strengths of PT. XYZ to be enhanced. In addition, in developing this competitive marketing strategy, the researcher also departs from the weakness and threat information analyzed to be overcome for the company.

To solve these problems, researcher proposes several marketing strategies, are as follows:

1. HCPs Community Marketing
2. Create Educational Content on the Brand's Official social media
3. Digitalization of Product Promotion Needs

Digital Catalog

Authorized Store Program in E-commerce

This chapter will explain competitive marketing strategies as a business solution for PT. XYZ, a company with the pharmaceutical industry, specifically FSMPs products. The creation of this strategy departs from SWOT Analysis and TOWS analysis in previous chapter.

- *HCPs Community Marketing*

The first marketing strategy solution that will be discussed is the creation of Community Marketing for HCPs. According to Aktas (2022), Community marketing is a marketing strategy that prioritizes the establishment of connections with desired audience. The primary focus of community marketing is to foster brand awareness and encourage customer loyalty by nurturing a community. This community can include customers and their families, employees, or individuals who share an interest in company's products or services.

Therefore, for this strategy, PT. XYZ can create a community of Healthcare Professionals (HCPs) because they are the ones who bridge the company with product users. The steps, among others, can be done by:

1. Establishing platforms for interactive dialogue

This can be done by creating an interactive platform such as WhatsApp Groups, and Telegram. Where one and other can discuss with fellow HCPs and also medical representatives from FSMPs companies. This strategy is aligned with (O9) not only partner with specific health workers but are expected to cover all elements of the healthcare services.

2. Enhancing scientific activities supported by PT. XYZ

The exchange of information for scientific events from PT. XYZ can be spread well because it is through a shared platform and can be tailored to the needs of what types of events are needed by the HCPs. In addition, it is preferred that events that will be conducted run offline because with the offline form, it can be better monitored that HCPs pay attention to the event well. This form of strategy is also supported by the company's strengths, including support of marketing budget per cycle in a year (S1) and acquiring marketing support from healthcare industry professional and professional organization (S2)

3. Enhanced satisfaction of potential customers by providing a better overall experience.

The importance of product knowledge for providing recommendations to patients is very influential in accordance with the HCPs' statement that providing product samples is preferred by health professionals as a form of learning (O10). Therefore, researcher suggest periodic distribution of FSMPs product samples from PT. XYZ to HCPs according to their needs.

The use of this solution is expected to be a solution for PT. XYZ to continue to grow in a competitive industry by utilizing cooperation with HCPs because consumer would still buy FSMPs product according to the recommender's advice (O11).

- *Create Educational Content on the Brand's Official social media*

Becoming a well-known brand in the pharmaceutical industry and having good marketing performance while still complying with applicable regulations is the goal of PT. XYZ (S5). In order to achieve this, the researcher suggests the development of social media based on educational pillar content that is in accordance with the form of content that PT. XYZ wants to highlight is the benefits of product through its formula and the healthcare educational content. (S6)

In addition to education, PT. XYZ can also provide information on their Instagram about the company's CSR activities that they have carried out. This is also a good opportunity because this strategy can also be an opportunity for PT. XYZ to expand the distribution of Company's CSR initiative information to gain a positive impression from relevant stakeholders (O2).

By utilizing this solution, PT. XYZ is expected to overcome their concerns all along where they are in doubt cannot tap into social media marketing due to company and government restrictions (W2). This will enable the company's social media presence to differentiate itself from competitors and enhance brand recognition. Consequently, it is expected that this approach will assist businesses to generate fresh marketing due to advertising restrictions (W3). Even so, with this strategy PT. XYZ is also very required to pay more attention and adhere to Peraturan Badan Pengawas Obat dan Makanan (BPOM) Nomor 6 Tahun 2021 Tentang Pengawasan Periklanan Pangan Olahan that regulate limited distribution of advertisements in the advertising media channel (T1).

- *Digitalization of Product Promotion Needs*

Referring to the statement from the medical representative of PT. XYZ, that they tend to always rely on offline sales both in terms of educational promotion needs, product knowledge, and sales channels. Therefore, digitalization is needed from PT. XYZ in order to reach all of the intended target consumers. The digitalization efforts include the creation of a digital catalog and an authorized store program.

PT. XYZ create a digital catalog with the hope that it can also make it easier to disseminate product information because of its form that can be distributed online to specific target audiences. This strategy is suggested due to the limited distribution of advertisement in advertising media channels (T2) and utilizing specific support of marketing budget per cycle of PT. XYZ (S1). PT. XYZ FSMPs products are products that can be purchased with the advice and prescription of HCPs. From the previous chapter analysis, it can be observed that products that have not been evenly distributed is also a determining factor for product recommendations (W6). Therefore, it is very necessary to have an authorized store creation program for PT. XYZ to deal with the problem of the lack of product availability with authorized distributors on online platform channels (W4).

Specifically, this strategy is expected to be implemented by also following the distribution channel rules of FSMPs, which in authorized stores must ensure that buyers must consult through HCPs who are assigned to be in charge of e-commerce to prescribe products. This is also supported by the fact that telehealth have positive trends

after pandemic (O4). Through this product promotion needs digitization strategy, it is hoped that PT. XYZ can be more responsive in the distribution of products and needs in line with the problems it wants to solve such as the absence of digital effort of PT. XYZ from their online catalog and authorized stores (W7) and difficulty for consumers to find trusted products other than in clinics and hospitals (W6).

Implementation Timeline

Implementation for HCPs Community Marketing will be carried out for 6 months starting with nutrition gathering and HCPs sponsorship which is held every month.

Table 13. Implementation Timeline for HCPs Community Marketing

HCPs Community Marketing	Timeline					
	2023					
	7	8	9	10	11	12
Nutrition Gathering						
Product Sample Distribution						
Scientific Seminar						
HCPs Sponsorship						

The implementation of the social media development of PT. XYZ will be carried out for 6 months from brainstorming to regular posts about public health education.

Table 14. Implementation Timeline for Educational Content on the Brand's Official social media

Educational Content on Brand's Social Media	Timeline					
	2023					
	7	8	9	10	11	12
Brainstorming with Social Media Agency						
Health & Medicine KOL Collaboration						
Finalization of Social Media Educational Content						
Post on Educational Content						

Implementation of digitalization of product promotion needs will be carried out for 5 months for the digital catalog and authorized store program in e-commerce.

Table 15. Implementation Timeline for Digitalization of Product Promotion Needs

Digitalization of Product Promotion Needs	Timeline						
	2023						
	6	7	8	9	10	11	12
Digital Catalog							
Brainstorming with Creative Team							
Finalization of Digital Catalog							
Digital Catalog Distribution							
Authorized Store Program in E-commerce							
HCPs Telehealth Coordination							
Authorized E-commerce Store Enhancement							

Financial Estimation

The following is the marketing strategy budget for PT. XYZ in carrying out its competitive strategy for HCPs Community Marketing, Educational Content on Brand's social media, and Digitalization of Product Promotion Needs.

Table 16. Marketing Budget for Proposed Strategies

Marketing Strategy	Description	Expenses
HCPs Community Marketing	Scientific Seminar	Rp 200.000.000
	Product Sample	Rp 125.500.000
	PR & Event Team	Rp 40.000.000
	Community Platform	Rp 5.000.000
	HCPs Sponsorship	Rp 350.000.000
	Media Partnership	Rp 5.000.000
	Grand Total	Rp 725.500.000
Educational Content on Brand's Social Media	Social Media Agency	Rp 4.000.000
	Health & Medicine KOL Collab	Rp 50.000.000
	Grand Total	Rp 54.000.000
Digitalization of Product Promotion Needs	Digital Catalog Production	Rp 5.700.000
	HCPs Telehealth Collab	Rp 50.000.000
	Authorized E-Commerce Store Enhancement	Rp 20.000.000
	Grand Total	Rp 75.700.000
Total Marketing Expenses		Rp 855.200.000

With a proposed marketing budget of IDR 855,200,000 it is estimated that the growth of PT. XYZ will increase, which previously in the 2021-2022 period was 35%, then with the use of new strategies, it will increase to 63%. With a return of investment (ROI) of 33%.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

The final result of this research is a strategy for PT. XYZ to overcome the main problem of ineffective marketing strategy. Here are 3 marketing strategy recommendations for PT. XYZ:

1. HCPs Community Marketing
2. Create Educational Content on the Brand's Official social media
3. Digitalization of Product Promotion Needs
 - Digital Catalog
 - Authorized Store Program in E-commerce

These marketing strategies are planned to be implemented in the second half of 2023. By allocating a suggested marketing budget of IDR 855,200,000, it is projected that PT. XYZ will experience growth. Previously, during the 2021-2022 period, the growth rate stood at 35%. By the implementation of new strategies, the growth rate is expected to rise to 63%. Additionally, the return on investment (ROI) is expected to reach 33%. Referring to the analysis and discussion in Chapter 3 and Chapter 4, this strategy will tend to involve cooperation with healthcare professionals referring to the limitations of marketing activities in government regulation. In addition, marketing activities that are carried out must still follow the applicable rules through Peraturan Badan Pengawas Obat dan Makanan (BPOM) Nomor 6 Tahun 2021 Tentang Pengawasan Periklanan Pangan Olahan that regulate limited distribution of advertisements in the advertising media channel (T1).

Business Implication

The findings of this research have significant implications for PT. XYZ's marketing strategy to overcome the problem of their ineffective marketing strategy that leads to profit loss. In addition, this research also expected to have a positive impact on the overall growth of the pharmaceutical industry specifically for FSMPs products in Indonesia. The significance of this research lies in its contribution to the field of management science, offering a thorough problem-solving approach encompassing problem analysis, identification of root causes, and the generation of alternative strategies to develop optimal solutions for interconnected problems.

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Analysis of Medicine Waiting Time at XYZ Hospital Pharmacy in Bandung

Catherine Tarida Hananaek¹, Mursyid Hasan Basri²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

Healthcare is a crucial industry that caters to the needs of the community, and hospitals and healthcare facilities must prioritize patient recovery and enhance the quality of care provided. Patients often choose private healthcare providers due to their perception of higher quality services, availability of brand-name medicines, and shorter waiting times. However, a significant issue arises when the waiting time, not only for treatment but also for obtaining medicine at the pharmacy, exceeds the expected duration. In Indonesia, the Ministry of Health has established standards for waiting times in pharmacies, specifying that ready medicine should be dispensed a maximum of 30 minutes while compounding medicine 60 minutes. Unfortunately, based on secondary data and observations from a private hospital in Bandung, it is evident that the waiting time for both ready and compounded medicine exceeds these standards. This research aims to examine the medicine waiting time at a private hospital in Bandung. To evaluate the service quality, a comprehensive examination of the entire process and a thorough analysis of the available data are necessary. Control charts, hypothesis testing, capability analysis, and value analysis are implemented in this research. The results have revealed that the quantity of medicine ordered directly impacts the waiting time and identifies the delays caused in the medicine provision process. Addressing this issue requires careful evaluation of government regulation and improvement of various aspects of the process. This includes optimizing resource allocation, streamlining workflows, enhancing communication channels, and potentially implementing technological solutions.

Keywords: Waiting Time, Pharmacy, Medicine.

I. INTRODUCTION

Background

Patient satisfaction is one of the most important factors in the healthcare industry, as it impacts hospital profitability, market share, and reputation (Zeithaml et al., 2000). The delivery method of healthcare services has a significant impact on related organizations and their administration. As a result, healthcare management should prioritize service quality to ensure patient satisfaction, especially in delivering precise medical care (Manzoor et al., 2019). Patients often choose private health providers due to their perceptions of the quality of healthcare services and availability of brand-name medicines, but they have high expectations that may lead to disappointment if not met (A.W. Widayanti et al., 2020) (Camilleri et al., 1998). Patients are willing to spend more money on their treatment in expectation of a better service. If this is not the case, they would just seek out rivals (Manzoor et al., 2019). Patients and their families may exhibit a sense of entitlement due to their status as private patients.

There is a strong correlation between hospital service quality and growing patient output. However, the limited facility and resources of healthcare can make the quality of service in hospitals out of control, and result in complex procedures of patient flow and long waiting times (A.W. Widayanti et al., 2020). Waiting time and queues are two aspects that cannot be avoided in the healthcare industry. Waiting for the patient's turn throughout the end-to-end process in healthcare facilities, is pretty common, especially in hospitals. A long waiting time implies there is an imbalance between supply and demand. It could make a patient's illness or disability worse for longer. (Yee Man et al., 2018). It can also affect the patient's level of trust in the doctors' ability and the treatment they take (Xie et al., 2017).

Patients visit the pharmacy right after they get their treatment from other hospital departments (Alam, S et al., 2018). When the number of patients arriving exceeds the rate at which services are being provided, queues form (Bahadori et al., 2014). Patient waiting time is counted when the patient arrives at the pharmacy department

until the time the patient receives their prescription and leaves the pharmacy (Kumari K et al., 2012). Pharmacy waiting time is impacted by a complex service system in the department that handles different types of patients' prescriptions and cases, utilizes resources with different possible job combinations, and makes a strategy to enhance the accuracy and efficiency of drug distribution (Reynolds, M et al., 2011). The complexity has increased because of government regulations and the national health insurance system which are always updated to ensure patients receive the highest quality care possible (Nadifa et al., 2021). Ministry of Health Indonesia stated that the standard length of waiting time in the pharmacy is 15-30 minutes for ready medicine and 30-60 minutes for compounding medicine (Menteri Kesehatan Republik Indonesia, 2021). There are many strategies for improving the dispensaries' operations in the hope to make them more effective such as modifying staffing patterns, implementing prioritization systems, and changing workflow (Reynolds et al., 2011). To prevent dissatisfaction, pharmacies, and hospitals should give clearer and more transparent information about the services.

Problem Statement

Based on the data the researcher got from a private hospital in we can identify that there is an error by the pharmacy division in fulfilling the waiting time standard. Based on the calculation above, the average waiting time for ready medicine (*obat jadi*) is 53.82 minutes, meanwhile, the average waiting time for compounded medicine (*obat racik*) is 73.68 minutes. The average of both medications exceeds the standard set by the Ministry of Health Indonesia that stated the maximum time of waiting for ready medicine is 30 minutes and compounded medicine is 60 minutes. This situation will be very detrimental to the hospital because it reduces patient satisfaction. The aim of this research is to focus on analyzing the reason and factors why the hospital didn't meet the minimum standard which is 30 minutes for ready medicine and 60 minutes for compounded medicine

II. LITERATURE REVIEW

Business Process Model and Notation (BPMN)

Business Process Model and Notation (BPMN) enables business to comprehend their internal business procedures in a graphical notation. BPMN also will give businesses the ability to communicate these procedures in a standardized manner, which can improve their overall operational efficiency (Object Management Group, 2023). By providing a visual representation of their business processes, business can recognize potential areas of improvement and enhance their resources. (Lubke et al., 2021). Business Process Model and Notation (BPMN) defines a total of thirty-eight language constructs with their associated attributes. These constructs are grouped into four main categories namely, Flow Objects, Connecting Objects, Swimlanes and Artefacts. (Recker et al., 2006). In conclusion, BPMN is a valuable tool for modeling business processes, and its use can lead to better understanding, analysis, and optimization of these processes.

Value-Added Analysis

According to (Dumas et al., 2013), value-added analysis is a method to identify unnecessary steps (non-value-adding steps) within a process and eliminate them. The steps can be considered adding value if there are changes in the form or function of the product and if the customer willing to pay for the change. The opposite of that, if the steps are not do any of that, it's called a non-value adding steps. The process only adds cost and time that is why these activities should be eliminated (Sarkar, 2009).

Control Charts

Data are essentials in order to create a control chart. There are 2 types of data: continuous data (e.g., measurements) and attribute (e.g., counts). Depending on their applicability to a specific situation, control charts can be selected for use (Suman et al., 2018). The initial focus of control charts is to assess the level of consistency in a process and determine whether adjustments should be made. Subsequently, the statistical process control chart compares the performance of the process with established standards in the pharmaceutical industry, offering a process capability index that serves as an ongoing and reliable guide for enhancing quality. Lastly, control charts and their associated process capability index efficiently evaluate the outcomes of quality improvement initiatives targeted at enhancing process consistency. This review concentrates on exploring the components of control charts, the different types of control charts available, and provides illustrative examples to support the discussion (Shah et al., 2010).

Hypothesis Testing

Hypothesis testing is a major concept in statistical inference, which provides the theoretical framework for decisions and inferences based on observed data. It includes a methodical evaluation of opposing hypotheses

and an evaluation of the importance of observable effects or differences. The only conclusions that can be drawn from a hypothesis test are whether a relationship is dependable or not, or if a difference between two groups is likely to be the result of chance or not.

ANOVA Test

ANOVA provides a powerful tool for drawing collective conclusions about population parameters. As previously mentioned, various procedures have been developed for further analysis. One such method is the Tukey method, which enables pairwise comparisons of population means. This method, also known as the HSD (honestly significant differences) test, allows us to compare all possible pairs of means while maintaining a single level of significance, such as $\alpha = 0.05$ (or a corresponding confidence coefficient, for example, $1 - \alpha = 0.95$). This uniform level of significance applies to the entire set of pairwise comparisons, facilitating a comprehensive analysis of mean differences. The test is often used as a post hoc test for an ANOVA, to create confidence intervals for all pairwise differences between each group's means, while controlling the overall error rate to a level that you choose. The Tukey test controls the Type I error rate on its own, so the ANOVA is not necessary. It is important to note that the Tukey test accounts for multiple comparisons by maintaining an overall significance level for all pairwise comparisons. The grouping resulting from the implementation of the Tukey method offers a lucid and comprehensive means to interpret dissimilarities among multiple groups. Each group created represents a subset of means that lack statistically significant differences from one another. This categorization facilitates a more precise comprehension of the interrelations between groups and aids in identifying the specific groups that stand apart from one another concerning the analyzed variable (Aczel, 2009).

Capability Analysis

According to ISO 25517-4, process capability is defined as the capacity of the process to fulfill the requirements for a specific characteristic. This means that the process should have the capability to consistently produce results that meet the predefined standards or criteria for that particular characteristic. The process of estimating process capability for an operation process typically involves the following steps (Wooluru et al., 2014)

1. Understanding the fundamental concepts of process capability analysis and its measures,
2. Collecting data for the process
3. Calculating necessary statistic
4. Validating critical assumptions
5. Estimating Cp, Cpu, Cpl, Cpk, Cpm, and Cpmk
6. Analyzing process capability results
7. Identifying predominant factors affecting process capability
8. Estimating confidence intervals and conducting hypothesis testing

Process Capability refers to assessing how effectively a process meets engineering specifications or its ability to produce parts that adhere to those specifications. On the other hand, Process Control refers to evaluating the stability of a process over time or its capacity to maintain a state of statistical control. These are distinct and crucial aspects to consider when evaluating process performance.

III. RESEARCH METHODOLOGY

This research includes problem identification, the establishment of a theoretical framework, the selection of research methods, data collection, data processing, and analysis, as well as the formulation of conclusions and recommendations. The researcher uses a quantitative method since this research discusses waiting time correlate with the number. The researcher will use Excel for calculating and sorting the waiting time data of the hospital pharmacy, Minitab for the tools creating a control chart, and hypothesis testing, and BPMN tools to create visualization about business process modeling and notation. Then, after the data has been analyzed, the researcher conducted interviews and observations directly at the hospital to support the statement and reassure the data. Theoretical foundations were established through a review of relevant theories, previous studies, frameworks, and models. Resources were selected based on criteria such as authority, recency, and unbiased information to ensure reliability. The research incorporates various methodologies, including BPMN, control chart analysis, hypothesis testing, and capability analysis, to develop a solution based on the theoretical framework.

In the data process and analysis, control chart is utilized to evaluate the pharmacy's performance and assess waiting time. In-control data is selected to establish the baseline performance, and the Individual Moving

Average Control Chart is employed for monitoring and comparison. A capability test using the Six Pack report assesses the process's ability to meet requirements. The ANOVA test is used to examine the relationship between waiting times and order quantity. BPMN methodology is employed to address pharmacy problems, and a detailed BPMN diagram is created using Cawemo. Value-added analysis helps identify and eliminate non-value-generating activities to improve efficiency. A capability test using the Six Pack report assesses the process's ability to meet requirements. These data analysis methods contribute to enhancing the quality and efficiency of pharmacy services.

Derived from the outcomes of the data analysis, the hospital management will verify the accuracy of the analysis. Once they have endorsed the findings, conclusions will be formulated, and recommendations will be presented to resolve the identified issue. The research findings have practical implications for the pharmacy industry, informing decision-making and suggesting improvements in operations. The researcher proposes recommendations to enhance the hospital's service based on the study's findings.

IV. RESULT/FINDING

Problem Analysis

The XYZ Hospital Pharmacy in Bandung, Indonesia, has collected transaction data for ready and compounded medicine orders. The average waiting time for ready medicine is 53.82 minutes, exceeding the government standard of 30 minutes. The average waiting time for compounded medicine is 73.68 minutes, exceeding the standard of 60 minutes. To analyze the factors contributing to the prolonged waiting time, data was examined based on the quantity of medicine ordered. However, caution is advised due to the limited sample size for certain order quantities. The analysis excluded order quantities with less than 50 data points to ensure statistical validity. The renewed analysis showed a paradoxical relationship between order quantity and waiting time. For ready medicine, the average waiting time increased with order quantity. Further examination of government guidelines is necessary to determine if standards consider the impact of order quantity on waiting times.

Control Chart

Based on the data, the mean waiting time for a single order of ready medicine exceeds the standard of 30 minutes, while for compounded medicine, it approaches the maximum time but doesn't quite meet it. A control chart analysis was conducted using 150 data points from a selected period to establish a baseline for performance. The chart revealed variations and outliers, indicating an out-of-control process. However, a subset of in-control data was identified, showing a mean waiting time of 0.54 hours or 32.4 minutes, which still meets the standard requirement of 60 minutes. The process in XYZ Pharmacy performs well overall but requires continued monitoring and analysis for consistent performance and identifying areas of improvement.

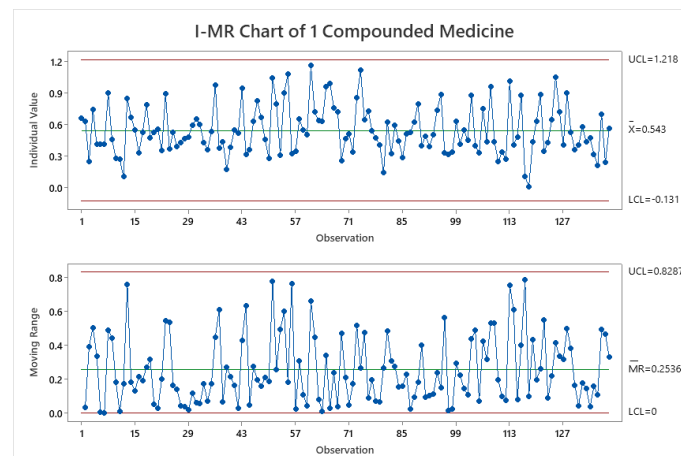


Figure 1. I-MR Chart of 1 Compounded Medicine

The control chart analysis for the process of ordering a single ready medicine indicates variations and suggests an issue with stability and predictability. The researcher selects a stable and reliable period (data points

6220th-6269th) for further analysis, eliminating outliers. The in-control data shows a mean waiting time of 0.28 hours or 16.8 minutes, which meets the standard waiting time of 30 minutes.

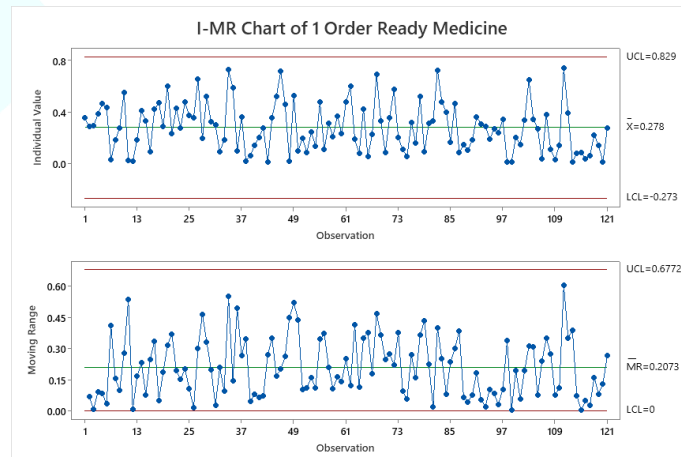


Figure 2. I-MR Chart of 1 Order Ready Medicine

However, it also highlights inconsistencies in quality, referring to variations in waiting times. To assess the process capability, further analysis, such as a capability analysis, is needed.

Capability Analysis

Once the stability and control of the process have been established with 150 data points, a capability analysis is performed to determine if the process meets required standards. The analysis assesses the waiting time process using the capability six-pack analysis, evaluating factors such as mean, standard deviation, process capability indices, and data points within specification boundaries. This analysis provides insights into process adherence, identifies areas for improvement, and offers recommendations for optimization to meet customer requirements.

To ensure accurate analysis, a distribution fit test is conducted to determine the distribution type of the data. The waiting time for compounding and ready medicine is best described by a Box-Cox distribution.

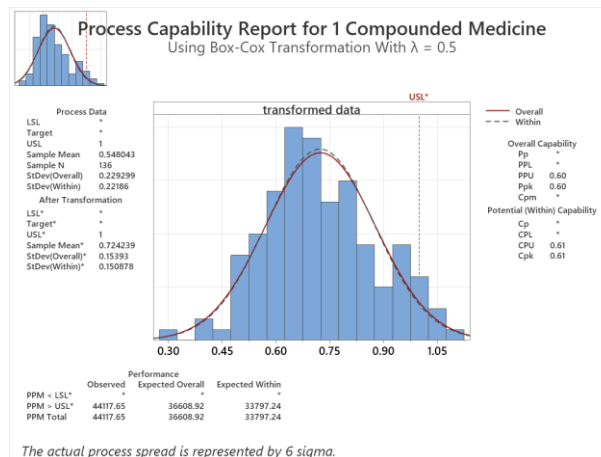


Figure 3. Process Capability Report for 1 Compounded Medicine

The capability analysis for compounded medicine reveals that the process is in control, but some variables require stabilization through Box-Cox transformation. The data generally falls within the desired range, but occasional instances exceed the upper limit. The Ppk value of 0.60 indicates a relatively low capability to meet specifications, suggesting the need for process improvement to reduce variability. The Observed PPM (Parts Per Million) value of 44,117 indicates the number of defective units that do not meet the required standards or

specifications out of a million opportunities or instances. It implies that only a small proportion (4.4%) of the waiting time values surpass the designated threshold, with a majority of the waiting time falling within the desired range. Overall, the capability analysis highlights areas for improvement and the need to reduce variability to ensure a higher proportion of waiting times fall within the desired range.

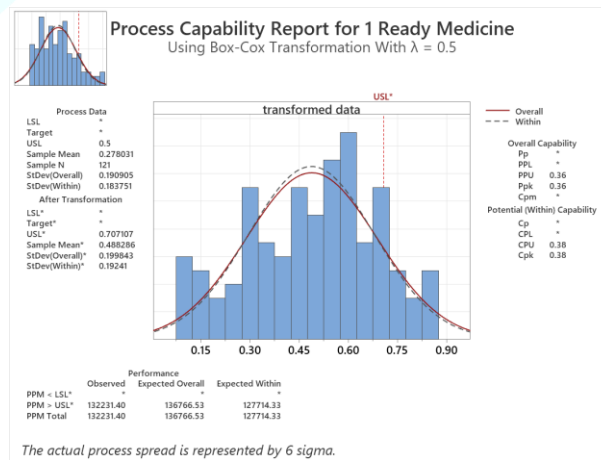


Figure 4. Process Capability Report for 1 Ready Medicine

The processing time of ready medicine has been analyzed using the six-pack report, considering a normal data distribution with Box-Cox transformation. The analysis reveals that the process is in control, with a mean value of 0.278. After transformation, the mean becomes 0.488, indicating predictable operation within acceptable limits. Most of the process time values fall within the specified limits, but there are instances where it exceeds the upper limit, indicating delays beyond the desired timeframe.

Based on the process capability report, the Ppk value of 0.36 suggests a low capability of the process to meet requirements, indicating a larger process spread compared to the specifications. The PPM value of 132,231 signifies a 13.2% probability of exceeding the maximum waiting time, highlighting the need for process improvements to consistently meet targets.

Overall, the analysis shows that both compounded and ready medicine processes have low capability to meet the specified standards, even during optimal performance periods. Improvement efforts are necessary to enhance process capability and meet waiting time requirements consistently.

ANOVA Test

The previous analysis indicates a low capability of the waiting time process for ordering one medicine to meet the specified standard consistently. This suggests that the process may struggle to fulfill waiting time requirements for individual orders, and this capability is likely even lower for orders with multiple medicines. To test the relationship between the number of medications ordered and waiting time, an ANOVA test is used to compare means across different quantity ranges of medication orders.

The researchers conducted a one-way ANOVA test with a 95% confidence level. The results show that the waiting time for compounded medicine is statistically significantly different across different quantity ranges of medication orders, rejecting the null hypothesis. Tukey pairwise comparisons further reveal significant differences among all quantity ranges of medication orders, indicating distinct effects on waiting times for each range. The results emphasize the need to consider different waiting time thresholds based on specific order quantities to ensure effective management and timely delivery of medicine.

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	3	12.51	4.1707	5.59	0.001
Error	4876	3635.96	0.7457		
Total	4879	3648.48			

Figure 5. Analysis of Variance Waiting Time Compounded Medicine

Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
8	115	1.2466	A
4	97	1.1152	A B
2	932	0.9587	B
1	3736	0.9460	B

Means that do not share a letter are significantly different.

Figure 6. Tukey Pairwise Comparisons for Compounded Medicine

The ANOVA test was conducted for compounded medicine waiting time, and the results showed a statistically significant difference among the quantity ranges of medication orders. Tukey pairwise comparisons further confirmed significant differences in waiting times across all quantity ranges. Specifically, order quantities 1 and 2 had different waiting times compared to order quantity 4, with an even more pronounced difference compared to order quantity 8. This indicates that a uniform maximum waiting time of 60 minutes cannot be applied to all order quantities, highlighting the importance of considering different waiting time thresholds based on the specific order quantity for effective management and timely delivery of medicine.

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	8	204.5	25.5588	51.27	0.000
Error	13040	6500.1	0.4985		
Total	13048	6704.5			

Figure 7. Analysis of Variance Waiting Time Ready Medicine

Grouping Information Using the Tukey Method and 95% Confidence

Factor	N	Mean	Grouping
8	267	0.9451	A
6	254	0.8297	A B
4	1066	0.8138	A B
3	598	0.7774	B
2	5405	0.7616	B
1	5405	0.53194	C

Means that do not share a letter are significantly different.

Figure 8. Tukey Pairwise Comparisons for Ready Medicine

The analysis of ready medicine waiting time showed a statistically significant difference between different order quantities, with a p-value of 0.00 indicating that the observed differences are unlikely due to chance alone. The Tukey pairwise comparisons revealed distinct groups with different means for waiting time. Specifically, order quantities 1 and 2 had the lowest sample mean, while order quantity 8 had the highest sample mean. The grouping analysis indicated that order quantities 4, 6, and 8 had similar means, order quantities 2, 3, 4, and 6 had similar means, and order quantity 1 was in a separate group. These groupings suggest that the quantity range of medication orders significantly impacts waiting times at the pharmacy. The findings emphasize the need to consider different waiting times based on the specific order quantity to ensure optimal service and customer satisfaction, as a uniform waiting time of 30 minutes may not be suitable for all order quantities.

Business Process Modelling and Notation (BPMN)

A BPMN illustrates the process of business operation in the form of a flowchart with interconnected elements. The purpose of modeling BPMN in XYZ hospital pharmacy is to acquire a comprehensive comprehension of their processes, recognize possible obstacles or deficiencies, and enable initiatives for enhancing the processes. After some observations and research, here is the BPMN representation:

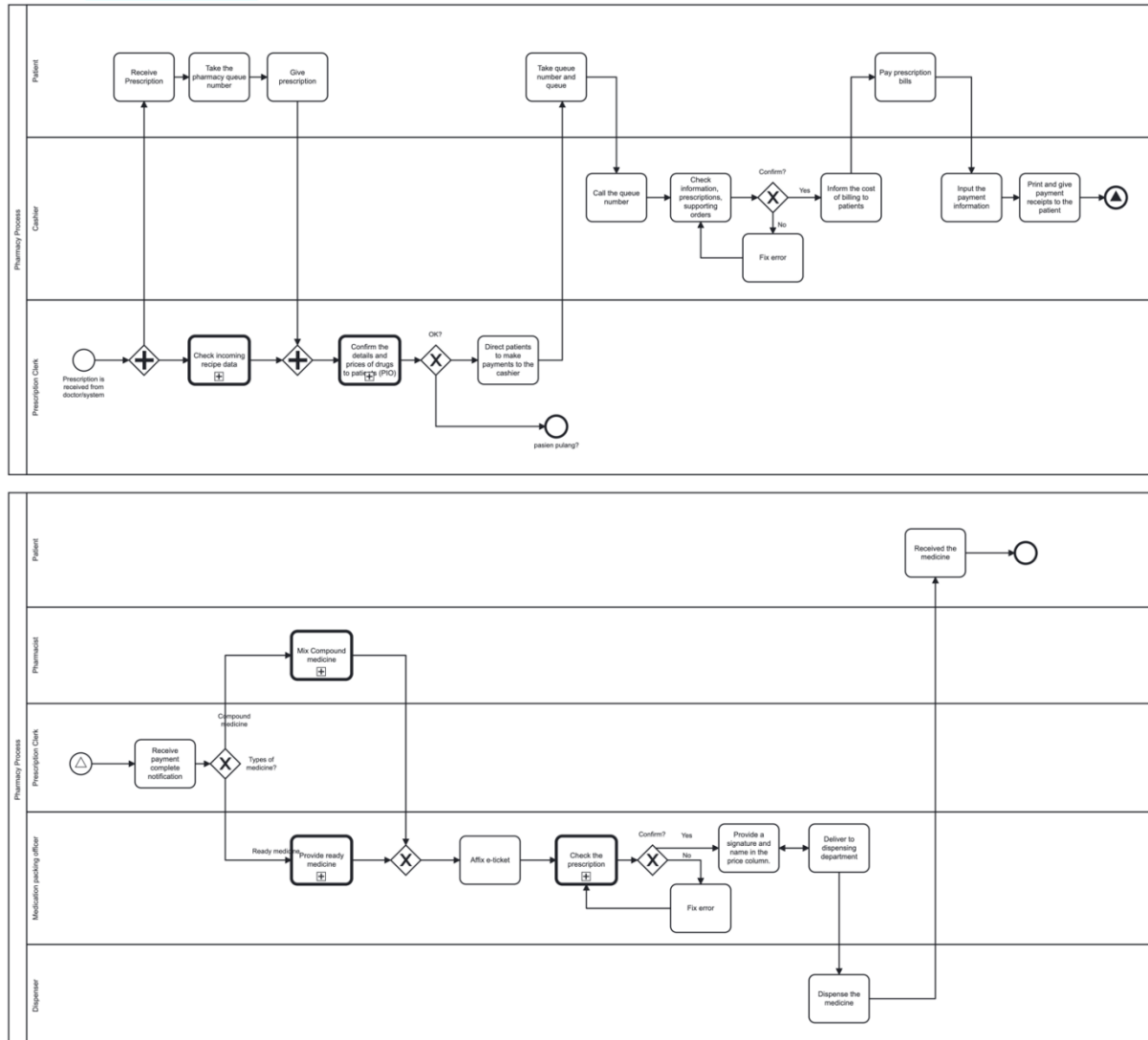


Figure 9. XYZ Hospital Pharmacy BPMN

The pharmacy operation process started when doctors input the prescriptions of the patients into the system. The pharmacy process involves three parties: patients, the pharmacy, and the cashier. The pharmacy is further divided into prescription clerks, pharmacists, medication packing officers, and medicine dispensers. Thus, here is the series of activities and tasks as the process started:

1. The pharmacy checks the prescription data, ensuring it meets administrative, pharmaceutical, and clinical requirements. If everything is in order, the prescription is reviewed and signed.
2. Patients receive a prescription from their doctor, take a queue number, and provide the prescription to the pharmacy.
3. The prescription clerk confirms the details and prices of medicine and asks if the patient wants to continue. The pharmacist explains medication information, and the patient signs the prescription sheet if they understand.

4. Patients proceed to the cashier and take a queue number.
5. The cashier will call from the queue number and receive the recipe to proceed.
6. The cashier checks pricing and prescription details, fixes errors if any, and confirms the prescription.
7. The cashier informs the cost of the medicine to the patient.
8. Patients pay the prescription bill for the exact amount.
9. The cashier records the payment, prints a receipt, and provides it to the patient.
10. The pharmacy receives notification of the completed transaction, prints an e-ticket, and prepares the prescription.
11. For compounding medicine, the pharmacist verifies the prescription, calculates doses, and mixes the medications based on specific techniques.

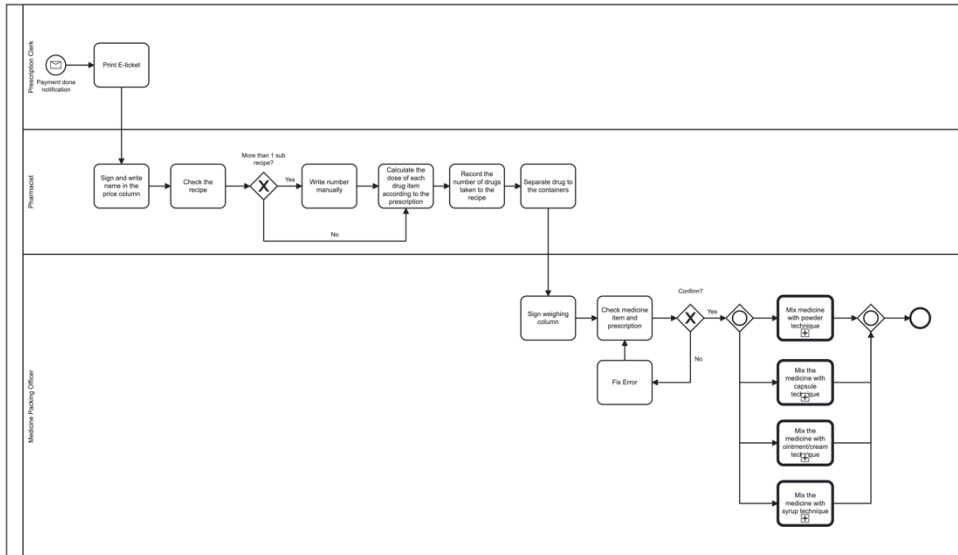


Figure 10. Mix Compounded Medicine Sub-Process

12. For ready medicine, the packaging officer prints the e-ticket, prepares the medicines, and packs them.

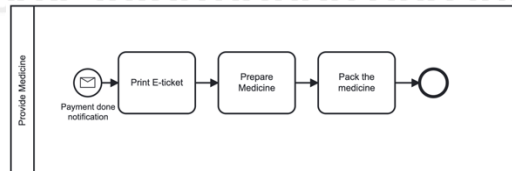


Figure 11. Provide Medicine Sub-Process

13. The pharmacist double-checks the medication and verifies the prescription.
14. The dispensing officer delivers the medication, prescription, and e-ticket to the patient.
15. The patient receives the medication from the dispensing officer.

Values Analysis

A values analysis of the business activities of hospital XYZ Pharmacy was conducted by analyzing each activity and categorizing them into customer value-added or customer non-value-activities. There is also business value analysis, an activity that didn't add any value to the business and customer but is necessary to stay in the business. The table shown below represents the value analysis of the process in Hospital XYZ Pharmacy.

Table 20. Value Analysis of Pharmacy Process

No	Task	VA	NVA	BVA
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1.	Patient Receive Prescription	V	
2.	Patient take the pharmacy queue number	V	
3.	Patient give prescription	V	
4.	The pharmacy checks incoming recipe data		V
5.	The pharmacy confirms the details and prices of drugs to patients (PIO)	V	
6.	Direct patients to make payments to the cashier	V	
7.	Patients take cashier queue numbers and queue		V
8.	The cashier calls the queue number		V
9.	The cashier check information, prescriptions, supporting orders		V
10.	The cashier informs the cost of billing to patients	V	
11.	The patients pay prescription bills	V	
12.	The cashier input the payment information to the system	V	
13.	The cashier print and give payment receipts to the patient		V
14.	The prescription clerk receives payment complete notification from the cashier	V	
15.	The prescription clerk print the e-ticket	V	
16.	Pharmacist mix compound medicine if the order is compounding medicine	V	
	Prescription Print the E-ticket	V	
	Pharmacist sign and write name in the price column		V
	Check the recipe		V
	Write number manually		V
	Calculate the dose of each drug item according to the prescription	V	
	Record the number of drugs taken to the recipe	V	
	Separate drug to the containers	V	
	Packaging officer sign weighing column		V
	Check medicine item and prescription		V
	Fix Error	V	
	Mix medicine with powder technique	V	
	Mix the medicine with capsule technique	V	
	Mix the medicine with ointment/cream technique	V	
	Mix the medicine with syrup technique	V	
17.	The medication packing officer prepares the medicine if the order is ready medicine	V	
	Print E-ticket	V	
	Prepare Medicine	V	
18.	Pack the medicine	V	
19.	Packaging Officer affix the e-ticket	V	
20.	Check the prescription and the prepared medicine	V	
20.	The medication packing officer sign and give their initials in the price column		V
21.	Deliver the medicine to the dispensing department		V

22.	Dispense the medicine	V
23.	Patient received the medicine	V

After conducting a value analysis, certain activities in the process can be identified as non-value added and should be eliminated to improve efficiency and reduce costs. These activities include:

- 1) Patients receive a physical prescription from the doctor, as the prescription can be directly accessed by the pharmacy through the system. Patients can go to the pharmacy immediately after their treatment.
- 2) Patients take a separate queue number at the pharmacy, as the system can automatically assign them a queue number based on the incoming prescription data, eliminating the need for additional waiting time.
- 3) Patients give their prescriptions to the pharmacy, as the doctors already send the prescriptions electronically. If there are different forms of prescription, the pharmacist can verify the accuracy without requiring patients to provide a physical copy.
- 4) Directing patients to the cashier, the pharmacist can instruct them to proceed with payment without the need for additional guidance from the cashier.

The value analysis indicates that these non-value activities contribute to inefficiencies but are not the primary causes of significant time delays or longer waiting times. However, it is important to address these activities to streamline the process and improve overall efficiency. Another concern is the discrepancy between the recorded waiting time and the actual time patients spend waiting. The recorded time starts when the doctor inputs the prescription, which may not accurately reflect the actual waiting time if the patient is still in the treatment room. This discrepancy can impact the accuracy of waiting time data and lead to underestimation or overestimation of patient waiting times.

To address these concerns, it is recommended to further analyze and improve the identified non-value activities. Additionally, aligning the data recording system with the actual waiting time experienced by patients will ensure more accurate measurements and enable better analysis and decision-making.

Proposed BPMN Revision and Actual Process

The results of the BPMN analysis and waiting time calculations indicate the need for a new BPMN diagram to address the identified issues and improve process efficiency, specifically to reduce waiting time. By analyzing the detailed pharmacy process and identifying factors causing longer waiting times, improvements can be made.

Through value analysis, non-value-added activities are identified and eliminated. This reallocation of resources and streamlining of the workflow allows for a focus on value-added activities that directly contribute to meeting customer needs and achieving business objectives. By eliminating non-value-added activities, the process in XYZ hospital pharmacy is optimized and productivity is enhanced.

The proposed process will be as follows:

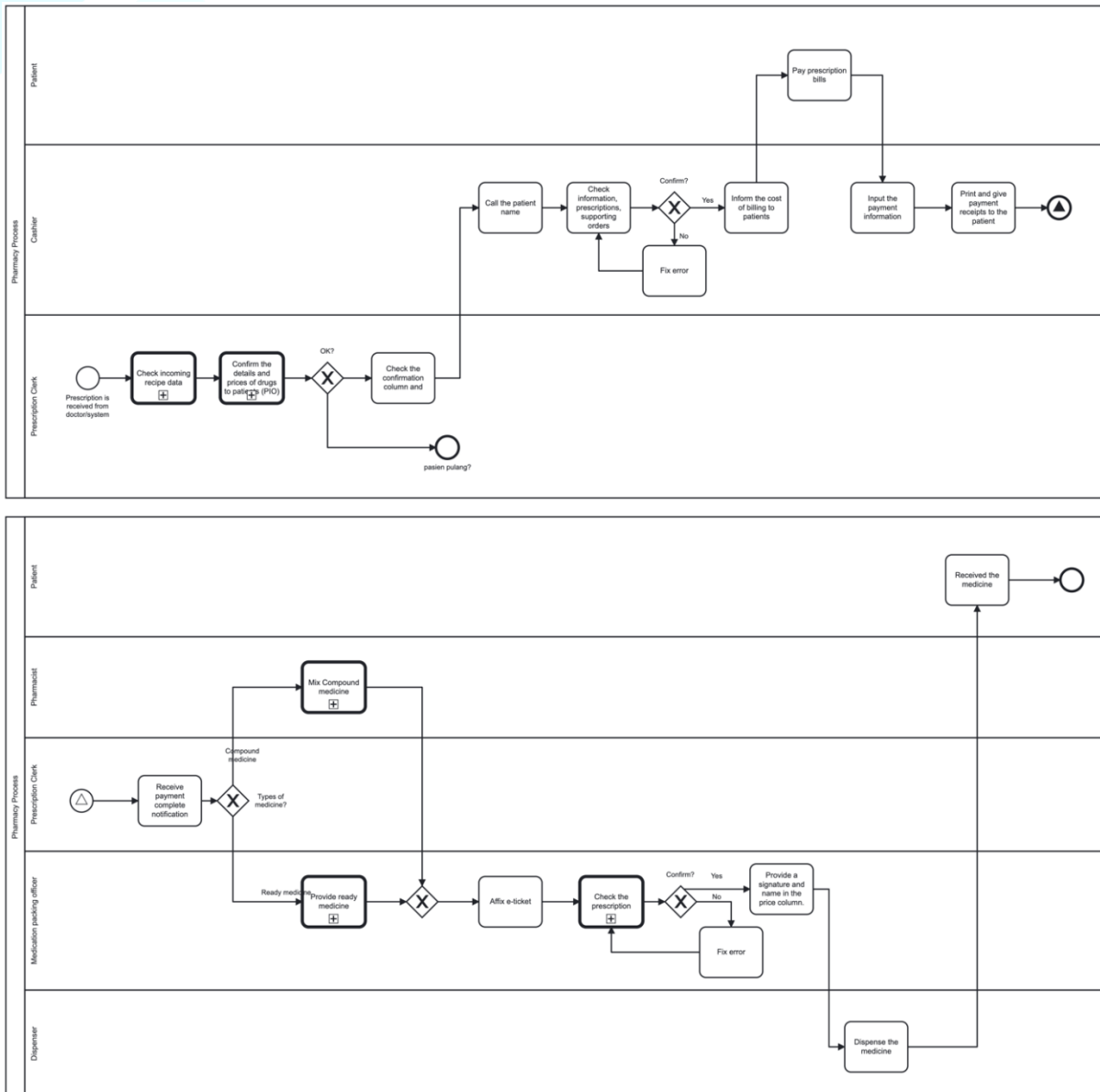


Figure 12. Proposed BPMN Revision

1. The prescription is received from the doctor/ system also with the exact time of the data input. The pharmacy can sort the patient queue based on the time the prescription was inputted.
2. The prescription clerk will check the incoming recipe data, including the availability of the prescribed medicine and the types of medicine required. They will then analyze various factors such as the cost and the potential benefits to determine whether the patient should proceed with taking the prescribed medicine or not. By conducting this analysis, the prescription clerk can ensure a more efficient workflow and provide appropriate medication options to patients without unnecessary discussions about cost.
3. The prescription clerk will call the patient's name and birth date to verify their identity. Once confirmed, the clerk will proceed to confirm the details of the prescribed medication, including the price. They will then ask the patient if they would like to proceed with taking all the prescribed medicine. If the patient agrees, the process will continue accordingly. This step ensures that the patient is aware of the medication details and associated costs, allowing them to make an informed decision about proceeding with the full prescription.

4. The prescription clerk will sign the confirmation column to inform the cashier installation about the confirmation through the system. This serves as a notification to the cashier station, informing them that the patient has confirmed their prescription. The patient will then be directed to proceed to the cashier to complete the payment and finalize the process. The signing of the confirmation column helps streamline the communication between the prescription clerk and the cashier, ensuring a smooth transition for the patient to continue the process at the cashier station.
5. The cashier will call from the patient number and birth date.
6. The cashier checks detailed information about the pricing and the prescription if it complies with the recipe. If not, they should fix the error and recheck the prescription.
7. If the prescription is already confirmed, the cashier will inform the cost of the medicine.
8. The patients pay the prescription bill for the exact price and exact order.
9. The cashier will input the payment data after the payment has been done and print the payment receipt and give it to the patient as proof that the payment has been received.
10. The prescription clerk from the pharmacy receives the notification of the completed transaction and continues to proceed with the prescription by printing an e-ticket of medicine.
11. Mix compounding medicine by a pharmacist if it is a compound medicine. There are several methods to make compounding medicine and it also takes several processes.
12. Preparing ready medicine by the packaging officer if the recipe is for ready medicine.
13. The pharmacist re-checks the patient's medication according to the prescription after the medicine is packed and ready to be delivered to the patient. Prescription and the medicine are checked including the expiration date, time, and type of dispensing the medicine. Pharmacists double-check for the High Alert category medication where verification is carried out by 2 different people.
14. Deliver medicine, prescription, and e-ticket to the dispensing officer to be delivered to the patient. The dispensing officer gives the medication order to the patient.

V. CONCLUSION AND RECOMMENDATION

Conclusion

The Hospital Pharmacy at XYZ plays a crucial role in serving patients from various departments with different health conditions. However, the overwhelming workload has resulted in delays, longer wait times, and potential errors in processing medication orders. The government has established maximum waiting time standards for ready and compounded medicines, but the average waiting times still exceed these standards. Based on the data provided by XYZ Hospital, the average for both ready and compounded medicine still exceeds the standard by 79,4% and 22,8%. The pharmacy still needs to improve its quality judging by this calculation.

Analysis was conducted and this is the results: Control chart analysis shows stable periods of in-control process, indicating the need for process improvement to reduce variability and bring waiting times closer to the targets. The ANOVA test reveals significant differences in waiting times based on order quantity, suggesting the need for specific waiting time targets for different groups. This analysis Recommendations include setting maximum waiting time based on order quantity, implementing revised BPMN for improved efficiency, updating data recording procedures, increasing staffing capacity, and regularly monitoring and evaluating the revised process.

Recommendation

To enhance the quality of service at the pharmacy, the following recommendations are proposed: Firstly, the suggestion is to tailor waiting times by defining maximum durations for distinct order quantity groups. This strategic segmentation aligns processes with specific needs, optimizing medication dispensing efficiency. Secondly, advocating for the revised Business Process Model and Notation (BPMN) aims to streamline workflows, reducing waste and enhancing overall service delivery. Updating data recording protocols to meet governmental regulations ensures accurate waiting time capture, boosting assessment precision. Addressing prolonged waiting periods, the recommendation to augment staffing capacity is put forth as essential to enabling effective workload management and shorter patient wait times. A continuous monitoring system is vital for

evaluating revised processes, promptly identifying improvement areas, and sustaining service quality. Prospective research includes in-depth medicine waiting time analyses across varied healthcare settings.

Moreover, for future research, comparing waiting times through order quantity-based grouping in hospitals promises insights into variations and best practices. In the future, the XYZ Hospital should expand data collection to encompass patient arrival to medicine receipt promising a holistic assessment of waiting times, and enriching service quality comprehension.

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Improving outpatient length of stay (LOS) in pediatric department of XYZ Hospital

Frisca Nadya Febrianty¹, Mursyid Hasan Basri²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

Healthcare is key to the government's structural reforms to take advantage of the demographic bonus. Because of that, Indonesia needs to increase the number of healthcare providers to fulfill the health services demand. Along with government's regulation in increasing healthcare providers, hospital management should increase the time optimization of their services. XYZ hospital is a private hospital in Bandung. For the past 3 years, the growth of their service demand keeps increasing, especially in pediatric department. To fulfil this growing demand, XYZ hospital created a regulation for outpatient length of stay (LOS) which is 2 hours and meets operational efficiency. However, in 2022, data shows that only 39% pediatric patients' LOS comply with this regulation. The purpose of this study is to know the business operational process to know what makes LOS visit that takes more than 2 hours is the majority of the cases (>50%). The methods that will be used are Control Chart and T-Test analysis for the quantitative data which is time record for each process. Then, the qualitative data which came from interviews and standard operational procedure (SOP) is analyzed using Business Process Modelling and Notation (BPMN) and Value-Added Analysis. From this study, to make the average of outpatient LOS that is less than 2 hours, it is analysed that the hospital management need to ensure that the process that is consist of outpatient waiting time (OWT), doctor's examination, and billing process does not exceed 58 minutes. This research also suggests that time allocation for pharmacy process should <28 minutes. This research also assesses processes that need to be eliminated/substituted/automated.

Keywords: BPMN, Hospital, Outpatient Length of Stay, Pediatric Department, Value-Added Analysis.

I. INTRODUCTION

The Republic of Indonesia Health System Review by WHO 2017 states that the demand for health services is increasing as the economy continues to grow (Harimurti et al., 2017). As Indonesia's population grows modestly at 1,2% per year, Human Resource Development (Education & Healthcare) is key to the government's structural reforms to take advantage of the demographic bonus and avoid the middle-income trap in the next 15 years (Karnali, 2021). The key determiner for healthcare quality can be seen from the availability of healthcare providers. Data from World Bank in 2017 states that the current rate of number of physicians per 1,000 people in Indonesia is 0.4, and the rate of hospitals per 1,000 people is 1.2 which is considered the three lowest rate in ASEAN countries. Because of that, Indonesia needs to increase the number of healthcare providers to fulfill the health services demand.

Along with government's regulation in increasing healthcare providers, hospital management should increase the optimization of efficiency to fulfill the health services demand. The optimization of healthcare efficiency in hospitals can be assessed through the Length of Stay of outpatient visit. In this study, Length of Stay (LOS) of outpatient visit is specifically defined as the time it takes for an outpatient to visit, get the healthcare procedures done, until the patient leaves the hospital.

XYZ Hospital is a private hospital located in West Java, Bandung that has a vision to provide the best healthcare services. For the past 3 years, the growth of their service demand keeps increasing. From their preliminary data, there is an increasing trend of outpatient visit number for each period. fulfils this growing demand, XYZ Hospital created a regulation for Outpatient Length of Stay (LOS) which is 2 hours and meets their operational efficiency.

Based on preliminary data findings, XYZ Hospital patient dominated from pediatric department in 2022 to 2023. This results in the Pediatric Department to be the department with the highest number of visits in that period. Due to its high number of visits, this study will specifically assess the Outpatient Length of Stay for the Pediatric Department.

Pediatrics is a medical specialty dealing with the physical, mental, and social health of children from infancy through early adulthood. Pediatric care includes a wide range of health services, from preventative care to the diagnosis and treatment of acute and chronic disorders (Rimsza et al., 2015). Outpatient length of stay, which refers to the duration of time a child spends in a clinic from admission to discharge, is an important metric that impacts patient satisfaction independently (Chandra et al., 2019). Therefore, implementing process improvement strategies to has LOS that is less than 2 hours is essential for providing high-quality care.

Other than the hospital's regulation to have Outpatient Length of Stay for less than 2 (two) hours, this study also assesses the LOS for outpatients in other countries. Based on data from the first 4 years (2003–6) of the American Time Use Survey (ATUS), conducted by the US Census Bureau for the Bureau of Labour Statistics, the average of outpatient Length of Stay is 116 minutes (1.93 hours) (Russell et al., 2008). A study from hospitals in Rivers State, Nigeria shows that the average outpatient time spent to receive treatment is 122,6 minutes (2,04 hours) for public hospitals and 44,8 minutes (0,74 hours) in private hospitals (Kemdirim et al., 2023). In conclusion, the outpatient length of stay in hospital to receive treatment for most hospital usually has never exceed 2 hours.

Due to factors that the management team cannot control, both from internal and external, this research will limit its findings on several constraints. First, the business process analysis will be limited only in the pediatric department of XYZ Hospital. Any process in this research that enter other department is not included. Then, the recommendation will be focused on the registration and administration process rather than the examination and treatment process by the health practitioner to keep the same healthcare quality. This research also limited for non BPJS patient that covers patient with general payment and private insurance.

II. LITERATURE REWIEW

Introduction to Outpatient Length of Stay (LOS)

Outpatient provides medical, nursing, and other non-hospitalized services. . A variety of medical and nursing services, including health counselling, are included in hospital outpatient services and should be made available to patients as needed (Zendrato et al., 2019). On the other hand, Length of Stay (LOS) is the amount of time a patient will spend in the hospital. Hospitals have long utilized the level of service (LOS) as a metric to help them better enhance patient care, lower overall costs, and allocate resources in accordance with staff and patient demands. It may also be a sign of patient flow and hospital care unit effectiveness (Stone et al., 2022).

Business Process Model and Notation (BPMN)

The most popular method to map out business process diagrams is called Business Process Model and Notation (BPMN). It is meant to be utilized directly by the parties involved in designing, managing, and implementing business processes while also being accurate enough to enable the conversion of BPMN diagrams into software process components. BPMN offers an intuitive notation that resembles a flowchart and is agnostic of any specific implementation environment (OMG Standards Development Organization, 2014). BPMN consist of elements that is divided into four categories which are Flow Objects, Connecting Objects, Swim Lanes, and Artifacts (Hamzah et al., 2021).

Control Chart Analysis

Control charts are extensively used statistical tools for process monitoring and improvement. A control chart examines a process in which data is gathered in a sequential manner across time. The data are then plotted over time, and control limits are added around the chart's center line. The most common type of control chart establishes control limits within +3 standard deviations of the statistical measure of interest. When these control limits are established, the control chart is evaluated by attempting to identify any patterns in the data over time and detecting if any points fall beyond the control boundaries.

A process is considered to be out of control if its control chart shows an out-of-control situation (i.e., a point outside the control limits or an ongoing sequence of points exhibiting a pattern). A process that is out of control comprises both common and unique reasons of variance. A process is considered to be in control if its control chart shows no out-of-control circumstances. Only common causes of variation exist in an in-control process. An in-control process is predictable since these causes of variation are embedded in the process itself. In-control processes are frequently referred to as being in statistical control.

Value Added Analysis

Value-added analysis is a technique for finding and removing unnecessary steps within a process. Value-added analysis typically consists of two stages: value classification and waste elimination (Dumas et al., 2013). Value classification is a technique in which an analyst decorates a process model, extracts each step in the process, then categorizes these stages into one of three groups.

First one is value-adding (VA). This is a process that adds value or satisfaction to the customer's experience. When considering if a step adds value, it can use the definition of value to determine whether a process is considered value added or not. There is 3 definition of value which are something that customer willing to buy, change product characteristic, and do thing right at the first time. The second one is business value adding (BVA). This step is required or advantageous for the business to function smoothly, or it is required owing to the business's regulatory environment. The last one is process that is not considered in VA and BVA which is non-value added.

After identifying and classifying all of the business operation process in the previous step, then in the waste in those process will be eliminated. The general rule of this step is striving to minimize the NVA steps and some of the NVA steps can be eliminated by automation. Having identified and classified the steps of the process as discussed above, one can then proceed to determining how to eliminate waste. A general rule is that one should strive to minimize or eliminate NVA steps. Some NVA steps can be eliminated by means of automation.

III. RESEARCH METHODOLOGY

To conduct this research, Figure 1 is the depiction in how this research will be conducted.

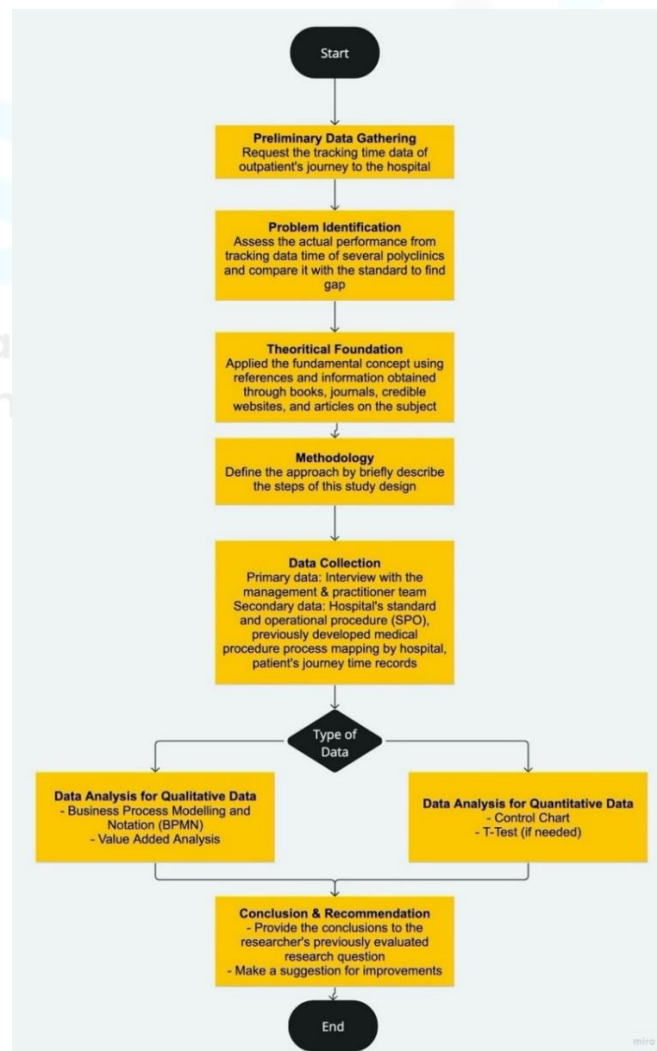


Figure 1. Research Design

Figure 1 shows the flow depiction of this research design. This research will be started from preliminary data gathering of XYZ Hospital, problem identification, theoretical foundation, methodology, data collection, data analysis, and also conclusion and recommendation. The data analysis will be divided into two condition when the data analyzed is quantitative and when the data analyzed is qualitative data. The detailed explanation regarding each processes will be explained below.

Preliminary Data Gathering:

The first step is to gather operational data from XYZ hospital's previous records. This data helps assess the hospital's current condition and identify issues. Two types of data are collected: tracking time data for outpatient journeys and unstructured interview data with the hospital management team.

Problem Identification:

, Problems in the hospital's outpatient services by analyzing the preliminary data is identified. The analysis focuses on tracking time to determine the department with the highest visits and identify non-compliant patient journeys. The pediatric department has the highest visit numbers, with most visits exceeding the average hospital stay. The research problem is improving outpatient journey times in the Pediatric Department by identifying bottlenecks.

Theoretical Foundation:

Various sources such as books, journals, and reputable websites are reviewed to establish a theoretical foundation for understanding and addressing the problem. These resources used for the research fundamental knowledge.

Methodology:

The methodology chapter details problem identification, theoretical foundation, methodology, data collection and analysis, and conclusions. This provides a guide for easier data analysis and information gathering.

Data Collection:

Two types of data are collected: primary and secondary. Primary data is obtained through interviews with the hospital management team and practitioners, while secondary data includes SOPs, historical tracking time data, and process flowcharts.

Data Analysis:

Data analysis involves quantitative and qualitative approaches. Qualitative data (interviews, SOPs, and flowcharts) is used for BPMN and value-added analysis, while quantitative data (tracking time) is analyzed using control charts and T-tests.

BPMN

BPMN is used to represent the current state of XYZ Hospital, particularly the pediatric department, based on interviews with department heads and nurses. The model's validity is confirmed through interviews with the management team.

Control Chart Analysis

Control charts determine in-control times for each process affecting outpatient LOS in the pediatric department. This analysis supports SOP development and identifies areas for improvement.

Value Added Analysis

Value Added Analysis identifies customer value and non-value added tasks in the BPMN model. Non-value added tasks are eliminated, substituted, or automated based on management discussions.

T-Test:

T-tests validate data by comparing mean times for different patient groups. In this research, a T-test is conducted on compound and ready medicine prescription times to inform new regulations for reducing overall outpatient LOS.

IV. RESULT / FINDING

BPMN

Registration Process

The registration process of XYZ Hospital is using technology named KIOSK. KIOSK is a software utilized so patient can independently register themselves. This system has been operated since September 2022 to increase effectivity in XYZ Hospital. By KIOSK XYZ Hospital also enable patient to check doctor's availability and make online appointment prior their arrival. The number of KIOSK registration in September 2022 is 332 registration (13.1%) and in April 2023, the number of KIOSK registration achieved 572 registration (33.4%). The trend of registration of non-KIOSK is also decreasing each year, from 2195 registration (86.8%) in September 2022 to 1140 registration (66.5%) in April 2023. This means that the KIOSK registration contribution trend is increasing every months, comparing to the non-KIOSK registration. This indicated a good technology acceptance by XYZ hospital patients.

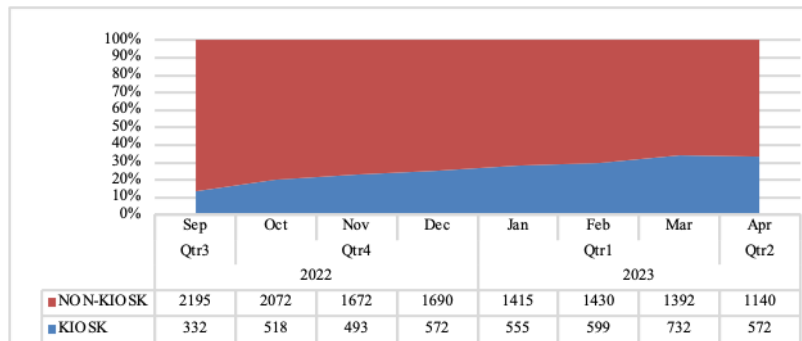


Figure 2. KIOSK Utilization in Pediatric Department from September 2022-April 2023

The registration process of KIOSK in XYZ Hospital is differentiated into 3 types: Online Service Counter, Self Service Counter, and Registration Counter. Each counter has its own types of qualifications explained in Table 1. Each of the registration counter serve both insurance and general coverage. However patient that is going to use insurance should go to the registration administration so their insurance availability will be checked by admin. New patient that has no medical record in the hospital should go to the registration administration as well. Existing patient that already made online appointment can directly wait in the pediatric department waiting room.

Table 1. Patient Specifications for Registration Counter

<i>Type of Registration</i>	<i>New/Existing Patient</i>	<i>Has online appointment or not</i>
<i>Online Service Counter</i>	Both	Yes
<i>Self Service Counter</i>	Existing patient	No
<i>Registration Counter</i>	New patient	No

Outpatient Waiting Time Process

After all registration process done, patient will be directed into the pediatric department waiting room. Pediatric department waiting room is a place where patient should wait to get treatment. In this process, the nurse will call the patient and do anamnesis. Then, nurse will input all of the data from the preliminary check-up into SIMRS. If the nurse aware of any emergency signs, they will direct the patient into the emergency department.

Doctor's Examination & Treatment Process

After the anamnesis, patient will be directed to the pediatric department waiting room again and will be called once the doctor is available and the room is vacant. Once the patient's name called and enter the doctor's room, they will be greeted, and the doctor will introduce themselves. After the doctor recheck the anamnesis data from the SIMRS program, they will explain the examination and treatments that will be taken. After that, the doctor will do the treatments needed for the patient. When all treatments done, doctor will wash their hand based on procedure and explain the results to patient/parent/guardian. Then, doctor will write drugs prescription to the SIMRS, explain the drugs to the patient/parent/guardian, and explain the patient's control time to the patient's parents. At the very last, the doctor will fill the results of examination and treatments to the SIMRS. They also need to create a cover letter to inpatient department if they think the patient needs to be hospitalized.

Billing/Payment Process

The payment process of outpatient in pediatric department will be conducted once the doctor's treatment is done. The nurse will direct the patient to the waiting room to wait until their name is called. The payment process for those who use insurance and general payment is differentiated since the administrator for insurance covered patient has to confirm first to the insurance. This will lead to longer waiting time for insurance covered patient.

Additional Process: Pharmacy, Laboratory, and Radiology (If Any)

After patient already do all of the payment, they can go home if there is no drug prescribed and don't referenced to get any test. However, if the patient prescribed drugs by the doctor, they need to wait for the drugs. If they need to have laboratory or radiology test, they need to go to the test place that is located in outside area from pediatric department. After they take the test(s) needed, they can directly go home because the test results for both laboratory and radiology test will be sent to patient's WhatsApp number. Thus, patients do not need to wait for the results in the hospital. The test results explanation also will be briefly explained in the chat and will be part of the examination data for their following visits. The BPMN of overall process of outpatient in pediatric department can be seen in Figure 3.

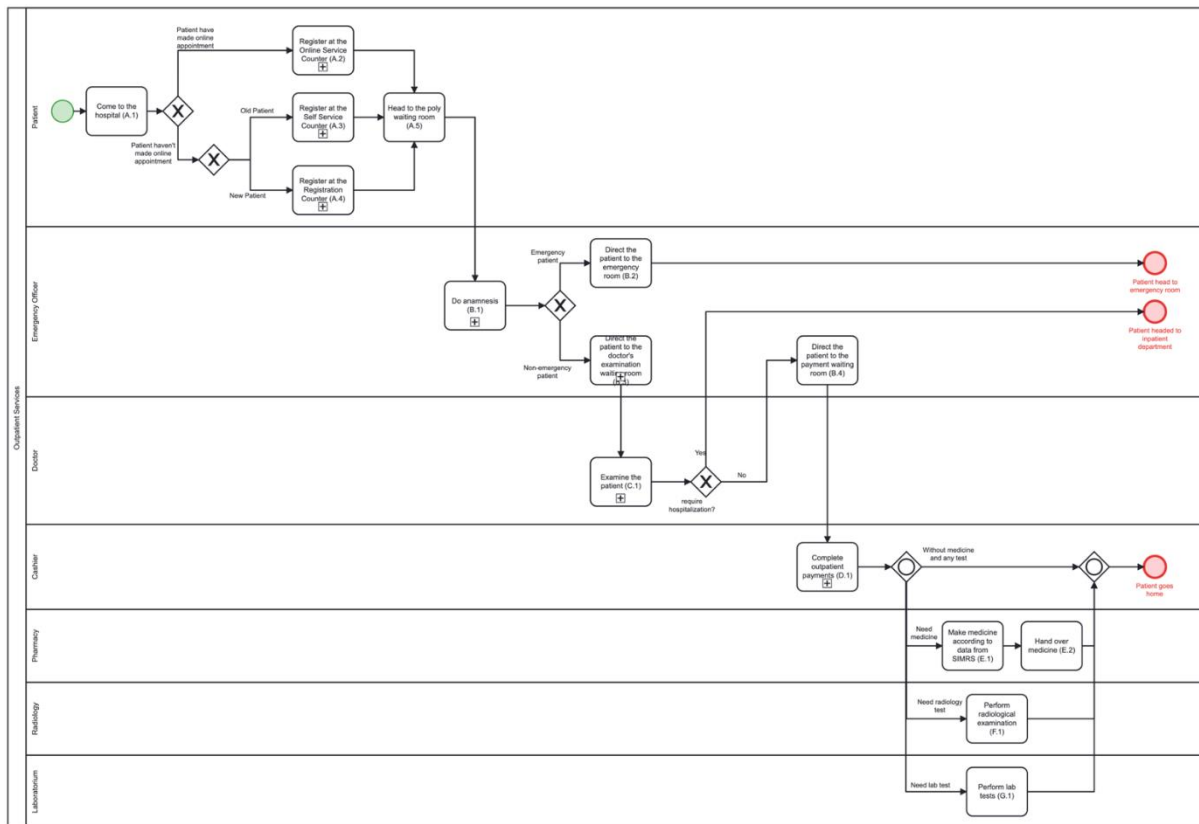


Figure 3. BPMN of XYZ Hospital Outpatient Journey in Pediatric Department

Control Chart

After analyzing the business process, it is founded that the LOS of patient in pediatric clinic who wait for medicine, lab test, and radiology test can't be equated. Because of that, analysis tool called I-MR Chart by using Minitab software is used to analyze the data for each process that contributed to patient's LOS. The objective of this analysis is to find out whether the time allocated for each process that contribute to the LOS already in control, to know whether the process has the same contributing variable for each processes, and give LOS recommendation for the XYZ Hospital based on patient's activities in the hospital. This analysis also used to determine if there any extreme time in each process of LOS and identify the reason.

The first process that will be analyzed is the outpatient waiting time as follows. Because there is no data regarding period of the hospital has the best performance, 100 consecutive sampling data in period with the least red dots

that indicates out of control is chosen as seen in Figure 4. By that, the 3600th data to the 3700th data is chosen and can be seen in Figure 5.

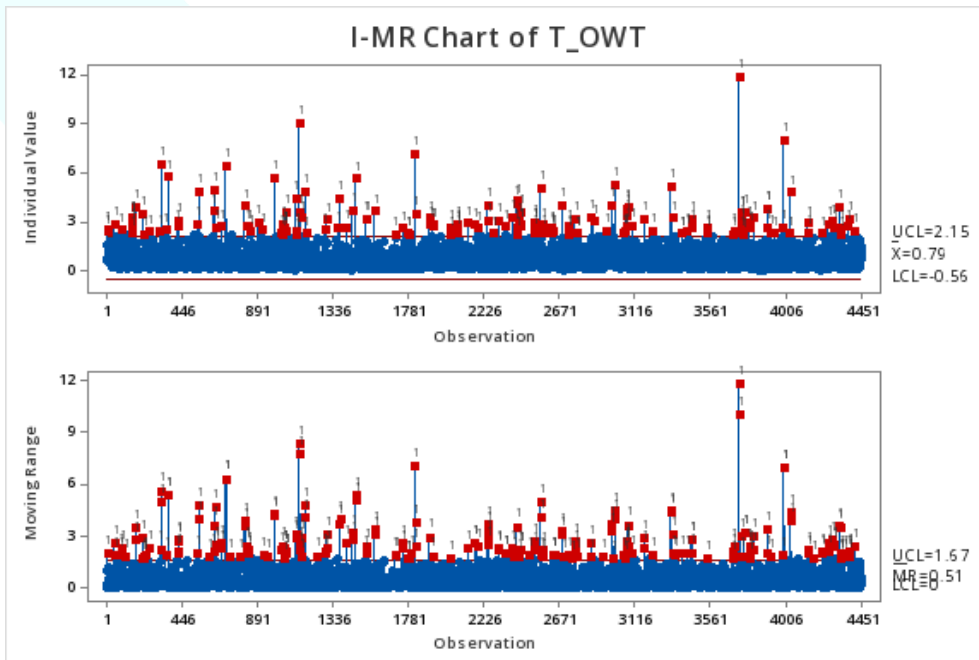


Figure 4. I-MR Chart of Outpatient Waiting Time (Out of Control)

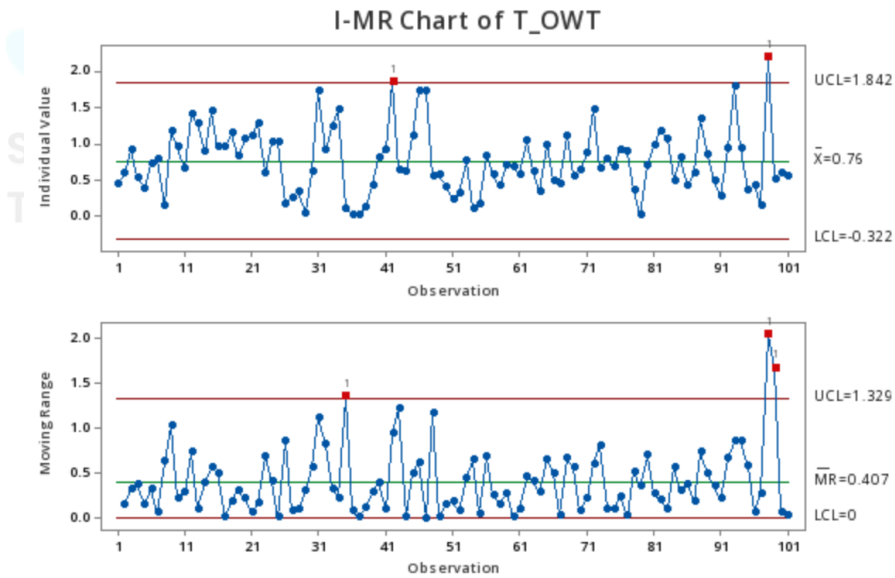


Figure 5. OWT Control Chart (100 Sample)

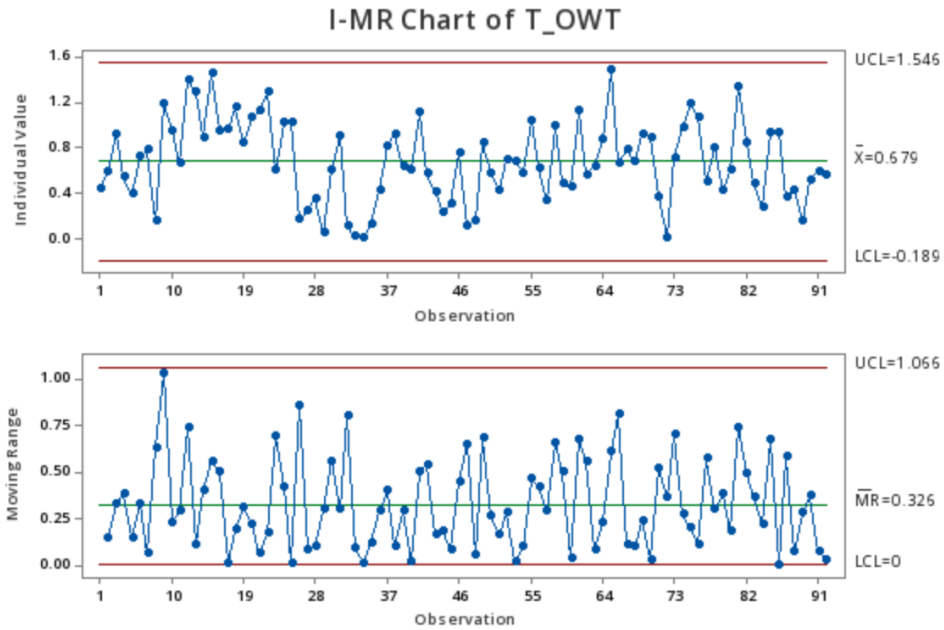


Figure 6. I-MR Chart of OWT Sample (In-Control)

From the Figure 5, the Individual Value figure shows that there is numerous red points that exceed UCL. This means that several outpatient waiting time points have exceed 3 standard deviations from center point. In the Moving Range figure, there is also numerous red points that has exceeded the UCL. This means that the difference between consecutive outpatient waiting time has exceed 3 standard deviations from center point. This indicates that the data is still out of control.

Because the data is still out of control, several data to make the process in control is removed. The in-control chart can be seen in Figure 6. The in-control data means that all data in the chart already have the same contributing variable that makes the process is in control.

From the in-control data, the maximum time limitation for outpatient waiting time is determined through determining the mean range. The statistical summary of this calculation can be seen in Figure 7. From this figure, it can be seen that the confidence interval for mean is between 0.60482 and 0.75279. This means that the maximum outpatient waiting time should be between 0.60482 hour (36 minutes) and 0.75279 hour (45 minutes).

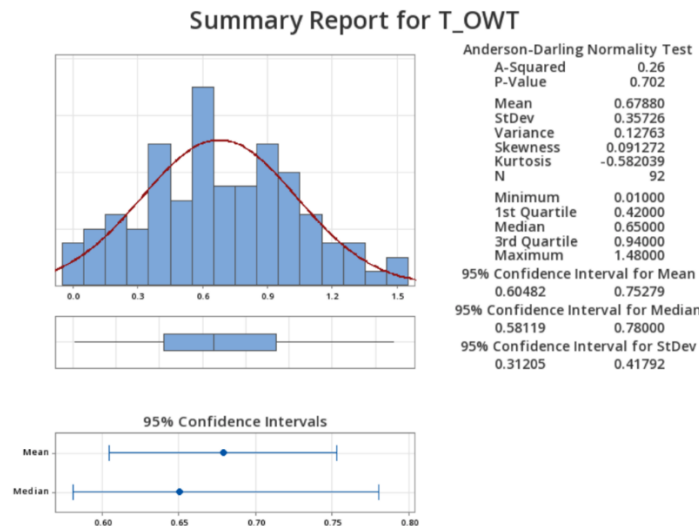


Figure 7. Statistical Summary for Outpatient Waiting Time

This method is applied to all process that contributes to the LOS of pediatric outpatient which consist of outpatient waiting time (OWT), doctor's examination, pharmacy, laboratory test, radiology test, and also billing process. All of the figure of each processes' control chart can be seen in appendix. The summary of the processes' calculation result is provided in Table 2. In this calculation, time with negative value is considered invalid and excluded from the calculation.

Table 2. Control Chart Analysis Summarize (hours)

		Process					
Calculation		Outpatient Waiting Time (OWT)	Doctor's Examination	Pharmacy	Laboratory Test	Radiology Test	Billing/ Payment
Lower Mean Confidence Interval		0.6482	0.18389	0.36040	16.550	5.5023	0.007086
Upper Mean Confidence Interval		0.75279	0.22751	0.46518	23.190	8.7134	0.010187

Analysis of OWT Process

The outpatient waiting time process is started when patient is already registered until the patient arrived in the doctor's room to get treated. This means that:

1. The time when patient arrived at the hospital until the patient registered is not recorded
2. Type of patient registration as stated in Table 1 is not recorded
3. The time when the nurse do anamnesis is also included in the outpatient waiting time process

Based on Table 2, the maximum time for this process is between 0.6482 to 0.75279 hour. Then, the business process of this process my using value added analysis from the BPMN is analyzed in Figure 4.2. The process that is included in the OWT is when patient head to the poly waiting room (A.5), when nurse does anamnesis (B.1), and when nurse direct the patient to the doctor's examination waiting room (B.3). From these three process, the B.1 and B.3 process is a sub-process and the mapping of these processes can be seen in Figure 8 and Figure 9.

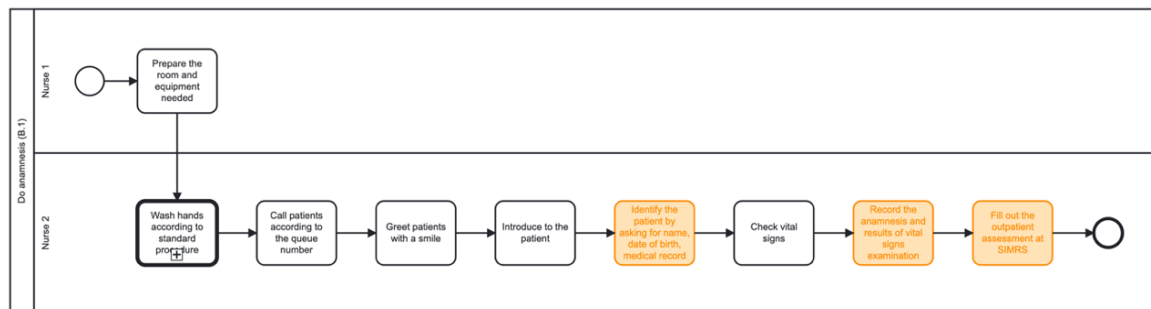


Figure 8. Sub-Process B.1 Nurse Does Anamnesis

From Figure 8, the sub-process when the nurse does anamnesis is explained more detailed using BPMN. From this sub-process, there is 3 NVA activities identified that is coloured orange in the BPMN. The first one is when the nurse identify the patient by asking name, date of birth, and medical record. This task is NVA because it creates time waste in asking the medical record of the patient, especially existing patient that already have data in the system. This task against the definition of value which customer willing to buy. Then, when nurse record the anamnesis and vital signs results followed by the nurse fill out the outpatient assessment at the SIMRS is

considered NVA. This is because both of the task can be completed at once and also against the definition of value which change the product characteristic. Then there is no NVA in the subprocess explained in Figure 9.

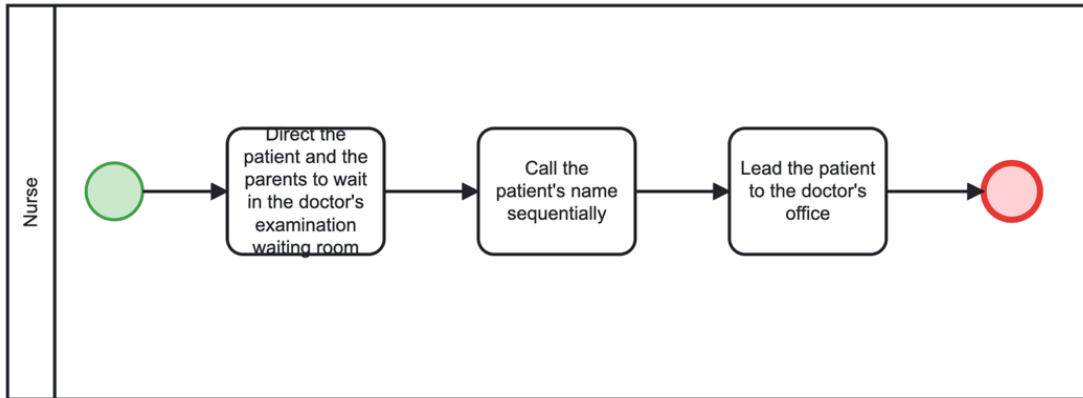


Figure 9. Sub-Process B.3 Nurse Directs the Patient to The Doctor's Examination Room

Analysis of Doctor's Examination Process

The doctor's examination process is started when the patient go in to the doctor's room until they come out from the doctor's room. Based on Table 2, the maximum time for this process is between 0.18389 hour to 0.22751 hour,

Then, the business process of this process by using value added analysis from the BPMN is analyzed in Figure 3. From the overall BPMN in Figure 4.2, the process that is included in the doctor's examination are when the doctor examines the patient (C.1), when the nurse direct the patient to the inpatient registration (B.5), and when the nurse direct the patient to the payment waiting room (B.4). There is one sub-process in the doctor's examination process which is the C.1 and the sub-process can be seen in Figure 10. From this analysis, one non-value-added process is founded, which is when the doctor need to provide a cover letter for patient that need hospitalization. This process is contradictory with the second definition of value which change product characteristic. One of the most possible solution for this NVA is by creating a cover letter can be automatized by system and it is can be integrated in the SIMRS system as the doctor input the examinations result to the system.

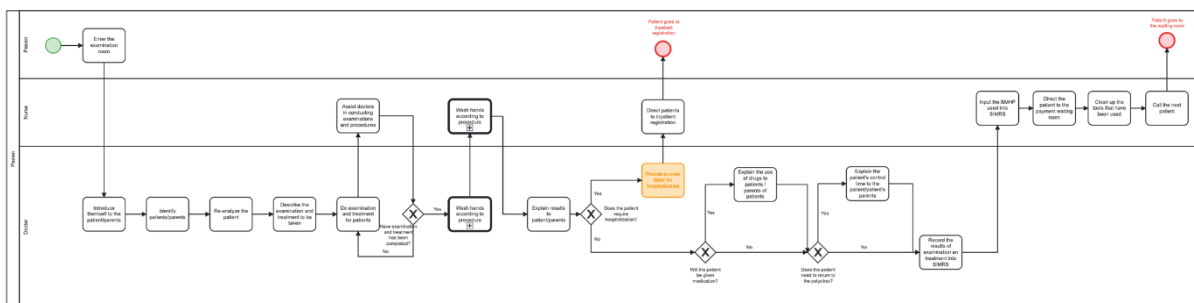


Fig. 10. Sub-Process C.1 Doctor Examines the Patient

Analysis of Billing & Payment Process

After patient get analyzed and treated, they will make payment. This process is starting from the billing is registered in the system until payment is done by patient. Based on Table 2, the maximum time in this process should be between 24.20 and 45.445 hours.

The operation process of billing time is mapped out. From the Figure 3, the billing time is started and ended when the cashier admin completes the outpatient payment (D.1). This process is categorized a sub-process and the BPMN for this sub-process can be seen in Figure 11

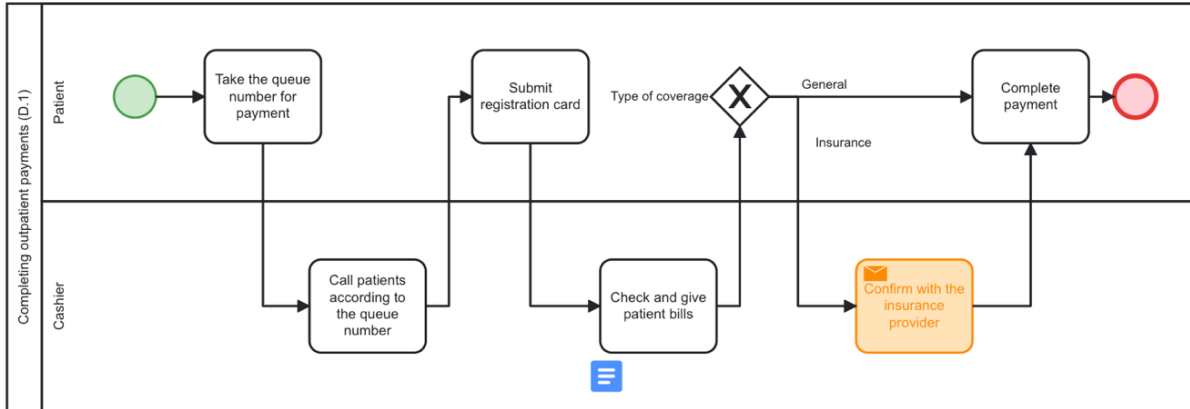


Figure 11. Sub-Process D.1 Completing Outpatient Payments

From Figure 11, one NVA process is identified, especially for insurance patient which are when the cashier staff confirm to the insurance provider regarding their payment. This process is considered NVA because it makes the patient should wait for administrative tasks which contradictory with the value definition of something that the customer willing to pay. Because of that, XYZ Hospital should create system that can decrease the billing time of insurance patients.

From the interview with the Head of Pediatric Department, it is known that the billing time for insurance patient generally higher comparing to billing time for general patient. It is because the admin staff need to make sure regarding the insurance coverage to the insurance company. By that, a following I-MR chart is created to segment the control chart between insurance and general patient. The I-MR chart can be seen in Figure 12. From this process, we can see that the time for payment using insurance and general payment is two different variable that can make the system out of control. Because of that. The maximum time between payment using insurance and general payment should be differentiated. Then a calculation for each stage of I-MR chart is created and can be seen in Figure 12.

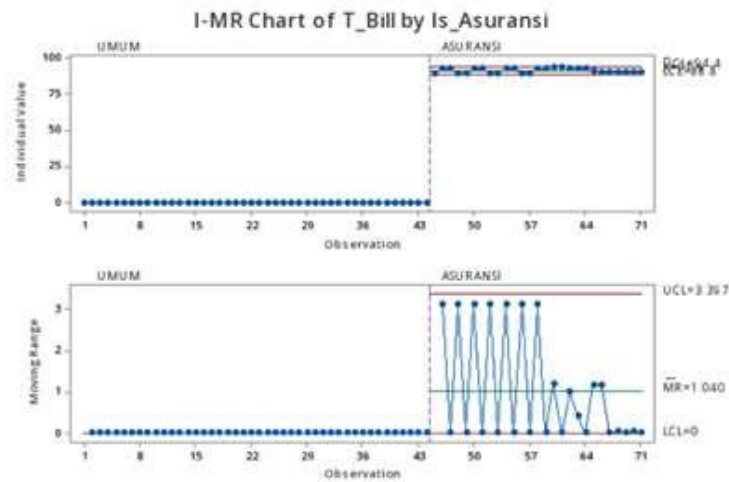


Figure 12. Control Chart for Billing Time with Stage

Based on Figure 12, the confidence interval for mean between insurance and general patient is very distinctive. General patient billing time interval is between 0.007086 hour (25 seconds) and 0.010187 hour (36 seconds). However, the insurance patient billing time is between 90.991 hour (90 hour 59 minutes) and 92.224 (92 hour 13 minutes). The record time for insurance patient is not valid because based on the interview with The

Head of Pediatric Department, there is no outpatient that can stay longer than one day in hospital. Because of that, there must be different definition of insurance patient billing time that cannot interpreted in the component of LOS. Because of the time recommendation of billing time will follow the general patient which is between 25 seconds to 36 seconds.

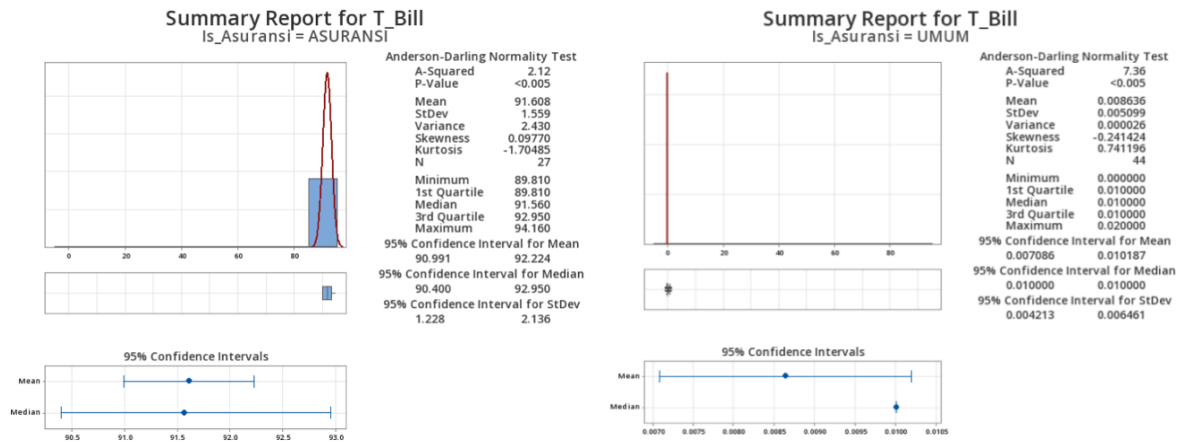


Figure 13. Graphical Summary for Billing Time of Insurance & General Patient

Analysis of Pharmacy Process

The pharmacy time is counted from the pharmacy got confirmation of drug order by doctor until the drug is given to the patient. This means that the time for this process has been counted before the patient completed the payment. Based on Table 2, the maximum time for this process is between 0.36040 hour (21 minutes) and 0.46518 (27.9 minutes).

From BPMN shown in Figure 3, the pharmacy process start when the pharmacist make medicine according to the data in SIMRS (E.2) until they hand over medicine (E.3). Both of this task has no sub-process and both of it is considered value added so there is no task eliminated or substituted in this process. However, from tracking time data given by Hospital XYZ, type of patient in this process is differentiated into two, patient with ready medicine prescription and compound medicine prescription. Then, the difference between pharmacy time of these two types of patient is analyzed. Two sample t-test for means is used, assuming it has different variances. The method of this t-test is shown below

μ_1 : population mean of Pharmacy Time of Ready Medicine

μ_2 : population mean of Pharmacy Time of Compound Medicine

Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis. The null hypothesis in this analysis is the mean of pharmacy time of ready medicine is same as the pharmacy time of compound medicine.

$$H_0: \mu_1 = \mu_2$$

The alternative hypothesis in this analysis is based on the assumption which the pharmacy time of ready medicine is faster (smaller) than the pharmacy time for compound medicine.

$$H_1: \mu_1 < \mu_2$$

Then, the data of pharmacy time is analyzed using t-test in Minitab. The t-test used is one tail test because the hypothesis of this analysis want to study about one direction relationship.

Table 3. Descriptive Statistics of T-Test in Pharmacy Time

Type of Medicine	N	Mean	StDev	SE Mean
Ready Medicine	12217	1.27	1.65	0.015
Compound Medicine	4346	1.65	1.73	0.026

From the descriptive statistics in Table 3, it can be seen that the mean for pharmacy time with compound medicine is higher than ready medicine. From the t-test results in Table 4, it shows that the p-value in this test is 0, which is lower than the significance level of this test (0.05 or 5%). This means that the null hypothesis should be rejected and we should accept the alternative hypothesis. This means that there is statistically significant different of pharmacy time between ready and compound medicine where pharmacy time of ready medicine is faster (smaller) than pharmacy time of compound medicine.

Table 4. Test Result for T-Test of Pharmacy Time

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 < 0$

T-Value	DF	P-Value
-12.63	7344	0.000

The conclusion from this analysis is XYZ Hospital should create strategy so they can serve both patient with ready and compound medicine with the same service quality. Due to the limited data in the pharmacy process, the detailed process in the pharmacy time can't be analyzed. There must be additional research regarding the process time in making and delivering compound and ready medicine in XYZ Hospital.

Analysis of Laboratory Process

Laboratory time process was recorded from the laboratory staff got an order confirmation until the laboratory team finish the order. Referring to Table 2, the maximum time for this process is 16.55 hours (16 hours 32 minutes) and 23.19 hours (23 hours 11 minutes). Comparing to other process, this process has the extreme longest time. This data tracking is considered invalid because it is impossible for patient to wait more than the operational hour of outpatient pediatric department XYZ Hospital which is from 7 AM to 9 PM (14 hours). Many factor can create this event but this can be because there is no enough data/too much invalid data. From thousands of tracking data time recorded in this process, only 66 data of it is valid to be counted for the control chart because it does not contain negative value. Due to that, there will be no recommendation gained from this data. Rather, it advises the management team to record a more accurate data in this process because there must be error in recording the time of laboratory process or even there is a different definition regarding the tracking time in this process.

Analysis of Radiology Process

Radiology time process is counted from the radiology staff got an order confirmation until the radiology test is done. From BPMN in Figure 3, the task that is included in this process is when the radiology staff perform radiological test (F.1). There is no sub-process in this particular process because this process is already out from the outpatient pediatric department. Because of that, the value added in the more detailed process of radiology test can not be analyzed. However, from Table 4.2, the maximum time to conduct radiology test should be between 5.5023 hours (5 hours 30 minutes) and 8.7134 hours (8 hours 42 minutes) is advised.

Based on the control chart analysis, the XYZ management team should differ the SOP of patient LOS based on the process that included in the patient journey. The summary of each processes' maximum time can be seen in Table 5.

Table 5. LOS Maximum Time for Each Processes

	<i>Process (hours)</i>					
	Outpatient Waiting Time (OWT)	Doctor's Examination	Pharmacy	Laboratory Test	Radiology Test	Billing/Payment
<i>Upper Maximum Time</i>	45 minutes	13 minutes	27.9 minutes	(invalid)	(invalid)	36 seconds

From this table, the process that contribute the most time in the LOS is the outpatient waiting time. There must also further research regarding the laboratory and radiology test with more accurate data and its' definition.

Value Analysis

Since the tracking time data gathered from the hospital does not record the registration timing, a Value Added Analysis is created for the 3 types of registration using KIOSK: Online Service Counter, Self Service Counter, and Registration Counter. Value Added Analysis is conducted to determine and eliminate the Non Value Added in the registration process to decrease the overall length of stay of pediatric outpatient. The values analysis can be seen as follows

Online Service Counter Analysis

Online Service Counter is part of KIOSK that enable existing patient that has made an online appointment to directly wait in the polyclinic waiting room without any registration needed again. However, this benefit only can be gained by those who pay using general coverage. Patient that already make online appointment but is going to use insurance coverage need to wait again in the registration waiting room to get registered. Because of that, there is 3 processes that is considered NVA, specifically targeted for patient that is going to pay using insurance.

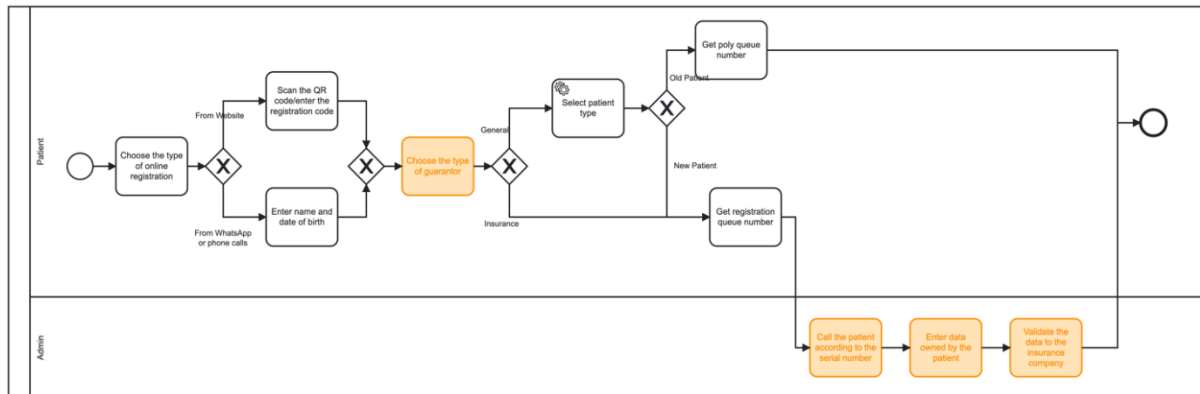


Figure 14. BPMN of Online Service Counter

1. Choose the type of guarantor. This process is considered NVA because this process creates a waste time that can be done in the online registration, before patient go to the hospital. This task is also contradicted with the definition of value which is something that customer willing to buy.
2. Call the patient according to the serial number. On this process, the patient needs to wait until they name is called. This process is considered NVA because the patient does not willing to pay more just to wait for a registration process and it also doesn't add value to the business process.

3. Entry data owned by the patient. The admin should enter the patient's data manually and it will create time waste. This process can actually be done in the online appointment to reduce the length of stay of patient in the hospital. This process also contradicts with the definition of value which is do the right thing at the time.
4. Validate the data to the insurance company. This process contradicts to the definition of value which something that customer would pay because it create time waste. This process can be done prior the patient go to the hospital if they already input their data in the previous process when they create the online appointment.

Self Service Counter Analysis

The Self-Service Counter is used when there is existing patient that has not made any online registration. There is one process that is considered Non-Value Added (NVA). The first one is when KIOSK service center admin should ensure that there are no data writing errors by the patient. The reason why this process is considered NVA is because it doesn't give value that the customer would pay. In addition, hiring an admin just to making sure the patient already input the right name is not considered business value added (BVA). By that, XYZ hospital should eliminate this process by mitigating any probability that the patient would misinput their data by creating a more specific data entering to the KIOSK machine.

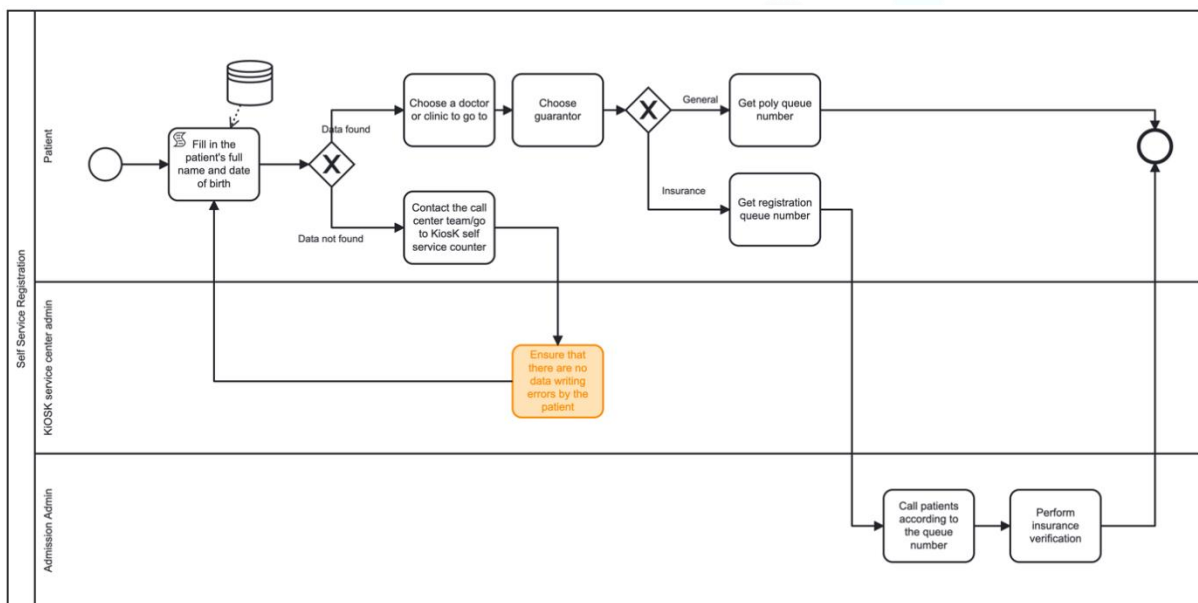


Figure 15. BPMN of Self-Service Counter

Registration Counter

Registration counter is a registration method that can be used by new patient that has not made any online appointment. In this method, the patient should go to the registration administration no matter what kind of payment that they are going to choose. The task that is considered NVA is when the administration staff should manually help the patient and enter the medical record number and register the patient. These two activities affect the waiting time of patient in the registration counter. These processes contradict with the definition of value which is something that customer would buy. In addition, due to high technology adaptation of XYZ Hospital patient, it is wise if this process can be independently done by the patient

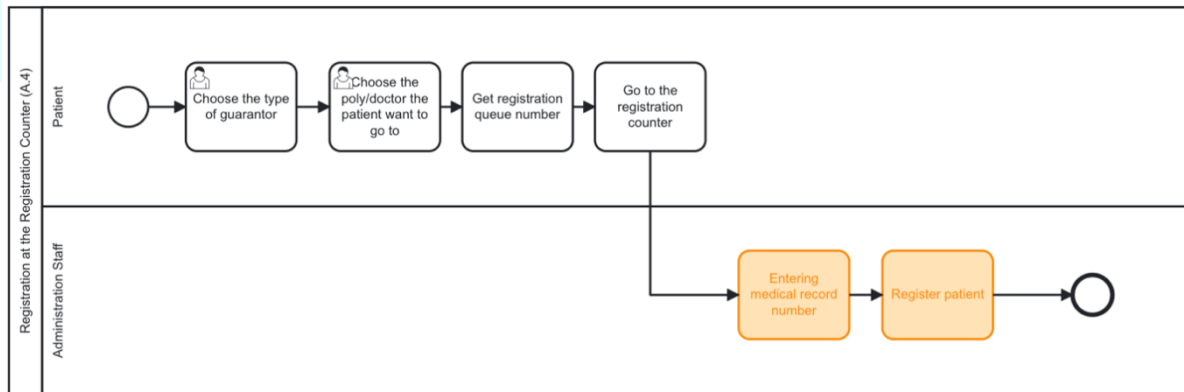


Figure 16. BPMN of Registration Counter

V. DISCUSSION

Based on the value-added analysis below, there is several proposed improvements targeted in the registration process using KIOSK.

1. The hospital should record the tracking time of the registration process as well. Currently, the hospital only has tracking time data after the patient registered in the hospital. It means that the hospital cannot track how long it takes for their patients to make registration. The hospital management team can use data gained from online appointment to track each patient journey in the registration process.
2. The new patient that has already made online appointment and register using Online Service Counter should not wait again in the registration que. The patients can fill all of the data needed when they make online appointment so they can directly go to the poly waiting room after they confirm their attendance in the KIOSK.
3. All of the insurance covered patient that have already made online appointment should not go to the registration admin again. The hospital can validate whether the insurance is applied on the day the patient made the appointment. So, when the patient arrives, they can directly go to the polyclinic waiting room instead to the registration waiting room.
4. The registration process for new patient with no appointment should be done independently by the patient to reduce waiting time. This also can increase the business value by eliminating the number of admin needed in the registration process.

VI. CONCLUSION AND RECOMMENDATION

XYZ Hospital in Bandung, Indonesia, experiences high patient volume in its Pediatric Department, leading to longer outpatient length of stay (LOS). To address this issue, business process analysis using Business Process Modeling and Notation (BPMN) is created. Data on patient journeys were used to identify time allocations for each process contributing to LOS. Additionally, value-added analysis was conducted for the registration process, revealing non-value-added processes. A t-test analysis showed significant differences in billing time between insurance and general payment methods.

Based on the findings, several recommendations were made: eliminating registration queues for online appointments, tracking outpatient journey through the registration process using a barcode system, reducing patient misinputs by implementing barcodes for existing patients using KIOSK, creating integrated systems or self-service payment methods to equalize billing time for insurance and general patients, and establishing new regulations for pediatric outpatient LOS based on patient activities. This research also suggests for XYZ Hospital to create new LOS regulation for operational procedure in order to make outpatient average LOS in pediatric department decreased. This research suggests LOS in 58 minutes for outpatient waiting time, doctor's examination, and billing time. Drugs prescription from pharmacy also should not exceed 28 minutes. By implementing this recommendation, this can help XYZ hospital to make the outpatient LOS of <2 hours took 39% of the cases into >50% of the cases. This will also decrease the average outpatient LOS.

This study shows that in order to achieve the majority of outpatient visit LOS that is less than 2 hours, patient LOS should be differentiated based on their activities within. Even though the data from American Time Use

Survey (ATUS) stated that the average of outpatient Length of Stay is 116 minutes (1.93 hours) and a study from hospitals in Rivers State, Nigeria shows that the average outpatient time spent to receive treatment is 122,6 minutes (2,04 hours) for public hospitals which shows 2 hours is the common average LOS, there should be several visits that is much more faster than that in order to balance up patients with longer LOS.

Acknowledgement

Due to scope and limitations in this research, several points that can be analyzed in the future are

1. The business process mapping of department outside pediatric department that contributes to pediatric patient LOS. The further research can analyze about radiology test, laboratory test, and also pharmacy operational process to reduce the overall LOS.
2. Analyze the impact of creating online appointment in reducing LOS of outpatient in pediatric department. Having a technology to create online appointment is helpful for the patient. However, the technology is only purposeful if all of the process is on time so patient can get in to the doctor's room as assigned in the appointment.
3. Analyze the registration time of outpatient in pediatric department. Since the current tracking time does not track the registration time process, the time difference of different counter can't be analyzed.
4. Analyze the time difference factors of generating compound medicine and ready medicine in XYZ Hospital.

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Stock Valuation Using the Discounted Cash Flow (DCF) Method, Relative Valuation, Monte Carlo Simulation, and Investment Recommendations for Fish, Meat, & Poultry Sub-Industry Companies for the 2022 Projection

Siti Kurniasih¹, Dwi Fitrizal Salim²

^{1,2}Master of Management, Telkom University, Bandung, Indonesia

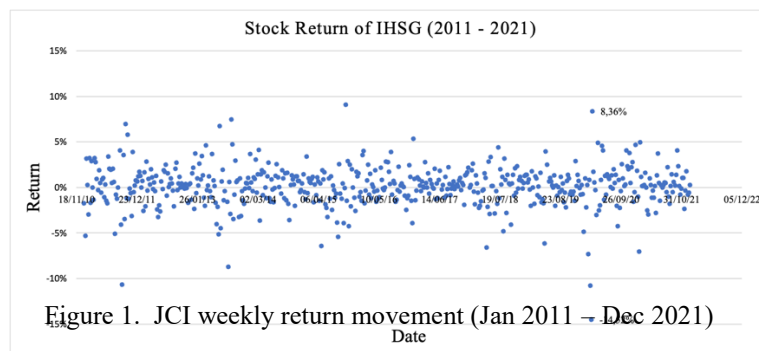
Abstract

This research aims to predict the intrinsic value and provide investment decision recommendations for the projection year 2022. The stock price movement and stock return fluctuate, which the Fish, Meat, and Poultry sub-industry exhibiting higher volatility compared to the risk and return of IHSG. Previous studies have shown that stock prices have not accurately reflected their intrinsic value, and analyst research has led to a variety of stock price recommendations. Previous research that has been linked to various scenarios, limited to providing information on overvalued or undervalued stocks in each scenario, has not specifically helped investors make decisions about which stock prices tend to be achieved in all the scenarios. Hence, this study was conducted to answer this question in order to provide more consistent and accurate stock price recommendations, especially for companies in the Fish, Meat, and Poultry sub-industry. The analysis is carried out using the Discounted Cash Flow (DCF) method with the Free Cash Flow to the Firm (FCFF) approach, the Relative Valuation (RV) method using the Price to Earnings Ratio (PER) and Price to Book Value (PBV) approaches, and further strengthened by Monte Carlo Simulation to ascertain the likelihood of achieving stock prices. The results of the DCF method showed that CPIN, JPFA, and SIPD stocks were overvalued and MAIN undervalued, while DSFI was overvalued in the pessimistic scenario. The Relative Valuation method with PER and PBV methods showed that all stocks were in valid condition because their values were within the range of their industry's PER and PBV. In the Monte Carlo simulation, the stock's intrinsic value in the pessimistic scenario shows the highest probability of being achieved, namely CPIN 75%, DSFI 73%, JPFA 96%, MAIN 70%, and SIPD 92%. Investment recommendations are "buy" for MAIN and "sell" or "hold" for CPIN, DSFI, JPFA, and SIPD.

Keywords: Stock Valuation, Intrinsic Value, FCFF, Relative Valuation, Monte Carlo Simulation

I. INTRODUCTION

The stock market is highly volatile and dynamic. Fluctuating stock returns can influence investor loyalty in investment decisions because every investment decision is based on two main factors: risk and return. Higher risk is associated with investments expected to provide higher returns, and vice versa (Goel, 2021). The Composite Stock Price Index (IHSG) over the past 10 years, from 2011 to 2021, is known to exhibit wide return volatility, with the lowest return recorded at -14.52% on March 14, 2020. This was in line with the Indonesian government declaring the Coronavirus (Covid-19) a national disaster. Based on the data of the weekly return movements of the IHSG shown in Figure 1, it can be observed that there was significant return fluctuation in March 2020, and stock prices rebounded by 8.36% on March 21, 2020.



Source: Yahoo Finance historical data (data processed)

The phenomenon of stock price volatility also occurs in Fish, Meat, and Poultry sectors, which are the subjects of this research.

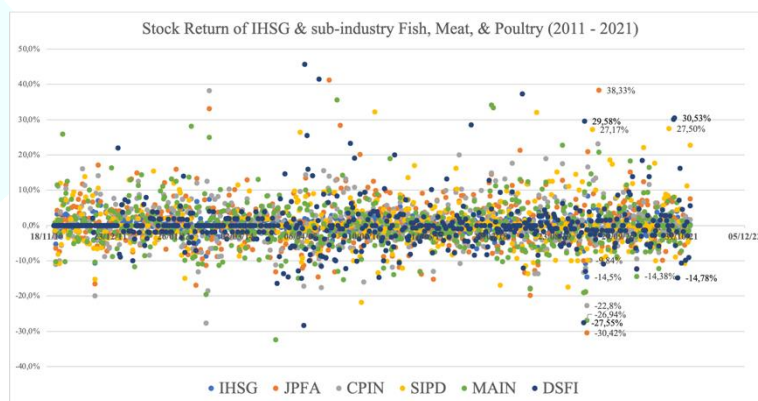


Figure 2 . Stock Return IHSG and sub-industry fish, meat & poultry

Source: Yahoo Finance historical data (data processed)

In Figure 2, It is evident that the stock price changes. Fluctuation of JPFA showed the lowest return on March 14, 2020, at -30.42%, and rebounded to its highest return on May 30, 2020, at 38.33%. The same pattern can be observed for the other four stocks, with CPIN recording the lowest return of -22.75% in early 2020, DSFI at -27.55%, MAIN at -26.04%, and SIPD at -10%.

As is well known, Indonesia and other nations have experienced tremendous economic constraints because of the epidemic that has affected countries all over the world over the past two years, between 2017 and 2021. The value of the company will be impacted by the drop in revenue and the fixed costs that must be covered in the face of uncertainty. Therefore, company valuation provides an overall picture of the extent to which macro- and micro-level changes can influence businesses and is of concern to all parties, including investors, creditors, and the government (Abbas Rizvi et al., 2022).

When valuing shares, it is crucial doing fundamental analysis to understanding the intrinsic value of a company and achieving returns adjusted for risk. Therefore, identify the key variables relevant to the valuation process is important (Kumar, 2016). Based on previous research, Hendrawan et al. (2021) estimated the fair value of livestock feed company stocks with the highest market capitalization for the projection year 2020. The research utilised the DCF-FCFF and RV. Investors were advised to sell their CPIN shares and purchase JPFA and MAIN shares.

Building upon the phenomenon and previous research, as well as research conducted by securities firms, this study aims to evaluate companies in Fish, Meat, and Poultry sub-industry using historical data from 2017–2021 and projecting values for 2022–2026. The objects of this research are CPIN, DSFI, JPFA, MAIN, and SIPD. The discounted cash flow (DCF) method with the free cash flow to firm (FCFF) approach and the relative valuation (RV) approach with the price-earnings ratio (PER) and price to book value (PBV) approaches are employed. The research findings are further reinforced by Monte Carlo simulations to assess the probability of achieving target stock prices. The study incorporates three scenarios (pessimistic, moderate and optimistic) considering company growth in relation to industry growth (Hendrawan and Permadi, 2020).

II. LITERATURE REVIEW

A. Valuation Theory

The process of valuation involves making an assessment of risk and return to estimate an asset's worth, specifically to obtain its intrinsic value. By knowing its fair value, investors gain information about whether a stock is undervalued or overvalued in order to make investment decisions on whether to buy or sell shares of that company (Gitman & Zutter, 2015). Valuation is a recurring process that involves analyzing the historical performance of a company, determining and projecting cash flows, specifically free cash flows, and discounting them with the cost of capital (Koller et al., 2010).

B. Free Cash Flow to Firm (FCFF) in Discounted Cash Flow (DCF)

DCF is a method where the present value of future cash flows for an asset is calculated. The DCF method is suitable for calculating a company's fair value if it has stable cash flows. This is because the stability of its income and growth can be more predictable (Damodaran, 2012). The formula of the DCF model is as follows:

$$\text{Value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1 + k_c)^t} \quad (1)$$

Where CF_t represents the expected cash flow in period t , k_c is the discount rate, and n is the asset's lifespan. FCFF accommodates the total cash flow available to all capital providers of a company, including shareholders, bondholders, and preferred stockholders (Kumar, 2016). FCFF is calculated by taking the company's EBIT, subtracting taxes, and then adding depreciation and amortisation, which are non-cash expenses in accounting. If there are capital expenditures, it will reduce the available cash flow because capital expenditures only involve changes in assets. Additionally, an increase in non-cash working capital will also reduce the available cash flow as it does not reflect actual cash flows (Damodaran, 2012). The formula for calculating FCFF is as follows (Kumar, 2016):

$$\text{FCFF} = \text{EBIT} (1 - \text{tax rate}) + \text{depreciation} - \text{capex} - \text{change in working capital}$$

The following formula is used to determine a company's value by discounting FCFF using the WACC (Kumar, 2016):

$$\text{Value of a firm} = \sum_{t=1}^n \frac{FCFF_t}{(1 + WACC)^t} + \frac{FCFF_{n+1}}{(WACC - g)} \frac{1}{(1 + WACC)^n} \quad (2)$$

Where: FCFF = Free Cash Flow to the Firm;
 t = time period in years;
 g = growth rate;
 WACC = Weighted Average Cost of Capital.

Relative Valuation

RV involves determining an asset's worth and then comparing it to other assets with similar characteristics. Relative valuation is also known as comparable valuation metrics, which are commonly used in the industry, such as the price-to-earnings ratio (PER) (Kumar, 2016). Empirical research recommends the use of multiples, as they are considered more valid predictors of value. In addition to the PER, the price-to-book value (PBV) is another commonly used multiple.

PER formula is as follows (Goel, 2021):

$$PER = \frac{\text{Market price per Share}}{\text{Earning Per Share}} \quad (3)$$

PBV formula is as follows (Kumar, 2016):

$$PBV = \frac{\text{Market price per share}}{\text{Book value of equity per share}} \quad (4)$$

Monte Carlo Simulation (MCS)

MCS is a method based on repeated iterations of random numbers. It is generally used to assist in solving problems by obtaining specific probabilistic estimates of a model (Marseguerra & Zio, 2009). The Monte Carlo method is used in many different areas, including figuring out what a company's stock should be worth. It does this by randomly picking potential stock prices from iterations (experiments) based on predetermined

assumptions, such as revenue growth, as input parameters in optimistic, moderate, and pessimistic scenarios. The MCS is then performed to generate the possibility of achieving a specific value, in this case, the fair stock price. By maximizing the Monte Carlo Simulation function to predict prices, it will greatly help companies and investors in their efforts to generate sustainable profits (Ravichandra Singh, 2021)

Previous Research

Maïke Ge (2022) conducted research with the aim of determining the latest fair value of TJX Company (a leading off-price retailer worldwide) based on data from 2016 to 2020. The research methods employed were the Gordon Growth Model and DCF using the FCFF approach. The findings of the study indicated that both methods together showed that TJX stock was relatively overvalued. Therefore, the investment recommendation is not to purchase new TJX stocks.

Meanwhile, Michal Drábek (2022) also conducted relative valuation research in the Czech Republic, focusing on private companies represented by 50 companies with financial data from 2015 to 2019 using the relative valuation (RV) method. The findings indicated that the RV calculations were on average lower for private companies compared to listed companies.

Julia and Hendrawan (2021) projected the fair stock prices of three companies in the retail trading industry in 2021. The projections using financial data (2016 to 2020) and covered the period from 2021 to 2025. The DCF method's findings showed that AMRT stock was deemed cheap in every scenario, while the stock was overvalued in every scenario according to the RV-PER and PBV methods.

Using financial data from 2016 to 2020, Nurwinda & Hendrawan (2021) also performed research to examine the fair value of firms in the F&B sector in 2021 using the DCF and RV techniques. It was discovered that utilising the DCF technique, the stocks of INDF and ICBP were judged to be cheap in all scenarios—pessimistic, moderate, and optimistic—while MYOR was judged to be overvalued. The intrinsic value of the equities INDF, ICBP, and MYOR was determined to be overvalued in all situations when applying the RV method using the PER approach. The intrinsic value ICBP and INDF stocks was determined by the PBV technique to be undervalued in all scenarios, whereas MYOR was determined to be too high in the optimistic scenario and too low in the others.

Kartawinata, Akbar, et al. (2022) looked at the stock prices of telecommunications companies. They used financial data from 2006 to 2010 and the FCFF method, PER and approaches to figure out how much the companies' stock prices should be. The results of the study suggested that Indonesian telecoms company stock prices were at a fair value.

Yuxin Liu (2021) evaluated Disney in research which aimed to analyze the valuation of Walt Disney Company for the projection of 2022 based on historical financial data from 2020. This research was conducted using the WACC model and the DCF model. The research findings indicated that, considering the business background and SWOT analysis amidst the COVID-19 situation, Disney is now undervalued, and the company still has significant potential to growth.

In China, Chen, Ma, et al. (2021) conducted research which aimed to verify the accuracy of the DCF model. The study compared and analyzed the DCF valuation and stock prices based on financial data for a historical period of 15 years, from 2005 to 2019. The research was conducted using the DCF method. The findings indicated that the DCF valuation was significantly higher (overvalued) than the actual stock prices. The degree of deviation varied across different industries, which was attributed to stock reforms in China.

While doing so, Genc & Saritas (2021) in Turkey researched the worth of cement industry companies listed on Borsa Istanbul based on financial data from 2011 to 2019. The DCF and RV methodologies were used to conduct the study. As a result of the analysis, PER, PBV and DCF were found to be the three most effective valuation techniques.

Tarigan & Fachrudin (2021) estimate the intrinsic value of coal mining companies' stocks based on the financial data of four companies over a two-year period from 2017 to 2018. The research was conducted using FCFF model and RV method. According to the study's findings, the fair value of BUMI and DOID stocks as of December 31, 2018, was undervalued at Rp197.3 and Rp659.6, respectively, compared to their corresponding

market prices of Rp124 and Rp525. The fair values of BYAN and FIRE stocks, on the other hand, were deemed to be excessively high (overvalued) as of Dec 31, 2018, at Rp19,226 and Rp6,710 respectively, in comparison to their respective market prices of Rp7,750 and Rp19,875.

Cheng (2021) carried out research with the objective of calculating the fair value of Johnson & Johnson based on financial data (2016 to 2020). The DCF approach with FCFF was used to conduct the research. According to the study's findings, J&J was valued at \$239.54 a share, which is considerably more than the stock's current market value (\$164.53 before September 22, 2021). Therefore, based on the company's business presentation and historical data from its financial reports for the previous five years, it can be said that Johnson & Johnson has high growth prospects and that its stock price will probably rise.

The previous research above is used as a reference for conducting research because it reveals how the intrinsic value of shares can be generated through DCF with the FCFF and RV approaches. The difference with the research conducted is that the resulting intrinsic value will be processed using a Monte Carlo simulation to obtain the probability of achieving the closest stock price from all of these scenarios.

III. RESEARCH METHODOLOGY

The valuation in this research object was conducted through analysis using the Discounted Cash Flow (DCF) method of the Free Cash Flow to Firm (FCFF) approach, considering that valuing with FCFF measures the overall value of the company and can accommodate future growth opportunities. Therefore, in making assumptions and projections, three scenarios are used: moderate, pessimistic and optimistic scenarios.

Then valuation results were validated by comparing them with analysis using the Relative Valuation (RV) method with the PER and PBV approaches. In order to determine the probability level of the stock's fair value, Monte Carlo simulation further strengthened the valuation results. The intrinsic value obtained from these fundamental estimations was then compared with the stock price in market. Based on the condition of the stock price, the researcher can provide recommendations on whether the stock should be bought, held, or sold to maximise profits.

The research object is company in Fish, Meat, and Poultry sub-industry. The selected sample companies are:

Table 1. List of Research Samples

No	Name of emiten
1	Charoen Pokphand Indonesia Tbk (CPIN)
2	Dharma Samudera Fishing Indust (DSFI)
3	Japfa Comfeed Indonesia Tbk (JPFA)
4	Malindo Feedmill Tbk (MAIN)
5	Sreeya Sewu Indonesia Tbk (SIPD)

Sampel Criteria.

A sample is data taken from a portion of the population used as a data source in research to determine the characteristics and attributes expected from the population (Siregar, 2013). Following are the criteria used, the purposive sampling technique to choose the sample:

1. Companies listed on the Indonesia Stock Exchange (IDX) in Fish, Meat, and Poultry sectors
2. Companies that have recently launched an Initial Public Offering (IPO) within the last 5 years
3. Companies that have shown positive average revenue growth over the past 5 years
4. Companies that have shown a positive average EBIT over the past 5 years

Data Gathering.

The research used secondary data, which include:

1. Published and audited financial report from the sample companies over the past five years, from January 2017 to December 2021. The www.idx.co.id website and the websites of the pertinent companies were used to gather the data.
2. Weekly stock price data for the sample companies and the Composite Stock Price Index (IHSG) from January 2011 to December 2021 were taken from www.finance.yahoo.com, while the stock beta was obtained from Pefindo.
3. Macroeconomic variables data for Indonesia, including the Bank Indonesia (BI) interest rates from www.bi.go.id and the Gross Domestic Product (GDP) growth rate, can be obtained from www.bps.go.id.
4. PER and PBV industry data were taken from the annual reports of companies for the year 2021.

IV. RESULT / FINDING

Based on the sample criteria and historical data that have been collected, stock's intrinsic value is determined through the valuation step. This process requires at least four basic inputs, namely cash flow, expected growth, cost of capital, and the company's projected value.

Historical Performance

The variables examined in the historical analysis are the variables that form the FCFF, namely EBIT (Earnings Before Interest and Taxes), Capital Expenditure (CAPEX), DA (Depreciation and Amortisation), and Change in Working Capital.

Table 2. Historical performance of company

Year	CPIN	DSFI	JPFA	MAIN	SIPD
Revenue Growth Average	7,7%	0,7%	11,1%	12,5%	18,1%
	% of Revenue				
Cost of Good Sold	81,5%	87,9%	78,4%	86,3%	86,9%
Sales and Marketing expenses	2,5%	3,8%	3,5%	2,6%	2,8%
General and administrative expenses	3,2%	3,7%	7,0%	4,1%	5,4%
EBITDA	12,7%	4,6%	11,0%	7,0%	4,8%
Depreciation & Amortization expenses	2,1%	1,4%	3,1%	3,5%	2,5%
EBIT	10,6%	3,2%	7,9%	3,5%	2,3%
Capex	4,0%	1,2%	5,3%	5,3%	2,8%
Change in Working Capital	1,6%	1,1%	2,6%	1,4%	2,0%

Source: data processed

Historical data on financial statements, namely revenue and cost structure for the period 2017 – 2021, are used as basic assumptions in projecting FCFF.

A. Projection

Data processing was conducted on the revenue of companies listed in Fish, Meat, and Poultry sub-industry during the period of 2017 to 2021. It was found that the average industry growth rate is 8.16%. This average is then used as the assumption for industry growth in this sector for the projection period of 2022 to 2026.

Table 3. Revenue Growth industry

Year	CPIN	JPFA	CPRO	MAIN	SIPD	DPUM	DSFI	Industry	Growth
2017	49.367.386	29.602.688	6.575.570	5.441.000	2.449.961	1.281.161	647.381	95.365.147	14,67%
2018	53.957.604	36.228.261	7.390.580	6.705.893	3.120.459	962.189	652.520	109.017.505	14,32%
2019	42.501.146	38.872.084	7.175.764	7.454.920	4.049.392	384.697	476.786	100.914.789	-7,43%
2020	42.518.792	36.964.948	7.573.506	7.000.570	4.341.295	137.116	365.871	98.902.099	-1,99%
2021	51.698.249	44.878.300	8.028.078	9.130.618	5.439.581	173.845	532.523	119.881.194	21,21%
	Average industry growth 2017 - 2021								8,16%

Source: data processed

After identifying the average company growth and industry growth, the spread or growth range between average company growth and industry growth can be calculated to project growth in the pessimistic, moderate, and optimistic scenarios.

Table 4. Company growth projections

Code	Average corporate growth	Average industry growth	Spread	Scenario growth		
				Pessimistic	Moderate	Optimistic
CPIN	7,7%	8,16%	0,41%	7,75%	8,16%	8,36%
DSFI	0,7%		7,49%	0,67%	8,16%	11,90%
JPFA	11,1%		2,96%	8,16%	11,11%	12,59%
MAIN	12,5%		4,34%	8,16%	12,49%	14,66%
SIPD	18,1%		9,96%	8,16%	18,12%	23,10%

Source: data processed

B. Cost of Capital

Cost of capital or the weighted average cost of capital (WACC) is the cost that needs to be incurred because of certain funding, computed by calculating the costs of debt and equity and taking into account how much of each is included in the total cost of capital.

Tabel 5. WACC calculation

WACC components	CPIN	DSFI	JPFA	MAIN	SIPD
Market Return	9,74%	9,74%	9,74%	9,74%	9,74%
Risk Free Rate	3,50%	3,50%	3,50%	3,50%	3,50%
Risk Premium	6,24%	6,24%	6,24%	6,24%	6,24%
Beta	1,128	0,811	1,308	1,518	0,514
Re (Rate of Equity)	10,54%	8,56%	11,66%	12,97%	6,71%
Rd (Rate of Debt)	3,28%	4,07%	7,93%	6,61%	7,37%
Xe (Equity)	25.149.999	211.407	13.102.710	2.048.040	926.013
Xd (Debt Maturities)	6.282.445	151.593	10.172.596	2.404.732	851.011
Debt Composition	19,99%	41,76%	43,71%	54,01%	47,89%
Equity Composition	80,01%	58,24%	56,29%	45,99%	52,11%
Tax	22,00%	22,00%	22,00%	22,00%	22,00%
WACC	8,94%	6,31%	9,27%	8,75%	6,25%

Source: data processed

C. DCF Analysis with FCFF

By predicting FCFF (Free Cash Flow to the Firm), DCF analysis is carried out once the fundamental assumptions have been established using historical financial data. To calculate the FCFF projection for the years 2022–2026 and determine the growth projection scenario, the intrinsic value is calculated.

Tabel 6. Intrinsic value summary

FCFF	Scenarios	Fair share value (Rp)	Share Price as of January 2, 2022 (Rp)	Condition
CPIN	Pessimist	3.313	5950	Overvalued
	Moderate	3.499		Overvalued
	Optimistic	3.599		Overvalued
DSFI	Pessimist	65	95	Overvalued
	Moderate	123		Undervalued
	Optimistic	158		Undervalued
JPFA	Pessimist	464	1720	Overvalued
	Moderate	1.076		Overvalued
	Optimistic	1.614		Overvalued
MAIN	Pessimist	1.215	670	Undervalued
	Moderate	1.650		Undervalued
	Optimistic	1.892		Undervalued
SIPD	Pessimist	719	2000	Overvalued
	Moderate	1.305		Overvalued

Source: data processed

The results of the DCF method showed that CPIN, JPFA, and SIPD stocks were overvalued and MAIN undervalued in every scenario, while DSFI was overvalued in the pessimistic or worst-case scenario.

D. Relative Valuation with PER and PBV

Relative valuation calculations are also performed to obtain PER and PBV values. Estimating stock prices using multiples is a common practice in valuation. In addition to using DCF, analysts use multiples to evaluate companies and provide recommendations to investors (Schueler, 2020). Therefore, the relative valuation method is also need employed by comparing the calculated PER and PBV ratios with the market PER and PBV ratios of similar companies in the industry. RV calculations using PER and PBV ratios are presented in the following table:

Tabel 7. Intrinsic value of PER and PBV

Relative Valuation	Scenarios	PER	Condition	PBV	Condition
CPIN	Pessimist	15,0	Undervalued	2,2	Overvalued
	Moderate	15,8	Undervalued	2,3	Overvalued
	Optimistic	16,3	Undervalued	2,3	Overvalued
DSFI	Pessimist	8,33	Undervalued	0,57	Undervalued
	Moderate	15,70	Undervalued	1,08	Undervalued
	Optimistic	20,20	Undervalued	1,39	Undervalued
JPFA	Pessimist	2,69	Undervalued	0,41	Undervalued
	Moderate	6,24	Undervalued	0,96	Undervalued
	Optimistic	9,36	Undervalued	1,44	Undervalued
MAIN	Pessimist	45,05	Overvalued	1,33	Undervalued
	Moderate	61,20	Overvalued	1,80	Overvalued
	Optimistic	70,16	Overvalued	2,07	Overvalued
SIPD	Pessimist	63,90	Overvalued	1,04	Undervalued
	Moderate	115,98	Overvalued	1,89	Overvalued
	Optimistic	148,49	Overvalued	2,42	Overvalued

Source : data processed

The Relative Valuation-PER method showed that CPIN, DSFI, and JPFA were undervalued, while MAIN and SIPD were overvalued. While with the PBV approach, CPIN was overvalued, DSFI and JPFA were undervalued in every scenarios, then MAIN and SIPD were undervalued in the worst-case scenarios. In general, the PER and PBV values of the five companies were said to be valid in all scenarios because they are within the industry range.

E. Monte Carlo Simulation

The simulation is conducted using revenue growth as the assumption parameter. Monte Carlo simulation is employed using Microsoft Excel as a tool, with 10,000 iterations. The results are processed and presented in the following table:

Tabel 8. Monte Carlo Simulation result

Iterations	10.000					
Monte Carlo Simulation	CPIN	DSFI	JPFA	MAIN	SIPD	
Average	3.518	167	1.147	1.547	1.149	
Standard Deviation	289	170	400	632	301	

DCF-CPIN	Intrinsic value	z	Probability achieved
Pessimist	3.313	0,7091	76%
Moderate	3.499	0,0634	53%
Optimistic	3.599	-0,2809	39%

DCF-DSFI	Intrinsic value	z	Probability achieved
Pessimist	65	0,6021	73%
Moderate	123	0,2619	60%
Optimistic	158	0,0536	52%

DCF-JPFA	Intrinsic value	z	Probability achieved
Pessimist	464	1,7058	96%
Moderate	1.141	0,1678	73%
Optimistic	1.177	-0,1122	52%

In the Monte Carlo simulation, the stock's intrinsic worth in the worst-case scenario or pessimistic showed the highest probability of being achieved, namely CPIN 75%, DSFI 73%, JPFA 96%, MAIN 70%, and SIPD 92%. Here, the quantitative results simulated by Monte Carlo can help to better understand the impact of uncertainty on stock price forecasts in the market.

V. DISCUSSION

Experts agree that the DCF method is one of the most used techniques for valuing companies worldwide (Basci, 2019), including both academics and practitioners (Ban, grah et al., 2021).

DCF-MAIN	Intrinsic value	z	Probability achieved
Pessimist	1.215	0,5256	70%
Moderate	1.650	-0,1638	43%
Optimistic	1.892	-0,5463	29%

DCF-SIPD	Intrinsic value	z	Probability achieved
Pessimist	1.305	-0,5178	30%
Moderate	1.305	-0,5178	30%
Optimistic	1.671	-1,7317	4%

As one of the best valuation models, DCF is widely used in actual company valuations, including stock pricing, financing, acquisitions and mergers, tax analysis, and owners' decisions to sell shares (Wang, 2022). According to the DCF method, a company's assets will increase in value by increasing its cash flow, specifically Free Cash Flow. Hayder & Kazem (2022) mentioned that free cash flow has a statistically significant impact on firm value. The FCFF approach is accurate when supported by good assumptions and projections. In practical terms, FCFF is commonly used as it allows analysis from the perspective of all stakeholders in the company (Mielcarz & Mlinari, 2014).

Considering the analysis done, it was found that the determined intrinsic value differs from their market prices. The fair value or intrinsic value of the stocks of CPIN, DSFI, JPFA, MAIN, and SIPD was calculated using the DCF method and the FCFF approach, and the results were compared to the market price as of January 2, 2022. It was found that CPIN stock was overvalued in all scenarios, indicating that CPIN stock is considered expensive. Therefore, it is recommended for investors to sell or hold CPIN stocks, i.e., refrain from purchasing them. As for DSFI stock, it was found to be overvalued in the pessimistic scenario. JPFA and SIPD stocks were found to be overvalued in all scenarios. On the other hand, MAIN stock was deemed undervalued in every scenario, indicating that it is advised to purchase MAIN stocks.

Though it can be inferred, intrinsic value cannot be exactly measured (Li, 2021). Therefore, the intrinsic value generated represents the highest price at which an investor can buy a stock without incurring losses when selling it. Despite being one of the most used valuation methods, DCF also has limitations that need to be considered and minimized. This model has the advantage of various factor business-related, including equity costs, debt costs, growth rate, reinvestment rate, and others. But it's critical to be aware of the model's flaws, which include its susceptibility to analyst assumptions about discount rates and cash flow growth rates (Daly et al., 2021).

Using Relative Valuation, based on the company's annual financial statements for the year 2021, it is known that the average PER among similar companies in the fish, meat, and poultry industries is 35.93 times, and the average PBV is 1.74 times. Through calculations, it is found that in the pessimistic scenario, SIPD has the highest PER of 63.90, indicating that the intrinsic value of SIPD stock is 63.9 times its earnings per share. Thus, SIPD's PER is considered overvalued and expensive due to its high PER compared to the industry average. The same holds true for the moderate and optimistic scenarios, where the valuation results show high P/E ratios for SIPD, namely 115.98 and 185.99, respectively. Overvalued conditions also occur for MAIN's PER in all scenarios, as indicated by the high PER. Meanwhile, for the other three stocks, namely CPIN, DSFI, and JPFA, they are undervalued in all scenarios based on the calculation results, as their intrinsic PER are lower than the industry average PER. As a consideration, investors tend to choose stocks with low PER or those in an undervalued position. A low PER indicates that the company is capable of generating high earnings per share (EPS), which presents an opportunity for investors to potentially earn greater profits. In the analysis using PBV, the calculation results show that in all scenarios, CPIN stock is in an overvalued position. This is because the PBV of CPIN in the pessimistic scenario is 2.2, which means that the intrinsic value of CPIN stock is 2.2 times its book value and is above the industry's average PBV of 1.74. Similarly, the PBV values of the other stocks are also above the industry's average PBV. On the other hand, DSFI and JPFA stocks are undervalued in all scenarios. As for MAIN and SIPD stocks, they are undervalued in the pessimistic condition but overvalued in the other two conditions.

Based on this relative valuation analysis, it can be observed that using the PER approach, stocks such as CPIN, DSFI, and JPFA are considered cheap compared to MAIN and SIPD stocks. On the other hand, when using the PBV approach, DSFI and JPFA stocks are cheaper compared to CPIN, MAIN, and SIPD stocks. It is clear that the industry has a significant impact on the overvalued or undervalued circumstances established by PER and PBV. According to Agudze and Ibhagui (2020), relative valuation compares a company's value to that of its rivals or industry peers. Therefore, in addition to using industry PER and PBV, it is also necessary to consider the historical average PER and PBV of each stock as a comparison. In general, the PER and PBV values of the five companies were said to be valid in all scenarios because they are within the industry range.

At least two methods—scenario analysis and the Monte Carlo method—can be used to construct DCF. Based on the same basic assumptions, these methods can be combined to produce results (Buttignon, 2020). To complement the analysis results, Monte Carlo simulation is used to validate the probability of achieving the intrinsic value of the examined stocks. MCS is used to simulate various uncertain factors that influence its value

(Ilic & Digkoglou, 2022). Since stock prices fluctuate, higher stock price volatility is frequently linked with higher risk. As a result, forecasting future stock price volatility can give investors crucial information they can use to make wise decisions. The principle of Monte Carlo simulation is to generate random numbers based on the characteristics of the data (Astuti et al., 2020). Monte Carlo simulations will produce values that approximate the true value as the number of iterations used increases (Anastasia & Subhan, 2022). The projected values for various scenarios and the estimated likelihood that they will occur are summarised in the expected value (Buttignon, 2020). From the simulation conducted with 10,000 iterations, it is found that, based on the Monte Carlo experiment, the intrinsic value of the stocks approximates the pessimistic scenario. This is based on the probability percentage that indicates higher results for these stocks in the pessimistic scenario.

VI. CONCLUSION AND RECOMMENDATION

From the analysis conducted using DCF, RV, and Monte Carlo simulation, there are differences in the valuation results for the research subject, which is the stocks in the sub-industry of fish, meat, and poultry products. It is important to note that there are other aspects that cause the PER and PBV of a company to be higher or lower compared to its industry.

An investor cannot simply judge a stock as expensive or cheap without conducting a valuation to determine its true value. In decision-making, Zahera and Bansal (2018) recommend that before investing, one must focus on investment prospects and historical performance data. Investors should concentrate on assets with intrinsic values that are equal to or greater than the stock market price since they will select lucrative investments (Mensah et al., 2022).

Based on research conducted, it was concluded as follows:

1. The results of the DCF method showed that CPIN, JPFA, and SIPD stocks were overvalued and MAIN undervalued, while DSFI was overvalued in the pessimistic scenario.
2. The Relative Valuation method with PER and PBV methods showed that all stocks were in valid condition because their values were within the range of their industry's PER and PBV.
3. In the Monte Carlo simulation, the stock's intrinsic value in the pessimistic scenario shows the highest probability of being achieved, namely CPIN 75%, DSFI 73%, JPFA 96%, MAIN 70%, and SIPD 92%.
4. Investment recommendations are “buy” for MAIN and “sell” or “hold” for CPIN, DSFI, JPFA, and SIPD.

Then, based on the research that has been done, the researcher recommends the following:

1. For Investors
 - a. Valuation is conducted to provide cheap shares information of good quality. Stocks with such criteria are what investors expect. Hence, valuation is needed, and the approach cannot be just one method but needs to be in-depth with several alternative methods. This needs to be done because it can be quite dangerous if an investor buys shares without knowing the details.
 - b. This research was conducted using DCF-FCFF, Relative valuation, and Monte Carlo Simulation methods in the hope of increasing investor confidence in the stocks they will choose. In the future, investors will need to consider other possible methods that will produce more accurate recommendations.
2. For Future Research
 - a. Diharapkan penelitian selanjutnya dapat memasukan faktor-faktor kualitatif seperti *brand* perusahaan, kualitas manajemen perusahaan, *strategic planning* perusahaan, kompetitor dan lain sebagainya dalam kerangka pemikiran agar hasil yang diperoleh lebih komprehensif.
 - b. It is expected that further research can include qualitative factors such as company brand, quality of company management, company strategic planning, competitors, and so on in the framework of thinking so that the results obtained are more comprehensive.
 - c. The growth used in this study was constant during the projection period; it is hoped that in future studies it can be adjusted to better reflect the company's condition in an environment full of uncertainty.
 - d. In the WACC calculation, researchers use a weighted proportion of the cost component using book value; it is expected that in future studies, market value will better reflect investor expectations.

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The Influence of Financial Literacy and Behavioral Biases on BNPL Users of Generation Z

Jeremy Ezechiele Jethjehian¹, Achmad Herlanto Anggono²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

Over the past years, BNPL has grown in size with almost 60 million users in 2022, consisting of mostly Generation Z customers. In making any financial decision, Generation Z's choices are influenced by their financial literacy. However, the Indonesian financial literacy level is relatively low at 38.03% and a recent study has shown that Generation Z has lower financial literacy when compared to other generations. Additionally, people's decision-making isn't always done rationally but is affected by their behavioral biases, which their impact on borrowing behavior has yet to be widely researched. Thus, this paper aims to investigate the influence of financial literacy and five behavioral biases such as illusion of control, pain of paying, overconfidence bias, bandwagon effect, and present bias on Generation Z BNPL users' borrowing behavior. The data for this study was collected through a questionnaire done by the researcher and analyzed using PLS-SEM. The result shows that financial literacy, overconfidence bias and illusion of control are influencing factors towards Generation Z BNPL users' borrowing behavior. This implies that Generation Z's choices in using BNPL aren't always rational. Instead, they are influenced by their tendencies to be overconfident and unaware of how much control they truly possess.

Keywords: Behavioral Biases, BNPL, Financial Literacy, Generation Z, Illusion of Control, Overconfidence Bias.

I. INTRODUCTION

The financial service sector in Indonesia has grown tremendously over the past 5 years despite the covid-19 pandemic (OJK, 2020). With this growth, the people to whom those sectors aim to provide need the financial knowledge and education in using those services properly. The term financial literacy refers to the joint knowledge, ability, behavior, and perception essential in making fine financial decisions leading to financial well-being (OECD, 2022). The Indonesia Financial Service Authority mentions that the purpose of financial literacy is to enable individuals in choosing and make use of financial services as well as enhancing their financial planning ability (OJK, 2017). This research studies one of the rising products in the digital financial service sector known as "Buy Now, Pay Later" or BNPL, a short-term financing service that allows customers to make a purchase and pay it later. In Indonesia, BNPL is projected to rise by 22.9% yearly, which will come to 4,242.3 million US dollars in 2023 (Research and Markets, 2023). By 2021, BNPL has a 72.5% penetration rate, which makes it the second most used product in the financial technology industry with digital money being first at 82.2% (Eka, 2021). Indonesia itself has already a number of BNPL platforms used such as Kredivo, Atome, Akulaku, Shopee, Home Credit, GoPayLater, Indodana Paylater, and Afterpay (Research and Markets, 2023). Estimation shows that the growth rate of BNPL and Mobile Wallets will grow rapidly more than other digital payment method (International Data Corporation, 2022).

Bringing forth less curtailments, BNPL gives easier access to consumer credit. This can create changes in how consumers behave financially, one of which is their borrowing behavior. Recent research has shown that opening a larger access to loans has a negative correlation with repayment rates (Pamuk, et al., 2022). Yet access to loans isn't the only factor affecting borrowing behavior. Current research has explored various factors affecting borrowing behavior such as religious belief (Chunping, Li, & Lingwei, 2016), confidence (Kopocka, 2017), financial literacy (Elliehausen, Lundquist, & Staten, 2007), and personality (Yazdanparast & Alhenawi, 2017). Based on research done by Mintel, 44% of Generation Z, people born between 1997 to 2012 (Dimock, 2019), are predicted to use BNPL at least once in 2022. Which is the majority when compared to the other generations. A recent study by Harvard shows that this phenomenon happens due to people's avoidance of credit card interest (Lux & Epps, 2022). The study also finds that 14% of them use BNPL because they can't get approved for credit cards.

Financial Literacy is an important factor in providing financial well-being (Philippas & Avdoulas, 2019). Research has shown that younger adults obtain finer financial literacy than those older (Nguyen, Ha, Nguyen, Doan, & Phan, 2022). This gives a higher prospect for the success of BNPL as their market mostly consist of young adults. Even so, Generation Z has the lowest financial literacy score when compared to other generations (Yakoboski, Lusardi, & Hasler, 2023), which makes it difficult for BNPL to truly provide better financial well-being for Generation Z. In addition, the financial literacy index is still relatively low at 38.03% (OJK, 2022).

McKinsey&Company discovered four main behaviors found specifically in Generation Z (Francis & Hoefel, 2018). They found that one of those core behaviors is 'Communaholic', which means that Generation Z is entirely inclusive in whom they connect with either in real life or online. Associated with this behavior is the inextricable knot between Generation Z and the internet. In an interview between Forbes and creative agency, The Digital Fairy, they mentioned that one of the behaviors found within the interaction between Generation Z and social media like TikTok is their credibility culture with Influencers. This means that they consult with online figures before buying or deciding to purchase an item (Sherbert, da Silva, & Lee, 2022). This gives a higher chance for Generation Z to expand their herding behavior, or to desire what other people are using. This is one of many examples of behavioral finance.

Behavioral finance is the practice of psychology in finance (Pompian, 2006). Although the topic is popularly associated with investors, the concept began with the theory that people would rely on behavioral biases, which as a result, produces errors in their decision-making (Tversky & Kahneman, 1974). Behavioral biases have been shown to influence Generation Z's financial decisions. Overconfidence Bias and Illusion of Control are proven to significantly affect how Generation Z invests in the stock market (Prasetyo & Rahadi, 2022). Overconfidence bias, which pushes an individual's belief in their ability and knowledge far beyond the reality. It has been shown to influence how Generation Z invests in crypto (Hafishina, Abraham, Warnars, Manurung, & Nainggolan, 2023). While illusion of control is defined as the human tendency to believe that they possess all the control, unaware of the external factors outside of their control. This bias has been shown to reduce risk perception for entrepreneurs which may result poorly in their venture (Simon, Houghton, & Aquino, 2000).

In purchasing, research on behavioral finance has also found that biases are influential on consumers' decision-making. The Pain of paying bias is able to push people away from making a purchase (Farahani, Momeni, Abbasian, Mohammadi, & Nikeghbal, 2022). Pain of paying can simply be defined as the discomfort a person experience when buying an item. Hence, the ability to make a purchase and pay it later may reduce the pain of paying a consumer experience, because consumers have been shown to purchase more with credit cards when compared to cash (Abidi & Khan, 2019). Contrarily, the present bias drives an individual to make a purchase in the present rather than waiting for the future. This happens because of the tendency to believe that the convenience of the present has a greater value than the one to come (König & Kleinmann, 2007). This explains why households who holds present bias tendencies are shown to have fewer savings and higher credit card debts than those who don't (Angeletos, Laibson, Repetto, Tobacman, & Weinberg, 2001).

With that said, because of the gap in Generation Z in Indonesia's financial literacy and the undiscovered effects of behavioral biases on the borrowing patterns of BNPL users, this study focuses on discovering deeper the effects of financial literacy and five behavioral biases namely illusion of control, pain of paying, optimism bias, bandwagon effect, and present bias on Generation Z BNPL users' borrowing behavior. The group of Generation Z specifically studied are those of the 17-26 age bracket as those are the age that passes the BNPL platform requirements. Therefore, this study will uncover the financial literacy level of Generation Z and discern if their financial literacy level is adequate for creating sound borrowing behavior. Alternatively, whether their behavioral biases are the prime factor in their borrowing behavior.

II. LITERATURE REVIEW

A. Financial Literacy

Financial Literacy is defined as one's ability to comprehend how money works in this current age, which involves how to manage and preserve it (Abdeldayem, 2016). To which includes all the skills and knowledge needed to make wise decisions in handling their financial resources. In today's age, financial decisions are made day to day using all kinds of instruments. However, due to the impact of technology and digitalization, these financial tools are not just variative, but they are also accessible to all people from different sorts of classes. Financial literacy is needed to make all sorts of financial decisions (Bunyamin & Wahab, 2022), especially in understanding the risk and consequences of said decisions. With that said, financial literacy's importance goes beyond an individual level, but on a national scale. Frank (2009) gives this example with The Financial Crisis of 2008, which shows that the American public's financial literacy did not enable them to understand interest loans that were safe and ones that were not. Therefore, the impact of financial literacy is critical in creating sound financial decisions.

Financial Literacy has been proven to have a positive association with all kinds of financial behavior, which includes borrowing behavior. Goedde-Menk, et al. (2017) research has shown the positive influence between the two. Yet with the growing accessibility of financial products such as credit and investments, plenty of people especially those of young age are deficient in their knowledge of understanding to use those products properly (Lusardi, et al., 2009). Thus, the researcher developed the hypothesis to explore the effects financial literacy has on Generation Z BNPL users' borrowing behavior.

H1: Financial Literacy affects the borrowing behavior of Generation Z BNPL users.

2. Borrowing Behavior

Though not much research has touched on the true definition of Borrowing Behavior. Yazdanparast & Alhenawi (2017) mentioned in their research that Borrowing can be generally defined as any behavior that relates to using another's wealth to fulfill current necessities. According to Guo et al. (2023), there are two subjects in borrowing behavior. The first refers to things associated with the borrowing process, while the second subject is related to the type of lending channels, formal and non-formal.

3. Illusion of Control

Illusion of Control, otherwise known as Gambler's Fallacy, was first referred to as it's called in Ellen Langer's research where she defined it as forecasting the future chance of success higher than reality. Durand (2003) mentions that illusion of control changes the natural character for individuals to underestimate positive information and overestimate negative information, which results in error decision making. People who hold this behavioral bias assume that the result of their actions is solely their cause when in reality luck and other factors take part in the result (Peón & Antelo, 2021). Although this bias is highly discussed in investment decisions, there is still not much research on borrowing behavior. Hence, this study aims to assess the impact of illusion of control on Generation Z BNPL users' borrowing behavior.

H2: Illusion of Control affects the borrowing behavior of Generation Z BNPL users.

4. Pain of Paying

Pain of paying can be described as the emotional loss people experience when they detach from their own money, making payment more than just an economic activity (Soman, 2003). In that same research, Soman discovered that different payment methods have different transparency levels which are a factor in increasing or decreasing the pain of paying, highly affecting customer's consumption. This relates to another research that states that pain of paying is a defining factor in a customer's self-control (Prelec & Loewenstein, 1998). More recent research shows that mobile payment influence customers to pay for expensive products without receiving much pain of paying but rather the pleasure of consuming (Ma, et al., 2021). It is theorized that consumers' view of money as a finite source that brings protection and stability is the main factor that contributes to this behavioral bias (Reshadi, 2020). Pain of paying has been shown to be a contribution in consumers' choice of payment method, which shows that people purchase more with credit cards due to its ability to suppress the pain of payment (Raghubir & Srivastava, 2008). Therefore, this research is conducted to explore the influence of Pain of Paying on BNPL users' borrowing behavior, especially Generation Z.

H3: Pain of Paying affects the borrowing behavior of Generation Z BNPL users.

5. Overconfidence Bias

An enormous level of assurance over the correctness of a person's ideas is what Moore & Healy (2008) define as overconfidence which can also be called Over-precision. This bias pushes people to misjudge their ability in connecting their present borrowing with future income and their future asset liquidity (Killborn, 2005). This is coherent with a study that presents how overconfidence bias influences borrowers to overestimate their net income's capability in repaying their future loans which also mitigates their present-day mental stress but minimizes their future welfare (White, 2012). There is still very little research on the impact of this bias toward borrowing behavior. This is why the researcher aims to understand the effects Overconfidence Bias has on Generation Z BNPL users' borrowing behavior.

H4: Overconfidence Bias affects the borrowing behavior of Generation Z BNPL users.

6. Bandwagon Effect

Bandwagon effect or also known as herding behavior or herding mentality is described as people's tendency to have a surge of desire for a certain item simply because other people are using it (Biddle, 1991). The definition can be defined differently according to the context in which it is placed. For example, bandwagon effect in electoral voting is not derived from the influence of other people but rather the result expectation, which in this case is the probability of the winning candidate (Kiss & Simonovits, 2014). There is still so little to no research on the role bandwagon effect has on borrowing behavior, for most research on this variable is towards investment decisions. So, to which, this research develops the hypothesis to delve into the influence bandwagon effect has on Generation Z BNPL users' borrowing behavior.

H5: Bandwagon Effect affects the borrowing behavior of Generation Z BNPL users.

7. Present Bias

Present bias or hyperbolic discounting is an idea that people have the tendency to prefer current pleasures, closest to the present, rather than waiting for future ones (Ai, et al., 2016) (O'Donoghue & Rabin, 2015). Present bias is great in understanding and unfolding certain behaviors (O'Donoghue & Rabin, 1999). In studies on borrowing behavior, Research has shown that people who hold this bias tend to possess more credit card debt (Meier & Sprenger, 2010). Hence, the researcher wants to explore deeper on the effects of Present Bias on borrowing behavior, especially for Generation Z BNPL users.

H6: Present Bias Affects the borrowing behavior of Generation Z BNPL users.

8. Hypothesis Development

From the literature review above, the researcher is able to develop a number of hypotheses that would be the framework of this research. They are as follows:

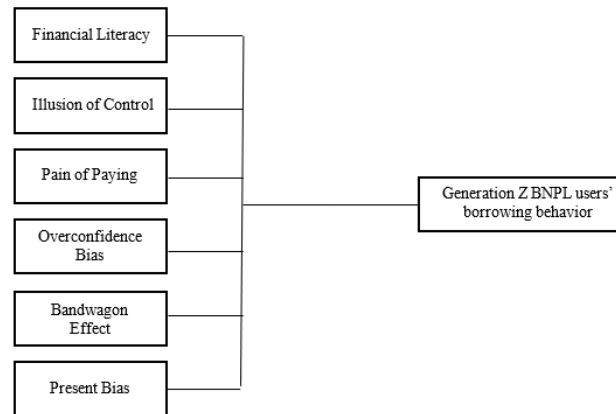


Fig. 1. Hypothesis Model

III. RESEARCH METHODOLOGY

1. Research Design

This research starts with what is known as problem identification. In this first step, the researcher discusses and explains the problem found within the relationship of the variables. After discovering the problem, the research questions can be developed from it, which will be answered in the final step of this research. Then, a foundational theory would need to be built from current and past research to further give the researcher and readers a firm understanding of each variable that would be analyzed in the research. This step would be called the literature review. Once the literature review is complete, the researcher would look back on the research questions, and from it, a number of hypotheses would be made and visualized in a conceptual framework. Continuing the research is the data collection process, which would be done using a questionnaire. After that, a reliability and validity test would be conducted in order to consider the goodness of the data. If the data proves to be reliable and valid, it could then be analyzed. The result should then answer the research questions in the final conclusion, which points of recommendation would be given.

The operational variables studied in this research are categorized under two types, they are independent variables and dependent variables. The independent variables are variables that influence the dependent variables either positively or negatively. Accordingly, the dependent variables are variables that are impacted by the independent variable, this causes its value to change in consonance with the independent variables. In this research, there are six independent variables which are Financial Literacy, Illusion of Control, Pain of Paying, Overconfidence Bias, Bandwagon Effect, and Present Bias. The dependent variable is the borrowing behavior of Generation Z BNPL users. Hence, this study will be looking at the effect of those six independent variables on the dependent variable.

2. Data Collection

The primary data is the main data collected by the researcher to fulfill this research objective (Hox & Boeije, 2005). The primary data is collected through a qualitative approach which the researcher chose due to its suitability with the need for an immense amount of data for Generation Z BNPL users in Indonesia. To support the primary data, secondary data is taken from a number of previous studies.

Ideally, it would be best to include the whole population for our respondents. However, due to the time constraint the researcher has, the researcher takes a sample from the population that enables the researcher to take vigorous implications and generalized results (Gogtay, 2010). The population being studied in this research is Generation Z BNPL product users in Indonesia. In spite of that, there are no data available that specifically or generally mentions the amount of BNPL users in Indonesia. With that said the sample of the population would need to be calculated in another way. In using PLS-SEM, which this research does, the “rule of ten” can be used to calculate the minimum sample size (Hair, et al., 2014). The “rule of ten” multiplies the maximum number of hypotheses by 10. However, because this method is unable to take other factors that affect the statistical power, it may produce an insufficient sample size. Therefore, sample sizes that are normally found in SEM, that is around 150-200 would be more appropriate (Garson, 2014). Hence, the number of samples that the researcher must gather is 200.

For this study, the researcher uses non-probability sampling. Non-probability sampling means that the sample taken from the population is not gathered equally. Specifically, this research will apply purposive sampling because of the restraint on both time and resources available to the researcher. The criteria for the respondents are Generation Z (Ages 17-26), Indonesian citizens, and have used a BNPL product at least once.

In this study, a questionnaire is used to gather the primary data from Generation Z BNPL users. The questionnaire is designed to have close-ended questions which are assembled using the Linkert scale. There are three sections to this questionnaire: socio-demographic, financial literacy measurement, and behavioral biases. In the socio-demographic section, respondents are asked about their gender, age, and domicile. For the financial literacy section, the respondents’ financial knowledge and behavior are measured using questions from the OECD/INFE toolkit that measures financial literacy in 2022. The toolkit was utilized for this study because of its mass application in financial literacy research. In the last section, the questions are made based by referencing past studies on behavioral bias.

3. Data Analysis

Once the data are gathered, the researcher could analyze it using the Partial Least Square Structural Equation Model (PLS-SEM) through SmartPLS. This analysis method is a part of the structural equation model (SEM), which is a technique that enables researchers to model and measure complex relationships between dependent and independent variables (Hair, et al., 2014). The researcher also uses descriptive statistics to organize and summarize the financial literacy level data.

IV. RESULT / FINDING

1. Respondent’s Profile

The questionnaire used to gather the data are separated into multiple parts, specifically four. The first section of the questionnaire is the demographic section. In this part, data concerning the respondent’s characteristics are gathered. Those data include gender, age, and domicile. The results of those characteristics are shown below.

Table 21. Respondents Gender

Gender	Frequency	%
Male	87	44%
Female	113	57%
Total	200	100%

Table 22. Respondents Age

Age	Frequency	%
25 - 26	45	23%
23 - 24	44	22%
21 - 22	46	23%
19 - 20	55	28%
17 - 18	10	5%

Total	200	100%
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Table 1. shows that the respondents consist of 52 males (44%) and 96 females (57%). This information indicates that the majority of the respondents are female (57%) with 26 more than the male respondents. While from Table 2. it can be implied that the respondents are equally varied in age between 19 to 26 years old (22% - 28%) with only 10 respondents aged 17 to 18 (5%). This signifies that this study represents all age groups of Generation Z.

As seen in Table 3, the respondents came from multiple parts of Indonesia with the majority coming from Bogor (42%). The rest of the respondents are scattered across the countries, from regions such as Bandung (10%), Jakarta (7%), East Java (7%), Central Java (5%), Bali (2%), Riau (2%), Kalimantan (1%), and Sulawesi (1%). The others (19%) are regions with only one or two respondents such as Palembang, Lampung, Nusa Tenggara Timur, and Nusa Tenggara Barat. The varied domicile of the respondents validates this study's claim to scope the nation's borrowing behavior.

Table 23. Respondents Domicile

Age	Frequency	%
Bogor	85	43%
Bandung	21	11%
Jakarta	15	8%
East Java	15	8%
Central Java	10	5%
Depok	5	3%
Bali	4	2%
Riau	4	2%
Kalimantan	3	2%
Yogyakarta	2	1%
Sulawesi	2	1%
Others	34	17%
Total	200	100%

2. Financial Literacy Descriptive Statistics

In the second part of the questionnaire, the respondents are given six questions from OECD to measure their financial literacy level. There are six questions within this section with questions that captures the respondent's financial literacy in various aspects. The results are shown below:

Table 24. Respondents' Financial Literacy Results

Questions	Respondent Answers	
	Right Answer	False Answer
Q1	175 (87.5%)	25 (12.5%)
Q2	73 (36.5%)	127 (63.5%)
Q3	116 (58%)	84 (42%)
Q4	187 (93.5%)	13 (6.5%)
Q5	193 (96.5%)	7 (3.5%)
Q6	181 (90.5%)	19 (9.5%)

From the table above, Indonesia's Generations Z possesses excellent financial literacy, with an average score of 46.25 from a maximum score of 60 and a minimum score of 0. This number proves that Generation Z in Indonesia possesses a high level of financial literacy. With a median score of 50, the Generation Z of Indonesia has a financial literacy level that is above average.

3. Validity Test

The validity test assesses how well was the questionnaire as a tool in showcasing the appropriate results (Cizek, 2020). This test consists of two parts, convergent validity and discriminant validity. Convergent validity uses Average Variance Extracted (AVE), which value should be higher than 0.5, and Standardized Loading Factor (SLF) which value should be higher than 0.7. For the discriminant validity, the value calculated is the square root of the AVE, and its value must be higher than the other latent variables for it to be acceptable (Wong, 2013). The result of the convergent validity is shown below:

Table 25. Outer Loading Result

Variable	Label	Outer Loading	Validity
Financial Literacy	F1	0.84	Satisfactory
	F2	0.854	Satisfactory
	F3	0.885	Satisfactory
	F4	0.792	Satisfactory
	F5	0.82	Satisfactory
Borrowing Behavior	Y1	0.962	Satisfactory
	Y2	0.95	Satisfactory
	Y3	0.919	Satisfactory
Illusion of Control	IC1	0.951	Satisfactory
	IC2	0.945	Satisfactory
Pain of Paying	PP1	0.968	Satisfactory
	PP2	0.671	Fair and Acceptable
Overconfidence Bias	OB1	0.962	Satisfactory
	OB2	0.951	Satisfactory
Bandwagon Effect	BE1	-0.019	Not Satisfactory
	BE2	0.658	Fair and Acceptable
	BE3	0.74	Satisfactory
	BE4	0.293	Not Satisfactory
Present Bias	PB1	0.968	Satisfactory
	PB2	0.671	Fair and Acceptable

From Table 5, the researcher removed the indicators that did not fulfill the outer loading value requirements to be considered valid. Once they are removed, it can be seen that most of the indicators are valid with a score higher than 0.7. There are two indicators that are below 0.7 which are PP2 and PB2. However, because their value that is still above 0.4, they are still considered valid with a score of 0.671 and 0.604. Therefore, all the indicators are acceptable for the next test. With the SLF test conducted, the researcher moves to the Average Variance Extracted (AVE) test. A score that is equal to or greater than 0.5 is needed to be considered valid and pass the convergent validity test (Wong, 2013).

Table 26. Average Variance Extracted (AVE) Results

Variable	Average Extracted	Variance	Validity
Financial Literacy	0.704		Valid
Generation Z BNPL Users' Borrowing Behavior	0.891		Valid
Illusion of Control	0.9		Valid
Pain of Paying	0.693		Valid
Overconfidence Bias	0.915		Valid
Bandwagon Effect	0.267		Not Valid
Present Bias	0.614		Valid

As seen in Table 6, all of the variables except for Bandwagon Effect are considered valid with an AVE score above 0.5. The researcher deletes the Bandwagon Effect variable because it did not meet the AVE requirements. Hence, the SLF and AVE calculations are able to assure the indicator and variable's validity through the convergent validity. All the variables except Bandwagon Effect passed the validity test and are able to be incorporated into this study. But before continuing to the reliability test, the variables must pass the discriminant validity test. For the discriminant validity test, this study uses the Fornell Larcker Criterion. To gain the value of the Fornell Larcker Criterion, the square root of the AVE is calculated. The requirement is that the square root value should have a larger value than all the other relationships, both column and row (Wong, 2013).

Table 27. Fornell Larcker Criterion Result

	Financial Literacy	Generation Z BNPL Users' Borrowing Behavior	Illusion of Control	Overconfidence Bias	Pain of Paying	Present Bias
Financial Literacy	0.855					
Generation Z BNPL Users' Borrowing Behavior	0.751	0.975				
Illusion of Control	0.687	0.794	0.948			
Overconfidence Bias	0.595	0.741	0.822	0.956		
Pain of Paying	0.383	0.419	0.443	0.553	0.828	
Present Bias	0.397	0.402	0.417	0.538	0.395	0.78

The result shows that all the variables' AVE square root has a value that is greater than the other square root construct of each variable. Hence, the measurement is able to discriminate between the variables. This signifies that there is no discriminant validity problem with this construct for all the square roots of AVE fulfills the requirement.

4. Reliability Test

The reliability test measures how consistent the results are. The result of the test would be considered reliable if the value found is larger than 0.7. However, a value greater than 0.4 is still considered acceptable and reliable (Wong, 2013). Table 8. shows that the Cronbach's alpha and Composite reliability shows scores of reliabilities, for most of the variables passed the requirement score of 0.7. There are two variables namely Pain of Paying and Present Bias that has scores below 0.7 but is still considered fair and reliable with a score greater than 0.4.

Table 28. Reliability Test Results

Variable	Cronbach's alpha	Composite reliability	Reliability
Financial Literacy	0.877	0.915	Reliable
Generation Z BNPL Users' Borrowing Behavior	0.947	0.974	Reliable
Illusion of Control	0.888	0.947	Reliable
Overconfidence Bias	0.907	0.955	Reliable
Pain of Paying	0.632	0.808	Reliable
Present Bias	0.422	0.746	Reliable

5. Collinearity Test

The collinearity test assures that the independent variables are not correlated within one another. The test is assessed using VIF that is taken from "1/Tolerance" and its value should be smaller than 5. As seen in Table 9, all of the indicators' VIFs are below 5, making all the variables pass the collinearity test as none of them show signs of multicollinearity.

Table 29. Collinearity Test Results

Variable	Label	VIF	Conclusion
Financial Literacy	FL1	2.139	No Symptoms of Multicollinearity
	FL2	2.884	No Symptoms of Multicollinearity
	FL3	3.265	No Symptoms of Multicollinearity
	FL4	1.849	No Symptoms of Multicollinearity
	FL5	2.082	No Symptoms of Multicollinearity
Illusion of Control	IC1	2.768	No Symptoms of Multicollinearity
	IC3	2.768	No Symptoms of Multicollinearity
Overconfidence Bias	OB1	3.215	No Symptoms of Multicollinearity
	OB2	3.215	No Symptoms of Multicollinearity
Present Bias	PB1	1.077	No Symptoms of Multicollinearity
	PB2	1.077	No Symptoms of Multicollinearity
Pain of Paying	PP1	1.271	No Symptoms of Multicollinearity
	PP2	1.271	No Symptoms of Multicollinearity

6. Inner Model Test

To assess the inner model, this study uses the Coefficient of Determination (R^2) and the Stone-Geisser test (Q^2). The Coefficient of Determination (R^2) gives us information on how accurate is the inner model, which based on Table 10., the inner model is 72.9% accurate. Which means that the model has a moderate effect on the dependent variable (Wong, 2013). Meanwhile, the Stone-Geisser test result should be above 0 to show predictive relevance (Fauzi, 2022). For the Stone-Geisser test, the researcher uses the PLSpredict calculation in SmartPLS. Because the Stone-Geisser result is 0.694, which is above 0, the model has predictive relevance upon the construct.

Table 30. Inner Model Test Results

	Coefficient Determination (R ²)	of Stone-Geisser (Q ²)
Generation Z BNPL Users' Borrowing Behavior	0.729	0.694

7. Hypothesis Testing: Bootstrapping

Using the bootstrapping method in SmartPLS, the researcher is able to conceptualize the relationship between each independent variable with the dependent variable. The hypothesis would be accepted if the T-value is greater than 1.96. While the P-value would show a significance level of 95%. The path coefficient should reveal if the relationship is positive if its value is larger than 0. The results of each hypothesis are shown below:

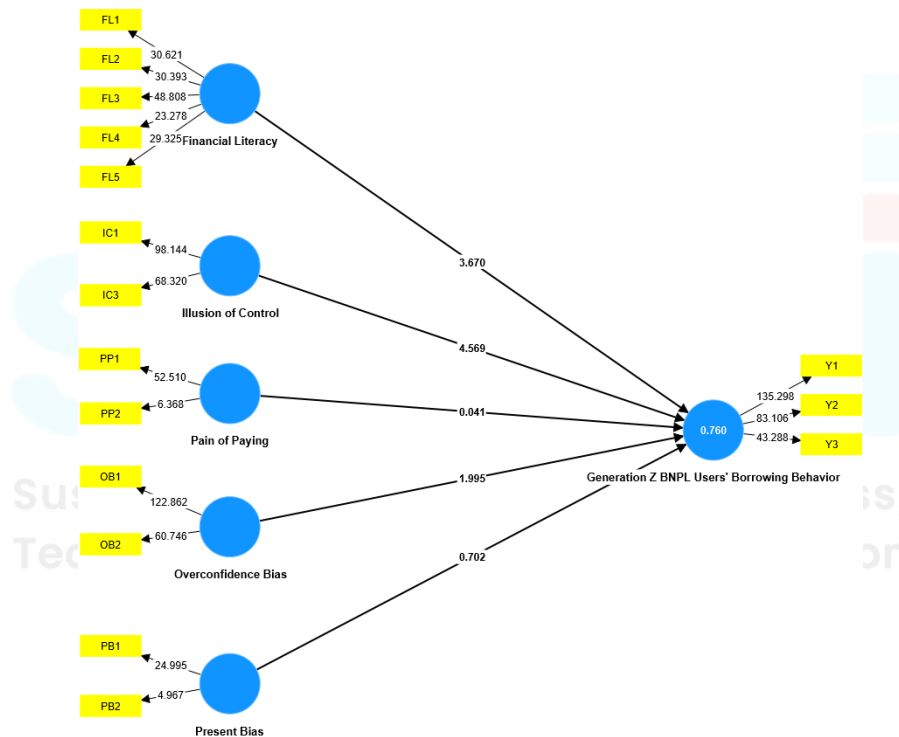


Fig. 2 PLS-SEM Bootstrapping T-Value

The result from Table 11. indicates that the hypothesis that Financial Literacy, Illusion of Control, and Overconfidence Bias influences Generation Z BNPL users' borrowing behavior is accepted for their T-value is above 1.96 and their P-value is within the significance level of 95%. The positive value of the path coefficient also signifies that those variables are positively influencing the dependent variable. Both the hypothesis that Pain of Paying and Present Bias influences the borrowing behavior of Generation Z BNPL users are rejected. This happens because their T-value are below 1.96 and their P-value did not fall within the significance level of 95%, which shows that both of those variables are not significant

Table 31. Bootstrapping Result

Hypothesis	Path Coefficient	T-Value	P Value	Result
H1 Financial Literacy affects the borrowing behavior of Generation Z BNPL users.	0.38	3.711	0.000	Hypothesis Accepted

H2	Illusion of Control affects the borrowing behavior of Generation Z BNPL users.	0.336	2.876	0.004	Hypothesis Accepted
H3	Pain of Paying affects the borrowing behavior of Generation Z BNPL users.	-0.007	0.149	0.882	Hypothesis Rejected
H4	Overconfidence Bias affects the borrowing behavior of Generation Z BNPL users	0.256	2.511	0.012	Hypothesis Accepted
H5	Present Bias Affects the borrowing behavior of Generation Z BNPL users	-0.023	0.476	0.634	Hypothesis Rejected

8. Hypothesis Testing: F Square Root Effect

The F Square completes the hypothesis test by assessing the effect size of each relationship. An effect size of 0.35 and higher is considered a large effect. 0.15 or greater is a size that shows moderate influence. A modest effect is considered with a size of 0.02. While under 0.02 would mean that there is no substantial effect.

Table 32. F Square Root Effect Results

Variable	F result on Generation Z BNPL users' borrowing behavior	Criteria
Financial Literacy	0.271	Moderate Influence Effect
Illusion of Control	0.108	Modest Influence Effect
Overconfidence Bias	0.061	Modest Influence Effect
Pain of Paying	0	No Substantial Effect
Present Bias	0.001	No Substantial Effect

As seen in Table 12, Financial Literacy has the highest influence effect on Generation Z BNPL users' borrowing behavior compared to the other variables with an F2 of 0.271. The F2 of Overconfidence Bias and Illusion of Control show a modest influence on Generation Z BNPL users' borrowing behavior. While Pain of Paying and Present Bias has no substantial effect since their F2 results are below 0.15. Therefore, Hypothesis 1, Hypothesis 2, and Hypothesis 4 are accepted. On the contrary, Hypothesis 3 and Hypothesis 5 are rejected.

V. DISCUSSION

Based on the analysis, all variables except bandwagon effect are shown to be valid and reliable, while the hypothesis testing shows that three variables positively affect Indonesia's Generation Z BNPL users' borrowing behavior. The most significant variables are Financial Literacy, followed by Illusion of Control, and Overconfidence Bias. The descriptive statistics results also show that Generation Z has a great financial literacy level which is an excellent driver in creating a healthy borrowing pattern for Generation Z in using "Buy Now, Pay Later". However, the existence of two behavioral biases can influence Generation Z to leave their rational thinking and fall into decisions that are impacted by their biases. The Illusion of Control bias leads Generation Z constantly use BNPL without taking notice of other factors that control their financing activities. While Overconfidence bias steers Generation Z to believe that their skills and knowledge is the only deterrent in their borrowing activities. Therefore, although Generation Z has an excellent financial literacy level and that in itself is a highly significant factor in their borrowing behavior, two behavioral biases are still found to take part in influencing how Generation Z BNPL users borrow. This is supported by past research that conveys the connection between overconfidence and financial decisions. The research shows that overconfidence decreases an individual's ability in making sound financial decisions (Aristei & Gallo, 2021). The model from the research findings is visualized below:

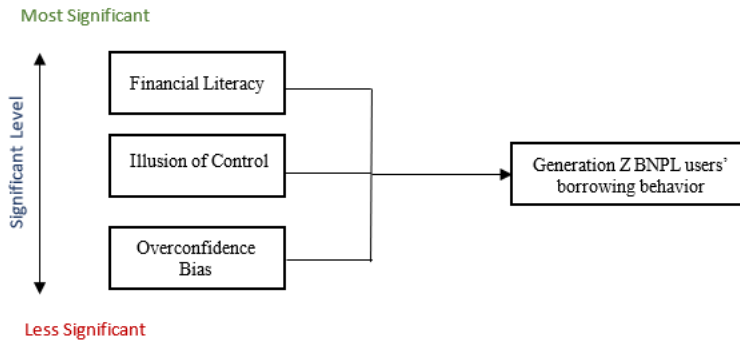


Fig. 3 Research Model Result

VI. CONCLUSION AND RECOMMENDATION

This Paper has studied the influence financial literacy and behavioral biases have on Generation Z BNPL users' borrowing behavior. By using data from 200 Generation Z BNPL users across Indonesia, the researcher was able to analyze and found compelling results. This study started with six independent variables, which are Financial Literacy, Illusion of Control, Overconfidence Bias, Pain of Paying, Bandwagon Effect, and Present Bias. One of those variables, namely bandwagon effect did not pass the validity test. While only three passed the hypothesis testing and have them accepted.

The result answers the aim of this paper which is to investigate the influence of financial literacy and some behavioral biases on Generation Z BNPL users' borrowing behavior. The well-literate Generation Z, with a level of 77.08%, has positively influenced the borrowing behavior of Generation Z BNPL users. This indicates that Generation has sufficient financial literacy to make great financial decisions through the BNPL platform. However, the study also finds that the behavioral biases of illusion of control and overconfidence bias also have a positive influence on Generation Z BNPL users' borrowing behavior. This determines that Generation Z may underestimate external factors that are in play on their borrowing activities, while also overestimating their abilities and financial literacy. In conclusion, Generation Z in Indonesia does possess a great financial literacy level, but may not be capable of being entirely rational by depending back on their biased tendency in borrowing using "Buy Now, Pay Later" payment methods.

With all of this study's findings, there are still limitations to this research. The researcher had to do this research within six months with few resources. This is why further research with more respondents evenly distributed across Indonesia could show better results in understanding Generation Z BNPL users' behavioral biases and their financial literacy. Further research can also touch on more kinds of behavioral biases that have not yet been explored in this study.

The purpose of studying behavioral biases is to know more about the irrational human tendencies that often result in destructive financial decisions. Thus, to avoid that phenomenon, there are recommendations that the researcher gives to Generation Z. This study has found that financial literacy is an influencing factor in Generation Z BNPL users' borrowing behavior. However, two behavioral biases were also found to be an impact on it as well. Hence, the recommendation for each bias would be discussed. The Illusion of Control bias leads Generation Z BNPL users to be unaware or ignorant towards external factors that are in effect on their borrowing activities while Overconfidence bias brings Generation Z to be over-assured about their skills and abilities in their financing activities. This bias is dangerous for Generation Z because it may lead them to excessive borrowing as well as debt issues when unexpected events take place. To tackle this, Generation Z need to be more aware of external factors that are affecting their financing activities like economic fluctuations as well as taking on more information on how they should handle their borrowing behaviors instead of relying on their intelligence.

Because of the significance of financial literacy found in this study, this is the recommendation for "Buy Now, Pay Later" Platforms to enhance their services. BNPL providers can evaluate their users' financial literacy even more to evaluate their customers' abilities in fulfilling their payments. One of the ways they can do this is by creating a digital financial literacy test as a part of their customer screening process.

Lastly, as the nation's regulator, Indonesia's Government has a role in creating policies that can reduce debt levels for Generation Z BNPL users in the country. The Indonesian government needs to constantly improve the generation's financial literacy, especially in managing credits and access to information on managing debt. This effort should be made to help Generation Z in managing their finances better as well as evade debt traps.

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Developing Marketing Strategies for Early-stage Social Media Startup in United States: A Case Study of My Carousel App.

Elan Pradana¹, Fitri Aprilianty²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

Increasingly, social media is replacing traditional media in satisfying the entertainment demand of young people. My Carousel as an early-stage social media start-up to get a fraction in the industry. Their unique value proposition is providing a platform that is free of advertisement. However, as an early-stage startup, they have not established the strategy for to attract users and high-quality creator and building a sustainable profit without ads. The goal of this study is to help Carousel achieve its vision of creating a platform that supports economic activity without ads, and attracts both users and high-quality creators to scale its business model. Basic strategic management model is applied to the research with a combination of primary and secondary data sources to support strategy formulation. Internal and external business environment gathered and analyzed. Findings from the business environment analysis concluded in a SWOT matrix then applied to the proposed strategies. The strategies include store opening procedure, adaptive algorithm, creator buffet, and joint business planning that assisted with the implementation plan. From the result, this research contributes for start-ups in the social media industry who want to learn from My Carousel case and apply the solution presented in this study.

Keywords: Digital communications technology, Early-stage start-up, social media, My Carousel.

I. INTRODUCTION

Increasingly, social media is replacing traditional media in satisfying the entertainment demand of young people. We are currently experiencing a period of fast technological development, also known as the "digital era," which is being driven by digital technology. The development of new technology has altered economies and society. As artificial intelligence (AI) inspires a new wave of breakthroughs, we might be on the verge of a dramatic deepening and acceleration of our economies' and societies' ongoing digital transformation. Digital media can transport us to new places, allow us to forge bonds with people from across the world, and help us feel part of something larger than ourselves. We can tap into creators, trusted advisors, communities, and experiences from wherever we are with just a click or a swipe. Faster than anticipated, the future is approaching (Qureshi, 2022).

Huge numbers of people throughout the world use the internet, social media, mobile apps, and other digital communications technology on a daily basis. Recorded those 4.76 billion individuals, or 59.4% of the world's population (Figure 1), are active internet users as of January 2023, according to recent figures (Statista, 2023). Social media usage has become an integral element to the lives of many people across the world

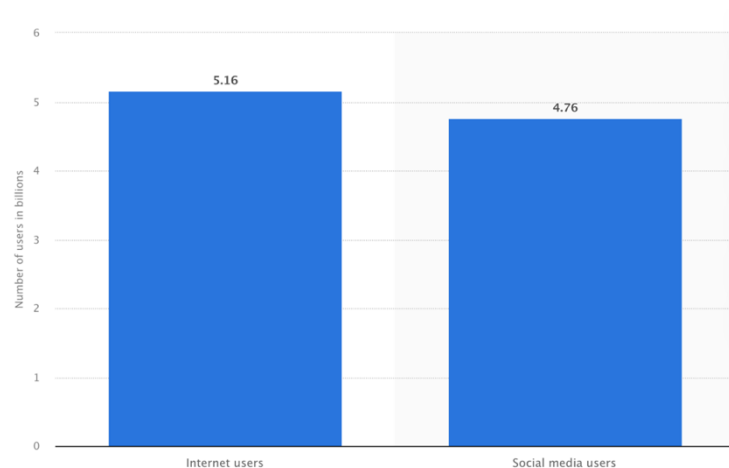


Figure 1. US Social Media User

Between 2023 and 2028, there will be an overall rise of 22.8 million users (+7.4%) in the number of social media users in the US. The number of social media users is predicted to reach 331.09 million users and, as a result, will reach a new peak in 2028 after the fifth straight year of growth (Figure 2). Notably, during the past few years, the number of people using social media has been steadily rising (Dixon, 2023)

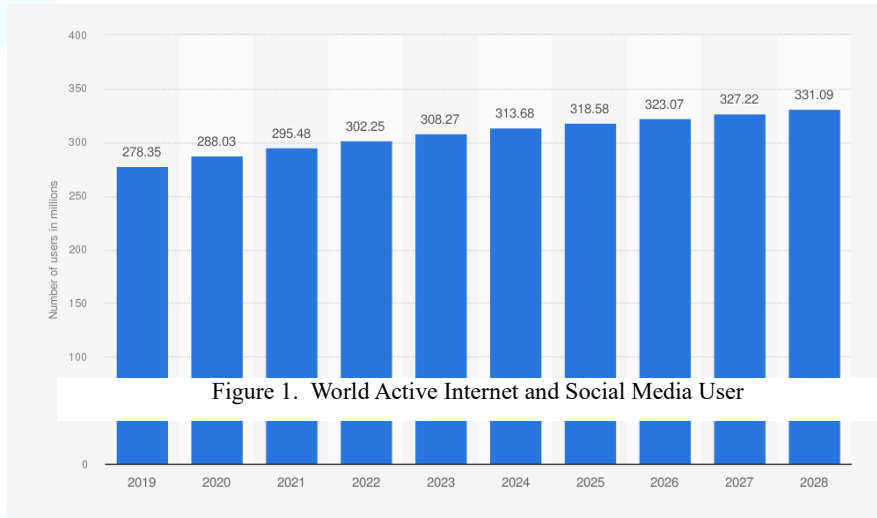


Figure 2. US Social Media User

There are various social media existed in the United States. Instagram was the most downloaded social media application in the United States in 2021. The app for sharing pictures and videos had 72 million downloads in the United States. WhatsApp, with 63 million downloads, was the second most downloaded program. Facebook Messenger ranked third, with approximately 46 million downloads from users in the examined period (Statista, 2023).

Sustainable Collaboration in Business,

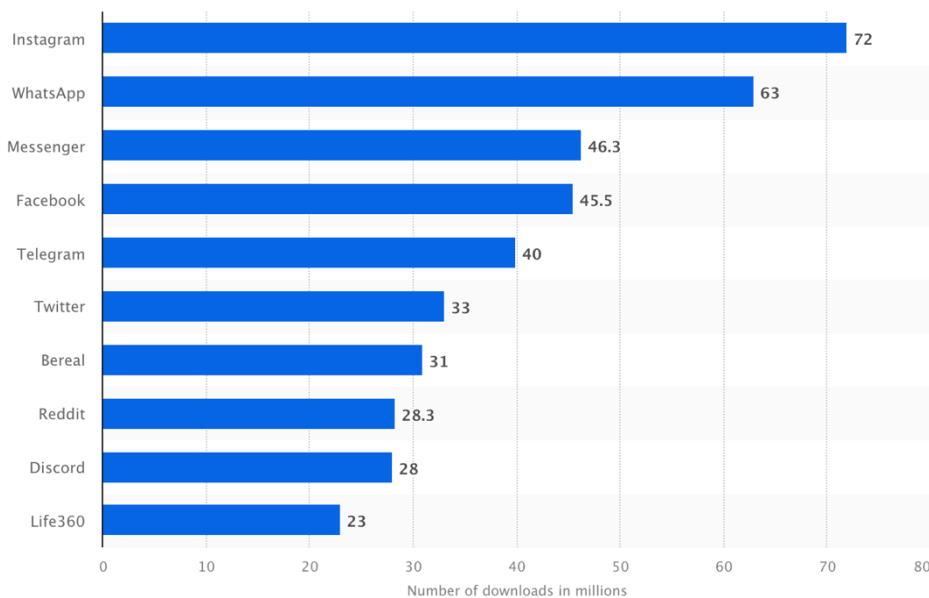


Figure 3 Top Social Media Apps by Downloads

But the presence and growth of TikTok creates a new competition in the social media industry. Reported also in 2021, social video app TikTok had approximately 86.9 million users in the United States. This number is projected to increase by around eight percent year-over-year, reaching 94 million users in 2022. TikTok is one of

the fastest-growing social media apps in the United States and especially popular with younger digital audiences (Ceci, 2022).

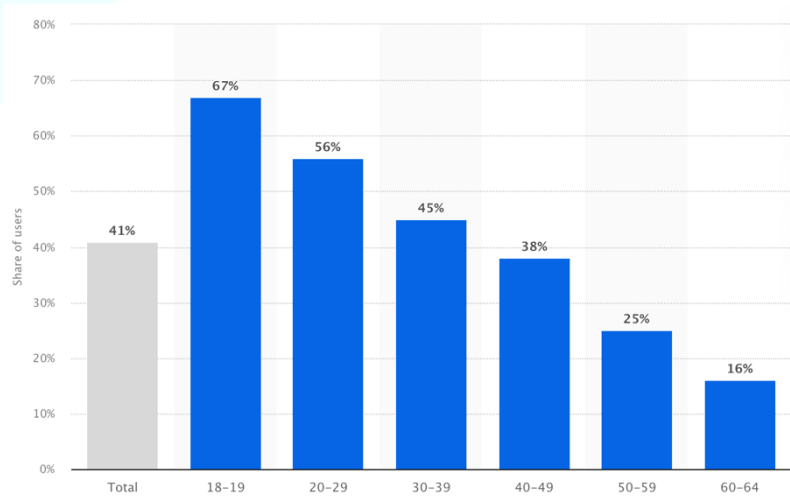


Figure 3. TikTok User by Age

The prevalence of TikTok, a 2016-launched social video app used for sharing and creating video content, continues to rise. As of 2022, approximately 41 percent of social media users in the United States were utilizing the ubiquitous social video app. Around 7 out of 10 teenagers between the ages of 18 and 19 used TikTok, whereas 56% of those between the ages of 20 and 29 did so (Statista, 2023). The Biden government has threatened to ban it in late 2022. The US government now considers TikTok, which is well-known for videos of people dancing, lip-syncing, and creating bread, to be a threat to national security as of 2023 (CNN, 2023).

There are numerous factors that make TikTok so accessible. People can really just pull out their smartphone and begin filming. There are options such as reaction videos. User can add various music or sound samples to their videos. Then, following users can modify them. And TikTok is focused less on connecting users with their family and friends and more on getting users to view all of these short videos. And it aimed to be more like television than a conventional social media application. When user launch the app, user are immediately presented with an endless stream of extremely brief videos. And very rapidly, the app begins to monitor user's subsequent actions. It examines how long user view the video and when user click away from it. If user leave a comment on the video or send it to a friend, all of that information is recorded. And it uses this information to rapidly customize the next video user watch, as well as the ones that follow. And its algorithm is exceptional at choosing what user enjoyed and serving user more of it (Maheswari, 2023). TikTok continues to introduce new features, some of which will be of great interest to brands engaged in social media marketing. After nearly a year of testing, TikTok has released TikTok Shopping, its most popular social commerce offering. Advertising based on personal data (such as demographic data, purchase information, and browsing data), also known as personalized advertising, has become more and more common in social media advertising with the development of data mining and recommendation algorithms (Knoll, 2016). Advertisers can successfully capture consumers' attention by pushing personalized advertisements to consumers. But personalization of advertising raises issues and emotions of vulnerability over potential breaches of privacy, which might lower the effectiveness of advertising.

This opportunity will not be wasted by My Carousel as an early-stage social media start-up to get a fraction in the industry. Based on the data from Nick, My Carousel's Co-Founder, there are lots of start-up which have various proposition, such as social event connections, new social media, creator tools, content discovery, monetized social platforms, and creative booking service that also make an effort to set a position in the industry. My Carousel is an early social media start-up that have planned to launch their BETA version of their app in this Summer of 2023. An early-stage start-up begins with a scalable idea that attracts funding (Adhanan, n.d). Based on their Co-Founder, their unique selling proposition is providing a platform that is free of advertisements. In order to provide

a platform that is free of advertisements, certain users will have stores on their profiles and operate on the platform accordingly to take control over their online presence. Considering that the platform has no advertising activity, the revenue of the app becomes an issue as other social media platforms are using ads as their main revenue streams.

The demand for Carousel will be impacted by the enjoyment of the platform, which relies on both the quality of the app's contents and its social rewards. The platform will support paywalled content by popular creators and artists, e-commerce, and services. Generally speaking, the higher the quality of the user base, the easier it will be to attract and maintain high-quality stores. Co-Founder, Nick, stated that developing the strategy to scaling up a user base is My Carousel's top priority. Thus, the Co-Founder of My Carousel have addressed researcher to solve these following problems:

1. How to attract users and high-quality creators?
2. How to build a sustainable profit without ads?

This research focuses to help Nick, the Co-Founder, on finding a proper and suitable strategy for My Carousel in their early stage phase using a strategic management basic model. Furthermore, the researcher hopes to create a strategy that will help My Carousel in scaling up as an early-stage social media start-up that will launch its BETA version in the summer 2023. Aside from that, this study can be valuable for start-ups in the social media industry who want to learn from My Carousel case and apply the solution presented in this study.

II. LITERATURE REVIEW

Carousel is an app for people to create, discover, and share content in an intentional, action-oriented way founded in 2022. Their value proposition is providing a platform that is free of advertisement. Users curate and exchange content that means something to them with hand-picked individuals and groups. They share multimedia collections in a context that encourages thoughtfulness and real activity: reflection, collaboration, transactions, and real-life interaction. Born out of a community of photographers and videographers, My Carousel value total ownership over the creative process: the app has extensive photo and video editors, creator subscription structures, and fully customizable stores. Above all, the platform is engineered to encourage the initiation and execution of real-world plans by providing tools for users to organize events, meetups, and projects together through their shared spaces. My Carousel is leaning into familiar designs but ultimately encouraging new outcomes of social media use. Above all My Carousel value honest self-expression, mindfulness, and unabashed creativity (in the broadest sense imaginable).

As an early stage social media start-up, My Carousel has a vision and mission to build a trustworthy network. The platform vision is:

“to connect the world in the name of creation.”

Their missions includes:

- Encourages new outcomes of social media use.
- Attract creators whose success will be the platform's success.
- Building out a mechanism of value creation and capture.

My Carousel consisted of 2 Co-Founders, Nick and Aidan, and some interns and employees including Malik Francis as The Creative Director, Sebastian Posillico as their Marketing Director.

III. RESEARCH METHODOLOGY

The object of this research is My Carousel as an early stage start-up. The limitation might occur due to the dynamics of an early stage start-up company and the geographic challenges. The research was conducted remotely from Indonesia. The U.S. social media user respondents were gain using convenience and snowball sampling method. Majority of the respondents lived in Boston because the BETA version were develop together with

Harvard students and disseminated around the nearest communities. The research will be conducted between January 2023 and March 2023, within the prescribed timeframes. A strategic change beyond the timeframe will not affect the result of the study.

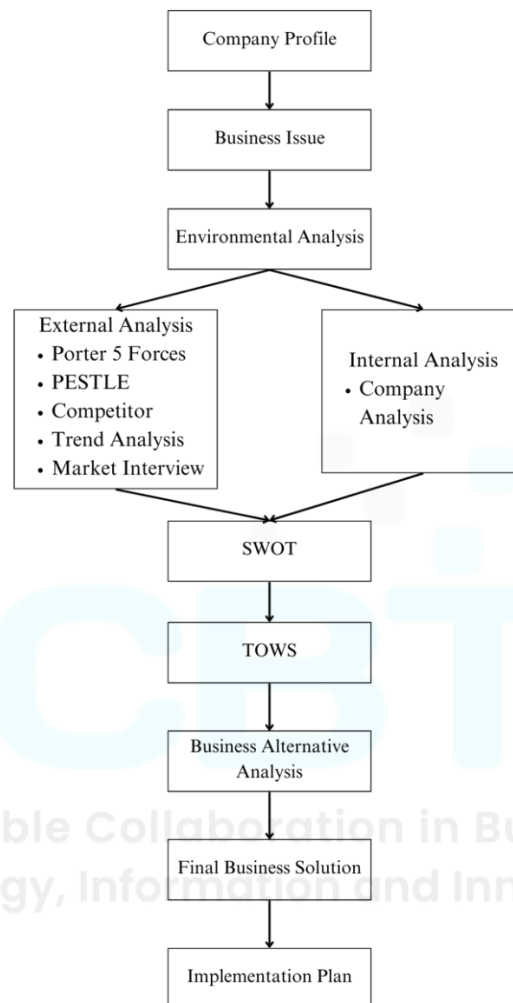


Figure 4. Research Design

The research design constructed for this study consist of company profile, business issue, environmental analysis, SWOT identification, TOWS analysis, business alternative analysis, and implementation plan as the final part. The business issue arise as the Co-Founder of My-Carousel, Nick Plante, needs an inputs of his project. The current condition of My Carousel as an early-stage start-up made it like a blank canvas to draw. Environmental analysis is conducted to gain a better perspective of the business environment and the internal condition of the start-up. The environmental analysis is divided into two, external and internal. Interview was conducted to gain data from the internal of the start-up through the Co-Founder, Nick. From the interview, researcher formulate SWOT analysis to better develop the strategy to be purpose that relevant to the strength, weakness, opportunity, and threat that existed. TOWS matrix then develop as the foundation of the strategy proposed as its helps researcher to take action from the SWOT analysis. The strategy proposed is followed by the implementation plan.

Qualitative methods will be applied in this study. The term qualitative implies an emphasis on thoroughly examined processes and meanings that are not quantified in terms of quantity, volume, or frequency. Qualitative methods typically generate plenty of detailed information about quite lesser number of individuals and cases. Through direct quotation and careful description of situations, events, interactions, and observed behaviours, qualitative data provide depth and precision (Labuschagne, 2015)

The data collected were divided into two, primary and secondary. Primary data collected through interviews of two subjects, My Carousel's Co-Founder and U.S. Social Media Users. The semi-structured interview will be conducted to the social media user in United States. Due to the semi-standardized interview's flexibility, the interviewer is able to ask a series of less organized questions and investigate any unplanned issues that the interviewee brings up. Semi-standardized (or semi-structured) interviews present a more adaptable method of conducting interviews. Although they may follow a timetable for the interview and ask about predetermined topics, they utilize open-ended questions to allow for unexpected responses and problems to arise (Priest et al., 2006). The wording of the questions is adaptable, allowing the interviewer to utilize a variety of phrases and provide clarifications (Berg, 2009). The U.S. social media user interviewed are Gen Z since it fits My Carousel's target market based on the Co-Founder interview. The respondent of social media user in United State must currently base in the U.S. and have stayed in the U.S. for more than 5 years in order for them to have experience the before and after pandemic social media environment. The respondents also have to had minimum of 3 different social media with the condition that one of them is Instagram, TikTok, or YouTube.

The structured interview was conducted to the Co-Founder of My Carousel App, Nick, as he only willing to do a structured interview due to his constrain in time and the problem has been confirmed by Nick prior to the interview. Structured interviews are the most systematized type of interview. In contrast to semi-structured or unstructured interviews, the interviewer uses predetermined questions in a set order (George, 2022).

"Netnography," or ethnography on the Internet, is a new qualitative research methodology that adapts ethnographic research techniques to the study of cultures and communities emerging through computer-mediated communications. As a marketing research technique, "netnography" uses the information publicly available in online forums to identify and understand the needs and decision influences of relevant online consumer groups (Kozinets, 2002). An annual industry report is compiled and evaluated as a basis for My Carousel's business activity. The information delivered on the report will include year-to-date essential insights on trend, customer behavior, and graphs. The data gained will be analyzed to develop the model and strategy for My Carousel. The report used in this research is "Digital 2022 Global Overview Report" which partnered with GWI, App Annie, Statista, Locowise, Similarweb, GSMA Intelligence, Semrush, and Skai. Researcher also analyze "GWI's Flagship Report on The Latest Trend in Social Media" that interviews over 700,000 internet users aged 16-64 via an online questionnaire that includes over 20,000 internet users in the U.S. aged 16+ each quarter. Influencer marketing trend data also gained from the Creator IQ as a partner for TikTok with their intelligence cloud.

The data collected from the U.S. social media users analyzed using open coding. Open coding is the interpretive procedure used to divide data for analytic purposes. The objective is to provide the analyst with new insights by interpreting phenomena reflected in the data (Corbin & Strauss, 1990). Assigning conceptual labels to the interview results completes the procedure. This method is used to generate categories and subcategories based on conceptually comparable results (Corbin & Strauss, 1990). In this study, coding was performed by searching for insightful information based on the answers mentioned by the respondent.

IV. RESULT / FINDING

The interview of My-Carousel's Co-Founder formulated into strength and weakness of the SWOT. The interview result of the U.S. social media users coded as shown in Table 1 and will be included to the opportunity in SWOT analysis.

Table 1. US Social Media User Coding Result

Interviewee	Open Codes	Axial Codes	Selective Codes
FS	Encountering explicit content that is only hidden, not deleted	Community Regulation and Content Filtering	Creating a balance between content regulation, user safety, and data security to foster a positive and secure social media environment.
KA	Credibility of source		
FS	Suggestion for stricter guidelines to prevent intellectual property violation.		
KA	Stricter regulation for insensitive content		
KS	Suggestions for better age restrictions and fact-checking in content filtering		
FA	Valuing privacy and data security to prevent the misuse of personal data'		
KA	Privacy and data security concerns	Strengthening Data Security and Better Protect Privacy	

FS	Valuing privacy and being concerned about data tracking and potential data sharing by social media platforms		
FA	Hacking problems and privacy breaches as potential downsides		
KS	Privacy issues as a major concern		
FS	Ease of content discovery and search functionality	Enhancement of Content Discovery and Personalized Content Recommendations.	Providing users with personalized and diverse content recommendations while also supporting and empowering small creators.
KA	FYP page as the best page to discover relevant content		
FA	Content discovery from the explore page and mutuals		
KS	Importance of UI/UX and content filtering algorithms		
KS	Improved personalization and relevance in content recommendations		
KS	Discovery of new content or accounts through suggested feeds and algorithmic recommendations	Creating Opportunities to Support Small Creator	
KA	Opportunities for small creators		
FA	Equal chance for smaller creators		
FS	Belief in equal opportunities for content creators to go viral		
KS	Desire to see platforms value and support smaller creators		

The industry report used in this research is “Digital 2022 Global Overview Report” and key insights from GWI social media flagship report in terms of digital user behavior and trends. The insights gained from this report will be analyzed as external factors for the development of My Carousel and considerations for the strategy formulation.

Table 2. Trend Analysis Result

Wellness in The Digital Network	There is a growing demand of meaningful content by the Gen Z that will be an opportunity for My Carousel.
Social Commerce	The opportunity of social-commerce shown as the market is expected to grow more than \$2 trillion by 2025.
Brand Partnership	Brand partnership allows brand shift to a more collaborative ecosystem that open more opportunity in the app.
Joint Business Program	JBP allows P&G to increase their sales and also foster deeper and meaningful connections with their consumers indicates opportunity to implement the program.

Result of the external and internal SWOT analysis is displayed in Table 3 and it will be used by researchers to summarize internal and external factors, particularly in marketing efforts, that affect firm performance and development. Using SWOT analysis, My Carousel position assessed before deciding on the strategies.

Table 3. SWOT Table

<p>STRENGTHS</p> <p>S1 – Unique Value Proposition: By putting a strong emphasis on purposeful, action-oriented content creation, curation, and sharing, Carousel provides a unique value proposition. It distinguishes itself from conventional social media platforms by placing a strong emphasis on meaningful engagement and offline activities.</p> <p>S2 – Community of Photographer and Videographer: Carousel has an advantage in luring customers from this specialized sector because it was developed by a group of photographers and videographers. Building an active user base can be aided by utilizing this community that already exists.</p>	<p>WEAKNESSES</p> <p>W1 – No Previous Experience: Carousel may encounter difficulties due to its early-stage start-up status in terms of resources and dynamics as they had no previous experience. Planning strategically and scaling up the model will be necessary to overcome these obstacles.</p> <p>W2 – Still in Search for a Solid Team: With the reset of the project, the current team of My Carousel has possibility of some reshuffle adapting the resources needed.</p>
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<p>S3 – Mission-driven and focused on seeing a certain future through: instills a sense of purpose and direction, motivating individuals or organizations to persist through challenges and setbacks.</p> <p>S4 – Connect Brands to The Audience: With no advertisement in the platform. Brand could experiment in a new way to connect and become more relate to their audience and eventually build a meaningful connection.</p>	
<p>OPPORTUNITIES</p> <p>O1 – Social Commerce and Joint Business Program: To create a sustainable economic activity, My Carousel’s commerce could adopt JBP program and work collaboratively with aligned partners.</p> <p>O2 – Personalized and diverse content recommendations while supporting and empowering small creators: My Carousel may promote a lively and inclusive creative community by improving content discovery and paving the way for small creators.</p> <p>O3 – Influencing the Policies: Creating a balance between content regulation, user safety, and data security to foster a positive and secure social media environment.</p> <p>O4 – Growing Demand for Meaningful Content: Carousel aligns with the increasing demand for social media platforms that prioritize intentional, thoughtful, and meaningful content. Capitalizing on this trend can help attract users seeking a more purposeful social media experience.</p> <p>O5 – Partnerships and Collaborations: Collaborating with content creators, influencers, or brands that share Carousel’s values can help expand its user base and increase visibility. Partnerships can also provide access to resources and expertise that can fuel growth.</p>	<p>THREATS</p> <p>T1 – Tough Competition: Like other apps out there, My Carousel has to face the prospect of battling against veteran social media players like Facebook and Instagram. In addition, the App also has to gain a fair share of competitors within its industry, such as Facebook, Instagram, Snapchat, etc.</p> <p>T2 – Data Privacy Concerns: Social media platforms face ongoing scrutiny regarding data privacy and security. Carousel must prioritize strong data protection measures and transparent data handling practices to mitigate potential risks and maintain user trust.</p> <p>T3 – Changing User Preferences: User preferences and trends in the social media landscape can evolve rapidly. To stay relevant, Carousel must continuously adapt and innovate its features and user experience to meet changing demands.</p>

V. DISCUSSION

The strategy proposed will reflect to some best practices that used in the similar industry or platforms with adjustments from insights gained out of the primary and secondary data. Benchmarking from best practices can improve efficiency since they comprise the highest standards to do something and has proven result. Programs that proposed bellow are intended to create an overall balance mechanism of value creation for every stakeholder in the platform.

Content Quality and Quantity Control

To attract high quality users and creators, Carousel must establish transparent and supportive policy. High-quality users and creators can lend credibility and reputation to a platform. When respected individuals or organizations join and actively participate, it enhances the platform's image and legitimacy. This, in turn, attracts more users, including other high-quality users and creators, who want to be part of a reputable community.

Store Opening Procedure

My Carousel should set an account opening procedure as part content quality and control to enhance user experience. The procedure is mainly to regulate users that will become creators and also brands that will open shops. This includes store opening procedure that reflects the strategy undertaken by TikTok seeing their rapid growth and success. This procedure will highlight the ability for creators and brands to connect with the audience and potential customers since there will be not advertising activities in the app. Every purchase and withdrawal made in the app will have transaction fee to fulfill the revenue stream. This procedure also creates a safe and trustworthy economic environment in My Carousel. It is formulated to avoid counterfeit products and illegal brand/products that did not comply with the law.

Users including creators and brands should have met 1000 followers to be eligible opening a store in the platform. This procedure will foster content quality and quantity to gain followers organically. Step 5 shown in Table 4 will make sure the profile was posting original content, not spamming and recycling. Exclusive promo

and other promotional activities are permitted so that big brands could move their settled audience to My Carousel app. The transaction and withdrawal fee will cost at 1.5% of the amount plus the amount of state tax rate.

Table 0. Store Opening Procedure

Step	Procedures
1	Reach 1000 followers.
2	Go to the “Seller Center” to register your shop.
3	Choose between “Individual” or “Company” and verify you ID or business license.
4	Complete business data. (e-mail, phone, address, etc)
5	Link bank account or payment credentials.
6	My Carousel will analyze brand’s profile and the content posted.
7	Upload your product and wait for confirmation.
8	Product confirmed by My Carousel.
9	Store established.

Adaptive Algorithm

Small creators frequently struggle to be seen and find a larger audience. By employing a cutting-edge adaptive algorithm that prioritizes niche content, My Carousel intends to change that. By providing small creators with equal opportunities to become viral and cultivating a thriving community of niche lovers, this algorithm revolutionizes content discovery. The increase of favorable content seen by users will positively result in greater engagement and satisfaction. There are key benefits of the strategy which are:

Niche Content Focus: Adaptive technology recognizes and promotes specialized material intelligently, ensuring that it reaches the appropriate audience who truly love about that topic. This strategy aids small innovators in gaining recognition inside their specialized communities.

Personalized Recommendations: The algorithm provides highly personalized content recommendations by analyzing user behaviour, preferences, and past interactions. Users will discover content relevant to their interests, resulting in greater engagement and satisfaction.

Equal Opportunity for Virality: The adaptive algorithm is unlike the traditional algorithms that favour popular content and established creators, levels the playing field. It actively promotes high-quality content from smaller creators, providing them with an equal opportunity to go viral and attract a larger audience.

The adaptive algorithm implementation will be separated to some phase with objectives and key result shown in Table 5 below. Considering that My Carousel is an early-stage start-up, researcher include software life cycle as time indicator.

Table 5. Adaptive Algorithm Implementation

Research and Development (Before BETA)	Objective 1	Conduct thorough research and develop a solid foundation for the adaptive algorithm.
	Key Result 1	Market research to identify niche content categories with high potential for engagement.
	Key Result 2	Develop algorithms and data models for content analysis and user behavior tracking.
	Key Result 3	Establish data collection mechanisms to gather user preferences and interactions.
Testing and Iteration (BETA ver.)	Objective 2	Test and refine the adaptive algorithm on BETA version based on user feedback and performance metrics.
	Key Result 1	Implement the adaptive algorithm in the BETA version.

	Key Result 2	Collect user feedback on content relevancy and algorithm performance.
	Key Result 3	Analyze performance metrics, including user engagement and content virality.
Deployment	Objective 3	Deploy the adaptive algorithm to the live platform and enhance the user experience.
	Key Result 1	Integrate the refined adaptive algorithm into the live social media platform.
	Key Result 2	Monitor user feedback and iterate the algorithm based on real-time usage.
	Key Result 3	Enhance the user interface and optimize content discovery features.

Creator Buffet

The Creator Buffet is a place where creator could expose themselves to a broader opportunity. The “buffet” will serve creator bunch of opportunities that can be choose by the creator at a tiered structure. The tiered structured is based on the performance metrics such as views, followers, and likes. This program will still be aligned with its aspiration build a more mindful environment. With no advertisement activities in the app the creator won’t be shackled by the ads, this program will also push the creator to create a relevant and authentic content while maintaining an equitable environment.

Exclusive Features and Tools: The buffet will offer exclusive features and tools to the creators. These include advanced analytics, content promotion opportunities, and access to premium resources. Providing creators with tools that enhance their content creation process and increase their reach sets your platform apart from competitors and attracts high-quality creators seeking additional support.

Early Access to New Features: This gives high quality creators a competitive edge and enables them to be among the first to utilize innovative functionalities. By involving creators in the testing and feedback process, you foster a sense of partnership and collaboration, making them feel valued and integral to the platform's development.

Access to Brand Partnership: Foster a strong creator community by connecting creators to brands where creators can connect and collaborate. This sense of collaborations not only provides support and monetization but also increases the visibility of the platform among creators. Creating brand partnership opportunities can lead to fruitful partnerships and collaborations, attracting high-quality creators who value collaboration and growth.

The Creator Buffet implementation will be separated to some phase with objectives and key result shown in Table 6. Considering that My Carousel is an early-stage start-up, researcher include software life cycle as time indicator.

Creators must fulfill certain eligibility requirements in order to take part in Creator Buffet. Users must, be 18 years of age or older, legally residing in one of the 50 U.S. states, the District of Columbia, or one of the country's territories or possessions, meet a minimum following threshold of 10K genuine followers, have racked up at least 60K genuine video views in the previous 30 days, and post original videos that adhere to the Community Guidelines.

Table 6. Creator Buffet Implementation Plan

Objective 1	Program Framework and Guidelines	Before BETA version launching
Key Result 1	Define the tiered structure based on performance metrics such as views, followers, and likes.	
Key Result 2	Establish clear eligibility criteria and requirements for each tier.	
Key Result 3	Outline how creators can join the program and opt for opportunities.	
Objective 2	Opportunity Identification and Acquisition.	BETA version running

Key Result 1	Research and identify potential opportunities, such as brand partnerships, sponsored content, and events.	
Key Result 2	Establish partnerships and collaborations with brands or agencies.	
Key Result 3	Secure a diverse range of opportunities for each tier, considering goals of creators.	
Objective 3	Program Launch	
Key Result 1	Establish a dedicated platform section or interface for creators to explore and select opportunities.	Release candidate (after BETA)
Key Result 2	Provide clear instructions and resources for creators to opt into the program.	
Objective 4	Performance Tracking and Evaluation	
Key Result 1	Set up data tracking mechanisms to capture relevant program data and metrics.	Final/Complete Release.
Key Result 2	Monitor the number of creators who opt into the program and the rate of opportunity selection.	
Key Result 3	Collect feedback and measure satisfaction levels of participating creators.	

Customer Support

Good customer service affects customer satisfaction and loyalty (Jahanshashi et al., 2011). My Carousel should have an extensive customer support that covers customer service goals such as improving customer satisfaction, reducing response times, or increasing first-call resolutions. TikTok users has reported that the customer service takes anywhere between 24 hours to a week in responding to a support ticket and take up to 48 hours to takedown a reported content. The duration of responding to a report is the key to maintaining a positive environment in social media so that it tackles the negative impact on unwanted and insensitive content.

My Carousel must comprehend that providing a platform for connecting with people is only one aspect of a pleasant user experience; it also entails supplying dependable and efficient support when customers run into problems or have inquiries. Carousel must maintain a 24/7 customer care center with a committed group of skilled and sympathetic support staff members in order to provide seamless help. Users can contact support through a variety of channels, including live chat, email, and a helpline, day or night. The customer support must be established by My Carousel as the BETA version start running to quickly respond to feedbacks. In Table 7 shows the action needed for My Carousel to set an extensive customer support in the Final Version of their app.

Table 7. Customer Support Implementation

No	Action	Details
1	Identify customer service channels	Establishing various communication channels such as email, live chat, and phone. Evaluate the most suitable for My Carousel's users.
2	Build the support team	Recruit or train a team of customer service staff who are familiar with the platform and its features. The team must be able to address user concerns, address problems, and provide useful solutions. It is essential to emphasize the significance of empathy, active listening, and straightforward communication skills.
3	Implement a ticketing system	Utilize a ticketing system or customer support software to effectively manage and monitor user requests. This will help in organizing and prioritizing consumer requests, assigning tickets to the appropriate

		team members, and ensuring prompt responses.
4	Create a comprehensive information base	Create an information base or frequently asked questions section that is user-friendly on website or app. This resource should contain answers to frequently asked questions, troubleshooting guides, and step-by-step tutorials to assist users in resolving fundamental issues on their own.
5	Establish service level agreements (SLAs)	Define the expected response and resolution limits for various customer inquiry types. This will establish distinct expectations for the team and provide a standard against which their performance can be measured. The faster, the better.
6	Monitor customer feedback and feedback loop	Actively collect and analyze user feedback in order to identify recurring issues, development opportunities, and potential feature requests. Utilize surveys, feedback forms, and social media monitoring tools to collect user feedback.
7	Train and improve the team	Maintain the customer service team's knowledge of new features, policies, and best practices with regular training sessions. Encourage continuous learning and professional development to ensure that the team is able to adapt to changing user requirements.

Provision of Capacity Building Activities for Creators

Aligned with its vision, My Carousel will have a Creator Academy that value the creative process behind every output on the platform. The capacity building program is a common program of a social media platform serve to their creators in order for the creators better managed their outputs and bring together creators in a positive environment. This program also aims to inform and teach the creator about the app with its features and opportunities. The activities will keep the content creators close and engaged to My Carousel for easier feedback and evaluation that may come up with another innovative ideas.

The Carousel Academy will have some regulations and will be implemented with objectives and key result shown in Table 8 in the Final Version of the app. Creators must fulfill certain eligibility requirements in order to take part in Carousel Academy. Users must, be 18 years of age or older, legally residing in one of the 50 U.S. states, the District of Columbia, or one of the country's territories or possessions, meet a minimum following threshold of 10K genuine followers, have racked up at least 60K genuine video views in the previous 30 days, and post original videos that adhere to the Community Guidelines. The regulations reflect to the TikTok policy that have been adjusted to meet the U.S. law.

Table 8. Carousel Academy Implementation

Objective 1	Develop a comprehensive curriculum.
Key Result 1	Create a curriculum framework that covers various aspects such as content creation, storytelling, audience engagement, branding, and features of the app.
Key Result 2	Develop supporting materials, resources, and exercises for each module.
Objective 2	Secure partnerships and resources for the Capacity Building Activities program.
Key Result 1	Identify potential partners, such as industry experts, influencers, or organizations, who can contribute to the program's success.

Key Result 2	Establish collaborations or sponsorships with relevant stakeholders to secure resources, funding, venues, or equipment needed for the activities.
Objective 3	Execute Capacity Building Activities
Key Result 1	Schedule and organize workshops, webinars, or training sessions based on the curriculum.
Key Result 2	Engage qualified trainers or industry experts to deliver the capacity building activities.
Objective 4	Monitor participant progress and impact of the program
Key Result 1	Continuously evaluate and improve the activities based on participant feedback and learning outcomes.
Key Result 2	Collect feedback from participants regarding their satisfaction, perceived value, and areas for improvement.
Key Result 3	Use the data collected to make informed decisions for program enhancements and future iterations.

Joint Business Planning

As the social commerce grows. Joint Business Planning (JBP) helps Consumer Goods suppliers and retailers build winning relationships that benefit both parties and improve the commerce experience through clear insights into the other's needs and recognition of mutual interests (8th & Walton, 2022). In this case of My Carousel, there will be a mutual long - term partnership between My Carousel and selected leading principal brands with committed deliverables and priority services. As a joint program, there will be commitment as shown in Table 9 that binds My Carousel and the partner to stick to the goals during the joint period. My Carousel targeted 8 brands to join the JBP program.

Table 9. JBP Commitment

Commitment from My Carousel	Commitment from Partner
<ol style="list-style-type: none"> Dedicated Account Manager. Dedicated Non-Paid Exposure to highlight brand's activation. Monthly business review and proactive recommendation dashboard. 	<ol style="list-style-type: none"> Dedicated PIC. Detailed Marketing and Brand Plan. Maintaining brand & store excitement in the platform. Maintaining store traffic and conversion with best deals and order fulfillment.

Joint Business Plan in My Carousel Platform has requirement to be fulfilled by brands in order to be eligible to join the program as shown in Table 10. The requirements are put together to select brands that has the same vision with my Carousel and minimize the investment failure.

Table 10. JBP Requirement

Metrics	Details
Sales Performance	Min. \$200.000 in previous year
Annual Investment Value	Min \$20.000
Duration	Full Year contract
Target & Investment Setting	Soft booking from the upcoming year planning.
Committed Brand's Growth Ambition	<ul style="list-style-type: none"> Exclusive product launch in My Carousel Exclusive activation in My Carousel Competitive pricing

The Joint Business Plan process is divided by the researcher into 4 phases, as shown in Table 11. The first phase registration to join the program. The second phase is needed to meeting the target setting and business planning. The third phase is where the brand gets their confirmation letter signed. The last phase is carried out is the execution phase. Time required for preparation is 3 months.

Table 11. JBP Implementation

Activities	Duration	Timeline
Registration to My Carousel JBP program	-	Week 1 October
Joint target setting and business planning	2-13 weeks	October-December
Confirmation Letter Signed	-	Before 31 December
Execution and Performance Review	1 year	January- December

VI. CONCLUSION AND RECOMMENDATION

My Carousel is an early-stage social media startup company. They have minimal resource and experience, but have to build a scalable idea and tested prototype that attracts funding. There are 6 recommendation for My Carousel from this research to overcome the root cause problem which is their position as an early-stage start up, with 2 issues of: users and high-quality creators attraction and building a sustainable profit without having ads.

After collecting and analyzing external and internal data. Researcher formulate the SWOT analysis to come up with strategy recommendation. The strategies are proposed to fill in the gap of the 3 issues faced by My Carousel while also considering the U.S. social media users demand and concerns. The strategies proposed are Store Opening Procedure, Adaptive Algorithm, Creator Buffet, Customer Support, Carousel Academy, and Joint Business Planning.

Business Implication and Recommendation

The business implication of this study is impacting the creation of My Carousel as an early-stage social media startup. Additionally, this study will support the growth of early-stage social media start up generally. In order to help My Carousel, this study analyzes the business environment and the internal of the startup. This study makes a contribution to management science by providing a thorough approach to problem solving that includes the phases of problem analysis, formulation of the root cause problem, and development of various strategies for producing the best solutions to connected problems. In other words, businesses undertaking problem-solving research can use this research as a reference.

However, the result of this study should be treated with caution due to small sample size and time frame. Future research could examine the updated condition of the dynamic social media industry. It could also valuable for start-ups in the social media industry who want to learn from My Carousel case and apply the solution presented in this study.

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The Accuracy of Relative Valuation Methods in Assessing Coal Production Firms' Value in Indonesia

Reynaldo Mulya¹ and Mandra Lazuari Kitri²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

The coal production industry is experiencing rapid development, attracting a growing number of investors seeking opportunities in this sector. The availability of numerous relative valuation methods has led to confusion among investors, as different methods yield significantly varied calculation results when compared to the market price. These deviations introduce considerable risks and result in valuation errors that investors must contend with when making investment decisions. To address this challenge, this research aims to assist investors in making informed decisions when investing in coal production companies within the IDXENERGY index. By utilizing the out-of-sample harmonic mean method, the study assesses the valuation errors associated with different methods. Additionally, theoretical foundations such as the efficient market hypothesis inform the investigation, guiding the determination of the most performing multiple. The findings of this research reveal crucial insights. Firstly, Large Coal Production Companies (CP Large) shown to have the most valuation accuracy compared to other categories while Small Coal Production Companies (CP Small) shows the other way around. Income-based multiples shown to have more valuation accuracy compared to non-income-based multiples. In determining the optimal combination of relative valuation calculations weighting that minimizes valuation errors, single multiple is more effective compared to combined multiples. Lastly, each coal production group has its own accurate single multiple, P/E for Large Coal Production Companies (CP Large) with errors of 5.6%, EV/Revenue for Medium Coal Production Companies (CP Medium) with errors of 22.3%, and P/E for Small Coal Production Companies (CP Small) with errors of 25.7%.

Keywords: coal production industry, efficient market hypothesis, out-of-sample harmonic mean method, relative valuation methods, valuation errors.

I. INTRODUCTION

The black gold works as the major source of energy in electrifying the world with electricity. In 2022, coal accounted for approximately 37% of the overall global electricity generation, which is 10% higher than the contribution from renewable energy sources (OECD/IEA, 2020). Indonesia is one of many countries that is shown the major economic development driven by the energy activity, especially in coal production industry. The energy sector has emerged as a prominent driver of the country's economy, it also happens to experience substantial growth, with a recorded IDR 141 trillion in value, representing a remarkable 103% year-on-year increase (Pribadi, 2021). Beside contributing around 3.5% of Indonesia's total GDP (Statista Research Department, 2023), when compared to other commodities, coal is supplied at 37.62% unlike oil, gas, and new renewable energy which stands at 33.40%, 16.82%, and 12.16% respectively from 2019 (Adi et al., 2021).

The country also holds a significant position as an exporter of coal in the international arena, particularly to its neighboring countries in Southeast Asia. This is particularly relevant for countries such as Thailand, the Philippines, and Malaysia, where there is a growing demand for increased power generation. Coal generation continues to be an attractive option in these regions due to its competitive cost. For instance, Malaysia heavily relies on fossil fuels and entirely relies on coal imports. Notably, more than 60% of Malaysia's coal supply is sourced from Indonesia (Arinaldo & Adiatma, 2019). Moreover, Indonesia categorized as the second most coal exporter globally after Australia with number of coals exported US\$ 26,538,188,000 and US\$ 32,934,893,000 in 2021 respectively (Workman, 2022).

One of the indicators that can represent the growth of companies in the same group of industry is through the index that the industry was listed on. From an investor's perspective, IDXENERGY, the energy sector index in Indonesia which coal companies are listed on has demonstrated relatively impressive performance since its launch

on January 29, 2021, up until January 29, 2023, with a growth of 182.04%. Comparatively, other well-known indices such as IDX Composite, IDX30, and LQ45 have reported significantly lower growth rates of 16.11%, 0.462%, and 2.93% respectively during the same period (Research Division, 2022). Therefore, compared to other well-known indices [Figure 1], IDXENERGY shown to yield the most lucrative return that attracts investor to investigate the index.

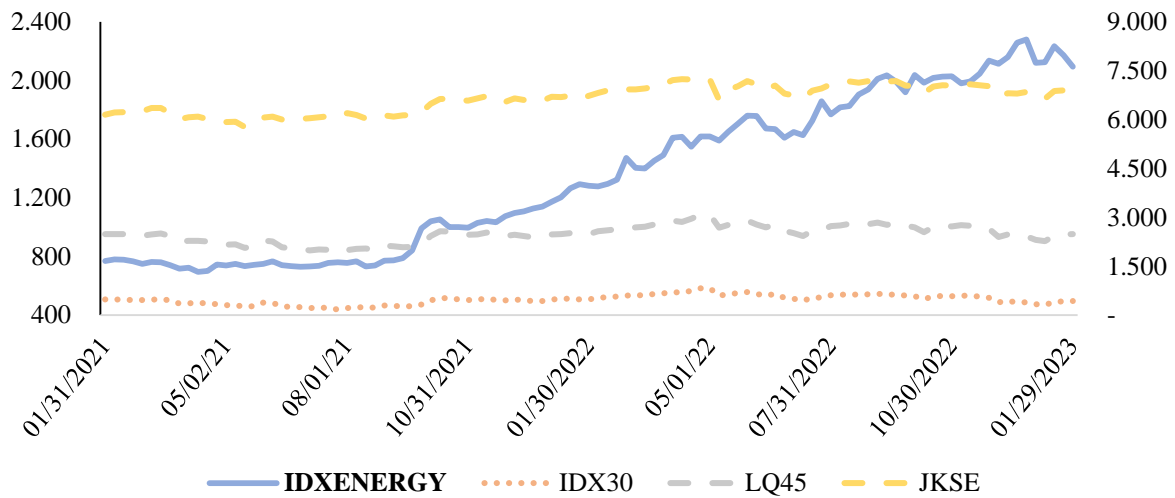


Figure 1. IDXENERGY vs. Other Indices (Source: Investing.com, MyRefinitiv)

Investing in stock market involves various steps, and determining the appropriate valuation approach and methods is a crucial aspect. Over the years, researchers in finance and accounting have developed methods of valuations in order to calculate the fair value of a specific stock. Nonetheless, the number of approaches stays the same, namely 1) the income approach, 2) the market approach, and 3) the asset approach (Hitchner, 2011). These method developments are meant to cover companies with different business models or in different types of industries.

Relative valuation of the market approach, one of many methods in stock valuation, deemed to be the simplest approach and preferred by practitioners, especially in the energy industry (Inezwari, 2011). Common relative valuation methods employed include P/E, EV/Revenue, and EV/EBITDA (Dumont, 2022). Moreover, other multiples, including EV/EBIT, EV/Resource, and EV/Reserve also often applied widely among practitioners (Rossi & Forte, 2016). Notably, major corporations like Deloitte have also adopted these methodologies (Vulpiani, 2017). These varying relative valuation methods create a paradox of choice for stock market investors in implementing the right valuation method to yield the highest return. For instance, [Table 1.1] here demonstrate relative valuation of random sample coal production companies that is listed in IDXENERGY FY22.

Table 1. Valuation of Coal Production FY22

FY22	Market Price	Fair Price		Fair Price		Fair Price	
		P/E	Deviation	EV/Revenue	Deviation	EV/EBITDA	Deviation
ITMG	33,300	37,303	12.0%	27,302	-18.0%	46,807	40.6%
HRUM	1,510	1,115	-26.2%	967	-36.0%	2,000	32.4%
MBAP	6,800	12,159	78.8%	5,917	-13.0%	9,726	43.0%

(Source: S&P Capital IQ, Companies' Annual Reports, Researcher's Calculation)

In developing [Table 1], researcher conduct relative valuation that focusses on the company's comparable, firms that operates in the same industry with relatively same risk, growth potential, and cash flows (Damodaran, 2012). From this table, researcher can quickly summarize that each valuation method yields different types of result. For example, ITMG were calculated through P/E, EV/Revenue, and EV/EBITDA yield different potential results, both upside of 12% from P/E, 40.6% from EV/EBITDA, and downside of -18% from EV/Revenue. This also happen among other companies, such as HRUM and MBAP. This deviation poses substantial risks and results

in valuation errors that investors must confront when making investment decisions. Therefore, this research aims to assist investors in making informed decisions when investing in the coal production companies in IDXENERGY index, enhancing the overall efficiency and accuracy of relative valuation.

This study has an objective such as the following: Assess and quantify the valuation errors associated with each relative valuation method employed in the study, thereby determining the level of accuracy or valuation errors introduced by each method. Identify and determine the optimal combination of relative valuation calculations weighting that minimizes valuation errors for investors. In conducting this research, several scopes and limitations are used to focus the research results: Companies used for the research are specifically taken from IDX Industrial Classification: Among all available sector, the energy sector shown to be the most prospect as identified in the background. Moreover, the researcher also wants to explore more regarding the multiples that specialize in the commodity sector, namely the EV/Resource and EV/Reserve. Coal production sub-industry is the most suitable since other sub-industry, for instance coal distribution companies do not have coal resource and reserve. Therefore, this analysis will utilize companies that are listed in the energy sector, oil gas and coal sub-sector, coal industry, and lastly coal production sub-industry.

Researcher uses end-of-April daily adjusted closing price with the study period January 1, 2008 - December 31, 2022. The data used is from end of April price considering all financial report and annual report are expected to be published maximum by the end of March of every year. With Indonesia current market condition in the weak form of efficient market hypothesis, end of April price might already reflect investor's decision in regards the newest financial information regarding securities (Swandari Budiarto & Pontoh, 2022).

Besides multiples, to conduct this study, coal resources and coal reserves also required in order to calculate EV/Resource and EV/Reserve. Researcher is able to gain those data from each companies' annual report from each year (2008 to 2022). Yet, the constraints come when there are companies that do not disclose the information regarding their companies' coal reserves and coal reserves in each year publicly, since it is not a legally mandatory. Therefore, this research, specifically in regards EV/Resource and EV/Reserve exclude some companies and years where they do not disclose those type of information.

II. LITERATURE REVIEW

Efficient Market Hypothesis

If researcher were to conduct research on capital market valuation, it is essential to include the fundamental concept underlying valuation, namely the efficient market hypothesis. The theory of Efficient Market Hypothesis posits that in a completely efficient market, asset prices incorporate all publicly available information (Fama, 1991). However, what if researcher were conducting study in a perfectly efficient market? The answer there will be no wiggle room for investor to find a mispricing stock, meaning in a perfect market, the price will perfectly reflect a securities' fair price in align with the instant given publicly available information of a specific security. Therefore, there is no point of valuation since investor will gain no potential upside (or downside) from investing in the security. Yet, before concluding anything, researcher would like to explore types of efficient market hypothesis that is available in the market, whereas there are three forms of efficient market hypothesis (Bodie et al., 2014).

First, the weak form of market efficiency, which contends that stock prices reflect all previously accessible market data, including historical prices, trading volume, and short interest. Historical trading data is readily available and cost-free on the market. If reliable indicators of future occurrences can be found in past data, all investors will attempt to make money by analyzing its patterns. As a result, all investors will profit from these signals, which will quickly be reflected in pricing and cause them to lose value. Next, the semi-strong type of market efficiency, where stock prices should already reflect all information that is now available on the market, including information about projected corporate growth. This comprises information on product lines, managerial quality, balance sheets as part of financial reports, held patents, earnings estimates, and accounting treatment. Therefore, once investors are aware of all the facts, stock prices will already reflect it. Lastly, the stock prices of a corporation represent all essential information, even information that is only accessible to internal parties like insiders, according to a strong type of market efficiency. Because all information will be revealed right away, even if company management and employees have access to information before it becomes public to the market, they cannot profit by trading using that information.

Based on the previous forms of market efficiency, Indonesian stock market shown to have shown a weak form of efficiency's characteristics. This is proven by numerous study that has been done in this topic. To measure weak

form efficiency, statistical tests like the run test and serial correlation test are utilized. In 2016, research was conducted, and the results indicate that the stock market in Indonesia has been labelled as weak from an efficiency standpoint, although there may be exceptions among individual companies, the collective stock market in Indonesia demonstrates efficiency in the weak form (Andrianto & Mirza, 2016). As a result, investors interested in the Indonesian stock market can still achieve abnormal returns.

Yet, in 2022 research regarding topic is conducted again. One study concluded that the Indonesian capital market during the observed period is inefficient in the weak form of efficiency, meaning the price does not fully reflect the information (Budiarso & Pontoh, 2022). While on the other hand, one study shows the effect of COVID-19 related events on price movements through event study analysis that was performed on JCI and nine sectoral indexes. The analysis discovered that JCI prices exhibit a random walk pattern, indicating that the Indonesian stock market is, at the very least, efficient in a weak form (Ghazali & Faturohman, 2022). Consequently, given the rapid flow of information accessible to investors, it facilitates their ability to ascertain the fair price of a company.

Relative Valuation and Valuation Multiples

Given the weak form of market efficiency of Indonesian capital market, fundamental analysis such as relative valuation is relevant to be conducted. According to relative valuation theory (Fama, 1991), comparable companies are valued similarly since equity market prices are efficient and the law of one price is valid. The goal itself is to determine an asset's value using market prices for comparable companies (Damodaran, 2012). As a result, the law of one price prevails, indicating that similar firms with comparable levels of assets should be traded at similar levels (Rossi & Forte, 2016). This implies that companies operating within the same industry, possessing similar maturity levels and capitalization, should have values that converge towards the industry average, else considered as errors.

Moreover, researcher came across studies on relative valuation in addition to the earlier research. The market approach is the most appropriate way, according to a 2012 study that focused on the telecommunications sector because it deviates from the company's current share price the least. The income approach, on the other hand, was regarded excessively risky because it necessitates a lot of assumptions, scenarios, and forecasts (Faris Arifin & Herlanto Anggono, 2012). Similar to this, a study by Nugraha and Sulasmiyati in 2017 looked at relative valuation in the cigarette industry. The analysis concluded that internal financial data alone should not be used for equity valuation. It stressed how crucial it is to take competitors' financial situations into account when conducting comparative valuation.

However, relative valuation metrics possess certain limitations. One major drawback is that they do not allow for the simultaneous analysis of multiple value drivers, meaning, the valuation that yielded by P/E as a value driver might differ from the valuation that yielded by P/BV as a value driver. The choice of the denominator, which serves as the fundamental value driver which in the previous case are earnings and book values can introduce biases. Consequently, researcher may selectively choose value drivers that align with their pre-established objectives. This include involving a group a firm's characteristics, namely the firm's model of business, competitors, and market share in order to make sure companies that are being grouped are relevant to one another (Schreiner, 2007). Beside the industry, more important factors in considering a company comparable are risk, growth potential and cash flows (Damodaran, 2012).

1. Price/Earnings

First multiple that researcher will discuss is Price to Earnings or widely known as P/E. The ratio is computed as the share price divided by earnings per share, is a commonly used equity multiple that provides insight into the relationship between the price paid per share and the profitability generated per share. This multiple is known to be used in all types of industry, including in coal industry since it is able to determine the payback period of buying a stock (Mubarak & Surya, 2012).

In 2019, Cahyono and Hendrawan conducted a study that centralized on identifying stocks to buy for coal mining listed companies but did not explicitly explain the rationale behind the selection of the P/E and P/BV ratios as valuation measures. It is worth noting that while these studies provide insights into the utilization of P/E and P/BV ratios for valuation purposes, further validation and justification for the choice of these metrics are necessary to strengthen the research findings. Furthermore, in 2021, Tarigan and Fachrudin, conducted a research study to determine the intrinsic value of coal companies. The study utilized Free Cash Flow to Firm and Relative Valuation as valuation methods, yet, the research did not provide specific details about the types of relative valuation employed in the study. In a separate study by Pulungan,

Batubara, and Rahmani in 2023, the same topic of intrinsic value in coal companies was investigated, but with a focus on Islamic coal companies listed in the Indeks Saham Syariah Indonesia (ISSI). The study utilized the P/E and P/BV ratios using the simple mean method. However, similar to the previous study discussed, no validation nor justification was provided regarding the validity of the research findings.

Despite its widespread usage, the P/E ratio has certain limitations. One limitation is its susceptibility to the influence of a company's capital structure (Enrique R. Arzac, 2007). This means that when comparing companies with significantly different capital structures, the P/E ratio may not be as useful. It fails to account for variations in the way companies finance their operations. Another limitation stems from the inclusion of non-operating items in the earnings per share figure. Non-operating items, such as one-time charges or write-offs, are not representative of a company's regular business activities. Consequently, they can distort the accuracy of the P/E ratio as a measure of ongoing performance. Furthermore, the P/E ratio does not consider disparities in growth rates among companies. Companies with varying growth prospects may have different P/E ratios, making it less effective for relative comparisons.

2. Enterprise Value/Revenue

In this analysis, researcher will initiate examination by assessing the Enterprise Value/Revenue multiple, which serves as a valuation metric comparing a company's enterprise value to its revenue generation. This multiple offers valuable insights into the relative valuation of a business, exhibiting less susceptibility to accounting choices when compared to earnings or book value metrics (Damodaran, 2006).

$$\frac{EV}{Revenue} = \frac{Market\ Value\ of\ Equity+Debt-Cash}{Revenue} \quad (1)$$

Equity investors commonly rely on the Price to Sales (P/S) as their relevant multiple, dividing the market value of equity by the company's revenues. This ratio facilitates the evaluation of the equity value in relation to the company's revenue stream. In order to comprehensively determine a company's overall value especially for coal companies, researcher modifies the P/S to EV/Sales, also known as EV/Revenue. This ratio incorporates the market value of a company's operating assets in the numerator. The Enterprise Value/Revenue ratio exhibits variations across industry sectors, primarily influenced by differing profit margins.

The utilization of revenue multiples presents an advantage in facilitating comparisons between firms operating in diverse markets with distinct accounting systems. In contrast, comparing earnings or book value multiples in such contexts poses challenges. Moreover, throughout the research, researcher will delve further into the evaluation of Enterprise Value/Other Value Drivers, including EBITDA, Resource, and Reserve as the denominator. These additional multiples provide comprehensive insights into various dimensions of a company's value, and a detailed examination of these factors will be conducted in subsequent sections of the study.

3. Enterprise Value/EBITDA

EV/EBITDA is beneficial for comparing company valuations that are not influenced by capital structure or when profits are negative and the P/E ratio cannot be applied (Van Eaton & Prochaska, 2020). Companies operating in the commodity industry, including the coal sector, may often face challenges in generating positive net income due to their heavy reliance on global coal prices. Moreover, this method will also prevent the earning to pass through depreciation whereas an account where not all companies take into consider. Therefore, the existence of depreciation could suppress the true earning of a company since depreciation is mainly used for accounting purposes.

$$\frac{EV}{EBITDA} = \frac{Market\ Value\ of\ Equity+Debt-Cash}{Earning\ Before\ Interest,Taxes,Depreciation,and\ Amortization} \quad (2)$$

In practice, relative valuation model such as P/E and EV/EBITDA were utilized to compare ITMG with its peers through research conducted by Darian and Sumirat in 2021. The recommendation for the investor would be to buy ITMG stocks based on its conditions, namely being undervalued among its peers and the historical multiple of EV/EBITDA shows an upside potential. Professionally, EV/EBITDA is the most commonly used enterprise value multiple in company valuation by the financial community (McKinsey & Company et al., 2010), as EBITDA is often seen as a proxy for operational cash flows, often preferred over EBIT because EBIT is sensitive to the accounting method chosen for depreciation (i.e. straight-line or double

declining balance), and managers may be encouraged to play around with depreciation to manipulate earnings (Enrique R. Arzac, 2007).

4. Enterprise Value/EBIT

EV/EBIT multiple is determined by dividing enterprise value by earnings before interest and taxes. EBIT may be seen of as a stronger proxy for cash flows than EBITDA if it were assumed that capital expenditures are nearly equal to depreciation and amortization (in such case, a company can at least maintain its operations). However, amortization is not a direct value generator because it is an accounting item that frequently results from prior acquisitions and is not always connected to future cash flows. Incorrect comparisons and misleading valuations may result from using amortization EV/EBIT multiples.

$$\frac{EV}{EBIT} = \frac{\text{Market Value of Equity} + \text{Debt} - \text{Cash}}{\text{Earning Before Interest and Taxes}} \quad (3)$$

5. Enterprise Value/Resource

The EV/Resource ratio takes the enterprise value of the business and divides it by the total resources contained in the ground (Corporate Finance Institute, 2023). This metric is frequently used in the assessment of early-stage development projects, particularly when it is difficult to obtain the comprehensive data needed to perform a discounted cash flow (DCF) analysis. It is necessary to remember that this ratio offers a skewed perspective on the project's worth and ignores critical elements like the capital expenditures related to building the mine or the operational costs related to extracting the commodity, in this case coal, itself.

$$\frac{EV}{\text{Resource}} = \frac{\text{Market Value of Equity} + \text{Debt} - \text{Cash}}{\text{Total Resources Contained in the Ground}} \quad (4)$$

In practice, relative valuation model such as P/E and EV/EBITDA were utilized to compare ITMG with its peers through research conducted by Darian and Sumirat in 2021. The recommendation for the investor would be to buy ITMG stocks based on its conditions, namely being undervalued among its peers and the historical multiple of EV/EBITDA shows an upside potential.

6. Enterprise Value/EBITDA

Enterprise Value/Reserves is calculated by dividing security's enterprise value by its proven reserves. Similar to other multiples, Enterprise Value/Reserves demonstrate the ratio between the company value and its marketable goods, which in this case are its reserves, usually commodity, such as coal reserves (Rossi & Forte, 2016). If a firm's multiple is higher than that of its peers, it indicates that the firm is trading at a premium. Conversely, if the multiple is lower compared to its peers, it suggests that the firm is trading at a discount.

$$\frac{EV}{\text{Reserve}} = \frac{\text{Market Value of Equity} + \text{Debt} - \text{Cash}}{\text{Total Proven and Unproven Reserves}} \quad (5)$$

However, while this metric is valuable, it does not consider the potential production from undeveloped fields. Therefore, researcher suggests that investors should also assess the cost of developing new fields to gain a more comprehensive understanding of a company's financial health. Moreover, this multiple shall not be the main determination of a security valuation, rather a supporting to a primary valuation (Monks et al., 2011). Yet, in this study, researcher would like to explore whether the multiple can still be used among other valuation multiples.

Relevant Study

The initial study that captured the interest of researcher's focused is the examination of relative valuation within the banking sector, specifically in European and U.S. banks, as documented by Forte G, Gianfrate G, and Rossie E in 2020. Its first objective was to explore in regarding the valuation error in the banking industry for US and EU market. The study itself was the advancement of a previous study that was conducted by Nissim in 2013 that studied an analysis of the accuracy of relative valuation for 372 U.S. insurance companies using monthly data from March 1990 to January 2011. His findings demonstrated that value based on analysts' earnings projections is superior to valuing based on past earnings. It emphasized the suitability of stock market multiples for U.S. institutions and identified the two-year-forward P/E ratio as the most accurate metric. Moreover, the study also elaborates other valuation methods error results.

Building upon this foundation, the researchers conjectured that a similar research approach could be applied to the context of Indonesian stock market, particularly within the coal production industry. Unfortunately, despite

extensive efforts, researcher was unable to find any comprehensive research specifically addressing the topic of relative valuation within the coal production industry in Indonesia. Therefore, researcher firmly believe that conducting this research is of utmost importance in order to explore the implementation of valuation methods in the Indonesian stock market, particularly within the coal production industry. In order do that, researcher implement every method that is implemented through the study that was conducted by Forte G, Gianfrate G, and Rossie E in 2020, namely out-of-sample harmonic mean method and valuation error.

From many existing research, harmonic mean yields a more not-skewed result, unlike what arithmetic mean yields. If all firms belonging to the same regional market and size-business group, harmonic mean could be executed (Forte et al., 2020). This method is effectively used to reduce outlier compared to arithmetic mean, geometric mean, and median (Dittmann & Maug, 2008). The harmonic mean is computed by dividing the total number of observations or entries in a series by the reciprocal of each individual number in the series. In contrast, the arithmetic mean is obtained by adding up all the numbers in the series and dividing the sum by the count of numbers. The harmonic mean can be calculated as the reciprocal of the arithmetic mean of the reciprocals of the numbers in the series.

To ascertain the most suitable valuation method for industry sectors, researchers can evaluate valuation errors across various methods and summarize the outcomes using percentiles like 10%, 25%, 50%, 75%, and 90% of fundamental values (Forte et al., 2020). The fundamental value represents the estimated intrinsic worth of a company. Valuation error refers to the disparity between the estimated equity value obtained through a specific valuation method and the actual market price of a security. The difference between the equity value estimated using a multiple and the actual market price is used to assess valuation error (Fernandez & Carabias, 2006). When a valuation method consistently generates valuation errors that position a higher proportion of companies within the 10% and 25% fundamental value range, it indicates the method's greater relevance to those specific industry sectors. This signifies that the valuation estimates derived from that method closely approximate market prices, implying a stronger alignment with market expectations and trends (Forte et al., 2020). By examining the distribution of valuation errors across diverse valuation methods, researchers can determine which method provides the most accurate and relevant estimates for a given industry sector. Nonetheless, it is important to note that reliance solely on valuation errors may not suffice in determining the relevance of a valuation method. Other factors such as underlying assumptions and industry-specific characteristics should also be taken into consideration.

III. RESEARCH METHODOLOGY

This chapter describes the methodology used by the researcher to address the research questions, namely how the study can determine 1) valuation errors of each relative valuation method, 2) best calculation combination of relative valuation weighting that yields the lowest valuation errors in coal production companies in IDXENERGY index.

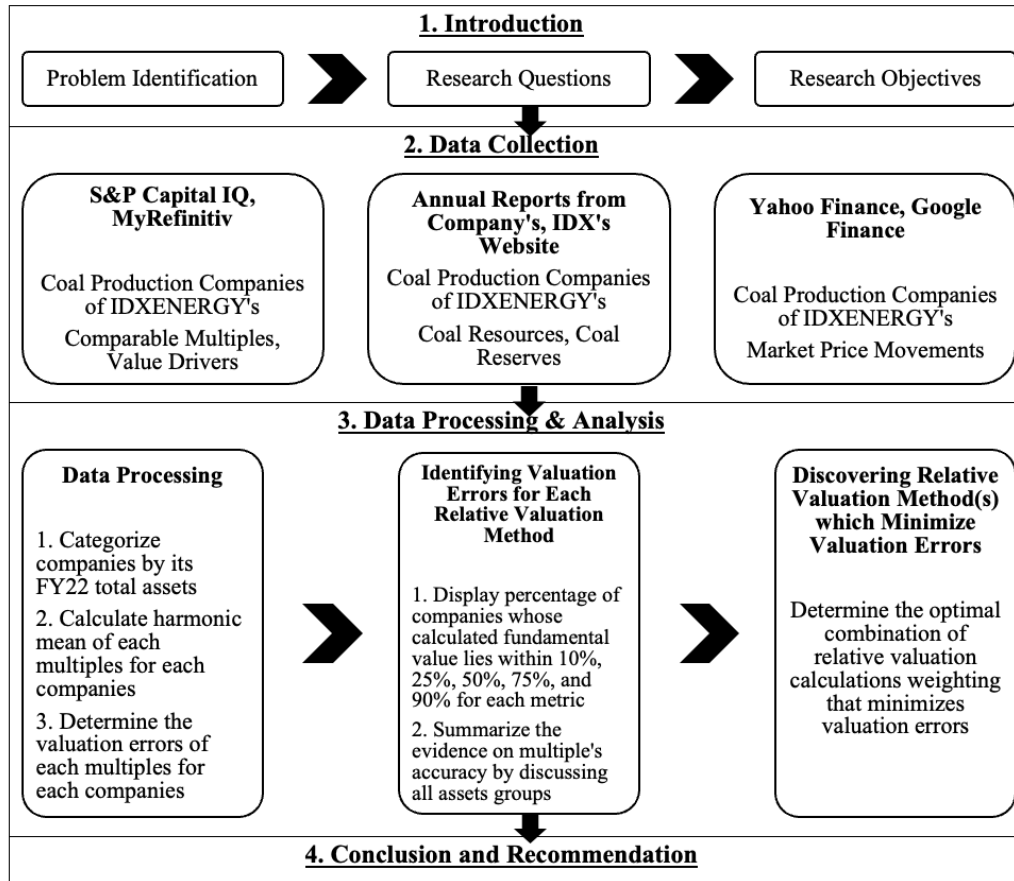


Figure 2. Research Design (Source: Researcher's Analysis)

Data Collection

This study uses secondary data obtained from S&P Capital IQ, MyRefinitiv, Yahoo Finance, Google Finance for Jakarta Composite Index 'IHSG or IDX Composite' and Indonesia energy sectoral index 'IDXENERGY' with the companies within for its end-of-April daily adjusted closing price with the study period January 1, 2008 - December 31, 2022. The data used is from end of April price considering all financial report and annual report are expected to be published maximum by the end of March of every year. With Indonesia current market condition in the weak form of efficient market hypothesis, end of April price might already reflect investor's decision in regards the newest financial information regarding securities (Swandari Budiarto & Pontoh, 2022).

Companies used for the research are specifically taken from IDX Industrial Classification: Among all available sector, the energy sector shown to be the most prospect as identified in the background. Moreover, the researcher also wants to explore more regarding the multiples that specialize in the commodity sector, namely the EV/Resource and EV/Reserve. Coal production sub-industry is the most suitable since other sub-industry, for instance coal distribution companies do not have coal resource and reserve. Therefore, this analysis will utilize companies that are listed in the energy sector, oil gas and coal sub-sector, coal industry, and lastly coal production sub-industry which consist of 18 coal production companies (shown in Table 2 of Part IV. DATA ANALYSIS, RESULT, AND DISCUSSION).

Besides multiples, to conduct this study, coal resources and coal reserves also required in order to calculate EV/Resource and EV/Reserve. Researcher is able to gain those data from each companies' annual report from each year (2008 to 2022). Yet, the constraints come when there are companies that do not disclose the information regarding their companies' coal reserves and coal reserves in each year publicly, since it is not a legal mandatory. Therefore, this research, specifically in regards EV/Resource and EV/Reserve exclude some companies and years where they do not disclose those type of information.

Data Processing

In this process, author elaborate the step-by-step of data processing to reach research objectives.

1. Categorize companies by its FY22 total assets

The author starts by categorizing the companies into three groups based on its assets as relative valuation is determining the value of an item by examining what the market is willing to pay for comparable assets (Damodaran, 2006). As there are companies that has been public recently, thus, the author decided to categorize the companies based on its FY22 total assets. Researcher has also considered a few alternatives that are available such as growth of EPS, which is the most common in relative valuation, growth of enterprise value, growth of market capitalization. Researcher decided to use company's FY22 assets since: **EPS** does not represent the growth of a commodity-based business companies, including coal production industry. The main driver of the earnings of the industry is based on the market price of the commodity, such as the global price of the coal. Therefore, it is very hard to determine the growth of the company just by relying only the EPS of a company. **Enterprise value and market capitalization** is able determines the price that the firm are valued. However, it still noised by the market price of the company since the main components of calculating enterprise value is market capitalization, calculated by market price times outstanding shares which researcher believe will hinder this research.

Therefore, the assets of the company play an important role in categorizing the companies in coal production industry. The process of categorizing the companies starts with finding all companies' FY22 total assets. Furthermore, as implemented by Forte et al. in 2020, sort the company based on its FY22 total assets, then divide it by the number of groups that this research is planning to have which is three in this case. Researchers believe three groups of total assets are the most appropriate number considering a study by Schreiner in 2007 suggests that the optimal number of comparable are five companies and any addition number are considered as noise. Moreover, all three groups will be statistically tested through ANOVA to show significant differences between each group.

2. Calculate harmonic mean of each multiple for each companies

The multiples are calculated for each company in each year. Out-of-sample multiples are used on each group, where the company being valued is excluded from the peer group of companies used to calculate the mean multiple. To prevent data skewing as all firms, belong to the same market and similar size-business group, the author uses harmonic mean instead of a simple mean to calculate the mean multiple. Harmonic mean will prevent the companies from being overvalued, therefore, outliers are less likely to be produced (Forte et al., 2020).

$$H = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \dots + \frac{1}{x_n}} \quad (6)$$

3. Determine the valuation errors of each multiple for each companies

Valuation errors are determined by how much the value of the company deviate from its market price. It is calculated by subtracting the current market price from the fundamental value and dividing this difference by the current price (Cooper & Cordeiro, 2008).

$$Valuation\ Error(x;t) = \frac{Peer\ group\ multiple\ (all\ companies\ except\ x;t) \times Value\ Driver(x;t) - Market\ Price(x;t)}{Market\ Price(x;t)} \quad (7)$$

To ensure the accuracy of multiples, the author compute the bias, the mean absolute deviation (MAD), and the mean-squared error (MSE) of the valuation errors (Rossi & Forte, 2016).

$$Bias = \frac{1}{T} \sum_{t=1}^n \sum_{x=1}^X Valuation\ Error(x;t) \quad (8)$$

$$MAD = \frac{1}{T} \sum_{t=1}^n \sum_{x=1}^X |Valuation\ Error(x;t)| \quad (9)$$

$$RMSE = \frac{1}{T} \sum_{t=1}^n \sum_{x=1}^X Valuation\ Error(x;t)^2 \quad (10)$$

Identifying valuation Errors for Each Relative Valuation Method

Next, researcher starts to identify valuation errors and have a study-based discussion regarding the result. Moreover, researcher will also determine the optimal combination of relative valuation calculations weighting that minimizes valuation errors.

1. Display percentage of companies whose calculated fundamental value lies within 10%, 25%, 50%, 75%, and 90% for each metric.

To evaluate the accuracy of different multiples, researcher measure the distance between fundamental valuations and actual prices. Researcher calculates the percentage of observations where the fundamental value is within 10%, 25%, 50%, 75%, and 90% of the market price for each metric in a form of a table.

2. Summarize the evidence on multiple's accuracy by discussing all subsamples.

After creating the table, researcher proceeds with a descriptive research approach to summarize the results presented in the table. This descriptive research aims to present the research findings related to the objectives of the study, namely, to quantify the valuation errors associated with each relative valuation method based on assets groups and multiples which can be categorized again into income and non-income multiples.

Discovering Relative Valuation Method(s) which Minimize Valuation Errors

Lastly, researcher will explore and study how this research will be able to determine the optimal combination of relative valuation calculations weighting that minimizes valuation errors. Researchers will analyze the accuracy performance of coal production across time for three groups: Large Coal Production Companies (CP Large), Medium Coal Production Companies (CP Medium), and Small Coal Production Companies (CP Small). The analysis will focus on the percentage of companies whose valuations fall within a 25% range of their actual pricing. To determine the optimal combination of relative valuation calculations weighting, researcher will utilize solver function in excel with some restrictions: The goal is to minimize valuation errors, weighting from each valuation methods shall not be less than 0%, weighting from each valuation methods shall not exceed 100%, Weighting from total valuation methods shall not exceed 100%

IV. RESULT/FINDINGS

Data Processing

In order to describe the process of data analysis, researcher will start by describing [Table 2] which provides the grouping of samples into Large Coal Production Companies (CP Large), Medium Coal Production Companies (CP Medium), and Small Coal Production Companies (CP Small) as mentioned in [Categorize companies by its FY22 total assets] with six companies listed within each group to fulfil the requirement of relative valuation as mentioned by Cooper and Cordeiro in 2008 as more number of firms will brings more information, but also more noise.

Table 2. Categorized Coal Production Companies

Category	Company Name	Ticker	FY22 Total Assets
<i>CP Large</i>			
1	PT Adaro Energy Indonesia Tbk (IDX:ADRO)	ADRO	161,885,557
2	PT Dian Swastatika Sentosa Tbk (IDX:DSSA)	DSSA	96,557,735
3	PT Bumi Resources Tbk (IDX:BUMI)	BUMI	67,383,537
4	PT. Indika Energy Tbk (IDX:INDY)	INDY	53,958,395
5	PT Bukit Asam Tbk (IDX:PTBA)	PTBA	45,359,207
6	PT Indo Tambangraya Megah Tbk (IDX:ITMG)	ITMG	39,639,618
<i>CP Medium</i>			
1	PT Adaro Minerals Indonesia Tbk (IDX:ADMR)	ADMR	19,317,384
2	PT Harum Energy Tbk (IDX:HRUM)	HRUM	19,199,991

3	PT Golden Energy Mines Tbk (IDX:GEMS)	GEMS	16,952,109
4	PT TBS Energi Utama Tbk (IDX:TOBA)	TOBA	13,502,534
5	PT Atlas Resources Tbk (IDX:ARII)	ARII	6,737,157
6	PT Baramulti Suksesarana Tbk (IDX:BSSR)	BSSR	6,078,135

CP Small

1	PT Mitrabara Adiperdana Tbk (IDX:MBAP)	MBAP	4,602,508
2	PT Resource Alam Indonesia Tbk (IDX:KKGJ)	KKGJ	2,555,153
3	PT Golden Eagle Energy Tbk (IDX:SMMT)	SMMT	1,182,853
4	PT Garda Tujuh Buana Tbk (IDX:GTBO)	GTBO	926,941
5	PT. Borneo Olah Sarana Sukses Tbk (IDX:BOSS)	BOSS	699,108
6	PT Akbar Indo Makmur Stimec Tbk (IDX:AIMS)	AIMS	29,309

(Source: Investing.com, MyRefinitiv)

Samples used are categorized based on firm's total assets. Therefore, there are three groups, namely large comps (CP Large), medium comps (CP Medium), and small comps (CP Small). All three groups are statistically tested through ANOVA showing significant differences between each group proven by its p -value of $1.428e-07$.

**CP: Coal Production*

After having all data samples categorized based on its groups, then calculate out-of-sample harmonic mean and valuation errors for each sample based on its group as discussed in [Calculate harmonic mean of each multiple for each company] for harmonic mean and [Determine the valuation errors of each multiple for each company] for valuation errors. For instance [Table 3] FY22 P/E Summary Table would be:

Table 3. FY22 P/E Summary Table

Category	Ticker	P/E	Harmonic Mean	Valuation Error
<i>CP Large</i>				
1	ADRO	2.60	2.91	12.02%
2	DSSA	5.00	2.63	-47.41%
3	BUMI	3.30	2.78	-15.75%
4	INDY	1.60	3.39	111.67%
5	PTBA	5.30	2.61	-50.68%
6	ITMG	2.50	2.94	17.56%
<i>CP Medium</i>				
1	ADMR	10.70	4.08	-61.83%
2	HRUM	5.90	4.35	-26.19%
3	GEMS	4.60	4.54	-1.21%
4	TOBA	7.00	4.26	-39.20%
5	ARII	2.40	5.55	131.23%
6	BSSR	3.60	4.81	33.56%
<i>CP Small</i>				
1	MBAP	4.70	8.40	78.82%

2	KKGI	3.70	9.56	158.36%
3	SMMT	9.10	6.91	-24.06%
4	GTBO	11.80	6.62	-43.87%
6	AIMS	90.60	5.90	-93.49%

(Source: S&P Capital IQ, Companies' Annual Reports, Researcher's Calculation)

[Table 3] describes a few column components, namely Category, Ticker, P/E, Harmonic Mean, and Valuation Errors. First, the Category column describes what group that a specific company lies on which divided into three groups, Large Coal Production Companies (CP Large), Medium Coal Production Companies (CP Medium), and Small Coal Production Companies (CP Small) as described in [Table 2]. Second, the Ticker column describe the name of companies that belongs on a specific group, for example, ADRO, DSSA, BUMI, INDY, PTBA, and ITMG belongs to CP Large as described in [Table 2]. Third, P/E is the type of multiple that currently being demonstrated among five other multiples namely, EV/Revenue, EV/EBTIDA, EV/EBIT, EV/Resource, and EV/Reserve as described in [II.B. Relative Valuation and Valuation Multiples]. Fourth, Harmonic Mean column describes the number that is yielded from the harmonic mean calculation that is done with companies within a specific group, for instance, harmonic mean of ADMR is based on the calculation of harmonic mean as described on [III.B.2. Calculate harmonic mean of each multiple for each company] of CP Medium namely, HRUM, GEMS, TOBA, ARII, BSSR. Fifth, Valuation Errors column describe the deviations between value of the company (fair price) from its market price as described on [III.B.3. Determine the valuation errors of each multiple for each company] for instance, ADRO from CP Large has valuation errors of 12.02% meaning ADRO's fair price is 12.02% from ADRO's current market price (the negative sign is ignored since this study focusses on errors, not upside nor downside potential).

V. DISCUSSION

Identifying Valuation Errors for Each Relative Valuation Method

Researcher examines the discrepancy between fundamental valuation and actual market price in order to assess the accuracy of various valuation methods, namely P/E, EV/Revenue, EV/EBITDA, EV/EBIT, EV/Resource, EV/Reserve. Moreover, researcher also measures the percentage of coal production companies' fundamental values inside specific ranges of the market price (10%, 25%, 50%, 75%, and 90%), [Table 4] describes these measurements. When a larger proportion of coal production companies fall within the 10% and 25% areas, it suggests that the relative valuation's chosen multiple is more accurate (Forte et al., 2020).

Table 4. Coal Production Multiples Accuracy Performance
Valuation within x % of price:

	10%	25%	50%	75%	90%
<i>CP Large</i>					
P/E	10.67%	38.67%	68.00%	84.00%	90.67%
EV/Revenue	6.74%	38.20%	68.54%	85.39%	87.64%
EV/EBITDA	12.79%	34.88%	65.12%	82.56%	93.02%
EV/EBIT	14.63%	31.71%	60.98%	76.83%	86.59%
EV/Resource	9.09%	27.27%	49.09%	78.18%	85.45%
EV/Reserve	12.90%	22.58%	38.71%	75.81%	82.26%
<i>CP Medium</i>					
P/E	6.98%	23.26%	55.81%	74.42%	83.72%
EV/Revenue	9.09%	20.00%	38.18%	58.18%	72.73%
EV/EBITDA	4.17%	20.83%	39.58%	70.83%	79.17%
EV/EBIT	4.35%	28.26%	41.30%	58.70%	73.91%
EV/Resource	0.00%	10.34%	27.59%	37.93%	58.62%
EV/Reserve	6.98%	11.63%	20.93%	51.16%	69.77%
<i>CP Small</i>					
P/E	4.88%	14.63%	31.71%	48.78%	68.29%
EV/Revenue	4.76%	9.52%	23.81%	38.10%	60.32%
EV/EBITDA	8.70%	13.04%	26.09%	45.65%	63.04%
EV/EBIT	4.65%	6.98%	23.26%	39.53%	58.14%
EV/Resource	0.00%	0.00%	0.00%	21.43%	42.86%
EV/Reserve	0.00%	0.00%	4.76%	19.05%	38.10%

1. Multiples Accuracy Performance Discussion Based on Groups

CP Large. Among all three types of categories, CP Large shown to have the most accuracy compared to other categories. This is proven by number of samples that lies in any range, especially in 10% and 25% which are much higher compared to those who are grouped in the CP Medium and CP Small.

CP Small. On the other hand, CP Small shown to have the least accuracy among all groups. Shown by the small number that lies within all the range compared to CP Large and CP Medium. Therefore, coal

production companies with larger assets tend to have a lower level of valuation error compared to coal production companies with smaller assets.

2. Multiples Accuracy Performance Discussion Based on Multiples

Income-based multiples. Amid six multiples that were employed during the study, P/E remarks as the most consistent multiple among others for coal production company valuation. For instance, in the CP Large, P/E failed to have the most companies with calculation within 10% range. However, the multiple (P/E) able to comeback their reliability based on the succeeding range, including the 25%, 50%, 75%, and 90%. The same goes among other categories, namely in CP Medium and CP Small. Therefore, despite the fact the multiple failed to become the most accurate one, it still manages to become the most consistent one among other five multiples.

Unlike P/E, EV/Revenue failed to perform reliable valuation accuracy. Moreover, it also does not have any advantage point on group to be utilized on. This phenomenon is different than EV/EBITDA and EV/EBIT which can be applied reliably on all three groups. Despite unable to provide the best accuracy, both EV/EBITDA and EV/EBIT is indeed popular among the coal production industry due to their reliance on coal prices on a worldwide scale, businesses participating in the coal production industry, especially the coal sector, may frequently encounter difficulties in achieving positive net income (Van Eaton & Prochaska, 2020).

Non-income-based multiples. Previous discussed multiples are able be applied generally, next, researcher will discuss the special multiples that are only available for specific coal production companies, namely EV/Resource and EV/Reserve. Those two multiples shown to be applicable in the coal production companies. It is shown that EV/Reserve multiple copes to trumps EV/EBITDA, EV/EBIT, and EV/Revenue in CP large; EV/EBIT and EV/EBITDA in CP medium. Unfortunately, unlike EV/Reserve, EV/Resource should not be a multiple to rely on with its current lack of accuracy condition. This could be explained by the fact that not all companies that disclose their coal reserve publicly also share their coal resource publicly.

Minimizing Valuation Errors

To minimize valuation error, researcher seek out the optimal combination of relative valuation calculations weighting that minimizes valuation errors. Therefore, researcher will also study how each multiple works on each year time of research. The percentage of companies whose valuations are within a 25% range of their actual pricing is shown on the graph's vertical axis [Figure 3], [Figure 4], and [Figure 5]. Errors are measured using absolute value. The inaccuracies are computed by subtracting the inferred price from the stock's real price at the end of April and dividing the result by the actual price. Using an harmonic mean out-of-sample method, the fair price is calculated by computing a peer-group measure for each multiple and multiplying it by the corresponding value driver.

Errors are measured using absolute value. The inaccuracies are computed by subtracting the inferred price from the stock's real price at the end of April and dividing the result by the actual price. Using out-of-sample harmonic mean method, the fair price is calculated by computing a peer-group measure for each multiple and multiplying it by the corresponding value driver.

1. CP Large's Optimal Combination of Relative Valuation Calculations Weighting

Along the year, it is quite hard to determine on what multiple that consistently produce a high level of accuracy valuation methods for CP Large [Figure 3]. However, P/E shows the most consistent in every year among other. Researcher confirms this by utilizing solver function in excel and it shown among all available relative valuation that P/E yields the smallest valuation errors among other multiple which stands at 5.59%.

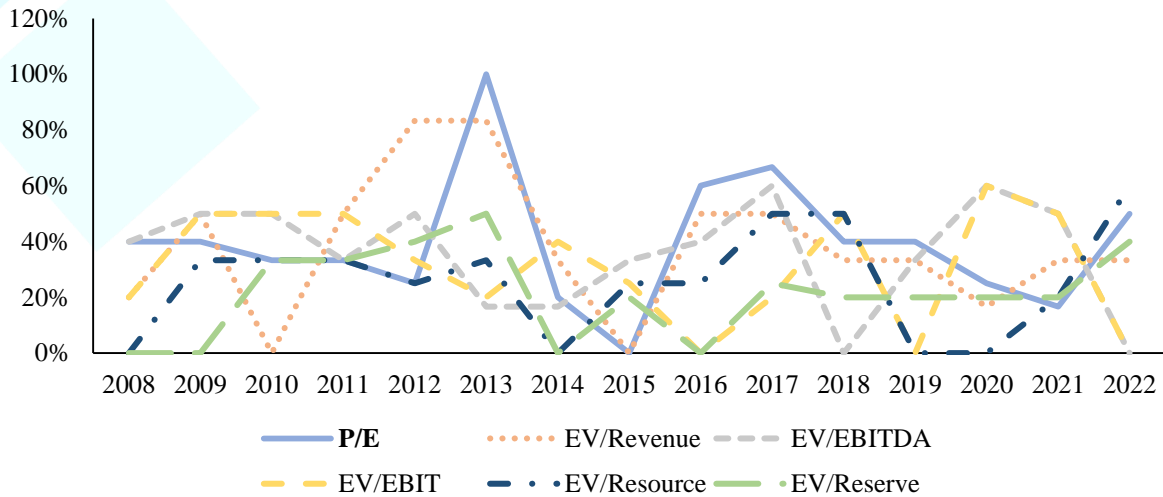


Figure 3. Coal Production Accuracy Performance Across Time: Large Comps

2. CP Medium’s Optimal Combination of Relative Valuation Calculations Weighting

Moving on to the next part, the researcher encountered difficulty in determining the relative valuation methods that produce the lowest valuation error for CP Medium based [Figure 4]. However, after conducting calculations in Excel, similar to the process for CP Large, it was found that the multiple with the lowest valuation errors for CP Medium is EV/Revenue, with valuation errors standing at 22.3%.

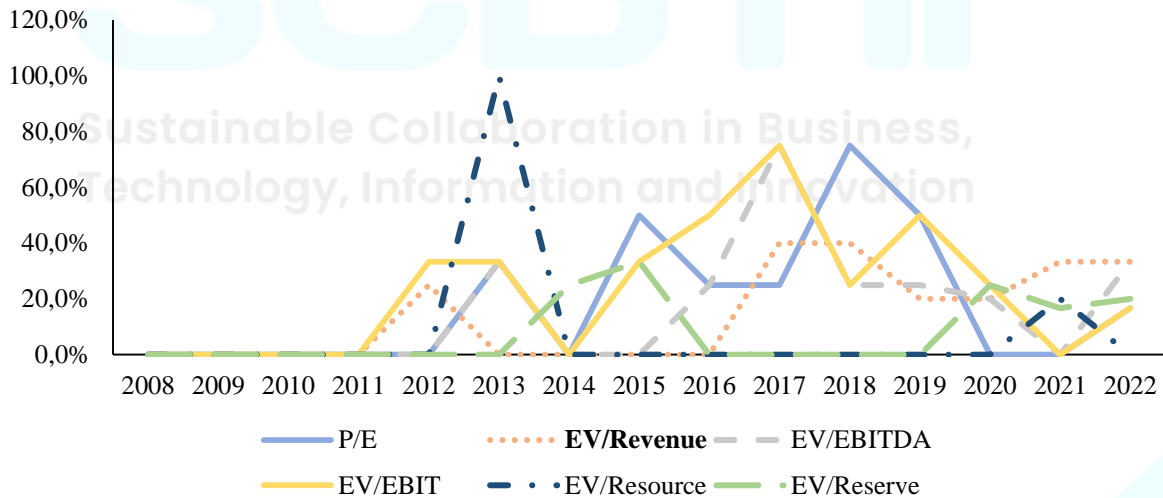


Figure 4. Coal Production Accuracy Performance Across Time: Medium Comps

3. CP Small’s Optimal Combination of Relative Valuation Calculations Weighting

Lastly, researcher also study what relative valuation methods that yield the lowest valuation error for CP Small. For this graph, by looking at [Figure 5] researcher able to have an educated guess that P/E is the multiple with the lowest valuation errors. After conducting calculations in Excel, similar to the process for CP Large and CP Medium, it was found that the multiple with the lowest valuation errors for CP Small is P/E, with valuation errors standing at 25.7%.

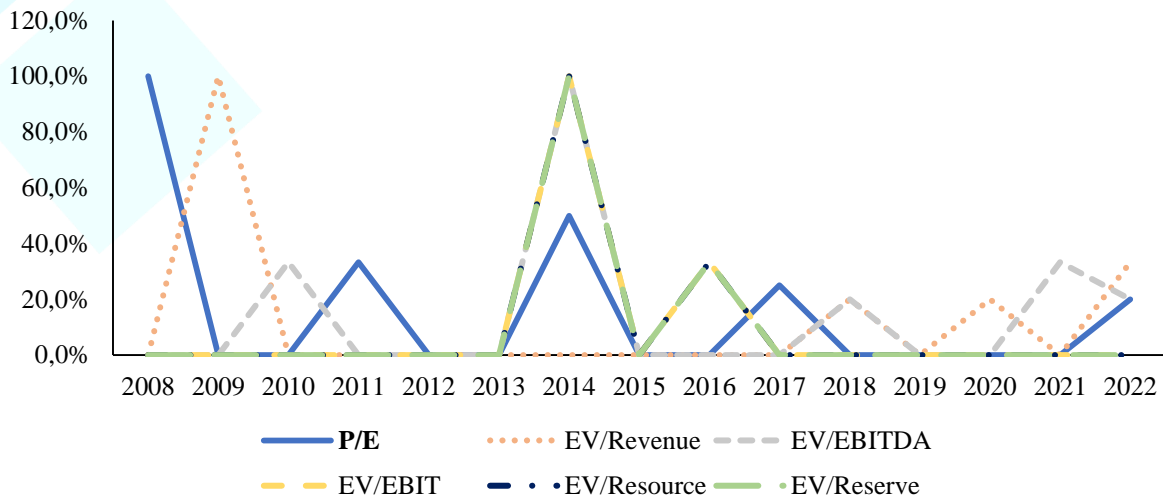


Figure 5. Coal Production Accuracy Performance Across Time: Small Comps

VI. CONCLUSION AND RECOMMENDATION

Conclusion

This research was done to figure out what multiples most suits Indonesian stock market, especially IDXENERGY, coal production sub-industry. This research uses the data from April 30, 2008 – April 30, 2022 and utilize out-of-sample harmonic mean method to determine valuation errors. Through efficient market hypothesis and other theoretical foundations namely, relative valuation including its multiples (P/E, EV/Revenue, EV/EBITDA, EV/EBIT, EV/Resource, and EV/Reserve), researcher manages to determine few findings from the 18 samples of coal production companies that were being used in the study.

First, Large Coal Production Companies (CP Large) shown to have the most valuation accuracy compared to other categories. On the other hand, Small Coal Production Companies (CP Small) shows the other way around, implying the least valuation accuracy compared to other categories. From the valuation errors, income-based multiples (P/E, EV/Revenue, EV/EBITDA, and EV/EBIT) shown to have more valuation accuracy compared to non-income-based multiples (EV/Resource and EV/Reserve).

Lastly, in determining the optimal combination of relative valuation calculations weighting that minimizes valuation errors, single multiple is more effective compared to combined multiples. Each coal production group has its own accurate single multiple, P/E for Large Coal Production Companies (CP Large) with valuation errors of 5.6%, EV/Revenue for Medium Coal Production Companies (CP Medium) with valuation errors of 22.3%, and P/E for Small Coal Production Companies (CP Small) with valuation errors of 25.7%.

Recommendation

To improve the study on valuation errors in the coal production industry, several recommendations are provided for future researchers. First, it is important to address the limitation of the current study, which involves using **samples** taken from the IDX Industrial Classification coal production sub-industry. Future research should consider including public coal companies operating outside this sub-industry to broaden the scope and validity of findings. Additionally, to gain a more comprehensive understanding of valuation dynamics, researchers can alter the **timeframe** of the study. For example, they can analyze the period before and after significant events like the Global Financial Crisis or the Covid-19 pandemic. Furthermore, considering the sensitivity of the Indonesian stock market to earnings announcements, it would be beneficial to **adjust the closing price selection**. Instead of solely using end-of-April daily closing prices, future studies may explore other months relevant to their research objectives.

Moreover, to gain a more comprehensive perspective on valuation, future research can delve into **additional multiples** beyond the six studied in the current research, namely P/E, EV/Revenue, EV/EBITDA, EV/EBIT, EV/Resource, and EV/Reserve. This exploration of alternative multiples can shed light on different aspects of valuation errors. Additionally, future researchers could employ **various valuation methods** beyond the harmonic

mean out-of-sample approach used in the current study. By considering alternative methods, a more robust analysis of valuation errors can be achieved.

Lastly, in **categorizing companies**, future researchers should adopt innovative approaches. For instance, they could divide companies based on their means and create appropriate ranges to form different groups for comparison. Such categorization methods can offer more nuanced insights into the variations in valuation errors among different groups of companies. By incorporating these recommendations, future research can significantly contribute to the understanding of valuation errors in the coal production industry, providing valuable insights for stakeholders and policymakers alike.

The findings of this study hold significant implications for future investors seeking to implement effective valuation strategies for coal production companies. By understanding the valuation errors identified in the research, investors can make informed decisions when valuing these companies. Specifically, they can focus on utilizing the multiple that historically exhibits the lowest valuation error for each group of coal production companies.

For instance, when analyzing Large Coal Production Companies (CP Large), investors can adopt the P/E (Price-to-Earnings) multiple, as it has shown the lowest valuation error in historical data. Similarly, for Medium Coal Production Companies (CP Medium), the EV/Revenue (Enterprise Value-to-Revenue) multiple can be utilized due to its historical track record of yielding the lowest valuation errors. Lastly, when analyzing Small Coal Production Companies (CP Small), investors can rely on the P/E multiple, as it has historically shown the lowest valuation errors for this group.

By tailoring their valuation strategies based on the historical performance of specific multiples for each company group, investors can enhance the accuracy and effectiveness of their investment decisions in the coal production industry. This study's insights can empower investors to approach their investment analysis with more confidence and optimize their portfolio allocations in this sector. Ultimately, the study's existence can prove to be a valuable resource for future investors navigating the complexities of valuing coal production companies and seeking to maximize their investment returns.

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Analyzing customer perspective towards slow fashion

Inggrid Angelique Sirait¹, Mustika Sufiati Purwanegara²

^{1,2} School of Business & Management, Bandung Institute of Technology, ITB, Bandung, Indonesia

Abstract

This research aims to investigate the level of customer understanding and potential ambiguity surrounding the definitions of slow fashion and sustainable fashion. Particularly, within the expansive realm of the Indonesian fashion industry, there are several slow fashion brands that may struggle to differentiate between the meanings of slow fashion and sustainable fashion, resulting in potential misconceptions. This study strives to achieve specific objectives, including identifying the specific actions customers undertake to avoid purchasing fast fashion, evaluating customer comprehension of the distinctions between slow fashion and sustainable fashion, exploring prevailing beliefs that hinder the acceptance of slow fashion, identifying factors that influence customer perceptions, and proposing potential categories of slow fashion to enhance sustainability in Indonesia. By addressing these objectives, this research contributes to the understanding of consumer behavior and the development of effective strategies for a more sustainable fashion industry. Qualitative methods are employed, with analysis conducted using NVIVO. The data will be further validated through triangulation, involving mini surveys and an extensive literature review. Consequently, the findings of this research hold relevance for the slow fashion industry in Indonesia, fostering heightened awareness among individuals and unlocking business potential.

Keywords: customer perspective, slow fashion, sustainable fashion.

1. INTRODUCTION

The accessibility of affordable trendy clothing tempts consumers to impulsively buy and use fast fashion items. People purchase fashion products to express their identity, fit in socially, follow cultural norms, or enjoy a connection to fashion (Llovet Rodríguez, 2016). Fashion becomes a way for individuals to display social status and identity. Fashion-conscious consumers actively participate in trends and willingly spend money on clothes that enhance their appearance (Azra Batool et al., 2021). Surprisingly, even individuals with lower incomes are willing to invest in clothing (Deloitte, 2019). However, this widespread clothing consumption leads to significant environmental consequences, as discarded garments end up in landfills instead of being reused or recycled. Disposing of clothes in landfills harms the environment by contaminating soil and water with synthetic fibers and chemical dyes, and contributing to greenhouse gas emissions (Manik, 2017). This wastefulness prevents resource conservation and sustainability promotion. Additionally, income levels directly influence the desire to buy clothes, as depicted by the growth in clothing sales. The rise of fast fashion is closely tied to our consumer-driven lifestyle, although many are unaware of the environmental damage caused. Consumers have noticed a decline in clothing quality due to fast fashion. "Slow fashion" emerged as a response to prioritize environmental considerations and combat fashion consumerism. In Indonesia, the concept of slow fashion gained recognition through The Slow Fashion Lab exhibition in 2017, leading to the gradual acceptance and emergence of numerous slow fashion brands.

The modern fashion industry has faced significant criticism for promoting obsolescence, excessive consumption, and unsustainable and unethical practices (Stringer et al., 2020). However, there is a lack of clear distinction between slow fashion and environmentally sustainable fashion, leading to confusion among consumers (Jung & Jin, 2014). This misconception, as exemplified by RIMMBA's statement, can influence customer perspectives, and create misconceptions (Henninger et al., 2016). Clear understanding of the concepts behind fashion products, particularly in the case of slow fashion brands, is crucial. These brands prioritize environmentally friendly practices throughout their product lifecycle, including material sourcing, manufacturing, and disposal methods (Aldilax & Pfoertsch, 2020). Despite slow fashion encompassing sustainable fashion, online searches show that sustainable fashion receives more attention (Google Trends, 2023). In the context of Indonesia, slow fashion has substantial potential, but misconceptions and societal pressures pose challenges. The perception of slow fashion as a luxury or niche market may limit its adoption by a broader population. Conflicting fashion ideals and the desire for constant trend-chasing can clash with the principles of slow fashion (Štefko & Steffek, 2018; Stringer

et al., 2020). Nevertheless, the slow fashion movement in Indonesia is gaining momentum, driven by increased awareness of sustainable fashion among consumers (Aldilax & Pfoertsch, 2020).

This study has multiple research objectives related to understanding and promoting slow fashion. Firstly, it aims to identify the actions and behaviors customers use to avoid fast fashion. Secondly, it seeks to assess customer understanding of the differences between slow fashion and sustainable fashion. Thirdly, the study explores prevailing beliefs and perceptions that may hinder the acceptance of slow fashion. Fourthly, it aims to identify the factors influencing customer perceptions of slow fashion. Finally, the research aims to propose categories of slow fashion that can effectively promote sustainable practices in Indonesia. These objectives aim to contribute to the growth and acceptance of the slow fashion industry by addressing consumer behaviors, understanding, and preferences. This research will collect data from diverse customers across various demographics and locations. The study will primarily use qualitative data. The objective is to develop an effective marketing strategy for the slow fashion sector in Indonesia, addressing any misalignment between customer perceptions and the offerings of the sustainable fashion industry.

II. LITERATURE REVIEW

1. Slow Fashion

Slow fashion is a response to the harmful effects of the modern fashion industry on the environment and society (Lee & Weder, 2021). It offers an alternative to fast fashion by emphasizing quality over speed, promoting sustainable and ethical practices, and encouraging consumers to make thoughtful investments in durable clothing (Pookulangara & Shephard, 2013). Slow fashion appreciates local resources, advocates for transparent supply chains, and aims to create sustainable and lasting products (Domingos et al., 2022; Gomes de Oliveira et al., 2022; Jung, 2014; Lee & Weder, 2021; Roozen & Raedts, 2020; Štefko & Steffek, 2018). It also involves consumers in the design process and promotes actions like repairing and recycling to minimize waste (Jung, 2014). Slow fashion has gained support due to increasing demand for sustainability and corporate ethics, although fast fashion still remains popular (Domingos et al., 2022). The media plays a significant role in raising awareness about the negative impacts of the fast fashion industry (Lee & Weder, 2021; Roozen & Raedts, 2020), while social media platforms have helped promote slow fashion and facilitate the exchange of information and ideas (Lee & Weder, 2021; Roozen & Raedts, 2020). By embracing slow fashion, individuals can contribute to a more mindful and responsible fashion ecosystem that values ethics, sustainability, and social equity.

2. Sustainable Fashion

Sustainable fashion, as a lifestyle approach, goes beyond the realm of fashion and encompasses practices that promote environmental friendliness and coexistence with nature. It involves using eco-friendly materials, implementing transparent supply chains, and considering the ecological impact of garment production on the ecosystem (Heinze, 2020; Kam & Yoo, 2022). In addition to manufacturing and supply chain considerations, sustainable fashion also takes into account factors related to consumption, including use, reuse, and disposal, as these greatly affect the overall sustainability of fashion products (Peleg Mizrahi & Tal, 2022).

3. Customer perspective towards Slow Fashion

According to Pookulangara & Shephard (2013), there is a growing trend of "ethical consumerism" where consumers actively seek out products that are produced in environmentally sustainable ways and prioritize the well-being of workers involved in their production. Studies have shown that consumers are willing to pay a higher price for environmentally friendly and ethically produced goods. In recent years, the concept of "slow fashion" has emerged as an important topic in the textiles and apparel industry. Slow fashion encourages mindful consumer behavior and prompts individuals to consider the environmental and social impact of their purchases (Pookulangara & Shephard, 2013). Ethical decision-making in consumer choices involves a careful evaluation of the individual and societal benefits and drawbacks associated with products that possess ethical attributes (Freestone & McGoldrick, 2008). Each garment carries a story, and consumers tend to develop a deeper appreciation and personal connection with their clothing (Pookulangara & Shephard, 2013).

4. Previous Study

There have not been many studies that are related to customer perspective and the awareness in slow fashion industry, therefore the previous references will focus more on slow fashion as general.

Table 1. Previous Studies

Author(s)/Title	Objective(s)	Finding(s)
Luana Gomes de Oliveira, Felipe G. Miranda, and Maria Amelia de Paula Dias (2022) <i>Sustainable practices in slow and fast fashion stores: What does the customer perceive?</i>	The present study aims to compare the customers' perception regarding sustainability practices of two different stores – one of slow fashion and the other of fast fashion.	In summary, it can be inferred that the fashion consumer is still in the process of transitioning towards adopting responsible behavior. To achieve better results, companies should focus on improving their disclosure methods and exploring alternative mechanisms to enhance transparency and reach a wider audience.
Ellen Lee and Franzisca Weder (2021) <i>Framing Sustainable Fashion Concepts on social media. An Analysis of #slowfashionaustralia Instagram Posts and Post-COVID Visions of the Future</i>	The study at hand fills the existing gap in research on how slow fashion is portrayed on social media, focusing particularly on slow fashion, Instagram, and an Australian context	Social media plays a significant role in advocating for sustainable fashion and increasing awareness about environmental concerns. It emphasizes the significance of ethical production and consumption behaviors while emphasizing the necessity for increased transparency within the fashion industry.
Róbert Štefko and Vladimira Steffek (2018) <i>Key Issues in Slow Fashion: Current Challenges and Future Perspectives</i>	The study offers an overview of the current state and presents a fashion matrix-based framework for outlining the position of the Slow Fashion movement within industry-specific fashion segments and uses the matrix to present current knowledge and review future challenges.	There is a need to educate consumers about the processes involved in the production of their clothing. Slow fashion faces several challenges that require prompt development of commercially viable solutions.
Irene Roozen and Mariet Raedts (2020) <i>The power of negative publicity on the fast fashion industry</i>	This paper explores how negative media reporting (negative publicity) about the fast fashion industry affects consumer attitudes towards fast fashion apparels, and examines the influence of consumer variations (e.g., attitude towards slow fashion, fashion involvement, and ethical/environmental consciousness) on this impact.	The results of our study highlight the significance of negative publicity for the fast fashion industry. Both audiovisual and written forms of negative publicity have a considerable adverse impact on various measures of attitudes towards the fast fashion industry.
Sojin Jung (2014) <i>Slow Fashion: Understanding Potential Consumers and Creating Customer Value for Increasing Purchase Intention and Willingness to Pay a Price Premium</i>	This study extended academic understanding of slow fashion through empirical identification of slow fashion dimensions, profiling of potential slow fashion consumers and confirming factors related to creating customer values and its consequences.	The results of the research suggest that both the traditional group (Group 2) and the exclusivity-oriented group (Group 3) possess characteristics that make them favorable segments for engaging in slow fashion consumption. Therefore, it is essential for marketers to identify and understand the distinct consumer traits within each segment in order to customize their strategies and approaches accordingly.

Author(s)/Title	Objective(s)	Finding(s)
Mariana Domingos, Vera Taixeira Vale and Silvia Faria (2022) <i>Slow Fashion Consumer Behavior: A Literature Review</i>	This study aims to understand the dimensions associated with the behavior of the Slow Fashion consumer, their values, attitudes, and motivations, as well as to know in depth the literature related to Slow Fashion.	The concept of Slow Fashion has gained consumer and brand attention. Brands are interested in understanding if consumers are willing to pay a premium for slow fashion. Nevertheless, the response of customers and the most effective ways to communicate with slow fashion supporters still remain uncertain.

III. RESEARCH METHODOLOGY

The research commenced with exploratory investigations, aiming to understand the phenomenon of slow fashion in Indonesia and its impact on consumer purchase decisions from a comprehensive perspective. Building upon the findings of the exploratory research, this study seeks to address the research problem by formulating relevant research questions and objectives. To establish a solid foundation, the author conducts a thorough review of the existing literature, encompassing various scholarly journals and articles to expand the knowledge base and identify potential variables. The data analysis employs both qualitative and quantitative approaches.

1. Qualitative Method

The qualitative aspect involves examining secondary data comprising consumer comments and word-of-mouth from online conversations. The target population for this qualitative consisted of individuals classified as a member of online communities of slow fashion, the key terms that are used to identify relevant conversation are “slow fashion community”, “support slow fashion community”, “avoid fast fashion community” and “trading fashion community”. These sources provide insights into consumer perspectives, which are analyzed through thematic coding and validated using methodological triangulation.

Once the author has collected qualitative data through online community conversations and applied coding techniques, the data will be evaluated using the triangulation approach. According to the research of Noble & Heale (2019) this approach involves comparing multiple sources of data or methods to enhance the credibility and validity of the findings. By employing triangulation, the author can strengthen the trustworthiness of the qualitative data analysis process. The application of triangulation in qualitative research data analysis aligns with the author's objective of enriching the customer perspective factor by incorporating additional variables. This approach is employed to ensure a comprehensive exploration of the research topic, thereby enhancing the depth and breadth of understanding. In accordance with Valencia (2022), throughout the research process, the choice of methodological triangulation has been contingent upon the nature of the study. Given that this research follows a deductive approach with pre-established concepts, the qualitative approach will be supplemented by the quantitative approach. In this case, the quantitative approach will be implemented as a form of simultaneous triangulation, intended to complement the data derived from the qualitative approach, rather than serving as a sequential research method. The methodological triangulation in this research is suggested to utilize the categorical data related to the transactions data about the products purchase in suggested to utilize category data related to coding data regarding the customer perspective on buying behavior of slow fashion found in the thematic analysis. This conversation data will then be used further to assess customer's understanding and awareness of slow fashion. This methodological triangulation data will complement the qualitative approach to answer research.

2. Quantitative Method

This study's population consists of individual aged above 17 years old who have previously bought slow fashion products. The questionnaire will be distributed via social media. According to Malhotra (2010), the required minimum number of samples for the marketing analysis is 200. In this study, the authors have several criteria regarding who is suitable to be the respondent in this study:

- Age 17-54 years
- Have bought or used slow fashion products
- Domiciled in Indonesia

Purposive sampling, also known as judgmental sampling, is employed in this research due to the need for a specific sample with characteristics to adequately complete the questionnaire. The selection of purposive sampling aligns with Palinkas et al. (2013) perspective, which characterizes it as a quantitative research technique aimed at

identifying and selecting information-rich situations. This approach is adopted to optimize the utilization of limited resources in the research process. Purposive sampling involves the identification and selection of individuals or groups who possess specific knowledge or expertise relevant to the topic of interest. This approach offers several advantages for researchers. According to Campbell et al. (2020), researchers can utilize purposive sampling to identify niche demographics that possess specific characteristics, thereby enabling the collection of precise data points. This approach allows for the selection of individuals who share common attributes, leading to focused and targeted data collection. Additionally, the use of purposive sampling can contribute to time and cost savings for the researcher.

IV.RESULT / FINDING

1. Actions taken by customers to avoid fast fashion

The following table illustrates the hierarchy of 13 key factors that have been identified through online community discussions as influential in supporting the sustainable fashion movement. These factors were determined based on the highest frequency of occurrence among a total of 229 statements gathered in this section. The data offers valuable insights into the behaviors and preferences of customers who embrace the principles of slow fashion.

Table 2. Actions taken by customer to support slow fashion movement

Actions taken by customer to support slow fashion movement					
Rank	Concerns	Files	Freq.	Percent	Cum.
1	Do ethical practices	9	40	17.47%	17.47%
2	Minimalist lifestyle	10	33	14.41%	31.88%
3	Decluttering wardrobe	9	30	13.10%	44.98%
4	Self-educate	9	24	10.48%	55.46%
5	Reduce waste	9	18	7.86%	63.32%
6	Planning budget for fashion expenses	6	18	7.86%	71.18%
7	Join community	5	17	7.42%	78.60%
8	Buying slow fashion brands	3	12	5.24%	83.84%
9	Remind the jeopardize of fast fashion brands	3	10	4.37%	88.21%
10	Create alternative fashion in future	1	10	4.37%	92.58%
11	Started sustainable clothing line	1	9	3.93%	96.51%
12	Avoid Consumptive behavior	2	5	2.18%	98.69%
13	Following slow fashion influencers	2	3	1.31%	100%
Total			229	100%	

2. Evaluating customer awareness of slow fashion vs. sustainable fashion

The distinction between slow fashion and environmentally sustainable fashion is often unclear in their conceptual frameworks (Jung & Jin, 2014), leading to confusion and misunderstandings (Henninger et al., 2016). While there is existing research on specific aspects of sustainable fashion, there is a notable gap in comprehensive academic understanding of sustainable fashion as a whole (Henninger et al., 2016). However, through NVIVO analysis, it is evident that members of online slow fashion communities have a clear understanding of the differences between slow fashion and sustainable fashion. This understanding is supported by customers who have launched sustainable clothing lines to promote fair treatment of workers. The active participation and support of the slow fashion community further demonstrate their awareness of the disparities between the two concepts. In order to gain a broader perspective, a survey was conducted to assess the general understanding of slow fashion among customers. The results indicated that the majority of respondents had a basic level of knowledge and comprehension of slow fashion, suggesting room for improvement in raising awareness about the concept. Additionally, when specifically asked about the differences between sustainable fashion and slow fashion, a significant portion of the customer base lacked understanding, indicating a need for further education. Previous studies have highlighted various perspectives on slow fashion, including its focus on mindful consumption, quality

over trends, ethical practices, eco-friendly materials, support for local designers, repair and maintenance, and transparency in supply chains.

Table 3. Definition of Slow Fashion from Mini Survey, NVIVO and Previous Journal

No.	Description	Survey	NVIVO	Journal
1.	Slow fashion is a concept that encourages individuals to be more conscious and intentional about their clothing choices.	✓	✓	✓
2.	Slow fashion emphasizes the importance of investing in high-quality garments that are designed to withstand the test of time.		✓	✓
3.	Slow fashion advocates for ethical and fair practices throughout the entire supply chain.		✓	✓
4.	Slow fashion promotes the utilization of eco-friendly and sustainable materials.	✓	✓	✓
5.	Slow fashion encourages the support of local designers, artisans, and manufacturers.	✓	✓	✓
6.	Slow fashion embraces minimalism by encouraging individuals to cultivate a curated wardrobe composed of a smaller number of versatile items.	✓	✓	
7.	Slow fashion places great emphasis on the significance of repairing and maintaining clothing instead of discarding it when minor damages or signs of wear appear.	✓	✓	✓
8.	Slow fashion is characterized by a commitment to transparency and an earnest encouragement for brands to disclose comprehensive information about their supply chains.		✓	✓

By considering insights from the mini survey, NVIVO analysis, and scholarly journals, a comprehensive definition of slow fashion is established, emphasizing conscious clothing choices, quality garments, ethical practices, sustainable materials, support for local industry, minimalism, clothing maintenance, and transparency. Overall, slow fashion encompasses a holistic approach to fashion that prioritizes social, environmental, and ethical considerations, aiming to create a more sustainable and responsible industry.

3. Perceived challenges to slow fashion's adoption and implementation

This table presents the ranking of 8 primary gaps between customer behavior and intention in selecting sustainable fashion brands. These gaps were identified through online community conversations and ranked based on their frequency of occurrence. A total of 59 statements were collected for this section.

Table 4. Customer behavior-intention gap in buying slow fashion

Customer behavior-intention gap in buying slow fashion					
Rank	Concerns	Files	Freq.	Percent	Cum.
1	Shopping trigger or scarcity mindset	7	14	23.73%	23.73%
2	Expensive	6	10	16.95%	40.68%
3	Body fluctuative	5	9	15.25%	55.93%
4	Difficult to find	3	8	13.56%	69.49%
5	Brand reputability	1	6	10.17%	79.66%
6	Mindset of backhanded compliment	1	5	8.47%	88.14%
7	Inconsistent quality	1	4	6.78%	94.92%
8	Brand self-claim	2	3	5.08%	100%

Total		59	100%	
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The NVIVO-processed data provides evidence supporting key characteristics of slow fashion:

1. **Expensive:** Slow fashion emphasizes sustainability and ethical practices, resulting in higher-priced garments compared to fast fashion. The data analysis confirms that slow fashion is indeed expensive.
2. **Difficult to find:** Slow fashion items are unique and often have limited availability in mainstream retail outlets. The NVIVO analysis supports the observation that slow fashion can be challenging to find.
3. **High quality:** Slow fashion prioritizes quality materials and craftsmanship, leading to superior garment quality. The NVIVO analysis confirms the association between slow fashion and high quality.
4. **Long-wearing or long-lasting:** Slow fashion garments are designed to be durable and timeless, intended for extended use. The NVIVO-processed data affirms that slow fashion items are long-wearing or long-lasting.

To support and enhance the perspectives of the online customer community, the researcher conducted a concise mini survey. This survey plays a vital role in validating and reinforcing the statements made by the online community, specifically within the Indonesian market, providing valuable insights into the local context. Similar to the findings from NVIVO analysis, the results of the mini survey indicate that 53.08% (112 respondents) of the participants perceive slow fashion as expensive, 27.49% (58 respondents) view it as eco-friendly, 14.22% (30 respondents) find it difficult to find, 3.79% (8 respondents) believe it to be of high quality, and 0.95% (2 respondents) see it as long-lasting. Furthermore, only 0.47% (1 respondent) expressed the belief that slow fashion is sustainable.

The congruence between the NVIVO analysis results and the findings from the mini survey offers valuable insights into the collective understanding and awareness of slow fashion among both the online social media community members and the wider customer base.

4. Customer perception of key factors supporting the slow fashion movement

This table presents the ranking of 8 primary influencing factors in choosing sustainable fashion products, based on their frequency of occurrence as identified through online community conversations. A total of 124 statements were collected for this section, divided as follows.

Table 5. Customer perception towards most influencing factors in choosing slow fashion products

Customer perception towards most influencing factors in choosing slow fashion products					
Rank	Concerns	Files	Freq.	Percent	Cum.
1	Consumerism or intentional purchasing	12	33	26.61%	26.61%
2	Peer influence	6	27	21.77%	48.39%
3	Unethical practices	6	19	15.32%	63.71%
4	Customization	3	13	10.48%	74.19%
5	Climate change	5	12	9.68%	83.87%
6	Long-wear or longlasting	8	11	8.87%	92.74%
7	High quality	4	6	4.84%	97.58%
8	Sustainable certification	1	3	2.42%	100%
Total			124	100%	

5. Propose slow fashion categories for sustainable fashion and diverse consumer preferences in Indonesia

Researcher propose slow fashion categories:

- **Customization:** represents an important aspect of slow fashion, as it aligns with sustainability principles and addresses the desire for personalized experiences among consumers. An example is provided to illustrate this idea: *a German goldsmith who crafts jewelry on-demand based on customer specifications*. This approach promotes uniqueness and reduces waste by producing items only when ordered. By offering customization, businesses can cater to individual preferences, create a sense of exclusivity, and minimize environmental impact. It also fosters a collaborative process between customers and producers, enhancing

customer satisfaction and connection to the product. Customization thus exemplifies a category within slow fashion that combines sustainability, individuality, and a personalized production approach, contributing to a more conscious and sustainable fashion industry.

- Social:

Jika kamu akan membeli slow fashion product, berapakah budget yang akan kamu berikan?
211 responses

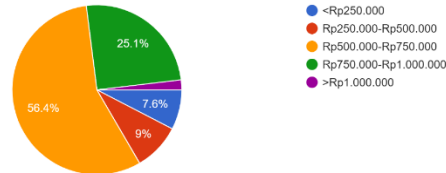


Figure 2. Result Survey of willingness spending of customer in buying slow fashion products

Based on the mini survey findings, a small number of respondents (4 respondents) showed willingness to spend above Rp1,000,000 on slow fashion products. In contrast, the majority of respondents (56.4%) expressed their willingness to spend between Rp500,000 and Rp750,000. This difference in spending preferences reflects the diverse income levels in Indonesian society.

Apakah kamu memiliki keinginan untuk membeli barang preloved?
211 responses

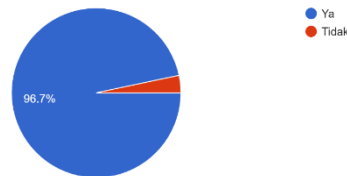


Figure 3. Result Survey of Customer Intention in Buying Preloved Products

The survey results highlight the potential limitations of focusing solely on expensive slow fashion businesses, as it may hinder accessibility for consumers with lower incomes. This issue can be addressed through the promotion of preloved items and thrifting. A significant 96.7% of respondents expressed their desire to purchase preloved items due to their relative affordability. The lower prices of preloved goods allow for bulk purchases without significant financial strain, as revealed in the respondents' reasons.

Kenapa kamu memiliki keinginan untuk membeli barang preloved?

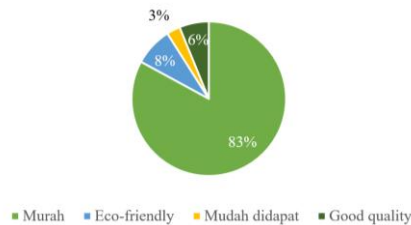


Figure 6. Result Survey of Customer Reason in Buying Preloved Products

The popularity of preloved items demonstrates the potential for sustainable fashion practices that cater to a wider range of budgets. By embracing preloved fashion and thrift shopping, the slow fashion movement in Indonesia can become more inclusive and accessible to individuals with varying financial capabilities.

- Culture: In Indonesia, there is great potential for slow fashion, particularly in the production of exquisite traditional fabrics.

Apakah kamu memiliki niat untuk membeli kain tenun, songket, atau batik tulis?
211 responses

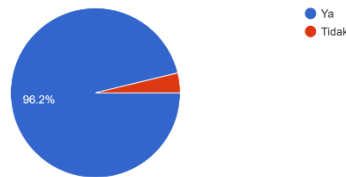


Figure 7. Result Survey of Customer Intention in buying traditional fabrics

According to the findings of the mini survey, the majority of respondents (96.2%) expressed a strong intention to purchase traditional fabrics such as woven textiles, songket, and hand-drawn batik. This indicates a profitable market for slow fashion businesses focused on traditional fabrics, as these fabrics require a time-consuming process that aligns with the principles of slow fashion. The survey results also suggest that the market for traditional fabrics is not saturated, presenting an opportunity for slow fashion businesses to tap into this niche.

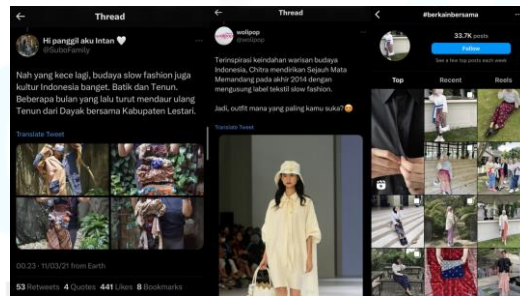


Figure 8. Twitter thread: #berkainbersama

(Twitter, 2023)

Young adults, particularly Generation Z, have embraced traditional fabrics as a collective activity, as seen in the popularity of the hashtag #berkainbersama. However, there is a need for a passionate slow fashion campaign to fully harness the potential impact of this trend.

To fully embrace sustainability, it is important to ensure that the production process of traditional fabrics incorporates eco-friendly materials and manufacturing techniques that minimize waste and optimize resource utilization. By adhering to sustainable practices, traditional fabrics can contribute to reducing waste and environmental impacts associated with the fashion industry. Furthermore, the influence of slow fashion influencers plays a crucial role in shaping customer preferences and guiding them towards sustainable and ethical fashion choices. Customers actively engage with slow fashion influencers for inspiration, advice, and recommendations, indicating the influencers' impact on promoting conscious and sustainable fashion practices. In conclusion, the combination of traditional fabrics and slow fashion in Indonesia presents an opportunity to create a greater impact on sustainability and ethical practices in the fashion industry. By integrating sustainability principles throughout the supply chain and leveraging the influence of slow fashion influencers, the industry can foster a more conscious and sustainable approach to fashion consumption.

V.CONCLUSION AND RECOMMENDATION

1. Conclusion

The perspective of customers is essential for the growth of the slow fashion industry in Indonesia, given the country's rich cultural heritage. This research aims to uncover customer knowledge and awareness of slow fashion, providing valuable insights for the industry. The findings contribute to the industry's understanding of customer

perspectives, helping improve strategies and meet customer expectations. This research aligns industry practices with customer preferences, driving the growth of the slow fashion movement in Indonesia. Based on the result obtained, several conclusions can be drawn.

- The research findings rank influencing factors in choosing sustainable fashion products based on online community discussions. These factors include consumerism, peer influence, unethical practices, customization, climate change, high quality, sustainable certification, and long-wearing clothing. Customer discussions highlight the importance of addressing climate change and intentionally purchasing sustainable products. Customization, high quality, and long-wearing clothing are valued by customers seeking unique and durable options. Peer influence, sustainable certification, and ethical considerations also shape customer perceptions and choices.
- While the online community shows a comprehensive understanding of slow fashion, the broader customer base demonstrates limited knowledge. The mini survey reveals room for improvement in customer awareness and comprehension of slow fashion. Education and awareness campaigns can bridge this gap and promote the principles of slow fashion. Collaboration and collective action are necessary to drive positive change in the industry.
- The research findings also address challenges to the wider adoption of slow fashion, such as cost, limited awareness, difficulty in finding slow fashion, and perceptions of quality and sustainability. Overcoming these challenges requires targeted efforts to educate consumers and raise awareness about the affordability, availability, quality, and sustainability benefits of slow fashion. The alignment between NVIVO analysis and the mini survey results provides valuable insights into the understanding and awareness of slow fashion among both the online community and the broader customer base.
- To promote slow fashion in Indonesia, three potential categories are proposed: customization, social, and culture. Customization offers a personalized production approach that aligns with sustainability principles. The social category emphasizes the affordability of preloved items and thrift shopping, making slow fashion more inclusive. The culture category highlights the market potential of traditional fabrics in Indonesia, such as tenun, songket, and batik, which align with slow fashion principles and hold cultural significance.
- Integrating sustainability practices throughout the production process of traditional fabrics is crucial. This includes using eco-friendly materials and minimizing waste generation. Slow fashion influences also play a vital role in shaping consumer preferences and promoting sustainable choices.

In conclusion, understanding customer perspectives is key to the growth of the slow fashion industry in Indonesia. The research findings provide valuable insights into customer knowledge and awareness, ranking influencing factors and addressing challenges. By aligning industry practices with customer preferences and promoting education and awareness, the slow fashion movement in Indonesia can thrive and contribute to a more sustainable and conscious fashion industry.

2. Recommendation

Recommendation for Slow Fashion Industry

This research provides practical implications and recommendations for the slow fashion industry. The key recommendations include:

1. Educating consumers about the value of slow fashion, emphasizing its benefits and long-term cost-effectiveness.
2. Enhancing accessibility and availability through online platforms, partnerships with retailers, and participation in fashion events.
3. Addressing body fluctuation concerns designing versatile and adjustable slow fashion designs.
4. Establishing brand credibility and transparency through transparent supply chain information and collaborations with recognized organizations.
5. Redefining slow fashion as stylish and contemporary, highlighting its trendy aspects.
6. Ensuring consistent product quality and providing customer-friendly return/exchange policies.
7. Validating sustainability claims through third-party certifications and transparent reporting.
8. Engaging with the community through social media and user-generated content.

Additionally, increasing the number of preloved and thrifting shops can contribute to the circular economy and reduce textile waste. In Indonesia, slow fashion brands should focus on utilizing and promoting traditional fabrics, prioritize sustainable and ethical practices, launch strategic marketing campaigns, and collaborate with slow fashion influencers to increase brand awareness and shape consumer behavior. These recommendations aim

to foster the growth and development of the slow fashion industry while aligning it with consumer preferences and sustainable practices.

Recommendation for Further Research

Further research is needed to enhance our understanding of customer perspectives on slow fashion. This study's limitations include the use of secondary data from online communities and a focus solely on consumer viewpoints. Conducting interviews or focus groups would provide deeper insights into consumer motivations and behaviors. Additionally, exploring the perspectives of industry stakeholders and examining cultural influences on slow fashion adoption would offer a more comprehensive understanding of the challenges and opportunities within the industry. Conducting such research will contribute to developing effective strategies for promoting and advancing the slow fashion movement.

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Analyzing Factors Influencing Brand Loyalty with Customer Satisfaction as Mediating Variable on A Local Luxury Muslim Brand

Ladya Lutfia Qurratuain Giffari¹, Nurrani Kusumawati²

^{1,2} School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

The luxury goods industry has garnered global attention as a symbol of status and pride in people's lives, notably in Asia, where it boasts a significant customer base. Within this context, Indonesia has witnessed notable expansion in the consumption of luxury goods within the upper-middle-class demographic. This growth has attracted the interest of both established fashion houses and local luxury brands operating in the country. However, dissatisfaction among customers regarding the quality of these Muslim local brand products has emerged as a concern. Such dissatisfaction jeopardizes the brand's public image and impacts brand loyalty. Consequently, this study explores the relationship between brand image, customers' perceived value, customers' perceived quality, and brand loyalty, with customer satisfaction as the mediating variable. This research utilized a quantitative methodology through an online survey. It specifically employed a judgmental sampling technique that targeted customers of local luxury Muslim brands. The total number of respondents involved in the study was 210 and the tool to analyze the data is PLS-SEM. The research reveals that customers' perceived value significantly influences brand loyalty, even when customers are dissatisfied. Therefore, it is recommended that Muslim wear brands strengthen the perceived value that they seek the brand to represent. This research adds to existing academic works by investigating the connections between these factors specifically in the context of Indonesian luxury brands. It contributes to giving valuable perspectives for professionals involved in branding and marketing, particularly in the domain of local luxury brands, and enhances the understanding of these areas.

Keywords—Brand Loyalty; Customer Satisfaction; Local Luxury Brand; PLS-SEM

1. INTRODUCTION

The fashion industry experiences continuous growth, with the entry of new brands that compete against established and well-known brands. These brands serve diverse markets and target different customer segments. The fashion industry is categorized into various segments, such as fast fashion and luxury premium. (Sanmiguel & Sadaba, 2020). As competition intensifies, brands need to specialize and concentrate on a specific segment within the industry.

Luxury brands are a segment that attracts many new entrants. Luxury is defined as products with the highest price and/or quality in the market (Candra & Abadi, 2018). In addition to price and quality, luxury is associated with customer perceptions of aesthetics, rarity, extraordinariness, and strong non-functional associations (Ko et al., 2019). Therefore, a luxury brand is perceived by customers as having a high level of price, quality, rarity, extraordinariness, and symbolic meanings. Research by Bain & Company (2022) indicates that the luxury market has shown growth for 95% of brands and is projected to grow by 21% in 2022.

Indonesia, situated in the Asia-Pacific region, shares a similar trend. It holds the fourth position as the world's largest consumer market (World Economic Forum, 2021), indicating a strong preference among Indonesians for purchasing products and services for personal use. This favorable climate presents opportunities for luxury brands in the Indonesian market, especially considering the growing middle class's increased expenditure on tertiary needs (Katadata, 2020).

Aligned with this trend, many luxury fashion brands have entered the Indonesian market, establishing boutiques in prominent malls across major cities. This scenario intensifies competition among renowned international fashion brands and local Indonesian brands as they strive to captivate the Indonesian customer base. Several local brands are competing by offering precisely tailored luxurious, exclusive products distinguished by high-quality fabrics and premium pricing. This phenomenon then creates one new understanding which is to be comprehended as a local luxury brand.

Those local luxury brands are the Indonesian brands that have the luxury value perception instilled in their brand identity that consists of social, functional, financial, and individual values (Hennigs et al., 2012) as cited in Klark

Luxury Brand

Luxury is a concept that elicits various definitions within the research sphere due to its intricate nature. Academic researchers have undertaken extensive investigations in this domain, each offering distinct interpretations of the essence of luxury. Ko et al., (2019) described a luxury brand as a product or service that possesses exceptional quality, offering genuine value, whether through its functionality or emotional appeal. It carries a prestigious reputation in the market and justifies a premium price while fostering a profound connection and resonance with its consumers. Similarly, Becker et al. (2018) refer to luxury brands as representing specific social and cultural meanings conveyed by the product or brand, which are used by consumers to describe their personal and social relationship with the brand and their position with others in society. Consequently, the scholarly discourse surrounding luxury embraces diverse perspectives, reflecting the multifaceted nature of this phenomenon.

Brand Image

According to Isoraite (2018), brand image refers to both the physical and emotional characteristics of a brand that are influenced by the perceptions consumers have about it. These perceptions are shaped by factors such as the individual's personality, feelings towards the brand, social interactions, and the effectiveness of the brand's communication efforts. Tuten (2019) defines brand image as the association and perception of a brand that is stored in the memory of consumers. This is triggered by the brand name and other brand symbols.

Customers' Perceived Value

Perceived value, as explained by Su & Chang (2018) as cited in Gunawan (2019), pertains to the value that resides within the cognition of customers or consumers. Gunawan (2019) further suggests that customers' perceived value is derived from the comparison between prospective customers' evaluations of the benefits and costs associated with an offering and those of its alternatives.

Customers' Perceived Quality

Perceived quality, as outlined by Melianawati, (2019) refers to a consumer's assessment of a brand's capability to meet their expectations. This evaluation is influenced by factors such as the company's image, the consumer's previous experiences with the company's other products, and the impact of opinion leaders on consumers' perceptions. The quality offered by a product or service must satisfy the needs of users so that they will believe to continue using it in their everyday lives. A product or service that is perceived by customers to have a high level of quality is sometimes associated with better performance and high reliability.

Customer Satisfaction

Customer satisfaction, as defined by Syahsudarmi (2022), is the emotional response of an individual, reflecting their level of pleasure or disappointment, which arises from comparing the actual performance or outcome of a product to their anticipated expectations. This satisfaction can be assessed using various criteria within the realm of business, including quality, service, and value, as highlighted by Wibowo (2022).

Brand Loyalty

According to Semuel & Putra (2018), brand loyalty refers to a firm and consistent commitment to continuously subscribe to or purchase a particular brand in the future. Kwan Soo Shin et al. (2019) further elaborate that brand loyalty arises from a strong emotional connection between a customer and a brand. Such loyal customers are generally less price-sensitive and more willing to pay premium prices as they have already developed a strong attachment to the brand. As a result, brands with a dedicated customer base benefit significantly in the market.

Hypothesis Development

In this section, the research hypotheses are formulated based on relevant findings from prior studies conducted in analogous industries. Each hypothesis is carefully crafted and presented, drawing upon the knowledge and insights gained from the existing body of research in similar domains. By integrating and building upon this foundation of previous knowledge, the research aims to establish a coherent and well-grounded framework for investigating the relationships between different variables under study. The development of each of the hypotheses is conveyed as follows.

Brand Image and Brand Loyalty

According to the research conducted by Gallart-Camahort et al. (2021) and Hokky & Bernarto (2021), it has been found that brand image plays a significant role in fostering loyalty among consumers of luxury brands. The study recommends that luxury brands prioritize the cultivation of a favorable brand image to enhance customer loyalty. Based on these findings, the hypothesis proposed is as follows:

H1: Brand Image positively influences Brand Loyalty.

Customers' Perceived Value and Brand Loyalty

Based on Gunawan's (2019) research findings, customers' perception of value plays a crucial role in predicting their loyalty toward a brand. The study measured perceived value across three dimensions: providing superior value, offering better alternatives considering factors like money, time, and effort, and demonstrating worthiness in terms of cost. The results indicated a significant and positive relationship between all these elements and brand loyalty. Based on these findings, the hypothesis proposed is as follows:

H2: Customers' Perceived Value positively influences Brand Loyalty.

Customers' Perceived Quality and Brand Loyalty

Based on the research carried out by Chansuk & Chaipoopirutana (2021) and Gunawan (2019), it was discovered that customers' perception of quality greatly influences their loyalty toward luxury brands. The study suggests that luxury brands should prioritize highlighting factors like production quality, aesthetic design, and unique products. By doing so, consumers will develop brand loyalty due to the excellent quality of the products and their distinct characteristics compared to competitors. Based on these findings, the hypothesis proposed is as follows:

H3: Customers' Perceived Quality positively influences Brand Loyalty.

Brand Image, Customers' Perceived Value, Customers' Perceived Quality, Customer Satisfaction and Brand Loyalty

Saninaya et al. (2023) examined the connection between brand image, customers' perceived value, customer satisfaction, and brand loyalty in luxury brands. The study found a positive and significant relationship among all these variables. The researchers suggest exploring additional factors like quality, price, or social culture to enhance understanding in future investigations. Similarly, Sumarto (2022) emphasized the importance of customers' perceived quality as a determinant of customer satisfaction. Based on these findings, the hypothesis proposed is as follows:

H4: Brand Image positively influences Customer Satisfaction.

H5: Customers' Perceived Value positively influences Customer Satisfaction.

H6: Customers' Perceived Quality positively influences Customer Satisfaction.

H7: Customer Satisfaction positively influences Brand Loyalty.

Conceptual Framework

The study integrated various research papers (Gallart-Camahort et al., 2021; Hokky and Bernarto, 2021; Gunawan, 2019; Chansuk & Chaipoopirutana, 2021; Saninaya et al., 2023; Sumarto, 2022) that align with the research objectives. The resulting framework is presented as follows.

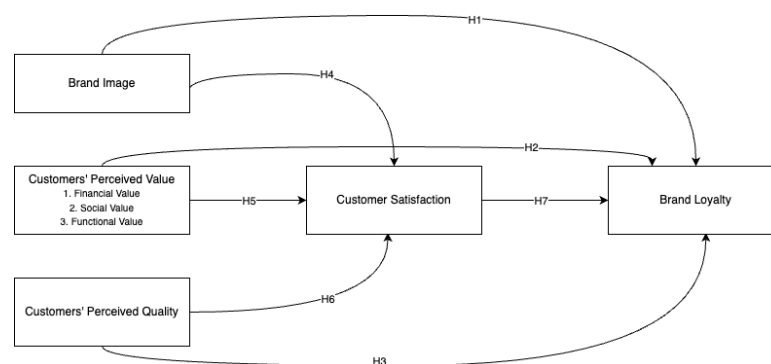


Figure 14. Conceptual Framework

Source: Gallart-Camahort et al., 2021; Hokky and Bernarto, 2021; Gunawan, 2019; Chansuk & Chaipoopirutana, 2021; Saninaya et al., 2023; Sumarto, 2022

III. RESEARCH METHODOLOGY

Figure 2 illustrates the research process, which commences with preliminary research on a trending topic to gather insights and validate perspectives from individuals. The preliminary research focuses on the perception of customers towards Local Luxury Muslim Brands and their opinions on the quality offered. Subsequently, a problem is identified, highlighting the discrepancy between customer perceptions of Local Luxury Muslim branding and the ongoing issue concerning the quality offered. A comprehensive literature review is then conducted to enhance understanding of the topic based on prior research. Hypotheses are subsequently formulated based on the research findings. The data collection phase employs a quantitative approach to test and validate the formulated hypotheses. A survey is administered to customers of Local Luxury Muslim Brands in major cities across Indonesia. To ensure efficient and comprehensive data collection from diverse populations, Google Forms was chosen as the preferred survey tool with the minimum respondent for this research being 200. The questionnaire items will be modified from previous studies that explore similar subjects and will be presented in Bahasa Indonesia to facilitate respondents in comprehending and providing clear answers to the specific topic being addressed.

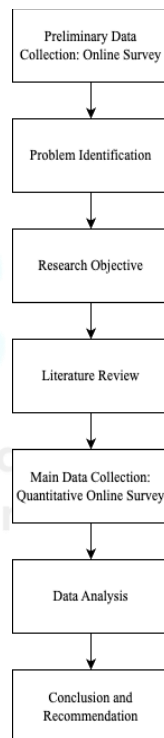


Figure 29. Research Design

Table 33. Demographic, Behavioral, and Screening Questionnaire Design

No.	Variable	Indicator	Label
1.	Demographic	Initial	<i>(open questions)</i>
		Age	18-25 26-40 41-55 >55
		Domicile	Jabodetabek Bandung

			Surabaya Makassar Padang Other (<i>open questions</i>)
2.	Behavioral	How many times do you buy Local Luxury Muslim Brand product in a year?	<3 times 3-10 times >10 times
		Have you ever had any unpleasant experiences with Local Luxury Muslim Brand?	Yes
		What specific aspect did you experience the unpleasantness?	No Products Service

Table 34. Main Questionnaire Design

No.	Variable	Label	Indicator	Source
1.	Brand Image	BI1	Local Luxury Muslim Brand has a luxury brand image	(Satornsantikul & Nuangjam nong, 2022; Gallart-Camahort et al., 2021; Saninaya et al., 2023)
		BI2	Local Luxury Muslim Brand has a brand image that is unique compared to the brands of competitors	
		BI3	Local Luxury Muslim Brand has a luxury brand image that influenced me to buy the products	
		BI4	Local Luxury Muslim Brand always improves its brand image to attract new generation of customers	
2.	Customers' Perceived Value	PV1	I believe that I spent my money wisely when purchasing Local Luxury Muslim Brand	(Xi et al., 2022; Satornsantikul & Nuangjam nong, 2022; Saninaya et al., 2023)
		PV2	Local Luxury Muslim Brand's products are good for investment	

		PV3	I feel proud when wearing Local Luxury Muslim Brand's product	
		PV4	Local Luxury Muslim Brand's product can be use in a long time period	
3.	Customers' Perceived Quality	PQ1	Local Luxury Muslim Brand's product has a superior quality	(Hanifati & Salehudin, 2021)
		PQ2	I found that Local Luxury Muslim Brand's product quality worth the price offered	
		PQ3	Local Luxury Muslim Brand's products have a high quality that is owned by other luxury products	
		PQ4	Local Luxury Muslim Brand's products are durable and reliable	
4.	Customer Satisfaction	CS1	I am pleased to buy Local Luxury Muslim Brand rather than other brands	(Gallart-Camahort et al., 2021; Saninaya et al., 2023)
		CS2	I am satisfied with Local Luxury Muslim Brand product that I purchased	
		CS3	I enjoy spending money purchasing Local Luxury Muslim Brand product	
		CS4	I am satisfied with the services and after-sale services that I received from buying Local Luxury Muslim Brand	
		CS5	I am satisfied with quality and design of Local Luxury Muslim Brand's product	
		CS6	I am satisfied with the durability of Local Luxury Muslim Brand' products	

5.	Brand Loyalty	BL1	I will stay continue using Local Luxury Muslim Brand even other brands provide greater diversity	(Saninaya et al., 2023; Satornsantikul & Nuangjamnong, 2022)
		BL2	I will recommend Local Luxury Muslim Brand to my friends	
		BL3	I would buy other products from Local Luxury Muslim Brand	
		BL4	I am loyal to Local Luxury Muslim Brand	
		BL5	I will give good review to other friend about Local Luxury Muslim Brand	
		BL6	I would still buy Local Luxury Muslim Brand even though I have unpleasant experience	
		BL7	I would still buy Local Luxury Muslim Brand even though I have heard bad reviews about their products	

The collected survey data is then analyzed using PLS-SEM, a widely employed multivariate data analysis technique in the field of marketing research (Mendez-Suarez, 2021). The data analysis was done to draw conclusions and develop recommendations that can be implemented by Local Luxury Muslim Brands within the same industry.

IV. RESULT / FINDING

Quantitative Research Result

Out of 223 distributed questionnaires, 210 respondents met the criteria and passed the screening questions. Hence, the data analysis for this study utilized 210 valid responses, which met the minimum required sample size stated in the previous chapter.

Descriptive Analysis

Table 35. Descriptive Analysis Result

No.	Variable	Indicator	Mean	Std. Dev	Median	Min	Max
1.	Brand Image	BII Local Luxury Muslim Brand has a luxury brand image	4.452	0.595	5	3	5

		BI2	Local Luxury Muslim Brand has a brand image that is unique compared to the brands of competitors	4.329	0.612	4	2	5
		BI3	Local Luxury Muslim Brand has a luxury brand image that influenced me to buy the products	4.176	0.814	4	1	5
		BI4	Local Luxury Muslim Brand always improves its brand image to attract new generation of customers	4.248	0.729	4	2	5
2.	Customers Perceived Value	PV1	I believe that I spent my money wisely when purchasing Local Luxury Muslim Brand	4.076	0.844	4	1	5
		PV2	Local Luxury Muslim Brand's products are good for investment	3.857	1.097	4	1	5
		PV3	I feel proud when wearing Local Luxury Muslim Brand's product	4.305	0.740	4	1	5
		PV4	Local Luxury Muslim Brand's product can be use in a long time period	4.290	0.749	4	2	5
3.	Customers Perceived Quality	PQ1	Local Luxury Muslim Brand product has a superior quality	4.257	0.726	4	2	5
		PQ2	I found that Local Luxury Muslim	4.124	0.866	4	1	5

			Brand's product quality worth the price offered					
		PQ3	Local Luxury Muslim Brand's products has a high quality that is owned by other luxury products	4.114	0.845	4	2	5
		PQ4	Local Luxury Muslim Brand's products are durable and reliable	4.048	0.829	4	2	5
4.	Customer Satisfaction	CS1	I am pleased to buy Local Luxury Muslim Brand rather than other brands	4.095	0.881	4	1	5
		CS2	I am satisfied with Local Luxury Muslim Brand's product that I purchased	4.233	0.717	4	2	5
		CS3	I enjoy spending money purchasing Local Luxury Muslim Brand's product	3.938	1.017	4	1	5
		CS4	I am satisfied with the services and after-sale services that I received from buying Local Luxury Muslim Brand	4.052	0.837	4	1	5
		CS5	I am satisfied with quality and design of Local Luxury Muslim Brand 's product	4.267	0.748	4	2	5

		CS6	I am satisfied with the durability of Local Luxury Muslim Brand's products	4.157	0.818	4	2	5
5.	Brand Loyalty	BL1	I will stay continue using Local Luxury Muslim Brand even other brands provide greater diversity	4.038	0.968	4	1	5
		BL2	I will recommend Local Luxury Muslim Brand to my friends	4.262	0.769	4	1	5
		BL3	I would buy other products from Local Luxury Muslim Brand	4.138	0.899	4	1	5
		BL4	I am loyal to Local Luxury Muslim Brand	4.033	0.960	4	1	5
		BL5	I will give good review to another friend about Local Luxury Muslim Brand	4.138	0.804	4	1	5
		BL6	I would still buy Local Luxury Muslim Brand even though I have unpleasant experience	3.767	1.080	4	1	5
		BL7	I would still buy Local Luxury Muslim Brand even though I have heard bad reviews about their products	3.938	0.949	4	1	5

Based on the data presented in the descriptive analysis table, it is evident that the variable "Brand Image," specifically the B1 indicator which states "Local Luxury Muslim Brand has a luxury brand image," has the highest average score compared to other indicators (4.452). This finding indicates that

Local Luxury Muslim Brand consistently maintains its brand image targeted towards upper-middle-class customers, shaping their perception of luxury within the brand's identity. This highlights the role of the brand's luxury image in influencing customer satisfaction. The perception of luxury surrounding Local Luxury Muslim Brands enhances customers' perception of the brand, creating a heightened sense of prestige and exclusivity associated with their products.

In contrast, the "Brand Loyalty" variable, particularly related to the statement "I would still buy Local Luxury Muslim Brand even though I have unpleasant experiences," has the lowest average score of 3.767. This finding suggests that customers demonstrate a lower level of loyalty toward the brand when they have negative experiences. Customer satisfaction plays a crucial role in determining the extent of brand loyalty. It indicates that although customers may continue to make purchases despite negative encounters, their overall satisfaction levels may be affected by these unpleasant experiences.

When examining the standard deviation, the data in the table above reveals that the variable "Customers Perceived Value" with the indicator PV2, which states "Local Luxury Muslim Brand's products are good for investment," has the highest standard deviation among the other indicators (1.097). According to Hargrave (2021), a larger standard deviation indicates a greater dispersion of data. Therefore, it can be inferred that respondents' perspectives vary significantly when it comes to this statement. Some perceive Local Luxury Muslim Brand products to be highly suitable for investment, while others hold different opinions.

On the other hand, the variable "Brand Image" with the indicator "Local Luxury Muslim Brand has a luxury brand image" has the lowest standard deviation of 0.595. According to Rumsey (2021), a low standard deviation suggests that the values within a statistical dataset are closely clustered around the mean. In this case, it indicates a high level of agreement or similarity among respondents in perceiving Local Luxury Muslim Brand's image as a luxury brand. This interpretation is further supported by the indicator's highest mean score compared to other indicators, its lowest minimum score of 3, and its highest maximum and median scores of 5.

Partial Least Square (PLS-SEM) Analysis Result

In this research, the conceptual framework was analyzed using the Partial Least Squares (PLS) method and the Smart PLS application. The Smart PLS tool was utilized to assess and quantify the relationships among the variables examined in the study. The reflective measurement model included variables such as Brand Image, Customers' Perceived Value, Customers' Perceived Quality, Customer Satisfaction, and Brand Loyalty. Here is the result of the model presented in Figure 3.

Structural Path Significance

After completing the previous stages, the researcher proceeds with the bootstrapping procedure, which is an analytical technique used to test the significance of both the inner and outer models in order to assess the relationships proposed by the hypotheses. This method generates T-values that are used to evaluate the significance of the structural paths representing the hypotheses in this study. The results obtained from bootstrapping help the researcher determine whether to accept or reject the hypotheses. The model used in this study consists of five latent variables and 25 indicators. Brand image is represented by four indicators, customers' perceived value is represented by four indicators, customers' perceived quality is represented by four indicators, customer satisfaction is represented by six indicators, and brand loyalty is represented by seven indicators.

Several quantitative measures, including the path coefficient, coefficient of determination (R^2), and cross-validated redundancy (Q^2), are used as evaluative indicators to assess the quality of the model. For a path coefficient to be considered significant, the T-statistics value must exceed 1.96. Below is the outcome of the bootstrapping analysis visually represented in Figure 3.

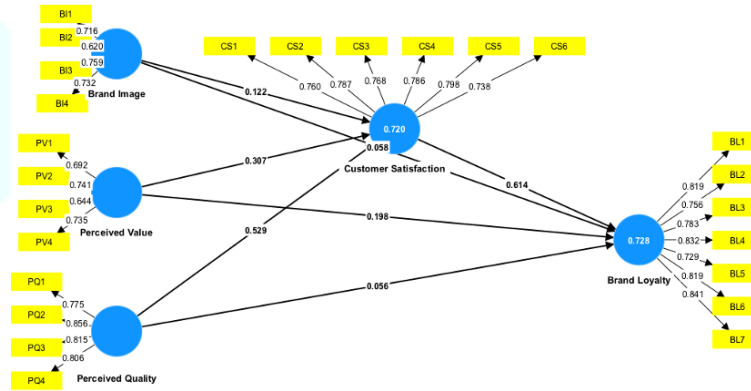


Figure 16. Structural Path Significance

Based on the results, it can be concluded that the two path coefficients are not statistically significant, as their respective T-statistics values are below the critical threshold of 1.96. These insignificant path coefficients are observed in the relationship between "Perceived Quality" and "Brand Loyalty", with a T-statistics value of 0.750, and between "Brand Image" and "Brand Loyalty", with a T-statistics value of 1.102. In contrast, all other path coefficients in the model are statistically significant.

Table 36. Structural Path Significance

Structural Path	Original Sample	Sample Mean	Standard Deviation	T Statistic	Coefficient of Determination (R ²)	Cross-validated Redundancy (Q ²)
Brand Image -> Brand Loyalty	0.058	0.059	0.053	1.102	0.728	0.603
Perceived Quality -> Brand Loyalty	0.056	0.056	0.075	0.750		
Perceived Value -> Brand Loyalty	0.198	0.203	0.070	2.824		
Customer Satisfaction -> Brand Loyalty	0.614	0.609	0.066	9.253		
Brand Image -> Customer Satisfaction	0.122	0.126	0.054	2.249	0.720	0.706
Perceived Value -> Customer Satisfaction	0.529	0.524	0.069	7.644		
Perceived Value -> Customer Satisfaction	0.307	0.311	0.058	5.314		

The results of the R² (Coefficients of Determination) and Q² (Cross-validity Redundancy) can be observed in Table 4. The R² metric is used to determine the proportion of variance in the dependent variable that is explained by the structural model. In marketing research, R² scores of 0.75 are considered high, 0.50 is considered moderate, and 0.25 is considered low. In this study, the R² values were calculated for Brand Image, Customers Perceived Value, Customers Perceived Quality, Customer Satisfaction, and Brand Loyalty. The R² value for Brand Loyalty is 0.728, indicating that 72.8% of the variance in Brand Loyalty can be accounted for by Brand Image, Customers Perceived Value, Customers Perceived Quality, and Customer Satisfaction. Similarly, the R² value for Customer

Satisfaction is 0.720, indicating that 72% of the variance can be attributed to Brand Image, Customers Perceived Value, and Customers Perceived Quality.

The Q^2 test assesses the predictive capability of the model by removing data points, averaging them, and then predicting the model's parameters. Q^2 values above 0 indicate the model's effectiveness in predicting the variable's outcome. The Q^2 test is conducted using the SmartPLS software, and it analyzes the common model redundancy. It is crucial for Q^2 to be greater than zero, and a Q^2 value of one indicates a perfectly fitting research model.

Hypothesis Testing Result

Hypothesis testing utilizes calculations based on Partial Least Squares (PLS) to analyze the results of the hypotheses. This process involves evaluating the significance of T-values and examining the path coefficients within the inner model. The outcomes of the hypothesis testing are subsequently presented.

Table 37. Hypothesis Testing Table

Hypothesis	Structural Path	Path Coefficient	T Value	P Value	Result
H1	Brand Image -> Brand Loyalty	0.058	1.102	0.270	Rejected
H2	Customers' Perceived Value -> Brand Loyalty	0.198	2.824	0.005	Accepted
H3	Customers' Perceived Quality -> Brand Loyalty	0.056	0.750	0.453	Rejected
H4	Brand Image -> Customer Satisfaction	0.122	2.249	0.025	Accepted
H5	Customers' Perceived Value -> Customer Satisfaction	0.307	5.314	0.000	Accepted
H6	Customers' Perceived Quality -> Customer Satisfaction	0.529	7.644	0.000	Accepted
H7	Customer Satisfaction -> Brand Loyalty	0.614	9.253	0.000	Accepted

From Table 5 above, it is seen that two out of seven hypotheses are rejected since it does not show a significant result according to the statistical analysis using T-value and P-value. Further explanations about each of the hypotheses will be discussed in the next section.

V. DISCUSSION

H1: Brand Image positively influences Brand Loyalty

The initial hypothesis proposed a positive relationship between Brand Image and Brand Loyalty. However, upon analyzing the study's data, it was found that this hypothesis is rejected due to a T-value lower than the standard threshold of 1.96 at a significance level of 0.05 (5%). This finding contradicts previous research, such as the studies conducted by Gallart-Camahort (2021) and Arisandi (2022), which indicated a significant positive influence of brand image on brand loyalty in the context of luxury brands. The questionnaire results reveal that although Local Luxury Muslim Brand has successfully established itself as a luxury brand, it does

not significantly impact customer loyalty. Other factors, as indicated by the BL6 indicator, which pertains to customers' willingness to continue purchasing from Local Luxury Muslim Brand despite unpleasant experiences, may influence brand loyalty. It suggests that customer experience might play a role in determining loyalty to the brand.

H2: Customers' Perceived Value positively influences Brand Loyalty

The second hypothesis posited that Customers' Perceived Value has a positive impact on Brand Loyalty is accepted since it has a T-value exceeding the standard threshold at a significance level of 0.05 (5%). This finding aligns with prior research conducted by Gunawan (2019), which demonstrated a positive relationship between customers' perceived value and brand loyalty. The average scores for all perceived value indicators exceed 4, indicating that Local Luxury Muslim Brand products meet or exceed customers' expectations. Particularly, the statement "Local Luxury Muslim Brand's product can be used for a long time" (PV4) scored an average of 4.3, suggesting that utilitarian value plays a significant role in customers perceiving the product as worthwhile and contributing to their brand loyalty.

Additionally, it is essential to emphasize Local Luxury Muslim Brand's positioning that successfully embodies affluence, particularly among Muslim women. By strategically setting higher prices compared to competitors, it has effectively established itself as a lifestyle brand that resonates with the social status of middle to upper-class Indonesian Muslim women. This deliberate pricing strategy creates an exclusivity image, reinforces the brand's perceived value, and enhances its appeal to the target market.

This positioning strategy has contributed to fostering a positive attitude towards the brand, as customers perceive the brand as a symbol of status and sophistication. This positive attitude cultivates an emotional connection and a sense of trust between customers and the brand, forming a solid foundation for increased brand loyalty. The association of a Local Luxury Muslim Brand with the lifestyle and aspirations of its target audience further reinforces this emotional connection and loyalty, as customers feel a strong alignment with the brand's values and aspirations.

H3: Customers' Perceived Quality positively influences Brand Loyalty

The third hypothesis assumed that there is a positive influence between Customers' Perceived Quality and Brand Loyalty. On the other hand, after analyzing the data, the hypothesis is rejected since it has T-value below the standard threshold at a significance level of 0.05 (5%). This finding contradicts previous research conducted by Chansuk & Chaipooirutana (2021) and Gunawan (2019), which indicated a significant influence of customers' perceived quality on brand loyalty.

Upon examining the questionnaire responses, it is observed that customers who have both positive and negative experiences with Local Luxury Muslim Brands show similar average scores in the brand loyalty indicators. This suggests that even customers who have had an unfavorable experience remain loyal to the brand, indicating that there are other factors influencing their loyalty beyond their perception of quality. This realization highlights the depth of customer loyalty and their affinity towards Local Luxury Muslim Brand that goes beyond the products offered.

H4: Brand Image positively influences Customer Satisfaction

The fourth hypothesis proposed that Brand Image has a positive influence on Customer Satisfaction. This hypothesis is accepted since it has a T-value above the standard threshold at a significance level of 0.05 (5%). The findings of Saninaya et al. (2023) support the alignment between brand image and customer satisfaction in luxury brands, as observed in this study.

The questionnaire used to assess the brand image variable in this study yielded a total average mean of over 4, particularly with the BI2 indicators showing the second-highest average score of 4.3. These indicators indicate that respondents perceive Local Luxury Muslim Brand as having a unique brand image. This uniqueness can be attributed to various factors such as design aesthetics, craftsmanship, and the brand's values and identity. Customers who appreciate and resonate with Local Luxury Muslim Brand' distinctive brand image are likely to experience higher satisfaction in their association with the brand. The brand's unique positioning contributes to customer loyalty and satisfaction as customers perceive a sense of differentiation in choosing the brand itself.

H5: Customers' Perceived Value positively influences Customer Satisfaction

The fifth hypothesis indicates there is a positive influence between Customers' Perceived Value and Customer Satisfaction. This hypothesis is accepted since it has a T-value above the standard threshold at a significance level of 0.05 (5%). These findings are consistent with prior studies conducted by Saninaya et al. (2023) and Prameswari & Santosa (2021), which also demonstrate a positive correlation between Customers' Perceived Value and Customer Satisfaction.

According to the questionnaire responses, particularly in the PV4 indicator with a statement of "Local Luxury Muslim Brand's product can be used for a long time," it received an average score of 4.2, which is the second highest among the Perceived Value variables. This suggests that respondents believe that the products are durable and have a long lifespan. The respondents' perception of exceptional value in the products is strongly associated with customer satisfaction, as customers prioritize longevity and reliability in their purchases.

H6: Customers' Perceived Quality positively influences Customer Satisfaction

The sixth hypothesis assumed that Customers' Perceived Quality has a positive influence on Customer Satisfaction is accepted since it has a T-value above the standard threshold at a significance level of 0.05 (5%). This finding is consistent with prior research conducted by Sumarto (2022), which similarly confirms the positive impact of Customers' Perceived Quality on Customer Satisfaction.

The data obtained from the questionnaire provides valuable insights into how the respondents perceive the quality of Local Luxury Muslim Brands products as actual buyers. The perceived quality is assessed through four indicators, and the average scores for all these indicators surpass 4. This indicates that the respondents generally perceive the products to possess a level of quality that aligns with the brand's claims and pricing. This perception of high quality is strongly linked to customer satisfaction, as evidenced by the average scores for the six customer satisfaction indicators, all of which exceed 4. Hence, it can be inferred that customers are indeed satisfied with their purchases, and this satisfaction is likely influenced by their perception of the product's quality.

H7: Customer Satisfaction positively influences Brand Loyalty

The seventh or the last hypothesis proposed a positive relationship between Customer Satisfaction and Brand Loyalty. This hypothesis is accepted since it has a T-value above the standard threshold at a significance level of 0.05 (5%). These findings align with prior studies conducted by Saninaya et al. (2023) and Prameswari & Santosa (2021), which similarly indicated a positive relationship between customer satisfaction and brand loyalty.

Based on the responses gathered from the questionnaire, it is evident that customers' satisfaction is relatively high, as indicated by the average score of 4.095 for the CS1 indicator, which states "I am pleased to buy Local Luxury Muslim Brands rather than other brands." This implies that most respondents expressed satisfaction with the products and exhibit a preference. These findings suggest a positive association between customer satisfaction and brand loyalty, as satisfied customers are more likely to demonstrate loyalty.

VI. CONCLUSION AND RECOMMENDATION

The researcher has derived several noteworthy conclusions based on the preceding research findings and discussions. Firstly, they have determined that brand image, customers' perceived value, and customers' perceived quality are influential factors that significantly affect customer satisfaction. Secondly, while brand image and perceived quality hold importance in the brand context, they may not solely serve as the primary drivers of brand loyalty. Instead, customers' perceived value emerges as the most influential factor in fostering brand loyalty, albeit with brand image and perceived quality playing significant roles in shaping customer satisfaction. Consequently, it is imperative for local luxury Muslim brands to prioritize the delivery of values that align with customers' expectations, as this will reinforce the development of loyal customer relationships.

Recommendation

Looking at the conclusion, several recommendations will be provided for stakeholder based on the research findings.

Marketers in The Local Luxury Muslim Industry

To achieve a high level of brand loyalty, it is essential to enhance customers' perceived value. Marketers in the same industry can consider the following strategies:

- Implement a rigorous quality control (QC) process to uphold the luxurious value. While the study findings suggest that customers' perceived quality does not directly impact brand loyalty, maintaining exceptional product quality aligned with luxury branding is essential. By consistently delivering high-quality products, it can enhance customer satisfaction and provide a positive brand experience, ultimately fostering long-term brand loyalty.
- Improve after-sales services, especially in regions outside Java Island. By offering efficient after-sales support, the brand can address customer concerns, provide timely assistance, and ensure customer satisfaction post-purchase. This can be supported by dedicated customer service teams, extended warranty programs, and hassle-free return and exchange policies.
- Uphold luxurious values and imagery throughout all operations and branding efforts. As indicated by the descriptive analysis, maintaining a strong brand image is crucial. To achieve this, Local Luxury Muslim Brands can continuously create innovative and unique hijab designs in various colors, considering that most respondents in the questionnaire are buyers of hijabs. Additionally, maintaining international-standard campaigns for every new product launch can further reinforce the luxurious brand image.

Future Research

In future research, there is a prospect for scholars to apply this model in various regions or countries, thereby broadening the research's scope. It is recommended to incorporate an additional dimension of luxury value, namely individual value. Furthermore, expanding the sample size and targeting specific regions would yield valuable insights into potential variations among respondents. Additionally, future researchers are encouraged to adopt mixed methods, combining qualitative and quantitative approaches, to gain a more comprehensive understanding of the topic and further explore factors influencing luxury brands.

Implications

This research also has two main implications as follows.

Practical Implications

The findings of this study have practical implications for fashion brands operating in the local luxury industry in Indonesia, particularly those specializing in Muslim wear. The research provides valuable insights and guidance for fashion brands to develop effective marketing strategies. Specifically, the study emphasizes the importance of prioritizing brand image, customers' perceived value, and customers' perceived quality to enhance customer satisfaction. Moreover, focusing on improving the perceived value aspect is crucial for increasing brand loyalty. By implementing these recommendations, fashion brands can enhance their sales performance, customer satisfaction, and ultimately cultivate stronger brand loyalty among their target audience. The implications of this research go beyond theoretical considerations and offer actionable recommendations for fashion brands in the local luxury industry in Indonesia to optimize their marketing efforts.

Theoretical Implications

Prior studies have examined the relationships between various factors, including Brand Image and Brand Loyalty, Customers' Perceived Value and Brand Loyalty, Customers' Perceived Quality and Brand Loyalty, Brand Image and Customer Satisfaction, Customers' Perceived Value and Customer Satisfaction, Customers' Perceived Quality and Customer Satisfaction, and Customer Satisfaction and Brand Loyalty. However, there is a research gap in the specific context of Indonesian luxury brands and Muslim wear. This study aims to address this gap by investigating the connections among Brand Image, Customers' Perceived Value, Customers' Perceived Quality, Customer Satisfaction, and Brand Loyalty within the context of Indonesian luxury brands. The findings from this research contribute to the body of knowledge in branding and marketing, particularly in the context of local luxury brands.

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Evaluation of Critical Risk Factors in Private Equity/Venture Capital Industry in Indonesia

Fauzan Khalil Ramadhan¹, and Raden Aswin Rahadi²

^{1,2} School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

In the landscape of global uncertainty, there's a push for VC in Indonesia to deliver prudent investment. Through the exploration of critical risk factors that pose a significant threat to investment portfolio, this research purpose is to determine the level VCs risk vis-a-vis their investment. Acknowledging previous literature, this research was able to identify 7 primary indexes in VC risks, which is also derived into 28 secondary indexes, both serve as risk factors of VC in Indonesia. A compilation of risk factors will be processed in multi-criteria decision making in the form of AHP method, incorporating expert judgment of Venture Capitalist from Kejora Capital, Northstar, Kolibra, and MDI Venture. The overall ranking of risk factors then transformed into a risk mapping that can confirm VC in Indonesia faced 8 critical risk factors that include uncertainty in future market growth or threat possibility, equal return with a specific collection period, sales projection bases and eroding margin, excessive burn rate, company objective fulfillment, establishing exit vehicle, investment after venture listing, and investment liquidity in conducting their decision process from screening to post-investment activities. Real option approach is proposed as a solution to address the risk factors that allows adaptive decision making of VC to proactively manage risk, maximize strategic flexibility, and adapt to uncertainties.

Keywords: Critical Risk Factors; Global Uncertainty; Real Option; Venture Capital.

1. INTRODUCTION

Innovation can be born when there's a plausible gap that would set up room for it. The development of industry would depend upon the creation of new economic structures that are achievable through constant innovation. Thus, it may perhaps need external aid to spread out the stress of innovating. Generally, the context of challenges revolves around the disparity of access and resources. Such access and resources would be more effective if it did not hinge on organic and dynamic processes, external parties may perhaps become the answer to all innovation problems.

Venture Capital is an increasingly popular option of the 'external parties' that can empower innovators to address their respective innovation challenges. Venture Capital finance influx positions them as a pivotal player in accentuating the next stage of the innovation cycle—the period in a company's life when it begins to commercialize its innovation. Venture capital (from now on abbreviated as VC) is a form of private equity and a type of financing that investors provide to startup companies and small businesses that are believed to have long-term growth potential. Ventures that have a limited operating history (or usually called startups), lack access to capital markets, bank loans, or other debt instruments. Thus, VC is essential to fill this void in raising capital. Venture capital source of funding originated from many sources, such as well-off investors, investment banks, and any other financial institutions.

As one of the most anticipated emerging economies, Southeast Asia also benefits from VC predominance. Up until 2019, Southeast Asia alone has absorbed US\$10.1 billion of global investment value. Most of those numbers, primarily capitalized by Singapore, other countries are beginning to reap some of these benefits, especially Indonesia. East Ventures stated that Indonesia has long been an appealing market to VCs due to its rapidly growing demographic of Internet users, and gaps in the market which will likely prove extremely lucrative. It implies in Indonesia Venture Capital Investment in technology-based startups which doubled between 2016-2017, indicating Indonesia's appeal as the newest tech innovation and growth site. Which backed by Mifza Muzayan, Google Sales Operations & Strategy, that stated that the number of investments has increased 60 times,

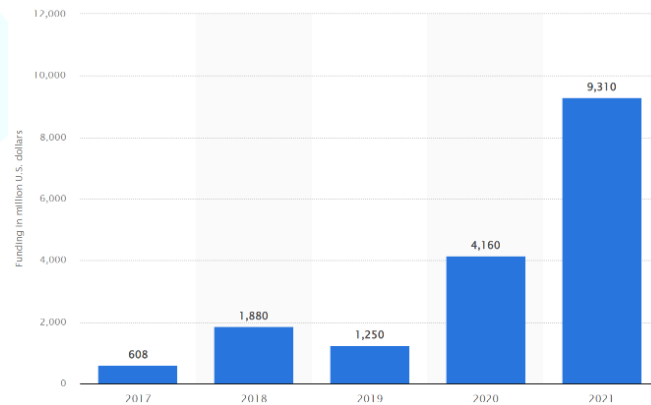


Fig. 1. Venture Capital Funding
Source: Statista Research Department, 2022

Despite all the positive outlook of the VC industry, particularly in Indonesia, all of the investments being made have a high uncertainty and high exposure that are made due to the nature of novelty that venture capital carries. According to Zacharakis and Meyer (2000), 35 to 55% of VC investments fail and do not lift to expectation. VCs invest in new firms with little to no performance history and/or data, which translates into emerging firms. All these characteristics become the main driver of the high investment risk possessed by VC. It shows how critical risk assessment and measurement are to pinpoint critical risk factors and mitigate it for sustaining their investment portfolio.

It will still be highly relevant especially heading into 2023. VC in Indonesia mostly will reduce their activity with a more conservative investment aimed for daring ventures that could capitalize this period of uncertainty and thrive. Since, global uncertainty is likely to occur and become the biggest driver of a recession in 2023. Economic decoupling between the world's two biggest economies is becoming a reality. There's also the case of interest rate rises in response to higher inflation spread across many nations.

VC in Indonesia experience a complex landscape of risk factors which certainly have an ability to negatively impact their investment portfolio. VCs investment activity can be considered as a high-risk, high-reward investment that aim for rapid growth with substantial return. This characteristic of investment makes it necessary for every VC to conduct a dynamic analysis on both internal and external risk factors vis-a-vis their investment projects. Therefore, there is a necessity to explore the critical risk factors that pose as a significant threat to VCs investment portfolio, especially considering period of uncertainty investment approach that concentrated in prudent yet beneficial investment. Through the gaps or room of improvements that are discovered, the researcher might offer recommendations and/or solutions which possibly better sustain the company investment efforts in the unpredictable and complicated environment that presented in the critical risk factors.

Research Objectives

13. Establish determinants of risk factors that pose a threat to VC business activity and portfolio
14. Obtain an applicable and effective risk assessment to protect the livelihood of Venture Capital business activity and portfolio
15. Develop strategies that could better support VC in mitigating those potential risks

Scope and Limitations

This research restricts its subject solely to VC that operate in Indonesia. The critical risk factors being questioned is limited for the time of this research conducted. Considering the sensitivity of information, investment risk—also applicable for investment return—kept within safe boundaries for public usage. Generally, Venture Capital have a

strict stance in sharing fact and data about their investment decision. Thus, it will make the availability and accuracy of data hinder the research process, limiting the scope of research and influencing the reliability of any conclusion being drawn particularly if the VC is reluctant to disclose specific information. Venture Capital also resists the generalization that many researchers attempted to impose upon them. This is because VCs treat every investment in their portfolio peculiar to itself. Accordingly, the applicability of the findings will also be partial, making it challenging to draw broader conclusions or provide relevant recommendations. These limitations could significantly make the researcher provide clouded judgment during the research, this will eventually lead to improper outcome of the recommendation and conclusion.

II.LITERATURE REVIEW

Previous Research regarding Risk in Venture Capital

As previously implied, risk management is still a developing topic in the business context of startups and private equity. Several research has become spearhead in the topic regarding risk factors and risk management on a venture level, such as LiPuma & Park (2014); Lu et al. (2006); Smolarski et al. (2005); Tan et al. (2008) that act as an underlying foundation for the other research alike. According to Ruhnka & Young, (1991) VC investment is almost certainly positioned in the realm of uncertainty with high unsystematic risks which force them to utilize a variety of strategies to improve the reward-to-risk ratio, which in this case are undisclosed by almost every VC. Presently, there's no theoretical structure and/or framework that have been widely accepted by the VC community.

This condition presents limitless alternatives in identifying, assessing, analyzing, and managing risk with the determination of a subset of criteria heavily relies on individual judgment since there is no specific guidance. With this nature, the literature that become the key driver of this research literature review will be centered around risk concept and theories, risk management, venture capital decision process, venture capital risk, risk relative measurement, that are all specific, relevant, and applicable towards the development of risk management strategy in the Venture Capital world, or the merest to the subject of this research, VC in Indonesia.

Risk Management

To obtain the critical risk factors, one must understand how venture risks work. Hain (2018) priorly mentioned in his research that it's pivotal for all types of companies to undertake systematic identification, assessment, and treatment of risks, including the unique business process of Venture Capital. It can be all compiled as integrated risk management can improve the management of the core processes of an organization by ensuring that key dependencies are analyzed, monitored, and reviewed (Paul Hopkin, Fundamentals of Risk Management, 2017). Borge (2001) stated that risk management is the taking of deliberate actions to shift the odds in our favor. We can conclude that Risk Management is the process to shift the negativity of risk factor/event from an organization through a series of coordinated activities which are identification, assessment, and treatment. Based on Olsson (2002) a risk management process consists of several parts, starting with the collection of information, risk processing and identifying, measuring the overall risk, and lastly planning regarding the risk. The process is tailored to formulate something that is more beneficial than only tackling risks that are present and tangible in a venture.

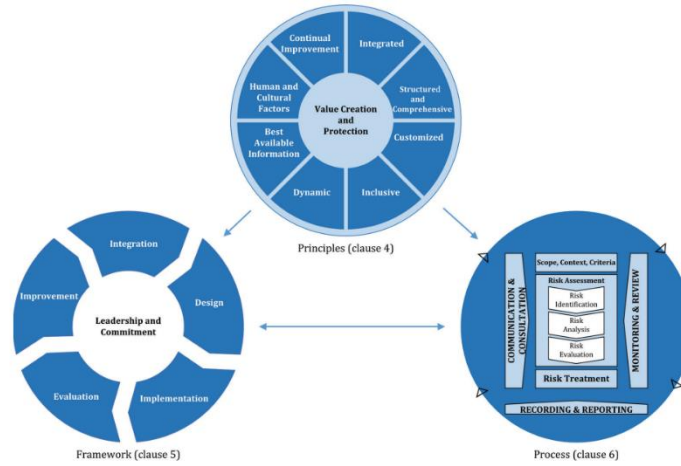


Fig. 2. ISO 31000:2018
Source: Risk Management ISO

As mentioned in the previous section, the ISO Guide 73 31000:2018 has become one of the most reputable and acceptable risk management guidelines for ventures to comply with. Based on ISO 31000:2018 risk assessment consists of risk identification, risk analysis, and risk evaluation. Firstly, in the risk assessment, an important feature is to decide whether the identified risk is going to be evaluated at the inherent level or at the current (or residual) level. In the case of VC, it's more fitting to tackle the inherent level of risk. The risk analysis being discussed will revolve around classifying, measuring, and plotting the overall risk that previously has been assessed. With the goal of dissecting the risk presented upon a particular venture, then each risk may well be classified according to the nature of the risk attributes. Risk can be classified to different extent, such as timescale, magnitude of impact, source of risk, subject/component of the risk, consequences of materializing.

We can plot the risk based on the likelihood and impact of it on the organization. The most common representation can be achieved from a risk matrix. Essentially, the risk matrix mapped out all the risk that previously has been assessed, combining it in one integrated matrix.

		Consequence				
		Negligible 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likelihood	5 Almost certain	Moderate 5	High 10	Extreme 15	Extreme 20	Extreme 25
	4 Likely	Moderate 4	High 8	High 12	Extreme 16	Extreme 20
	3 Possible	Low 3	Moderate 6	High 9	High 12	Extreme 15
	2 Unlikely	Low 2	Moderate 4	Moderate 6	High 8	High 10
	1 Rare	Low 1	Low 2	Low 3	Moderate 4	Moderate 5

Fig. 3. Risk Matrix
Source: Research Gate. 2020

Private Equity and Venture Capital

Private Equity and Venture Capital have experienced a tremendous bloom in the past 10-15 years, contributing extensively to the maturity of economic development in many countries as an alternative source of financing. It involves investing in privately held companies with the goal of achieving significant returns through a combination of operational improvements and financial engineering. Venture capital essentially is an independent, professionally managed, dedicated pool of capital that focuses on equity or equity-linked investments in privately held, high growth companies (Gompers & Lerner, 2001, p. 146). Venture capital involves investing in early-stage companies with high growth potential. Keuschnigg (2004) revealed that venture capital has a role in creating new business models that are believed to make start-up companies grow faster and have added value.

In the context of PE/VC Industry in Indonesia, it has been viewed as an emerging and attractive market considering the formation of many technological based startups and substantial economic influence and power among other developing countries. There were over 2.3 thousand startup companies in total in Indonesia as of January 2022. The bloom of startups happened because of information and technology access of Indonesian innovators that foster industry-based development. This trend is not only creating a betterment for Indonesia economy, startups, but also Venture Capital Investors in Indonesia.



Fig. 6. The Rise of Venture Capital
Source: FDI Intelligence, 2020

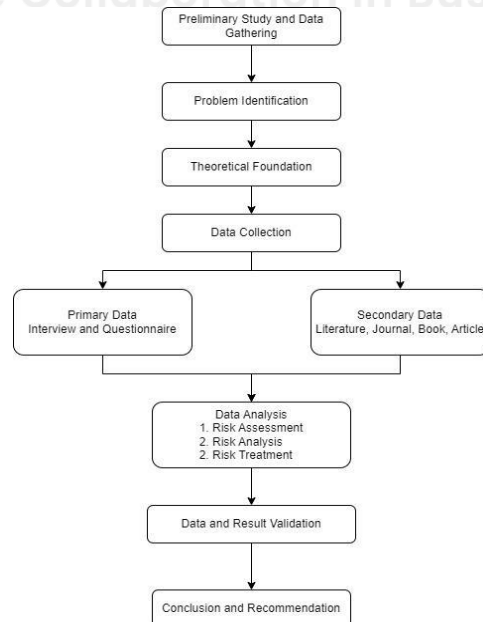
During the investment process, VCs face several types of risks and uncertainties (Kaplan and Strömberg, 2004). Although each investment that VC made recognizes non-identical risk factors, it could be grouped based on the character/type of the risk into a predetermined group. Venture capital uses specific internal standards and selects companies in which to invest. In this way, it finally selects companies to invest in the sectors they can professionally judge (Gompers & Lerner, 2001). Proskch, Stranz, & Pinkwart (2018) in their journal identify seven areas of risk, which are financial risk, market risk, strategic risk, technology risk, production risk, human capital risk, and legal risk.

<i>Risk types</i>	<i>Identified subcategories</i>
Financial risk	Liquidity, solvency, revenue development, follow-up financing, bridge financing, financial planning, governmental sponsorships, credits
Market risk	Market assessment, market attractiveness including potential and development, market acceptance, founder's market know-how, marketing and sales, product portfolio, pricing, regulation, customer awareness and behaviour
Strategy risk	Competition, market positioning, market structure, market entry barriers, unique selling proposition
Technology risk	Prototypes and tests, proof of concept, marketability studies, certification and patents, quality issues regarding technology, supplier products, competitive positioning of technology, implementation of technology, market acceptance of technology, know-how regarding technology
Production risk	Production delays, supplier issues, increase in prices of raw materials, quality issues after producing the product, changes in production facilities
Human capital risk	Management team, stock of employees, salary issues, parental leave, hiring of external consultants to complement the managing team
Legal risk	Intellectual property, governmental regulations, contracting, tax issues, insurances, legal conflicts with former founders, consultations of lawyers

*Fig. 7. Summary of Risk Type
Source: Proschkh et al. 2018*

III. RESEARCH METHODOLOGY

The research methodology will be designed through a framework that displays methodologies in conducting the research. It starts from preliminary study and data gathering, problem identification, theoretical foundation, primary and secondary data collection, data analysis, data, and result validation, and lastly the research conclusion and recommendations. The research design highlights the data analysis phase as the most important since the essence of the risk management will be carried out through the implementation of risk assessment, risk analysis, and risk treatment.



*Fig. 8. Research Design
Source: Author's Analysis*

Data Collection Method

The research regarding VCs critical risk factors will be done in a mixed method, utilizing both qualitative and quantitative studies. The qualitative approach is pivotal to obtain understanding regarding the definition of VC risks from experts, whilst the quantitative will assist in categorizing and ranking it. In addition, the research also builds upon the theoretical foundation that previously formed as the research secondary data.

Primary Data

The primary data of this research will be obtained through an interview and questionnaire. Both methods will use purposive sampling that seek expert judgement of Venture Capitalist from multiple VCs that operate in Indonesia and/or have an Indonesian-based venture as part of their portfolio which will act as the sole indicator. The sample size of both approaches is set to 4 respondents as the subject.

a. Interview

The interviews will assist the data analysis by providing relevant insights about the landscape of Venture Capital industry. This part will solely help the research in understanding the perspective of VC industry and doesn't generate any outcome in terms of risk factors

b. AHP Questionnaire

As for the questionnaire, it will follow the Analytical Hierarchy Process steps and applicable for the data analysis in the risk analysis section.

Secondary Data

Secondary data is collected from various sources, such as books, journal literature, and news websites. This section will be a follow up from the theoretical foundation section. The secondary data will assist the risk assessment of Venture Capital in Indonesia. The highlighted source includes, Zacharis and Meyer (2005); Proksch et al. (2018); Ruhnka (1991); Tybjee and Bruno (1984); LiPuma and Park (2013), Kut et al. (2005), and many others previous studies. As for the book, the researcher acknowledges The Fundamentals of Risk Management by Paul Hopkin (2017) and Managing Risk and Organization: A Guide for Managers by Davidson Frame (2003).

Data Analysis

The research will utilize both qualitative and quantitative approaches. The data processing is conducted mainly in the Data Analysis part of the research design with three main drivers which are Interview, AHP Questionnaire, and Literature. Both data collection and data processing are conducted simultaneously. The figure below will display the flow of data processing that started with the risk assessment as a process with a result of critical risk factors with primary and secondary index.

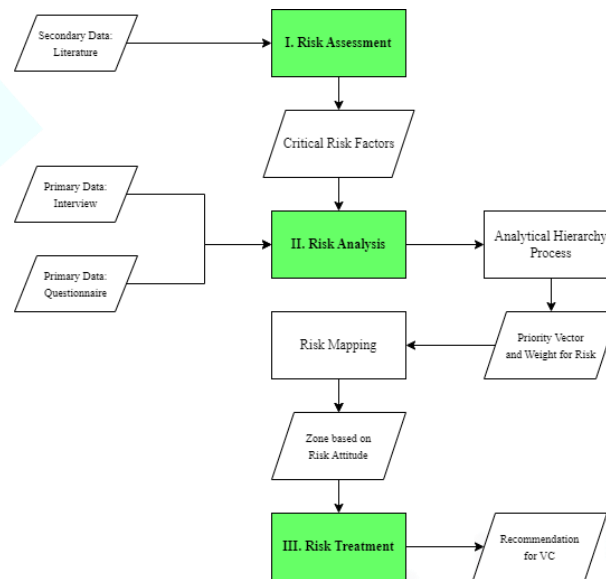


Fig. 9. Data Processing Flow
Source: Author's Analysis

In the risk assessment phase, a series of risk factors will be identified by acknowledging relevant academic literature, books, and lectures related to risk in VC, all obtained as secondary data. Afterwards, the compilation of risk factors will be processed into a multi-criteria decision making in the form of Analytical Hierarchy Process method that measures the risk factors based on two significant categories, risk likelihood and impact or other similar term that serves the same purpose. From the measurement, a risk mapping of VCs risk is created based on the priority vector and weight score of each subsequent risk factor. The relative measurement also implies information about VC perspective and attitude regarding potential risk factors. Lastly, all of the risk factors will be addressed through the risk treatment method. Essentially, this risk treatment focuses on the creation of dynamic strategies and countermeasures for each risk factor that is deemed critical.

Data Processing (Analytical Hierarchy Process Method)

Since the relative measurement is there to tackle improper and subjective judgment, one of the keys of this method is to construct a judgment matrix which is required to have a satisfying consistency. In the topic of VC risks, Analytical Hierarchy Process can quantify this subjective judgment into a subjective value which strengthens the decision from the scientific standpoint. AHP in risk setting will solely focus on a goal, managing risk in VC. It derives dominance priorities from paired comparisons of homogeneous elements, considered to be under a common criterion or attribute. With the appropriate utilization of AHP, the individual reviewing the overall risk factors could pinpoint a critical factor that would majorly impact the investment decision.

AHP follows a sequential process that consists of 4 steps based on Saaty (1994),

1. Decomposition – A complex decision problem is decomposed into a hierarchy with each level consisting of a few manageable elements; each element is then further decomposed and so on.
2. Prioritization – Involves pairwise comparisons of various elements residing at the same level with respect to an element from the upper level of the hierarchy.
3. Synthesis – The priorities are pulled together through the principle of hierarchic composition to provide the overall assessment of the available alternatives.
4. Sensitivity analysis – The stability of the outcome is determined by testing the best choice against ‘what-if’

Consistency is the main issue that needs to be validated to conduct a proper AHP process. The verification of these 4-steps then could be reviewed through a measure called consistency ratio (CR) that will omit the decision maker inconsistent and faulty during the AHP process.

IV.RESULT / FINDING

Primary Index of Critical Risk Factors

It resulted in 7 primary index of risk factors, which include technological, market, financial, strategic, external environment, management and agency, and exiting. These 7 primary indices highlight all the potential risk factors based on the main business activity of a VC, which is investing. Furthermore, it also considers the dynamics of VC process in executing their activity, that include but not limited to deal origination, screening, evaluation, deal structuring, and post-investment activities (Tyebjee & Bruno, 1984).

*Table 1. Primary Index of Risk Factors
Source: Authors Analysis*

Group	Primary Index	Code
1	Technological Risk	P1
2	Market Risk	P2
3	Financial Risk	P3
4	Strategic Risk	P4
5	External Environment Risk	P5
6	Management/Agency Risk	P6
7	Exiting Risk	P7

Secondary Index of Critical Risk Factors

Inspired by extensive research made by foreign and domestic scholars on risks associated with venture capital, this research suggests a detailed arrangement of each index by forming 28 secondary indexes that will become a blueprint for the proceeding process of analysis. Previous studies that become the rationale for the formulation of the secondary index includes, Hu (2011); Proksch et al. (2018); Ruhnka and Young (1991); Tybjee and Bruno (1984); Kollmann and Kuckerts (2010); Zacharakis and Meyer (2000); Cumming et al. (2005); Macmillan et al. (1985); Kut et al. (2007); Kohn (2018).

*Table 2. Risk Factors of VC in Indonesia
Source: Authors Analysis*

Group	Primary Index	Secondary Index	Code	Previous Studies
1	Technological	Uncertainty about fungibility of technology	R1	(Hu, 2011; Proksch et al., 2018; Ruhnka & Young, 1991; Tyebjee & Bruno, 1984)
		Uncertainty about outlook of the technology	R2	
		Uncertainty about impactul effect of the technonology	R3	
		Uncertainty about potential technological obselence	R4	

2	Market	Uncertainty about consumer acceptance and diffusion rate of new products	R5	(Hu, 2011; Kollmann & Kuckertz, 2010; Kut et al., 2007; Proksch et al., 2018; Zacharakis & Meyer, 2000)
		Uncertainty of competitive edge of new products	R6	
		Uncertainty about future market growth or threat possibility	R7	
		Uncertainty about the realized amount of market share	R8	
3	Financial	Uncertainty about equal return with a specific collection period (5-10 years)	R9	(Cumming et al., 2005; Hu, 2011; Macmillan et al., 1985; Proksch et al., 2018; Ruhnka & Young, 1991; Tyebjee & Bruno, 1984)
		Uncertainty about sales projection bases and eroding margin	R10	
		Uncertainty about excessive burn rate due to inadequate financial controls	R11	
		Uncertainty about attracting latter funding or not making to the next stage	R12	
4	Strategic	Uncertainty about company objective fulfillment	R13	(Hu, 2011; Macmillan et al., 1985; Proksch et al., 2018; Ruhnka & Young, 1991)
		Uncertainty about prioritizing shareholders wealth and agenda	R14	
		Uncertainty of synergy with existing VC portfolio	R15	
		Uncertainty of investment stake, clause, and restrictive convenents that hindered success	R16	
5	External Environment	Uncertainty about proprietary or intellectual rights of product	R17	(Hu, 2011; Kollmann & Kuckertz, 2010; Kut et al., 2007; Macmillan et al., 1985; Proksch et al., 2018; Ruhnka & Young, 1991)
		Uncertainty about business complying with legal and domestic regulatory	R18	
		Uncertainty about other participants in the deal (syndicate investing)	R19	
		Uncertainty about recession or economic slumps	R20	
		Uncertainty about local and national political influence	R21	
6	Management/ Agency	Uncertainty about competence in management team	R22	(Hu, 2011; Kollmann & Kuckertz, 2010; Macmillan et al., 1985)
		Uncertainty about entrepreneurs moral and mindset disposition	R23	

		Uncertainty in attracting key management partners	R24	
		Uncertainty about founders in managing development	R25	
7	Exiting Risk	Uncertainty about establishing exit vehicle	R26	
		Uncertainty of investment after venture listing or IPO	R27	
		Uncertainty about investment liquidity	R28	
				(Cumming et al., 2005; Köhn, 2018; Macmillan et al., 1985; Zacharakis & Meyer, 2000)

In addition, the determination of a secondary index is based on the potential hindering aspect that occurs in the business operation of VC. It acknowledges all the risks that could be faced in every stage of VC investment, implementing the investment stage categorization from Cumming et al. (2005) that include early stages, expansion stages, and later stages. In which it will be divided even more based on the maturity (value of realized funding) of the invested firm, early stage (pre-seed, seed, start-up, first stage); expansion (second stage, third stage, expansion), later stage (bridge, buyout, IPO).

Table 3. Risk Factors based on Investment Stage
Source: Authors Analysis

Stage	Secondary Index
Early Stage	R2, R3, R5, R6, R7, R10, R15, R16, R17, R18, R19, R20, R21, R22, R23
Expansion	R1, R4, R7, R11, R12, R13, R14, R18, R20, R21, R24, R25,
Later Stage	R8, R9, R26, R27, R28

From all the 28 list of secondary indexes, the critical risk factors majorly concentrated on the early-stage part, where more than half of the secondary index falls in this stage. There's a decline in the number of risk factors leading to the later stage category. In which the expansion consists of 12 secondary indexes whilst the later stage has 5 secondary indexes respectively. As this research attempts to create a general landscape of risk in each stage, it's apparent that every VC has their peculiar perspective in viewing risk factors. A strict classification of whether risk is a subject of a particular stage is almost impossible to define. Therefore, the researcher attempts to group out the risk factors by comparing it with the pilot research of Ruhnka and Young (1991) hypothesis about major risk faced by VC in every stage.

Risk Analysis

After establishing the primary and secondary indexes as the critical risk factors of Venture Capital in Indonesia, an Analytical Hierarchy Process is conducted to understand the global and local weight of both the primary and secondary index respectively. The approach of the risk analysis to target the Venture Capitalist rather than the VC. Venture Capitalists should be able to serve as an expert whilst also representing the VC risk assessment process, ultimately portraying VC attitude towards risk.

The Venture Capitalist should originate from a VC that operates in Indonesia (a minimum of 1 Indonesian-based venture in their portfolio) and have an active investment in their portfolio or already raised funds prior to now. Furthermore, because the expert judgement from a Venture Capitalist will not diminish if he/she has already changed their professional industry, the research allows for both former and current Venture Capitalist. This research was able to obtain 4 subjects from various VC, namely Kejora, Northstar, Kolibra, and MDI Venture.

Analytical Hierarchy Process

Analytical Hierarchy Process will be an input to determine the importance of both primary and secondary indexes. Initially a subset pair-wise comparison is collected from the raw data of the research subject mentioned before. The data obtained is in a form of scale between 1-9, where the selection of a particular scale value for each comparison scale needs to yield consistent outcomes. Since the goal of utilizing AHP is to subset the potential subjectivity of understanding investment risk in VC, it will cover both the computation of primary and secondary index that will be abbreviated as global weight and local weight respectively.

With the primary index acting as global weight and secondary index as local weight already set, an exhaustive predominant critical risk factor ranking can be established. In which the global weight and local weight will be stated as “Importance” and “Priority Vector” respectively. Just the same as what formulated in the previous section, the critical risk factor ranking will be dissected into two parts, based on the likelihood and impact. Ranking in the priority column is obtained by calculating the multiplication of critical risk factors importance and their priority vector. From this calculation, we learn the weighted values of each critical risk factor that when accumulated will result in a value of 1, meaning that all values are already normalized.

Compiled Risk Factors

Table 4. Compiled Risk Factors based on Impact
Source: Authors Analysis

Based on Impact					
<i>Primary Index</i>	<i>Importance</i>	<i>Secondary Index</i>	<i>Priority Vector</i>	<i>Weighted Value</i>	<i>Priority</i>
Technology Risk	0.077	R1	0.1448	0.0111	28
		R2	0.3178	0.0244	19

		R3	0.3362	0.0258	15
		R4	0.2012	0.0154	25
Market Risk	0.144	R5	0.2778	0.0400	9
		R6	0.1392	0.0200	21
		R7	0.4114	0.0592	5
		R8	0.1717	0.0247	18
		R9	0.3578	0.0867	1
Financial Risk	0.242	R10	0.2863	0.0694	3
		R11	0.2194	0.0532	8
		R12	0.1365	0.0331	11
		R13	0.4814	0.0590	6
Strategic Risk	0.123	R14	0.1630	0.0200	22
		R15	0.1233	0.0151	26
		R16	0.2323	0.0285	12
		R17	0.1761	0.0178	24
External Environment Risk	0.101	R18	0.1454	0.0147	27
		R19	0.2395	0.0242	20
		R20	0.2466	0.0250	17
		R21	0.1924	0.0195	23
		R22	0.3346	0.0399	10
Management/Agency Risk	0.119	R23	0.2163	0.0258	16
		R24	0.2259	0.0269	13
		R25	0.2232	0.0266	14
Exiting Risk	0.194	R26	0.3899	0.0757	2
		R27	0.3008	0.0584	7
		R28	0.3092	0.0601	4

Overall compilation of critical risk factors based on impact displayed that there are 3 secondary indexes that among others have the highest weighted value which are R9, R26, and R10. This superiority comes from the combination of high-level importance and priority vector. The uncertainty of equal return with the specific time period is considered the most impactful risk by the expert judgement due to the principle of VC that seek the most amount of return through their investment. Inability of venture/startup to obtain the targeted valuation implies that VCs can't exercise the capital gain that they were after.

Table 5. Compiled Risk Factors based on Likelihood
Source: Authors Analysis

Based on Likelihood					
Primary Index	Importance	Secondary Index	Priority Vector	Weighted Value	Rank
Technology Risk	0.077	R1	0.3201	0.0245	21

		R2	0.1604	0.0123	28
		R3	0.4746	0.0364	10
		R4	0.1978	0.0152	27
Market Risk	0.144	R5	0.2287	0.0329	12
		R6	0.2091	0.0301	14
		R7	0.3769	0.0542	6
		R8	0.1854	0.0267	17
		R9	0.1856	0.0450	8
Financial Risk	0.242	R10	0.3103	0.0752	2
		R11	0.1575	0.0382	9
		R12	0.3466	0.0840	1
		R13	0.3702	0.0454	7
Strategic Risk	0.123	R14	0.2258	0.0277	15
		R15	0.1949	0.0239	22
		R16	0.2091	0.0256	19
		R17	0.1700	0.0172	25
External Environment Risk	0.101	R18	0.1664	0.0169	26
		R19	0.2686	0.0272	16
		R20	0.2188	0.0222	23
		R21	0.1761	0.0178	24
Management/Agency Risk	0.119	R22	0.2716	0.0324	13
		R23	0.2134	0.0254	20
		R24	0.2160	0.0257	18
		R25	0.2990	0.0356	11
Exiting Risk	0.194	R26	0.3058	0.0594	5
		R27	0.3442	0.0668	4
		R28	0.3500	0.0680	3

There's a resemblance between the impact based with the likelihood based critical risk factors. The secondary indexes that arise among others also originate from the financial and exiting risk group. Uncertainty of attracting later funding or making it to the next round (R12) become the most likely critical risk factors to happen with 8.4% priority. The rule of thumb is only 30% of venture/startup able to escape "The Valley of Death" and thrive successfully. In startup/venture bootstrapping phase, they rely heavily to the fund provided by investors to ensure growth. It happened due to multiple factors that correspond to other critical risk factors.

Along with the risk assessment, risk assessment, and analytical hierarchy process, the risk mapping of all the risk factors—both primary and secondary index—is conducted to determine the categorization of risk based on its exposure to 4 groups, critical, concerned, cautious, and comfort. Prior to the risk mapping, a guiding indicator is mapped to assign each risk factor into a specific matrix value. The grounds of establishing each matrix value indicator through the weighted value range is based on the data value spread in a particular order of normal distribution.

Table 6. Risk Mapping
Source: Authors Analysis

Likelihood	(5) Very Likely	R12		R7 R10 R26 R27 R28		
	(4) Likely			R9 R11 R13		
	(3) Possible	R6 R8 R14 R19	R3 R16 R23 R24 R25	R5 R22		
	(2) Unlikely	R1	R4 R15 R17 R18 R20 R21			
	(1) Very Unlikely	R2				
		(1) Negligible	(2) Minor	(3) Significant	(4) Major	(5) Catastrophic
		Impact				

Comfort
Cautious
Concern
Critical

The risk mapping clearly depicts the nature of risk in VC industry, where 11 out of the 28 secondary index or risk factors are positioned in the concern and critical zone. Only 8 risk factors that VC can tolerate due to their comforting position. Addressing the main objective of this research, the researcher will be focusing on the risk factors that are located in the critical zone.

V.DISCUSSION

Based the risk matrix set R7, R9, R10, R11, R13, R26, R27, and R28 as the critical risk factors of VCs in Indonesia, with 5 of them (R7, R10, R26, R27, and R28) obtain maximum value of exposure. It's a compilation of risk factors that if occurred will significantly hindered the livelihood of VCs in Indonesia. These critical risk factors are dispersed in all types of stages, R7 and R10 is a critical risk in the early stages of investment, also R7, R11, and R13 is stationed in the expansion, and lastly R9, R26, R28 is stationed in the later stages. All the critical risk factors will be addressed through the risk response by selecting the most possible treatment for it.

- R7 (Uncertainty about future market growth and threat possibility)

The market risk of future market growth and threat possibility treatment really depends on how a particular VC positions their investment. Does the VC apply sector-agnostic investment to that investment in every sector, or does the VC rely on investment on a particular sector only. As diversification might be the obvious solution, VC familiarity is mostly concentrated in several groups of industries because an all-out diversification is something that is hard to obtain. If the VC diversification is not carried out appropriately, it results in a new set of risks, entering an industry that the VC doesn't have firm grasp on.

1. Option to Expand: Opportunity for structuring the investments clause to include an option for expanding the value of investment and/or taking part in subsequent funding rounds based on market growth and conditions.
2. Option to Delay: As the party with highest power, VC can implement flexibility in their investment decisions that allow an option to stall the investment or create phase investments based on the assessment of market growth potential.

- R9 (Uncertainty about equal return with a specific time period of 5-10 years)

Based on the psychological theory, one should consider the weight of many potential outcomes and reside with the alternatives that provide the highest utility. Furthermore, there's also a strong case to implement the lowball strategy that presents a much lower valuation of a venture/startup. This strategy can lower the expected return of an investment, with higher potential upside if the investment turns out to be successful. However, the lowball approach needs to acknowledge other parties in a syndicate investing, since there's a possibility of different valuation that set by each VC. The possible option approach is as follows:

1. Option to Abandon: VC includes the option to abandon or exit investments that do not meet the expected returns within the specified time frame that put a pressure to the venture/startup.
2. Option to Switch: VC upholds the flexibility to switch investments or redirect resources to other opportunities in their existing or new set of portfolios that show greater potential for equal or better returns to subset the loss.

- R10 (Uncertainty about sales projection bases and eroding margin)

Such risk occurs due to asymmetric information between VC and the invested venture. This is where industry specialization comes into play. With profound understanding regarding the dynamic of an industry, VC could easily point out the potential of miscalculated sales projection bases and eroding margin. The evaluation criteria become more prudent by also implementing the sales projection bases into a financial model that the VC develops for their investment. In terms of the balance sheets a mark to market approach needs to consider in evaluating the venture/startup asset and liability implications from the return on investment. As for the option approach, the researcher points out two options,

1. Option to Scale: VC covers an option for scaling up or down production and operations of a product/service from the venture/startup based on sales projections and margin erosion.
2. Option to Switch Markets: VC explores an option to switch the target markets or pivot business models from their invested venture/startup if sales projections and margin erosion become unfavorable to the VC context and current market.

- R11 (Uncertainty about excessive burn rate due to inadequate financial controls)

An unsupervised investment can lead to excessive burn rate from startup/venture. This will eventually lead to the ability to identify early warning signs and take proactive measures in containing the excessive burn rate. In the light of this, a comprehensive burn rate analysis can resolve this case. The analysis is conducted quarterly to ensure that the burn rate is stationed within a safe threshold. Furthermore, the funding that is burned needs to solely for productive overhead rather than investment compensation of cash flow for investors. Such cases have happened before in the startup ecosystem of Indonesia. In addition, there's also the option approach that VC can execute,

1. Option to Restructure: VC works out an agreement with invested venture/startup to look into options for restructuring operations, cost-cutting measures, or optimizing resource allocation to resolve the problem of excessive burn rate.
2. Option to Intervene: VC provides impactful guidance, mentorship, and resources beside funding to help improve financial controls and governance practices within the venture/startup.

- R13 (Uncertainty about company objectives fulfillment)

Failure to establish an effective communication channel creates a unsynchronized view of how the venture/startup should operate an fulfill their purposes. VC needs to understand that when they can't measure something then they can't manage it. A mutually agreed objective then becomes an answer to this. A simple way to approach this problem is by strategically placing a board member from the VC itself. It assures that the interest of the company will be aligned to the designated track. All this needs to target long term value co-creation for the sake of the venture/startup success. Following this set of recommendation there are also the option approach that VC can consider,

1. Option to Pivot: VC push venture/startup to be agile by exposing themself to strategic pivots or modifications for their business objectives and models based on changing market conditions.
2. Option to Reevaluate: VC firms can periodically reassess and refine company objectives in collaboration with portfolio companies to ensure they remain relevant and achievable.

- R26 (Uncertainty about establishing exit vehicle)

The evaluation of potential exit options through many ways such as mergers and acquisitions, secondary offerings, or public needs to be addressed in the early stage of the investment process. When an exit becomes less possible, VC could invest proportionately more in new early-stage projects (relative to new projects in other stages of development) to postpone exit requirements and thus invest in riskier projects. In syndicate investing, the size of the funding group can also influence the probability of exit, since the combination of resources from multiple VC can enhance the credibility of a venture/startup. The alternative option approach includes,

1. Option to Merge: VC identify options for venture/startup to merge their investment or enter strategic partnerships as alternative exit vehicles.
2. Option to Hold: VC exercises an option to momentarily hold investments longer than initially expected when an exit opportunity is limited, waiting for more favorable conditions.

- R27 (Uncertainty about investment after venture listing or IPO)

In terms of venture listing or IPO, VC could opt in to take the listing prematurely, and inject capital in the development of the venture/startup in the public market. VC needs to proactively monitor the market performance in the sector and subsector, also the changes in retail investor sentiment. From this approach, VC will have leverage in their investment. In addition, it's important to note that all the strategy after venture/startup listing is based on a value enhancing investment mindset. With this in mind, VC only have 1 option, which is

1. Option to Provide Post-IPO Support: VC continue to provide support and guidance to venture/startup after listing or IPO, helping them navigate the challenges and uncertainties associated with public markets.

- R28 (Uncertainty about investment liquidity)

Liquidity in this case means that VCs can have their investment liquidated at any point in time if there's other options of investment available. As explained in the previous section of data analysis, it's difficult for venture/startup to meet the demand of VC through internally sourced funding (retained earnings) if they want to liquidate the investment promptly. Thus, VC needs to explore innovative solutions such as venture debt, structured exits, ownership transfer to enhance liquidity chance. Implementing the option approach can be presented as follows,

1. Option to Diversify Form of Liquidation: VC opt in to diversify their liquidation by considering options such as secondary sales, acquisitions, or strategic partnerships.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

As the final part, a detailed conclusion can be drawn that is built upon all the data, fact, and finding of the research. It accommodates the research questions and objectives previously stated in the first chapter. The conclusion is hoped to provide a systematic and concise explanation of the research.

1. In the development of critical risk factors that pose the potential threat of VC in Indonesia, the researcher acknowledged previous studies of that resulted in the formulation of 7 primary index risk factors of technological, market, financial, strategic, external environment, management/agency, and exiting risk. This primary index then furthermore developed by creating 28 secondary index as its derivation
2. Through this research risk analysis, we could confirm that there are 7 critical risk factors that's important to protect the livelihood of VC in Indonesia. Based on the mapping of risk exposure that includes future market growth or threat possibility (R7), equal return with a specific collection period of 5-10 years (R9), sales projection bases and eroding margin (R10), excessive burn rate due to inadequate financial controls (R11), company objective fulfillment (R13), establishing exit vehicle (R26), investment after venture listing or IPO (R27), and investment liquidity (R28). This finding confirms that VC business activity is really a high-risk high return type with the substantial risk factor considered as critical.
3. In answering the critical risk factors, as part of risk mitigation to better support VCs in Indonesia investment, the researchers utilized both resource-based view and real option approach. Both principally can allow an adaptive decision making of VC to proactively manage risk, maximize strategic flexibility, and adapt to uncertainties in the VC landscape. The options that are provided include option to expand, delay, abandon, switch, scale, switch market, restructure, intervene, pivot, reevaluate, merge, hold, provide post-IPO support, and diversify.

Recommendation

As the analysis suggests, VC in Indonesia can adjust their investment approach by understanding the potential obsolescence presented in the form of critical risk factors. Since the critical risk factors come concurrently with their investment, it's merely impossible to eliminate all the critical risks. The sheer threat in a business-as-usual condition is just too substantial. The idea of treating each investment in VC peculiar to itself is already a correct approach from VC. From the VC standpoint, they were able to create dynamic countermeasures that ensure the assessment, analysis, and treatment of risk is highly relevant. Thus, VC need to rigorously find solution to the risk in their business activity because as the VC industry grows, the presentable critical risk factors will still be the same. In addition, the real option approach is something evolving in the VC landscape. The initial findings that are provided in the risk treatment phase can be modified or built from to create a more comprehensive risk treatment.

In the near future, the researcher also encourages further exploration of risk management topics in the VC context. As stated in the theoretical foundation chapter, there's minimum agreement from VCs upon a specific definition or principle regarding risk and its implications. As this research highlights the critical risk factors based on the analysis of 4 VC, a further more inclusive and comprehensive study to a larger subject of VC need to be made which addressed the potential of information discrepancies. Furthermore, the researcher felt there's an urge in exploring the real option approach as the alternative. Reflecting to the concept of real options, there's a high relevance on how VC conduct their business activity.

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Factors Affecting Parents Financial Planning on the Security of Their Children's College Funds. An Empirical Study of Students from Universities in Bandung

Muhammad Zem Kisralativa¹, Tuntun Salamaton Zen²

^{1,2} School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

Rising tuition fees and economic barriers often deter high school graduates from pursuing further education, leading to increased dropout rates. Hence, the role of financial planning in facilitating access to higher education is significant. This study investigates the factors affecting parents' financial planning for their children's university education in Bandung, Indonesia. Through a quantitative approach with stratified random sampling, a questionnaire was administered to parents from diverse socioeconomic backgrounds to identify the key variables influencing their financial planning decisions. The study considered demographic factors, preference factor, financial knowledge and economic as potential influencers. Using the binary logistic regression, the study examined relationships between independent variable and dependent variables. Statistical analysis indicated that marital status, the number of children, and education level significantly influenced financial planning. Among preference factors, the existence of a long-term plan played a crucial role. The research also revealed a positive correlation between financial literacy levels and effective financial planning. Furthermore, economic factors such as home ownership, debt levels, health insurance, and specific fragility factors (too much debt and spending excess income) emerged as significant determinants of parents' financial planning. Despite income and employment variables being insignificant, the findings emphasize the need for targeted financial education and policy interventions to address the challenges parents face in securing college funds for their children.

Keywords : Financial Planning, Education Fund, Parents, Financial Literacy, Education for Children

I. INTRODUCTION

In the 1970s and 1980s, financial planning emerged as a recognized profession, with the establishment of professional organizations, such as the International Association of Financial Planners (now the Financial Planning Association) and the establishment of the Certified Financial Planner (CFP) designation. The Certified Financial Planner (CFP) title has become the industry standard for financial planning professionals, requiring financial planners to finish a demanding educational program, pass a difficult exam, and follow a strict code of conduct (E. Denby Brandong JR. & H. Oliver Welch, 2009)

Financial planning is critical in ensuring that children obtain a high-quality education. Education is frequently seen as one of the most essential investments a parent can make in their child's future, and financial planning can assist parents in ensuring that they have the means necessary to pay for their child's education. Parents may provide their children with the option to pursue the school and job of their choosing by ensuring that they have the financial resources to do so. In the long run, this can lead to greater earning potential and financial security for the child (Checchi et al., 2014).

The perception that college is expensive is largely generated by reports of rising tuition expenses and the growing financial strain on families. These worries, which have been made worse by the global financial crisis, have been raised by the change in financial help from grants to loans and the complexity of the financial aid system (Jean Chatzky, 2006). Many parents are confused or unaware of the financial aid system, and they will be asked to contribute heavily when aid packages are computed, despite the fact that the net price for the majority of students is lower than the reported rates. (Ryan S. Wells & Catherine A. Manly, 2009)

According to a book on Sociology of Children by Prof. Dr. Bagong Suyanto, economic factors are one of the main reasons why children from poor families are forced to drop out of school, often due to the role of children as a strategic source of income for the family. Data from the Central Statistics Agency (BPS) shows that the majority of families (76%) state that the main reason their children drop out of school is due to economic reasons, with 67% unable to pay for school fees and 8.7% needing to work to support their family (Hanindita Basmatulhana, 2022). This economic factor is not only a problem for individual families, but also a national issue.

OJK is holding the 2022 National Financial Literacy and Inclusion Survey once more in order to examine the Indonesian people's financial literacy and inclusion index (SNLIK). From July to September 2022, SNLIK 2022 held in 34 provinces covering 76 cities/regencies, with a total of 14,634 respondents aged 15 to 79 years. The findings of the 2022 SNLIK show that the Indonesian people's financial literacy index is 49.68 percent, up from 38.03 percent in 2019 (OJK, 2022).

Prof. R. Agus Sartono, the deputy minister for coordination of education quality improvement and religious moderation, has expressed worry about the fact that only 1.8 million of the approximately 3.7 million high school graduates each year are accepted into institutions of higher learning. This means that about 1.9 million young people in Indonesia cannot pursue higher education (Mahar Prastiwi, 2021). This situation is concerning, especially for individuals who cannot afford to attend university or who are unable to get a spot because there aren't enough openings. Those who are unable to finish their school must compete with recent graduates, which happens virtually every year. This demonstrates the necessity of investing in education and the need for expanded access to higher education.

Provinsi Province	Mahasiswa Students	Putus Sekolah Drop Outs	Presentase Putus Sekolah Drop Outs Percentage
(1)	(2)	(3)	(4)
D.K.I. Jakarta	764.084	103.372	14%
Jawa Barat	871.191	51.114	6%
Banten	1.334.358	22.241	2%
Jawa Tengah	692.462	29.917	4%
D.I. Yogyakarta	402.883	17.964	4%
Jawa Timur	1.007.427	71.755	7%

Figure 1 - Drop Outs Percentage for Each Province

Source : Statistik Pendidikan Tinggi Kemendikbud (2020)

Kemendikbud Statistics Report also provided data that there are currently 871,191 registered students in higher education institutions in West Java, Indonesia. However, the number of students dropping out of college in the region stands at 51,114, which represents a significant dropout rate of 6% (Pendidikan & Kebudayaan, 2020). The high rate of college dropouts in West Java is concerning and could have serious consequences for the region's economy and workforce. Students who drop out of college may find it difficult to find high-paying jobs or advance in their careers, resulting in lower earnings and slower economic growth.

When it comes to saving for their children's education, parents may confront a number of problems. One of the biggest issues is the rising cost of tuition and related fees, which can be difficult for parents to keep up with, especially when they have numerous children. Another challenge is balancing the cost of education with other financial priorities, such as retirement savings, debt repayment, or home ownership. Due to restricted income or unforeseen expenses, parents may find it difficult to set away monies on a regular basis. Furthermore, there may be uncertainty about the economy's future, which can affect the parents' ability to save or the value of their savings. Furthermore, parents may lack financial literacy and awareness about the best savings and investing options accessible (Marsh, 2012). These issues can make saving for a child's education a complex and frightening endeavour for many parents.

II. LITERATURE REVIEW

Financial Planning

Financial Planning is the process of determining financial goals and creating a plan to reach them. It entails figuring out a person's existing financial capability, creating a budget, developing a strategy for savings and investments, managing debt, and making plans for retirement and other long-term goals. (Lurtz et al., n.d.).

The process of financial planning is generally agreed upon and includes six-steps: (a) establish the relationship, (b) gather data and discuss goals, (c) analyze and evaluate current financial situation (financial security), (d) review recommendations, (e) implement financial plan, (f) benchmark and review outcomes (Lurtz et al., n.d.).

Factors Affecting Financial Planning

The National Financial Capability Study (NFCS) data from 2015 offers important insights into the variables that may affect parents of dependent children's college savings decisions. For the purpose of identifying potential influences on college savings, the study takes into account a variety of demographic, choice, financial literacy, and economic characteristics. The life-cycle theory predicts an inverted U-shape link between age and savings, with factors like age, race, educational level, and marital status potentially having an impact (Korankye & Kalenkoski, 2021). Parents with more financial understanding may be better able to plan and save for future expenses. Financial knowledge characteristics like financial literacy and subjective financial knowledge may also have an impact on college savings. Economic factors that can affect parents' financial stability and resources, such as household income, work status, homeownership, student loan debt, health insurance ownership, and financial fragility, may also have an impact on college savings.

Financial Literacy

Financial literacy defines the information and abilities that enable people to make wise decisions about their personal finances. It involves comprehending financial ideas and products, such as budgeting, investing, saving, and managing credit and debt. Those who are financially literate are able to successfully manage their finances and make decisions that are in line with their financial objectives. (Chen & Volpe, 1998)

Financial planning can aid in the development of financial literacy. Individuals can have a better understanding of financial concepts and tactics such as budgeting, saving, and investing by constructing a financial plan (HUSTON, 2010). Individuals can enhance their overall financial literacy by engaging in financial planning and developing the information and skills required to make educated financial decisions (Lusardi & Mitchell, 2014).

Education Funds

Martha Kanter, the former United States Under Secretary of Education, said that "An education fund is a type of financial account set up by individuals or organizations to save money for educational purposes, such as tuition fees, books, and other related expenses. It is usually designed to provide financial assistance to students or their families who might otherwise struggle to cover the costs of education" (Hayley Glatter, 2020).

Previous Study

Table 2. 1 - Previous Studies

Author	Title	Variables	Methodology	Findings
Catherine A. Manly, Ryan S. Wells, Genia M. Bettencourt (2017)	Financial Planning for College: Parental Preparation and Capital Conversion	Independent : parental aspirations and expectations, and home-and school-based parental involvement Dependent : planning financially for college Control : income, demographic, and education relate	Logistic regression analysis	Parents' aspirations for their child's education were higher than their expectations for their child's achievement. Parents who were more involved in their child's education were more likely to take financial planning actions. Parental expectations, rather than aspirations, were related to the likelihood of taking financial planning actions. Parents with higher education and income were

Author	Title	Variables	Methodology	Findings
				more likely to save for their child's college education and take financial planning actions.
Thomas Korankye, Charlene M. Kalenkoski (2021)	Determinants of Parents' College Education Saving Decisions	Independent : demographics, preference, financial knowledge, economic factors, Dependent : College savings Control : not reported	Probit model	married, having higher parental education, having a postgraduate degree, having higher household income, owning a home, having health insurance, being self-employed or employed full-time, and having low financial fragility were all associated with higher probabilities of saving for college. On the other hand, being white, having four or more financially dependent children, having higher financial risk, being older, and having lower financial literacy were associated with lower probabilities of saving for college.
Consumer Federation of America, CFP Board (2012)	The Impact of Financial Planning on Retirement Preparedness	Independent : financial planning, Dependent financial confidence, retirement savings Control : Income levels	Survey of 1,508 financial decision-makers in US households, descriptive statistics and cross-tabulations	Financial plan holders are more likely to meet financial goals, feel confident in money management, live comfortably, and save more in higher income brackets.
T. Rowe Price (2018)	Parents, Kids & Money Survey	Independent : financial education in school Dependent : financial habits, budgeting, savings, retirement, account ownership Control : age, parental influence	Survey of 1,000 young adults (18-24) and 1,013 parents of 8- to 14-year-olds nationally, descriptive statistics, and comparisons between groups	Financial education in school leads to better financial habits, including budgeting, savings, and retirement account ownership. Parental influence is also crucial in developing good financial habits.

Source : Author's interpretation

Previous research has found that a variety of factors influence financial planning for children's college education. The study by Thomas Korankye and Charlene M. Kalenkoski (2021) discovered several key factors associated with higher chances of saving for college. Being married, having higher parental education, having a postgraduate degree, having a higher household income, owning a home, having health insurance, being self-employed or employed full-time, and having low financial fragility are among these factors. These findings suggest that families must have financial stability, access to resources, and a stable employment situation in order to save for their children's college education.

Despite previous research that has identified several factors that influence financial planning for children's college education, all results show that many variables influence parents' financial planning for children's college education. However, to the author's knowledge, no research has been conducted to determine which factors have the most significant impact on parents' likelihood of saving money for their children's college education.

Hypothesis Development

In a previous study conducted by (Korankye & Kalenkoski, 2021), various factors were examined to determine their influence on financial planning towards children's education funds. The study identified several categories of factors that were found to significantly impact financial planning in this context.

2.6.1 Demographic Factors and Financial Planning towards Children Education Fund

Based on the previous research by (Korankye & Kalenkoski, 2021) the demographic factors indicator are age, educational attainment, marital status, and number of children.

H1 = Financial planning towards children education fund differs significantly based on demographic factors.

2.6.2 Preference Factors and Financial Planning towards Children Education Fund

Based on the previous research by (Korankye & Kalenkoski, 2021) the preference factors indicators are financial risk taking and financial planning horizon. Individuals with different levels of financial risk-taking tendencies and planning horizons were observed to have varying approaches to financial planning for their children's education

H2 = Financial planning towards children education fund differs significantly based on preference factors.

2.6.3 Financial knowledge and Financial Planning towards Children Education Fund

Based on the previous research by (Korankye & Kalenkoski, 2021) The study considered financial literacy scores and subjective financial knowledge as indicators of financial knowledge.

H3 = Financial planning towards children education fund differs significantly based on level of financial knowledge.

2.6.4 Economic Variables and Financial Planning towards Children Education Fund

Based on the previous research by (Korankye & Kalenkoski, 2021) the economic variables indicators are household income, homeownership, employment status, student-loan debt, health insurance ownership and financial fragility. It suggests that individuals with different economic circumstances may adopt diverse strategies when planning for their children's education

H4 = Financial planning towards children education fund differs significantly based on economic variables.

2.6.5 Conceptual Framework

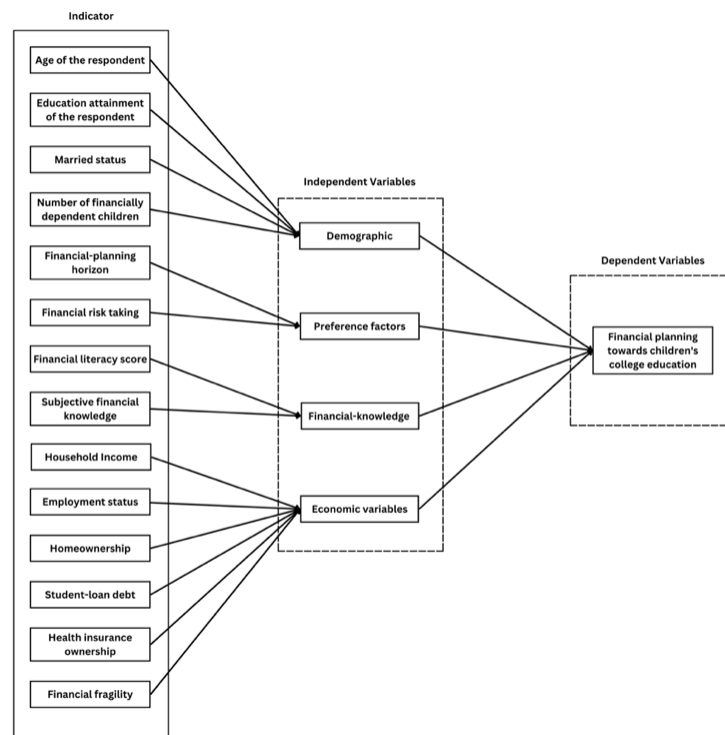


Figure 2. - Conceptual Framework

III. RESEARCH METHODOLOGY

3.1 Research Design

Sustainable Collaboration in Business, Technology, Information and Innovation

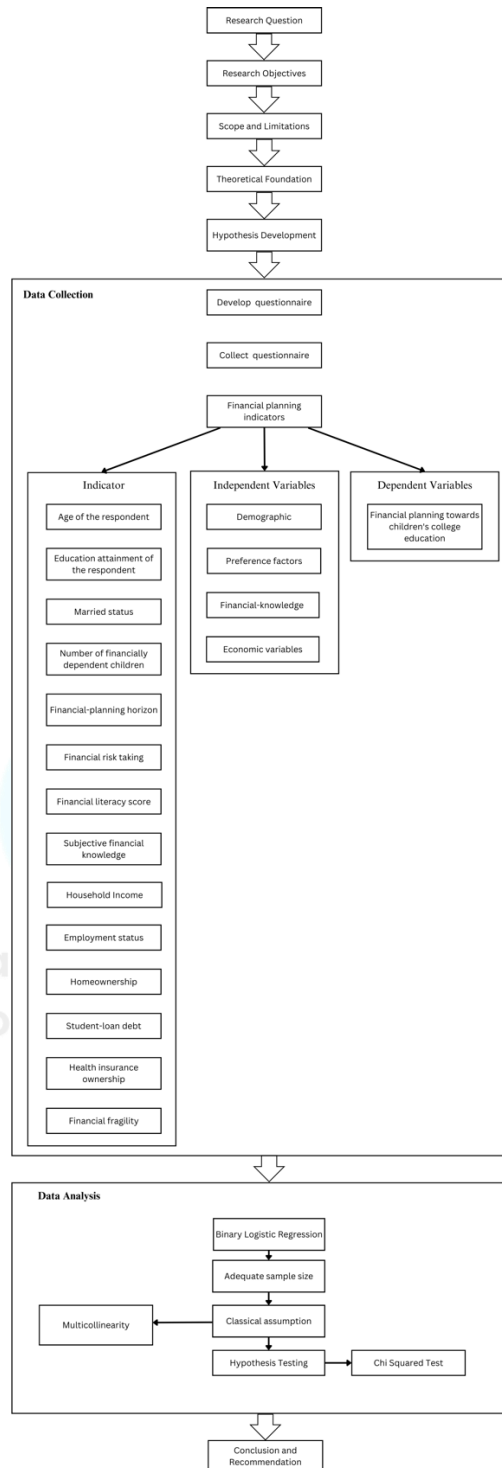


Figure 3 – Flow of research

As discussed in Chapter 1, the study focuses on parents of university students in Bandung. Furthermore, this study employs many universities in Bandung. The theoretical foundations are built to support the hypothesis development after the scope and limitations are determined. The theories are then elaborated. There are four hypotheses in this study, one for each independent variable. Hypotheses serve as a foundation for empirical testing and are intended to investigate the links between independent and dependent variables. Data collection follows the evolution of the theory. Creating questionnaire questions is required for this. The survey is

thoughtfully created to collect pertinent data that is in line with the dependent variable, independent variables, and pre-determined indicators. The data collected is then examined using Binary Logistic Regression. Due to the binary character of the dependent variable (yes/no), binary logistic regression was chosen. Testing traditional assumptions like linearity, multicollinearity, and heteroscedasticity, as well as estimating parameters and interpreting coefficients, are all steps in the analysis. The chi-squared test is then used to examine hypotheses. To ascertain whether there are any meaningful connections between the independent and dependent variables, the study's hypotheses are put to the test. To confirm the research hypotheses and offer empirical support for the suggested correlations in the study, hypothesis testing is essential.

3.2 Operations Variable

The variables included in this research are independent variables and dependent variables. Each independent variable has its own factors that affect it. The two basic types of variables utilized in research are dependent and independent variables. The independent variable is the one that researchers control or believe will "cause" a change in the dependent variable (Alison Mackey & Susan M. Gass, 2005). The dependent variable is the one that is measured to see how the independent variable affects it.

The independent variable in this study is based on the previous research by (Korankye & Kalenkoski, 2021). Based on that study, the independent variable in this study is then called as explanatory variable. Explanatory variables were also used in this study which were strengthened from literature review by Thomas Korankye and Charlene M. Kalenkoski. The researchers used explanatory variables to classify their independent variables. This shows that the researchers have chosen specific independent variables that are most relevant to their research issue and have used them to develop explanatory variables that can help explain the link between the independent variables and the dependent variable. The author decides to employ the same explanatory factors because these research issues are connected to their research issues. The use of explanatory variables enables the author to analyze the research topic and develop a more nuanced understanding of the variables that affect the dependent variable more fully.

The explanatory variables used are demographic variables, preference factors, financial knowledge variables, and economic variables. Demographic variables include age of the respondent, educational attainment of the respondent, married status of the respondent, and financially dependent children. Preference factors include financial-planning horizon and financial-risk-taking. Financial knowledge variables include financial-literacy score and subjective financial knowledge. Economic variables include household, employment status, homeownership, health insurance ownership, and financial fragility.

Table 1 - Variables Definition

Variables	Code	Measurement	Explanation
Dependent variables			
Financial planning towards children's college education	FP	Dichotomous	Are you setting aside any money for your children's college education? (Yes or No). According to the findings, those who can least afford college are the least informed of how much it costs to attend (Horn et al., 2003).
Independent variables			
Demographic Variables			
Age of the respondent	AGE	Continuous and quadratic	Quadratic continuous variable to capture the non-linear relationship between age and the decision to save for college over the life cycle. The life cycle model of consumption is a theory that argues people's spending patterns change predictably across their lives (Browning & Crossley, 2001). The age-consumption relationship is sometimes depicted as an inverted U-shaped curve, with consumption rising until it hits a peak and then dropping. To reflect the non-linear relationship, this study incorporates the respondent's age as a quadratic continuous variable.

Variables	Code	Measurement	Explanation
Educational attainment of the respondent	EDU	Three dummies	Some college (1), college degree (2), and high school or less (3) with postgraduate degree as reference category. Parents' educational attainment can influence their children's financial decision-making abilities(Lusardi & Mitchell, 2014).
Married status of the respondent	MARRIED	Dichotomous	Married (1) or not married (0). According to the findings, parental divorce can have major financial consequences for college students and may affect their capacity to enter and finish higher education(Grissett & Furr, 1994).
Number of financially dependent children	NCHILD	Three dummies	One (1), two (2), and three (3) with four or more as reference category. According to the findings of one study, parents may opt to have fewer children in order to devote more resources to their child's education, resulting in higher quality education. On the other side, parents may choose to have more children while allocating fewer resources to each child's education, resulting in lower-quality education but potentially a larger number of children who can benefit from education(Yilmazer, 2008).
Preference Factors			
Financial-planning horizon	PLAN	Dichotomous	Short-term (0) or long-term (1). The short-term variable comprises responses for the following several months, year, and years. Long-term variables include answers for the next 5 to 10 years as well as responses for more than 10 years. A research found that people who think about saving or investing their money for a longer time are less likely to only have a savings account (Hong & Hanna, 2014).
Financial-risk-taking	RISK	Two dummies	Medium (1) and high (2) with low as reference category. Respondents were divided into three categories in this study: low-risk taking (responses 1-2), medium-risk taking (responses 3-4), and high-risk taking (responses 5-6). Different risk attitudes can influence how people spend their money and plan for the future(John Gilliam et al., 2010). The replies of participants were measured using a Likert scale in this study(Joshi et al., 2015).
Financial Knowledge Variables			
Financial-literacy score	LIT	Two dummies	The Financial Knowledge Index (FKI) is a metric used in Indonesia to assess financial literacy by . The research assesses financial literacy using one question about their subjective financial literacy of each respondent due to the untransparent of the questions to know about the Financial Knowledge Index in Indonesia. Medium (1) and high (2) with low as reference category. Those who rate their knowledge from 1 to 2 are classed as low, those who score 3 and 4 as medium, and those who rate to 5 and 6 as high. For the subjective-financial-knowledge variable, the study used two dummy variables, with the reference group being poor subjective financial knowledge. The replies of participants were measured using a Likert scale in this study(Joshi et al., 2015).
Subjective financial knowledge	KNOW	Two dummies	Medium (1) and high (2) with low as reference category. Because of the scarcity of observations in the bottom two response categories, this study recodes responses into three groups: low, medium, and high. Those who rate their knowledge from 1 to 2 are classed as low, those who score 3 and 4 as medium, and those who rate to 5 and 6 as high. For the subjective-financial-knowledge variable, the study used two dummy variables, with the reference group being poor subjective financial knowledge. The replies of participants were measured using a Likert scale in this study(Joshi et al., 2015).
Economic Variables			
Household income	INCOME	Three dummies	Based on GDP per capita, income levels in Indonesia can be divided into three categories: low income, middle income, and high income. Low income is defined as less than IDR 50 million per year(1), middle income is defined as IDR 50 million to IDR 100 million per

Variables	Code	Measurement	Explanation
			year(2), and high income is defined as more than IDR 100 million per year(3) with low income as reference category. These classifications are based on Gross Domestic Product (GDP) per capita (Badan Pusat Statistik, 2023). According to studies, high-income workers and the rich are more likely to save for their children's college education than low-income earners and the less affluent(Yilmazer, 2008).
Employment status	EMP	Seven dummies	Self-employed (1), employed full-time (2), employed part-time (3), full-time student (4), permanently sick or disabled (5), unemployed (6), and retired (7) with homemaker as reference category.
Homeownership	HOME	Dichotomous	Owned a house (1) or not (0) This research can compare the effects of different categories of a variable (in this case, job status) on the outcome variable (in this case, homeownership) by utilizing a reference category. A research shows that have a valuable asset usually have a higher probability of saving for college (Korankye & Kalenkoski, 2021)
Student-loan debt	DEBT	Dichotomous	Had student loan debt (1) or not (0)
Health insurance ownership	HEALTH	Dichotomous	Had health insurance (1) or not (0)
Financial fragility	FRAG	Five dummies	Too much debt (1), difficulty covering expenses (2), no 3-month emergency fund (3), unable to cover unexpected spending of IDR 20 Million (4), and spending exceeds income (5) with no financial fragility as reference category(Korankye & Kalenkoski, 2021).

The data will be analyzed by using Binary Logistic Regression in R. At the end, this paper will provide the overall conclusion from the research and recommendation for further studies.

3.3 Data Source and Collection Method

The main data source used in the final research, which focused on the factors of parents' financial planning towards children's education funds, was a questionnaire issued to parents of university students in Bandung, Indonesia. The online questionnaire was distributed to a stratified random sample of parents across the city, guaranteeing representation from varied socioeconomic origins, age groups, and educational institutions. The questionnaire consisted of a combination of closed and open-ended questions regarding about the independent variables used to know the impact towards the dependent variables.. The data collected through this method was then compiled, cleaned, and analyzed to identify trends and patterns, shedding light on the factors parents' financial planning plays in securing funds for their children's higher education.

3.3.1 Population Sample

The Slovin calculation is a statistical procedure that is widely used to determine the minimal sample size required to produce accurate results in a big population-based research study. This strategy is based on the premise that the population data has a normal distribution. We use the formula $\left(\frac{N}{1+N(e)^2}\right)$ to compute the minimal sample size required, where n is the sample size, N is the population size, and e is the margin of error.

According to data statistics from Kemendikbud (Pendidikan & Kebudayaan, 2020) the overall student population of West Java universities is 871,191. It is critical to carefully pick an appropriate sample size for a study of this demographic in order to acquire accurate and trustworthy results. The Slovin formula was

used to compute the minimal sample size required in this situation, with a margin of error of 5% and a significance level of 95%. According to the slovin formula, a sample size of 399 is required for this population size, margin of error, and confidence level. To produce reliable and trustworthy results, a sample of at least 399 people must be taken from the population.

3.3 Data Analysis Method

3.3.1 Classical Assumptions

To assure the accuracy of the estimation findings in binary logistic regression, certain assumptions must be verified. Multicollinearity is the classical assumptions that must be tested in binary logistic regression. Binary logistic regression's estimated coefficients are the most accurate, linear, and unbiased approximations of the actual population parameters. These estimates are obtained by maximising the likelihood function, which captures the connection between the observed data and the model parameters.

3.5.1 Binary Logistic Regression

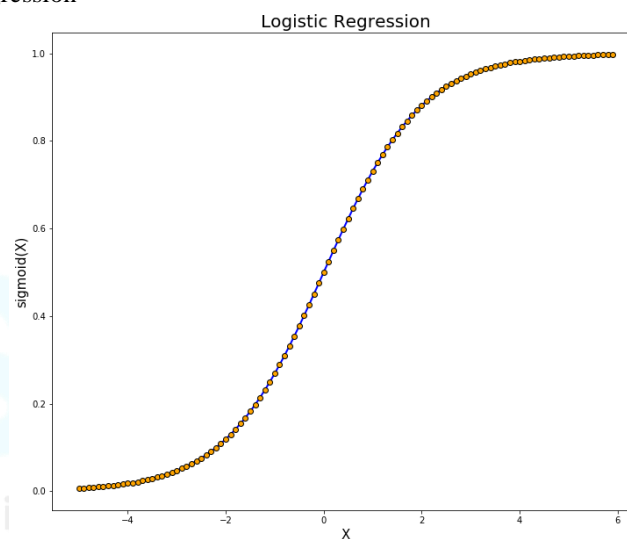


Figure 4 - Binary Logistic Regression Graph

The binary logistic regression statistical method was employed for this study. Binary logistic regression is a statistical method for modelling the link between a dependent variable with just two possible outcomes (in this case, whether or not parents save for their children's college education) and a collection of independent variables. The purpose of binary logistic regression is to predict the likelihood of the dependent variable based on the independent variables' values (Gujarati & Porter, 2009).. Because the dependent variable is dichotomous, binary logistic regression is suited for this study, and the purpose is to determine which independent variables have a significant impact on the chance of parents saving money for their children's college education. By using binary logistic regression, the study can identify which factor are most strongly associated with parents' financial planning for their children's education, providing valuable insights for policymakers, educators, and families.

For goodness of fit the data, A statistical metric called R-squared (R^2) is used to assess how well a regression model matches the observed data. It gives details on the percentage of the dependent variable's variance that the model's independent variables can account for (Harrell, 2016). The R-squared metrics of Hosmer and Lemeshow, Cox and Snell, and Nagelkerke are all used to assess the goodness-of-fit of binary logistic regression models. The R-squared of Hosmer and Lemeshow quantifies how well the model predicts the observed data, whereas the R-squared of Cox and Snell assesses the amount of variance explained by the model. Similarly, Nagelkerke R-squared represents the proportion of variation explained and is an extension of Cox and Snell R-squared. R-squared values vary from 0 to 1, with higher numbers suggesting greater fit..

3.5.3 Hypothesis Testing

The chi-squared test contrasts the actual frequencies with those predicted under the null hypothesis of no association. The test statistic has a chi-squared distribution, and the p-value is used to determine the level of significance. When the p-value is significant, it can be inferred that there is enough data to disprove the null hypothesis and prove that the independent and dependent variables are significantly correlated.

IV. RESULT / FINDING

Table 2 - Binary Logistic Regression Result Model 1

Model 1				
Relationship between Demographic Variable and Financial Planning				
Dependent Variable : Financial Planning Towards Education Fund				
Coefficient Estimate	P-value	Vif Score	Odds Ratio	Pseudo R-squared Measure
(Intercept)	0.522		0.134	
AGE	0.260	1.120	0.940	
MARRIED1	1.96E-05***	1.231	166.898	
EDU		1.129		
NCHILD		1.047		
EDU0	0.033*		0.144	
EDU1	0.079		20.328	
EDU2	0.754		1.303	
NCHILD1	0.0007***		36.453	
NCHILD2	0.0003***		39.160	
NCHILD3	0.771214		1.387	
Null deviance	472.393			
Residual deviance	83.661			
Test Statistics	DoF	P Value		
388.916	8	0		
Hosmer and Lemeshow R-squared				0.823
Cox and Snell R-squared				0.544
Nagelkerke R-squared				0.885

Table 3 - Binary Logistic Regression Result Model 2

Model 2	
Relationship between Preference Factor and Financial Planning	
Dependent Variable : Financial Planning Towards Education Fund	

Coefficient Estimate	P-value	Vif Score	Odds Ratio	Pseudo R-squared Measure
(Intercept)	0.0033**		0.077	
PLAN		1.142		
RISK		1.068		
PIAN1	<2e-16***		546.081	
RISKMedium	0.705		0.686	
RISKHigh	0.413		2.383	
Null deviance	472.393			
Residual deviance	95.755			
Test Statistics	DoF	P Value		
376.637	3	0		
Hosmer and Lemeshow R-squared				0.797
Cox and Snell R-squared				0.533
Nagelkerke R-squared				0.866

Table 4 - Binary Logistic Regression Result Model 3

Model 3				
Relationship between Economic Variable and Financial Planning				
Dependent Variable : Financial Planning Towards Education Fund				
Coefficient Estimate	P-value	Vif Score	Odds Ratio	Pseudo R-squared Measure
(Intercept)	0.040*		0.311	
LIT		1.101		
KNOW		1.101		
LITMedium	0.921		1.058	
LITHigh	0.0007***		8.293	
KNOWMedium	0.908		1.068	
KNOWHigh	2.24e-05***		14.994	
Null deviance	472.393			
Residual deviance	95.755			
Test Statistics	DoF	P Value		
228.555	4	0		

Hosmer and Lemeshow R-squared	0.484
Cox and Snell R-squared	0.37
Nagelkerke R-squared	0.601

Table 4 - Binary Logistic Regression Result Model 3

Model 4				
Relationship between Economic Variable and Financial Planning				
Dependent Variable : Financial Planning Towards Education Fund				
Coefficient Estimate	P-value	Vif Score	Odds Ratio	Pseudo R-squared Measure
(Intercept)	0.805		1.57E-03	
INCOME		1.511		
EMP		1.132		
HOME	0.038*	1.666	1.99E+01	
DEBT	0.001**	1.465	6.10E-02	
HEALTH	0.02*	1.455	1.76E+01	
FRAG		1.174		
INCOME2	0.609		4.39E+00	
INCOME3	0.283		1.65E+00	
EMP1	0.156		8.30E-02	
EMP2	0.395		2.21E-01	
EMP3	0.173		7.20E-02	
EMP4	0.998		0.00E+00	
EMP5	0.999		1.17E+08	
EMP6	0.998		0.00E+00	
EMP7	0.327		4.00E-02	
FRAG1	0.023*		2.60E-02	
FRAG2	0.996		0.00E+00	
FRAG3	0.336		2.34E-01	
FRAG4	0.012*		1.10E-02	
FRAG5	0.994		0.00E+00	
Null deviance	472.393			

Residual deviance	43.34	
Test Statistics	DoF	P Value
428.929	17	0
Hosmer and Lemeshow R-squared		0.908
Cox and Snell R-squared		0.58
Nagelkerke R-squared		0.943

V. DISCUSSION

5.1 Relationship between Demographic Variable and Financial Planning

5.1.1 Classical Assumption

There is no specific cut-off or threshold for determining when a GVIF value is considered too high or problematic. in line with Gujarati's book on basic econometrics. It depends on the situation, the research issue, and how much multicollinearity is tolerated in the particular analysis. According to Gujarati's book on basic econometrics, researcher frequently see $GVIF\left(\frac{1}{2df}\right)$ which is above 3,16 as being suggestive of significant multicollinearity in practice(Gujarati & Porter, 2009).

Given these findings, it is essential to carefully consider the effects of high scores of $GVIF\left(\frac{1}{2df}\right)$. High scores suggest a greater correlation between the variables, which could cause problems with multicollinearity. Multicollinearity can reduce the precision of coefficient estimations and make it more difficult to pinpoint the impact of specific variables.

These findings show that multicollinearity among these variables is not significantly supported. The $GVIF\left(\frac{1}{2df}\right)$ values are close to 1, indicating that these variables have low correlations and are generally independent.

5.1.2 Binary logistic regression

Three asterisks (***) denote the "MARRIED1", "NCHILD1", and "NCHILD2" category, which stands out among the significant factors with an extraordinarily low p-value of 1.96E-05, 0.0007, and 0.0003, respectively. This conclusion is supported by the statistically significant odds ratio of 166.898, 35.453, and 39.160, respectively, which shows a close connection to the result. Being married, has one child, and has two child has a big impact on the dependent variable, which is financial planning towards education.

The categories "EDU0" are shown to have significant connections because denoted with a one asterisks (*), indicating that there is a significant difference from the baseline category, with a p-value for 0.033 and an odds ratio of 0.144 this factor also significantly affect the result.

These results offer important, such as "MARRIED1" which is meaning of being married, "NCHILD1," which is meaning of has 1 child, "NCHILD2," which is meaning of has 2 child and "EDU0" which is meaning of has a post graduate degree which is meaning of has a diploma degree, need for extra consideration in future study and interpretation. The non-significant variables, not denoted with asterisk, can be thought of as having little impact on the result.

The Hosmer and Lemeshow R-squared score of 0.823 suggests that the variables in the model may be responsible for approximately 82.3% of the variation in the results of financial planning. The Cox and Snell R-squared value of 0.544 indicates that the model appears to account for around 54.4% of the variation in the outcomes of financial planning. Despite being weaker than the Hosmer and Lemeshow R-squared, this result

nevertheless implies a moderate amount of explanatory power. The highest of the three measures, the Nagelkerke R-squared score of 0.885, indicates that the model explains around 88.5% of the variation in the outcomes of financial planning. These pseudo-R-squared values demonstrate that the logistic regression model can interpret the dependent variable in a correct manner.

5.1.3 Hypothesis Testing

According to the results of the test, the chi-square value is 388.7313, which is a significant number. This demonstrates a substantial link between the demographic variables and the dependent variable. The p-value serves as a particular number that represents the probability that this difference was the result of random chance. Because the p-value is 0, the difference in our example is extremely improbable to have happened by chance alone.

5.2 Relationship between Preference Factor and Financial Planning

5.2.1 Classical Assumption

The variable PLAN has a VIF score of 1.142, which indicates a reasonably low level of multicollinearity. Similar results are seen for the variable RISK, which has a low VIF score of 1.068 and little multicollinearity. This means that there is little association between the variable RISK and the other variables, enabling more accurate calculations.

5.2.2 Binary logistic regression

The "(Intercept)" variable, has a very low p-value of 0.0033, which is denoted by two asterisks (**). This shows that the intercept significantly affects the result. The corresponding odds ratio of 0.077 shows that the intercept significantly affects the outcome variable.

With a p-value of less than $2e-16$, the variable "Plan1", exhibits high significance, as indicated by the three asterisks (***). There is a significant correlation between the long-term plan variable and the financial planning. Having a long-term plan significantly affects the financial planning, as indicated by the odds ratio of 546.081, indicates an effect on the outcome.

Moving on to the results that were not statistically significant, we have the variable "RISK" and its two subcategories, "RISKMedium" and "RISKHigh." With p-values of 0.70 and 0.41, respectively, neither category significantly affected the result.

The Hosmer and Lemeshow R-squared value in this instance is 0.797, indicating that around 79.7% of the variation in the outcome variable is explained by the model. With a Cox and Snell R-squared value of 0.533, the model appears to be responsible for about 53.3% of the variation. Nagelkerke R-squared implies that the model accounts for around 86.6% of the variation in the outcome variable, with a value of 0.866.

5.2.3 Hypothesis Testing

With three degrees of freedom (DoF) and a p-value of 0, the test statistics result shows a value of 376.637. This shows a very significant result, strongly rejecting the null hypothesis. The test statistics value exceeding the threshold indicates the presence of a significant difference or impact. The alternative hypothesis is strongly supported by the fact that the observed outcomes are exceedingly improbable to have happened by chance alone (p-value = 0).

5.3 Relationship between Financial Knowledge Variable and Financial Planning

5.3.1 Classical Assumption

LIT and KNOW both have variable VIF scores of 1.101. These results show a low level of multicollinearity, indicating that these variables do not have a strong correlation.

5.3.2 Binary logistic regression

A single asterisk (*) indicates that the intercept, which has a p-value of 0.040, is statistically significant. The intercept significantly affects the outcome variable, according to the odds ratio of 0.311. Three asterisks (***)

denote the "LITHigh" group, which has a 8.293 odds ratio and is very significant. A three asterisks (***) also are used to indicate the KNOWHigh category's extremely low p-value of 2.24e-05. The category's odds ratio is 14.994, which is linked. These categories indicate that they will have a big influence on the result.

With p-values of 0.921 and 0.9080, the variables "LITMedium" and "KNOWMedium" do not demonstrate statistical significance.

The Hosmer and Lemeshow R-squared score is 0.484, meaning that the model can account for around 48.4% of the variation in the outcome variable. The Nagelkerke R-squared value of 0.601 says that roughly 60.1% of the variation is accounted for by the model, while the Cox and Snell R-squared value of 0.37 suggests that about 37% of the variation is explained.

5.3.3 Hypothesis Testing

Indicating a significant difference or effect in the data, the test statistics value above the threshold of significance denotes this. The observed differences are exceedingly unlikely to have been the result of chance alone, according to the p-value of 0, which provides strong evidence for the alternative hypothesis.

5.4 Relationship between Economic Variable and Financial Planning

5.4.1 Classical Assumption

The VIF scores for the variables "INCOME," "EMP," "HOME," "DEBT," "HEALTH," and "FRAG" are all under 2 according to the presented table. These results typically show that the variables' multicollinearity is not very high. In general, lower VIF scores are preferred because they imply that the variables do not have a strong correlation. Inferring from the table that there is no significant problem with multicollinearity among these variables in the regression model, the VIF scores can be regarded good.

5.4.2 Binary logistic regression

The author then divides the variables into two categories: significant coefficient and not significant coefficient.

The statistical significance in the significant group for the variables "HOME," "DEBT," "HEALTH," "FRAG1" and "FRAG4." With p-values less than 0.05, these variables are denoted by asterisks (* or **). The odds ratios reflect the strength and direction of the relationship between the independent and dependent variables and the outcome variable.

In the not significant group, the variables "INCOME2," "INCOME3," "EMP1," "EMP2," "EMP3," "EMP4," "EMP5," "EMP6," "EMP7," "FRAG2," "FRAG3," and "FRAG 5" do not demonstrate statistical significance as their p-values are greater than 0.05.

These results indicate that the significant group of variables have a substantial impact on the outcome variable, whereas the not significant group of variables may not have a significant impact.

The Hosmer and Lemeshow R-squared value is 0.908, indicating that the model can account for 90.8% of the variation in the outcome variable. The Nagelkerke R-squared value of 0.943 indicates that 94.3% of the variation is accounted for by the model, while the Cox and Snell R-squared value of 0.58 says that about 58% of the variation is explained. These pseudo-R-squared measurements show how well the model captures and explains a sizeable percentage of the variability in the outcome variable.

5.4.3 Hypothesis Testing

The table's test statistics show a result of 428.929 with 18 degrees of freedom (DoF) and a p-value of 0. The null hypothesis is strongly rejected by this finding, which points to one that is highly significant.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The goal of this study is to identify the specific factors and that detrimental to the security of the education fund for children. The current study makes use of information that was initially gathered through the use of questionnaires with a focus on the city of Bandung, Jawa Barat, Indonesia. The thorough analysis carried out in Chapter 4 has successfully addressed the research questions posed at the starting point of this project, highlighting key challenges experienced by parents of students from Bandung universities when getting their children's college funding.

It was found that the key factors revolved around demographic variables, preference factors, financial knowledge, and economic variables. Specifically, variables such as marital status, number of children, and education level were identified as key demographic factors. The preference for long-term planning emerged as a significant influence. High levels of financial literacy and understanding were seen as central to financial planning, while economic variables such as home ownership, debt levels, health insurance, and economic fragility (FRAG1 and FRAG4) were also notable.

In determining the most significant factors was complex due to the interplay of variables. Nevertheless, marital status and the number of children were found to have profound impacts, alongside education level within the demographic variables. From the preference factors, having a long-term plan was most impactful, while in financial knowledge, higher levels seemed to significantly influence the planning. Among economic variables, home ownership, debt, health, and FRAG1 and FRAG4 factors played substantial roles.

Addressing the research objectives, this study not only identified the various factors faced by parents but also highlighted the ones with the most significant impact on financial planning for their children's college funds. The findings suggest that parents' marital status, number of children, and level of education, along with long-term planning, financial literacy, and certain economic factors are of utmost importance when securing funds for higher education.

6.2 Recommendation

The comprehensive analysis of demographic, preference, financial knowledge, and economic factors' role in financial planning for education fund several critical implications and offers recommendations for stakeholders, including parents, practitioners, and future researchers.

5.2.2 Recommendation for Parents

The significant impact of family planning decisions on financial planning, such as marital status and the number of children, stresses the necessity of early and comprehensive financial planning. When making family planning decisions, parents should consider the long-term financial impacts. Parents should also prioritize long-term education planning for their children, as our data show that it has a considerable impact on financial planning outcomes.

5.2.4 Recommendation for Practitioner

Financial advisors must guarantee that their clients' advice is specific and takes into consideration their clients' particular circumstances, such as marital status, number of children, economic fragility, and long-term goals. They should also urge clients to improve their financial literacy, since it has been shown to have a major impact on financial planning outcomes. Financial advisors can even provide educational resources or workshops to their clients in order to assist them enhance their financial knowledge. Given the importance of economic aspects in financial planning, advisers should be prepared to comprehend and advise on a wide range of financial problems, such as debt management, house ownership, and health care costs.

5.2.1 Recommendation for Future Research

The outcomes of this research provide an appropriate foundation for future studies on educational financial planning. The parameters found offer light on the complicated dynamics that influence financial decision-making in respect to college funding. This study emphasizes the necessity of taking demographic, preference, financial knowledge, and economic variables into account when analysing financial planning behaviours. There are, nevertheless, prospects for additional research to enhance our understanding and progress the profession.

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Optimal Capital Structure Analysis of PT Triputra Agro Persada Tbk

Michael Samuel Aquila¹

¹ School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

Currently, PT Triputra Agro Persada Tbk has a different capital structure from other competitors in the Indonesian CPO industry. This indicates that the company might not yet have an optimal capital structure. By having an optimal capital structure, the company is expected to be able to minimize the cost of capital and maximize the value of the company. In 2023, PT Triputra Agro Persada Tbk will increase production capacity with an expansion plan that will cost 900 billion rupiah. The expansion plan with a cost of 900 billion rupiah is expected to be a momentum for PT Triputra Agro Persada Tbk to carry out capital restructuring. This study applies M&M Theory Proposition II to find the optimal capital structure of PT Triputra Agro Persada Tbk. This study succeeded in finding that the company has an optimal capital structure with the lowest weighted-average cost of capital (WACC). Currently, the company has a proportion of 15% debt and 85% equity to total capital. Based on the results of this study, the optimal capital structure of the company is with a proportion of 89% debt and 11% equity to total capital. Previously, the company had a WACC of 13.71%. With an optimal capital structure, the company can have a WACC of 12.45%. In conclusion, this study shows that PT Triputra Agro Persada Tbk should have adjustments to the capital structure to get a proportion of 15% debt and 85% equity to total capital. This should be done so that the company can minimize the cost of capital and maximize the value of the company. The company should raise a budget of 900 billion rupiah for an expansion plan in the form of debt because the company needs to increase the proportion of debt to total capital.

Keywords: Cost of Capital; Debt; Equity; Expansion; Optimal Capital Structure; Value

I. INTRODUCTION

Indonesia's Crude Palm Oil (CPO) industry has tremendous potential in the future. The statement is supported by the historical evidence related to the CPO production amount in Indonesia, the competitiveness of Indonesia in the international CPO market, and the immense contribution of Indonesia's CPO industry to the local economy. The enormous potential of Indonesia's CPO industry is also supported by the plan for Indonesia to have its own CPO price index. The CPO companies in Indonesia should support the potential of Indonesia's CPO industry.

The Indonesia Ministry of Trade states that Indonesia has the most significant CPO production compared to other countries. As of 2022, Indonesia holds more than half of the world's palm oil production, precisely 59 percent or equal to 45 million metric tons (MT) of CPO (U.S. Department of Agriculture, 2022). According to research by the international price reporting agency (PRA), Agricensus, Malaysia, the world's second-largest palm oil producer, reached 18.6 MT production of CPO in 2022. CPO production in Indonesia is nearly three times bigger than in Malaysia.

With its enormous CPO production, Indonesia contributes significantly to the international CPO market. Two research have proven the competitiveness of Indonesian CPOs in the international market. First, from 2000 to 2019, Indonesia had the highest Revealed Comparative Advantage (RCA) average of CPO compared to other countries (Nugraha Ramadhani et al., 2019). As a reference, the RCA average is an economic index used to calculate the competitiveness of trade activities. Second, from 2000 to 2020, Indonesia's CPO accounted for 15% to 30% of the total CPO available in the European Union market (the Netherlands, Spain, and Germany), which is higher than any other country that exports CPO to the same region (Jamilah et al., 2022).

Even with its position as the biggest CPO producer in the world, the price of Indonesian CPO is still driven by the international market. Specifically, the price of Indonesian CPO refers to the Malaysian CPO price index. In 2023, according to Zulkifli Hasan, Indonesia's Minister of Trade, Indonesia will have its own CPO price index, and the country's CPO price will not be driven anymore by the international market. With its own CPO price index, Indonesia is expected to gain more benefits from the international CPO market by setting more reasonable prices to sell CPO.

Indonesia's CPO industry also contributes to the local economy. According to the Indonesian Palm Oil Association (GAKPI), the CPO industry contributes around 3.5% to the country's GDP annually. The government still heavily relies upon the CPO industry to support economic growth.

The CPO companies in Indonesia could capture this big potential of the CPO industry as an opportunity to gain advantages by supporting the production of CPO in Indonesia. In this case, PT Triputa Agro Persada Tbk as an Indonesian CPO company could be one of the companies that capture the opportunity. Established in 2005, PT Triputa Agro Persada Tbk operates in Jambi, Central Kalimantan, and East Kalimantan. To fulfill the amount of CPO needed, the company needs to assure that there is an available amount of supply of CPO. Thus, the company always evaluates whether its current capacity is enough to produce the amount of CPO needed.

The common problem of CPO companies in Indonesia is that they cannot produce more as there are no plants and supporting resources (Nafisah & Amanta, 2022). If there is not enough capacity to produce CPO, PT Triputa Agro Persada Tbk must allocate a certain amount of capital expenditure to acquire more assets that will improve the capacity production of CPO. According to the corporate secretary of the company, Joni Tjeng, the company has planned to allocate IDR 900 billion capital expenditure in 2023 for developing infrastructure, acquiring fixed assets like the mill, transportation, and other supporting assets, as well as expanding their business to downstream (Melani, 2023). The company might need to raise capital through debt or equity to support the expansion plan.

Currently, PT Triputa Agro Persada Tbk capital structure differs entirely from local competitors in the same industry. The company has 85% of equity and 15% of debt. On average, the competitors have 73% equity and 27% debt. As the current structure is different from the competitors, it is necessary to evaluate the current capital structure and find the optimal capital structure for the company.

PT Triputa Agro Persada Tbk should change its capital structure if there is an optimal capital structure that is better than the current. The expansion plan could be an opportunity for adjusting the current capital structure to the optimal one as there could be financing activity to fund the expansion plan. The company could raise capital for the expansion plan with the right sources of funds to achieve the optimal capital structure.

There is also a consequence if the company chooses to adjust its capital structure. In general, whether by adding debt or equity capital, an adjustment for the capital structure will create a new cost of capital as there is a new composition of the financing structure (Heerkens, 2006).

Based on the problem explained earlier, the objectives of this research are to determine the optimal capital structure of PT Triputa Agro Persada Tbk and to know the best financing sources for PT Triputa Agro Persada Tbk to conduct the expansion plan.

This research will focus on finding the optimal capital structure of PT Triputa Agro Persada Tbk and the right financing source to support the amount of capital needed for the expansion plan. All the data in this research will be based on secondary data. Most of the data will be from the latest company annual report (as of 2022). Other data from external sources (such as yahoo.finance) might be needed to support this research.

This research consists of five chapter: Introduction to provide explanations about general context of this research, the literature review to provide thorough theories and principles related to capital structure, methodology to explain the method used for this research, data analyses to show analyses of data collected, and conclusion and recommendations to summarize all the research findings and answering the research objectives.

II.LITERATURE REWIEW

In this chapter, the author will explain the concept of capital structure in general, M&M Theory Proposition II as the fundamental of optimal capital structure, the concept of optimal capital structure, and the importance of finding an optimal capital structure.

A company's capital structure refers to the relative proportion of different forms of financing that the company will use to finance its various investment project (Heerkens, 2006). Capital structure can visualize how the company chooses the proportion from different sources of financing, with debt or equity.

The company pays the cost of funds to the lenders or investors for providing capital to the company. Each financing source, debt, or equity will have its own cost of funds for the company. According to Damodaran (2006), the sum of the cost of funds by each financing source, weighted by its proportion to the total capital provided, is the company's cost of capital or as known as the weighted average cost of capital (WACC). The proportion of debt or equity to the total capital raised by the company will affect the cost of capital. Based on the previous statements, the capital structure as the relative proportion of different forms of financing will determine the cost of capital that the company will incur.

One of the methods to value a company is using the discounted cash flow (DCF) method as an absolute valuation. In the DCF method, the cost of capital is the discount rate to the total free cash flow when calculating the present value of the company (Ogier et al., 2012). The higher cost of capital will minimize the company's value and vice versa. Suppose the capital structure affects the cost of capital to the company, and the cost of capital will affect the company's value. In that case, it is sufficient to conclude that the capital structure will also affect its value. Below are the deeper explanations related to each source of financing, debt and equity.

Debt capital refers to the amount of money a company raises through borrowing from lenders, such as banks or investors, with the agreement to repay the principal amount plus interest in the future at a specific period (Raynes & Verde, 2015). Interest acts as the cost of the fund when a company raises money through debt. Debt capital can take several forms, such as loans, bonds, commercial paper, etc.

Equity capital refers to a form of financing where a company sells ownership shares in the business to investors (Vernimmen et al., 2021). A company chooses equity as it does not require the company to make regular payments like interest and repay the principal. With equity capital, a company can raise capital without the obligation to repay the investment in the long term. When raising money through equity capital, the cost of funds is the expected rate of return from the investor by investing in a company.

In 1963, there was an initiative by Modigliani and Miller to develop a second version that suits the real market condition. Specifically, in the real market, the company should pay taxes and any other implied costs by the market (Miller & Modigliani, 1963). Related to the statement before, in this second version, a company market should consider the tax applied to formulate the company's capital cost.

Optimal capital structure refers to the proportion of debt and equity with the least weighted average cost of capital (WACC) that maximize the company's value (Damodaran, 2015). A company's capital structure is not a fixed concept, but rather a dynamic change under different circumstances of the company. Different circumstances could be the change in the cost of capital, changes in the amount of capital needed through different strategic initiatives, and others. Generally, a company will adjust its capital structure to minimize the WACC and subsequently maximize its value (Miller & Modigliani, 1963). The weight of debt refers to the proportion of debt to the total capital of a company (Damodaran, 2015). It can be used to measure the importance of debt capital compared to other sources of capital for a company. Only long-term debt should be included when determining the capital structure debt rather than combining it with current liabilities (Gitman, 2005). The debt value should be stated according to its market value. The weight of debt is typically expressed as a percentage of all sources of financing in a company.

The cost of debt of a company refers to the expense paid by the company in exchange of funds provided with debt financing (Damodaran, 2016). It is the required return that lenders or investors expect by providing debt capital to a company. It will increase as a company deal with a higher level of financial distress (Opler & Titman, 1994). The weight of equity refers to the proportion of capital in the form of equity to the total capital available in

a company (Damodaran, 2015). The equity value should be stated according to its market value. The weight of equity will be expressed as a percentage of all sources of financing in a company.

The cost of equity is defined as the cost incurred by a company to raise capital through equity financing. The cost of equity is the required return by equity investors provides capital in exchange for ownership of the company (Damodaran, 2016). The cost of equity reflects the return that shareholders expect associated with the risk they undertake by investing in the company. The more risk faced by investing in a company implies a higher expected return from the investment. According to Damodaran (2012), two methods to calculate the cost of equity are by using Dividend Discount Model (DDM) and Capital Asset Pricing Model (CAPM). CAPM is more widely used to calculate the equity cost as it applies to most companies, including those that do not provide dividends. In contrast, the DDM model only applies to companies that provide dividends.

The CAPM formula states that the required return on investment should be determined by market data, specifically risk-free rate, historical market returns, and the systematic risk or beta of the investment with the overall market.

III. RESEARCH METHODOLOGY

This chapter discusses the approach that the author used to answer the research question. The first part discussion will be the research design which is the framework of the research. The second part is the data collection process and data analysis to answer each research question.

In this section, the author will explain the workflow of the research. The research is problem-identification based, where the author starts by identifying the problem. Based on the problems identified, the author determines the research questions and research objectives. To answer research questions and complete objectives, the author processes the data, specifically by doing data collection and data analysis stages. After processing the data, the author can get answers to research questions and complete research objectives.

For problem identification, the author analyzes the current conditions of the company and the industry the company operates, including the company's competitors under study. After that, the author can look for possible gaps between possible ideal company conditions based on research from the industry and current company conditions. Based on problem identification, the author formulates research questions to be answered at the end of the research and research objectives as research directions. Subsequently, the author reviews the literature to find theories supporting the research.

The author continues the research by collecting secondary data. The author divides the data collection process into financial and market data collection. Then, the author does the data analysis using the secondary data collected. The data analysis process includes analyzing the current capital structure, determining the optimal capital structure, and recommending appropriate financing resources to achieve an optimal capital structure.

The author made figure 1 to portray the research design that was explained before. At the end of this research, the author will make a conclusion to answer the research questions and recommendations for the company based on the findings of this research.

The data collection process is divided into two parts, collecting financial data and market data. The financial data are all collected from the company's latest annual report, which is from the year 2022. The market data will be collected from various external sources. All details of the data that are collected are mentioned in figure 1.

The data generated from the annual report will be processed using financial models and appropriate methods. The author will analyze the current capital structure of PT Triputra Agro Persada Tbk by the stages below.

Step 1: Calculate the current beta of the company. (It will be the levered beta as the current company is financed by debt and equity)

Step 2: Find the current D/E ratio.

Step 3: Calculate the weight of debt (w_d) and weight of equity, which is the market value of both debt and equity. Because it is quite difficult to determine the market value of debt, in theory, the author can still use the book value of debt as a substitute for the market value of debt. To obtain the market value of equity, the author calculates the market share price of the company multiplied by the total outstanding share.

Step 4: Determine the current interest coverage ratio and spread.

Step 5: Determine the current cost of debt.

Step 6: Calculate the current cost of equity using CAPM formula, which components are:

- a) Risk-free rate acquired from 10-year government bond rate.
- b) Country market risk premium acquired from Damodaran country risk premium.
- c) The beta of PT Triputa Agro Persada Tbk (TAPG) was calculated with the formula from the previous chapter.

Step 7: Calculate the current WACC, with the components as stated in the previous steps.



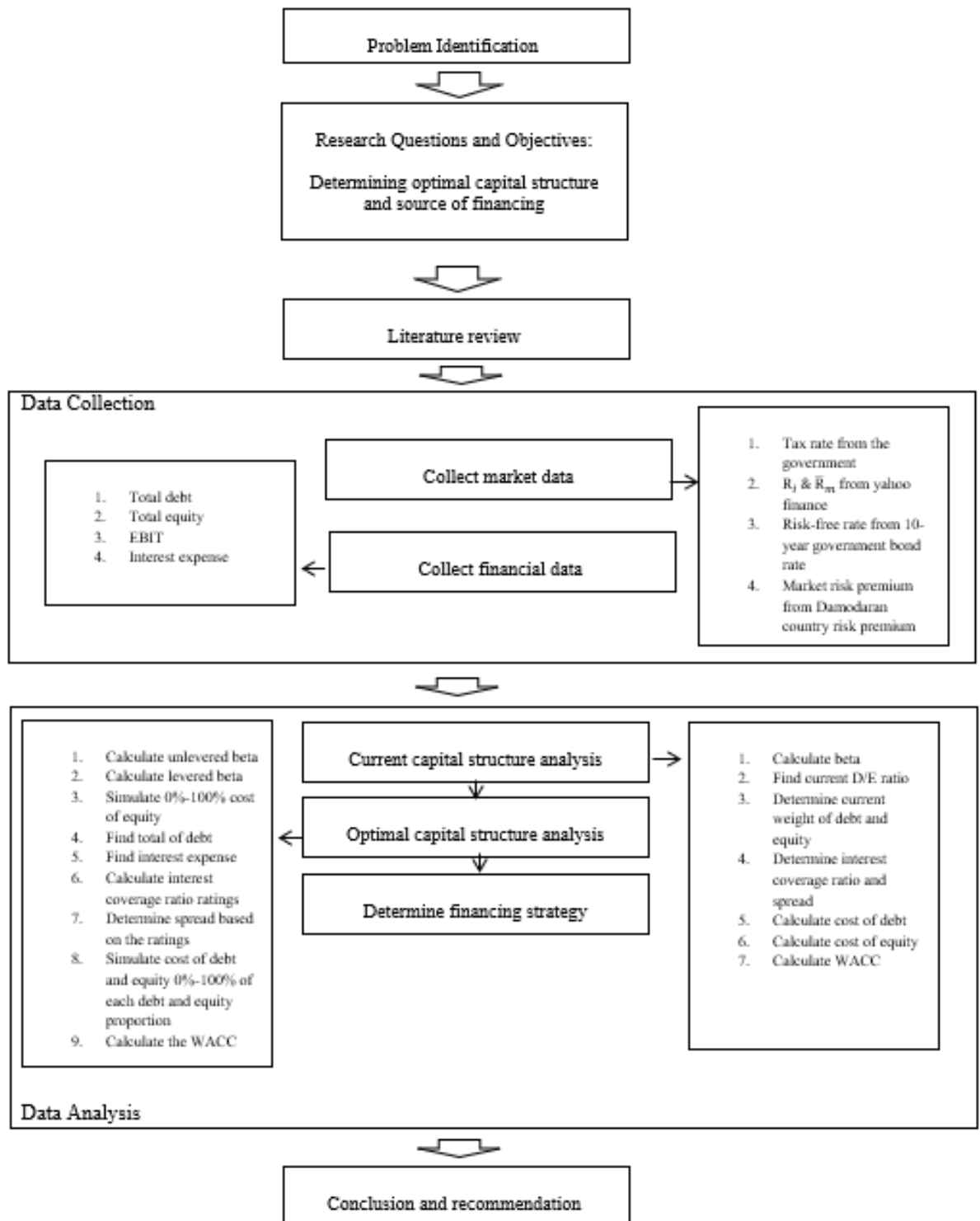


Fig. 1. Research design

Next, the author simulates the different capital structures based on the mix of debt and equity to find the optimal capital structure with the lowest WACC. The WACC will be calculated according to each different capital

structure. The author will start by calculating the after-tax cost of debt and the cost of equity. Then, the author will calculate the WACC according to each capital structure.

Step 1: Calculate unlevered beta.

Step 2: Calculate levered beta from 0-100% portion of the equity to total capital.

Step 3: Calculate the cost of equity for every portion of the equity that has been calculated in the previous steps.

Step 4: Find the total debt for every portion of equity that has been calculated on step 2.

Step 5: Find the interest expense for every total debt determined on the previous step.

Step 6: Calculate interest coverage ratio for every total debt that has been calculated on step 4.

Step 7: Determine the spread based on interest coverage ratio ratings.

Step 8: Simulate cost of debt and equity from 0-100% proportion of debt and equity.

Step 9: Calculate the WACC for every portion of debt and equity.

The optimal capital structure will be the portion of debt and equity with the lowest WACC.

After determining the optimal capital structure, the author will determine the future capital needed by PT Triputra Agro Persada Tbk by adding the capital for the expansion plan to the current total capital of the company. Subsequently, the author will determine amount new capital (debt, equity, and total capital) structure based on optimal percentage of debt and equity to the new total capital. Next, the author will formulate how much debt and equity should be adjusted by the company to achieve the optimal capital structure. Finally, related to the expansion plan, the author will determine what financing sources should be chosen by the company to fulfill the capital for expansion plan.

IV. RESULT / FINDING

With all related theories and equations as the principles of this research as well as the methodology for guidance, the author will do the data analysis to obtain answers to the research questions mentioned in the first chapter. The author will start this chapter with key assumptions on the subsequent steps, then determine the current capital structure of PT Triputra Agro Persada Tbk, formulate the optimal capital structure for the company, and determine the source of financing to fulfill the capital for the expansion plan.

In table 1, the author mentioned several key assumptions for the data analysis. There are several key assumptions that are obtained from the market: tax rate, risk-free rate, market risk premium, and beta.

Table 1. Key Assumptions

No	Item	Value	Description
1	Tax Rate	22.00%	Indonesian Regulation on Corporate Tax Rate
2	Risk-Free Rate	6.30%	Acquired from Indonesia's 10-year Government Bond Rate
3	Market Risk Premium	9.23%	Acquired from Damodaran Country Risk Premium
4	Current beta (β)	0.955	Calculated based on company and market return

After calculating each financing proportion's debt and equity cost, the author can determine the weighted-average cost of capital (WACC) for each proportion. The author will determine the financing proportion with the lowest WACC to determine the optimal capital structure.

Table 1. Optimal Capital Structure

Debt	Equity	D/E	Rd (1-t)	Re	WACC
0%	100%	0%	0.00%	14.08%	14.08%
5%	95%	5%	5.45%	14.40%	13.96%
10%	90%	11%	5.45%	14.76%	13.83%
15%	85%	18%	5.45%	15.16%	13.70%
20%	80%	25%	5.45%	15.60%	13.57%
25%	75%	33%	5.45%	16.11%	13.44%
30%	70%	43%	5.45%	16.69%	13.32%
35%	65%	54%	5.58%	17.35%	13.23%
40%	60%	67%	5.58%	18.13%	13.11%
45%	55%	82%	5.87%	19.05%	13.12%
50%	50%	100%	6.02%	20.16%	13.09%
55%	45%	122%	6.02%	21.51%	12.99%
60%	40%	150%	6.02%	23.19%	12.89%
65%	35%	186%	6.18%	25.36%	12.89%
70%	30%	233%	6.18%	28.25%	12.80%
75%	25%	300%	6.18%	32.30%	12.71%
80%	20%	400%	6.18%	38.37%	12.62%
85%	15%	567%	6.18%	48.49%	12.52%
86%	14%	614%	6.18%	51.38%	12.51%
87%	13%	669%	6.18%	54.72%	12.49%
88%	12%	733%	6.18%	58.61%	12.47%
89%	11%	809%	6.18%	63.21%	12.45%
90%	10%	900%	6.47%	68.73%	12.70%
91%	9%	1011%	6.47%	75.48%	12.68%
92%	8%	1150%	6.47%	83.91%	12.67%
93%	7%	1329%	6.47%	94.75%	12.65%
94%	6%	1567%	6.47%	109.21%	12.64%
95%	5%	1900%	6.47%	129.45%	12.62%

As shown in table 1, PT Triputra Agro Persada Tbk has an optimal capital structure with 89% of debt and 11% of equity proportion to total capital. The WACC for the optimal capital structure is 12.45%. This new proportion of debt and equity is different compared to the industry average. In chapter 1, the author mentioned that the industry average proportion is 27% of equity and 73% of debt.

PT Triputra Agro Persada Tbk has a really high-interest coverage rating which makes the spread of each proportion of debt not so large. The larger the portion of the debt to total capital, the cost of debt will only increase slightly. On the other hand, the larger the portion of equity to total capital, the cost of equity will increase significantly. Therefore, the company is better off raising capital through debt than equity as an increasing portion of debt will not impact the cost of capital significantly.

V.DISCUSSION

The author has found the optimal capital structure for PT Triputra Agro Persada Tbk. The optimal capital structure for a company is 89% debt and 11% equity to total capital. Previously, the company had a financing proportion of 14.51% debt and 85.49% equity to total capital. The company can utilize additional capital to adjust its capital structure. Therefore, the author will determine a financing strategy for the company to achieve optimal capital structure, starting from future total capital, future capital structure, and financing strategy with additional capital from the expansion plan.

Future Capital of pt triputra agro persada tbk

The table below shows the current capital structure of the company and the future total capital added with the capital for the expansion project.

Table 2. PT Triputra Agro Persada Tbk New Capital

Item	Value
Current total debt (A)	IDR1,700,244,000,000.00
Current total equity (B)	IDR 10,021,277,000,000.00
Current total capital (C=A+B)	IDR 11,721,521,000,000.00
Addition capital for the expansion project (D)	IDR 900,000,000,000.00
Total capital after added capital (E=C+D)	IDR 12,621,521,000,000.00

Currently, the company has IDR 1,700,244 million of debt and IDR 10,021,277 million of equity. The current total capital of the company is IDR 11,721,521 million. Added with IDR 900,000 million capital for the expansion project, the company will have IDR 12,621,521 million of total capital.

Future Capital of pt triputra agro persada tbk

PT Triputra Agro Persada Tbk will have a new capital structure according to its optimal capital structure. In table 13, the author has mentioned the company's new capital structure. As the company's new total capital has been determined, below in Table 3, the author determined the total debt dan equity capital based on its optimal weight of debt and equity.

Table 3. New capital structure of PT Triputra Agro Persada Tbk

Item	Value
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Total capital after added capital (A)	IDR 12,621,521,000,000.00
New weight of debt (B)	81%
New weight of equity (C)	19%
Expected total debt after added capital (D= B x A)	IDR 10,223,432,010,000.00
Expected total equity after added capital (E=C x A)	IDR 2,398,088,990,000.00

With the new total capital of Rp11,730,521 million, 81% debt, and 19% equity, the company should have IDR 10,223,432 million of debt and IDR 2,398,089 million of equity.

Financing strategy for the expansion plan

After determining the company's new capital structure, the author will determine how the company should adjust its capital structure from the current to the new and optimal.

Table 4. Optimal capital structure after financing for the expansion plan

Item	Value
Current debt (A)	IDR 1,700,244,000,000.00
Current equity (B)	IDR 10,021,277,000,000.00
Expected total debt after added capital (C)	IDR 10,223,432,010,000.00
Expected total equity after added capital (D)	IDR 2,398,088,990,000.00
Amount of change in debt (E=C-A)	IDR 8,523,188,010,000.00
Amount of change in equity (F=D-B)	(-)IDR 7,623,188,010,000.00
Current total capital (G)	IDR 11,721,521,000,000.00
New total capital (H)	IDR 12,621,521,000,000.00

According to table 4, the new total capital is IDR 12,621,521 million after being added with IDR 900,000 million capital for the expansion plan. New total capital will be a new basis for the company in restructuring capital. The amount of debt and equity will be adjusted to the optimal percentage of debt and equity from the new total capital.

To obtain an optimal capital structure, the company needs to increase debt capital by IDR 8,523,188 million and reduce equity capital by IDR 7,623,188 million. As the company needs to raise debt to achieve the optimal capital structure, the company can raise IDR 900,000 million in debt capital for the expansion plan.

VI.CONCLUSION AND RECOMMENDATION

PT Triputra Agro Persada Tbk currently has 14.51% of debt and 85.49% of equity, with a weighted-average cost of capital (WACC) of 13.71%. Based on the analysis results, the company has an optimal capital

structure that is different from the current one. The optimal capital structure comprises 81% of debt and 19% of equity. The optimal capital structure has the lowest WACC that is 12.45%. With a lower WACC, the company can maximize its value of the company.

The optimal capital structure proportion of debt and equity is different to the industry average. Companies in the same industry with PT Triputra Agro Persada Tbk have 27% of debt and 73% of equity. This might happen as the amount of the cost of debt owned by PT Triputra Agro Persada Tbk is not too affected by the proportion of debt to the total capital.

An expansion plan with a total capital of IDR 900,000 million can be a momentum for the company to adjust its capital structure. Currently, the company has IDR 11,721,521 million in total capital. With additional capital for the expansion plan, the company has a new total capital of IDR 12,621,521 million. Based on the total new total capital and adjustments to the optimal capital structure, the company should have IDR 10,223,432 million of debt for the expansion plan and IDR 2,398,088 million of equity.

The company should increase the amount of debt capital by IDR 8,523,188 million and reduce the amount of equity capital by IDR 7,623,188 million to have the optimal capital structure. The IDR 900,000 million capital for the expansion plan should be raised in debt capital as the company needs to increase the debt capital to have the optimal capital structure.

PT Triputra Agro Persada Tbk should adjust its capital structure to 81% of debt and 19% of equity. Therefore, the company needs to increase the proportion of debt and reduce the proportion of equity from total capital. Related to the financing strategy, the IDR 900,000 million capital for the expansion plan should be raised through debt. The author suggests further research for determining complete strategies to fully achieve the company's optimal capital structure.

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The Influence of Social Commerce on Compulsive Buying Behavior of Generation-Z

Nayla Nurhaliza¹, Annisa Rahmani Qastharin²

^{1,2} Bandung Institute of Technology (ITB), School of Business and Management, Bandung, Indonesia

Abstract

Technological advancements have revolutionized shopping, offering convenience and easy access to information. E-Commerce and Social Commerce have transformed the way people shop through interactive platforms. However, some users on social commerce platforms exhibit impulsive buying behavior, making spontaneous purchases without much planning. It is important to differentiate impulsive buying from compulsive buying as they represent distinct phenomena. Compulsive buying involves an uncontrollable urge to make purchases, often triggered by negative emotions, causing personal distress. This research aims to investigate the influence of social commerce marketing strategies on the compulsive buying behavior of Generation Z. Surveys will be conducted among Generation Z individuals aged 15 to 24, with experience in using social commerce platforms. Data collected will be analysed using the Partial Least Squares (PLS) technique to gain meaningful insights. The findings suggest that social commerce marketing indirectly contributes to an increase in compulsive buying behavior among Generation Z consumers, indicating the potential of marketing strategies to trigger or worsen compulsive buying tendencies. To address this issue and mitigate the negative impact of social commerce, recommendations will focus on promoting mindfulness among Gen-Z consumers. Encouraging awareness of impulsive tendencies and critical evaluation of purchases, setting budgets, avoiding triggers, practicing delayed gratification, and seeking support from friends and family can help prevent and manage compulsive buying behavior. Limiting the influence of social media by reducing usage, unfollowing or muting accounts promoting impulsive buying, and finding alternative sources of entertainment can minimize impulsive purchasing decisions. Acquiring knowledge about marketing tactics empowers Gen-Z consumers to make informed choices and develop healthier shopping habits, resisting the allure of compulsive buying.

Keywords: Compulsive Buying Behavior; Consumer Behavior; Social Commerce

I. INTRODUCTION

The foundation of Traditional E-Commerce has permeated social media companies, giving rise to a new term known as Social Commerce. Social commerce refers to the utilization of digital media on the internet to facilitate users in engaging with online marketplaces and communities for purposes such as purchasing, selling, comparing, and exchanging information regarding goods and services (Zhou, Zhang, & Zimmermann, 2013). Social Commerce is a relatively new addition to the online shopping experience. This evolution of E-Commerce investigates the style of online buying and selling by providing a more interactive shopping experience while also entertaining the consumer (McKinsey & Company, 2022). In the *Q4 Global Social Commerce Market Survey*, it was revealed that over 30 million individuals from Indonesia engaged in online transactions. Among these transactions, 60% of the sales were attributed to e-commerce platforms, while the remaining 40% took place on social media networks within the country during the year 2021. As a result, the social commerce market is projected to experience significant expansion over the next four to six quarters (Research and Market, 2022). Social Commerce features make it easier for both small and large brands to sell their products to their target audiences and potential customers (Ronnie Gomez, 2021). In contemporary social commerce, merchants engage in direct selling to consumers through live broadcasting on social media, while others rely on brand ambassadors to endorse products on these platforms. This approach is aimed at stimulating impulse buying behavior, whereby consumers make immediate and uninhibited purchase decisions online (Nasution et al., 2020). Social commerce involves utilizing social media platforms to facilitate online transactions between businesses and consumers (Pavlou, 2023). Through social commerce, the entire shopping process, starting from product discovery and research, all the way to the checkout, takes place directly within the realm of social media (Jacob, 2023). The surge

in Social Commerce users in Indonesia has tripled in 2020 (Muslim, 2021). According to CNBC Indonesia TV (2023), TikTok Shop, one of the Social Commerce platforms, out formed e-Commerce sites, such as Shopee and Bukalapak in terms of selling goods and services. Talking about online shopping, the phenomenon of impulse buying in online shopping platforms has been the subject of research in various fields. In addition, the influence of social media on impulse purchasing varies by 70.1% (Andriyany and Arda, 2019). According to Strack et al. (2006) in Xi et al. (2016), e-commerce has created numerous opportunities for consumers to make impulsive purchases. This argument is supported by the Global Web Index Survey, which indicates that e-commerce sales promotions encourage unplanned purchasing among Indonesian consumers (Tumanggor et al. 2022)

Impulsive buying behavior is a behavior that is carried out by customers unplanned and relatively quickly in making purchasing decisions (Schiffman and Kanuk, 2004). This tendency to purchase impulsively and without consideration can be explained by the buyer's desire for immediate satisfaction (Pradhan et al., 2018). According to Pandya and Pandya (2020), impulse buying results in an emotional loss of control brought on by the tension between the desire for an instant pleasure and the potential drawbacks of the purchase, which can lead to pathological and persistent obsessive behaviors. The occurrence of impulse buying behaviors over time can contribute to the emergence of compulsive buying, as stated by Darrat et al. (2016). Compulsive buying can be categorized as a form of control disorder that arises from impulsive purchasing (Faber, 2004). Additionally, Compulsive consumption is a behavioral addiction that may be provoked and sustained by negative emotions or events. Research suggests that consumers often resort to compulsive buying out of their need for affection and sense of belonging (O'Guinn and Faber, 1989). Commonly, compulsive consumption is regarded as a negative aspect of consumer behavior (Hirschman, 1991). Compulsive buying refers to an overwhelming, recurring, and uncontrollable obsession, desire, or action associated with shopping that results in personal distress and compromised functioning (Black, 2007). Individuals afflicted with compulsive buying engage in impulsive purchases, despite the potential negative consequences stemming from repetitive and unregulated buying (Babin & Harris, 2015; Kukar-Kinney et al., 2009; Flight et al., 2012).

Additionally, Social Commerce presents unique characteristics that have the potential to influence Impulsive Behavior that can lead to Compulsive Buying Behavior. It is important to avoid compulsive buying behavior due to its potential negative outcomes. According to Edwards (2019), compulsive buying is characterized as an abnormal and excessive shopping behavior that lacks control, repeats itself, and is driven by a strong urge to shop as a means of relieving stress, anxiety, and other disturbances. This disorder can often coexist with other conditions. If not addressed, the long-term effects of compulsive buying can have adverse consequences on both financial and psychological well-being. These repercussions encompass increased credit card debt, excessive indebtedness, diminished savings, legal entanglements, diminished self-esteem, heightened feelings of guilt, depression, anxiety, frustration, and strained interpersonal relationships (Retno, 2014). Researchers aim to investigate the relationship between social commerce and compulsive buying behavior to provide insights to social commerce users. Understanding this relationship will help identify the factors contributing to the impact of social commerce marketing on compulsive buying behavior among Generation Z (15-24 years), who are highly active on social media platforms. By examining the negative aspects of consumer behavior like compulsive buying, researchers can increase social awareness and generate potential remedies. This research endeavor seeks to shed light on the factors influencing compulsive buying tendencies and provide valuable insights for strategies and interventions to mitigate compulsive buying behavior among Generation Z in the context of social commerce. Ultimately, this research aims to offer a clearer understanding of Generation Z, consumer behavior, the influences of social commerce, and how to avoid the negative impact of compulsive buying behavior specifically in this demographic.

II. LITERATURE REVIEW

2.1 Social Commerce

Sharma and Crossler (2014); Huang and Benyoucef (2013) claim that social commerce is a contemporary business strategy that resulted from the fusion of social networking and ecommerce, utilizing well-established social media and networking platforms to facilitate product sales and influence consumer buying behavior. This ground-breaking approach makes use of the influence of social networks to market goods and entice customers to buy them, resulting in a more individualized and engaging shopping experience. This brand-new "Social Commerce" platform differs from conventional e-commerce models in several significant ways (Busalim and Hussin, 2016; Hussain & Subramaniam, 2020). The presentation of goods and services, as well

as improving search engine and navigational functionality, are given top priority in e-commerce. Therefore, social commerce has changed the online marketplace from a platform that was product-focused to one that was customer-centric (Busalim and Hussin, 2016).

2.2 Social Interaction

Recent studies in marketing and social interaction have highlighted the importance of online reviews (Zhang et al., 2018; Zhang, Xu, Zhao, & Yu 2018). This recognition results from the fact that buyers in today's digital marketplace regularly consult reviews and suggestions to gauge product quality and mitigate risk (Isa et al., 2016). Consumers' trust in online reviews is affected by their beliefs about the reliability and value of the products reviewed, according to research by Gvili and Levy (2016). Online reviews have been shown to have a significant impact on consumer purchase behavior and alleviate uncertainty in prior research by authors like Mudambi and Schuff (2010) and Zhang, Zhao, Cheung, and Lee (2014). Online reviews are often well-received because their perceived benefits outweigh the perceived risks associated with using them (Zhang et al., 2018). There is no empirical data on how online reviews directly influence users' engagement in impulse purchase behavior, however the concept of online reviews has not been completely studied (Zhang et al., 2018). The idea is grounded in prior research, which suggests that sociability influences impulsive purchases.

H1: Social Interaction has a positive influence on the impulse buying intentions of young consumers.

2.3 Live Shopping Commerce

Live streamers showing various parts of the products and enticing the audience to buy them is often the characteristic activity of live streaming for product sales. Since it fosters attitudes, trust, and active user behaviors in terms of communication and transactions, interactive communication is a crucial component of the live streaming commerce environment. According to Chao and Chien (2021), attractiveness is correlated with competence as evidenced by their knowledge, experience, and talents, but trustworthiness is viewed as a result of honesty and integrity.

describes trustworthiness as the belief and confidence held by the message sender, enabling others to see the sender as dependable (in Gusnia, 2022). The message carrier's expertise is their knowledge of the products being marketed. Aspects of attraction include physical appeal, adoration, and resemblance. While resemblance refers to how much the celebrity is thought to share traits with the audience, such as age, gender, and ethnicity, admiration refers to the praise or honor given to someone for their accomplishments or celebrity intelligence. The physical attraction of the famous person supporting the goods is what makes them attractive. Previous studies have shown that live broadcasting has an impact on consumers' impulsive purchasing decisions. Consequently, the following hypothesis is:

H2: Live Shopping Broadcast has a positive influence on the impulse buying intentions of young consumers.

2.4 Sales Promotion

Sales promotions consist of a variety of temporary incentives that encourage individuals to purchase products rapidly. Prior research has divided sales promotions into two categories: value-added promotions (such as premiums and lucky drawings) and value-increasing promotions, such as price reductions and coupons (Gilbert and Jackaria, 2002). (Kotler, 2012) The purpose of sales promotion is to encourage consumers to purchase multiple products or services within a limited time frame by employing various motivating techniques. Its purpose is to arouse consumers' desires and encourage immediate purchases of a specific brand's product (Akram, 2017). According to Amanah and Pelawi (Amanah and Pelawi, 2015), sales promotions have a substantial positive effect on impulsive purchases. The more compelling a sales campaign, the greater the number of consumers attracted to purchase. It is an instance of purchasing on impulse. The vendor should have a solid grasp of how to use deft marketing to encourage impulse buys. Providing a transient price reduction or discount is one of them. It has a significant impact on the frequency of impulsive purchases. Amara and Kchaou (2014) concur that sales marketing significantly influences impulse purchases in a positive manner. This suggests that the attractiveness and quality of the sales promotion program increase consumers' impulse purchases.

H3: Sales Promotion has a positive influence on the impulse buying intention of young consumers

2.5 Impulsive Buying Behavior

According to Rook and Fisher (1995), impulsive buying behavior involves customers' thoughts and feelings. In three dimensions, Piron (1991) describes impulsive buying as an unplanned purchase with emotional arousal and quick decision-making. Piron separates experiencing and non-experiential impulsive buying. Impulsive purchases are unplanned, emotive, and unconsidered. External environmental signals influence customers' impression of product usefulness and hedonism and their inclination to make impulsive purchases, according to Parboteeah et al. (2009). Impulsive buyers buy without thinking about their wants to satisfy a buying obligation (Verhagen and van Dolen, 2011). These temptations may cause customers to seek immediate gratification or develop a stronger emotional connection to the desired product, resulting in an intense, sudden, persistent, and hard-to-resist urge to buy (Park et al., 2012; Rook, 1987; Spiteri Cornish, 2020; Verhagen and van Dolen, 2011). Impulse purchases are made when a buyer is emotionally aroused and lacks self-control. Online retail's low entrance hurdles, simple purchase, and low societal impact have aided this phenomenon. Online retailers use more reasonable product promotion strategies, which increases impulse purchases. (Ek Styvén, 2017; L. Wu, 2020)

Several factors can entice a buyer. Ozer and Gultekin (2015) found that a customer's mood or store layout can influence their impulse purchase. Other research (Beatty and Ferrell, 1998) suggests that sudden time or money availability may encourage impulse purchases. Customer demand is hard to resist. Impulsive purchases typically lead to regret and remorse (Gardner and Rook, 1998). When they can't control a purchase, customers feel uncomfortable and scared, according to studies.

H4: Impulsive Buying has a positive influence on Consumer Anxiety

2.6 Consumer Anxiety

Anxiety causes conscious fear and tension (Spielberger, 1966). This feeling communicates a potential threat, causing gloomy judgments of future events and negative psychological responses (Butler and Mathews, 1983; Raghunathan and Pham, 1999; Shepperd et al., 2005). A-trait refers to a more stable predisposition or proneness to state anxiety, while A-state is a momentary or emotional state reaction accompanied by physiological arousal (Kantor et al., 2001). The difference between the two is the individual's tendency to behave in a particular way. Many consumer-behavior studies focus on situational anxiety, a short-lived emotional state triggered by threatening situations that manifests as fear, depression, stress, worry, and tension (Spielberger, 1966; Brooks and Schweitzer, 2011). Consumer anxiety may be produced by an event or by earlier stimuli unrelated to the decision (Raghunathan and Pham, 1999; Lerner and Keltner, 2001). Twienge (2000). Technology anxiety (Meuter et al., 2003), stereotype threat anxiety (Lee et al., 2011), travel anxiety (Reisinger and Mavondo, 2005), death anxiety (Rahimah et al., 2018), math anxiety (Suri et al., 2013), status anxiety (Chiou and Pan, 2008), and employee anxiety (Xue et al., 2021) can all make consumers anxious when making daily decisions. These even include specific consumption situations, such as an inexperienced homebuyer who is worried about losing the chance to buy a desirable home may feel anxious when making an offer or how to invest savings, or when choosing a medical treatment (Gino et al., 2012). High uncertainty and low control characterize anxiety (Smith and Ellsworth, 1985; Raghunathan and Pham, 1999). Thus, rather than trait anxiety, we are more concerned about consumers' decision-making under state anxiety, as anxious consumers tend to make decisions that promote security and self-control, such as compulsive buying. (Raghunathan et al., 2006). Consumer emotional aspects influence advertising persuasion (LauGesk and Meyers-Levy, 2009), drive and persuade consumers, and shape attitudes and behaviors (Andrade and Cohen, 2007). The research doesn't reveal concerned customers' advertising preferences. Thus, this article examines how anxious customers make judgments and react to assertive marketing.

Panic disorder generalized anxiety disorder, obsessive-compulsive disorder, social anxiety disorder, and particular phobias are anxiety disorders that cause internal distress and restlessness. These illnesses frequently coexist with major depressive disorder (Bittner et al., 2004). Anxiety and compulsive purchase have been linked in numerous research (Faber & Christenson, 1996; Davenport et al., 2012; Williams & Grisham, 2012; Otero-López & Villardefrancos, 2013).

Compulsive buying serves as a quick solution for individuals experiencing anxiety, as it offers a way to alleviate tension through impulsive actions (Robert & Jones, 2001). Trait anxiety, a long-standing characteristic of individuals, has been found to have a positive association with compulsive buying behavior (Weinstein et al., 2015). It is believed that consumers at shopping malls are more likely to engage in compulsive buying because they seek an escape from their anxiety. Escaping anxiety is the primary motivation for compulsive buyers, and they utilize shopping and purchasing to achieve relief. Shopping malls create an environment that facilitates this escape from anxiety. Recent research has further confirmed the positive relationship between anxiety and compulsive buying behavior (He et al., 2018). Thus, the researcher can assume that.

H5: Consumer Anxiety has a positive influence on Compulsive Buying Behavior

2.7 Consumer Escapism

Escapism is mostly studied in psychology as a sub-dimension of coping, or the way in which consumers deal with negative thoughts and feelings. Consumers who engage in avoidant coping "attempt to take their mind off the problem and distract themselves by doing other things" (p. 46), as defined by Duhachek (2005), who developed a measurement scale for various coping strategies. However, avoidant coping is viewed as ineffectual since it does not address the root cause of the stressor, only the symptoms (Duhachek, 2005; Rohde et al., 1990). For the most part, escapism is viewed as a form of "cognitive distraction" in psychological literature. While participating in the behavior, compulsive consumers can briefly escape their bad emotions by immersing themselves in fantasies or vivid visions of personal success and societal acceptability. By imagining different outcomes to stressful events, consumers may find some respite.

However, when people "escape" uncomfortable situations to reduce anxiety, they risk losing touch with reality and developing compulsions as a coping mechanism. Because they are avoiding their worries, persons who "Escape" may also be in a better mood or frame of mind, making them more prone to ritualize their escape through obsessive spending. According to a meta-analysis (Cardi et al., 2015), people who are in a good mood are more likely to have a problem with compulsive eating. While the eventual effect of such dreams or escapism may lead to more compulsive purchase, Darrat et al. (2016) expect that impulsive consumers may seek momentary comfort from worries by imagining. Compulsive shoppers seem to have a propensity for elaborate daydreaming (O'Guinn and Faber, 1989).

H6: Consumer Anxiety has a positive Influence to Consumer Escapism

H7: Consumer Escapism has a positive to Compulsive Buying Behavior

2.8 Compulsive Buying Behavior

Intense preoccupation with shopping and an inability to regulate impulse purchases are hallmarks of compulsive buying, as described by Edwards (1993). Buying things spontaneously or lingering in a store for far longer than planned are examples of this disruptive and erratic behavior. Mowen (2002) defines compulsive buying as an "irrational preoccupation with acquisition, utilization, or experience" that leads to recurrent risky behavior. In order to alleviate negative emotions like sadness, depression, or anger, compulsive shoppers often resort to spending excessive amounts of money (O'Guinn and Faber, 1989). O'Guinn and Faber (1989) identified several characteristics of compulsive shoppers, including an intense craving for new purchases, a lack of self-control when faced with shopping urges, a propensity to make multiple purchases at once, and a preoccupation with appearances.

"Repetitive and seemingly purposeful" activities "performed according to certain rules or in a stereotypical fashion" (American Psychiatric Association, 2013, p. 234) are what most specialists agree describe compulsive behavior as. In the context of marketing, compulsive behavior is characterized as excessive, irrational, and innate tendencies in consumers' purchase behavior (O'Guinn and Faber, 1989). Furthermore, Faber and O'Guinn (1988) argue that customers' current want is linked to compulsive purchase, despite the fact that it is at odds with customers' genuine desire. Further, compulsive shopping behaviors can be either impulsive or obsessive (Ridgway et al., 2008). An impulse purchase is one made on the spur of the moment (Fenton-O'Creevy et al., 2018). The haste with which impulsive buyers make their purchases is another defining feature of this type of shopping behavior (Jones et al., 2003). An obsessive-compulsive shopper, as defined by Ridgway et al. (2008), is someone who has an incessant need to shop and who does it repeatedly to alleviate anxiety. There are a variety of causes for compulsive shopping (Flight et al., 2012; Watson et al., 1988) that should be considered. In contrast to compulsive purchasing, which is prompted by negative affect (such as discomfort, uneasiness, stressfulness, and fear), impulsive shopping is maintained by positive affect (such as happiness, enjoyment, and excitement). Obsessive-compulsive buying, as opposed to impulsive buying, is a constant activity, as stated by Solomon (2002). Both Verplanken et al. (2005) and Silvera et al. (2008) report that compulsive buying is a common source of customer dissatisfaction.

The term "online compulsive buying" (Manchiraju, Sadachar, & Ridgway, 2016) describes a person who feels an overwhelming need to shop online for a variety of products, even if they don't need them. This condition, sometimes known as "oniomania" or "shopaholism," is defined by an individual spending an excessive amount of time and effort shopping at the expense of other critical tasks (Andreassen, 2014). Wang, Xiao-qin, and Yin (2016) point out that even people who don't have obsessive purchasing habits when they go to stores in person may develop them when doing their shopping online. Although there are more steps involved in the online purchasing process than there are in traditional shopping (store contact, transaction, and execution), the internet

opens boundless possibilities for obsessive shoppers who prefer not to engage with real people. The ability to fantasize is crucial in the cycle of compulsive online shopping. Negative financial outcomes strained social relationships, and mental health difficulties like low self-esteem, excessive idealization, sadness, preoccupation, and anxiety have all been linked to compulsive internet shopping (Kukar-Kinney, Scheinbaum, & Schaeffers, 2016).

According to Andreassen et al.'s (1996) DSM-IV criteria (Manchiraju, Sadachar, & Ridgway, 2016), compulsive online shopping has seven basic features. Among these factors are: 1) Prominence, when the convenience of shopping online is highly valued; 2) Mood modification, in which online shopping is used as a coping method to manage negative emotions; 3) tolerance, demonstrating a rise in the frequency of online shopping with time; 4) withdrawal, characterized by negative emotions when cutting back on or ceasing online shopping. 5. Discord, or difficulties caused by online shopping; 6. Relapse, or the propensity to resume and normalize internet purchasing; 7. Resulting Problem, or any Adverse Effects Caused by Online Shopping.

Online compulsive shopping is influenced by both external and internal factors (Luo, Gu, Wang, & Zhou, 2018). The internet and online shopping environments are exogenous factors because of the ease of access they provide, the lack of restrictions based on physical location, and the variety of payment methods available. A lack of self-control can be disrupted by restricted availability and time pressure used as part of promotional methods on well-designed ecommerce websites, as well as using multimedia experiences and appealing product descriptions. Anxiety, despair, loneliness, and boredom are all internal problems that can be alleviated through retail therapy. Other factors that lead to compulsive internet shopping include materialistic values, low self-esteem, bad interpersonal relationships, strong psychological strain, and a lack of self-control.

2.9 Characteristic of Gen-Z

Generation Z, often called Baby Boomers or the iGeneration, is the first cohort to grow up in a world greatly shaped by the internet. They are known as "digital natives" and are comfortable with technology in their everyday lives. Generation Z interacts directly with businesses and falls within the birth years of 1994 to 2010, although there are variations in these dates depending on different sources. Some sources suggest a narrower range, such as 1997 to 2005 or 1995 to 2010. Compared to Generation X, Generation Z spends more than five hours online each day and has greater financial resources, making them the primary focus for online producers and retailers. Their upbringing in a society that values social media, online communication, and constant technological advancements significantly influences their behavior (Dabija et al., 2020).

According to Nielsen's 2018 research, there are notable features in Generation Z's online purchasing behavior. Social media serves as a platform for self-expression, sharing experiences, evaluating businesses and products, and exchanging information. Generation Z tends to avoid brands with poor ethical reputations. They have a strong inclination toward innovation and change, with 75% of research participants expressing an eagerness to try new things and discover new companies. Marketers face challenges in persuading Gen Z customers to make purchasing decisions and maintain loyalty due to their heightened awareness of the risks associated with purchases and their lack of brand loyalty (Alanko, 2018). Additionally, Generation Z typically avoids online advertisements and often uses ad-blocking software. They are more influenced by electronic word of mouth (eWOM), such as online reviews and recommendations from friends, family, and colleagues (Alanko, 2018). In summary, when making online purchases, Generation Z primarily relies on their personal preferences and the uniqueness of products rather than the brand name. They seek shopping experiences that offer convenience, speed, variety, and enjoyment (Westmark & Hondar, 2020). Brand value, transparency, and product authenticity also play a role in shaping Generation Z's online purchasing behavior (Munsch, 2021).

2.10 Conceptual Framework

The conceptual framework presented in Figure 2.1 represents a set of variables that are associated with compulsive buying behavior in the context of Social Commerce marketing. This framework is derived from a comprehensive literature review and has been adapted from the work of Gbandie and Ugbechie (2023) and Darrat et al., (2016). The researcher found this model to be relevant and appropriate for studying The Influences of Social Commerce Marketing on Consumer Compulsive Buying Behavior in relation to Social Commerce marketing. The research conducted by Gbandie and Ugbechie (2023) reveals that there is a correlation between marketing relationships and Impulsive Buying Behavior in Social Commerce. In a separate model, Darrat et al. (2016) explain that Impulsive Buying Behavior has an impact on Compulsive Buying Behavior. Thus, the researcher combines these two models to find out the influence of social commerce marketing on Compulsive Buying Behavior, specifically on Generation - Z. The conceptual framework for this study is outlined below.

By using these models in their study, the researcher gets a full picture of how social commerce affects Generation Z's need to buy things repeatedly. This way of looking at things gives us useful information about the specific mechanisms and factors that lead to compulsive buying in social commerce. In the end, the goal of the study is to come up with effective strategies and interventions to reduce the negative effects of Gen Z consumers' compulsive buying.

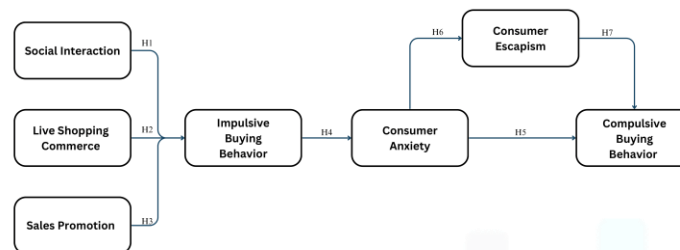


Figure 1. Conceptual Framework
(Adapted from Gbandi and Ugbechie, 2023 and Darrat et al., 2016)

H1: Social Interaction has a positive influence on the Impulse Buying Behavior.

H2: Live Shopping Broadcast has a positive influence on the Impulse Buying Behavior.

H3: Sales promotion has a positive influence on the Impulse Buying Behavior.

H4: Impulsive Buying has a positive influence on Consumer Anxiety.

H5: Consumer Anxiety has a positive influence on Compulsive Buying Behavior.

H6: Consumer Anxiety has a positive Influence on Consumer Escapism.

H7: Consumer Escapism has a positive to Compulsive Buying Behavior.

III. RESEARCH METHODOLOGY

3.1 Research Design

The researcher presents an outline of the method of research, it includes an exploration phase designed to examine the impact marketing stimuli on Social Commerce Marketing. Social Interaction (Online Review), Sales Promotion, and Live Shopping Commerce are all examples of such triggers with respect to in-store and online impulse purchases. During this stage, the researcher pinpoints problems that may arise from the subject matter. Next, the researcher performs a thorough literature analysis to evaluate existing studies and generate hypotheses that will direct our own. Quantitative questionnaires are used during the data collection process. The completed surveys are examined to determine trends and provide advice based on the results.

3.2 Research Design Approach

This study uses a quantitative analytic technique to collect numerical data that can subsequently be converted into statistical data in order to meet its research objectives. Quantitative data is a research method that uses mathematical reasoning to effectively examine events, claims Malhotra (2007). The quantitative data collected will be statistically analyzed, which will provide significant insights and inform the findings. To address the research topics and specific hypotheses, Malhotra et al. (2016) proposed utilizing a quantitative approach. Furthermore, the availability of sufficient data will allow for the investigation of relationships between various

metrics. The researcher can successfully address study topics and specific hypotheses by using a quantitative technique. This methodology enables the testing of variable relationships and the investigation of the impact of social commerce on compulsive buying behaviors in Generation Z. The researcher can determine the level of compulsive buying behavior and its relationship to other circumstances.

3.2.1 Quantitative Approach

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3.2.1.1 Survey Method

In this study, a representative group of the study population will fill out standard questionnaires, just like Malhotra et al. (2016) suggested. By asking questions about the "what," "where," "who," and "how many" parts of the study question, useful information will be gathered through this method. By using a quantitative approach, the survey method makes it possible to look at all of the factors in the study in a systematic way. This makes it possible to find and analyze any possible relationships or correlations between them (Saunders et al., 2009). For the survey method to work, questionnaires will be used to make sure that true and reliable information is collected. These questionnaires will be carefully made to make sure they collect all the information needed to meet the study goals. By using standardized questionnaires, answers will be consistent and easy to compare. This will make it easier to collect and analyze data in a useful way.

3.2.1.1 Data Collection

- **Population and Sample**
The targeted population in this research is Generation-Z (15-24 years) that uses Social Commerce Platforms (SCPs), such as Instagram, Facebook, Pinterest and TikTok (Jacob, 2023). According to Sharma and Crossler (2014) and Huang and Benyoucef (2013), Social Commerce is a contemporary business strategy that has evolved through the merging of social networking and e-commerce. It utilizes popular social media and networking platforms to facilitate the sale of products and influence consumer purchasing patterns. The area of research only focuses on the Social Commerce users, specifically Gen-Z. Moreover, based on the Snapcart (2018), 50 % of the online shopping platforms users are millennials and Gen-Z. Whereas Gen-Z (15-24 years) is the more dominant generation in online shopping platforms. Additionally, 200 samples are needed for the marketing study (Malhotra, 2010). This research can be categorized as a marketing analysis because it centers on consumer behavior. It specifically investigates the compulsive buying behavior of Gen Z and explores the impact of social commerce on their purchasing decisions. By focusing on understanding consumer behavior, this research aligns with the realm of marketing analysis, which involves studying consumers' attitudes, motivations, and actions.
- **Sampling Technique**

This research employed a sampling technique called Judgmental Sampling, which is a type of non-probability sampling method. In this approach, the researcher relies on their own expertise and professional judgment to select the sample units. For this particular study, the researcher chose to target individuals who have experience using social Commerce platforms (SCPs), with a specific focus on Generation Z (aged 15-24) residing in the Jakarta and Bandung regions of Indonesia. The decision to use Judgmental Sampling was made based on the researcher's confidence in their knowledge of the subject matter and the specific characteristics of the target population. By handpicking participants who have experience with SCPs, the researcher aimed to gather insights from individuals who are well-versed in this particular area, which is crucial for the study's objectives. The selection of Jakarta and Bandung as

the study's geographical areas was based on certain data. Jakarta, being the province with the highest internet penetration rate at 85.55% (Rizaty, 2022), offered a substantial potential pool of participants who likely have access to SCPs. On the other hand, Bandung was chosen for its reputation of having a significant number of users who are familiar with social commerce platforms, as supported by data from Yusra (2022).

By focusing on these two regions, the study aimed to ensure that the selected participants would represent a diverse range of experiences and insights related to social Commerce platforms, particularly among Generation Z. The inclusion of this age group was likely due to their high digital savviness and their substantial presence in the online market, making them a relevant target demographic for studying social commerce trends and behaviors. It is essential to acknowledge that Judgmental Sampling has its limitations, as it can introduce bias and may not be as statistically representative as probability sampling methods. However, in cases where the goal is to gain in-depth insights from specific expertise or experiences, it can be a useful approach. The researcher's expertise and careful selection of participants from these specific regions provide valuable insights into the usage patterns and preferences of Generation Z in relation to social Commerce platforms in the context of Jakarta and Bandung.

3.2 Questionnaire Design

The present study employs a questionnaire specifically designed and administered to potential participants with the aim of examining the impact of Social Commerce Marketing on the Compulsive Buying Behavior of Generation-Z in Indonesia. In conducting this research, the researcher has adapted an existing questionnaire design, drawing from prior studies conducted by various authors, as indicated in the reference section. The questionnaire incorporates a Likert scale to measure participant responses and gather pertinent data for analysis.

3.4 Data Analysis

This research will conduct few of analysis, such as Pilot test Pilot studies, commonly known as feasibility studies, refer to scaled-down versions of full-scale research endeavors, as well as the specific pre-testing of research instruments such as questionnaires or interview schedules. These preliminary investigations allow researchers to refine their methodology, enhance data collection techniques, and rectify any identified issues before embarking on the main study (Teijlingen and Hundle, 2002). The data acquired for this study will be analyzed using the Partial Least Square (PLS) method. The PLS technique will be used to process the obtained data. Tobias (1995) claims that PLS is a technique for building prediction models by considering several variables that are highly linked. PLS was characterized by Chin (1998) as a method that may validate ideas, reveal potential relationships between 24 variables, and make suggestions for further study. The PLS-SEM technique was chosen due to its adaptability in assessing the exploratory model of the investigation. The researcher also analyzing the reliability and validity test, to check the consistency of results obtained when replicating advancements and to determine the appropriateness of the respondents' results. Malhotra (2007) states that to ensure convergent validity and discriminant validity in research studies, the Average Variance Extracted (AVE) should have a value equal to or higher than 0.5. The collinearity test, Coefficient of Determination (R²) and Stone-Geisser test to evaluate the predictive accuracy and effectiveness of a model. The researcher also tests the Effect Size and the Mediation Test.

IV.RESULT / FINDING

The researcher conducted data analysis on a total of 226 respondents using PLSSSEM. The respondents were selected from the Generation-Z population (aged 15-24 years) in Indonesia, specifically those who use or have access to social commerce platforms in the Jakarta and Bandung areas. The data collection process took place from June 5th to June 14th, 2023.

To obtain eligible respondents, the researcher employed various methods, including social media outreach and personal connections. Only individuals who met the researcher's criteria, such as being between the ages of 15 and 24, actively using social commerce platforms, and residing in Jakarta or Bandung, were included in the study. The behavioral result of most of the respondents also shows the respondents are valid criteria for this research. Most of respondent are Impulsive Buyers and it shows that individuals have experienced or are currently experiencing consumer anxiety and consumer escapism, which can lead to Compulsive Buying Behavior.

Moreover, a total of 226 eligible respondents were successfully collected, surpassing the minimum requirement of 200 respondents needed to ensure the validity of the findings.

4.1 Descriptive Analysis

Based on the descriptive analysis provided in the table above, most indicators for each variable exhibit comparable mean scores, indicating a general agreement among the respondents. It is important to note that the Likert scale ranging from 1 to 5 was employed in this survey-based research, with 1 representing "strongly disagree" and 5 representing "strongly agree." Notably, the sales promotion variable displays the highest mean score of 4.288 for the indicator "I think positively about the reduction in price of social commerce." This finding suggests that a decrease in prices within the social commerce domain holds significant value for consumers. Reduced costs incurred by businesses operating on social media platforms can be passed on to customers in the form of discounts, promotions, or competitive pricing. Consequently, consumers can enjoy more favorable deals, enhanced affordability, and increased purchasing power.

This positive perception of advantageous pricing conditions may contribute to impulsive buying behavior, as the allure of acquiring goods or services at lower costs, particularly during limited time offers, can trigger spontaneous and unplanned purchases. Furthermore, the constant influx of new products, coupled with attractive discounts and time-sensitive promotions, can create a sense of urgency and a fear of missing out, stimulating compulsive buying tendencies. In contrast, the lowest mean scores are observed in the indicators of Customer Anxiety, specifically "I feel afraid for no reason at all" and "I feel like I'm falling apart and going to pieces." These expressions reflect the respondents' current and past experiences. Nonetheless, when considering the overall dataset, all indicators across the variables exhibit mean scores approximating 4, even surpassing the threshold of 4. Despite two indicators within the Customer Anxiety variable displaying scores of 3.996 and 3.982, respectively, these values were rounded to 4. This collective evidence demonstrates a strong agreement among respondents regarding the presented statements.

4.2 PLS-SEM Analysis Result

The primary objective was to construct the model based on the conceptual framework and investigate the relationships among the variables. The independent variables considered in this research encompassed social commerce marketing aspects, namely Social Interaction, Live Shopping Commerce, and Sales Promotion. Mediating variables included Impulsive Buying Behavior, Customer Anxiety, and Customer Escapism, while the dependent variable of interest was Compulsive Buying Behavior.

To conduct the analysis, several crucial steps were undertaken. These include validity and the reliability of the indicators, evaluating internal consistency reliability, examining convergent validity, and determining discriminant validity. These phases were necessary to ensure the quality and validity of the data. The computational output of this model, comprising seven variables interconnected by seven pathways, is illustrated in the figure below. It can be inferred that all variables satisfy the minimum criteria for outer loading scores in the reliability test, thereby indicating their reliability. As a result, these variables can be deemed trustworthy and can be further utilized in the subsequent stages of the study. The Convergent Validity is assessed through the examination of the Average Variance Extracted (AVE) for each variable. Purwanto and Sargini (2021) An AVE value of 0.50 or above is deemed acceptable, indicating that the construct explains a minimum of 50 percent of the variance among the instruments. The findings indicate that all variables meet the criteria for convergent validity, as their AVE ratings.

Lastly, to address potential concerns of collinearity and determine the need for variable elimination, combination, or the development of a higher-level latent variable, a collinearity test was conducted (Wong, 2013). The Variance Inflation Factor (VIF) was employed to assess collinearity, where a VIF score below 5 indicates the absence of collinearity concerns. A lower VIF value closer to 3 is considered more desirable (Hair et al., 2017). Additionally, if indicators have insignificant weights and lack importance, they should be omitted. Based on the findings, all VIF values are found to be below the threshold of 5. This observation signifies that all indicators satisfy the desired criteria, indicating the absence of any multicollinearity concerns among the independent variables.

4.3 Structural Path Significance

After the preceding steps were concluded, the researcher employed Smarts to perform bootstrapping on the model, aiming to evaluate the relationships between each hypothesis (Wong, 2013). The researcher relied on the results

obtained from bootstrapping to determine whether to accept or reject a hypothesis. Bootstrapping was utilized to assess the proposed hypotheses and served as both the inner and outer model for testing significance. This methodology yielded T-values for evaluating the significance of the structural paths, which represent the hypotheses. The study model encompassed 7 variables and 26 indicators, including Compulsive Buying Behavior (3 indicators), Impulsive Buying Behavior (5 indicators), Social Interaction (4 indicators), Live Shopping Commerce (5 indicators), Sales Promotion (3 indicators), Consumer Anxiety (3 indicators), and Consumer Escapism (3 indicators). To meet the standard for path significance, T-values must surpass the threshold of 1.96. All the structural paths exhibit T-Statistic values greater than 1.96, signifying their statistical significance. Therefore, it can be concluded that all the paths are deemed significant based on this criterion. The researcher also calculated the GoF (Goodness-of-Fit) to check whether the model is valid or not. The result shown that goodness of fit score of 0.38 was attained. It is noteworthy that a goodness of fit value equal to or greater than 0.1 signifies the model's ability to effectively capture and describe the actual data under investigation. With interpretations such this result indicating large GoF.

4.4 Hypothesis Test

The presented table utilizes PLS computation to analyze the results of hypothesis testing and assess the significance of the T-values obtained from the path coefficients in the inner model. The outcomes of the hypothesis testing are displayed in the table.

Table 1. The outcomes of the hypothesis testing

	T statistics (O/STDEV)	P values	Result
Consumer Anxiety -> Compulsive Buying Behavior	8,892	0,000	Accepted
Impulsive Buying Behavior -> Compulsive Buying Behavior	6,213	0,000	Accepted
Impulsive Buying Behavior -> Consumer Anxiety	6,300	0,000	Accepted
Live Shopping Commerce -> Consumer Anxiety	5,545	0,000	Accepted
Live Shopping Commerce -> Compulsive Buying Behavior	4,643	0,000	Accepted
Live Shopping Commerce -> Consumer Escapism	4,615	0,000	Accepted
Social Interaction -> Consumer Anxiety	5,346	0,000	Accepted
Social Interaction -> Compulsive Buying Behavior	4,506	0,000	Accepted

Social Interaction -> Consumer Escapism	4,679	0,000	Accepted
Sales Promotion -> Consumer Anxiety	4,207	0,000	Accepted
Sales Promotion -> Compulsive Buying Behavior	3,773	0,000	Accepted
Sales Promotion -> Consumer Escapism	3,709	0,000	Accepted

The Table above shows that all the path between variables is accepted, which means that the T value for each of the hypothesis are greater than 1.96 at a 5% significance level. In conclusion, are hypothesis are accepted.

4.8 Effect Size (f^2)

Assessing the effect size is an important consideration for researchers to bolster the credibility of this study. It enables the researcher to ascertain the existence or absence of relationships between variables and quantify the overall magnitude of these relationships. Effect sizes are typically classified as small, medium, or large, with values of 0.02, 0.15, and 0.35 respectively representing these categories. The detailed presentation of the F Square Effect Size, which provides significant information regarding the intensity of the relationships, can be found in the provided table.

V. DISCUSSION

Based on the primary data collected, several key points can be emphasized to offer guidance for Gen-Z in avoiding Compulsive Buying Behavior. Social Commerce marketing indirectly has a positive influence Compulsive Buying Behavior. The high level of agreement among respondents regarding indicators related to impulsive buying behavior, consumer anxiety, consumer escapism, and compulsive buying behavior lends support to the interconnectedness of these factors among Gen-Z users of social commerce. This finding contributes to the existing research literature on this subject. Gen-Z consumers need to be mindful of the indirect impact of social commerce marketing on compulsive buying behavior. The study's results indicate the potential for Social Commerce Marketing to have an indirect positive influence on Compulsive Buying Behavior. This influence operates through various processes, such as the positive influence of Social Commerce Marketing on Impulsive Buying Behavior, implying that Social Commerce Marketing engages consumers' impulsive tendencies. In turn, Impulsive Buying Behavior contributes to increased Consumer Anxiety, leading to escapism and Compulsive Buying Behavior. Understanding the persuasive techniques employed by marketers can assist individuals in making informed purchasing decisions.

Given the positive influence of social commerce marketing on impulsive buying behavior, it is crucial for Gen-Z consumers to be mindful of their own impulsive inclinations. Cultivating self-awareness and considering the motivations behind purchasing decisions can help avoid unnecessary or regrettable purchases. Additionally, Gen-Z consumers should acknowledge the positive link between impulsive buying behavior and consumer anxiety. This recognition can prompt individuals to reflect on the emotional and psychological factors driving impulsive purchases and explore healthier coping mechanisms for managing anxiety. Developing effective strategies to manage anxiety, such as practicing self-care, seeking support from friends and family, or engaging in activities that provide healthy escapism (e.g., hobbies, exercise, mindfulness), is of paramount importance.

Additionally, Based on the analysis findings regarding the impact of social commerce marketing on compulsive buying behavior. Given that most respondents engage in online shopping approximately four times per month, Gen-Z consumers should develop mindful shopping habits. This includes setting budgets, creating shopping lists, and taking time to evaluate the necessity and value of each purchase. It is important to avoid excessive or

impulsive spending that may lead to financial strain. As most respondents have an income less than Rp500.000 and are students/university students, it is crucial for Gen-Z consumers to focus.

On financial awareness and planning. Developing financial literacy skills, such as budgeting, saving, and understanding personal finance, can help ensure responsible spending habits and longterm financial stability. In accordance with previous statements, there are several suggestions that can be adopted by Gen-Z consumers to prevent engaging in compulsive buying behavior. Firstly, it is crucial for individuals to establish a budget and adhere to it when making online purchases, ensuring that they do not exceed their predetermined spending limits. Additionally, recognizing triggers that often lead to impulsive buying behavior, such as specific advertisements or social media platforms, can assist individuals in consciously avoiding or minimizing their exposure to such triggers. Practicing delayed gratification is another effective strategy. By taking the time to reflect on a purchase and delaying it for a day or two, individuals can diminish the impulsive nature of their buying decisions and carefully assess whether the purchase is truly necessary and worthwhile. Creating a shopping list prior to browsing or shopping online, and adhering strictly to the list, can also aid individuals in staying focused on their genuine needs and avoiding the addition of unnecessary items to their cart.

The previous study that conducted by Darrat et al., (2017), about How is the Relationship between Impulsive Buying Behavior and Compulsive Buying Behavior also study that conducted by Gbandi and Ugbechie (2023), stated that Impulsive Buying Behavior can influence Compulsive Buying Behavior through consumer anxiety but not consumer escapism. Compares to this research, both of the variables, consumer anxiety and consumer escapism can influence Compulsive Buying Behavior. Based on Darrat et al., (2017) future research suggestions, the researcher suggested that to use another indicators for consumer escapism, in result this research used another indicators for consumer escapism and it is significantly has positive influence with Compulsive Buying Behavior. All of the Social Commerce Marketing that Gbandi and Ugbechie (2023) test significantly influenced the Compulsive Buying Behavior, compare to this research, it is also has same results, which are the Social Interaction, Live Shopping Commerce, and Sales Promotion has positive influence on Compulsive Buying Behavior.

VI. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The researcher has analyzed the relationship between Social Commerce Marketing and Compulsive Buying Behavior. The findings reveal that all hypotheses were supported, indicating a significant and positive impact between the variables. Social Commerce Marketing, Social Interaction, Live Shopping Commerce, and Sales Promotion were found to significantly influence Impulsive Buying Behavior. In each case, social interaction, live shopping commerce, and sales promotion employ psychological and behavioral factors to stimulate impulsive purchasing tendencies. By employing PLS-SEM analysis, it can be inferred that Social Commerce Marketing has the potential to influence Impulsive Buying Behavior. The study revealed that Impulsive Buying Behavior has a significant impact on Consumer Anxiety. The analysis indicates that although impulsive buying may provide immediate satisfaction, it can ultimately lead to consumer anxiety due to negative emotional and financial consequences associated with impulsive behavior. Consumer Anxiety was found to positively influence both Consumer Escapism and Compulsive Buying Behavior. The analysis conducted by the researcher suggests that individuals experiencing high levels of anxiety may seek ways to escape or cope with their distressing emotions. In conclusion, the research demonstrates that Social Commerce Marketing indirectly influences Compulsive Buying Behavior. This influence begins with Social Commerce Marketing positively affecting Impulsive Buying Behavior, which in turn positively affects Consumer Anxiety. Furthermore, Consumer Anxiety was found to have positive influences on both Consumer Escapism and Compulsive Buying Behavior.

This study also addresses the issue of Compulsive Buying Behavior among Generation Z individuals in the context of Social Commerce. The research findings indicate that Social Commerce Marketing indirectly influences Compulsive Buying Behavior through its positive impact on Impulsive Buying Behavior. This impulsive buying tendency, in turn, contributes to increased Consumer Anxiety, leading to escapism and ultimately Compulsive Buying Behavior. To prevent falling into the trap of Compulsive Buying Behavior, it is crucial for Gen-Z consumers to be aware of their own impulsive inclinations and consider the underlying motivations driving their purchasing decisions. They should recognize the connection between impulsive buying and consumer anxiety, prompting them to explore healthier coping mechanisms and strategies for managing anxiety, such as practicing self-care, seeking support from friends and family, and engaging in activities that provide healthy escapism. Given

that most Gen-Z respondents engage in online shopping approximately four times per month, it becomes important for them to develop mindful shopping habits. This involves setting budgets, creating shopping lists, and carefully evaluating the necessity and value of each purchase to avoid excessive or impulsive spending that can lead to financial strain. Additionally, it is essential for Gen-Z consumers, especially those with limited income and students/university students, to focus on financial awareness and planning by developing financial literacy skills, including budgeting, saving, and understanding personal finance. Several practical suggestions can be adopted by Gen-Z consumers to prevent engaging in compulsive buying behavior. These include establishing and adhering to a budget when making online purchases, consciously avoiding or minimizing exposure to triggers that lead to impulsive buying (such as specific advertisements or social media platforms), practicing delayed gratification by taking time to reflect on purchases before making them, and creating shopping lists to stay focused on genuine needs and avoid unnecessary purchases. Furthermore, limiting the impact of social media is crucial, as it often presents tempting products and promotions that encourage impulsive buying. Gen-Z consumers are advised to restrict their social media usage and unfollow or mute accounts that frequently promote such behavior. Seeking support and accountability from trusted individuals can also be beneficial in maintaining shopping goals and intentions. Practicing mindfulness and being aware of one's emotions and thoughts related to shopping is essential, ensuring that shopping is not used as a coping mechanism for stress, boredom, or negative emotions. Exploring healthier alternatives like engaging in hobbies, exercising, or spending quality time with loved ones is encouraged.

Additionally, gaining knowledge about marketing tactics and techniques used to influence consumer behavior can enhance awareness and empower Gen-Z consumers to make more informed choices. By implementing these recommendations, Gen-Z individuals can cultivate healthier and more mindful shopping habits, reducing the likelihood of falling into compulsive buying behavior and making more deliberate and intentional purchasing decisions.

5.2 Future Research

To further investigate the impact of social commerce marketing on compulsive buying behavior among Generation-Z, there are several potential research directions that can be pursued. One avenue is conducting longitudinal studies to observe the long-term effects of social commerce marketing on buying behavior. By tracking individuals' purchasing patterns and exposure to social commerce marketing over an extended period, researchers can gain insights into how these factors evolve and mutually influence each other. Another potential research area involves comparing the influence of social commerce marketing on compulsive buying behavior across different demographic groups within Generation-Z. This could involve examining variations in buying behavior among different age groups, socioeconomic backgrounds, or cultural contexts. By identifying potential moderating factors, researchers can develop a more comprehensive understanding of how social commerce marketing affects compulsive buying behavior within distinct segments of the Generation-Z population. Furthermore, future research can delve into exploring mediating and moderating variables that may influence the relationship between social commerce marketing and compulsive buying behavior. For instance, investigating the role of self-esteem, materialism, or peer influence as potential mediators or moderators in this relationship can provide deeper insights. Understanding these underlying mechanisms can enhance our comprehension of the complex dynamics between social commerce marketing and compulsive buying behavior among Generation-Z. In conclusion, future research on the influence of social commerce marketing on compulsive buying behavior among Generation-Z can be advanced through longitudinal studies, comparisons across demographic groups, and exploration of mediating and moderating variables. These research avenues will contribute to a more nuanced understanding of the interplay between social commerce marketing and compulsive buying behavior, ultimately enabling the development of effective strategies for promoting healthier consumer behaviors among Gen-Z.

5.3 Implications for The Organization

The findings of this research will be particularly relevant for organizations and marketers targeting Gen-Z consumers. The insights can help organizations develop more effective marketing strategies on social commerce platforms, ensuring that their promotions are engaging, appealing, and aligned with the needs and preferences of Gen-Z individuals, while also promoting responsible consumption. Additionally, the research outcomes can inform the development of educational campaigns or interventions aimed at raising awareness about compulsive buying behavior among Gen-Z consumers and providing them with tools and resources to make informed purchasing decisions. While consumer addictions can bring short-term profitability to organizations, these behaviors are often inconsistent and challenging to maintain. By providing viable substitutes and targeted

approaches to address shopping addiction, research has the potential to enhance the well-being of compulsive buyers and their families, thus improving their overall quality of life. In conclusion, this research will contribute to the body of knowledge on the intersection of social commerce and compulsive buying behavior among Gen-Z consumers and provide actionable recommendations for organizations to engage with this demographic effectively.

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Stock Valuation in Pharmaceutical Sub-Sector Companies Using Discounted Cash Flow and Relative Valuation Methods in 2022

Fista Monica Deswanti¹, Dwi Fitrizal Salim²

^{1,2}Master of Management, Telkom University, Bandung, Indonesia

Abstract

The objective of this research is to compute the intrinsic value or fair value of stocks belonging to firms in the pharmaceutical sub-sector that are listed on the IDX. The data employed in this research consist of historical data and financial statements of the firms from 2017 to 2021. These data are projected for the next five years, specifically from 2022 to 2026. The methodologies utilized for determining the fair value of these stocks consisted of the Discounted Cash Flow (DCF) method, specifically employing the Free Cash Flow to Firm (FCFF) approach, and the Relative Valuation method, utilizing the Price to Earnings Ratio (PER) and Price to Book Value (PBV) approaches. The research findings fulfilled from the implementation of DCF-FCFF method indicated that MERK was determined to be overvalued in both the pessimistic and moderate scenarios, while being undervalued in optimistic scenario. On the contrary, SIDO was identified as overvalued in all scenarios, while TSPC was consistently found to be undervalued across all scenario. In the scenario of RV method using PER approach, the outcomes indicate that both MERK and SIDO are consistently undervalued in all scenarios. In contrast, TSPC was found to be undervalued in pessimistic and moderate scenarios, while being overvalued in optimistic scenario. Based on PBV approach, the outcomes suggest that MERK was undervalued in pessimistic scenario, but overvalued in both moderate and optimistic scenario. SIDO was determined to be overvalued in all scenarios, while TSPC was identified as undervalued in pessimistic and moderate scenarios and overvalued in optimistic scenario.

Keywords: Discounted Cash Flow; Relative Valuation; Pharmaceutical sub-sector; Valuation.

I. INTRODUCTION

In Indonesia, the pharmaceutical industry is one of the promising sectors that has experienced significant growth between 2015 and 2021. Notably, the number of medical device manufacturers has increased from 193 to 891 firms (<https://www.indonesia.go.id>). The pharmaceutical industry can continue to grow when some industries experience negative growth due to the pandemic. Unexpectedly, the Covid-19 outbreak has exposed the importance of medicines, health workers and medical devices. According to data from the Ministry of Industry of the Republic of Indonesia, the pharmaceutical industry exhibited a growth rate of 8.48% in 2020, representing a 9.39% increase compared to the previous year.

The Covid-19 pandemic has outcome in economic losses in numerous countries, including Indonesia. In 2020, Indonesia experienced an economic loss of IDR 1,356 trillion as a consequence of the pandemic, which is equivalent to 8.8% of the country's GDP. However, while many industries have suffered due to the impact of the pandemic, Indonesia's pharmaceutical industry has experienced the most considerable growth among other industries. However, the pharmaceutical industry still depends on raw materials from other countries, such as China and India. Almost 95% of Indonesia's pharmaceutical raw materials (BBO) are imported from other countries. 70% of these imports come from China, 20% from India and the rest from the US and EU. Indonesia belongs to category C1, a country that can duplicate pharmaceutical raw materials and finished drugs. However, Indonesia has not been able to reach category B, which is a country characterized by an innovative pharmaceutical industry by mass production of patented drugs and has not been able to enter category A, which is a country that can focus on research, development, and mass production of finished drugs. In response to the difficulties of the industrial sector, the government provides tax incentives and subsidies to encourage industrial growth, especially in the pharmaceutical industry.

In 2020, investment in the pharmaceutical industry decreased by 32.7% from IDR 1.8 trillion to IDR 3.7 trillion, from IDR 5.5 trillion in 2019. As a outcome, pharmaceuticals, chemical pharmaceutical products, and traditional medicine experienced the fourth most significant decline in investment value among all industry types at IDR 1.79 trillion in 2020. Over the past ten years, the JCI has shown quite dynamic movements. The lowest point reached by JCI by a return of -6.6% occurred on 9 March 2020. It was one of several impacts of the Covid-19 outbreak that began to take over Indonesia in early 2020, causing a lockdown policy implemented by the government. This phenomenon caused panic among people to invest in stocks. Then the stock price was recorded

to have strengthened again on 26 March 2022 by a return of 10.2%. Based on the daily return of JCI 2011 - 2021, the high volatility occurred in March 2020.

Judging from the return on the JCI and comparing it by each registered firm to be studied shows the highest volatility and unpredictability. The rate of return can jump sharply or even plunge freely at any time. The presence of both high and low return conditions signifies the existence of uncertainty in the future. Moreover, the return risk associated by each pharmaceutical sub-sector firm issuer is even more substantial compared to the return of the JCI. The high volatility will impact the risk that investors will bear. According to Bodie et al. (2018: 573), uncertain return conditions affect stock performance, causing the market stocks' value to be inconsistent by their fair or intrinsic value. Therefore, it is necessary to carry out a stock valuation research to understand the stock's accurate price before investing (Damodaran, 2012).

The aim of this research is to determine the intrinsic value of stocks belonging to pharmaceutical sub-sector companies listed on IDX using DCF method employing FCFF approach. Additionally, the Relative Valuation method will be employed, considering PER and PBV approaches. The calculations will be performed for pessimistic, moderate, and optimistic scenarios.

II. LITERATURE REVIEW

Valuation Theory

Valuation is a process carried out by an investor to estimate the fair price of a stock or what is commonly referred to as intrinsic value. Performance of a firm can be described through its intrinsic value. Valuation aims to determine a firm's estimated stock value and compare the intrinsic value by a stock's market price (Tandelilin, 2017).

Discounted Cash Flow (DCF)

The DCF method is employed for the estimation of the intrinsic value of an asset. This method functions based on the assumption that value of the asset corresponds to the present value of the cash flows it has the potential to generate. These cash flows are discounted using a specific rate that encompasses the associated risk (Damodaran, 2006, p. 35).

Relative Valuation

When calculating the firm's valuation value, many still focus on calculations using DCF, where the actual reality is that the widely used firm valuation value concept is Relative Valuation. RV method uses value of assets derived from comparative assets of firms in the same industry (Damodaran, 2006, p. 47).

Previous Research

In 2022, Soelistyo and Hendrawan carry out an assessment of the intrinsic value of stocks belonging to Indonesian automotive and component sub-sector companies, specifically ASII, INDS, GJTL, and SMSM. For their analysis, they utilized DCF-FCFF method along with RV method employing PER and PBV approaches. Based on the application of DCF method using FCFF approach, the findings reveal that ASII and INDS were consistently overvalued across all contexts. Conversely, GJTL consistently displayed undervaluation in all contexts. In contrast, SMSM exhibited overvaluation in pessimistic and moderate contexts, but undervaluation in optimistic context. The findings derived from the application of RV method using PER approach indicate that ASII, INDS, and GJTL exhibit undervaluation across all contexts. Conversely, SMSM consistently displays overvaluation in all contexts. The outcomes fulfilled from RV method using PBV approach align with the outcomes fulfilled from PER approach.

In 2022, Gibran and Hendrawan carry out a comprehensive examination of the fair value of stocks in oil and gas sub-sector firms, focusing on the year 2021. The research encompassed the application of both DCF and RV methods, incorporating three contexts: optimistic, medium, and pessimistic. Based on the implementation of DCF approach, it was observed that MEDC and ELSA demonstrated undervaluation in all contexts, whereas ESSA exhibited overvaluation across all contexts. Similarly, when employing the RV technique, MEDC, ESSA, and ELSA consistently displayed undervaluation in each context.

In 2021, Hendrawan, Lubis, and Permana carry out a study on stock valuation within the Indonesian pharmaceutical sub-sector, specifically focusing on firms registered on the IDX. The research incorporated the utilization of FCFF method, along with RV method employing PER and PBV approaches. The analysis encompassed three contexts: pessimistic, moderate, and optimistic. The selected firms for analysis were KAEF, KLBF, and INAF. According to FCFF method, the research findings indicate that the three selected sample firms, namely KAEF, KLBF, and INAF, consistently demonstrated undervaluation across all contexts. Conversely, the utilization of RV method employing PER approach revealed that the three firms were overvalued in all contexts. In contrast, the findings derived from RV method using PBV approach indicate that KLBF and INAF consistently exhibited overvaluation across all contexts. On the other hand, KAEF displayed undervaluation in pessimistic context but demonstrated overvaluation in both moderate and optimistic contexts.

III. RESEARCH METHODOLOGY

This research adopts a descriptive approach, specifically falling under the longitudinal or time series category, given the timing of data collection. The target population for this study comprised all publicly registered stocks of firms operating in the pharmaceutical sub-sector on the IDX. Purposive sampling was utilized to select the samples for analysis. The secondary data for this research was acquired from the following sources:

- The research collected secondary data from published and audited financial statements for period of 2017-2021. The financial report data was fulfilled from the IDX website (www.idx.co.id) as well as the official websites of the respective firms.
- Daily stock price movement data from January 2011 to December 2021 was fulfilled from www.yahoofinance.com.
- Information on Indonesia's macroeconomic factors, such as GDP growth rate, Bank Indonesia interest rate, and industry growth rate, can be found online or in other published sources.
- Composite Stock Price Index (JCI) data can be fulfilled from www.yahoofinance.com

This research utilizes two data analysis techniques: the DCF method with the FCFF approach, and the Relative Valuation method with PER and PBV approaches.

IV. RESULT / FINDING

Projection Model

The projection in this research encompasses three scenarios. Scenarios can be seen depending on environmental data and facts (Naexie and Hendrawan, 2018). Optimistic scenario is condition that will lead to the firm's highest growth rate, which can be seen from the gap between industry growth and company management targets (above the industry's average growth). When talking about business fundamental conditions, moderate scenario is condition that are most likely to occur (most likely conditions). Meanwhile, if the company's condition is in the worst condition, it is a pessimistic scenario. The details of each scenario are as follows:

Table 1. Determination of the growth of each scenario

Scenario	Growth	
	<i>Growth industry > Growth corporate</i>	<i>Growth industry < growth corporate</i>
Pessimistic	Moderate - (0.5*spread)	<i>Growth industry</i>
Moderate	Historical <i>growth of the firm</i>	Historical <i>growth of the firm</i>
Optimistic	<i>Growth industry</i>	Moderate + (0.5*spread)

Source: Dewi and Hendrawan (2022)

Based on the aforementioned Table 1, it is imperative to compute average growth for each firm as well as the historical industry growth. The industry's average growth can be derived by analyzing the revenue data of all firms in the pharmaceutical sector registered on the IDX. The subsequent information presents the outcomes of the analysis carry out on average industry growth of 11 firms registered on the IDX in period of 2017-2021:

Table 2. Revenue Growth of Pharmaceutical Sector BEI 2017-2021 (in a million IDR)

	2017	2018	2019	2020	2021
DVLA	1.575.647	1.699.657	1.813.020	1.829.699	1.900.893

INAF	1.631.317	1.592.980	1.359.175	1.715.588	2.901.987	
KAEF	6.127.479	8.459.247	9.400.535	10.006.173	12.857.627	
KLBF	20.182.120	21.074.306	22.633.476	23.112.655	26.261.195	
MERK	582.002	611.958	744.635	655.847	1.064.395	
PEHA	1.002.126	1.022.969	1.105.420	980.556	1.051.444	
PYFA	223.002	250.445	247.114	277.398	630.530	
SCPI	2.184.623	2.205.541	1.841.268	2.893.298	2.159.191	
SIDO	2.573.840	2.763.292	3.067.434	3.335.411	4.020.980	
SOHO	4.047.677	4.563.185	5.048.301	6.163.939	7.076.164	
TSPC	9.565.462	10.088.119	10.993.842	10.968.402	11.234.443	
					<i>average gr. industry</i>	
<i>growth</i>		9,33%	7,22%	6,33%	14,89%	9,44%

Source: Firm Financial Statements (processed)

Based on the data and formula above, the revenue growth assumptions for each scenario are as follows:

Table 3. Projected revenue growth

Firm	Pessimistic	Moderate	Optimistic
MERK	9,44%	19,30%	24,23%
SIDO	9,44%	11,91%	13,15%
TSPC	1,52%	4,16%	9,44%

Source: data that has been processed

FCFF projections will be carry out for the upcoming five-year period, spanning from 2022 to 2026, considering the three aforementioned scenario: pessimistic, moderate, and optimistic. The projections are also based on assumptions fulfilled from the historical analysis of each firm. WACC needs to be calculated as the discount rate in FCFF and will be used to perform the present value calculation. Then, the enterprise value (EV) is derived by summing the present value of FCFF and the terminal value. The long-term debt reduces the EV and contributes to the firm's cash, thereby establishing the equity value. The intrinsic value, PER, and PBV can be determined based on the equity value.

Projection of MERK

MERK projection outcomes by data in 2021 for WACC of 7.99%, industry growth of 9.44% and firm growth of 19.30% for the three scenarios are described in Table 4.

Table 4. MERK Projection Outcomes (in a million IDR)

Scenario	Variables	2022	2023	2024	2025	2026
Pessimistic	Present Value	15.250	18.024	21.302	25.176	222.838
	Terminal Value	210.381				
	Enterprise Value	290.133				
	-Debt	-				
	+Cash	196.343				
	Equity Value	486.476				
Moderate	Present Value	27.591	48.507	77.810	118.349	1.302.159
	Terminal Value	848.325				
	Enterprise Value	1.120.581				
	-Debt	-				
	+Cash	196.343				
	Equity Value	1.316.924				
Optimistic	Present Value	33.761	64.733	109.821	174.487	1.993.512
	Terminal Value	1.092.031				
	Enterprise Value	1.474.833				
	-Debt	-				
	+Cash	196.343				
	Equity Value	1.671.176				

Source: processed data

Table 4 shows that the *equity value* for the pessimistic scenario is IDR 486 billion, moderate scenario is IDR 1,120 billion, and the optimistic scenario is IDR 1,671 billion. The *equity value* can be derived into intrinsic value, PER and PBV. Therefore, the outcomes of the intrinsic value, PER and PBV for MERK are as follows:

Table 5. MERK valuation outcomes

Scenario	Intrinsic Value	PER	PBV
Pessimistic	1.086	3,69	0,71
Moderate	2.940	10,00	1,93
Optimistic	3.730	12,69	2,44

Source: processed data

Projection of SIDO

The projection outcomes for SIDO by data from 2021, considering a WACC of 4.06%, industry growth of 9.44%, and firm growth of 11.91% for the three scenarios, are described in Table 6.

Table 6. SIDO Projection Outcomes (in a million IDR)

Scenario	Variables	2022	2023	2024	2025	2026
Pessimistic	Present Value	1.021.210	1.163.003	1.324.484	1.508.386	15.485.384
	Terminal Value	12.557.786				
	Enterprise Value	17.574.869				
	-Debt	-				
	+Cash	1.082.219				
	Equity Value	18.657.088				
Moderate	Present Value	1.048.489	1.225.840	1.433.045	1.675.109	17.649.353
	Terminal Value	13.043.686				
	Enterprise Value	18.426.169				
	-Debt	-				
	+Cash	1.082.219				
	Equity Value	19.508.388				
Optimistic	Present Value	1.062.129	1.257.785	1.489.159	1.762.726	18.805.535
	Terminal Value	13.278.317				
	Enterprise Value	18.850.116				
	-Debt	-				
	+Cash	1.082.219				
	Equity Value	19.932.335				

Source: processed data

Table 6 above shows that the *equity value* for the pessimistic scenario is IDR 18,657 billion, moderate scenario is IDR 19,508 billion, and the optimistic scenario is IDR 19,932 billion. The *equity value* can be derived into intrinsic value, PER and PBV. Therefore, the outcomes of the intrinsic value, PER and PBV for SIDO are as follows:

Table 7. SIDO valuation outcomes

Scenario	Intrinsic Value	PER	PBV
Pessimistic	622	14,80	5,37
Moderate	650	15,47	5,62
Optimistic	664	15,81	5,74

Source: processed data

Projection of TSPC

The outcomes of TSPC projections by data in 2021 for WACC of 11.65%, industry growth of 9.44% and firm growth of 4.16% for the three scenarios are described in Table 8.

Table 8. TSPC Projection Outcomes (in a million rupiah)

Scenario	Variables	2022	2023	2024	2025	2026
Pessimistic	Present Value	703.294	797.148	903.526	1.024.101	7.359.628
	Terminal Value	5.002.890				
	Enterprise Value	8.430.960				
	-Debt	775.147				
	+Cash	2.687.634				
	Equity Value	10.343.447				
Moderate	Present Value	728.827	855.780	1.004.513	1.178.720	8.766.867
	Terminal Value	6.567.001				
	Enterprise Value	10.334.839				
	-Debt	775.147				
	+Cash	2.687.634				

Optimistic	Equity Value	12.247.327				
	Present Value	779.891	977.560	1.222.374	1.525.235	12.043.550
	Terminal Value	11.035.484				
	Enterprise Value	15.540.544				
	-Debt	775.147				
	+Cash	2.687.634				
	Equity Value	17.453.031				

Source: processed data

From Table 8 above, it can be seen that the *equity value* for the pessimistic scenario is IDR 10,343 billion, moderate scenario is IDR 12,247 billion, and the optimistic scenario is IDR 17,453 billion. The *equity value* can be derived into intrinsic value, PER and PBV. Therefore, the outcomes of the intrinsic value, PER and PBV for TSPC are as follows:

Table 9. TSPC valuation outcomes

Scenario	Intrinsic Value	PER	PBV
Pessimistic	2.294	11,78	1,50
Moderate	2.716	13,95	1,78
Optimistic	3.870	19,88	2,54

Source: processed data

V.DISCUSSION

PT Merck, Tbk (MEREK)

The analysis outcomes indicate that utilizing DCF-FCFF method, the intrinsic value of MERK is estimated to be Rp1,086 in pessimistic scenario, Rp2,940 in moderate scenario, and Rp3,730 in optimistic scenario. Consequently, it can be inferred that the stock price of MERK is deemed overvalued in both the pessimistic and moderate scenario, while it is considered undervalued in optimistic scenario. These outcomes were fulfilled by comparing the market price of MERK on January 2, 2022. In cases of overvaluation, it is recommended that investors sell their stocks, as the market price is considered to be higher than the actual value, allowing investors to realize a profit. Meanwhile, in cases of undervaluation, it is recommended that investors purchase these stocks because the market price is lower than the actual value, indicating that they are considered cheap. Investors are advised to buy these stocks by the expectation that MERK's stock price will increase.

Meanwhile, in RV method utilizing PER approach, PER value for MERK is 3.69 times in pessimistic scenario, 10.00 times in moderate scenario, and 12.69 times in optimistic scenario. PER values for the three scenarios are still in the pharmaceutical industry range of -33.97 to 60.39. In all scenario, MERK is undervalued. It is because PER value fulfilled is lower than the industry average. Thus, investors can be recommended to buy MERK stocks because they are considered lower compared to PER value of the pharmaceutical industry. Subsequently, applying RV method by PBV approach, PBV value is 0.71 times in pessimistic scenario, 1.93 times in moderate conditions, and 2.44 times in optimal conditions. Comparing these values to the industry's average PBV value, MERK is considered undervalued in pessimistic scenario, as the firm's PBV value falls below the industry average. Conversely, in moderate and optimistic scenario, MERK is deemed overvalued, as its PBV value surpasses the industry average. In overvalued conditions, investors should consider selling their stocks due to the possibility of the market stock price exceeding the firm's book value. On the other hand, in undervalued conditions, it is advisable for investors to buy the stocks as PBV value is lower than average industry PBV value.

This condition is the same as previous research from Dea Natalia et. Al. (2019) states that the results of MERK valuation are undervalued using the DDM, PER and PBV methods, likewise with the other six companies studied, such as GGRM, HMSP, ICBP, INDP, KLBF and UNVR. This condition is also the same as research conducted by Setiawan and Sumirat (2021) on the Kalbe Farma or KLBF company with overvalued results in the FCFF, P/E and EV/EBITDA methods. This research has similar calculations but differences in the subjects studied. Similar research was also conducted by Ariyanto and Damayanti (2023) on the Medikaloka Hermina (HEAL) company using the DCF method with the result that the HEAL share price was overvalued. However, this study has differences in the companies and sub-sectors studied. Sariguna et al. (2022) also conducted valuation research on the IRRA company in 2021. The results obtained are based on the DCF-FCFF method is undervalued. This research has similar calculation methods but differs for the subject and sub-sector. Then, in other previous research conducted by Afriani and Asma (2019) on manufacturing companies. The results obtained in the FCFF method are one company in an overvalued state and 11 companies in an undervalued state. Meanwhile, based on the RV-

PER method, the results are four overvalued companies, one fair-valued company and seven undervalued companies. This research has similar calculation methods but differs in the sub-sector of the company under study.

PT Industri Jamu dan Farmasi Sido Muncul, Tbk (SIDO)

The analysis outcomes reveal that, according to DCF-FCFF method, the intrinsic value of SIDO is IDR 622 in pessimistic scenario, IDR 650 in moderate scenario, and IDR 664 in optimistic scenario. Hence, the stock price of SIDO is deemed to be overvalued across all three scenarios, namely pessimistic, moderate, and optimistic. These outcomes were fulfilled by comparing the market price of SIDO on January 2, 2022, which was IDR 865. Therefore, it is recommended that investors sell their stocks since the market price is valued higher than the actual value, allowing investors to realize a profit.

In RV method using PER approach, PER value for SIDO is 14.80 times in pessimistic scenario, 15.47 times in moderate scenario, and 15.81 times in optimistic scenario. These PER values for the three scenarios fall within the range observed in the pharmaceutical industry, which ranges from -33.97 to 60.39. When compared to average industry PER value, it can be observed that SIDO is undervalued in all scenarios, as PER value fulfilled is lower than the industry average PER value. Therefore, investors can be recommended to buy SIDO stocks, considering that they are priced lower than PER value observed in the pharmaceutical industry. Meanwhile, when employing RV method using PBV approach, PBV value for SIDO is 5.37 times in pessimistic scenario, 5.62 times in moderate conditions, and 5.74 times in optimal conditions. In comparison to the industry's average PBV value, SIDO is considered overvalued in all three scenarios since its PBV value exceeds the industry's PBV average. Therefore, it is advisable for investors to sell their stocks, as the market's stock price may be higher than the firm's book value.

This condition is the same as previous research conducted by Nurlia et al. (2022), which states that based on the RV-PER method, the results show that SIDO, DVLA and PEHA are undervalued, while KBLF and MERK are undervalued. In addition, it also uses the DDM method, but it is not used in this study. Similar research was also conducted by Jumran and Hendrawan (2021), who examined valuations in the State-Owned Bank sub-sector. The results are BBNI, BBRI, BMRI and BBTN in undervalued conditions. However, this study differs in the company sub-sectors studied and the methods used. These conditions are also the same as research conducted by Angelica (2022). The research object is Adaro Energy Indonesia, and after the calculation, the company is declared undervalued. Budiarti (2022) conducted similar research on 19 companies and obtained the results that BBTN, BMRI, PGAS, PWON and TLKM were undervalued, then ACES, BBNI, BBRI, CTRA, INTP, JSMR, KLBF, PTBA, SCMA, UNTR, UNVR and WIKA were in overvalued conditions, while ADHI and BJTM were in fair value conditions. Then, there is also research conducted by Siregar (2021) which analyses the valuation of pulp & paper industry companies using the DCF-FCFF, RV-PER and RV-PBV methods. Based on these calculations, it shows that INKP and TKIM are undervalued, while FASW is overvalued. This research has similar calculations, but there are differences in the subsectors studied.

PT Tempo Scan Pasific, Tbk (TSPC)

Based on the analysis outcomes, it is evident that in DCF-FCFF method, the intrinsic value of TSPC is IDR 2,294 in pessimistic scenario, IDR 2,716 in moderate scenario, and IDR 3,870 in optimistic scenario. Therefore, the stock price of TSPC is considered undervalued in all three scenarios: pessimistic, moderate, and optimistic. These outcomes were fulfilled after comparing them by the market price of TSPC on January 2, 2022, which was IDR 1,500. Consequently, it is recommended that investors purchase these stocks as the market price is lower than the actual value, indicating an undervalued condition. In other words, the stocks are considered cheap. Investors are advised to buy these stocks by the expectation that TSPC's stock price will increase.

In RV method using PER approach, PER value for TSPC is 11.78 times in pessimistic scenario, 13.95 times in moderate scenario, and 19.88 times in optimistic scenario. These PER values for the three scenarios remain within the range observed in the pharmaceutical industry, which spans from -33.97 to 60.39. In pessimistic and moderate scenario, SIDO is considered undervalued as the fulfilled PER value is lower than the industry average, while in optimistic scenario, it experiences overvaluation. Ultimately, the firm's PER value exceeds the industry average PER value. Therefore, investors can be advised to consider purchasing TSPC stocks in pessimistic and moderate scenario. Conversely, in optimistic scenario, it is recommended for investors to sell TSPC stocks. Subsequently, when utilizing RV method with PBV approach, PBV value for TSPC is 1.50 times in pessimistic scenario, 1.78 times in moderate conditions, and 2.54 times in optimal conditions. Comparing these values to the industry's average PBV value, TSPC is regarded as undervalued in both the pessimistic and moderate scenario. This phenomenon occurs because PBV value of the firm is lower than average PBV value of the industry in pessimistic and moderate scenario. In contrast, in optimistic scenario, TSPC is considered overvalued as its PBV value surpasses the industry's average PBV value. In situations of overvaluation, it is advisable for investors to contemplate selling their stocks as the market stock price may exceed the firm's book value. Conversely, in

undervalued conditions, it is recommended to consider purchasing the stocks as PBV value is lower than average PBV value of the industry.

This condition is also similar to research conducted by Silalahi et al. (2022) on several telecommunication, pharmaceutical and finance subsector companies. By using the PER method, the results show that five companies (TLKM, KAEF, KLBF, PYFA and SIDO) are undervalued, and six companies (ISAT, DVLA, MERK, TSPC, BRIS and BTPS) are overvalued. Then using the PBV method, the results show that five companies (DVLA, KAEF, KLBF, MERK and SIDO) are undervalued, while six companies (ISAT, TLKM, PYFA, BRIS, BTPS and TSPC) are in an overvalued condition. This study has similar calculation methods and companies studied. Similar research was conducted by Alfadilla and Dalam (2023) using the DCF-FCFF method and RV PER and PBV approaches. The research shows that four companies (MTLA, JRPT, DMAS and CTRA) are undervalued, while two companies (MKPI and PPRO) are overvalued. This study uses the same calculation method but differs in the sample companies used. Similar conditions also occur in research conducted by Hendrawan et al. (2020), which shows that CTRA is undervalued while LPKR and BSDE are overvalued. Then, research conducted by Hartono and Noveria (2023) also stated that based on the DCF method, it was found that PWON was overvalued. Although they have similar calculations, these studies have differences in the subjects studied. Ganefi et al. (2023) also conducted research related to valuation. Of the 12 companies studied, the results showed ten undervalued companies and two overvalued.

VI. CONCLUSION AND RECOMMENDATION

Based on the analysis and discussion of the outcomes, the following conclusions can be drawn: 1) The research findings fulfilled from the application of DCF-FCFF method indicate that MERK was observed to be overvalued in pessimistic and moderate scenarios, while being undervalued in optimistic scenario. Based on the analysis carry out, it can be concluded that SIDO is consistently overvalued in all scenarios, whereas TSPC is consistently undervalued in all scenarios; 2) Based on the application of RV method using PER approach, the findings indicate that MERK and SIDO are consistently undervalued in all scenarios. Conversely, TSPC is undervalued in pessimistic and moderate scenarios but overvalued in optimistic scenario, 3) Based on the analysis carry out using PBV approach, the outcomes indicate that MERK is undervalued in pessimistic scenario, while being overvalued in both moderate and optimistic scenarios, and SIDO is determined to be overvalued in all scenarios, while TSPC is found to be undervalued in pessimistic and moderate scenarios and overvalued in optimistic scenario. 4) The results of this study indicate that there are differences in the results between the methods used, namely DCF-FCFF, RV-PBV and RV-PER. So that the recommendations given to investors can consider the goals of each investor in investing. For investors who aim to obtain dividends, it is recommended to choose companies whose growth is relatively stable, so they can follow the advice from the results of research using the DCF-FCFF and RV-PBV methods. Whereas for investors who have the goal of seeking profits through capital gains or through fluctuating movements of stock prices, it is advisable to follow the advice from research results using the RV-PER method. The recommendations that researchers give to investors are based on the results of a moderate scenario, because a moderate scenario is the most likely condition to occur based on the company's fundamental conditions (Naexie and Hendrawan, 2018).

The recommendations given by researchers are as follows, 1) the stock price in the market does not necessarily reflect performance of the firm, so investors should pay attention to the firm's intrinsic value as comparative information before making investment decisions; 2) for firms it is recommended to improve firm performance in order to increase firm revenue growth consistently so that it is always in a favorable condition, and reduce firm expenses by reducing unnecessary operating costs, and 3) if future researchers want to examine valuation in the pharmaceutical sub-sector, it is recommended that future researchers extend the historical data, for example to 10 years in order to obtain more accurate research outcomes.

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Identifying The Emotion of People in Food Tourism Experience

Gabriel Benjamin Sembiring¹, Mustika Sufiati Purwanegara²

^{1,2} SBM ITB, Bandung Institute of Technology, Bandung, Indonesia

Abstract

Food tourism is one of the key elements for attracting tourists to come and visit a place in any country. In recent years, this element has been growing very fast and popular due to the high technology and social media development where people can easily search for food in certain places. People from around the world can also express and share their food tourism experiences through social media like YouTube. Food tourism experience can trigger positive and negative emotions, which will have an impact on post culinary experience, which affects revisit intention and behavior after traveling. Therefore, this research aims to find kinds of positive and negative emotions that are captured by the tourist's video on YouTube. Tourist emotions arise from several factors such as food taste, service failure, and place inconvenience. This study uses a qualitative approach and thematic analysis to validate the identifying emotions of people which also provides rich and detailed information about the phenomenon. Aside from that, this study discovered that "unsatisfied" and "uncomfortable" have the highest percentage for the negative emotions that appeared from 32 YouTube videos. There are still some negative emotions that have been identified in the food tourism industry that need to be considered and repaired by the authorities to make the tourist feel more pleased and want to come back and visit any food tourism places. Several implications such as infrastructure improvement, authenticity and quality assurance, tourist awareness campaigns, and social welfare programs can be the best way to improve this kind of negative emotions. By that, it could give a good reputation and testimony for other people who wanted to experience food tourism in Indonesia.

Keywords: Emotion; Food Emotion; Tourism; Food Tourism

I. INTRODUCTION

After the post pandemic situation, tourism activities have grown significantly because people want to have some refreshment after staying at home for a long time. Food tourism is one of the key elements for attracting tourists to come and visit a place in any country. In recent years, this element has been growing very fast and popular due to the high technology and social media development where people can easily search for food in certain places. According to the World Tourism Organization (UNWTO), food tourism is one of the fastest-growing segments of the tourism industry, with a growth rate of 25% in recent years (UNWTO, 2012). Food tourism is also considered a form of sustainable tourism, as it promotes local food production and consumption, and supports small-scale food producers and artisans. The high percentage of social media users have a big impact on increasing the awareness of local food by generating content in the place where tourists from other places could attract and visit it. According to studies, food tourism is an important part of the travel and tourism industry and has a significant impact on local economies. Food tourists, for example, tend to spend more money eating local food than other types of tourists, and the food and beverage industry is frequently one of the largest employers in many tourist destinations.

Studies on emotion and tourists' food consumption have examined the affective component as one part of the three-component model of attitude (Kim et al., 2011; Pestek & Cinjarevic, 2014; Seo & Yun, 2015), confirmed the importance of the affective component on tourists' intentions and behaviors, and related it to tourists' perceived destination food image (Choe & Kim, 2018; Pestek & Cinjarevic, 2014; Seo et al., 2017), and their personality traits, such as neophilia (Baah et al., 2019). This affective component is represented by affective terms, such as satisfaction (Kim et al., 2011; Suhartanto et al., 2018). Satisfaction is one of the important factors that tourists consider and to express their thoughts about the food they eat.

Nield et al., (2000) and Quan and Wang (2004) say that tourists are likely to eat and drink both familiar and strange foods and drinks while traveling, making food experiences at a place almost impossible to avoid. (Harrington et al., 2012) says that tourists can have bad food experiences that might make them not want to visit certain places. That experience strongly influences a tourist's overall journey in traveling to some places. There are some incidents that could make tourists not satisfied with the cuisine. Harrington et al. (2012) states that there are three categories of negative incidents, related to food (taste and quality), physical environment (decor/atmosphere) and service quality. Similarly, Chung and Hoffman (1998) also state that poor service delivery and facility failures (e.g., cleanliness problems and bad odors) were the most unforgettable service failures in restaurants, but food-related problems were less likely to be remembered by customers. Furthermore, Harrington et al. (2012), through empirical evidence, identified a list of top negative restaurant attributes: quality of service, speed of service, quality of food/drink, and friendliness of staff.

Therefore, this research was conducted because there is a lack of research in emotion, especially positive and negative expression that are taken from the social media that have been shared by the tourist's in experiencing food from certain places. This research aims to identify what kinds of positive and negative emotion that appear in YouTube video, factors that influence tourist negative emotions on food tourism, and the effects that appear from the negative emotion that have been experienced by tourist in YouTube video. It is hoped that this research could provide some insightful information and recommendations for the food tourism industry in years to come.

II. LITERATURE REVIEW

2.1 Emotions

The definition of emotion entails a multifaceted response of individuals to their environment, which involves an evaluation of self-relevant interactions that lead to various states, such as excitement, attention direction, facial expressions, action tendencies, and behavior. This reaction is a complex and dynamic process influenced by various factors. The definition's originators, Lazarus (1991) and Levine (2010), provide a comprehensive understanding of the complexity of emotional responses. Emotions are characterized by their brief duration, high intensity, and close association with a particular object or event that prompts a responsive behavior. This definition, as provided by Cohen and Areni (1991), highlights the dynamic nature of emotions and their significant impact on human behavior. Emotions constitute a fundamental component of the human experience, and their influence on individuals' well-being, both psychologically and physically, is significant. Pressman, Gallagher, and Lopez (2013) and Richman et al. (2005) underscore the critical role of emotions in promoting optimal health and functioning in individuals. The tourism sector focuses on creating memorable experiences, with happiness and joy being among the most sought-after emotions by travelers. Filep and Deery (2010), Hosany and Prayag (2013), and McCabe and Johnson (2013) highlight the crucial role of positive emotional experiences in shaping tourists' perceptions and satisfaction with their travel experiences. Although tourism typically fosters positive emotions, it can also trigger negative emotional responses such as sadness or anger, particularly for individuals engaging in dark tourism activities. Biran, Poria, and Oren (2011) highlight the potential for tourism to evoke such negative emotions. This highlights the crucial role of emotions in shaping individual eating habits and underscores the need to examine the complex interplay between emotions and food choices for a better understanding of human dietary behavior.

2.2 Service Failure

Service failure refers to a situation where the service provided to a customer falls short of their expectations, as described by several scholars including Hoffman and Bateson (1997), Migacz et al. (2018), and Smith et al. (1999). When customers are dissatisfied with a service that does not meet their expectations, it can lead to negative emotions (Kim and Baker, 2019) or even switching to a different service provider (Lu et al., 2020). However, due to the diverse nature of experiential products in the hospitality and tourism industry, such as their heterogeneity, inseparability, intangibility, and perishability, customers' expectations are not uniform (Kim and So, 2022). There are two types of service failure that have been recognized by researchers, namely process failure and outcome failure (Smith et al., 1999). Process failure stems from inadequate service delivery, such as impolite staff or unreasonably slow service, according to Li et al. (2020). Li et al. (2016) explain that outcome failure is

characterized by a firm's failure to provide necessary products or services, such as overbooking, not honoring reservations, or having out-of-stock items. Such failures are common in the hospitality and tourism industry and can range from tangible to intangible along a continuum (Chen and Tussyadiah, 2021).

2.3 Satisfaction and Revisit Intention

Tourist satisfaction can be understood as the outcome of a cognitive or emotional response by tourists to a particular experience (Bigne et al., 2001). It refers to the evaluation and emotions experienced by tourists after experiencing a specific tourism product or service (Ranjanthran and Mohammed, 2010). Baker and Crompton (2000) have identified that satisfaction is influenced by various gap factors, including both internal factors such as tourists' attitudes, behaviors, and needs, and external factors such as weather conditions and social interactions. Thus, satisfaction can be defined as the assessment of a consumer's experience after using a particular product or service (Ranjanthran and Mohammed, 2010). Additionally, Chen and Tsai (2007) have defined overall satisfaction as the degree of pleasure that tourists experience based on how well the tour fulfills their expectations, desires, and needs. Revisit intention refers to the intention of a tourist to visit a particular destination again in the future, and it is considered as a strong indicator of destination loyalty (Acharya et al., 2022). The concept of repeat tourism, emphasizing the importance of tourists who visit a destination repeatedly rather than only first-time visitors, is widely recognized as a key factor for the growth and sustainability of tourism destinations (Meleddu et al., 2015; Van Dyk et al., 2019). Consequently, revisit intention is a common metric used to evaluate a tourist's behavioral intention to revisit a destination, which is closely associated with the notion of repeat tourism.

2.4 Negative Word of Mouth

The impact of word-of-mouth communication (WOM) on consumer purchase decisions is widely recognized, as it is perceived to provide valuable and trustworthy information to consumers, as indicated by previous research (Lai, 2020; Whelan & Dawar, 2014). The widespread adoption and growing reliance on social media and electronic devices have led to a heightened necessity for a more comprehensive comprehension of consumers' word-of-mouth (WOM) behaviors, as emphasized by recent scholarship (Azemi, Ozuem, & Howell, 2020). The efficient and rapid transmission of negative information to consumers through the influential communication channel of negative word-of-mouth (N-WOM) has significant implications (Seo and Jang, 2021). Consequently, scholars in the fields of marketing and hospitality have given significant attention to N-WOM due to its destructive impact on consumer purchasing decisions and complaint behaviors, as revealed by the research of (Joe and Choi, 2019; Jones et al., 2002). Previous research has established that negative word-of-mouth (N-WOM) plays a crucial role in shaping consumers' perceptions of products and their subsequent intentions to purchase. Furthermore, the effect of N-WOM is magnified when it is conveyed through digital platforms, as indicated by studies conducted by (Cheng et al., 2006; Eisingerich et al., 2015). Negative word-of-mouth (N-WOM) is widely recognized as a more suitable measure of consumer dissatisfaction than actual complaint behaviors. Many dissatisfied consumers opt not to convey their grievances to the organization, yet they do share their negative experiences with their acquaintances. Therefore, solely focusing on consumers' complaint behaviors may not accurately represent their level of dissatisfaction (Seo and Jang, 2021).

III. RESEARCH METHODOLOGY

Research Design Flowchart

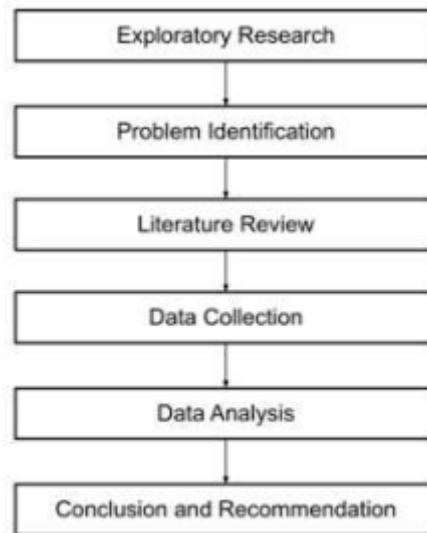


Figure 1 Research Design Flowchart

Figure 1 describes the process of the research of Identifying Emotions of People in Food Tourism Experience which consists of 6 steps. The first step is exploratory research, which involves gathering information and knowledge by watching YouTube videos of tourists' experience in eating different kinds of food in Indonesia and identifying the problems that this research aims to solve. The second step is problem identification which is to identify the emotions that often appear in food tourism experiences and its causes. The third step is literature review, which is to obtain a clearer understanding of the research problem and provide explanations and data to support the research. The literature review was conducted using a variety of sources, including journals, articles on websites, publications, and videos. The fourth step is data collection which was done by looking at videos of negative food tourism experiences that have been experienced by tourists that came to Indonesia on YouTube. The fifth step is to analyze data by using thematic analysis and interpretation that has been classified into 2 which is positive and negative emotions. There are 16 emotions that can be identified in the analysis including 8 positive emotions and 8 negative emotions. The last step is to determine the conclusion of the research and generate recommendations for further research in the future.

3.2 Qualitative Data Collection Method

3.2.1 Method

Qualitative research is a systematic and subjective way to describe or understand and make sense of life experiences. This methodology is used for a variety of purposes, including gaining an overall understanding of a phenomenon or situation; studying the depth, richness, and complexity of phenomena; inductively developing emergent or data-driven theories; and understanding human experiences, processes, or group culture and how they are experienced by those who shape them (Hito and Garcia, 2021). This data and information gathered from YouTube will be analyzed using NVIVO. NVIVO is a software program used to analyze qualitative and mixed methods research data. This program can be used to analyze video, journal data, survey, audio, image, and unstructured text. By providing the tools that can categorize, sort, and arrange data it helps to organize, analyze, and visualize the mixed media and unstructured data, and it allows people to see the themes and patterns.

3.2.2 Population and Sample

The population of this research is videos of negative reviews or tourist's experiences in trying Indonesian food that are published on YouTube. The sample of the video consists of people telling a real time unpleasant experience on their food tourism journey that captured their negative emotions on the video. The key terms that

are used to identify the relevant videos are “worst food tourism experience in Indonesia”, “worst culinary experience in Indonesia”, “worst food review experience”, “bad food review journey in Indonesia”, “unpleasant food experience in Indonesia”. Thus, the exact search terms included different combinations of the keywords. The reason for choosing keywords that use English compared to Indonesian is because the data to be taken is videos by people from foreign countries outside Indonesia, so if the researcher is trying to use Indonesian, the videos that come out are irrelevant or follow the desired data.

By using YouTube video, tourists can provide information about their perception and experience after having an unpleasant food tourism experience including which aspect that has the most concern on food tourism in general, tourist’s real emotions before, during, or after tasting the food, and some other findings that can provide insights to this research. The data collection process begins with the search for videos relevant to the previously mentioned keywords. Of the total of 35 videos watched, 30 are the primary data source because they meet the qualifications, while the rest are irrelevant and won’t be used as data for this study. The video data to be collected is a travel vlog video that was published on YouTube from tourists outside Indonesia that includes tourist travel and captures the tourist’s emotional reaction (in real-time) when confronted with some incidents. The video will show tourists dealing with some incidents such as the uncomfortable place and the emotions that arise because of these incidents. From there, it will be seen what factors that influence or trigger tourist’s emotions to emerge on that food tourism experience.

3.3 Qualitative Data Analysis

3.3.1 Thematic Analysis

According to Braun and Clarke (2006), thematic analysis is a qualitative way of organizing and describing the available data by identifying underlying themes. This method is used to organize and describe the data. This study chose thematic analysis because it provides rich and detailed information about the phenomenon. Various data sources, such as academic literature and journals, interviews, focus groups, social media, and so on, can also be used. The first step is to read and comprehend the transcripts to understand the data as a whole. In thematic analysis, there are two steps that must be taken. The first step is to generate initial codes, in which labels for data features are identified and provided. The second step is to generate themes, in which previously established themes are grouped into larger, more general themes based on patterns found within the codes (Braun & Clarke, 2012).

IV.RESULT / FINDING

4.1 Data Profile

According to the data, the video was uploaded to YouTube between 2017 and 2023. Consists of tourists or people from various countries, including Australia, Canada, United States and Europe continent includes Germany, Italy, United Kingdom, Scotland, and Netherlands. The tourists that took the video were aged between 20-40 years old with the status of single, dating/couple, and married. From the total of 30 videos that are collected, it consists of tourist’s stories about their positive and negative experiences while traveling to Indonesia and trying some Indonesian food from various cities. For instance, a video showed tourist’s negative emotions by receiving bad treatment from people around the area that makes them feel annoyed and frustrated because of that experience.

4.2 Descriptive Statistics

Table 1 shows the total data of emotions that have been classified into 2 categories which are positive and negative emotions that were published on YouTube. The size of the dataset was 30 videos with a total of 286 statements of participants collected and calculated. As can be seen for the positive emotions, fun and energetic has the lowest frequency of participants' statements with 1.06% which means that participants feel very **energetic** and **fun** in the moment after experiencing the food tourism in Indonesia. **Pleased** has the highest percentage with 39.68% and **happy** has the second highest percentage with 16.93% for the positive emotions, which means that the participants feel very pleased and happy with the taste of Indonesian food and also the environment around the area. Meanwhile for the negative emotions that has been appeared in the analysis, **annoyed** and **shocked** has the lowest frequency of participants statements with 4.12% which means that participants feel **annoyed** with people around the area and **shocked** with the environment of the place, the taste of the food, and also the process

of making the food itself. The highest percentage of participants' statements was **unsatisfied** with 26.80% followed by **uncomfortable** at the second highest percentage with 20.62%. This means that the participants feel unsatisfied with the taste and the price of Indonesian food and uncomfortable with the hectic and dangerous area for tasting the food. So from the analysis of 30 videos, the majority of participants' statements indicated that the positive emotions had more frequency (189) than the negative emotions (97).

Table 1 Emotion Categories Distribution

Categories	Frequency	Percentage	Cumulative Percentage (%)
Positive Emotions	189	66.08%	66.08%
Negative Emotions	97	33.92%	100%
Total	286	100%	-

4.3 Frequency Analysis

The emotions that emerged in the gathered YouTube video of the tourist's food tourism experience were rated in terms of their frequency. Table 2 and 3 shows the extraction and the classification of the emotions that have been divided into 2 categories with the different frequency that represent the tourists culinary experience in Indonesia that have been captured from YouTube videos. The frequency of each emotion in the total word frequency was calculated, and the emotions with the highest frequency in each category were ranked first.

Table 2 Positive Emotions

Rank	Emotions	Files	Frequency	Percentage (%)	Cumulative
1	Pleased	22	75	39.89%	39.89%
2	Happy	16	32	17.02%	56.61%
3	Excited	16	30	15.96%	72.87%
4	Interested	17	28	14.89%	87.77%
5	Comfortable	9	15	7.98%	95.74%
6	Pleasurable	4	4	2.13%	97.87%
7	Energetic	1	2	1.06%	98.94%
8	Fun	2	2	1.06%	100%
TOTAL			189	1	-

Table 3 Negative Emotions

Rank	Emotions	Files	Frequency	Percentage (%)	Cumulative
1	Unsatisfied	18	26	26.53%	26.53%
2	Uncomfortable	9	21	21.43%	47.96%
3	Worried	8	14	14.29%	62.24%
4	Disgusted	8	14	14.29%	76.53%
5	Frustrated	5	9	9.18%	85.71%
6	Scared	2	6	6.12%	91.84%
7	Annoyed	1	4	4.08%	95.92%
8	Shocked	3	4	4.08%	100%
TOTAL			189	1	-

4.4 Positive Emotions

In this section, it will be displayed several positive emotions that has been capture from YouTube about people trying Indonesian food experience.

Table 4 Captured of Positive Emotions

Issues	Statements	Details
  	<p>“It is so good oh really good it's not to order silly sausages um, but this is really good delicious flavorful peanutty sweet soft chicken really well.”</p>	<p>The statement indicated that the food tasted very delicious and better than expected. This statement indicated that the participant is very satisfied with their culinary experience</p>
 	<p>“Little man, he was just so cute, and he gave us an extra plate of food. What a nice guy.”</p>	<p>The statement indicated that the participant is very happy with the seller because of his kindness and friendliness to the tourists that came up to eat at the place. The seller gave the tourist an extra plate of food to try on, so it makes the tourists very happy with him.</p>
	<p>“Oh, look at this plate wonderful I see some colors I see a lot of fish crackers on top of it and the rice looks delicious the color is amazing.”</p> <p>“Oh, that smells good too here we go.”</p>	<p>The common issues that make tourists feel frustrated for buying the food. These issues could affect the food that are served is not in line with the tourist's expectation whether in the number of quantities, flavor preference, and price.</p>



“Interesting thing is it's like crispy on the outside but like quite chewy in the inside and it's completely hollow and it's a little bit sweet but not too sweet it's really good.”

Statement indicated that the participant is very interested with the texture and the taste of Bola Ubi.

4.5 Negative Emotions

In this section, it will be displayed several negative emotions that has been capture from YouTube about people trying Indonesian food experience.

Table 5 Captured of Negative Emotions

Issues	Statements	Details
	<p>“It's so weird. I don't like this one.”</p> <p>“Have another bite. You need a 2nd opinion.”</p>	<p>Statement indicated that tourist feel very unsatisfied with the taste of Indonesian fruit called Terong Belanda. From the statement of “weird” indicated that the taste of the fruit is something that they never tried before because it was to sour to be eaten.</p>
	<p>“No, I don't want another bite.”</p>	
		
	<p>“That's the face you get when you smell Durian.”</p>	<p>The statement indicated that tourists feel very worried when he smells and wanted to taste durian at street food in Bandung. He was worried because of the bad review that people saying that the smell and taste of Durian wasn't good just like feet.</p>
	<p>“This is durian literally the smelliest food you can get in Asia apparently it doesn't taste good, someone said it tastes like feet or smells like feet.”</p>	
		



“No, go away. I'm getting... I'm getting followed by these beggars, which I don't particularly like.”

Based on the face expression and the statements, tourists were very annoyed with the beggars start to follow him on the streets and always walk near him. The participant didn't want to give them any money and just keep going forward.



“Yeah, I don't give money to beggar's guys, you know. I only give money to people who are working, providing a service, etc. So, they can follow me as much as they want, they won't get anything out of me.”



“I don't know what to say, like I'm really shocked I know what's not... excuse me.... not very nice to see this in western culture, but this is the culture here.”

Based on the facial expression and the statements, the tourist was looking very shocked with the process of taking the snake blood to be consumed. One of the things was because back in his country, there is a culture where people should protect animals rather than kill and consume it directly.

“As you know when you travel around Asia, they eat all different things.”

“I know it's weird seeing it as a westerner, even to me I like wow It's a bit extreme I thought.”

4.6 Results

In this section, it will be displayed on a table to make it easier to read which will contain the amount of data per issue and the effect that occurs on tourists.

Table 6 Tourist's Issues and Effect

Issues	Count	Effect
Followed by Beggar	2	The common issues that make tourists feel annoyed and frustrated which will cause traumatized feelings that will make tourist not intend to return and visit the place
Culture Shock	2	The common issues that make tourists feel shocked and scared due to the tourist's lack of cultural knowledge about Indonesian food tourism
Language Barrier	6	The common issues that make tourists feel frustrated for buying the food. These issues could affect the food that are served is not in line with the tourist's expectation whether in the number of quantities, flavor preference, and price.
Food Taste	18	The common issues that make tourist feels unsatisfied and disgusted that can lead them to have negative word of mouth (reviews, and badmouthing) so they didn't recommend it to other people
Price Issues	3	The common issues that make tourist feels unsatisfied with the price of Indonesian food that can influence the post-customer experience such as negative word of mouth (online reviews, negative word of mouth, and so on)
Place Issues	10	The common issues that make tourists feel uncomfortable and worried about the surroundings. The most important factor that will influence the post-customer experience, which will be influenced by how tourists react (online reviews, negative word of mouth, and so on) also showed some uncomfortable gesture

V.DISCUSSION

Emotion plays an essential role in the tourist experience, especially food tourism. The result of the analysis above indicated that negative emotion affects many things, such as negative word of mouth, satisfaction, loyalty, and place attachments which will have an impact to tourist attraction. From the results of the dynamic analysis that consist of 2 categories which are positive and negative emotion, several issues cause these emotions to arise in tourist experience.

There are several issues that has been a worst experience for tourist in visiting Indonesia. The main points that impact the tourist experience are followed by beggars, culture shock, language barrier, food taste, price issue, and place issue. After analysis of what causes the problems, events like that will affect tourist emotions, and each subject must have a different effect. There are issues that related with safeties in experiencing Indonesian food tourism such as the tourist has been followed by beggar. This issue will affect tourist emotions, namely the emergence of feelings of annoyance and frustration. The second order is the issue that makes the tourist feel uncomfortable and worried in certain places when tasting food. This happened because of the crowded and hectic places, lots of vehicles passing by, and the unhealthy environment. There is also an issue that is related to the easiness way to communicate with the food vendors which is a language barrier. This issue effect the tourists and makes them feel frustrated because they could not communicate easily with the food vendors and there are some cases when the tourists didn't get what they want from the food vendors. These are followed with an issue that is related to tourists' satisfaction with the price and taste of the food. There are some cases where the tourist feels unsatisfied with the expensive price of Indonesian food and feel very disgusted with some Indonesian food because the taste wasn't in line with their expectation. These issues will affect them to share a bad review, negative word of mouth, and not recommend other people to eat at certain places. The last issues were related with tourist's

lack of knowledge about Indonesian culture that makes them feel shocked and scared by seeing a process of making some of Indonesian food for the first time.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Emotions are one of the essential things that need to be considered in the tourism industry, especially for food tourism. Indonesia is a country that has many tourist attractions that can attract tourists especially from the foreign country. Because emotions have an important role in the tourism industry, this research is meant to discover the cause or factors that influence the emotion that appear in the tourist experience. This identification could then be insight for the tourism industry in general especially for Indonesia. By this research, the researcher hopes that this analysis could give a better understanding of the impact of negative emotions on the tourist experience.

6.2 Recommendation for Food Tourism in Indonesia

1. Infrastructure Improvement:

Invest in infrastructure development to address place inconvenience and enhance accessibility to food destinations. Improve road conditions, cleanliness, and the hygiene of the food places options to make it more comfortable for tourists when visiting the place.

2. Authenticity and Quality Assurance:

Implement measures to ensure the authenticity and quality of food experiences. Encourage food vendors to maintain hygiene standards, use fresh ingredients, and adhere to food safety regulations. Establish certification programs or quality assurance initiatives that recognize vendors and restaurants offering exceptional culinary experiences, helping visitors identify reliable and trustworthy establishments.

3. Tourist Awareness Campaigns:

Launch awareness campaigns targeting tourists to promote responsible and respectful behavior. Educate visitors about local customs, cultural sensitivity, and responsible tourism practices to foster a positive environment. Encourage visitors to support local businesses, engage with local communities, and contribute to local social initiatives to make a positive impact during their culinary journeys.

4. Social Welfare Programs:

Address the issue of beggars through targeted social welfare programs that provide support and assistance to those in need. Collaborate with local authorities, non-profit organizations, and community leaders to develop initiatives aimed at helping beggars access social services, education, vocational training, and employment opportunities. By addressing the root causes of begging, we can contribute to the overall well-being of the community.

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Financial Feasibility Study of Environmental Laboratory Establishment at XYZ Foundation

Zahra Putri Endru Subekti¹ and Mandra Lazuardi Kitri²

^{1,2} School of Business and Management, Institut Teknologi Bandung, ITB, Bandung, Indonesia

Abstract

XYZ Foundation, a non-profit organization established in 2008 by a major heavy equipment distributor in Indonesia, aims to support corporate social responsibility programs. The foundation plans to establish an accredited environmental laboratory to address environmental concerns and generate additional revenue. The project costs IDR10 billion which is a significant amount for the foundation. Therefore, the foundation wants to discover the feasibility of this project and its risk. To assess the project's financial feasibility and risks, the study uses primary data from interviews, as well as secondary data such as historical and benchmark data. The data analysis involves six stages. Pro forma financial statements are constructed based on assumptions, and Free Cash Flow to the Firm is calculated. The Weighted Average Cost of Capital is also determined for the financial feasibility study. Capital budgeting techniques, including NPV, IRR, PI, payback period, and discounted payback period, are employed to evaluate the project's feasibility. If the project is deemed feasible, the next stage assesses its risks. Alternative strategies are proposed by modifying various variables if it is considered unfeasible. Since the actual strategy proposed by the foundation is unfeasible. Therefore, a proposed strategy is introduced, considering factors such as production capacity and the high Cost of Service Provided. However, the proposed strategy also presents considerable risk, as indicated by the Monte Carlo Simulation. Mitigation strategies are necessary to address the associated risks. Overall, the study concludes that the foundation should adopt the proposed strategy due to its feasibility and considers risk mitigation measures.

Keywords: Environmental Laboratory; Financial Feasibility Study; Capital Budgeting; Net Present Value; Risk Analysis

I. INTRODUCTION

The unsustainable patterns of consumption and production in the world have led to significant economic and societal challenges and pose a potential threat to life on Earth (United Nations, 2013). To address these issues, sustainable development is considered a crucial activity for global recovery (Sustainable Development Solutions Network, 2012). The environment plays a vital role in sustainable development, as it provides the necessary resources for human life (The Scientific World, 2019). However, misuse and overexploitation of natural resources have led to environmental damage, including pollution, water scarcity, and mismanagement of waste (Tripathi, 2007). Industrial waste, in particular, has become a significant concern in this era of industrialization (Başaran, 2012; Wilson et al., 2012)). The awareness of environmental issues grew after incidents like the Donora Smog Disaster in 1948, highlighting the dangers of industrial pollution (The Scientific World, 2019).

In Indonesia, the government has established regulations and instruments to address pollution and environmental damage, such as the requirement for environmental impact analysis and environmental quality standards (Pratama, 2015). In terms of environmental quality standards, Indonesia has defined limits or levels of pollutants allowed to coexist with living organisms and resources, which vary based on different ecoregions and environmental conditions (Indonesia Decree of the Minister of Manpower Number 187 of 2016). These standards serve as a basis for environmental protection and must be adopted in national development efforts.

XYZ Foundation, a non-profit organization established in 2008, aims to contribute to the founder's corporate social responsibility through various fields, including the environment. The foundation plans to establish an accredited environmental laboratory as a new business line and a new contribution. The project cost is estimated to be around IDR 10 billion and it considered as a huge amount for the foundation since the ratio of the total current assets and the total required fund of the project only have slight differences. To ensure the feasibility of this project, a financial feasibility study is necessary to mitigate potential financial losses and ensure desired

returns (Eshandriana, 2023). Therefore, the objectives of this research are to assess the financial feasibility of XYZ Foundation's plan to establish an accredited environmental laboratory and identify the associated risks.

II. LITERATURE REVIEW

A. Financial Feasibility Study

Financial feasibility is a crucial aspect of a feasibility study as it assesses the project's financial viability and the potential for financing (Melnic & Iliescu, 2017). It determines whether the project is financially viable and capable of generating returns or revenue. Conducting a thorough financial feasibility study is essential for accurate and reliable analysis, as it helps investors make informed decisions about the profitability of their investments (Björnsdóttir, 2010). The study involves creating a base case financial plan and assessing the project's profitability and expected return on investment under different scenarios. The Discounted Cash Flow (DCF) method is commonly used, since it is considering expected cash flows, associated risks, and discounting future cash flows to their present value. Various calculations, such as Free Cash Flow to the Firm (FCFF), Weighted Average Cost of Capital, and long-term growth rate, play a role in the DCF method (Fabozzi & Drake, 2008; Pan, 2022).

B. Capital Budgeting Cash Flow

When evaluating investment opportunities, financial managers need to estimate the relevant cash flows associated with the project. This involves identifying the incremental cash outflows or investments that will be required to implement the project, as well as the incremental cash inflows or returns that will be generated as the result of the project. The relevant cash flows needed to estimate are divided into three types, initial investment, operating cash flow, and terminal cash flow (Gitman & Zutter, 2015).

C. Free Cash Flow to the Firm

The free cash flow to the firm is the cash flow that must be sought to find out the company's present value of future free cash flow. It is a measure of investors' cash in the form of cash flow when a company has covered all its commitments, operating expenses, and made all necessary investment in fixed and current assets (Gitman & Zutter, 2015). The formula of free cash flow by Gitman & Zutter (2015) is defined below:

$$FCF = \text{Operating Cash Flow} - \text{Net fixed asset investment (NFAI)} \\ - \text{Net current asset investment (NCAI)}$$

D. Weighted Average Cost of Capital

The weighted average cost of capital (WACC) is a commonly used discount rate in investment analysis to determine the present value of future cash flows. It represents the average expected rate of return required by investors and is calculated by considering the cost of equity and cost of debt in the company's capital structure (Dolbnya et al., 2020). The formula of weighted average cost of capital by Gitman & Zutter (2015) is defined below:

$$WACC = \left(\frac{E}{E + D} \right) \times R_E + \left(\frac{D}{E + D} \right) \times R_D \times (1 - t_c)$$

where: E = Company's equity market value

D = Company's debt market value

t_c = Corporate Tax

R_E = Cost of equity

R_D = Cost of debt before tax

E. Capital Budgeting Techniques

Capital budgeting is a commonly used method for project analysis and evaluation, and it is closely related to the Discounted Cash Flow (DCF) method (Lander & Leggio, 1999). Businesses often employ multiple criteria or techniques, such as Payback Period, Net Present Value, Profitability Index, Internal Rate of Return, and Discounted Payback Period, to ensure accurate evaluation and profitability in investment decision-making since each technique has its own distinct characteristics (Bhandari, 2009).

- *Payback Period*

The payback period (PP) is a popular financial measurement method that evaluates the time required for a project to recover its initial capital investment (Rakesh Jory et al., 2016). However, it is considered a simplistic tool as it does not account for the time value of money, fails to assess cash flow beyond the payback period (Gitman & Zutter, 2015), and does not consider the cost of capital (Rakesh Jory et al., 2016). The acceptance or rejection of a project based on the payback period depends on whether it falls within the permitted payback period set by the business entity or investor (Gitman & Zutter, 2015).

- *Discounted Payback Period*

The discounted payback period (DPP) is a financial measurement tool that addresses the limitations of the payback period by considering the time value of money. By considering the present value of cash flows, the DPP determines the time frame in which the cumulative net present value of a project's cash flows reaches zero. This approach ensures both liquidity and profitability, unlike the payback period, which focuses solely on liquidity. The DPP provides an objective and straightforward rule for investment decision-making. If the DPP of a project is shorter than its expected life, it indicates that the project can generate sufficient cash flows to recover the initial investment within a reasonable timeframe (Bhandari, 2009).

- *Net Present Value and Profitability Index*

Net present value (NPV) is a commonly used method for evaluating investment projects by many large companies. Its calculation considering the time value of money and inflation which represent more sophistication than payback. The hypothesis criteria for evaluating the Net Present Value (NPV) are straightforward: if the NPV is positive, the project should be accepted as it is expected to generate returns higher than the cost of capital and is considered a favorable investment. Conversely, if the NPV is negative, the project should be rejected (Gitman & Zutter, 2015). The formula for calculating Net Present Value by Gitman & Zutter (2015) is stated below:

$$NPV = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} - CF_0$$

where: NPV = Net Present Value
 CF_t = Expected cash flow at time t
 r = Discount rate
 t = Time period
 CF_0 = Initial investment

In addition, the profitability index (PI) is a variation of the net present value (NPV) rule and is another commonly used method for evaluating investment projects. The result of PI and NPV leads to the same conclusion Gitman & Zutter (2015). According to Gitman & Zutter (2015), the hypothesis criteria for evaluating the Profitability Index (PI) are as follows: if the PI is greater than 1, it indicates that the project is projected to generate value greater than the initial investment. On the other hand, if the PI is less than 1, it suggests that the project is projected to generate value smaller than the initial investment. The formula for calculating Profitability Index (PI) by Gitman & Zutter (2015) is stated below:

$$PI = \frac{\sum_{t=1}^n \frac{CF_t}{(1+r)^t}}{CF_0}$$

where: NPV = Net Present Value
 CF_t = Expected cash flow at time t

r = Discount rate
 t = Time period
 CF_0 = Initial investment

- *Internal Rate of Return*

Internal Rate of Return (IRR) is the other well-known financial metric that measures the potential profitability of an investment (Belyadi et al., 2017). IRR is the rate at which the from an investment opportunity's present value of future cash flows equals to zero. A higher internal rate of return (IRR) indicates greater potential for growth and profitability in an investment, and if it exceeds the required rate of return or cost of capital, the investment is considered financially viable and should be pursued (Gitman & Zutter, 2015). The formula for calculating Internal Rate of Return (IRR) by Gitman & Zutter (2015) is stated below:

$$NPV = 0 = \sum_{t=1}^n \frac{CF_t}{(1+i)^t} - CF_0$$

$$CF_0 = \sum_{t=1}^n \frac{CF_t}{(1+IRR)^t}$$

where: IRR = Internal Rate of Return
 CF_t = Expected cash flow at time t
 t = Time period

F. Risk Analysis

Risk analysis involves identifying, assessing, and managing potential threats to a project through a systematic process (Platon & Constantinescu, 2014). Quantitative techniques, chosen for this research since it provides more objective information than the qualitative techniques, will be used to conduct risk analysis, specifically employing tools such as sensitivity analysis and Monte Carlo Simulation Evrin (2019).

Sensitivity analysis or also known as *what-if* analysis is a simpler method of risk analysis that can be used to evaluate the sensitivity response of the output which NPV calculation to changes in the underlying assumptions (Ross, 2013). However, the sensitivity analysis has a limitation, that is it only allows for the evaluation of the impact of one input variable on the project's outcome at a time. On the other hand, in the real situation, it is likely that multiple variables will change simultaneously (Ross, 2013).

Whereas Monte Carlo simulation is a highly applicable technique that involves on iteratively generating random numbers to obtain a probability model forecast in solving a problem that makes this simulation can be utilized to predict the financial feasibility of a project (Zaman et al., 2017). It can be said that the Monte Carlo simulation is more useful tool than sensitivity analysis because the interactions between the variables represent by this tool (Ross, 2013).

III. RESEARCH METHODOLOGY

The research for this project utilizes primary data collection through interviews with the foundation's representative, as well as secondary data collection from credible sources such as journals. These data will be analyzed to determine the project's feasibility, leading to the formulation of conclusions and recommendations for the company and the project.

To answer research questions, this study will the research design shown in Figure 1. The first step must be done is constructing pro forma financial statement of the environmental laboratory establishment project. The second step is calculating the Free Cash Flow to Firm (FCFF). Then, the third step is determining Weighted Average Cost of Capital (WACC) although the project doesn't use any debts as the financing. After the WACC is determined, the next step of the data analysis is calculating the terminal cash flow of the project. Before assessing the risk of the project, this research will execute the financial feasibility study using several capital budgeting techniques, such as Net Present Value, Internal Rate of Return, Profitability Index, Payback Period, and Discounted Payback Period. The previous stage is to discover whether a project with certain assumptions is feasible. If the project with current strategy is not feasible based on the calculation of capital budgeting techniques,

then this study will propose new strategy as a recommendation. The final stage of data analysis is assessing the risk of project feasibility by conducting a sensitivity analysis to see sensitive variables which are variables that have a large impact on the NPV as a forecast variable. Then, the sensitive variable will be used in the Monte Carlo simulation as an input variable.

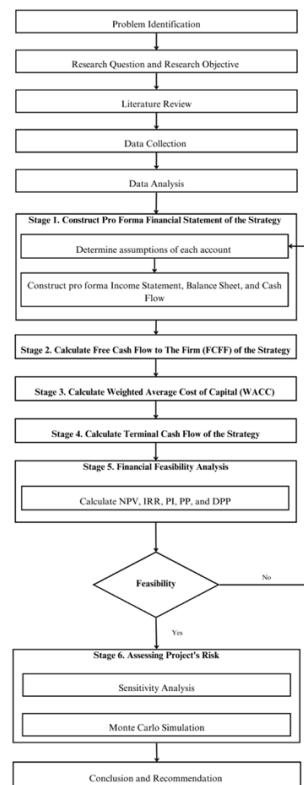


Fig. 1. Research Design

IV.RESULT / FINDING

G. Project Overview

XYZ Foundation has a plan to establish an accredited environmental laboratory. The laboratory is planned to only have one revenue stream, which is environmental testing analysis. the environmental item which can be analyzed in this laboratory stated below:

1. Clean water
2. Drinking water
3. Surface water
4. Domestic wastewater
5. Production wastewater
6. Air emission
7. Ambient air
8. Noise
9. Vibration

The foundation has had their main target market, those are founder's branch, affiliate company group, and parent's affiliate company. The relationship between the foundation and all the main target markets are relatively close and it makes the foundation have easier access in reaching them to become customers of their environmental laboratory. Nonetheless, the XYZ Foundation only has authority over all the founding branches, which can make it easier for the foundation to reach them into environmental laboratory customers. Therefore,

the XYZ Foundation can provide the founder's branch exact quantity of environmental items to be tested. On the other hand, foundations do not have the same authority over the other two main target markets (affiliated companies' group and parent's affiliated companies) which means the foundation does not have the same level of convenience as the ease of accessing all the founder's branches in reaching the other two main target markets.

The environmental laboratory has several things which will be the part of the initial investment, such as infrastructure, laboratory equipment, initial licensing, and operating expenses. The requirement fund for the investment proposed by XYZ Foundation to establish the laboratory approximately IDR10 billion. The detail of the required fund for initial investment defined in Table 1.

Table 1. Required Fund for Initial Investment (in Rupiah)

Description	Amount
Infrastructure	1,800,000,000
Equipment	7,250,440,000
Beginning Licensing	512,000,000
Operating Expenses	1,338,794,559
Total Initial Investment	10,901,234,559

Source: XYZ Foundation

H. Project Analysis

- Actual Strategy

The actual strategy is the strategy proposed by the foundation. Therefore, the several financial assumptions are based on the interview result with the representatives of XYZ Foundation. In the actual strategy, the XYZ Foundation targets that in the first 3 years all branches of the founder have become customers of the environmental laboratory. Then, in the following years, XYZ Foundation aims to achieve all the remained main target markets to become customers of the environmental laboratory and followed by the external market.

By applying all the assumptions for the actual strategy, the annual value of the profit (loss) of the environmental laboratory in the next 10 years using the actual strategy and the Free Cash Flow to the Firm can be projected and can be seen in Figure 2 and Figure 3.



Fig. 2. The Annual Value of the Profit (Loss) of the Environmental Laboratory in the Next 10 Years using Actual Strategy



Fig. 3. The Free Cash Flow to the Firm of the Environmental Laboratory in the Next 10 Years using Actual Strategy

Before conducting financial feasibility analysis, the Weighted Average Cost of Capital must be discovered by calculating the cost of equity and cost of debt first. The components used to calculate the cost of equity are levered beta of XYZ Foundation, risk-free rate, and market return. Meanwhile, the cost of debt for this project only needs the average current lending rate of several bank. Below in Table 2 is shown the calculation of the weight of cost of capital.

Table 2. The Weight Cost of Capital

	Amount	Weight	Cost
Debt (before-tax)	0	0%	8,09%
Equity	10,901,234,559	100%	10.91%
Total	10,901,234,559	100%	

Based on the Table 2, the calculation of WACC for the actual strategy can be seen below:

$$WACC = (100\% \times 10.91\%) + (0\% \times (8.09\% (1 - 22\%)))$$

$$WACC = 10.91\%$$

After discovered all the fourth stages, the financial feasibility analysis can be conducted and below in Table 3 is the result of the data analysis using several capital budgeting techniques.

Table 3. NPV, IRR, PI, Payback Period, and Discounted Payback Period – Actual Strategy

Description	Amount	Decision
NPV	(18,538,939,777.75)	Reject
IRR	N/A	Reject
PI	(2.00)	Reject
Payback Period	N/A	Reject
Discounted Payback Period	N/A	Reject

Based on the table above, the project is not feasible to carry out if based on the hypothetical criteria of each capital budgeting technique that has been explained in chapter 2, there is no need to carry out the last stage, which is risk analysis.

- Proposed Strategy

The proposed strategy is proposed by the researcher through several consideration which comes from the evaluation of the actual strategy. Based on the evaluation, it becomes evident that the actual strategy has not effectively utilized the full potential of their production capacity and the percentage of COSP is quite high. Therefore, the amount of the revenue for each period will be increased to maximize the production capacity that has not been maximized in the actual strategy. Therefore, in the initial year of proposed strategy, all the founder's branches are required to be the customers of the environmental laboratory. In the following years, it is targeted that all the remained main target markets are turned into environmental laboratory customers by increasing annual quantity. This progress will act as a predecessor of the following years' strategy, reaching out their external markets. Due to the increase in annual sales quantity, the required fund for the initial investment for the proposed strategy shown in Table 4 displays a slight difference from the first strategy. Other than that, the percentage of COSP will be lowered.

Table 4. Required Fund for Initial Investment of the Proposed Strategy (in Rupiah)

Description	Amount
Infrastructure	1,800,000,000
Equipment	7,250,440,000
Beginning Licensing	512,000,000
Operating Expenses	1,758,794,559
Total Initial Investment	11,321,234,559

After all the assumptions are already determined, the annual value of the profit (loss) and the Free Cash Flow to the Firm of the environmental laboratory in the next 10 years using the proposed strategy can be projected. Below in Figure 4 and Figure 5 is shown the annual value of the profit (loss) and the Free Cash Flow to the Firm of the environmental laboratory in the next 10 years using the proposed strategy.



Fig. 4. The Annual Value of the Profit (Loss) of the Environmental Laboratory in the Next 10 Years using Proposed Strategy



Fig. 5. The Free Cash Flow to the Firm of the Environmental Laboratory in the Next 10 Years using Proposed Strategy

However, the WACC that will be used for the calculation of the proposed strategy is remained the same as the actual strategy. After discovered all the fourth stages, the financial feasibility analysis can be conducted and below in Table 5 is the result of the data analysis of the proposed strategy using several capital budgeting techniques.

Table 5. NPV, IRR, PI, Payback Period, and Discounted Payback Period – Proposed Strategy

Description	Amount	Decision
NPV	1,264,108,233.32	Accept
IRR	12.46%	Accept
PI	1.23	Accept
Payback Period	6.96 years	Accept
Discounted Payback Period	7.24 years	Accept

Based on the table above, the project with the proposed strategy is feasible to be executed, but the risk still needs to be analyzed. Risk analysis in this study will be carried out using Monte Carlo simulation that will be conducted with a total of 1,000 simulation. However, the variable that will be used for Monte Carlo simulation needs to be known by implementing a sensitivity analysis.

Under the proposed strategy, there are 68 variables used for sensitivity analysis. Those variables will be analyzed by increasing and decreasing the current assumption by 20%. Therefore, later, the sensitive variable will be obtained with the criterion when the absolute change of the variable is more than or equal to 40%. In Table 6 and Figure 6 shown the top 2 variables which have the highest effect to the net present value.

Table 6. Sensitivity Table – Proposed Strategy

Variable	Increase in Variable Input		Decrease in Variable Input		Absolute
	Variable	NPV	Variable	NPV	
	Swing	Swing	Swing	Swing	
Cost of Service Provided (COSP)	20%	-363%	-20%	360%	723%
Indonesia Inflation Rate	20%	63%	-20%	-60%	122%

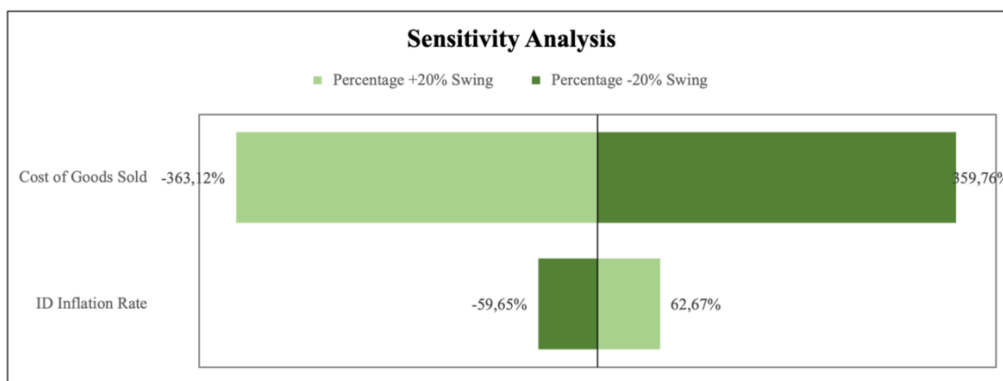


Fig. 6. Tornado Chart – Proposed Strategy

Those variables will be chosen to be the sensitive variable used for Monte Carlo simulation analysis. Those two variables are the Cost of Service Provided (COSP) and Indonesia inflation rate. The dependent variable or usually known as forecast variable for this Monte Carlo simulation analysis will be the net present value. Below in Table 7 and Figure 7 is the result of the Monte Carlo Simulation.

Table 7. Descriptive Statistics Result of Monte Carlo Simulation

Description	Amount
Minimum	(10,110,159,580.13)
Maximum	13,901,632,466.76
Mean	1,486,736,853.38
Standard Deviation	3,419,463,493.23
Prob NPV Lower than 0	33.19%

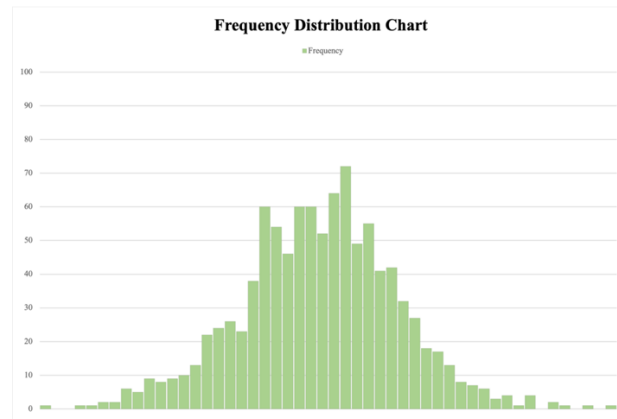


Fig. 7. Monte Carlo Simulation Result

V. DISCUSSION

Based on the data analysis result that already attached in the chapter 4, the project with the actual strategy is not feasible to be executed based on the hypothesis criterion of each capital budgeting. The analysis of actual strategy shows that the value of the NPV and PI of the actual strategy are negative. The value becomes an evident that the strategy should be rejected. Therefore there is no need to run the last stage, which is risk analysis. However, referring to the explanation of the research design, in this condition the researcher should propose another strategy as a recommendation for the foundation. Before a new strategy can be formed, it must be known in advance what made the actual strategy not feasible to execute so an evaluation of the actual strategy must be carried out.

Based on the evaluation, it becomes evident that the actual strategy has not effectively utilized the full potential of their production capacity and the percentage of COSP that quite high. To achieve optimalization, the laboratory can maximize their production capacity by generating more revenue every year and apply cost management by maintain the percentage of the Cost of Service Provided (COSP).

Build upon the situation, the researcher will propose another strategy to be analyzed by considering the evaluation of the actual strategy. The changes in the new strategy results in escalation of the required fund for initial investment. The result of the calculation of the proposed strategy shows that the project with this strategy is feasible to implement because all the results of the value of the capital budgeting techniques used are in accordance with the hypothesis criteria which states that the strategy can be accepted. However, the risks still need to be analyzed by conducting risk assessment.

Risk assessment will be conducted by using two tools: sensitivity analysis and Monte Carlo simulation states. The result of sensitivity analysis shows that there are two variables suspected as sensitive variables, those two variables are the Cost of Service Provided (COSP) and the Indonesian inflation rate. Those two sensitive variables must be normally distributed first before it can be used as the input variable in Monte Carlo simulation. Based on the Monte Carlo simulation, the results of 1,000 simulations state that there is still a risk of failure as

shown by the NPV probability of lower than 0 in this strategy of 33.19% and it means that the percentage of succeed is only 66.81%. Also, the result tells that the variability of this strategy is still huge since the standard deviation is higher than the average. Indicating from the result, the XYZ Foundation has to prepare for risk mitigation by taking more notice for the two sensitive variables.

VI. CONCLUSION AND RECOMMENDATION

XYZ Foundation, a non-profit foundation established in 2008 by a leading heavy equipment distributor in Indonesia, aims to support the founder's corporate social responsibility program. To expand its contributions, the foundation plans to establish an accredited environmental laboratory. However, considering the numerous investment that require consideration, such as the infrastructure, equipment, and other investment, it is possible for the plan will result in financial losses. Therefore, the foundation should do financial feasibility study. The financial feasibility study will use Discounted Cash Flow method and several capital budgeting techniques, such as Payback Period, Net Present Value, Profitability Index, Internal Rate of Return, and Discounted Payback Period.

A financial feasibility study using several capital budgeting techniques revealed that the actual strategy is not viable to be executed. Therefore, a proposed strategy was recommended in this research by considering factors that come from the evaluation of the actual strategy which resulted in a feasible project with the NPV of IDR1,264,108,233.32, the internal rate of return of 12.46%, profitability index of 1.23, also payback period and discounted payback period shorter than the expected year determined by the foundation.

The proposed strategy that has been declared feasible by using capital budgeting techniques must still go through the risk analysis process using sensitivity analysis and Monte Carlo simulation. The Monte Carlo simulation with two input variables determined in the sensitivity analysis step, Cost of Service Provided and Indonesia inflation rate, shows that the project with the proposed strategy still has risks with the possibility of producing an NPV less than 0 of 33.19%. Therefore, it requires risk mitigation for the proposed strategy. There are several mitigations which XYZ Foundation can do by taking more notice to the two sensitive variables.

The environmental laboratory must employ cost management strategies to ensure that the Cost of Service Provided (COSP) remains at or below 52.54% of revenue or it will result in negative NPV. Furthermore, considering the unpredictable nature of fluctuations in Indonesia's inflation rate, risk mitigation can be implemented by changing the growth assumptions of the costs whose growth is affected by the inflation rate, those are the growth of salary and equipment price.

The growth rate assumption of salary doesn't have to follow Indonesia's current inflation rate, the increase of salary can also be triggered by the presence of employee skills. Therefore, with salary growth that is influenced by the increase in the skills of these employees, it can later increase customer satisfaction so that the company reputation will also increase, and it will benefit the company. On the other hand, the equipment price can be managed by creating a long-term contract with the suppliers to keep the equipment's price flat from year to year.

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Post COVID-19 Pandemic Effect of Perceived Job Stress and Work Flexibility on Gen X and Y's Perceived Employee Performance in JABODETABEK

Violetta Adhea Sahetapy¹, Adita Pritasari²

^{1,2} Institut Teknologi Bandung, ITB, Bandung, Indonesia

Abstract

Unforeseen events and uncertainties have always been inherent in our world, affecting various aspects of work and businesses. The outbreak of the COVID-19 pandemic has emerged as an unexpected global crisis creating job insecurity that leads to job stress among employees. This pandemic has also forced companies to apply social distancing and Work From Home policy. Following the COVID-19 pandemic, these two issues have increased importance in terms of employee performance. Consequently, business owners need to address these critical matters, as unresolved issues may have long-term implications for employee performance, ultimately affecting other employees and the overall performance of the company. This research aims to further investigate the relationship between Perceived Job Stress and Work Flexibility to Employee Performance, shedding light for companies on the nature of this association using Multi Linear Regression. The findings concluded from 210 questionnaire respondents indicate that there is a positive effect of perceived job stress and work flexibility towards employee performance among Gen X and Gen Y working in JABODETABEK. These findings provide recommendations for businesses to establish employee stress level management programs and sustain the integration of work flexibility within their policies.

Keywords : Gen X; Gen Y; Perceived Employee Performance; Perceived Job Stress; Work Flexibility

I. INTRODUCTION

Background

Drawing upon data from the 2020 Deloitte Global Millennial survey, it is revealed that 48% of Gen Z and 44% of millennial participants were experiencing stress either consistently or most of the time (Adriana, 2022). Moreover, one-third of millennial respondents were known having taken leave from work within the past year due to stress-related concerns. Given that millennials comprise approximately 50% of the workforce, such absences represent a significant loss of work output annually (Adriana, 2022). In Indonesia, the number of workforces is dominated by those in the age range 25-29 years old followed by age range of 30-34 years old. Gen X in total contribute to roughly 55.6 million people of the workforce while Gen Y contribute to roughly 50.8 million of the work force. A study from University College London discovered that individuals experienced the highest levels of stress when faced greater uncertainty compared to situations in which they possessed knowledge of the potential outcomes. This implies that individuals tend to experience a greater sense of ease when they are aware of forthcoming events, even if the events are perceived as unpleasant, rather than when they are confronted with ambiguity (Walton, 2016).

Although it is typically viewed as an undesirable aspect of life, uncertainty has always been in our lives. Everything around us is constantly changing, and this is just how life is (*Living with Uncertainty - Stanford Report*, 2020). The concept of uncertainty in our daily lives is frequently viewed as an unusual and unsettling occurrence, with many individuals feeling compelled to seek out certainty within it. The emergence of the COVID-19 pandemic in 2020 has challenged this perspective. This unexpected global crisis, which was declared a pandemic by the World Health Organization, has caused extensive damage and disruption worldwide. The novel coronavirus, originating in China, has resulted in numerous fatalities, significant revenue losses, job displacement, and disruption of daily activities in more than 180 countries (Dhoopar et al., 2022). This pandemic has taken our understanding regarding uncertainty to another level. The uncertainty from the COVID 19 pandemic has introduced a new source of fear and stress, leading to psychological pressure among individuals (Ketut et al., 2022). This is particularly evident among employees who face additional concerns due to COVID-19-related policies, such as the fear of job termination and the potential loss of income. Research conducted by Peng & Potipiroon (2022) has confirmed that job insecurity can impact job stress. Consequently, job stress can have detrimental effects on employee performance (Antonita Christy & Sholihati Amalia, 2017). This undesirable

situation not only effect individuals but also business. When the Indonesian government started the Work From Home policy in March 2020 (Arnani, 2020), it caused a decrease in their performance and challenged their ability to conduct their businesses. For example, businesses may need direct interaction due to the physical nature of most of their work activities, many jobs such as transportation, food service, property maintenance, and farming have few or no opportunities for telecommuting. Building inspectors must travel to building or construction sites, while nursing assistants must work in health care facilities. Many of the jobs the government has declared essential during the pandemic fall into the category of jobs with low potential for remote working (Lund, 2020).

Currently, the pandemic has slowly turned into an endemic and created a new “normal” for us (Rokom, 2022). While cases of Covid-19 are not as dire as they used to be, COVID19 has changed the way we live, some forever. That change is how currently some of as employees may have things, they prioritize (McGuinness, 2023). Compared to pre-pandemic era, in this era, 53% of global workers care more about their wellbeing than work (Pink, 2022). Work from home might be seen as a tough challenge in the early pandemic, but there are also several advantages of working from home for employees such as: improving flexibility and agility. Since working from home offers employee a better power to manage their time, this method of working is also useful for multinational companies with employees from different time zones. Working remotely also benefits the employer in improving employee retention. The feeling of being able to control more things and having such power delegated the company their working with can create a sense of safety and leads to employee loyalty. In the beginning of 2020, WFH started as a policy or restriction, but is currently done as a choice of the employer and employee instead of a necessity to avoid the Covid-19 virus (Parker et al., 2022). Although it seems promising, work flexibility or WFH policy is not for everyone. For some employees, working from home can be difficult because they love the interaction with co-workers and the environment of the office. Especially for those with a lot of home distraction and not sufficient technology to provide them a good WFH set up. Having flexible working hours can also result in no clear physical distinction between work life and home life. When employees can't decide when to work and when to rest at home, they're unable to switch their brain off and would end in employees having a burnout or increase in stress level (*Advantages and Disadvantages of Employees Working at Home* | *Nibusinessinfo.Co.Uk*, n.d.) Recognizing the significance of employees as a valuable resource, businesses who continue to implement work flexibility measures, can experience both positive and negative impacts on their employee performance.

The pandemic along with the lockdowns and social distancing that come with it has forced us to find ways around it and to have control of the situation or to have resilience. Having resilience helps the business respond quickly to changes, thus making people feel good about themselves and their ability to cope with change (Dhoopar et al., 2022). In addition to cultivating resilience, businesses must prioritize enhancing employee performance to consistently attain their organizational goals, even in the face of challenges. Employee performance is one of the few ways to determine how well an employee is working. In the world during and after the COVID-19 pandemic, employee performance is being affected in many ways. There are different sayings on how employee performance is affected due to the pandemic. The COVID-19 pandemic has significantly impacted the economy, particularly specific market segments that have experienced a substantial decline. This decline can be attributed to businesses and industries being unable to fulfill the needs of the community effectively. Consequently, a series of significant recessions have occurred, leading to widespread repercussions on people's lives (Nathanael, 2021). Recent research indicates the existence of a bidirectional relationship between company performance and employee performance. A high-performing employee is associated with reduced costs, fewer delays, and a positive impact on overall company outcomes. Furthermore, such employees tend to outperform competitors, thereby creating a competitive advantage for the business. In the context of emerging markets and disruption of COVID-19, the performance of employees and their ability to capitalize on opportunities significantly influence the overall performance of the company (Vosloban, 2012).

Problem Statement

Work-related stress can contribute to a continuous cycle. Stress often leads to significant mental health challenges that adversely affect the productivity levels of team members. Additionally, stress is associated with increased rates of anxiety and depression, which can have a detrimental impact on employees' job performance and personal lives. When employees experience anxiety and depression, they may encounter difficulties in functioning normally and require additional effort to maintain productivity at work (Eys, 2021). Not only that, but stress can also have implications for workplace conflicts as well. Increased work-related stress arising from factors such as heavy workloads, tight deadlines, or organizational transformations can create a sense of overwhelm and diminish employees' patience. As mentioned above, COVID-19 has created a sense of job insecurity among employees that contributes to the increase of job stress. Likewise, external stressors stemming from family or personal life can

influence an employee's capacity to effectively collaborate with colleagues. The considerable energy consumed by stress limits employees' ability to navigate and address conflicts that arise in the workplace (Keller, 2021). Alongside with that, as a result of this global crisis, some employees may have encountered the opportunity to work remotely for the first time. This newfound ability to work from home may have resulted in a sense of work-life balance that contributed to increased levels of happiness among certain individuals. When this pandemic situation slowly turns into an endemic and companies are starting to shut down work flexibility, many workers who loves the pandemic working style decided to resign, thus creating what was known as “Great Resignation” (Brace, 2022). While some companies are experiencing the “Great Resignation”, some are trying to save their employees by continuing the work flexibility policy. In January 2023, a petition to bring back Work From Home policy was signed by over 23,000 employees in Indonesia. In interviews conducted with the employees, it was observed that the implementation of Work From Home policies has positively impacted their financial management, particularly by reducing commuting expenses. Conversely, the effectiveness of Work From Office policies in ensuring employee productivity has been questioned, particularly for those facing long commutes (Pranita, 2023). These issues have gained significance in relation to Employee Performance following the COVID-19 pandemic. Employees have reported experiencing high levels of Perceived Job Stress and have emphasized the importance of Work Flexibility. Consequently, business owners need to address these critical policy matters, as unresolved issues may have long-term implications for employee performance, ultimately affecting other employees and the overall performance of the company. This research aims to further investigate the relationship between Perceived Job Stress and Work Flexibility to Employee Performance, shedding light for companies on the nature of this association.

Research Question

1. What is the relationship between Perceived Job Stress and Perceived Employee Performance?
2. What is the relationship between Work Flexibility and Perceived Employee Performance?

Research Objective

1. To analyze the relationship between Perceived Job Stress and Perceived Employee Performance
2. To analyze the relationship between Work Flexibility and Perceived Employee Performance

Scope and Limitation

The scope of this study is limited to the relationship among the variables mentioned above to the life of an employee after the pandemic era. This research will be conducted with a quantitative approach through questionnaire. This research will be conducted mainly from March 2023 until June 2023. The respondents itself will be limited to workers that have been working before (a minimum of 6 months) and after the COVID-19 pandemic, Gen X and Gen Y with work domicile in Jakarta, Bogor, Depok, Tangerang, and Bekasi. The participants in this study are exclusively drawn from the Gen X and Gen Y cohorts, as previously noted, given their substantial representation, accounting for approximately 50% of the workforce in senior positions. Given the significant numbers and influential roles held by individuals from these generations, the findings of this research hold potential value for businesses seeking to make informed decisions regarding employee's job stress level and the implementation of work flexibility measures that cater to the needs of most of their workforce. This limitation is needed to achieve a better result in understanding the differences happening due to the pandemic. Since this research is conducted in Indonesia, the result of this study will be accurately applicable to Indonesian employees and companies. Further research might be needed to understand the result in other regions or other generation cohort.

II. LITERATURE REVIEW

Perceived Job Stress

Stress arises from various stressors, which are factors or events that disturb the balance or well-being of an individual. The detrimental consequences of excessive stress on individuals, organizations, and society are high. This includes the increased risk of anxiety disorders and various stress-related illnesses among employees. Work-related stress is characterized as the stress that an individual experiences in the workplace or as a result of their job's characteristics, leading to physiological, psychological, and behavioural changes when the individual cannot

adapt to the work environment (Hsieh & Tsai, 2019). Work stress negatively impacts organizations, which will ultimately result in losses because of worker dissatisfaction, negativity, high turnover rates, and absenteeism (Xie et al., 2021).

Several scientific studies have documented the impacts of extended and non-standard work hours on various health outcomes, encompassing immediate effects such as stress, fatigue, deteriorating health, and mental disorders. Insufficient rest periods and irregular working schedules have been identified as the primary factors contributing to work-related stress (Sari et al., 2021). There are several causes of Job Stress, five of them are, workload, work environment, concentration, positivity, and future perspective. Features of working environment can cause a great job stress, this includes working hours, ambiguity at work, and workplace condition (Sidhu et al., 2020). Research conducted in manufacturing industry in Indonesia prove that working hours and tight deadlines are what contributes to the increase of stress among its employees (Sari et al., 2021).

There are ways to cope with stress. From the company side, creating a supporting environment, training, and improvement of individual characteristics, increase in job satisfaction, and an increase in compensation might reduce job stress (Riyadi, 2019). From the perspective of the employee, there are 3 types of stress' coping mechanism, cognitive, behavioural, social coping. Cognitive includes mental strategies and self-talk, for example shifting their way of thinking in a positive way and seeing stressful situation as an opportunity to learn and develop new skills. Behavioural can be jogging, exercising, or even smoking. The social coping is involving others in the coping process, for example asking or seeking information from others about the job (Latack & Havlovic, 1986). Ultimately, work-related stress experienced by employees can have a detrimental impact on their work performance (Riyadi, 2019; Sari et al., 2021).

Work Flexibility

The concept of flexible working refers to any policies or practices, formal or informal, that allow individuals to adjust their working hours and locations (Chatterjee et al., 2022; Maxwell et al., 2007). Such arrangements may or may not involve a decrease in working hours, adding another layer of work variability. Various types of flexible working practices include part-time work, job sharing, flexible hours, teleworking, and working from home (Maxwell et al., 2007). The implementation of non-traditional work hours especially Work from Home (WFH) can present a dual outcome, offering greater adaptability for employees to regulate their professional and personal obligations, while concurrently amplifying the potential for work-related time constraints and stress to impact their familial and leisure activities. It can rupture the separation between work and leisure time (Dockery & Bawa, 2014; Marinho et al., 2017). The pandemic era is not the first time Indonesian was introduced to the term of "work flexibility". The Indonesian government first introduced the concept of work flexibility to the public in 2019, with the main aim of improving productivity and performance, both at the individual employee level and within organizations (Ruth et al., 2021).

The implementation of work flexibility policies has been found to yield numerous benefits, including enhancing employee productivity, allowing individuals to attend to familial obligations or other responsibilities, minimizing instances of absenteeism and staff turnover, promoting improved worker health, and facilitating a more harmonious balance between the work and family demands of employees (Dockery & Bawa, 2014). The flexibility firm theory proposes that organizations should have adaptable structures to effectively respond to unpredictable situations like the COVID-19 pandemic. By incorporating flexibility into their policies, organizations enable their employees to embrace flexibility as well. Moreover, optimal outcomes in terms of remote work flexibility can be achieved when senior management actively endorses the system by formulating suitable and flexible organizational policies (Chatterjee et al., 2022). One important consideration, however, is that while work flexibility can offer significant advantages, it may also present certain disadvantages that warrant careful evaluation. The disadvantages of work flexibility are as follows: extended work hours, a lack of opportunities for career advancement, and a heightened sense of social isolation (Dockery & Bawa, 2014).

Perceived Employee Performance

Employee performance is defined as the specific actions undertaken by individuals that contribute to the achievement of organizational objectives (Campbell & Wiernik, 2015). Another definition was found mentioning that employee performance refers to the expected functioning and behavior of an individual in relation to the tasks assigned to them (Wolor et al., 2020). Employee performance is about employee productivity and output as essential components that impact the efficiency and effectiveness of an organization in accomplishing its objectives. Such performance is evaluated based on a predetermined work schedule outlined in an employee's performance plan, which is aligned with the overarching vision of the organization (Ohemeng et al., 2018). The concept of job performance includes only those behaviors that are relevant to the execution of organizational tasks and can be evaluated. Therefore, not all individual behaviors are considered as constituting job performance. The

challenge lies in defining individual performance as behavioral, as it becomes difficult to discern which behaviors are truly applicable to the organization (Santos et al., 2018). Furthermore, it is crucial to make a clear distinction between performance itself and the outcomes of that performance, particularly when there are various factors beyond the individual's performance level that contribute to the variability in outcomes, such as sales, stock price, or salary (Campbell & Wiernik, 2015). There are several factors that contribute to employee's performance, such as Job Satisfaction, Work Environment, Individual Characteristics, Compensation, and Stress Level (Riyadi, 2019). Work performance is a conceptual and unobservable construct that cannot be directly observed or measured. It has various components or dimensions, each of which consists of indicators that can be directly measured (Koopmans et al., 2011). Although it might seem difficult, a measuring tool can be established in way where it is influenced by the actions and efforts of the individual, thereby qualifying them as performance measures (Campbell & Wiernik, 2015). Performance measures can be in a form of ratings, samples, simulation, proxies, and technology enhanced assessment (Campbell & Wiernik, 2015).

Gen X and Gen Y

The idea of a generation cohort is a theoretical concept that clarifies the phenomena of people who have similar life experiences during their formative years of late adolescence and early adulthood in addition to a shared time of birth. Such shared experiences may include significant external events that shape their beliefs, values, and attitudes, resulting in a relatively homogeneous group of individuals (Ting et al., 2018). The generational cohort is comprised of five groups, namely Baby Boomers or Boomers (born between 1946-1964), GenX (born between 1965-1980), and Gen-Y (born between 1981-1996), and Generation Z (1997-2012) (Fry & Parker, 2018). Within the majority of companies, individuals from Generation X tend to occupy the highest-ranking managerial positions or serve as middle-level managers.

In terms of achieving work-life balance, Generation 'X' employees demonstrate a distinct inclination towards maintaining a harmonious equilibrium between their professional responsibilities and personal lives. Rather than solely focusing on climbing the corporate ladder or pursuing financial gains, they prioritize their families and overall quality of life (Weerarathne et al., 2022). This can be observed in their preference of spending time with their families and engaging in leisure activities (Med, 2015). On the other side, the 2023 Deloitte Gen Z and Millennial Survey highlights the prevalence of workplace stress and anxiety among Millennials, with a substantial proportion (39%) reporting experiencing these negative emotions frequently (Deloitte, 2023). Notably, Millennials identify several stressors, including long-term financial security, day-to-day financial concerns, and the well-being of their families' health, as significant contributors to their stress levels (Deloitte, 2023). Regarding flexibility, Generation 'X' employees exhibit a greater inclination to switch jobs if a new opportunity offers flexible working hours that enable them to achieve a better work-life balance (Weerarathne et al., 2022).

Gen X are also recognized for being achievement-oriented individuals in their career goals. They exhibit a strong drive to succeed and make progress in their professional lives, while demonstrating lower levels of attachment towards their company compared to previous generations (Ismail M, 2016; Med, 2015). In terms of work expectation, Gen X are known to have higher work expectation compared to Gen Y (Chandra et al., 2015). Although both Gen X and Gen Y exhibit an achievement-oriented personality, the latter group is inclined to work autonomously and prioritize a work environment that fosters freedom, creativity, and curiosity (Ismail M, 2016). Employees from Generation 'Y' place a strong emphasis on work and career flexibility. They hold the belief that they can accomplish tasks efficiently within shorter timeframes, thereby justifying their desire for reduced working hours while actively seeking challenging job roles (Weerarathne et al., 2022). Work time flexibility and the absence of overtime office hours are among the factors that Generation Y takes into account when making commitments to their work (Chandra et al., 2015).

Relationship between Job Stress and Employee Performance

According to a scholarly journal, employees experiencing job-related stress tend to develop a desire to disengage from their work environment. Failure to address this inclination promptly can lead to a decline in performance or intentional substandard job execution within the company, thereby diminishing overall employee productivity (Daniel, 2019). Numerous factors can contribute to job stress. Researchers in Malaysia have substantiated that, despite its general influence on employee performance, job stress is primarily driven by two factors: time pressure and role ambiguity (Murali et al., 2017).

Additionally, another study highlights the correlation between work stress and mental health, illustrating how the former can impact the latter, consequently affecting employee performance (Tang et al., 2022). It is mentioned in past research that an employee who is not stress will have a better employee performance compared to those who is stressed (Antonita Christy & Sholihati Amalia, 2017). Although seemed like job stress always effect negatively, Daniel mentioned that job stress, when maintained at a tolerable level, can potentially augment productivity, and

exert a positive influence on employee performance. However, it is important to note that excessively low or excessively high levels of job stress have been shown to have an adverse impact on employee performance (Daniel, 2019). Another research was conducted in Indonesia among manufacturing industry. Same result was concluded that work stress has a positive impact on employee performance (Sari et al., 2021).

Relationship between Work Flexibility and Employee Performance

Based on research conducted in Turkey, work flexibility causes a positive impact on Employee Performance (Altindag & Siller, 2014). The findings of a systematic review indicate that work- life balance, which includes work flexibility, has a positive influence on the behavior, attitudes, and performance of employees from the millennial generation. It is observed that an increasing number of organizations are implementing comprehensive policies aimed at promoting work- life balance, which in turn positively affects job satisfaction, organizational commitment, and ultimately, performance and productivity within the organization (Wolor et al., 2020). In addition to that, another study was conducted specifically about time flexibility among teachers in district Peshawar. The study's results revealed that teachers employed in management science colleges within the Peshawar district considered time flexibility to be a crucial determinant of employee performance and expressed a favorable attitude towards its implementation. The findings highlight that college administrations, aiming to enhance productivity and efficiency, are compelled to adopt a Flexible Time System as a viable solution (Hashim et al., 2017). Among Romanian employees, Work flexibility, encompassing functional flexibility, working time flexibility, and workspace flexibility, provides employees with a harmonious equilibrium between their professional and personal lives. This integration fosters job satisfaction and enhances overall performance levels (Davidescu et al., 2020).

Research Gap

The Table 2.1 shows the conclusion of previous research drawn from the literature review conducted in previous sub chapter. This previous research gaps are used to refine the research question and understand which part or areas the research should focus on as the novelty of this research.

Table 2. 2

No	Authors	Sample	Findings	Job Stress	Work Flexibility	Employee Performance
1.	(Daniel, 2019)	Lecturers in Nigeria	Negative factors that distressed employees has a negative impact on performance	Yes	No	Yes
2.	(Tang et al., 2022.)	Employees of SME in China	Work stress negatively impact employee performance	Yes	No	Yes
3.	(Antonita Christy & Sholihati Amalia, 2017)	Production employee of PT Catur Kartika Jaya in Bandung	Strong and significant negative influence of work stress on the employee performance	Yes	No	Yes
4.	(Altindag & Siller, 2014)	Employees with 1-16 years of experience in Turkey	Flexible method factors have a direct and positive impact on employee performance	No	Yes	Yes
5.	(Hashim et al., 2017)	Staff from academic section in a government college in Pakistan	Time flexibility have a positive impact on job performance	No	Yes	Yes
6.	(Davidescu et al., 2020)	15-64 years old employees in Romania	Total home office is associated with a higher level of job performance	No	Yes	Yes

7.	(Sari et al., 2021)	21-30 years old in manufacturing industry in Indonesia	Work stress have a positive relation to employee performance	Yes	No	Yes
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Conceptual Framework

Driven by the research gap presented above, this figure below shows the conceptual framework of this research. By combining previous theories and research about the three variables used in this research, a conceptual framework is created.

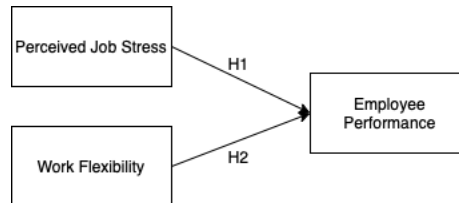


Figure 3. 1

H1: There is a negative relationship between Perceived Job Stress and Perceived Employee Performance

H2: There is a positive relationship between Work Flexibility and Perceived Employee Performance

III. RESEARCH METHODOLOGY

Looking at the specific number of variables that are going to be studied in this research, this research will be conducted using quantitative approach. The quantitative research methodology focuses on quantifying and analyzing variables to obtain findings. The population for this research will be Gen X and Gen Y that has been working before and after the COVID-19 Pandemic. Furthermore, this population will be limited to Gen X and Gen Y living and/working in Jakarta, Bogor Depok, Tangerang, and Bekasi or the JABODETABEK area. Based on the generation cohort, the population for this research would be both female and male, age 27 – 57 years old. The sample size for this research will be calculated by multiplying the parameters by five (Hair et al., 2019). Therefore, the sample size would be $21 \times 5 = 105$ respondents. When the ratio of the number of observations to the number of predictor variables (N:p) decreases below 5:1, there is a potential risk of overfitting the variables to the sample. This overfitting can result in findings that are excessively specific to the particular sample used, thereby reducing the generalizability of the results. Since this survey's objectives are defined, the sampling techniques that will be used for this research is nonprobability purposive sampling. This technique is used because the researcher will conduct an online survey that has specific criteria that is align with the research objectives. The survey will be conducted by using a questionnaire. The questionnaire type used for this research is online questionnaire. The questionnaire will be distributed through social media, personal approach to targeted respondents or their relatives, maximizing the network relationship the researcher had. The questionnaire will be distributed from the third week of May 2023 until the third week of June 2023. The analysis of this data will begin with Validity and Reliability test. After that a series of classical assumption are done to assure that the data set is ready and qualified to used in the next analysis process. Multi Linear Regression is used considering the number of variables analyzed in this research. Lastly, an F Test is conducted to see the simultaneous relationship between the independent variable and the dependent variable.

IV. RESULT / FINDING

Validity Test

Table 4. 1 Validity Test

No.	Variable	Validity	N
1.	Perceived Job Stress	Valid	7
2.	Work Flexibility	Valid	7
3.	Perceived Employee Performance	Valid	7

Validity Test are conducted by comparing the Pearson Correlation of each instrument of the variables and comparing it to the R-Table. Based on the calculation all three of the variables used in this research have a R-Count greater than the R-Table of 0.1367. Therefore, all variables are considered valid.

Reliability Test

Table 4. 2 Reliability Test

No.	Variable	Cronbach's Alpha	N
1.	Perceived Job Stress	0.792	7
2.	Work Flexibility	0.890	7
3.	Perceived Employee Performance	0.865	7

Reliability Test are done by calculating the Cronbach's Alpha. According to Heale & Twycross, a reliable variable is a variable with a minimum of Cronbach's Alpha of 0.7. Looking at the table above, it can be seen that all three variables used in this research are considered reliable.

Normality Test

Table 4. 3 Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		210
	Mean	.0000000
Normal Parameters ^{a,b}	Std. Deviation	303.112.298
	Absolute	.046
Most Extreme Differences	Positive	.036
	Negative	-.046
Test Statistic		.046
Asymp. Sig. (2-tailed) ^c		.200 ^d
a Test distribution is Normal.		
b Calculated from data.		
c Lilliefors Significance Correction.		
d This is a lower bound of the true significance.		

The test used to measure the normality of this data is the one sample Kolmogorov-Smirnov Test. It is a statistical test used to determine if a given dataset follows a normal distribution. It assesses the degree of similarity between the observed data and the theoretical normal distribution. In the context of assessing normality using the Kolmogorov-Smirnov test, the statistical findings are typically interpreted by examining the Asymp Sig value presented in the table 4.3. If the Asymp Sig value exceeds the threshold of 0.05, it indicates that the data can be considered normally distributed. In the specific dataset examined, the Asymp Sig value of 0.2 indicates that the data adheres to a normal distribution.

Multicollinearity Test

Table 4. 4 Multicollinearity Test

Coefficients^a

Model	Collinearity Statistics	
	Tolerance	VIF
1		
(Constant)		
JS	.824	1.213
WF	.824	1.213

The assessment of multicollinearity in the regression analysis involves examining the coefficients table presented above. To ensure the absence of multicollinearity, certain criteria are considered. Specifically, if the Tolerance value exceeds 0.1 and the VIF value remains below 10, it indicates that the data does not violate the assumption of multicollinearity. Based on the obtained results, it is evident that the variable Perceived Job Stress exhibits a Tolerance score of 0.824 and a VIF score of 1.213. Similarly, the variable Work Flexibility demonstrates a Tolerance of 0.824 and a VIF of 1.213. Consequently, it can be concluded that all variables subjected to the multicollinearity test have successfully met the specified criteria and are deemed suitable for utilization in subsequent regression analyses.

Heteroscedasticity

Table 4. 5 Heteroscedasticity

Coefficients ^a		
Model		
1		
(Constant)	t	Sig.
JS	4.727	.000
WF	-1.476	.142
	-1.069	.388

a Dependent Variable: ABS

The outcome of the Heteroscedasticity test, employing the Glesjer Test, is presented in the Table 4.5. The Glesjer Test is utilized to assess heteroscedasticity by examining whether the Sig value exceeds 0.05. If the Sig value is greater than 0.05, it indicates the absence of heteroscedasticity violation within the data. In the case of the variable Perceived Job Stress, the Sig value is seen to be 0.142, while for the variable Work Flexibility, the Sig value is found to be 0.388. These findings indicate that both variables exhibit no violation of heteroscedasticity and can be safely incorporated into the regression model without concerns of heteroscedasticity affecting the validity of the results.

Regression Model

Table 4. 6 Regression Model

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1					
(Constant)		12.639	1.441		8.768
JS		.345	.045	.443	7.583
WF		.274	.050	.322	5.519

a Dependent Variable: EP

From the regression model above, it can be seen that Perceived Job Stress and Employee Performance both each have a significant and positive relationship. This conclusion is drawn by looking at the Significant level of both independent variables that is less than 0.05 and the positive number in the coefficient. The coefficient of Perceived Job Stress is 0.345 and the coefficient of Work Flexibility is 0.274. This indicates that, between the two independent variables, Perceived Job Stress have a stronger impact to the dependent variable Employee Performance.

Table 4. 7 Model Summary

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.647a	.419	.413	304.573

a Predictors: (Constant), WF, JS

b Dependent Variable: EP

The table presented above illustrates the R-squared value of the Regression Model. From the regression analysis, it is evident that in the initial model, the independent variables, namely Perceived Job Stress and Work Flexibility, account for 41.9% of the variability observed in the dependent variable, Employee Performance.

F Test

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.385.126	2	692.563	74.658	.000b
	Residual	1.920.231	207	9.276		
	Total	3.305.357	209			

a Dependent Variable: EP

b Predictors: (Constant), WF, JS

Based on the F test conducted, it can be concluded that for the first model, all of the independent variables have simultaneously significant relationship with the dependent variable. This conclusion is drawn by looking at the Significant Level of 0.000 and the F count of 74.658 that is bigger than the F table of 3.03.

V. DISCUSSION

After conducting several statistic calculations, it can be concluded that Perceived Job Stress have a positive and significant relationship with Employee Performance. This conclusion is drawn by looking at the significant level and t count of Perceived Job Stress in the Regression Model 2. Perceived Job Stress has a significant level of 0.000 with t count of 7.815 greater than the t table of 1.9714. This result means that for every increase in Perceived Job Stress on an employee will result in an increase in Employee Performance. This result is contradictory to two previous research that mentioned how an increase in stress can lower the employee's performance. Past research explained that if the employee is not stress, they will perform better (Antonita Christy & Sholihati Amalia, 2017). Not only that, but job stress can also cause burnout among employees that can negatively influence employee performance (Tang et al., 2022). Although contradictory to those two research, similar result was shown in research conducted in manufactory industry in Indonesia. The result shows that there is also a positive effect of job stress to employee performance. These positive relationship between perceived job stress and employee performance are supported by a published journal mentioning how at a tolerable level, work stress can positively affect an individual and their performance before it exceeds the tolerable level and create a negative impact on the employee performance (Daniel, 2019). Among the independent variables, Perceived Job Stress and Work Flexibility, Perceived Job Stress seem to have a bigger impact on Gen X and Gen Y compared to Work Flexibility. This can be caused by the high number of stressors faced by the Gen X and Gen Y like financial future, daily finance, health and welfare of their families that impact more on their job stress and employee performance compared to the option of Work Flexibility (Deloitte, 2023).

Based on the analysis conducted using Multi Linear Regression and other statistical tests, it can be deduced that there exists a positive and significant association between Work Flexibility and Employee Performance. This conclusion is derived from the Regression Model, where Work Flexibility exhibits a significant level of 0.000 and a t count of 5.930, surpassing the critical t table of 1.9714. This result indicated that for every increase in the parameter of Work Flexibility, it will increase the Employee Performance. This result is aligned with a systematic review that mentioned how work flexibility can have a positive impact on the behavior, attitude, and performance of employee (Wolor et al., 2020). Another past research also showed how work flexibility including functional flexibility, working time flexibility can create a work life balance that enhance overall performance level (Davidescu et al., 2020). This result aligns with the characteristics of both Gen X and Gen Y regarding their work preferences. Previous research has mentioned how Gen X tend to maintain a great balance between their professional and family life. They will switch jobs if new opportunities offer flexible working hours that enable them to achieve a better work-life balance (Weerarathne et al., 2022). Gen Y are also mentioned to have place a strong emphasis on their work and career flexibility (Weerarathne et al., 2022). Gen Y itself are known to prioritize a work environment who fosters freedom to them as an employee. Work time flexibility and the absence of over-time working hours are two among factors that Gen Y put to thoughts before committing to their work (Chandra et al., 2015).

VI. CONCLUSION AND RECOMMENDATION

Conclusion

After the pandemic, businesses and its employee's performance are affected in many ways. The two variables used in this research, known as Perceived Job Stress and Work Flexibility are two predictors of Employee Performance. This research aim to analyzed the relationship between Perceived Job Stress and Work Flexibility after the COVID-19 pandemic on Gen X and Gen Y. A series of statistical tests was performed, including the Multi Linear Regression to gain result as follows:

1. There is a positive and significant relationship between Perceived Job Stress and Employee Performance (RQ 1 and H1 rejected)

This research has proved that Perceived Job Stress have a positive and significant relationship. This positive and significant relationship means that for every increase of Perceived Job Stress experienced by employee, it will increase their Employee Performance.

2. There is a positive and significant relationship between Work Flexibility and Employee Performance (RQ 2 and H2 accepted)

This research has proved that Work Flexibility have a positive and significant relationship. This positive and significant relationship that for every increase in employee's Work Flexibility, it will increase their Employee Performance

Recommendation

Addressing companies, it is important to note that while both variables exhibit a positive and significant correlation with the dependent variable, Perceived Job Stress exerts a more pronounced influence on Employee Performance in comparison to Work Flexibility. As a result, the primary focus should be on addressing Perceived Job Stress, despite the subsequent recommendations being applicable to both factors. Specifically, companies, particularly their Human Resource Departments, are advised to undertake the following measures such as enhancing employees' management of job stress by establishing a comprehensive stress management program. This initiative aims to maintain employees' job stress within manageable levels, consequently leading to heightened performance. Methods could encompass periodic stress level assessments or stress management workshops, imparting valuable insights into recognizing and coping with job-related stress. Companies can also strengthen the management of job stress by providing counselling, consultations, and fostering transparent communication among employees. This approach creates a secure space for employees to alleviate excessive job stress levels when necessary, contributing significantly to their psychological well-being. They can also augment employees' access to diverse forms of work flexibility, tailored to suit specific industries or departments. This could entail offering options such as a Work From Home policy, Work From Anywhere, or temporal flexibility through adjustable working hours, thus accommodating individual needs. Lastly, companies can facilitate employees' seamless adaptation to work flexibility by furnishing them with essential tools and resources. These provisions could encompass physical equipment such as computers, laptops, tablets, phones, etc., as well as digital assets like premium video conferencing access.

Meanwhile, recommendation for further research are to expand the scope of investigation to encompass other generations, such as Gen Z, would enhance the applicability of the findings for the broader workforce. Analyzing whether the observed results hold true for subsequent generations would provide valuable insights for the evolving dynamics of the workforce. Delving deeper into the dimensions of Perceived Job Stress and Work Flexibility presents an avenue for more nuanced and readily applicable outcomes. Investigating these dimensions in greater detail could yield comprehensive insights that are easier to implement in real-world scenarios. Exploring the optimal threshold at which stress levels contribute positively to employee performance before potentially turning detrimental constitutes a crucial area for further exploration. In-depth exploration of the acceptable stress level would equip companies with the necessary understanding to effectively integrate this insight into their practices. Future research could extend its scope by incorporating additional independent variables, such as other predictors of employee performance, to create a more comprehensive analysis. By examining the interplay between the variables explored in this study and other relevant factors, a more holistic understanding of employee performance determinants can be achieved. Employing a combination of quantitative and qualitative methodologies offers a promising approach to enrich the study's context and depth. By amalgamating these two approaches, a more comprehensive and nuanced understanding of the quantitative findings can be obtained, providing a well-rounded perspective on the research's implications.

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The Impact Of Consumers' Brand Switching Intention from Fast Fashion to Slow Fashion in Indonesia towards Fast Fashion Companies

Afina Anjaina Putri Rachmat¹, Fitri Aprilianty²
^{1,2} Institut Teknologi Bandung, Bandung, Indonesia

Abstract

The fashion industry has gained global recognition as one of the most environmentally harmful industries, second only to the oil industry. Fast fashion brands like Zara, H&M, GAP, Forever 21, and TopShop have become widely known among consumers. Indonesia, being with a large and growing population, presents a significant market potential for the fashion industries. However, there is a significant segment of the population that opposes this trend. Generation Z, individuals born between 1996 and 2012, are highly environmentally conscious and are spearheading the shift away from fast fashion towards sustainable and eco-friendly alternatives or slow fashion. Therefore, the objective of this research was to identify key factors that influence brand switching intention and examine the relationship between consumer satisfaction and brand switching intention in Indonesia. The research adopted a quantitative approach, utilizing online surveys with questionnaires targeted at Generation Z who have previously purchased products from fast fashion brands and have either switched or intend to switch to slow fashion. Descriptive analysis and PLS-SEM methods were employed to analyze the collected data. The findings indicate two significant factors that have the potential to influence consumers' brand switching intention from fast fashion to slow fashion in Indonesia: poor performance and foreignness. Additionally, the research reveals a significant and substantial relationship between consumer satisfaction and consumer brand switching intention. The insights gained from this research are expected to provide valuable guidance for the formulation of effective marketing strategies for fast fashion brands operating in Indonesia.

Keywords: Fast Fashion, Slow Fashion, Generation Z, Consumer Satisfaction, Brand Switching Intention

I. INTRODUCTION

The global textile and apparel supply chain has seen tremendous transformation over the past ten years, which has had an effect on the fashion sector (Doeringer & Crean, 2006). The fashion sector in Indonesia, one of the top exporters and importers of textiles, has a lot of potential given the size of the nation and its economic importance (Aldilax, et al., 2020). Major fashion labels like Louis Vuitton and Nike have become more well-known thanks to fashion e-commerce, which has seen significant sales volumes overall but particularly in the clothes category (FashionUnited, 2021). However, there is a growing backlash against fast fashion, especially among environmentally conscious Generation Z shoppers who favor apparel that is manufactured sustainably and responsibly (Michaelidou & Dibb, 2009).

With significant water waste and carbon emissions, the fashion business has been identified as one of the most environmentally destructive industries (Forum, 2020). In the last 20 years, the amount of clothing produced has increased dramatically, resulting in unnecessary waste and energy use. Fast fashion companies, which are renowned for producing clothing quickly and cheaply, contribute to these detrimental environmental effects (Remy et al., 2016). The fashion industry's reliance on unfair labor practices has also sparked worries about worker safety and compensation (Akhter, et al., 2017). These problems have sparked the growth of the slow fashion movement, which puts an emphasis on worker rights, environmental protection, and human health (Barnes, et al., 2013).

Numerous elements, such as brand loyalty and brand switching behavior, have an impact on consumer behavior

in the fashion sector (Indeed, 2022). Fast fashion companies have historically had loyal customers, but the emergence of sustainable fashion has caused a change in consumer tastes. Customers in Generation Z, in particular, have demonstrated a significant desire for ethical and sustainable fashion (Francis & Hoefel, 2018). In order to address sustainability issues, the fashion industry has also produced eco-friendly collections. Significant business opportunities are presented by sustainable fashion, and brand collaboration is growing to support ethical behavior (CBI, 2022).

For the fast fashion sector, it is essential to comprehend consumer behavior, such as brand switching intentions and preferences for sustainable fashion (Morwitz et al., 1997). Changes in the fashion industry are being driven by consumer concerns about social and environmental issues. To be competitive and satisfy environmentally concerned customers' expectations, brands must adjust and handle these issues. Brands may reflect customer values and support an ethical and sustainable fashion business by implementing sustainable practices and promoting them.

II. LITERATURE REVIEW

2.1 Consumer Brand Switching Intention

The possibility that customers may move their purchases from one brand to a rival is referred to as brand switching intention (Wu et al., 2018). It may be impacted by elements like unhappiness, boredom, or the allure of benefits provided by competing businesses. Consumer behavior is greatly influenced by brand trust, which includes consumer faith in a company's aesthetics, dependability, and moral fiber. Lower brand switching intentions are linked to great brand trust (Ghasrodashti, 2018).

Unmet Expectation

Consumers frequently experience experiential brand avoidance as a result of a mismatch between expectations and brand performance. Different manifestations of this dissonance include subpar product quality, uncomfortable retail settings, and an unsatisfying overall shopping experience. Unmet expectations, notably those connected to poor performance, overly-trendy styles, and big store discomfort, are the root of negative perceptions about brand performance. Poor performance in the context of fast fashion refers to difficulties including shoddy sewing, materials, and durability. Overly-trendy styles, meanwhile, refers to how well fast fashion follows swiftly evolving fashion trends. Big store discomfort may make customers uncomfortable, which makes it challenging to browse the merchandise (Yoon et al., 2020).

Symbolic Incongruence

When customers feel that a brand's symbolic meaning does not align with their own self-identity, brand avoidance may result. Known as symbolic incongruence, this discrepancy causes feelings of deindividuation and inauthenticity. The term inauthenticity describes the copying of famous businesses' designs, including the appropriation of high-fashion and ready-to-wear trends from around the globe. In the context of fast fashion, judgments of a lack of originality and excessive mass production are also included under the term inauthenticity. The capacity to express one's personality through rapid fashion is referred to as deindividuation. Consumers may have a negative attitude toward deindividuation if they believe that quick fashion items are all the same and lack imagination, and if they think that everyone purchases at the same stores (Yoon et al., 2020).

Ideological Incompatibility

Consumers who have political and socioeconomic ideals at odds with a company's ethos are said to avoid the brand out of moral obligation. Furthermore, two sub-constructs of ideological incompatibility are irresponsibility and foreignness. Sustainability concerns, such as environmental problems, and abuses of labor

laws, such as child labor and unhealthy working conditions, are all included in irresponsibility. Contrarily, the term foreignness describes the psychological distress and cultural alienation that people go through when their

identities are compromised as a result of societal pressures during the consumption of fast fashion (Yoon, et al., 2020).

Consumer Satisfaction

The importance of consumer satisfaction as a brand management goal has been well investigated. However, because of many contextual considerations, defining consumer satisfaction can be difficult. Three key elements make up a specific definition in the context of shared garment consumption: an overall emotional response, an emphasis on satisfaction during consumption, and a particular moment of determination. Consumer satisfaction in the context of shared clothing refers to the sentiment generated by assessing the goods and services offered by the platform after use. Whether or whether the goods or services live up to consumers' expectations and offer good value for their money determines whether they are satisfied or dissatisfied. Despite not owning the clothing in shared garment consumption, factors like quality, emotional appeal, affordability, and alignment with societal ideals influence customers' appraisal (Park & Joyner Armstrong, 2019).

Consumer Trust

The term consumer trust refers to a wide and general trust that is not specific to any one behavior or component in a relationship and is typically held by one party toward the other (Swan et al., 1988; Driscoll, 1978). Trust, however, is not a constant quality and can alter over time depending on variables like perceived risk and interdependence between the parties (Rousseau et al., 1998). Different trust-building strategies have been put out to take into account this changing nature of trust.

III. RESEARCH METHODOLOGY

Research Design

The study process starts with problem identification through preliminary research, which was completed in Chapter 1. Chapter 2 then explains a literature review that is connected to the difficulties. The survey method will be used to gather data for this study using a quantitative methodology. Following data collection, conclusions and recommendations will be reached through analysis and discussion.

Research Approach

Quantitative Approach

With the aid of mathematical methods such as statistics, quantitative research focuses on gathering numerical data to describe and study a specific phenomenon (Aliaga & Gunderson, 2006). A quantitative research strategy is used in the current study to collect data from a bigger and more varied target population. This method examines the correlations between various variables and validates whether specific aspects affect consumers' intention to switch brands. The survey method, one of several techniques for doing quantitative research, enables systematic data collection using well-structured questionnaires, simplifying the analysis of quantitative data for statistical inference and interpretation.

Survey Method

The survey approach includes gathering information from a group of people based on their answers to a series of questions. An online survey is used as the method of data collecting in this study. When resources are scarce, questionnaires are a practical and economical instrument. The demographic factors and consumer fashion engagement among Indonesians are measured in this study using the survey method and questionnaires. A five-point Likert scale is employed in the questionnaire to evaluate respondents' consideration of and interest in clothing. By conducting the survey in Bahasa Indonesia, respondents can freely express their opinions in their mother tongue, improving the precision and dependability of the information gathered.

Data Collection Population And Sample

According to Malhotra (2010), the study needs a minimum sample size of 200 participants. Consumers who have made purchases at well-known fast fashion retailers including ZARA, MANGO, H&M, Topshop, and Forever21 are included in the study's target group. These companies stand for the popular fast fashion brands among young women in Korea and Spain nowadays. Fast fashion stores generally target young females by providing cutting-edge looks. In spite of having a favorable outlook on both rapid fashion and sustainable consumption, there is a paradox in sustainable fashion that has to be investigated to comprehend why young Indonesian consumers eschew quick fashion.

Sampling Technique

Non-probability sampling, which will be used in this study, incorporates the researcher's subjective judgment in choosing respondents (Yeo et al., 2017). Convenience sampling, snowball sampling, quota sampling, and purposive sampling are a few examples of non-probability sampling types. Purposive sampling will be used for this study. An approach expressly selected with the research's objective or purpose in mind is called purposive sampling. The chosen sample should match the criteria of having previously shopped for fast fashion companies and possessing prior knowledge of slow fashion as Generation Z because the goal of this research is to analyze the influence of brand switching intention from fast fashion to slow fashion.

Questionnaire Design

Table 3.1 provides a detailed analysis of the design of the questionnaire.

Table 3.1 Questionnaire Operational Variable

Variable	Label	Indicators
Unmet expectation	UE1	The performance of fast fashion brands is poor
	UE2	My hate for fast fashion brands is linked to their bad performance.
	UE3	I am dissatisfied with fast fashion brands
Symbolic incongruity	SI1	The products of fast fashion do not reflect who I am
	SI2	The products of fast fashion do not fit my personality
	SI3	I don't want to be seen with fast fashion brands.
	SI4	Fast fashion brands symbolize the kind of person I would never want to be
Ideological incompatibility	II1	Fast fashion brands act irresponsible
	II2	Fast fashion brands act unethical
	II3	The fast fashion company violates moral standards
	II4	Fast fashion brands don't match my values and beliefs.
Poor performance	PP1	Fast fashion products stitching is not strong enough
	PP2	Fast fashion's clothings form often changes after washing and repeated use.
	PP3	Cheap material is used in fast fashion products.
	PP4	Fast fashion products are low priced and not durable at all
Overly-trendy styles	OS1	Fast fashion styles are too trendy to use for a long time
	OS2	Fast fashion styles are too sensitive to changing trends
Big store discomfort	BSD1	Fast fashion stores are too big to look around
	BSD2	Fast fashion clothing displays are not well organized

	BSD3	Waiting time for the cashier in fast fashion stores is too long
Inauthenticity	I1	Fast fashion styles are similar to other brands.
	I2	Fast fashion styles have too much mass appeal.
	I3	Fast fashion styles look like copies
	I4	Fast fashion styles are dull
Deindividuation	D1	Fast fashion products make it hard to express my personality.
	D2	Fast fashion products make it hard to create my own style
Irresponsibility	IR1	Fast fashion products stimulate over-consumption
	IR2	Fast fashion products contaminate the environment.
	IR3	Fast fashion brands exploit labor in less developed
Foreignness	F1	Fast fashion ruins my own fashion.
	F2	Fast fashion perverts traditional culture
	F3	Fast fashion makes the world's fashion all look the same
Consumer satisfaction	CS1	The fast fashion products I buy meet my expectations
	CS2	I have done the right thing by buying fast fashion products
	CS3	I feel satisfied with the services provided by fast fashion brands.
	CS4	I like the services provided by fast fashion brands
Consumer trust	CT1	I trust fast fashion brands
	CT2	Fast fashion brands are honest brands
	CT3	Fast fashion brands are safe
Brand switching intention	BSI1	I will choose slow fashion brands rather than fast fashion brands next time I need to shop
	BSI2	Next time I shall need apparel from slow fashion brands rather than fast fashion brands
	BSI3	I am thinking about changing from fast fashion brands to slow fashion brands

Additionally, the researcher includes inquiries addressing demographic and behavioral characteristics together with the operational variables. Table 3.2 provides a thorough overview of the questionnaire's structure and content by detailing the questionnaire's development, including the exact components and their order.

Table 3.2 Questionnaire Demographic-Behavioral Factors

Factors	Components	Answer Options
Demographic	Age	a < 13 years old b 13 - 15 years old c 16 - 19 years old d 20 - 24 years old e 25-35 years old f >35 years old

Gender		a Female b Male
Income range per month		a No income b < Rp1,000,000 c Rp1,000,000 - Rp3,000,000 d Rp3,000,001 - Rp5,000,000 e Rp5,000,001 - Rp9,000,000 f > Rp9,000,000
Occupation		a Student b Entrepreneur c Private employees d Government employees e Freelancer f Others
Behavioral	Have you ever bought products from fast fashion brands such as Zara, H&M, Topshop, etc. before?	a Yes b No
	Have you ever heard of slow fashion before?	a Yes b No

Data Analysis

Partial Least Squares Structural Equation Modeling (PLS-SEM)

The structural equation modeling (SEM) method known as partial least squares (PLS) will be used to examine the data collected for this investigation. To incrementally maximize the variance of endogenous components, PLS is a statistical method used in the field of SEM (Miuradewi, 2020). Based on both quantitative and qualitative causal assumptions, causal relationships are examined and evaluated using a statistical technique known as SEM.

IV.RESULT/FINDING

4.1 Quantitative Approach Analysis

This study's technique, which was quantitative in nature, involved conducting a questionnaire-based survey. 257 people answered the questionnaire, which satisfies the prerequisite for a minimum sample size as described in chapter three.

Respondents' Socio-Demographic Profile

4.1.1.1 Age

An empirical representation of the participant distribution across different age cohorts. 31.9% are between the ages of 16 and 19 (82 respondents), and 39.7% are between the ages of 20 and 24 (102 respondents).

Gender

The data offers information on how participants who are male and female are represented in the sample. Out

of the total respondents, 56.4% (145 respondents) are female and 43.6% (112) are male.

Income per Month

An empirical representation of the participant distribution across different occupations. Based on the information, out of the 257 respondents, 27.6% (71 respondents) stated they had a monthly income of less than Rp1,000,000; and 35.4% (91 respondents) stated they had a monthly income between Rp1,000,000 and Rp3,000,000.

Occupation

Based on the data it provided 257 respondents. Out of all the respondents, 54.1% (139 respondents) are students, 28.8% (74 respondents) are private employees.

Partial Least Square Structural Equation Modeling (PLS-SEM) Analysis Result

In this study, the conceptual framework was established and evaluated using partial least squares (PLS) analysis. The study's relationships between the variables' associations were analyzed and quantified using the SmartPLS program.

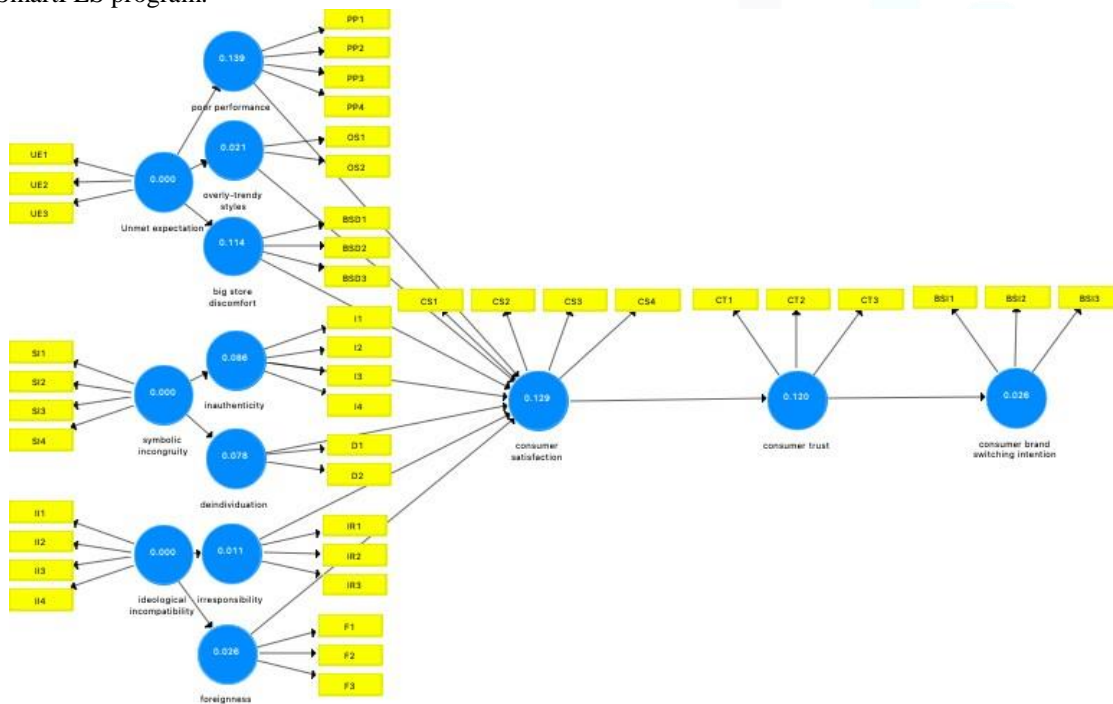


Figure 4.1 PLS-SEM Analysis Result

The developed model has sixteen paths connecting thirteen related variables. The following subsections include the calculations for the reflective measuring model.

Structural Path Significance

These findings highlight the significance of the identified variables in shaping consumer satisfaction and suggest the need to address and mitigate the factors leading to consumer avoidance in the fast fashion industry to enhance overall customer satisfaction. Furthermore, calculating the Goodness of Fit (GoF) combines measures of effect size and convergent validity to evaluate the model's quality, providing an overall assessment of how well the model aligns with the observed data.

Table 4.2 Goodness of Fit Result

Variables	R2	Q2
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Poor Performance	0.468	0.284
Overly-trendy Styles	0.250	0.205
Big Store Discomfort	0.208	0.139
Inauthenticity	0.378	0.264
Deindividuation	0.327	0.246
Irresponsibility	0.443	0.280
Foreignness	0.334	0.218
Consumer Satisfaction	0.674	0.494
Consumer Trust	0.471	0.341
Consumer Brand Switching Intention	0.570	0.388
Average	0.412	0.286
GoF		0.184

The GoF result from this investigation, which is shown in Table 4.2, indicates a value of 0.184. Given that the GoF value is greater than 0.1, this number indicates that the model can satisfactorily explain the available empirical data. The model therefore effectively captures and accounts for the observed data, further proving its validity and dependability in explaining the phenomenon under study, based on the results of the GoF analysis.

Hypothesis Testing

The analysis used by the researcher in this section includes assessing T-values and inner model path coefficients, which provide important insights into the relevance of the results. Table 4.3's presentation of the results of the hypothesis testing enables a thorough comprehension of the study's findings and their statistical significance. The statistical results for the investigated hypotheses are displayed in the table, giving a thorough comprehension of the research findings and their importance.

Table 4.3 Hypothesis Testing

Hypothesis	Structural Path	T Values	P Values	Result
H1	Unmet Expectation -> Poor Performance	23.044	0.000	Accepted
H2	Unmet Expectation -> Overly-trendy styles	8.320	0.000	Accepted
H3	Unmet Expectation -> Big Store Discomfort	9.029	0.000	Accepted
H4	Symbolic Incongruence -> Inauthenticity	13.872	0.000	Accepted
H5	Symbolic Incongruence -> Deindividuation	10.741	0.000	Accepted
H6	Ideological Incompatibility-> Irresponsibility	16.821	0.000	Accepted
H7	Ideological Incompatibility -> Foreignness	16.821	0.000	Accepted
H8	Poor Performance -> Consumer Satisfaction	4.757	0.000	Accepted
H9	Overly-trendy Styles -> Consumer Satisfaction	1.531	0.126	Rejected
H10	Big Store Discomfort -> Consumer Satisfaction	1.125	0.261	Rejected
H11	Inauthenticity -> Consumer Satisfaction	1.370	0.171	Rejected
H12	Deindividuation -> Consumer Satisfaction	1.301	0.194	Rejected
H13	Irresponsibility -> Consumer Trust	1.073	0.284	Rejected
H14	Foreignness -> Consumer Satisfaction	4.846	0.000	Accepted
H15	Consumer Satisfaction -> Consumer Switching Intention	23.894	0.000	Accepted
H16	Consumer Trust -> Consumer Brand	24.623	0.000	Accepted

UNMET EXPECTATION POSITIVELY AFFECTS POOR PERFORMANCE.

The first hypothesis, which asserts that unmet expectations positively influence poor performance, is supported by the data, according to the analysis carried out in this study. This outcome is consistent with prior research by Yoon, et al., (2020), who also highlighted the link between disappointed expectations and different unfavorable opinions of fast fashion, such as poor execution. Therefore, a thorough explanation can be provided for the large beneficial impact that unmet expectations have on poor performance among Indonesian customers.

UNMET EXPECTATION POSITIVELY AFFECTS OVERLY-TRENDY STYLES.

The second hypothesis, which claims that unmet expectations positively influence overly-trendy styles, is discovered to be validated by the data based on the analysis carried out in this study. This result is consistent with earlier research by Yoon, et al. (2020), which examined Spanish consumers and discovered that consumers were reluctant to purchase fast fashion due to concerns about its physical characteristics, such as overly-trendy styles. Thus, a thorough explanation can be provided for the enormous positive impact that disappointed expectations have had on excessively contemporary fashion among Indonesian customers.

UNMET EXPECTATION POSITIVELY AFFECTS BIG STORE DISCOMFORT.

The third hypothesis, which indicates that unmet expectation positively increases big store discomfort, is supported by the data, according to the analysis carried out in this study. This finding is consistent with earlier research by Kim et al. (2013), which found that big store discomfort was a result of higher-order factors including unmet expectations. As a result, it is possible to fully explain the large beneficial impact of unmet expectations on big store discomfort among Indonesian consumers.

SYMBOLIC INCONGRUENCE POSITIVELY AFFECTS INAUTHENTICITY.

The fourth hypothesis, which asserts that symbolic incongruence positively promotes inauthenticity, is discovered to be validated by the data based on the analysis carried out in this study. According to earlier study by Rodrigues et al. (2021), symbolic incongruity has a beneficial impact on brand inauthenticity as a catalyst for brand hatred, especially when a brand breaks its promises (Schallehn et al., 2014). This conclusion is consistent with their findings. Therefore, a thorough explanation of the considerable favorable impact of symbolic incongruence on inauthenticity among Indonesian customers is possible.

SYMBOLIC INCONGRUENCE POSITIVELY AFFECTS DEINDIVIDUATION.

The fifth hypothesis, which asserts that symbolic incongruence favorably promotes deindividuation, is discovered to be supported by the results based on the analysis carried out in this study. This finding is consistent with earlier research by Lee et al. (2009), which found that some people avoid brands with symbolic incongruity because they perceive it to be indicative of a lack of personality. Thus, a thorough explanation can be provided for the large favorable effect that symbolic incongruence has on deindividuation among Indonesian consumers.

IDEOLOGICAL INCOMPATIBILITY POSITIVELY AFFECTS IRRESPONSIBILITY.

The sixth hypothesis, which asserts that ideological incompatibility positively promotes irresponsibility, is discovered to be validated by the data based on the analysis carried out in this study. This result is consistent with earlier research by Hashim & Kasana (2019), who found that ideological incompatibility exposes irresponsible brands as one of the prominent causes of anti-consumption. As a result, the large beneficial effect of ideological incompatibility on reckless purchasing behavior among Indonesians may be fully explained.

IDEOLOGICAL INCOMPATIBILITY POSITIVELY AFFECTS FOREIGNNESS.

The seventh hypothesis, which argues that ideological incompatibility positively influences foreignness, is found to be confirmed by the data, according to the analysis carried out in this study. This result is consistent with prior research by Yoon et al. (2020), who discovered that foreignness, a factor in ideological incompatibility, had an impact on people's opposition to fast fashion. This provides a thorough justification for the considerable beneficial impact of ideological incompatibility on perceived foreignness among Indonesian consumers.

POOR PERFORMANCE NEGATIVELY AFFECTS CONSUMER SATISFACTION.

According to the analysis done for this study, the findings support the eighth hypothesis, which claims that poor performance has a negative impact on customer satisfaction. This outcome is consistent with prior research by Yoon et al. (1976), which found that performance that matches expectations is associated with pleasure. As a result, a thorough explanation can be provided for the large negative impact that poor performance has on consumer satisfaction among Indonesian consumers.

OVERLY-TRENDY STYLES NEGATIVELY AFFECT CONSUMER SATISFACTION.

The analysis in this study disproves the ninth hypothesis that suggests overly-trendy styles have a negative impact on consumer satisfaction. The T-value is below the significance level of 0.05, leading to the rejection of this hypothesis. This contradicts prior research by Sun et al. (2012) who found that customers prioritize well-crafted designs over passing trends, leading to increased satisfaction. The disparity in findings may be due to cultural differences between Chinese and Indonesian customers, as previous studies focused on Chinese customers while this study focused on Indonesian customers. These cultural variations in purchasing behavior may explain the inability to confirm the relationship. Consequently, this finding addresses the first research question, indicating that overly-trendy styles do not influence consumers' brand switching intention from fast fashion to slow fashion in Indonesia.

BIG STORE DISCOMFORT NEGATIVELY AFFECTS CONSUMER SATISFACTION.

The analysis in this study contradicts the tenth hypothesis proposing a negative influence of big store discomfort on consumer satisfaction. The T-value is below the significance level of 0.05, leading to the rejection of this hypothesis. This finding contradicts previous research by Nurhajjah et al. (2022), who found a positive relationship between store atmosphere and customer satisfaction. The difference in findings can be attributed to the focus on different store environments, as previous studies examined the Business Centre Shop in Cirebon while this study focused on fast fashion stores. This discrepancy may explain the inability to confirm the relationship in this research. Therefore, this finding addresses the first research question, indicating that big store discomfort does not affect consumers' brand switching intention from fast fashion to slow fashion in Indonesia.

INAUTHENTICITY NEGATIVELY AFFECTS CONSUMER SATISFACTION.

The analysis in this study contradicts the eleventh hypothesis proposing a negative influence of inauthenticity on consumer satisfaction. The T-value is below the significance level of 0.05, leading to the rejection of this hypothesis. This finding contradicts previous research by Kadirov et al. (2013), who found that consumers prioritize authenticity from brands and companies as a factor influencing satisfaction. The difference in findings can be attributed to the focus on overall business marketing strategy in previous studies, while this study specifically examines brands in the fast fashion industry. This discrepancy may explain the inability to confirm the relationship in this research. Therefore, this finding addresses the first research question, indicating that inauthenticity does not impact consumers' brand switching intention from fast fashion to slow fashion in Indonesia.

DEINDIVIDUATION NEGATIVELY AFFECTS CONSUMER SATISFACTION.

The analysis in this study does not support the twelfth hypothesis, which suggests a negative influence of deindividuation on consumer satisfaction. The T-value falls below 1.96 at a significance level of 0.05, leading to the rejection of this hypothesis. This finding contradicts previous research by Yan & Lotz (2009), who found that deindividuation influences the level of satisfaction or dissatisfaction among purchasers. The disparity in findings can be attributed to previous studies focusing on service providers in the southwestern region of the United States, while this study specifically examines the fashion industry, particularly fast fashion, with Indonesian respondents. These cultural differences between countries may explain the inability to confirm the relationship in this research. Therefore, this finding addresses the first research question, indicating that deindividuation does not impact consumers' brand switching intention from fast fashion to slow fashion in Indonesia.

IRRESPONSIBILITY NEGATIVELY AFFECTS CONSUMER SATISFACTION.

Based on the analysis in this study, the thirteenth hypothesis, which suggests a negative influence of irresponsibility on consumer satisfaction, is not supported by the data. The T-value falls below 1.96 at a significance level of 0.05, leading to the rejection of this hypothesis. This finding contradicts previous research by Simonson (1991), who found that irresponsibility significantly contributes to dissatisfaction. The disparity in findings can be attributed to previous studies focusing on respondents from Northwestern University in Boston, Massachusetts, USA, while this study focuses on Indonesian respondents. These cultural differences between countries may explain the inability to confirm the relationship in this research. Therefore, this finding addresses the first research question, indicating that irresponsibility does not impact consumers' brand switching intention from fast fashion to slow fashion in Indonesia.

FOREIGNNESS NEGATIVELY AFFECTS CONSUMER SATISFACTION.

The fourteenth hypothesis, which argues that being foreign negatively affects consumer satisfaction, is shown to be validated by the data based on the analysis done in this study. The observed data show that foreignness does indeed have a detrimental impact on consumer satisfaction. This outcome is consistent with earlier research by Garrison, et al. (1976), which found that being foreign may cause contentment to decline. As a result, a thorough explanation can be provided for the strong negative impact of foreignness on consumer satisfaction among Indonesian consumers.

CONSUMER SATISFACTION POSITIVELY AFFECTS CONSUMER TRUST.

The fifteenth hypothesis, which asserts that consumer satisfaction positively increases consumer trust, is found to be validated by the data based on the analysis carried out in this study. According to earlier research by Junaedi et al. (2020), higher levels of pleasant consumer experience increase consumer satisfaction, which has a favorable impact on consumer trust. This conclusion is consistent with their findings. Thus, a thorough explanation can be provided for the strong beneficial impact of consumer satisfaction on consumer trust among Indonesian consumers.

CONSUMER TRUST NEGATIVELY AFFECTS CONSUMER BRAND SWITCHING INTENTION.

The sixteenth hypothesis, which asserts that consumer trust negatively affects consumer brand switching intention, is found to be validated by the data based on the analysis carried out in this study. This result is consistent with prior research by Wang, et al. (2022), which found that brand trust increases the possibility that customers won't move to competing products. Thus, a thorough explanation can be provided for the strong negative impact of consumer trust on Indonesian consumers' inclination to switch brands.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

This study aims to identify the factors influencing Indonesian consumers' intention to switch brands from fast fashion to slow fashion and examine the impact of consumer satisfaction on brand switching intention. Quantitative data was collected through a survey and analyzed using descriptive statistics and PLS-SEM analysis. The findings reveal two significant factors influencing brand switching intention: poor performance and foreignness. Poor performance refers to consumers perceiving unsatisfactory performance from fast fashion brands, leading them to consider switching to slow fashion alternatives. Foreignness, on the other hand, indicates that the perceived foreign nature of fast fashion brands may influence consumers to shift towards slow fashion options. Furthermore, the analysis shows that consumer satisfaction has a significant impact on brand switching intention, with dissatisfied consumers more likely to explore alternative brands and switch their buying preferences within the fast fashion context.

Recommendations

Fast Fashion Industry

Based on the findings of this research, several recommendations can be made for fast fashion brands to retain customers and maximize sales, as well as for future researchers in this field. Firstly, brands should address issues related to poor performance by ensuring product quality, addressing flaws, and providing reliable customer service. Secondly, they should tackle negative perceptions associated with foreignness through transparent supply chains and sustainable practices. Thirdly, brands should prioritize consumer satisfaction by actively listening to feedback and enhancing the shopping experience. Lastly, building trust and transparency through clear communication about origins and initiatives is crucial. By focusing on these factors, fast fashion brands can foster loyalty, reduce brand switching, and maintain a competitive edge.

Future Research

The study aimed to identify factors influencing consumers' brand switching intention from fast fashion to slow fashion in Indonesia. Variables such as poor performance, overly-trendy styles, big store discomfort, inauthenticity, deindividuation, irresponsibility, and foreignness were examined. Future research should explore additional factors specific to the Indonesian context and validate the variables to strengthen the hypotheses. Different research methods can complement the findings, and the inclusion of millennials' experiences and motivations in brand switching is recommended. The study also provided marketing recommendations, but future research should expand on these and explore innovative strategies like technology integration, personalization, and sustainability initiatives to enhance the customer experience and loyalty.

Research Implications

Practical Implication

This study provides useful information and references for enhancing marketing strategies in the fast fashion sector, particularly in terms of enhancing customer satisfaction. The study's findings offer useful information and a greater understanding of the variables influencing customers' intention to move from fast fashion to slow fashion. With the use of this research, marketers can learn more about the ways in which these diverse aspects affect consumer behavior and utilize that understanding to create strategies that will be appealing to their target audience.

Theoretical Implication

This study makes a significant contribution to the study of brand switching theory and its use in analyzing consumer purchasing behavior. This study provides a thorough view on the elements influencing customers' intention to switch brands from fast fashion to slow fashion by embracing a number of theories and concepts. The results of this study offer empirical support and new understanding of the complicated dynamics that influence customer brand switching.

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Valuation of Basic Materials Sub-Sector Companies Metal and Minerals Using Discounted Cash Flow and Relative Valuation Methods in 2022

Laila Nurjannah¹, Dwi Fitriзал Salim²

^{1,2} Master of Management, Telkom University, Bandung, Indonesia

Abstrak

This study aims to calculate the fair value of company shares in the basic material sub-sector of the metal and mineral industry using the Discounted Cash Flow method, the Free Cash Flow to Firm (FCFF) approach and the Relative Valuation (RV) using the Price to Earning Ratio (PER) and Price approaches. to Book Value (PBV). The basis for the estimate is an analysis of the financial statements of the three companies for the period 2017 to 2021, to evaluate the fair price of shares in 2022, with the performance of these financial statements used as a basis for historical data, projections are carried out using pessimistic, moderate and optimistic scenarios for the projection 2022-2026. The analysis concludes that by using the DCF-FCFF, ANTM's stock price is overvalued in the pessimistic scenario and moderate, undervalued in the optimistic scenario. INCO shares are overvalued in pessimistic scenarios and undervalued in moderate and optimistic scenarios. Meanwhile, NIKL's shares are undervalued in all scenarios. Analysis using ANTM's PBV is overvalued in pessimistic scenarios and undervalued in moderate and optimistic scenarios. Meanwhile, INCO shares are undervalued in all scenarios and NIKL shares are overvalued in all scenarios. Furthermore, using the undervalued PER of ANTM and INCO shares in all scenarios, NIKL shares are overvalued in all scenarios. So, the conclusion of this study is to buy ANTM, INCO and NIKL shares.

Keywords: *Valuation, Metal and Minerals, Discounted Cash Flow, Free Cash Flow to Firm, Relative Valuation, PER dan PBV.*

I. INTRODUCTION

Stock investment has a high level of risk because of its "high risk, high return" nature. However, stock returns that fluctuate one-sidedly can benefit investors while preventing significant losses. (Bodie et al., 2018). Therefore, investors are advised to carry out a valuation before starting to invest in certain stocks to understand their intrinsic value (Hutapea et al, 2012).

Metal mining is considered to have a bright future. This is taking into account the ongoing global economic recovery, which will affect the prices of base metals such as nickel and tin in the first half of 2022, with the electric vehicle program in the long term will further boost sales of nickel ore in the domestic market. (*kontan.co.id*, 2021). This is supported by the positive growth trend of Indonesia's tin and nickel exports from 2020 to 2021.

According Badan Pusat Statistik, the gross domestic product of the base metal industry in the second quarter of 2022 was around Rp. 30.64 trillion, this value increased by 15.79% compared to the previous year on a year on year (yoy) basis of around Rp. 26.45 trillion. Figure 1 the rate of return on the Daily Composite Stock Price Index (IHSG) January 2012 – December 2021 shows the high volatility occurred in March 2020 where the lowest rate of return occurred on March 9 2020 of -6.58% and again strengthened by 10.19% on March 26 2020. This is in line with the government deciding Covid-19 as a national disaster in March 2020. Furthermore, high volatility will affect the risks that will be borne by investors.

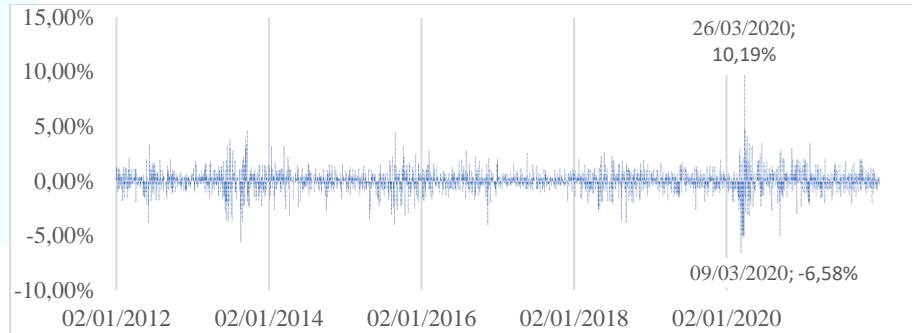


Fig. 1. Trends Return of IHS G from 2012 – 2021
Source: *finance.yahoo.com (data processed)*

Fig. 2 shows that the highest level of fluctuation occurred in 2020. The highest rate of return for ANTM shares occurred on October 14 2020 of 24.84%. This is supported by positive sentiment regarding the plan to build a battery factory from the government of IDR 178 trillion. Meanwhile, the lowest return occurred a few months earlier, namely March 17 2020 of -15.10%, due to the impact of government policies to limit social relations and work from home. Then, proves that the highest return on INCO shares in the last ten years occurred on March 26 2020 of 17.76% which was supported by positive sentiment for the purchase of shares by PT Inalum which is a BUMN Mining holding of 20%. Meanwhile, the lowest return occurred in the previous three years, namely on January 13 2017 of -15.93%. This decrease was partly due to the decline in the selling price of nickel products. The highest return on NIKL shares in the last ten years occurred on April 26 2016 with a return of 93.55%, the rise in share prices was in line with the company's performance that managed to escape from losses and the lowest return occurred on February 17 2017 of -24.35%, this is in line with global tin prices which were observed to fall 2.42%.

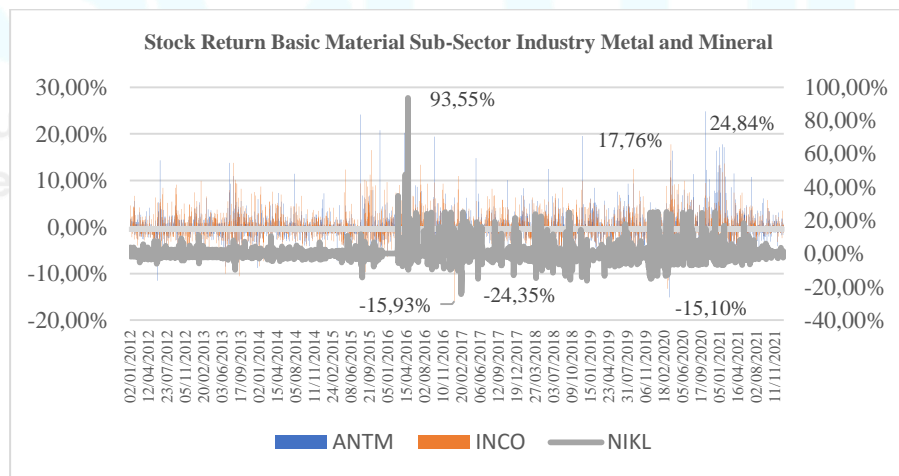


Fig. 2. Stock Return ANTM, INCO and NIKL 2012 - 2021
Source: *finance.yahoo.com (data processed)*

Based on the phenomenon and description of the background above, it shows that fluctuations in the movement and growth of stock prices for metal and mineral industrial companies have a higher risk/return than the JCI risk/return this research was conducted and entitled “Valuation of basic materials sub sector-companies metal and minerals using discounted cash flow and relative valuation methods in 2022 ”

II. LITERATURE REVIEW

This study makes use of numerous preceding studies as a connection with determine the method of calculation and how to do the calculation, in addition to to carry ut an evaluation.

Valuation is carried out to determine the value of a particular asset that will be used as an investment object based on variables related to the return on investment in the future, besides that a comparison is also made with similar assets. The ability to perform valuations is a very important element in investing (Pinto et al, 2015) in order to be profitable, investors will buy stocks when the price is below their fair value (Damodaran, 2006).

Discounted Cash Flow (DCF)

The Discounted Cash Flow (DCF) method is a valuation method that assumes the value of an asset is the present value of the expected cash flow in the asset, then discounted again at a rate that reflects the risk of the cash flow (Pinto, 2015).

The formula for calculating the DCF method is (Damodaran, 2012):

$$\text{Value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t}$$

Free Cash Flow to Firm (FCFF)

Is the amount of cash flow available to all investors in a company, including common stockholders, bondholders and preferred stockholders (Damodaran, 2012). The formula is as follows:

$$\text{FCFF} = \text{EBIT} (1 - \text{Tax Rate}) + \text{Depreciation} - \text{Capex} - \Delta \text{Working Capital}$$

The first stage of FCFF analyzes the historical performance of the company. The calculation components analyzed are company income, operational costs, depreciation costs, capital expenditure, net working capital obtained from the financial reports for the study period, namely 2017 to 2021 which will be a reference for making projections for the period 2022 to 2026.

The next step is to determine growth projections based on established criteria such as pessimistic, moderate, and optimistic. An analysis of industrial growth is obtained by processing revenue data for companies engaged in sectors that are members of the metal and mineral basic material sub-sector for 2017-2021, there are 10 listed companies. The WACC value has calculation components such as the cost of equity multiplied by the company's total equity and the cost of debt after deducting taxes and multiplied by the company's total liabilities. Summing all FCFF and terminal values that had been projected to the present using WACC as the discount rate would produce enterprise value (EV). Subtracting EV by debt and adding it to cash and cash equivalents would produce equity value. Dividing the equity value by the number of outstanding shares would produce the intrinsic value per share. The intrinsic value obtained needed to be further validated using Relative Valuation (RV) with Price to Earnings Ratio (PER) and Price to Book Value (PBV) approaches (Gilbran and Hendrawan, 2022).

Relative Valuation (RV)

RV compares a company with other similar companies or with the industry in which the company is located. PER is a ratio that measures how investors view the company's growth prospects in the future. PBV is used to determine whether a stock is valued too high or too low.

PER Formula is as follows (Damodaran, 2012):

$$PER = \frac{\text{Market Price per share}}{\text{Earning Per Share}}$$

PBV Formula is as follows (Damodaran, 2012):

$$PBV = \frac{\text{Price per share}}{\text{Book value of equity per share}}$$

Previous Research

Soelistyo and Hendrawan (2022) accomplishing research objectives to discover the honest value or intrinsic value of the automobile and components enterprise in 2021. The historical performance of each company is derived from financial data for 2016 and 2020, and three optimistic, moderate and pessimistic scenarios are used to project it from 2021 to 2025. DCF and RV are the 2 methods used in this study. Results of the DCF, ASII, and INDS methodologies overpriced all scenarios. Next, GJTL overvalued all scenarios, while SMSM overvalued pessimistic and moderate scenarios but undervalued optimistic scenarios. Investment advice from SMSM and GJTL is to buy advice from ASII and INDS is to sell.

Ge (2022) conducted research aimed at calculating the fair value of the company TJX which is the world's leading off-price retailer. This research uses the Gordon Growth Model and Discounted Cash Flow methods with data for 2016-2020. The research results show that the two methods together show that TJX's shares are overvalued and the recommendation is not to buy new shares from TJX.

Hendrawan et al. (2020) performed research to decide the fair fee of local improvement Banks listed at the IDX in 2018, using the DCF-FCFE technique and validating the results the use of the RV-in keeping with PBV approach. Financial historical data for five years 2013-2017. According to the study's findings, utilizing FCFE for BJBR and BJTM issuers is overpriced in every circumstance, but BEKS is consistently discounted. Results of the study sample are in a variety of sectors utilizing the PER and PBV techniques, meaning that the calculation results are feasible, except for the PBV from BEKS issuers in a moderate and optimistic scenario but not significant. The recommendations for the three samples are selling BJBR and BJTM shares and buying BEKS shares.

Silalahi et al. (2022) conducted research on telecommunications, determining if the intrinsic value of shares is overpriced, undervalued, or fairly valued for financial and pharmaceutical enterprises. On eleven firms listed with ISSI, particularly in the telecommunications, pharmaceutical, and financial industries, quantitative research techniques were used. The methods used are PER and PBV. Using PER, this research finds that TLKM, KAEF, KLBF, PYFA, and SIDO are undervalued, while six other stocks ISAT, DVLA, MERK, TSPC, BRIS, and BTPS are overvalued. DVLA, KAEF, KLBF, MERK, and SIDO are five businesses with undervalued shares when using the Price Book Value (PBV) method. Furthermore, still using the PBV method, six companies were found to be overvalued, namely TSPC, BRIS, PYFA, ISAT, BTPS and TLKM and six other companies were assessed as Fair-valued, namely BTPS, KLBF, TSPC, SIDO, BRIS and KAEF using the PER and PBV methods.

Hibban dan Wardana (2021) conducted research to determine the fair value of Islamic banking shares traded on the IDX. BRIS, BTPS, and PNBS are the three Islamic bank businesses that are included in this research sample and are listed on the IDX from 2018 to 2021. PBV and PER are the two approaches taken. Based on research findings, the PBV approach recommends buying shares of PT BTPN Syariah and PT Bank Syariah Indonesia Tbk because they are undervalued shares, while the PER approach recommends buying shares of PT Bank Syariah Indonesia Tbk.

III. METHODOLOGY

This research uses a quantitative descriptive approach and aims to provide an up-to-date picture of the fair price of the sample company's shares. The method used is the Discounted Cash Flow (DCF) Free Cash Flow to Firm (FCFF) approach and the Relative Valuation Price Earning Ratio (PER), Price Book Value Ratio (PBV) and using three scenarios: pessimistic, moderate and optimistic.

The population of this research consists of all shares in publicly traded firms in the basic materials sector of the metal and mineral industry listed on the Indonesian Stock Exchange (IDX). Purposive sampling is the sampling method that researchers use.

Following are the criteria and purposive sampling method used:

1. Stocks in the basic materials sub-sector of the metal and mineral industry listed on the Indonesian Stock Exchange (IDX).
2. Companies that have published financial reports for the last 5 (five) years.
3. Companies with positive net margins in the last 3 years
4. Companies listed on the Indonesian Stock Exchange as of January 1, 2017.

PT. Aneka Tambang Tbk (ANTM), PT. Vale Indonesia Tbk (INCO), and PT. Pelat Timah Nusantara Tbk (NIKL) are companies that satisfy the study's sample requirements.

Data Gathering

1. Data collection in this study uses secondary data sourced from published and audited financial reports in the last five years of the sample companies, namely from 2017-2021 which were processed from the annual reports of sample companies and websites. www.idx.co.id,
2. Daily stock prices of sample companies as well as the Composite Stock Price Index (IHSG) period January 2012-December 2021 obtained from www.finance.yahoo.com while the stock beta was obtained from Pefindo.
3. PER and PBV industry data is taken from the company's annual report for 2021.

IV. RESULTS

A. PT Aneka Tambang Tbk

The primary assumption model for the projection DCF-FCFF will be the financial behavior and average growth of ANTM based on historical data from the company's Annual Report for the 2017–2021 timeframe:

Table 1. Historical Data of ANTM Financial Report in 2017-2021

	2017	2018	2019	2020	2021	Average
Revenue	12.653.619	25.241.268	32.718.542	27.372.461	38.445.595	
Growth		99%	30%	-16%	40%	38%
Total Operating Expense	11.222.394	22.384.360	30.652.920	24.240.823	34.853.716	81%
EBITDA	1.431.225	2.856.908	2.065.622	3.131.638	3.591.879	
Depresiasi	830.618	1.004.178	1.110.007	1.099.335	853.735	4%
EBIT	600.607	1.852.730	955.615	2.032.303	2.738.144	
Capex	2.321.508	2.137.853	1.137.324	506.759	429.060	6,7%
Total Current Asset	9.001.935	8.498.438	7.665.235	9.150.514	11.728.143	
Cash and Equivalent	5.550.677	4.299.068	3.636.243	3.984.388	5.089.160	
NetCurrent Liabilities	1.937.242	2.938.135	2.299.846	3.348.885	4.394.107	
Working Capital	1.514.016	1.261.235	1.729.146	1.817.241	2.244.876	
Δ WC		(252.781)	467.911	88.095	427.635	0,47%

Source: ANTM Annual Report (data processed)

Based on Table 1, it can be seen that ANTM's average revenue growth from 2017 to 2021 is 38.3%, with a maximum value of 99% and a minimum value of -16% revenue in 2020, due to the COVID-19 pandemic. Therefore, growth anomalies are excluded from the calculations, so that the average is obtained at 17.9%. Furthermore, the average portion of OPEX is 81%, then for Capex's portion of revenue is 6.7% and the difference between working capital and revenue is 0.47%.

Table 2. ANTM WACC Calculation

ANTM			
Cost of Equity (ke)	Risk free (Rf)	3,50%	13,92%
	Risk Market (Rm)	9,74%	
	Beta (β)	1,67	
Cost of Debt (kd) After Tax	Kd	5,4%	4,2%
	Tax	22%	
Capital Structure	Equity	20.837.098.000.000	78%
	Debt	5.871.630.000.000	22%
WACC			11,8%

Source: data processed

Table 3. FCFF Projection of ANTM for 2022-2026

Scenario	2022	2023	2024	2025	Terminal Value	Enterprise Value	Equity Value
Pesimistic	934.699	924.294	914.004	903.828	22.810.848	18.289.030	12.417.400

Moderate	997.096	1.051.817	1.109.540	1.170.432	70.549.369	49.521.498	56.810.442
Optimistic	1.059.493	1.187.577	1.331.147	1.492.072	89.936.708	62.682.072	56.810.442

Source: data processed

Table 4. Results of the ANTM Stock Valuation

DCF - FCFF				
Scenario	Intrinsic Value (IDR)	Market Price 3 January 2022		Analysis
Pesimistic	729	2.260		Overvalued
Moderate	2.028			Overvalued
Optimistic	2.576			Undervalued

RV-PBV						
Scenario	PBV Company	PBV - Industry			In Range? (Yes/No)	Analysis
		MIN	Average	Max		
Pesimistic	0,84	1,17	4,07	15,5	No	Undervalued
Moderate	2,34				Yes	Undervalued
Optimistic	2,97				Yes	Undervalued

RV-PER						
Scenario	PER Company	PBV - Industry			In Range? (Yes/No)	Analysis
		MIN	Average	Max		
Pesimistic	9,40	(1,21)	34,68	122	Yes	Undervalued
Moderate	26,18				Yes	Undervalued
Optimistic	33,25				Yes	Undervalued

B. PT Vale Indonesia Tbk

The following is financial behavior as well as average growth from INCO according to historical data from the company's Annual Report for the 2017-2021 period as a model of basic assumptions that will be used in projections DCF-FCFF:

Table 5. Historical Data of INCO Financial Report in 2017-2021

	2017	2018	2019	2020	2021	Average
Revenue	629.334	776.900	782.012	764.744	953.174	
Growth		23,4%	0,7%	-2,2%	24,6%	11,6%
Total Operating Expense	623.133	549.610	545.869	499.003	564.708	72,0%
EBITDA	6.201	227.290	236.143	265.741	388.466	
Depresiasi	126.606	128.930	132.184	148.747	157.306	17,9%
EBIT	(120.405)	98.360	103.959	116.994	231.160	
Capex	74.614	83.784	166.560	152.149	180.653	16,6%
Total Current Asset	597.056	630.998	588.313	695.972	836.576	
Cash and Equivalent	237.589	316.760	249.035	388.682	508.327	
Net Current Liabilities	56.262	138.821	136.552	160.709	168.430	
Working Capital	303.205	175.417	202.726	146.581	159.819	
ΔWC		(127.788)	27.309	(56.145)	13.238	-4,7%

Source: INCO Annual Report (data processed)

Table 6. INCO WACC Calculation

INCO

Cost of Equity (ke)	Risk free (Rf)	3,50%	11,8%
	Risk Market (Rm)	9,74%	
	Beta (β)	1,33	
Cost of Debt (kd) After Tax	Kd	0%	0,0%
	Tax	22%	
Capital Structure	Equity	30.733.243.515.000	100%
	Debt	0	0%
WACC			11,8%

Source: data processed

Tabel 7. FCFF Projection of INCO for 2022-2026

Scenario	2022	2023	2024	2025	Terminal Value	Enterprise Value	Equity Value
Pesimistic	125.508	124.090	122.688	121.301	3.054.654	2.449.027	2.449.027
Moderate	162.485	162.249	162.013	161.778	4.472.166	3.511.385	3.511.385
Optimistic	164.087	165.464	166.853	168.253	5.149.312	3.960.994	3.960.994

Source: data processed

Tabel 8. Results of the INCO Stock Valuation

DCF-FCFF				
Scenario	Intrinsic Value (IDR)	Market Price 3 January 2022		Analysis
Pesimistic	4.246	4.700		Overvalued
Moderate	6.550			Undervalued
Optimistic	7.296			Undervalued

RV-PBV						
Scenario	PBV Company	PBV - Industry			In Range? (Yes/No)	Analysis
		MIN	Average	Max		
Pesimistic	1,37	1,17	4,07	15,5	Yes	Undervalued
Moderate	1,87				Yes	Undervalued
Optimistic	2,07				Yes	Undervalued

RV-PER						
Scenario	PER Company	PBV - Industry			In Range? (Yes/No)	Analysis
		MIN	Average	Max		
Pesimistic	17,84	(1,21)	34,68	122	Yes	Undervalued
Moderate	24,04				Yes	Undervalued
Optimistic	26,96				Yes	Undervalued

C. PT Pelat Timah Nusantara Tbk

The following is the financial behavior as well as the average growth from NIKL according to historical data from the company's Annual Report for the 2017-2021 period as the basic assumption model that will be used in the DCF-FCFF projection:

Table 9. Historical Data of NIKL Financial Report in 2017-2021

	2017	2018	2019	2020	2021	Average
Revenue	151.792.945	163.135.351	163.085.289	144.729.810	210.736.463	
Growth		7,47%	-0,03%	-11,26%	45,61%	10,45%
Total Operating Expense	147.411.751	159.230.947	157.365.770	139.665.921	196.721.142	92%
EBITDA	4.381.194	3.904.404	5.719.519	5.063.889	14.015.321	
Depresiasi	2.176.216	2.174.527	2.411.182	2.413.973	2.442.058	1,41%

<i>EBIT</i>	2.204.978	1.729.877	3.308.337	2.649.916	11.573.263	
<i>Capex</i>	1.754.586	4.733.120	1.640.462	2.225.333	591.501	1,38%
<i>Total Current Asset</i>	94.640.013	112.805.625	117.688.728	99.134.511	159.537.110	
<i>Cash and Equivalent</i>	14.502.848	11.103.613	28.392.647	14.858.890	27.822.257	
<i>Net Current Liabilities</i>	26.068.386	33.989.110	29.022.247	26.390.422	59.310.735	
<i>Working Capital</i>	54.068.779	67.712.902	60.273.834	57.885.199	72.404.118	
ΔWC		13.644.123	(7.439.068)	(2.388.635)	14.518.919	2,3%

Source: NIKL Annual Report (data processed)

Table 10. NIKL WACC Calculation

NIKL			
Cost of Equity (ke)	Risk free (Rf)	3,50%	12,9%
	Risk Market (Rm)	9,74%	
	Beta (β)	1,51	
Cost of Debt (kd) After Tax	Kd	4,7%	3,7%
	Tax	22%	
Capital Structure	Equity	778.619.305.440	43%
	Debt	1.019.510.620.110	57%
WACC			7,7%

Table 11. FCFF Projection of NIKL for 2022-2026

Scenario	2022	2023	2024	2025	Terminal Value	Enterprise Value	Equity Value
Pesimistic	8.968.388	9.198.473	9.434.461	9.676.503	556.250.032	450.933.533	379.464.159
Moderate	8.975.315	9.212.688	9.456.339	9.706.433	568.039.837	459.773.978	416.126.861
Optimistic	8.982.242	9.226.914	9.478.250	9.736.432	580.258.484	468.933.445	397.464.071

Source: data processed

Table 12. Results of the NIKL Stock Valuation

DCF-FCFF				
Scenario	Intrinsic Value (IDR)	Market Price 3 Januari 2022		Analysis
Pesimistic	2.302	985		Undervalued
Moderate	2.352			Undervalued
Optimistic	2.404			Undervalued

RV-PBV						
Scenario	PBV Company	PBV - Industry			In Range? (Yes/No)	Analysis
		MIN	Average	Max		
Pesimistic	7,46	1,17	4,07	15,5	Yes	Overvalued
Moderate	7,62				Yes	Overvalued
Optimistic	7,79				Yes	Overvalued

RV-PER						
Scenario	PER Company	PBV - Industry			In Range? (Yes/No)	Analysis
		MIN	Average	Max		
Pesimistic	69,47	(1,21)	34,68	122	Yes	Overvalued
Moderate	70,98				Yes	Overvalued
Optimistic	72,54				Yes	Overvalued

V. DISCUSSION

Discounted cash flow is one of the finest valuation models and is frequently used in company valuation, stock price, mergers and acquisitions, financing, tax evasion, and share sales. (Wang, 2022). The Discounted Cash Flow (DCF) approach is one of the recognised valuation techniques by professionals and businesses worldwide. (Basci, 2019).

After reviewing the company's five-year historical data from 2017 to 2021, the results were obtained to make projections for the next five years in 2022-2026. The projection made is growth of revenue, this makes use of the optimistic, moderate, and pessimistic scenarios. This analysis can be used as a reference for growth and development for each company as well as efforts to survive in competition with similar companies.

A. PT Aneka Tambang Tbk (ANTM)

According to calculations made using the DCF and FCFF techniques, the ANTM firm is overpriced in the pessimistic and moderate scenarios but undervalued in the optimistic scenario. However, using the RV approach, the PER and PBV indicated that the company is undervalued. This is different from research from (Hasan & Hendrawan, 2020) When used the DCF-FCFF approach to determine the fair price of shares in 2018, the findings revealed that ANTM shares were undervalued in all scenarios while INCO and TINS stock prices were viewed as overpriced overall. The valuation results reveal that ANTM, INCO, and TINS stock prices are undervalued in all situations when applying the RV technique, the PER approach, and the PBV strategy. Furthermore, another study from (Nurlia et al., 2022) stock valuation using DDM and PER for pharmaceutical companies listed on the IDX in 2015-2020, obtained the result that using DDM and PER DVLA shares, SIDO was undervalued, so the decision was to buy shares. KLBFB, MERK, PEHA shares are in overvalued condition, so the recommendation is to sell these shares.

Furthermore, in previous research (Liu, 2019) which conducted an analysis of the world's famous automobile industries, namely Tesla, Ferrari and Ford, research used DCF financial ratio analysis to assess each stock, also used the CAPM model to calculate the discount rate, the result was that Tesla shares and Ferrari are in overvalued condition while Ford's stock is considered undervalued. Then (Colline & Anwar, 2021) performs a stock valuation using the RV method. The results obtained were that eight shares were in an overvalued condition in 2018, 12 shares in 2017 and 2016 there were 6 shares. Furthermore, there were 8 shares that were undervalued in 2018, 5 shares in 2017 and 11 shares in 2016. Then, research conducted by (Ulya & Hendrawan, 2021) who conducted research on the toll road operator or operator sector using the same method as the researcher, found that JSMR shares were in *overvalued* condition for pessimistic scenarios and undervalued for moderate and optimistic scenarios, then CMNP shares are undervalued and META shares are *undervalued* in pessimistic scenarios & *overvalued* in scenario moderate and optimistic

B. PT Vale Indonesia Tbk (INCO)

The INCO company with the DCF calculation of the FCFF approach shows undervalued results in all scenarios, as well as using the RV method with the PER & PBV approaches, the results are undervalued in all scenarios. Research from (Wijayanti et al., 2020) conducted a valuation of the financial institution sector in Indonesia. There are 7 companies that are the object of this research, including ADMF, BFIN, BPFI, CFIN, MFIN, TIFA, WOMF. The study's findings indicate that the sub-sector of financing institutions' stock prices is overpriced. These factors show that investing in the firm would be a mistake since the price of the shares being sold is more than their fair value. Furthermore, according to study by (Jumran & Hendrawan, 2021), state-owned bank shares are undervalued in all scenarios with the research object being state-owned banks listed on the Indonesia Stock Exchange. In contrast, PBV in the optimistic scenario simply reveals that BBNI is undervalued using RV techniques. Additionally, only BBRI exhibits an overpriced state in the moderate and pessimistic scenarios. Additionally, PER displays undervalued outcomes for all situations.

Subsequent research from (Fang, 2022) used the DCF model to value express delivery services, and the outcomes demonstrate that the technique is workable for use in evaluating the export shipping sector. Research from (Martia et al., 2018) used the DCF method to value the shares of PT Semen Indonesia for the years 2014 to 2016. The results of this study indicate that PT Semen Indonesia's shares are *undervalued*, so the right decision is to buy these shares in the hope that these shares will rise in the future. ice. Then, other supporting research is from

(Cahyono & Hendrawan, 2020) Using DCF to analyze coal mining equities in 2018 employing RV, it is shown that all samples are within industry range and that all findings from ADRO, BYAN, and PTBA are discounted in all situations. This suggests purchasing the shares. Research from (Tarigan & Fachrudin, 2021) It uses historical data from 2017–2018 to assess the intrinsic value of coal mining businesses using DCF and RV. According to the analysis, BUMI and DOID shares were undervalued as of December 31, 2018, whereas FIRE and BYAN shares were deemed to be overpriced.

C. PT Pelat Timah Nusantara Tbk

Furthermore, NIKL shares using the FCFE technique get the result that the company is *undervalued* in all scenarios and the PBV approach RV calculations are overvalued in all scenarios, while the PER approach results are undervalued in all scenarios. Research (Panigrahi et al., 2021) conducted research on Industries Exide using the DCF method and the results obtained in the bullish, base and worst scenarios were Rs.253.25, Rs.171.37, Rs.133.25 each by adjusting the WACC value growth. Furthermore, research using the same method as this research is (Soelistyo & Hendrawan, 2022) The following findings are attained when the automotive and component subsectors are used as the study subject and are established on the IDX in 2020 during the Covid-19 pandemic utilizing DCF, GJTL is *undervalued* in all scenarios, ASII and INDS shares have gained in all scenarios, and SMSM is overpriced in moderate and pessimistic scenarios while *undervalued* in optimistic ones. The findings of the RV examination suggest that the DCF effect of the two firms is not totally genuine, which implies that the pandemic has considerably impacted the prices of the two enterprises, necessitating the correction of the intrinsic value of SMSM and ASII. For ASII and INDS, the investing advise is to sell shares, but for SMSM and GJTL, it is to buy shares.

Furthermore (Chen et al, 2021) conducted research using DCF and based on financial data over a 15-year period from 2005–2019, the results obtained were that DCF's valuation was significantly overvalued compared to the actual stock price. Then (Alhazami, 2020) carried out a valuation of shares that were still feasible to collect during the Covid-19 pandemic on the IDX and the results obtained were three companies were undervalued cheap, seven companies were overvalued and five other companies were correctly valued. In addition, (Cheng, 2021) calculates Johnson & Johnson's intrinsic value based on historical data for 2016-2020 using the DCF and FCFE methods, the results obtained are good stock growth prospects and tend to increase. Meanwhile, (Genc & Saritas, 2021) conducted research at the Istanbul Stock Exchange using the DCF and RV approaches in the cement industry with historical data for 2011-2019, the results revealed that DCF was the best valuation method, followed by Price Earning and PBV.

VI. CONCLUSION

The calculation results show that ANTM's shares are overvalued in both pessimistic and moderate scenarios, and undervalued in the optimistic scenario with an intrinsic value of IDR.2.576 and a January 3 market price of IDR2.260. Looking at the optimistic scenario, the recommendation is to buy of the shares. Then, INCO shares are in an overvalued condition with an intrinsic value of the pessimistic scenario of IDR.4.246 and undervalued in the moderate scenario of IDR.5.771, and an optimistic scenario of IDR6.416 with a market price of January 3, IDR4.700, the recommendation is to buy these shares because the stock price in the market is smaller than its intrinsic value. Furthermore, for NIKL shares, the calculation results are in an undervalued condition with an intrinsic value in the pessimistic scenario of IDR2.302, the moderate scenario of IDR2.352, and the optimistic scenario of IDR2.404, so it is advisable for investors to buy these shares. For investors who already own these three shares, it is better to hold the shares because the intrinsic value of the shares is higher than the market value.

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Social Media Data to Develop Default Prediction Determinant in Saving and Loan Cooperative: Case Study of The Keuangan Mandiri & Sejahtera Saving and Loan Cooperative (Not The Real Name)

Samuel Mauliate Naibaho¹, Taufik Faturohman²

^{1,2}Institut Teknologi Bandung: School of Business and Management, Bandung, Indonesia

Abstract

Savings and loan cooperatives in Indonesia as an Indonesian cultural-financial institution have the potential to increase business scale based on internal and external opportunities. However, credit risk is still the primary concern of saving and loan cooperatives, as evidenced by various default cases at these financial institutions. One of the saving and loan cooperatives, Keuangan Mandiri & Sejahtera Saving and Loan Cooperative (not the real name), is categorised as a national primary cooperative in Indonesia that experienced NPL fluctuations in the last five years. This problem has the urgency to be addressed in the long run because these gaps can lead to rush money and default. To process the credit risk issue, borrowers' social media data assessments have been developed. Therefore, research has aimed to identify social media variables that could be used as default probability predictors. Four independent variables consisting of social media data and twelve variables from historical payment and demographic data were used to construct a goodness of fit model, with criteria of Weight of Evidence (WoE), Information Value (IV), and Logistic Regression model. The results identified four variables that could be considered and used as default probability predictors, which are Employment, Money used as time deposits in saving and loan cooperatives, Number of friends on Facebook, and The ratio of the total number of Facebook posts to the number of months the account has used Facebook.

Keywords: Default Prediction Determinant; Goodness of Fit; Saving and Loan Cooperative

I. INTRODUCTION

Based on regulations regarding cooperatives, the cooperative is defined as an autonomous association of individuals who voluntarily join together based on the principles of mutual trust and democracy to fulfil member economic and common interests through jointly owned and democratically controlled enterprise (Dewan Perwakilan Rakyat RI, 1992). Cooperative is an Indonesian cultural-financial institution whose operational foundation is based on Pancasila and the UUD 1945 with principles of kinship and cooperation where its members are service users as well as owners of a cooperative. Cooperative in Indonesia can be classified into various types based on their member's similarities and economic interests. Types of cooperatives in Indonesia based on applicable law can be divided into four classes, which are consumer cooperatives, producer cooperatives, service cooperatives, and saving and loan cooperatives. The saving and loan cooperative, one of the types of cooperatives that apply in Indonesia, is a non-bank financial services entity with the main business activities of receiving deposits and distributing loan funds to its members (Dewan Perwakilan Rakyat RI, 1992).

Saving and loan cooperative development in Indonesia has the potential to grow the market size through digitalization and reach the number of unbanked people in Indonesia. The implementation of digital financial services at financial institutions brings advantages to customers and providers, especially in improving service quality and increasing accessibility (Tevetova, 2020). Referred to the Asosiasi Penyelenggara Jasa Internet Indonesia (APJII) survey report (2022), from 2018 to 2021, the percentage of internet penetration in Indonesia increased by 8.9%, reaching 73.7% of the total population in 2021. The spread of saving and loan cooperatives in Indonesia is dominated in Java Island, with a concentration of 58.95%; more than half of the cooperatives are on Java Island (Badan Pusat Statistik, 2022). However, it should be noted that this distribution is in line with the distribution of the population in Indonesia, of which 56.1% are also on Java Island (databooks, 2021). Thus, the percentage distribution of the number of savings and loan cooperatives in Indonesia follows the distribution of population density, that cooperatives in each region have the potential to reach market-saving and loan demand inside also outside located offices through digital finance services.

In addition to opportunities to develop effectiveness and accessibility, saving and loan cooperatives also has the potential to expand their business scale through macroeconomic and microeconomic opportunities from the savings and loan industry. Through the Gross Domestic Product (GDP) indicator, Indonesia experiences economic

growth of 5.31% from 2021 to 2022 and is expected to continue growing to reach 55.32% in 2028 (Badan Pusat Statistik, 2023; Statista, 2023). Indonesia's GDP growth stands in alignment with the Bank Indonesia survey results, which predicts credit growth of 10.4% (yoy) in 2023. These results are the outcome of optimism in monetary and economic conditions and risk management in lending (Bank Indonesia, 2023). As 51% number of adults in Indonesia, 181 million people, are still included in the category of unbanked people even though the government is targeting a financial inclusion rate of 90% through the National Financial Inclusion Strategy (NSFI) in 2024 (The Asian Banker, 2022).

In maximizing its potential and carrying out its business operations, saving and loan cooperatives must face several challenges and risks, especially credit risk. Otoritas Jasa Keuangan (2016) stated that credit risk is an occurrence caused by another party's inability to fulfil commitments to a bank or other financial institution. According to Deloitte's biennial global survey (2021) on the state of risk management in the financial services sector, credit risk is the top risk management agenda that needs to be considered in institutional financial business. To reduce the impact of credit risk, financial institutions and saving and loan cooperatives need to apply credit risk management principles and credit evaluations. Credit risk management is a systematic approach to controlling default risk that includes numerous activities such as risk assessment and mitigation utilizing managerial resources (Van Greuning & Iqbal, 2007). In improving saving and loan cooperative credit risk management through digital transformation, digitalization can be used as one of the developments in the credit risk management process saving and loan cooperative. Credit risk management is becoming more transparent as a result of digital transformation. The advantages of digitalization credit risk go well beyond these enhancements. Credit risk costs may be reduced even further by incorporating novel sources of data and utilizing sophisticated analytics methods. These improvements offer richer information for better risk assessments as well as more effective and progressive credit risk management (McKinsey & Company, 2016).

There is one of the saving and loan cooperatives, Keuangan Mandiri & Sejahtera Saving and Loan Cooperative (not the real name), which categorize as a national primary cooperative in Indonesia. Despite experiencing a significant increase in profit (yoy) over the last three years, the saving and loan cooperative has experienced NPL fluctuations in the last five years. This problem has the urgency to be addressed in the long run because these gaps can lead to rush money and default. To process the issue, the cooperative is currently identifying loan default determinants by applying social media information to increase accuracy in determining creditworthiness as a form of credit management to reduce NPL growth. During the cooperative's modernization, social media assessment is being developed in order to construct a default prediction determinant on loans. This research seeks to uncover social media factors that can be utilized as predictors of loan default models. The outcome of this research is expected to provide input for Keuangan Mandiri & Sejahtera Saving and Loan Cooperative (not the real name) in identifying default prediction determinants so the cooperative can improve its accuracy in conducting credit risk management through the utilization of social media information variables as a form of increasing operational digitalization in financial institutions.

According to the problem statement section in the preceding part, the author develops a research question related to the main research topic, which is as follows:

1. What social media variable attributes could be used as predictors for a saving and loan cooperative's credit scoring?

This research exclusively focuses on the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative (not the real name) to prevent prejudice. It does not generalize all the problems and solutions that will be generated with other cooperatives in Indonesia because the issues are focused on specific research objects and only occur in this saving and loan cooperative. The researcher limited the research data to a span of the last three years of saving and loan cooperative operational activities, the period of July 2020-February 2023. Social media from cooperative loan borrower data that is used is only social media accounts that have a minimum of 21 posts.

II. LITERATURE REVIEW

2.1 Saving and Loan Cooperative Development

National regulations describe saving and loan cooperatives as non-bank financial services entities with the main business activities of receiving deposits and distributing loan funds to its members (Dewan Perwakilan Rakyat RI, 1992). The platform has its own uniqueness and competitive advantage compared to other financial institutions through the nature of its membership and ownership, which grants voting rights to each member, the principle of gotong-royong, and the goals of the institution, which are engaged in improving its member welfare. The saving

and loan cooperative has the potential to develop its business through its crucial contribution as an effective alternative financial organization to facilitate the growth and development of SMEs (Badan Pusat Statistik, 2022). Saving and loan cooperatives can provide easier and more affordable access to financing for SMEs. By utilizing the function of saving and loan cooperatives as institutions that facilitate SMEs, institutional values that focus on member welfare, and the spread of saving and loan cooperatives in Indonesia, the institution has the potential to expand its business by reaching the SME market and individuals who are still in the unbanked category and do not have access to credit.

Besides saving and loan cooperative potential to scaling its business, the institution must face several challenges and risks, especially bad debt risk, as Bank Indonesia sets a safe limit for Non-Performing Loans (NPL)/Non-Performing Financing at a 5% limit (Bank Indonesia, 2021). Besides credit risk, saving and loan cooperative also experiences several problems that can affect institutional development in Indonesia, including the absence of a deposit insurance agency, an independent cooperative supervisory institution, and cases of default in several saving and loan cooperative in Indonesia, which resulted in losses of up to trillions of rupiah (Bursa Efek Indonesia, 2023; CNBC Indonesia, 2023).

In conclusion, saving and loan cooperatives have promising opportunities in Indonesia to develop their business, but they need to improve their internal management and credit risk exposure to avoid default and bad non-performing loan.

2.2 Credit Risk

Although saving and loan continues to grow in Indonesia, these institutions face serious risks, such as credit risk, because their members fail to repay their loans. Credit risk is defined as a condition that indicates the partner's inability to pay off his debts on the agreed date (Christoffersen, 2012). Since saving and loan derives its income through intermediation activities, these institutions must pay attention to credit risk management and maintain a low level of non-performing loans (NPL). Credit risk management is a systematic approach to controlling default risk that includes numerous activities such as risk assessment and mitigation utilizing managerial resources (Van Greuning & Iqbal, 2007). Managing credit risk is necessary to reduce NPL through actions such as detecting possible risks, analyzing risks, implementing effective treatments, and employing evaluation methodologies (Christoffersen, 2012; Gestel & Baesens, 2008).

This study will concentrate on loan default determinant investigation with the implementation of social media data. Furthermore, according to the explanation, internal credit risk assessment is a widely utilized risk management strategy and one of the primary techniques in establishing creditworthiness in financial institutions.

2.3 Social Media-Driven Default Prediction Determinant

Social networking platform is currently used worldwide; around 59.9 percent of the world's population are social media users. Several previous studies involved social media as a predictor component in making loan default prediction models. The purpose of this study is to investigate if social media data can be utilized as default prediction determinant in saving and loan cooperative. The hypothesis could be developed as follow:

H_0 = Social media data cannot be utilized as default prediction determinant in the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative (not the real name)

H_1 = Social media data can be utilized as default prediction determinant in the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative (not the real name)

2.4 Probability of Default

The probability of default is an essential credit risk in the finance area. It gives an estimation of how likely it will be that a borrower be able to pay back their debt or not (Dar, Anuradha, & Qadir, 2019). The probability of default is the dependent variable used in this research due to the research focus on the problem of credit risk in saving and loan cooperatives. The probability of default with the outcome binary of default and the non-default borrower is the dependent variable of this study, and several previous studies that raise the topic of default prediction determinants will be incorporated into the model and logistic regression as a research method.

2.5 Hypothesis Development

Based on the prior study, this research constructed a hypothesis for each independent variable. Four independent variables comprise social media data: the number of Facebook friends (Friend), the duration of Facebook usage in months (FB_Month), the ratio of the total amount of posts divided by month period using Facebook (FBPost_Month) (Guo et al., 2016), and the number of religion accounts followed on Facebook (Rel_Account) (Tan and Phan, 2018). Twelve factors have been designated as controls: gender, age, married status, district, employment, income (Tsai et al., 2009; Yap et al., 2011), tenor, installment (Hsieh et al., 2010), collateral (Franata et al., 2018), deposit, period, and dividends (Cahyani, 2015). Independent and control variables consist of categorical and continuous data. In logistic regression, incorporating control variables potentially improves the model's precision. Those variables are considered because demographic variables and payment history have been widely employed in past studies to forecast the likelihood of borrowers defaulting on loan payments and as saving and loan cooperative considerations in loans granted. In addition, the research's dependent variable, creditworthiness, is expected to have a binary outcome of default or non-default borrowers.

III. RESEARCH METHODOLOGY

The purpose of the research is to identify the loan default prediction determinant using demographics, previous payment data, and social media information variables of the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative. This was done to assist the saving and loan cooperative in avoiding credit losses with the utilization of loan default prediction determinant models. The purpose of this chapter is to identify the processes performed to answer the research question and also to highlight important aspects.

3.1 State of the Art

This section provides a research state of the art that describes the research process sequentially to obtain conclusions and recommendations based on research objectives to answer research questions. The first step is to observe the research object as a whole and identify the problems that are currently faced by one of the national primary saving and loan cooperatives in Indonesia, the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative. The next process is to determine the theoretical framework used to support research obtained from journals, books, and websites. The data collected as the next process is borrower data and social media data belonging to the savings and loan cooperative. After that, SPSS statistical software and Microsoft Excel will be used to conduct the data processing stage, which includes data preparation to data analysis. Finally, conclusions and recommendations are generated based on the results of data analysis addressed to the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative as objects of research and future research. The research state of the art is shown below (See Figure 3.1):

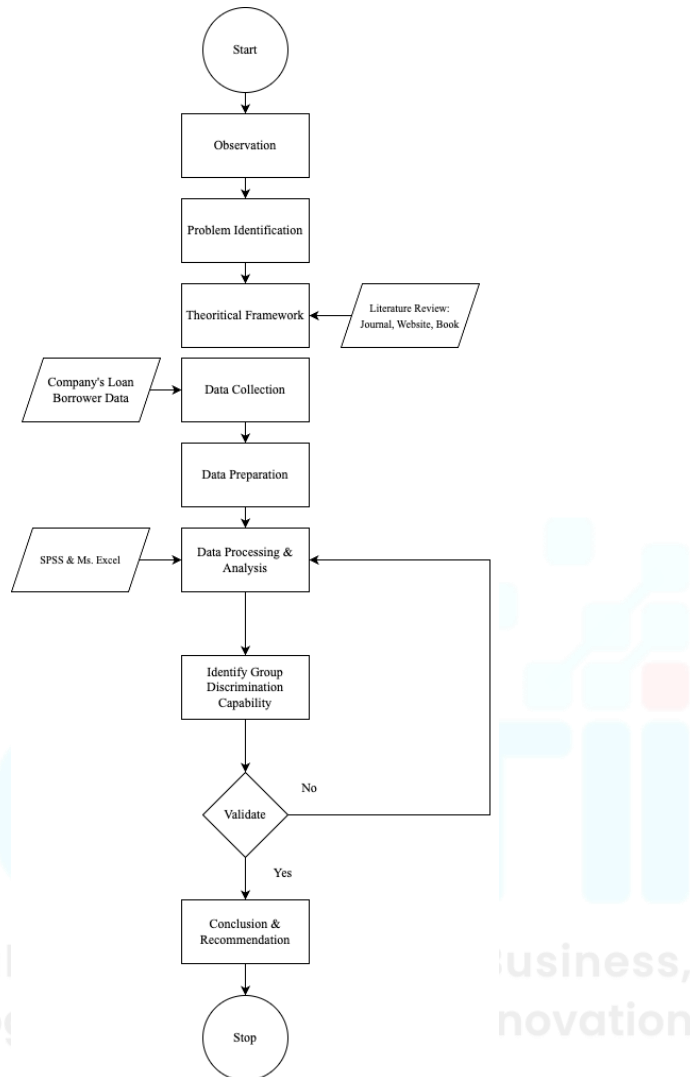


Fig. 1 Research State of the Art

3.2 Data Overview

The variables in the research are classified into three types: independent, control, and independent variables. Thus 155 borrower data will be used. Through this research, the independent variable of demographic, historical payment, and social media data will be investigated to identify the impact of those variables on the dependent variable results. The independent variable in this research will be the social media variable, and the dependent variable will be the probability of default with a binary result of default or non-default borrower, as applied to previous research from Hsieh et al. (2010); Khilfah and Faturohman (2020); Saputra et al. (2021); Tan and Phan (2018); Tsai et al. (2009); Yap et al. (2011). Social media will focus on the use of Facebook as the platform used by the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative and have borrower data regarding the platform. Research using social media data will focus on the number of friends on Facebook (Friend), the duration of Facebook use in the form of months (FB_Month), the proportion of total posts divided by the period in a month using Facebook (FBPost_Month) (Khilfah and Faturohman, 2020), and the number of religious accounts followed in Facebook (Rel_Account) (Tan and Phan, 2018). The demographic data consist of gender, age, marital status, district, employment, and income (Tsai et al., 2009; Yap et al., 2011). Meanwhile, historical payment data consist of loan tenor period, monthly installment amount, collateral, period as the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative member also owner, deposit stored at the institution, and dividends that have been received

as a member of the institution (Franata et al., 2018; Khilfah and Faturhoman, 2020). Below is the description of each variable (Table 3.1):

Table 3.1 Table of Variables

Variable Name	Description of Variable	Role
Creditworthiness	The binary outcome of the borrower's creditworthiness evaluation (default/non-default)	Dependent
Gender	The gender type of the borrower	
Age	Age of the borrower in years	
Marital	Borrower's marital status	
District	Province where borrowers live	
Employment	Borrower's type of work	
Income	Monthly amount of money that borrowers receive from employment	
Tenor	Loan payment duration	
Installment	Monthly amount of money that has to be paid as loan proportion	
Collateral	Borrower ownership to secure the loan facility	Control
Period	Duration as the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative member in the form of months	
Deposit	Money used as time deposits and placed in Keuangan Mandiri & Sejahtera Saving and Loan Cooperative	
Dividends	The amount of money received from the proportion of business income as a member and owner of the Keuangan Mandiri & Sejahtera Saving and Loan Cooperative	
Friend	Number of friends on Facebook	
Account Usage Duration	The number of months that a user has been using Facebook since the date of their first posting.	
Number of Posts per Month	The ratio of the total number of Facebook posts to the number of months the account has used Facebook.	Independent
Religion Account	The total number of religious accounts, followed by the borrower's Facebook account	

3.3 Data Processing & Analysis Method

Data will be processed using SPSS and Microsoft Excel. The software is used to support the processing and visualization of approximately 155 data to make it time-efficient used. The following are the analytical methods used in this study:

3.3.1 Multicollinearity Test

In the context of the logistic regression model, multicollinearity is a statistical phenomenon in which there is a strong correlation or association between two or more predictors (Midi et al., 2013). Due to multicollinearity, adding more predictors to a regression analysis frequently fails to provide a clear understanding of the model (Shrestha, 2020). Moreover, Siddiqi (2005) stated that when building predictive models with large datasets, multicollinearity is not a major concern. However, this research only uses 155 borrower data sets, thus multicollinearity test needs to be implemented in the research process to ensure there is no correlation between predictor variables. Mathematically, tolerance and its inverse, the variance inflation factor (VIF), are primarily used to identify multicollinearity. A tolerance of 0.1 and Values of VIF greater than 10 are the rule of thumb to indicate a high level of multicollinearity between predictor variables (Midi et al., 2013).

3.3.2 Weight of Evidence (WOE)

The Weight of Evidence (WOE) of an attribute is defined as the logarithm of the ratio of the proportion of 'goods' in the attribute over the proportion of 'bad' in the attribute. Therefore, high negative values of WOE indicate high

risk, and high positive values indicate low risk (Yap et al., 2011). It is frequently described in the context of credit scoring as a method to differentiate between good and bad customers (Selviana and Faturohman, 2021). Additionally, since WOE variables and the logistic function have a linear relationship, using logistic regression to represent the characteristic makes the WOE more appropriate (Khilfah and Faturohman, 2020). The following is the computation of the weight of evidence for each attribute (Yap et al., 2011):

$$\text{Weight of Evidence}_{\text{attribute}} = \log \frac{P_{\text{goodattribute}}}{P_{\text{badattribute}}}$$

Where:

$$P_{\text{goodattribute}} = \frac{\# \text{ goods}_{\text{attribute}}}{\# \text{ goods}}$$

$$P_{\text{badattribute}} = \frac{\# \text{ bads}_{\text{attribute}}}{\# \text{ bads}}$$

3.3.3 Information Value (IV)

The information value (IV), which assesses a variable's predictive power and ability to differentiate between high and low risks, is essential to provide assistance for the selected variable that must be made for a credit scoring model. (Khilfah and Faturohman, 2020). The weighted sum of the evidence's weights for the variable's attributes makes up the information value. The weights reflect the disparity between the proportion of 'goods' and 'bad' in each attribute (Yap et al., 2011). Yap et al. (2011) also stated that a variable should have a value of information greater than 0.02 to be taken into account for the credit determinant model. Information values below 0.1 are considered to have weak predictive power, scores below 0.3 are considered to have medium predictive power, scores below 0.5 are considered to have strong predictive power, and information values above 0.5 may indicate that the characteristics are being overpredicted (Khilfah and Faturohman, 2020). The following is the formula of information value computation applied in this research (Bolton, 2009):

$$\text{Information Value} = \sum (P_{\text{good attribute}} - P_{\text{bad attribute}}) \times \text{Weight of Evidence}$$

3.3.4 Logistic Regression

Logistic regression is a common method used for credit ratings. In logistic regression, the method results are dichotomous ($Y = 0$ or $Y = 1$) related to the estimate of the predictor variable. The purpose of this method to assess the conditional likelihood of an applicant falling into the default or non-default class, provided that the credit applicant is a non-default applicant (Yap et al., 2011). Logistic regression is applied in this study because the dependent variable is categorical (non-metric data). However, continuous (metric data) and categorical variables are both included in the independent variables. The model is built from the growth scorecard, based on the study of Yap et al. (2011), because it will explicitly concentrate on the most important variables by considering the predictive potential and risks for each dependent variable. In developing the credit prediction model, logistic regression is carried out as follows:

$$\log \left(\frac{p}{1-p} \right) = W_0 + \sum W_i \log x_i$$

IV. RESULT / FINDING

4.1 Assumption Test (Multicollinearity and Normality)

At first, the data set consisted of 350 data. However, as many as 155 data are ready to be processed after preparing the data and investigating social media data variables. The normality test was then performed on 155 data points, yielding the results shown below. (Table 4.1):

Table 4.1 Normality Test

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Gender	.435	155	0.000	.585	155	0.000
Age	.254	155	0.000	.844	155	0.000
Marital	.535	155	0.000	.309	155	0.000
District	.378	155	0.000	.700	155	0.000
Employment	.425	155	0.000	.596	155	0.000
Income	.307	155	0.000	.821	155	0.000
Tenor	.261	155	0.000	.789	155	0.000
Installment	.211	155	0.000	.904	155	0.000
Collateral	.488	155	0.000	.497	155	0.000
Period	.485	155	0.000	.503	155	0.000
Deposit	.488	155	0.000	.497	155	0.000
Dividends	.327	155	0.000	.739	155	0.000
Friend	.211	155	0.000	.843	155	0.000
FB_Month	.201	155	0.000	.861	155	0.000
FBPost_Month	.392	155	0.000	.622	155	0.000
Rel_Account	.502	155	0.000	.459	155	0.000

According to the outcomes of the normality test, it can be figured that the data is not normal because none of the variables has a significance level above the value of 0.05. Furthermore, data preparation is carried out at this stage by removing outliers from the data set. Therefore, the final amount of data to be used in this study is 155 data. Gujarati (2004) stated that if the final data to be used in the study is more than 100, then it is assumed that the dataset is already normally distributed.

After testing the normality assumptions, it is necessary to carry out the multicollinearity test stage to ensure that there is no correlation between each independent variable. The multicollinearity test uses the Tolerance Score and the Variance Inflation Factor (VIF) test with the results below (Table 4.2):

Table 4.2 Multicollinearity Test

Model	Standardized Coefficients	T	Sig.	Collinearity Statistics	
	Beta			Tolerance	VIF
(Constant)		1.508	.134		
Gender	-.147	-1.830	.069	.807	1.239
Age	-.156	-1.672	.097	.603	1.658
Marital	.000	.003	.997	.663	1.508

District	-.023	-.289	.773	.835	1.197
Employment	.224	2.633	.009	.723	1.383
Income	.074	.534	.594	.274	3.646
Tenor	.095	1.058	.292	.650	1.538
Installment	.138	.833	.406	.192	5.207
Collateral	-.092	-.673	.502	.280	3.573
Period	.070	.834	.406	.734	1.363
Deposit	-.163	-2.020	.045	.800	1.250
Dividends	.010	.102	.919	.517	1.933
Friend	-.179	-2.317	.022	.872	1.147
FB_Month	.029	.375	.708	.875	1.143
FBPost_Month	-.172	-2.232	.027	.880	1.136
Rel_Account	-.144	-1.896	.060	.911	1.098

Through the Tolerance Score and VIF test, multicollinearity in the data exists when the test indicates that there are variables with a Tolerance Score < 0.1 and $VIF > 10$. According to the outcomes of the multicollinearity test, none of the variables has a Tolerance Score < 0.1 and $VIF < 10$. It can be concluded that there is no multicollinearity exist, which indicates that each independent variable has no correlation. Thus, all independent variables will be used in the research.

4.2 Information Value

Information Value (IV) needs to be calculated to identify the predictive capability for each independent variable with the result that can be seen in Table 4.3 below:

Table 4.3 Information Value (IV)

Variable	Information Value	Ordering	Predictive Power	Decision
Income	.58403	1	Over-Predicting	Input
Installment	.50545	2	Over-Predicting	Input
Friend	.49896	3	Strong	Input
FBPost_Month	.42227	4	Strong	Input
Employment	.39804	5	Strong	Input
Dividends	.32246	6	Strong	Input
Gender	.31497	7	Strong	Input
Age	.27819	8	Strong	Input
Deposit	.27182	9	Strong	Input
Tenor	.19342	10	Medium	Input

Rel_Account	.17794	11	Medium	Input
Marital	.07533	12	Weak	Reject
District	.07243	13	Weak	Reject
Collateral	.06555	14	Weak	Reject
FB_Month	.05318	15	Weak	Reject
Period	.00359	16	Extremely Weak	Reject

Based on the IV test in Table 4.20, the outcome shows that there are five variables that need to be excluded since these variables have an IV with a value lower than 0.1, which indicates these variables have weak predictive power. Based on previous research, Income and Installment variables with an IV value of more than 0.5 and indicating over-predicting power are still incorporated in the model to be built. As a result, the following 11 independent variables are included as input from the Information Value decision, in the following order of predictive power: Income, Installment, Friend, Facebook Post per Month, Employment, Dividends, Gender, Age, Deposit, Tenor, and Religion Account.

4.3 Logistic Regression

At first, all variables are included in the logistic regression to obtain a significant level or p-value of each variable which will be one of the considerations in the Goodness of Fit. According to previous research (Khilfah and Faturrohman, 2020; Siddiqi, 2005; Yap et al., 2011), each variable in the model needs to be categorized based on the logical order of the Weight of Evidence results. Following are the results of the initial logistic regression (Table 4.4):

Table 4.4 Initial Logistic Regression

	Coef	Std. Error	Sig.
Gender	-1.193	.682	.080
Age	-.573	.391	.143
Marital	-1.159	1.369	.397
District	-.060	.276	.828
Employment	-1.279	.572	.025
Income	.077	.432	.858
Tenor	.735	.442	.096
Installment	.487	.505	.335
Collateral	-.450	1.468	.759
Period	.291	.825	.725
Deposit	-1.831	.912	.045
Dividends	.070	.559	.900
Friend	-.639	.264	.016
FB_Month	.050	.251	.842

FBPost_Month	-1.447	.614	.018
Rel_Account	-1.977	.922	.032
Constant	9.239	4.869	.058

From the results in Table 4.4, it shows that five variables have a significance level of less than 0.05, which are: Employment (0.025), Deposit (0.045), Friend (0.016), Monthly post frequency on Facebook (0.018), and Religion Accounts (0.032). Furthermore, logistic regression is repeated on the five variables with a significance level below 0.05 to see the significance of these five variables as the final result, which will be used as a consideration in Goodness of Fit. Following is the outcome of the logistic regression (Table 4.5):

Table 4.5 Logistic Regression

	Coef	Std. Error	Sig.
Employment	-1.291	.467	.006
Deposit	-1.638	.796	.040
Friend	-.605	.231	.009
FBPost_Month	-1.457	.558	.009
Rel_Account	-1.298	.823	.114
Constant	7.182	1.769	<.001

According to Table 4.5, the Religion Account Variable has a significance level value of more than 0.05, so this variable will be excluded from the model, while the other four variables (Employment, Deposit, Friend, and FBPost_Month) with a significance level value below 0.05 will be used.

4.4 The Goodness of Fit

At the Goodness of Fit stage, each variable is analysed based on criteria consisting of Weight of Evidence (WOE), Information Value (IV), and significance level (p-value) to determine what independent variables will be incorporated into the model development. The following are the outcomes of the Goodness of Fit (Table 4.6):

Table 4.6 Goodness of Fit Criteria

Variable	WOE	Information Value	P-Value	Decision
Gender	Yes	Yes	No	No
Age	Yes	Yes	No	No
Marital	Yes	No	No	No
District	No	No	No	No
Employment	Yes	Yes	Yes	Yes
Income	No	Yes	No	No

Tenor	No	Yes	No	No
Installment	No	Yes	No	No
Collateral	Yes	No	No	No
Period	Yes	No	No	No
Deposit	Yes	Yes	Yes	Yes
Dividends	No	Yes	No	No
Friend	Yes	Yes	Yes	Yes
FB_Month	No	No	No	No
FBPost_Month	Yes	Yes	Yes	Yes
Rel_Account	Yes	Yes	No	No

According to the Goodness of Fit results in Table 4.23, when WOE, IV, and p-value are taken into account, there are four variables that match the three requirements and could be included in the model development since it can indicate the borrower's creditworthiness. Employment, Deposit, Friend, and FBPost_Month are the four variables.

V. CONCLUSION AND RECOMMENDATION

The objective of this research is to discover social network platform characteristics that could be utilized as predictors in the loan default prediction model for savings and loan cooperatives. The following are the conclusions and recommendations derived from the research:

5.1 Conclusion

Utilizing 155 borrower's data with a time frame from July 2020 to February 2023 and through logistic regression and goodness of fit, it can be concluded that:

1. The number of friends on Facebook (Friend) and monthly posting frequency on Facebook (FBPost_Month) variables are social network platform variables that can be used as predictors in the default probability model since these two variables meet the criteria of Goodness of Fit, which are Weight of Evidence (WOE), Information Value (IV), and significance level (p-value). In addition to these two variables, the Employment and Deposit variable is included as a variable that could be used as a predictor in the default probability model.
2. The results of this study in the form of selected variables that can be used as predictors of loan default events have a correlation with previous studies (Khilfah & Faturohman, 2020; Saputra, Faturohman, & Wiryono, 2021) that discuss appropriate topics. The use of the Employment variable as a predictor of the loan default event is in accordance with the results of previous research, which employment variable shows the level of risk owned, the level of monthly income, and the stability of income. This includes point Capability of the borrower on the 5C of credit.
3. The results of the selected social media variable, which are the number of social media connections and the frequency of posts per month, are also in accordance with the intended results from previous research. The use of social media variables as a predictor of the loan default event shows the social reputation and behavior of prospective borrowers. This includes point Character of the borrower on the 5C of credit. Character assessment is necessary and crucial, especially when the loan is included in the type of unsecured loan which does not have assets as collateral if a loan default occurs.

5.2 Recommendation

According to the research conclusion, researchers could derive the recommendation as below:

1. Keuangan Mandiri & Sejahtera Saving and Loan Cooperative can build its social media assessment by considering the number of friends on Facebook (Friend) and monthly posting frequency on Facebook

(FBPost_Month) variables added by Employment and Deposit variables. Furthermore, saving and loan cooperative can be more cautious with borrowers who have few social media connections, low monthly frequency of posting on social media, have employed average low salaries, and contribute little to the cooperative's financial condition. However, the savings and loans cooperative require a testing period with a larger amount of borrower data to re-evaluate which variables are significant in increasing the accuracy in predicting the probability of default.

2. For further and future research, it is better to use a larger amount of borrower data, a longer borrower data frame duration, and consider using other social media variables to get a bigger set of population data, better model accuracy, and specific results regarding predictors that can be used in models.
3. For the regulator and supervisor (Kementerian Koperasi dan UMKM), social network platform variable data can be considered to build a credit scoring model regulation, as an alternative form of loan default problems in saving and loan cooperatives. However, these regulations need to regulate user privacy in the application of credit scoring models.

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The Influence of Social Media and Capital on the Development of Micro, Small and Medium Enterprises in Karawang Regency

Kholida Atiyatul Maula¹, Irvan Yoga Pardistya², Seia Piantara³, Indah Laily Hilmi⁴

^{1,2} Accounting Study Program, Universitas Singaperbangsa Karawang, Karawang, Indonesia

³ Business Administration Politeknik Tri Mitra Karya Mandiri, Indonesia

⁴ Pharmacy Study Program, Universitas Singaperbangsa Karawang, Karawang, Indonesia

Abstract.

The main objective of this study was to investigate how social media and business capital influence the growth of Micro, Small, and Medium Enterprises (MSMEs) in Karawang Regency. The research was conducted in Karawang using a quantitative method, where questionnaires were distributed to 58 MSMEs that were part of the MSMEs Champion in 2019 in the Karawang district. However, only 48 MSMEs returned the questionnaires. The findings of this study revealed that both social media and entrepreneurial capital have a significant impact on the growth of MSMEs in Karawang Regency. Therefore, it is suggested that MSME stakeholders, particularly those involved in the MSME champions program in Karawang Regency, should increase their utilization of social media to enhance their businesses further. Additionally, MSME owners should carefully plan and manage their business capital to meet the needs of their businesses, boost production volume, and ultimately increase the income of entrepreneurs.

Keywords: social media, Entrepreneurial capital and MSME Development

1. INTRODUCTION

MSMEs play an important role in building and improving the regional economy and the economy of a country (Arliani et al, 2019). MSMEs need to continue to be improved because of their resilience to various economic crises and compared to large companies, MSMEs are actually more able to absorb labor and can open up various jobs so that it will reduce unemployment (Gunartin, 2017). Therefore, the existence of MSME resilience needs to be improved.

Alyas et al (2017) stated that MSMEs in Indonesia as a developing country, MSMEs can continue to thrive despite the economic crisis. Because its existence is useful in terms of equal distribution of income. Apart from that, it can also generate creativity by maintaining and developing a business (Hayat et al, 2015).

Therefore, MSMEs have a very important role in overcoming the impact of the economic crisis, especially the economic problems that occurred during the monetary crisis in 1997 where many large companies went bankrupt. However, MSMEs actually still exist and can overcome the crisis. The MSME sector tends to have good resilience so that it can minimize economic and monetary crises (Agustien et al, 2019).

Table 1. Development of Micro, Small and Medium Enterprises (MSMEs) in Indonesia in 2014-2018

Year	Business Unit (Unit)	GDP (Rp. Billion)
2014	57,895,721	5,440,007.9
2015	59,262,772	6,228,285.0
2016	61,651,177	7,009,283.0
2017	62,922,617	7,820,282.6
2018	64,194,057	8,573,895.3

Source. *www.depkop.go.id* (Data processed, 2020)

Based on the data, the business units of MSMEs 2014-2018 continue to grow, and the data on cooperatives and MSMEs services 2014-2018 shows the gross domestic product (GDP) of Indonesia continues to increase every year.

MSMEs registered in Karawang Regional Cooperative and UMKM service in 2019 totaled 936 MSMEs. However, there are still many MSMEs who have not used social media as a means of promoting their business development, and limited business capital is also an obstacle for MSMEs to develop their business.

In contemporary business contexts, information technology represents a valuable potential that can be harnessed to overcome limitations of distance, space, and time. With the advent of the internet, individuals and businesses now enjoy enhanced opportunities to collaborate and connect with other entrepreneurs, facilitated by the ease and cost-effectiveness of social media platforms (Purwiantoro et al., 2016).

Upon examining data from the Karawang Regency Cooperative Service, it becomes evident that the region hosts a substantial number of 936 MSMEs dispersed across 37 sub-districts. Klari and Purwasari sub-districts boast the largest number of MSMEs with 93 enterprises each, while some regions like Duren Palm, Kuta Gandok, and Karawang in the eastern Adiarsa area only have one MSME each. Nevertheless, it is concerning that only half of these MSMEs utilize social media for promotional purposes, thereby limiting their business development opportunities. Additionally, limited venture capital poses as a significant obstacle hindering SMEs' growth (Kaplan et al., 2010).

The current prominence of social media has significantly eased marketing communications, with platforms like Facebook, Instagram, YouTube, and Twitter being noteworthy examples (Mursito et al., 2019). The role of social networks, particularly Facebook, in augmenting sales efforts for Micro and Small Enterprises (MSEs) is highly effective, as these businesses can promote their products without incurring exorbitant fees (Mursito et al., 2019).

Business capital is a critical factor in establishing and running a business, encompassing aspects such as determination, experience, courage, knowledge, and financial resources (Purwanti, 2012). The significance of business capital is evident from its positive influence on business success, as highlighted by previous studies (Tripalupi et al., 2019; Abbas, 2018). Insufficient working capital can lead to reduced business efficiency (Abbas, 2018).

Given the context outlined above, this study aims to explore the impact of social media and entrepreneurial capital on the development of Micro, Small, and Medium Enterprises (MSMEs) in Karawang. By investigating the influence of these factors, the research endeavors to contribute to the existing body of knowledge related to MSME development. The study is titled "The Influence of Social Media and Entrepreneurial Capital on the Development of Micro, Small, and Medium Enterprises (MSMEs) in Karawang."

II. LITERATUR REVIEW & RESEARCH METHODS

This research uses descriptive research methods. The approach used in this study is the quantitative method. The population of this study includes MSMEs who were the Karawang region MSMEs for the period of 2019, 58 MSMEs in total.

The number of samples taken from the population is 48 MSMEs as the sample.

The researcher identified some sample criteria as follows:

1. MSMEs including Champion MSMEs in Karawang
2. Individual MSMEs have an annual turnover of Rp 300,000,000 and have a maximum net worth (excluding land and buildings) of Rp 50,000,000.

The data collection technique used in this study was a questionnaire made by submitting a list of questions to the MSME owner.

Table 2. Measured by questionnaire using Likert scale.

Variable	Indicator	Measurement
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Social media	<ul style="list-style-type: none"> • Social media help in increase exchange information with consumer • Social media help for give more service _ Good to consumer • Social media help for expand range business • Social media help for reduce cost promotion • Social media make it easy in marketing product • Social media make business own strong position _ in competition 	Likert scale
Venture capital	<ul style="list-style-type: none"> • Umkm need additional capital for operate business through credit / financing . • The credit given is very useful For MSME development . • MSMEs get using funds from given credit _ For buy equipment to be more complete , so can Simplify and speed up the production process . • MSME sales are increasing increase Because exists additional capital from credit / financing from the bank. • With capital from _ credit increase amount production business I • After accept credit happen enhancement profit business 	Likert scale

III.RESULTS / FINDING

Results of Data Collection and Characteristics of Respondents

This study used MSME Champion respondents in Karawang Regency. Collecting data by distributing questionnaires directly to respondents. The results of the research data collection are presented as follows:

Table 3. Data Collection Results and Rate of Return

Number of Questionnaires Distributed	58
Number of Return Questionnaires	48
Total Questionnaire No Return	10
Questionnaire Data Used	48
Percentage Rate of Return	83%

Source: Processed data results, Researcher (2020)

The data presented above indicates that out of the 58 distributed questionnaires, 48 questionnaires were returned, representing 83% of the total. Consequently, the study utilized data from these 48 returned questionnaires. The subsequent section provides an overview of the characteristics of the MSME respondents who participated in the Champion MSME program, categorized by gender and type of business.

Table 4. Characteristics of Respondent Data

Category Type	Information	Amount	Percentage
Type of business	Food	34	70.8%
	Drink	6	12.5%
	fashion	1	2.1%
	Craft	1	2.1%
	Leather Craft	1	2.1%
	Handycrafts	1	2.1%
	Convection	3	6.3%

	Furniture	1	2.1%
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Source: Data processed by SPSS, Researcher (2020)

The data indicates that the majority of research respondents were women, constituting 58.3% of the total, while men accounted for 41.7%. In terms of the type of business, the characteristics of respondents were as follows: Food businesses represented 70.8%, Beverages 12.5%, Clothing 2.1%, Crafts 2.1%, Leather crafts 2.1%, Handicrafts 2.1%, Convection 6.3%, and Mebeul 2.1%.

The subsequent section outlines the social media platforms used by MSME respondents who are champions, categorized by the type of social media.

Table 5. Use of Social Media by MSMEs

Types of Social Media	Amount	Percentage
Facebook	48	100%
Instagram	18	37.5%
WhatsAPP	48	100%

Source: Data processed by SPSS, Researcher (2020)

Based on data, it shows that there are 48 respondents who use Facebook social media with a percentage of 100%, for Instagram 18 with a percentage of 37.5%, and Whatsapp as many as 48 with a total percentage of 100%.

Descriptive Statistics

This research utilizes descriptive statistics as a method for data analysis. The descriptive analysis involves computing various statistical measures such as the mean (average), minimum (lowest), maximum (highest) values, and standard deviation for each variable. The primary purpose of employing descriptive analysis is to present statistical summaries and descriptions of the data.

Table 6. Descriptive Analysis Results

	N	Min	Max	Means	std Deviation
X1	48	12	30	25.00	2,813
X2	48	19	40	30.48	5,279
Y	48	12	20	17.17	1,802

Source: Data processed by SPSS, Researcher (2020)

Based on the aforementioned data results, it is evident that a total of 48 data sheets were used in this study, collected from UMKM champions in Karawang Regency.

Regarding social media, the data analysis revealed an average value of 25.00, with a standard deviation of 2.813. These findings indicate a normal distribution, as the standard deviation is smaller than the average. The minimum value recorded was 12, while the maximum value was 30.

For entrepreneurial capital, the data analysis yielded an average value of 30.48, with a standard deviation of 5.279. Similarly, the data for entrepreneurial capital demonstrated a normal distribution, as the standard deviation was smaller than the average. The minimum value recorded was 19, and the maximum value was 40.

Regarding MSME development, the data analysis resulted in an average value of 17.17, with a standard deviation of 1.802. The normal distribution of the data is confirmed by the standard deviation being smaller than the average. The minimum value recorded was 12, while the maximum value was 20.

The normality, validity, and reliability of the variables were tested, and the significant values indicated that all the variables are normal, valid, and reliable.

Hypothesis test

1. Partial Hypothesis Test (t test)

Table 7. Partial Hypothesis Test Results

Coefficient					
Model			standardized Coefficients Betas	T	Sig.
1. Cons	4,460	2,034		2,193	0.034
X1	0.415	0.069	0.647	6.012	0.000
X2	0.077	0.037	0.225	2,090	0.042

Source: Data processed by SPSS, Researcher (2020)

a. The Effect of social media on MSME Development

Based on the test results, the tcount value is 6.012. When compared with the t table, which is 2.014, so t count > t table. And a significant value of 0.000 is smaller than 0.05. Therefore, it can be said that there is an influence between social media on MSME Development.

b. The Effect of Entrepreneurial capital on MSME Development

Based on the test results, the tcount value is 2.090. When compared with the t table, which is 2.014, so t count > t table. And a significance value of 0.042 is smaller than 0.05. So, it can be showed that there is an influence between Entrepreneurial capital on MSME Development.

3. Simultaneous Hypothesis Test (f Test)

Table 8. Simultaneous Hypothesis Test Results ANOVA

Model	Sun Of Square	df	MeanSquare	f	Sig.
Regression	73.141	2	36.571	20.694	0.000b
Residual	79.525	45	1.767		
Total	152,667	47			

a. Dependent Variable: Total MSME Development.

b. Predictors: (Constant), Total Financial Statements, Total Entrepreneurial capital, Total social media.

Source: Data processed by SPSS, Researcher (2020)

Based on the test results above, the Fcount value is 20,694. As for the value of Ftable at a significance level of 5% and degrees of freedom $df_1 = 2$ and $df_2 = 48$, then Ftable is obtained $(2:48) = 3.19$

The value of F count with F table is then compared, so that a value of $20.694 > 3.19$. A significant value of 0.000 concludes that there is a simultaneous influence of social media and Entrepreneurial capital on MSME Development.

3. Coefficient of Determination

Table 9. Coefficient of Determination

Model	R	R Square	Adjusted R Square	std. Error of the Estimate
1	0.692	0.479	0.456	1.329

a. Predictors: (Constant), Entrepreneurial capital and social media

b. Dependent Variable: MSME Development

Results of Analysis of the Coefficient of Determination

Source: Data processed by SPSS, Researcher (2020)

Based on the data processing outcomes mentioned earlier, the coefficient of determination or R² value is calculated to be 0.479 or 47.9%. This indicates that the variables under investigation, namely social media and entrepreneurial capital, collectively account for 47.9% of the influence on the development of MSMEs in Karawang Regency. The remaining 53.1% is influenced by other variables that were not examined in this study or potential confounding factors.

IV. DISCUSSION

Analysis of the Impact of social media on MSME Development in Karawang Regency

The results of the statistical analysis revealed a count value of 6.012, exceeding the critical t-table value of 2.014, with a highly significant p-value of 0.000 (less than 0.05). Consequently, it can be inferred that social media exerts a significant influence on the development of MSMEs in Karawang Regency, particularly in facilitating increased product sales.

Social media, as its name suggests, serves as a platform for social interaction. By leveraging social media, MSMEs can effectively engage with consumers throughout the entire buying and selling process, thereby gaining valuable insights into consumer preferences and needs.

These research findings corroborate previous studies by Hardian Mursito (2019), Moch Hari Purwiantoro, Dany Fajar Kristanto SW, Widiyanto Hadi (2016), Sohrab Karimi, Hengameh Sadat Naghibi (2015), and Grace Citra Dewi (2019). All these studies demonstrate the significant influence of social media variables on the development of MSMEs.

Analysis of the Impact of Entrepreneurial Capital on the Development of MSMEs in Karawang Regency

The calculated t count value is 2.090, surpassing the critical t-table value of 2.014, with a significant p-value of 0.042 (less than 0.05). These results indicate a significant influence of working capital on the development of SMEs. Thus, the augmentation of business capital plays a pivotal role in fostering the growth of MSMEs in Karawang Regency. Support in the form of capital from relevant agencies and financial institutions can alleviate production and operational costs, making additional capital a vital catalyst for the development of MSMEs.

The outcomes of this study are in line with the research by Baraka Alex Peter and Abel G. Anyiyeni (2015), which substantiates the influence of working capital variables on the development of MSMEs. Additionally, findings from Lia Arliani, Luh Indrayani, Lulup Endah Tripalupi (2019), Djamila Abbas (2018), and Haniyah Safitri, Khasan Setiaji, S.Pd., M.Pd. (2018) are consistent with this study, confirming the significant impact of working capital on MSME growth. Furthermore, the research conducted by Muhamad Takhim and Meftahudin (2018) also supports the notion that working capital variables affect the development of MSMEs.

Analysis of the Combined Impact of Social Media and Entrepreneurial Capital on the Development of MSMEs in Karawang Regency

The findings of this study underscore the influence of social media and business capital on the development of MSMEs in Karawang Regency, contributing to 47.9% of the overall impact. However, it is worth noting that the remaining 53.1% of the influence is attributable to other unexamined factors. The results highlight the imperative for MSMEs to enhance their proficiency in utilizing social media for both marketing and business management purposes, in conjunction with augmenting their business capital. These combined efforts would enable MSMEs to not only endure but also foster broader business development, ultimately leading to increased job opportunities for the community.

V.CONCLUSIONS AND RECOMMENDATION

Conclusions :

This study delves into the analysis of Micro, Small, and Medium Enterprises (MSMEs) development in Karawang Regency. Based on the research and discussions concerning the impact of social media and entrepreneurial capital on MSME growth in Karawang Regency in 2020, the following conclusions can be drawn:

Social media exerts a significant influence on the growth of MSMEs in Karawang Regency. Entrepreneurial capital plays a crucial role in fostering the growth of MSMEs in Karawang Regency. The combined effect of social media and entrepreneurial capital accounts for 47.9% of the MSME growth in Karawang Regency.

Suggestions:

Drawing from the research results, discussions, and conclusions reached, the following recommendations are proposed:

MSME Champions in Karawang:

- a. MSME stakeholders, particularly the MSME champions in Karawang Regency, should enhance their utilization of social media to capitalize on its positive influence on business growth.
- b. MSME owners should strategically plan capital management to meet business requirements, increase production capacity, and ultimately enhance entrepreneurs' income.

Future Researcher:

- a. Subsequent researchers may expand on this study by exploring other factors that potentially influence MSME development. Additionally, alternative research methods may be employed to investigate the growth of MSMEs further.

Academic Community:

- b. The findings of this study should be utilized as valuable input and contribution to the field of knowledge pertaining to the development of Micro, Small, and Medium Enterprises (MSMEs). These findings can serve as a credible reference for further research and academic discourse.

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Financial Feasibility Study of PT XYZ's Plantation Construction Project

Jasmine Raudhatul Jannah¹, Kurnia Fajar Afgani.²

^{1,2} School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

PT XYZ is a new consortium company in the biopharmaceutical industry specializing in producing vaccines for immunization. As a consortium company, PT XYZ is responsible for the downstream phase of vaccine production, which includes formulation, filling, and product packaging until it is available for sale to consumers. Through this consortium, PT XYZ sincerely hopes to assist the Indonesian government in achieving national independence and providing the community with affordable vaccines. Aside from this, the biopharmaceutical market in Indonesia is viewed as a substantial business opportunity due to the presence of several foreign companies filling market gaps. Therefore, PT XYZ has a planning project to build a plant in order to produce the vaccines. The project would require a cost of IDR316 billion which is considered a huge amount of initial investment for PT XYZ. The company would like to know the financial feasibility of this project and also the risk implied from the financial standpoint, which would be the aim of this research. This study comprises six phases for evaluating the project, the first five of which are devoted to calculating the project's financial feasibility. To determine the financial feasibility of this project will use capital budgeting methods, including PP, DPP, NPV, IRR, and PI. The result of NPV will later be tested to assess the risk using sensitivity analysis. The conclusion and recommendations for PT XYZ will be included in the final chapter of this study.

Keyword: Vaccines, Financial Feasibility Study, Capital Budgeting Analysis, Sensitivity Analysis.

I. INTRODUCTION

1.1 Background

In 2022, Indonesia had a population of 275.8 million people, showing a growth of 5.5% in the past five years (Annur, 2022b). With this large population, Indonesia ranks as the fourth most populous country globally, following China, India, and the United States (Annur, 2022a). These statistics are significant because they present a substantial opportunity for business growth, especially in the healthcare sector, considering the vital role it plays in people's lives. This notion is further supported by Article 4 of Law Number 36 of 2009 Concerning Health, which emphasizes that every individual has the right to healthcare, as well as by Law Number 39 of 1999 Concerning Human Rights. There are multiple ways to address the right to healthcare, and these can be categorized into different approaches, including maintenance, health improvement (promotive), disease prevention (preventive), disease healing (curative), and health restoration (rehabilitative) (ELSAM, 2014). Each approach requires specific methods to be implemented effectively. A well-known method for disease prevention (preventive) is vaccination.

Vaccines are altered forms of viruses or bacteria that are introduced into the human body with the aim of strengthening the immune system. They can be administered through injection or orally, and once inside the body, they trigger the production of antibodies (DITPSD Kemendikbud, 2022). Vaccines are usually given to children as part of immunization programs but some vaccines can also be administered to adults.

Establishing a pharmaceutical business in Indonesia is considered a lucrative venture due to its significant growth prospects. This is primarily attributed to the fact that immunization, a key priority in the healthcare sector, covers 30.73 million young children, accounting for approximately 11.21% of the country's total population in 2022 (Rizaty, 2022). Furthermore, article 130 of Indonesian Law No. 36 of 2009 specifies that the government holds the responsibility of ensuring comprehensive immunization coverage, emphasizing their obligation in this regard. Additionally, in 2022, the government introduced three additional vaccines that are now compulsory.

The demand for vaccines in Indonesia has been further boosted by the requirement for vaccines for Hajj and Umrah pilgrimages. According to the World Population Review (2021), Indonesia has the largest Muslim

population, reaching 231,000,000 individuals. Consequently, a significant number of people aspire to undertake the Hajj and Umrah pilgrimages. In 2022, Indonesia witnessed 317,200 Indonesians performing Umrah (Dewi, 2022), and it also topped the list with 100,051 pilgrims participating in the Hajj (Sani, 2022). Participation in these religious activities is subject to specific conditions, as outlined in Circular Letter Number HK.02.02/C.1/9325/2022, which mandates meningitis vaccination for Hajj and Umrah pilgrims (Kemenkes, 2022). While receiving the meningitis vaccine is now optional for Umrah, it is strongly recommended to protect individuals from the heightened risk of contracting meningitis due to the large gathering of people from various parts of the world in one place.

Looking at the demand for vaccines in Indonesia from a market segmentation standpoint, it can be categorized into two segments: the government and the private sector. The government market primarily focuses on providing mandatory vaccines to the public, which are supplied by the government itself. In contrast, the private sector market caters to both mandatory and optional vaccines. In terms of vaccine supply, the industry is dominated by a few major players. Notably, Bio Farma, a state-owned enterprise (BUMN), is the sole vaccine producer in Indonesia. It supplies the majority of the government's mandatory vaccines and also serves a limited portion of the private sector market. In addition, there are still big foreign players that primarily serve private sector.

Seeing this condition PT XYZ, as a consortium with a Chinese company, recognizes the business potential in the biopharmaceutical industry. They aim to support the Indonesian government's affordable vaccine initiative while advancing technology and innovation. PT XYZ plans to build plant in Serang and offer seven types of vaccines, including Moningococcal, Measles and Rubella, Influenza, Pnومococcal, and DTaP-Hib. They will focus on downstream processes and actively support government programs promoting immunization and national self-reliance.

1.2 Business Issue

According to Biofarma's annual report for 2020, the government vaccine market in Indonesia was valued at 1,007.3 trillion rupiah. Additionally, Bio Farma's private market segment accounted for 741.43 trillion rupiah (Biofarma, 2020). It should be noted that the overall private market size in Indonesia is larger than this, as several major foreign companies like Sanofi Pasteur, GlaxoSmithKline, Merck Sharp & Dohme Corp, and Pfizer cater to this market segment. The private market served by foreign companies is estimated to be 787.53 billion, assuming growth similar to that of Biofarma's private market. Consequently, the total vaccine market demand in Indonesia for 2020 was approximately 2,536.25 trillion rupiah.

This condition shows the biopharmaceutical industry shows immense potential, especially in addressing the significant gap in the private sector market that remains open for foreign companies. At the same time, this industry supports the government's efforts to meet the country's vaccine demands adequately. PT XYZ aims to contribute to national self-reliance by establishing a plant to fill this gap. Notably, one of the products PT XYZ will offer is the meningitis vaccine, which has not been produced by Indonesian vaccine manufacturers thus far. This unique offering gives PT XYZ a competitive advantage and opens up larger market opportunities for the company to explore.

In this vaccines production facilities investment, PT XYZ requires money of 21,222,000 USD or equivalent of 316,504,908,000 rupiah. The financing for the construction of the plant will involve a combination of debt and capital. Hence, the purpose of this research is to evaluate the investment in plant construction and determine its financial viability and the risk implied.

II. LITERATURE REVIEW

Biopharmaceuticals are pharmaceutical products that consist of biologically derived active substances and are manufactured using biotechnology. The biopharmaceutical industry comprises businesses and organizations primarily involved in various aspects of biopharmaceuticals, such as research, development, manufacturing, and marketing. (Rader, 2008).

2.1 Capital Budgeting

Capital budgeting refers to the procedure of recognizing and opting for long-term investments in durable assets or assets that are projected to yield advantages beyond a one-year timeframe. (Fabozzi and Peterson, 2004). When assessing a capital expenditure proposal, there are six categories of techniques: "naive" and "sophisticated." The sophisticated methods include Net Present Value (NPV), Internal Rate of Return (IRR), and Profitability Index

(PI), which involve discounted cash flows (DCF). The naive approaches encompass payback period, discounted payback period, and accounting return on investment (AROI). (Freeman and Hobbes in 1991 in Alfiyah, 2019).

2.2 Financial Feasibility Study

A Financial Feasibility Study is an assessment conducted to determine the financial viability of a new investment project (Burger, 2022). The objective of conducting a financial analysis for a project is to evaluate the extent to which the project aligns with established investment criteria. Essentially, the goal is to ensure that the project attains a level of business profitability that meets the acceptable standards (Abu Jamie, 2014).

2.2.1 Net Present Value (NPV) and Profitability Index (PI)

According to the Principles of Managerial Finance book by Gitman and Zutter (2015), Net Present Value (NPV) is an advanced capital budgeting technique. NPV is calculated by subtracting the initial investment of a project from the present value of its cash inflows, which are discounted at a rate equivalent to the firm's cost of capital.

Net Present Value = Present value of cash inflows - Initial investment

$$NPV = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} - CF_0$$

Equation 2.1 NPV Formula

Where,

- CF_t = Net cash inflows-outflows during a single period of t
- CF₀ = Total initial investment cost
- r = Discount rate or return that could be earned in alternative investments
- t = Number of time periods

Criteria for NPV:

- If the NPV is >0, accept the project.
- If the NPV is <0, reject the project.

According to Gitman and Zutter (2015), the Profitability Index (PI) is a modified version of Net Present Value (NPV) that measures the relationship between the present value of expected cash flows and the initial investment. Below is the formula to calculate Profitability Index (PI):

$$PI = \frac{\sum_{t=1}^n \frac{CF_t}{(1+r)^t}}{CF_0}$$

Equation 2.2 PI Formula

Where,

- CF_t = Net cash inflows-outflows during a single period of t
- CF₀ = Total initial investment cost
- r = Discount rate or return that could be earned in alternative investments
- t = Number of time periods

The decision criteria used to make an accept-reject decisions are as follows:

- Accept the project if the PI > 1.
- Reject the project if the PI < 1.

2.2.2 Internal Rate of Return

The Internal Rate of Return (IRR) is the discount rate at which the sum of the present values of cash flows becomes zero. In other words, if the Net Present Value (NPV) of a project is zero at a specific discount rate, that discount rate is considered the IRR, as defined by Patrick and French (2016).

The formula for calculating IRR as follows:

$$0 = \sum_{t=1}^n \frac{CF_t}{(1 + IRR)^t} - CF_0$$

$$\sum_{t=1}^n \frac{CF_t}{(1 + IRR)^t} = CF_0$$

Equation 2.3 IRR Formula

Where,

CF_t = Net cash inflows-outflows during a single period of t

CF₀ = Total initial investment cost

IRR = Return that could be earned in alternative investments

t = Number of time periods

When IRR is used to make accept-reject decisions, the decision criteria are as follows:

- The project is acceptable if the cost of capital is lower than IRR
- The project is not acceptable If the IRR is less than the cost of capital

2.2.3 Payback Period and Discounted Payback Period

Brigham (1982) defined the payback period as the time required for the total earnings or net cash inflow from an investment to equal the total outlays. The payback period method is frequently used by small and medium-sized companies to evaluate proposed investments. In the case of an annuity, the payback period is calculated by dividing the initial investment by the annual cash flow. Below is the formula to calculate payback period:

$$\text{Payback Period} = \frac{\text{Initial Investment or Original Cost of the Asset}}{\text{Cash Inflows}}$$

Equation 2.4 PP Formula

The criteria for payback period when making accept-reject decisions are:

- The project can be accepted if the payback period is not more than the maximum acceptable timeframe.
- The project is rejected if the payback period duration is longer than the maximum acceptable payback period.

The discounted payback period is another method that takes into account the time value of money when assessing the financial feasibility of an investment. It measures the time required to generate discounted cash flows that are equal to the initial investment. This approach provides a more comprehensive understanding of the investment's profitability, as explained by Gildersleeve (1999).

2.3 Capital Budgeting Cash Flow

In order to evaluate investment opportunities, financial managers need to identify the pertinent cash flows associated with the project. These cash flows can be classified into three main components: the initial investment, operating cash flow, and terminal cash flow, as outlined by Gitman and Zutter (2015).

- **Initial investment**
The concept of "initial investment" refers to the financial outlays that need to be considered when evaluating a potential capital expenditure (Gitman and Zutter, 2015). Cash flows related to the initial investment encompass various factors such as the purchase price of the asset or materials required for production, expenses for installation and delivery, and any additional investment in net working capital (Gallagher and Andrew, 2011).
- **Operating cash flow**
Operating cash flows are the cash flows generated by a project once it is operational, resulting from changes in sales or expenses. It is crucial to consider the project-specific incremental operating cash flows when evaluating capital budgeting decisions. This entails factoring in tax changes due to adjustments in depreciation expenses, opportunity costs, and external factors (Gallagher and Andrew, 2011).
- **Terminal Cash Flow**

Terminal cash flow represents the cash flow generated when a project reaches the end of its economic life and is liquidated. It captures the cash flow after taxes, excluding operating cash flows, that occurs in the final year of the project. This definition aligns with the explanation provided by Gitman and Zutter (2015).

2.6 Weighted Average Cost of Capital (WACC)

When evaluating the ideal capital structure, management often determines the firm's weighted-average cost of capital (WACC). This process involves calculating the cost of different forms of financing, such as debt, preferred stock, and common equity, and assigning weights to each based on the actual or proposed proportion of total capital (Delaney and Whittington, 2007).

$$WACC = \frac{E}{V} \times Re + \frac{D}{V} \times Rd \times (1 - Tc)$$

Equation 2.5 WACC Formula

Where,

- Re = Cost of equity
- Rd = Cost of debt
- E = Market value of the firm's equity
- D = Market value of the firm's debt
- V = Total market value of the firm's financing (equity and debt)
- T_c = Corporate tax rate

2.7 Sensitivity Analysis

Sensitivity analysis is a method used to explore the potential outcomes by modifying one of the factors in an analysis (Fabozzi and Peterson, 2002). In its simplest form, sensitivity analysis involves adjusting the value of a variable to observe its impact on the final outcome. This technique is employed to identify the most crucial and highly sensitive factors within a project, as highlighted by (Savvides, 1994).

III. RESEARCH METHODOLOGY

3.1 Research Design

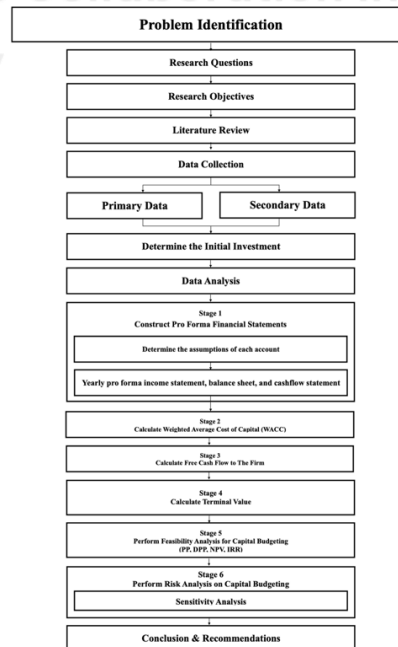


Figure 3.1 Research Design

The figure above shown the stages that the research must goes through in order to get the result. The research divides the stages into six which starts with construct pro forma financial statements, followed by calculate WACC, calculate FCFF, calculate terminal value, perform feasibility study, and perform risk.

3.2 Data Collection

- **Primary Data**

Regarding the research, the authors collected primary data through unstructured interviews with individuals responsible for the project. The purpose of these interviews was to gain a deeper understanding of PT XYZ's investment plan, allowing the authors to generate financial assumptions and verify the data provided by the company.

- **Secondary Data**

The secondary data for this research consists of PT XYZ's financial plans report, as well as benchmarks from comparable companies operating in the same industry. The benchmark data is obtained from the websites of these well-known companies, and the author selects the relevant data for their analysis. Additionally, the author gathers information from various websites to meet other necessary assumptions.

3.3 Data Analysis Method

3.3.1 Stage 1 – Construct Pro Forma Financial Statements

- **Determine the Assumption of Each Account**

Assumptions are vital for defining calculation conditions and justifying data usage. They can be obtained from interviews, company historical data, industry benchmarks, or expert insights. In this research, the author will rely on assumptions gathered from the interviewee and benchmarks of similar companies due to the absence of historical data from PT XYZ.

- **Construct Pro Forma Income Statement, Balance Sheet, and Cash Flow**

After identifying all the assumptions, the subsequent step involves constructing the income statement and balance sheet. The pro forma cash flow statement can then be created based on the developed income statement and balance sheet. It's important to note that all the pro forma statements generated by the author are projected for the next ten years.

3.3.2 Stage 2 – Calculate Weighted Average Cost of Capital

Noting this company has two sources of funding, so these are the formulas to calculate WACC:

$$Re = Rf + \beta i(ERm - Rf)$$

Equation 3.1 Cost of Equity Formula

Where,

Re = Cost of equity

Rf = Risk-free rate

Bi = Beta of the company

ERm = Expected return of the market

$$Rd \text{ (after corporate tax)} = Rd \times (1 - tC)$$

Equation 3.2 Cost of Debt Formula

Where,

Rd = Cost of debt

Tc = Corporate tax rate

Meanwhile, formulas to calculate the beta are:

$$\beta_{levered} = \beta_{unlevered} + \left[1 + (1 - \text{tax rate}) \left(\frac{\text{debt}}{\text{equity}} \right) \right] \beta_{levered}$$

$$\beta_{unlevered} = \frac{\beta_{levered}}{\left[1 + (1 - \text{tax rate}) \left(\frac{\text{debt}}{\text{equity}} \right) \right]}$$

Equation 3.3 Unlevered & Levered Formula

Consequently, the cost of capital can be computed using the following formula for weighted average cost of capital:

$$WACC = \frac{E}{V} \times Re + \frac{D}{V} \times Rd \times (1 - Tc)$$

Equation 3.4 WACC Formula

Where,

Re	= Cost of equity
Rd	= Cost of debt
E	= Market value of the firm's equity
D	= Market value of the firm's debt
V	= Total market value of the firm's financing (equity and debt)
T'c	= Corporate tax rate

3.3.3 Stage 3 – Calculate Free Cash Flow to Firm (FCFF)

The required data to calculate FCFF are operating cash flow, net capital expenditure, and changes in net working capital. Below are the formulas:

$$\begin{aligned} OCF &= EBIT (1 - Tc) + Depreciation \\ Net\ CAPEX &= (Fixed\ asset_t - Fixed\ asset_{t-1} + Depreciation) \\ \Delta NWC &= (CA - CL)_t - (CA - CL)_{t-1} \end{aligned}$$

Equation 3.5 OCF, Net CAPEX, Δ NWC Formula for FCFF

Where,

OCF	= Operating cash flows
EBIT	= Earnings before interest and tax
Tc	= Corporate tax rate
Net Capital Expenditure	= Net capital expenditure
Δ NWC	= Changes in net working capital
CA	= Current asset
CL	= Current liabilities
t	= In year t

. By calculating the terminal value, it is assumed that this factory will continue to operate eternally with the help of a variable growth rate of the industry. Therefore, the formula to calculate it as follows:

$$Terminal\ cash\ flow = \frac{CFn (1 + g)}{(r - g)}$$

Equation 3.6 Terminal CF Formula

Where,

CFn	= Free cash flow at the end of forecasted period
r	= Weighted Cost of Capital of the company
g	= Terminal growth rate

3.3.4 Stage 4 – Perform Feasibility Analysis for Capital Budgeting

The purpose of this stage in the research is to evaluate the financial feasibility of the project. Various financial evaluation tools such as net present value (NPV), internal rate of return (IRR), payback period, and discounted payback period will be employed. These calculations will be based on the data discussed in the previous chapter.

3.3.5 Stage 5 – Risk Assessment in Capital Budgeting

The sensitivity analysis identifies variables that have a notable impact on the net present value (NPV). This analysis involves determining the number of scenarios and inputting the relevant variables for calculation. The results of this analysis reveal the NPV changes associated with each scenario. Variables that demonstrate a substantial effect on the NPV after the swing are considered sensitive variables.

IV. RESULT / FINDING

4.1 Investment Project Overview

PT XYZ is a company operating in the biopharmaceutical industry and has plans to construct a plant with the necessary facilities to support the production process. The company's main focus will be on manufacturing and

selling vaccines as their products. The production process in the biopharmaceutical industry involves both upstream and downstream activities. However, as mentioned in the scope and limitation, PT XYZ will only concentrate on the downstream process, specifically formulation, filling, and packaging. The following is the process flow of factory activities:

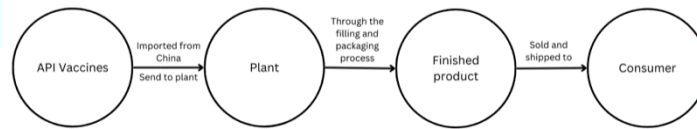


Figure 4.2 Process Flow of Plant

PT XYZ chose Serang as the plant location and the factory will be built on two floors and to implement this project plan, a total investment cost of USD 21,222,000 is needed, which is equivalent to approximately 316,504,908,000 Indonesian rupiahs based on the exchange rate of 14,914 rupiahs per US dollar as of June 1st. The following is a detailed breakdown of the initial investment:

Table 4.1 Initial Investment

Items	Total (in USD)
Land	2,200,000
CoD & BoD	200,000
DeD & Construction Facility	17,500,000
Cleanroom and Equipment Validation and Qualification	250,000
GMP Certificate by Indonesian NRA	2,000
Office (250m ²) + warehouse 1000m ²	120,000
Cold storage 100m ²	150,000
Black utilities (industrial steam and electricity)	800,000
Total Initial Investment	21,222,000

The financing strategy that PT XYZ will use to fund the initial investment is from 50% equity and 50% bank loan. Having access to all of the available data aids in the calculation process, which will ultimately determine whether or not this endeavor is viable.

4.2 Pro Forma Financial Statements

	2024E	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F	2034F
INCOME STATEMENT											
Revenue	-	-	-	4,987,793,402,392	5,281,614,468,796	5,546,717,576,327	5,824,053,455,143	6,115,256,127,900	6,421,018,934,295	6,742,069,881,010	7,079,173,375,060
COGS	-	-	-	1,496,320,020,718	1,584,484,340,639	1,664,015,272,898	1,747,216,036,543	1,834,576,838,370	1,926,305,680,289	2,022,620,964,303	2,123,752,012,518
Net Gross Profit	-	-	-	3,491,473,381,674	3,697,130,128,157	3,882,702,303,429	4,076,837,418,600	4,280,679,289,530	4,494,713,254,007	4,719,448,916,707	4,955,421,362,542
Operating Expenses	9,653,358,587	15,820,868,839	15,821,863,105	2,361,562,847,759	2,235,740,816,695	2,347,223,473,657	2,463,848,823,582	2,586,303,330,330	3,035,929,323,799	2,849,879,913,549	2,991,629,184,177
EBIT	(9,653,358,587)	(15,820,868,839)	(15,821,863,105)	1,129,850,533,916	1,461,389,311,463	1,535,478,829,771	1,612,988,595,018	1,694,375,959,200	1,458,783,930,207	1,869,569,003,158	1,963,792,176,365
Tax expense	-	-	-	248,567,117,461	321,505,648,522	337,805,342,550	354,857,490,904	372,762,711,024	320,937,464,646	411,305,180,695	432,034,279,240
Interest expense	-	14,764,953,958	14,764,953,958	14,764,953,958	14,764,953,958	14,764,953,958	14,764,953,958	14,764,953,958	14,764,953,958	14,764,953,958	14,764,953,958
Net Profit	(9,653,358,587)	(30,585,822,797)	(30,586,817,063)	866,518,462,496	1,125,118,708,983	1,187,908,533,264	1,243,366,150,156	1,306,848,294,218	1,123,086,511,603	1,443,498,868,505	1,516,992,945,167

Figure 4.3 Yearly Income Statement (2024-2034)

Figure 4.4 Yearly Balance Sheets (2024-2034)

CASH FLOW	2024E	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F	2034F
Net Income	(9,653,358,587)	(30,585,822,797)	(30,586,817,063)	866,518,462,498	1,125,118,708,983	1,182,908,533,264	1,243,366,150,156	1,306,848,294,218	1,123,086,511,603	1,443,498,868,505	1,516,992,945,167
Depreciation	8,393,358,587	14,516,301,287	-	13,523,028,887	13,523,028,887	13,523,028,887	13,523,028,887	13,523,028,887	13,523,028,887	13,523,028,887	13,523,028,887
Changes in Net working Capital	-	-	-	655,921,049,972	39,647,373,116	34,862,874,415	36,471,567,625	38,259,146,006	40,209,903,307	42,220,398,472	44,331,418,396
Operating Cash Flow	(1,260,000,000)	(16,069,521,509)	(16,069,521,509)	224,120,386,411	1,099,994,364,754	1,161,568,687,736	1,220,417,611,418	1,282,076,177,099	1,096,399,637,184	1,414,801,498,920	1,486,184,555,659
Acquisition of New Assets											
Land	32,810,800,000	-	-	-	-	-	-	-	-	-	-
CoD & BoD	2,982,800,000	-	-	-	-	-	-	-	-	-	-
DED & Construction Facility	143,547,250,000	117,447,750,000	-	-	-	-	-	-	-	-	-
GMP Certificate by Indonesian NRA	-	-	29,828,000	-	-	-	-	-	-	-	-
Office + Warehouse	357,936,000	1,431,744,000	-	-	-	-	-	-	-	-	-
Cold Storage	447,420,000	1,789,680,000	-	-	-	-	-	-	-	-	-
Black Utilities	2,386,240,000	9,544,960,000	-	-	-	-	-	-	-	-	-
Investing Cash Flow	182,532,446,000	130,214,134,000	29,828,000	-	-	-	-	-	-	-	-
F Cash received from Equity financing	158,252,454,000	32,000,000,000	32,000,000,000	-	-	-	-	-	-	-	-
I Cash received from long term Debt	158,252,454,000	-	-	-	-	-	-	-	-	-	-
C Long term Debt repayment	-	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)
Financing Cash Flow	316,504,908,000	16,174,754,600	16,174,754,600	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)	(15,825,245,400)
Net Cash Flow	132,712,462,000	(130,108,900,909)	75,405,091	208,295,141,011	1,084,169,119,354	1,145,743,442,336	1,204,592,366,018	1,266,250,931,699	1,080,574,391,784	1,398,976,253,520	1,470,359,310,259
Opening cash balance	132,712,462,000	2,603,561,091	2,678,966,181	210,974,107,193	1,295,143,226,547	2,440,886,668,883	3,645,179,034,901	4,911,729,966,599	5,992,104,358,384	7,391,280,612,904	8,861,639,922,162
Closing Cash Balance	2,603,561,091	2,678,966,181	2,678,966,181	210,974,107,193	1,295,143,226,547	2,440,886,668,883	3,645,179,034,901	4,911,729,966,599	5,992,104,358,384	7,391,280,612,904	8,861,639,922,162
Costs in new	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000	4,384,800,000
Less: Acc Depre CoD & BoD	994,266,667	1,988,533,333	2,982,800,000	2,982,800,000	2,982,800,000	2,982,800,000	2,982,800,000	2,982,800,000	2,982,800,000	2,982,800,000	2,982,800,000
DED & Construction Facility	143,547,250,000	240,995,000,000	260,995,000,000	260,995,000,000	260,995,000,000	260,995,000,000	260,995,000,000	260,995,000,000	260,995,000,000	260,995,000,000	260,995,000,000
Less: Acc Depre DED & Construction Facility	7,177,362,500	20,227,112,500	33,376,862,500	46,326,612,500	59,376,362,500	72,426,112,500	85,475,862,500	98,525,612,500	111,575,362,500	124,625,112,500	137,674,862,500
GMP Certificate by Indonesian NRA	-	-	29,828,000	29,828,000	29,828,000	29,828,000	29,828,000	29,828,000	29,828,000	29,828,000	29,828,000
Less: Acc Depre GMP Certificate by Indonesian NRA	-	994,267	1,988,533	2,982,800	3,977,067	4,971,333	5,965,600	6,959,867	7,954,133	8,948,400	9,942,667
Total fixed asset	174,139,087,413	289,836,920,125	275,349,452,571	261,826,423,683	248,303,394,796	234,780,365,909	221,257,337,021	207,734,308,134	194,211,279,246	180,688,250,359	167,165,221,471
Total Assets	306,851,549,413	292,440,481,216	278,028,418,752	1,251,706,843,031	2,368,246,689,072	3,541,866,765,889	4,776,246,089,574	6,074,449,478,268	7,189,250,101,342	8,624,840,049,160	10,134,319,889,876
Liabilities											
Account Payable	-	-	-	122,985,207,182	130,231,589,642	136,748,378,594	143,606,797,524	150,787,137,400	158,326,494,270	166,242,818,984	174,554,959,933
Long term Debt	158,252,454,000	142,427,208,600	126,601,963,200	110,776,717,800	94,951,472,400	79,126,227,000	63,300,981,600	47,475,736,200	31,650,490,800	15,825,245,400	-
Total Liabilities	158,252,454,000	142,427,208,600	126,601,963,200	233,761,924,982	225,183,062,042	215,884,605,594	206,907,779,124	198,262,873,600	189,976,985,070	182,068,064,384	174,554,959,933
Equity											
Paid-up capital	158,252,454,000	190,252,454,000	222,252,454,000	222,252,454,000	222,252,454,000	222,252,454,000	222,252,454,000	222,252,454,000	222,252,454,000	222,252,454,000	222,252,454,000
Retained earnings	(9,653,358,587)	(40,239,181,384)	(70,825,998,448)	795,692,464,048	1,920,811,173,031	3,103,719,706,294	4,347,085,856,450	5,653,934,150,668	6,777,020,662,271	8,220,519,530,776	9,737,512,475,943
Total Equity	148,599,095,413	150,013,272,616	151,426,455,552	1,017,944,918,048	2,143,063,627,031	3,325,972,160,294	4,569,338,310,450	5,876,186,606,668	6,999,273,116,271	8,442,771,984,776	9,959,764,929,943
Total Liabilities & Equity	306,851,549,413	292,440,481,216	278,028,418,752	1,251,706,843,031	2,368,246,689,072	3,541,866,765,889	4,776,246,089,574	6,074,449,478,268	7,189,250,101,342	8,624,840,049,160	10,134,319,889,876

Figure 4.5 Yearly Cash Flow (2024-2034)

The figures above show the projected financial statement of PT XYZ. It shows that the company is predicted to have a healthy financial condition since they will always generate profit every year since they produce the products.

4.3 Capital Budgeting Analysis

Following the completion of the previous four phases, the fifth and final phase involves assessing the financial feasibility of the plantation project by calculating essential information relevant to capital budgeting components. Various tools such as Payback Period (PP), Discounted Payback Period (DPP), Net Present Value (NPV), Profitability Index (PI), and Internal Rate of Return (IRR) will be utilized to determine whether the project meets the predetermined acceptance criteria. The summary is shown in the following table:

Table 4.2 Financial Feasibility Study Result

Assessment Technique	Result	Acceptance requirement	Status
Payback Period	3.07	Maximal 5 years	Accept
Discounted Payback Period	3.16	Maximal 5 years	Accept
Net Present Value	12,295,730,219,542.80	NPV > 0	Accept
Profitability Index	67.90	PI > 1	Accept
Internal Rate of Return	58%	IRR > WACC	Accept

The table above clearly indicates that the project meets the acceptance criteria for each capital budgeting assessment technique, as all the results exceed the required benchmarks. The Payback Period is calculated as 3.07, which translates to a duration of 3 years and 3 days for the project's net cash flow to recover the initial investment. In terms of the Discounted Payback Period, it takes 3.16, equivalent to 3 years, 1 month, and 28 days, to recoup the initial investment by considering the time value of money through discounting. Both the Payback Period and Discounted Payback Period fall within the company's maximum expectation of 5 years.

Furthermore, the NPV result is greater than 0, indicating that the projected cash flows from the project exceed the initial investment. The Profitability Index (PI) is calculated as 67.90, indicating that the present value of predicted net cash flows, considering the discount rate, surpasses the initial investment by a factor of 67.90. This implies that the project's present value significantly exceeds the initial investment cost.

Lastly, the Internal Rate of Return (IRR) for this project is 58%, indicating an estimated return of 58% on the initial investment.

4.4 Sensitivity Analysis

After the financial feasibility has performed then perform the risk assessment using sensitivity analysis. Here the author using swing for $\pm 10\%$. The calculation of sensitivity is commonly depicted in chart as can be seen in the figure below:

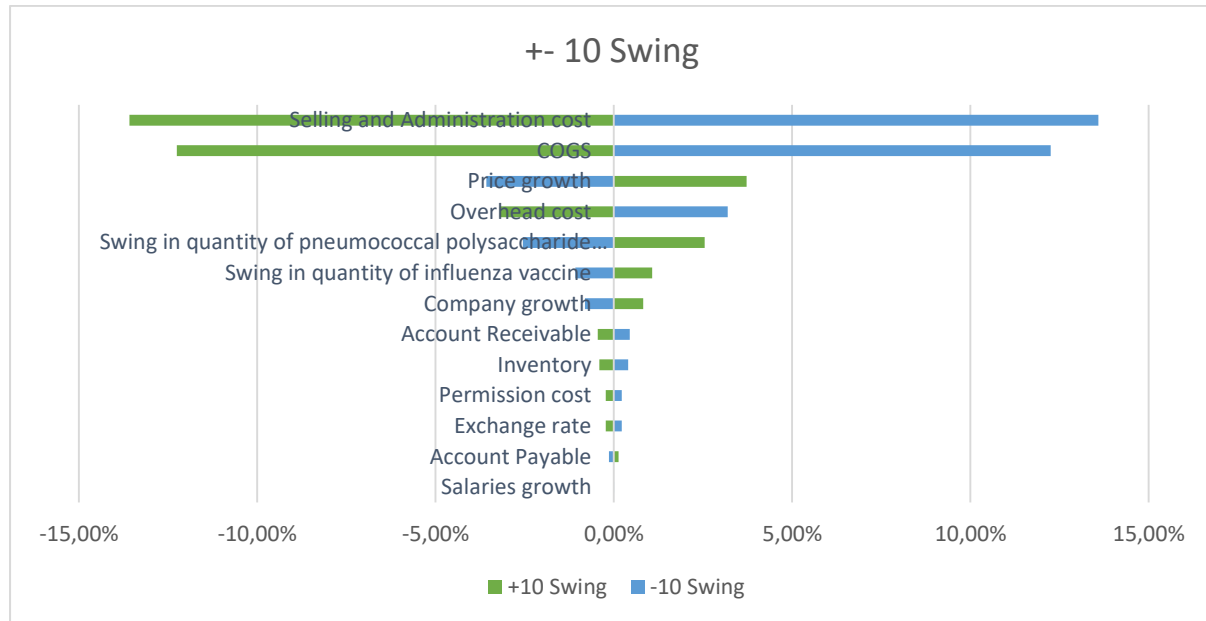


Figure 4.5 Tornado Chart with 10% Swing

Following the sensitivity analysis conducted using three different percentages, it was observed that out of the 13 input variables, two variables showed sensitivity towards the NPV. These variables were selling & administration and COGS (Cost of Goods Sold), as they exhibited the highest changes in NPV values. On the other hand, the variable related to salaries growth had the least significant impact on the NPV. Below, you will find a detailed interpretation of the sensitivity analysis for each variable:

Table 4.3 Analysis of $\pm 10\%$ Swing

+- 10% Swing	
Variable	Interpretation
S&A	<ul style="list-style-type: none"> Every 10% increase in S&A, the NPV will decrease for 13.59% Every 10% decrease in S&A, the NPV will increase for 13.59%
COGS	<ul style="list-style-type: none"> Every 10% increase in COGS, the NPV will decrease for 12.26% Every 10% decrease in COGS, the NPV will increase for 12.26%
Price growth	<ul style="list-style-type: none"> Every 10% increase in price growth, the NPV will increase for 3.72% Every 10% decrease in price growth, the NPV will decrease for 3.58%
Overhead cost	<ul style="list-style-type: none"> Every 10% increase in overhead cost, the NPV will decrease for 3.20% Every 10% decrease in overhead cost, the NPV will increase for 3.20%
Swing in quantity of pneumococcal	<ul style="list-style-type: none"> Every 10% increase in quantity of pneumococcal polysaccharide vaccine, the NPV will increase for 2.55%

polysaccharide vaccine	<ul style="list-style-type: none"> • Every 10% decrease in quantity of pneumococcal polysaccharide vaccine, the NPV will decrease for 2.55%
Swing in quantity of influenza vaccine	<ul style="list-style-type: none"> • Every 10% increase in quantity of pneumococcal polysaccharide vaccine, the NPV will increase for 1.08% • Every 10% decrease in quantity of pneumococcal polysaccharide vaccine, the NPV will decrease for 1.08%
Company growth	<ul style="list-style-type: none"> • Every 10% increase in company growth, the NPV will increase for 0.83% • Every 10% decrease in company growth, the NPV will decrease for 0.81%
Account Receivable	<ul style="list-style-type: none"> • Every 10% increase in account receivable, the NPV will decrease for 0.45% • Every 10% decrease in account receivable, the NPV will increase for 0.45%
Inventory	<ul style="list-style-type: none"> • Every 10% increase in inventory, the NPV will decrease for 0.40% • Every 10% decrease in inventory, the NPV will increase for 0.40%
Permission cost	<ul style="list-style-type: none"> • Every 10% increase in permission cost, the NPV will decrease for 0.22% • Every 10% decrease in permission cost, the NPV will increase for 0.22%
Exchange rate	<ul style="list-style-type: none"> • Every 10% increase in exchange rate, the NPV will decrease for 0.22% • Every 10% decrease in exchange rate, the NPV will increase for 0.22%
Account payable	<ul style="list-style-type: none"> • Every 10% increase in exchange rate, the NPV will increase for 0.13% • Every 10% decrease in exchange rate, the NPV will decrease for 0.13%
Salaries growth	<ul style="list-style-type: none"> • The 10% of increase in salaries growth do not affect the NPV. • Every 10% decrease in salaries growth, the NPV will increase for 0.01%

V. DISCUSSION

Reflecting from the gathered result, PT XYZ should execute the project plan in vaccines production facilities because after going through the financial feasibility study it is proven that building a plant is feasible and will generate large profits for the company. Since there are S&A and COGS are variables that considered as sensitive then they must make preventive actions. For COGS they could negotiating and reaching an agreement with the supplier regarding the material. The company might form an upfront agreement with the supplier to deliver at a fixed price so that if an undesirable situation occurs in the future that forces the price to raise, they could give an advance notification and not alter the price too much from what has been set. Aside from that, an emphasis on optimizing the production process through employee training is required so that vaccine production can be more efficient and no products are wasted. For selling and administration, the company could maintain the number of assumptions in the calculation by educating employees on how to spend the budget more efficiently and ensuring the budget is spent wisely on promotion. They should ensure that the platform or activities for promoting the product are appropriate, so that once the product is promoted, the sales increase until they could cover the costs. Additionally, the organization must carefully plan by understanding its priorities. Therefore, if there are unpredictable expenses, they can still be managed.

In addition, PT XYZ should maintain the number of COGS assumption for not exceeding 54.47%. Because if assuming other variables are remaining the same, but the COGS is more than 54.47%, the company is no longer generating profit. PT XYZ should maintain the number of selling & administration for not exceeding 59.02%. Because if assuming other variables are remaining the same, but the selling & administration is more than 59.02%, the company is no longer generating profit.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

PT XYZ is a consortium operating in the biopharmaceutical industry, specializing in the production and sale of vaccines. Their focus is solely on the downstream stage of vaccine production. Recognizing the substantial demand for vaccines in Indonesia, particularly due to mandatory immunization regulations, PT XYZ aims to build a factory to meet this demand. To offer more affordable prices, PT XYZ plans to adopt a pricing strategy by setting their selling price at 75% of the market price. The project requires an initial investment of \$21,222,000 or Rp316,504,908,000, which will be funded equally through equity and debt.

The financial feasibility study of this project utilizes capital budgeting techniques such as Payback Period (PP), Discounted Payback Period (DPP), Net Present Value (NPV), Profitability Index (PI), and Internal Rate of Return (IRR). The PP for this project is determined to be 3 years and 3 days, while the DPP is estimated at 3 years, 1 month, and 28 days, both falling within the company's desired timeframes. The NPV for the project is calculated to be \$12,295,731,542.80. Additionally, the PI exceeds the requirement of 1, with a value of 67.90, and the IRR stands at 58%, significantly higher than the weighted-average cost of capital (WACC). Based on the positive results from the capital budgeting assessment, it can be concluded that the plant construction of PT XYZ are financially feasible.

To further enhance the research, a risk analysis incorporating sensitivity analysis is conducted to identify potential risks faced by the company due to future uncertainties. The sensitivity analysis reveals that the NPV is highly sensitive to two variables: sales and administration costs, and Cost of Goods Sold (COGS). Recognizing the sensitivity of these variables, PT XYZ can focus on closely managing and monitoring them, as they significantly impact the NPV.

6.2 Recommendation

To have a complete analysis, it is better for PT XYZ to run another analysis in feasibility study aspect such as operation and marketing. Moreover, they also need to add further analysis regarding the risk since the assumption they have could not be calculated for monte carlo and add expert's judgement for scenario analysis.

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The Effect of QRIS as a Unified Cashless Payment towards Payment Switching Method in E-Wallet and M-Banking Usage in Indonesia

Stella Sutedja¹ and Fitri Aprilianty²

^{1,2} School of Business and Management Institut Teknologi Bandung (SBM ITB), Bandung, Indonesia

Abstract

Payment systems have revolutionized from cash to cashless payments with the adoption of electronic money starting with brand-specific QR codes. Bank Indonesia introduced a Non-Cash National Movement program with Quick Response Code Indonesian Standard (QRIS) as its leading initiative. While QRIS proves to have high societal acceptance, it also creates a competitive landscape for platforms such as e-wallets and m-banking to compete in acquiring QRIS users. Experts and preliminary studies have shown that QRIS becomes a serious threat to e-wallet service providers, noting that people are shifting to m-banking for QRIS payments. This research aims to explore the effects of QRIS as a unified cashless payment towards payment switching methods in e-wallet and m-banking usage in Indonesia through combined qualitative and quantitative methods. Qualitative approach is done through a series of interviews and is analysed with NVivo. Quantitative approach data is collected through questionnaires are analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). This research targets QRIS users that have used both e-wallet and m-banking for QRIS payments and have decided to switch to m-banking with 12 participants for the qualitative and 221 participants for the quantitative approach. The research findings show a significant effect of trust, perceived compatibility, price, attitude towards switching, perceived behavioral control, and personality traits towards switching intention. Moreover, switching intention is shown to have a significant influence on switching behavior. The findings give an understanding of the factors that influence payment-switching methods and give marketing recommendations for QRIS payment platforms.

Keywords— Cashless; E-wallet; M-banking; Switching; QRIS

I. INTRODUCTION

The evolution of payment systems has remarkably improved transactions in modern society as technology adoption has made payments more effortless and seamless. In Indonesia, Bank Indonesia, the country's central bank, authorized the usage of electronic money on 13 April 2009 with *Peraturan Bank Indonesia Nomor 11/12/PBI/2009*. Furthermore, Bank Indonesia launched the Non-Cash National Movement (GNNT) five years later to support cashless payments and create a safe, efficient, and seamless payment system that reduces the hassle of cash payments. GNNT also aims to create an ecosystem for a cashless society (Bank Indonesia, 2023).

A cashless society is described as a "Bank Central Initiative to transform cash instruments into non-cash in economic activities" (Ewa Abbas, 2017). The European Central Bank (2023) defines electronic money (e-money) as electronic stores of monetary value on a technical device that can be widely used for making payments to entities other than the e-money issuer. According to *Buku Kajian Stabilitas Keuangan Bank Indonesia*, e-money transactions have grown 40.6% yearly (yoy) and reached Rp185.7 trillion (Bank Indonesia, 2022). The payment system service providers, which include electronic wallet (e-wallet) and mobile banking (m-banking), offer e-money transactions.

Bank Indonesia (2023) states that there are 48 licensed e-wallet service providers in Indonesia. A survey conducted by Populix (2022) reveals that Gopay, Dana, OVO, ShopeePay, and LinkAja are the five most used e-wallet applications, with many respondents having multiple e-wallet applications. The same survey suggests that users choose e-wallets due to their practicality and as a payment method for e-commerce transactions, with the top three factors being hassle-free, integration with e-commerce, and ease of use (Populix, 2022). However, there is no exact number of licensed m-banking service providers in Indonesia. According to Angelia (2022), derived from Populix's survey, the five most used applications for mobile banking are BCA Mobile, BRImo, Livin' by Mandiri, BNI Mobile Banking, and BSI Mobile. The survey also shows that the top three reasons why users use mobile banking are hassle-free, time efficiency, and ease of use (Populix, 2022). One of the government's products for

Indonesia's urge for payment digitalization is the Quick Response Code Indonesian Standard (QRIS). QRIS is a unified QR code payment that unifies various payment system service providers. Bank Indonesia launched and developed QRIS in 2019 with the aim to provide an easier, faster, and safer transaction process. The unified QR payment system is accessible with all payment services, including e-wallet and m-banking, to do transactions ranging from stores, vendors, *warung*, parking, donations, merchants, and others. Individuals or businesses accepting QR payments must open their account with one of QRIS' service providers under BI licensing, but it allows them to receive payments through any provider (Bank Indonesia, 2023).

According to *Buku Kajian Stabilitas Keuangan Bank Indonesia*, QRIS has been highly welcomed within society, with statistics showing that its usage has increased by 322.5% by nominal and 194.4% by value yearly (*yoY*) in 2022, alongside societal acceptance (Bank Indonesia, 2022). The book also highlights Bank Indonesia's strategies to continue strengthening its digital financial economic strategies through QRIS Transfer, Withdrawals, Deposits, and QRIS Crossborder for international transactions. Bank Indonesia aims to expand both QRIS' merchants and users with its three pillars of expansion, education, and campaign (Bank Indonesia, 2022). With QRIS' innovation, advantages offered, substantial growth, and governmental support, financial provider services in Indonesia are rapidly trying to acquire and get people to adopt QRIS in its platforms.

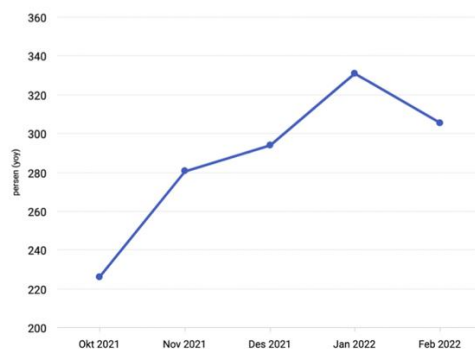


Fig. 1. QRIS Growth Percentage (Yesidora, 2022)

Before QRIS was introduced, leading fintech companies in Indonesia, such as e-wallets and m-banking, had already implemented cashless technology through QR codes. GoPay and OVO allowed customers to make payments with their QR codes at offline merchants since 2018. Additionally, BCA introduced QRku as a QR payment method. However, with the launch of QRIS, Bank Indonesia restricted the use of brand-exclusive QR codes, making QRIS the authorized and simplified payment form for all applications from any provider.

Tauhid Ahmad, the Executive Director of INDEF, argues that QRIS levels the competitive playing field between m-banking and e-wallets, suggesting that they complement each other. Bhima Yudhistira, the Director of Economic and Law Studies, acknowledges a shift from e-wallets to m-banking supported by QRIS due to factors such as comfortability and lower top-up fees. This poses a serious threat to e-wallet providers. Twitter users' opinions also indicate a preference for mobile banking over e-wallets. The growth of QRIS in Indonesia presents an opportunity for payment system service providers. A survey reveals higher usage of m-banking compared to e-wallets. Experts in the field have discussed the cashless market and the connection between QRIS, e-wallets, and m-banking.

Therefore, this study aims to assess the impact of QRIS as a unified cashless payment on the usage of e-wallets and m-banking in Indonesia and understand the factors influencing users' decisions to switch. It considers the government's efforts, advancements in payment services, and the promising growth of QRIS with the elimination of brand-exclusive QR codes.

II. LITERATURE REVIEW

Cashless Payment and Cashless Society in Indonesia

Indonesia's economic growth is projected to make it the 7th largest economy in the world by 2030, surpassing countries like Germany, Japan, and the UK. To support this growth, Bank Indonesia has promoted the *Gerakan Nasional Non-Tunai (GNNT)* or cashless movement, aiming for a safe, efficient, and seamless payment system (Bank Indonesia, 2023). Currently, 42% of Indonesians have adopted electronic payment instruments for cashless transactions, while 58% still use cash. This indicates a transitioning phase, as previous research suggests that a range of 40-60% cashless transactions shows society's readiness for adoption. Factors such as performance

expectancy, social influence, and culture influence people's intention to use and actual usage of electronic payment instruments (Rahadi et al., 2021).

E-Wallet and M-Banking Usage in Indonesia

Factors influencing the adoption of e-wallets in Indonesia include mobile self-efficacy, perceived enjoyment, satisfaction, and behavioral intention. Perceived enjoyment impacts performance expectancy and effort expectancy, which in turn affect behavioral intention and satisfaction. Social influence also plays a role in users' behavioral intentions. Additionally, facilitating conditions directly influence the use of e-wallets (Esawe, 2022).

For the adoption of mobile banking (m-banking), factors such as self-reliance, social dominance, perceived surveillance, customer support, and added variables are influential. Social dominance, perceived surveillance, relative advantage, and ease of usage have positive effects on m-banking adoption, while self-reliance does not. Privacy, security, and standardization are critical concerns for m-banking customers, highlighting the importance of user education and simplified processes (Khan et al., 2023).

Consumer Switching Behavior

1. Switching

According to Merriam-Webster (2023), switching is an intransitive verb that means to make a shift or exchange. In this study, switching behavior refers to customers shifting from one brand to another (Akwensivie, 2014). It also corresponds to the concept of "level of use" in the User Acceptance of Information Technology (UTAUT) model, which considers the frequency and variety of customers' usage. Therefore, in this study, switching, as a customer behavior corresponds to use behavior in the UTAUT model.

2. Switching Intention

Switching intention refers to the act of abandoning current service providers and seeking new ones, resulting in negative outcomes for the service providers (Bansal et al., 2005, as cited in Zhang et al., 2021). It is considered a stage of relationship termination (Kim and Yoon, 2022). In this study, switching intention is part of the broader concept of behavioral intention within the UTAUT model (LaMorte, 2022). Therefore, in this study, switching intention is classified as a part of behavioral intention to assist variables affecting the construct from the UTAUT model.

3. Facilitating Conditions

Facilitating conditions are a construct within the UTAUT model, representing the extent to which individuals believe that organizational and technical infrastructures support the use of the intended system (Venkatesh et al., 2003; Onaolapo, 2018).

4. Trust

Trust is a complex concept that varies in definition across different contexts. It involves arrangements to engage in social matters with uncertainty and vulnerability, where rewards can be potential benefits (Liang et al., 2018; Bicchieri et al., 2002).

5. Perceived Compatibility

Perceived compatibility refers to the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters (Lai and Chang, 2011; Rogers, 2010, as cited in Ismail, 2016).

6. Price

Price is the amount of money exchanged between a buyer and a seller in exchange for a good or service (Asmundson, 2013).

7. Attitude towards Switching

Attitude towards switching is a psychological factor that evaluates the advantages and disadvantages of switching based on expected outcomes. It is influenced by beliefs and expectations (Zoellner, 2012; Sivakumaran and Peter, 2020).

8. Subjective Norms

Subjective norms are influenced by interactions and represent an individual's beliefs that contribute to their decision-making process and motivation to comply with those beliefs (Ajzen, 2005, as cited in Sulaiman and Artanti, 2021; Pookulangara et al., 2011).

9. Perceived Behavioral Control

Perceived behavioral control is a conceptual perspective within the theory of planned behavior, indicating an individual's perception of control over their behavior. It is evaluated based on the ease or difficulty of performing the behavior (Ajzen, 1988; Wallston, 2001).

10. Personality Traits

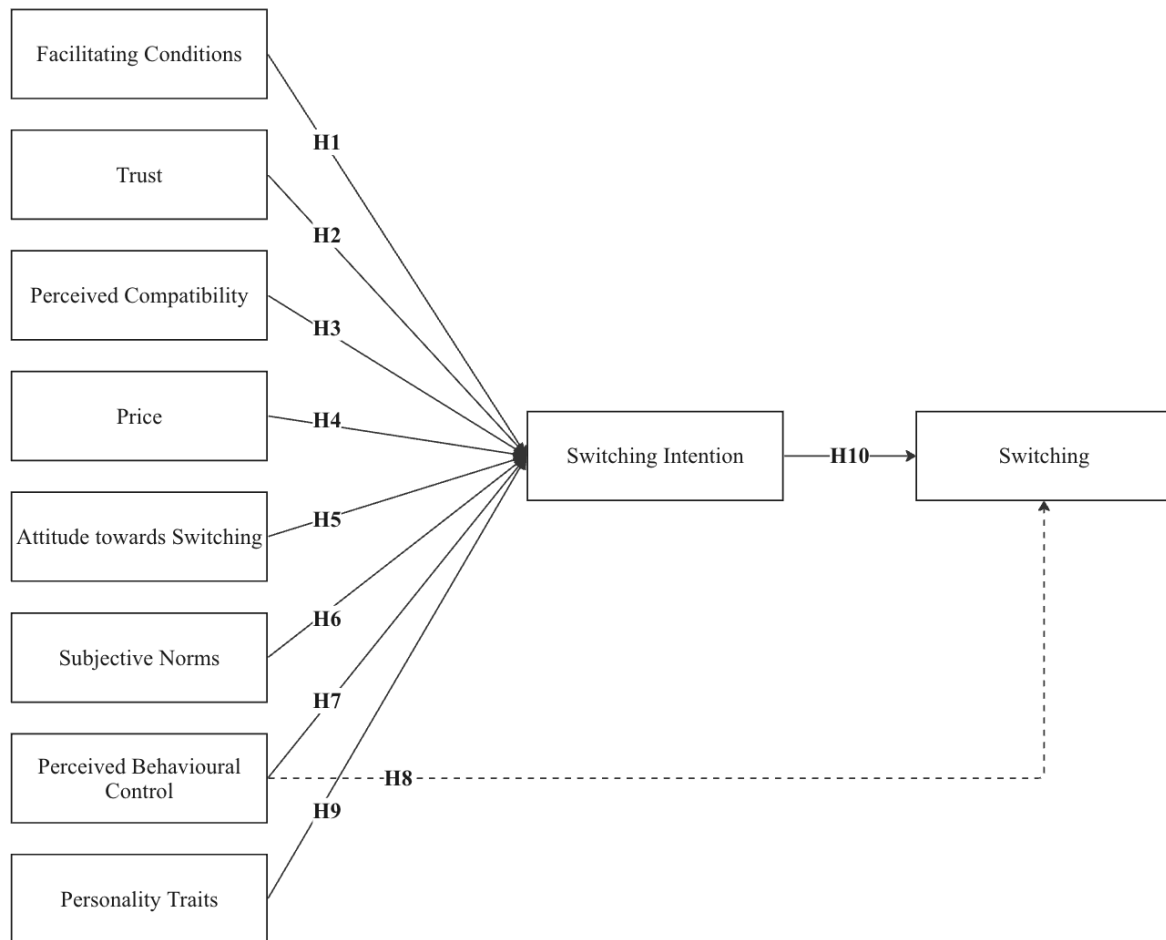
Personality traits are consistent and stable internal characteristics derived from behavioral patterns, attitudes, feelings, and habits (American Psychological Association, 2023; Yin, 1997).

Hypothesis Development

In this study, the variables are derived from prior research within the topic with sources listed in Table 1. Some relationships between variables and switching intention are derived from the relationship of variables with behavioral intention. This is because of a lack of research on factors influencing switching intention. The table below depicts the correlations among variables found towards switching intention and switching behavior. The literature review shows the influence between the variables. Furthermore, Figure 2. depicts the research model with adaptations from prior studies.

Table 1. Hypothesis Development Matrix

Correlations	Source	Findings
Facilitating Conditions on Switching Intention	Ambarwati et al., (2020); Rafferty and Fajar (2022)	Facilitating conditions influence the intention to use (intention to switch)
Trust on Switching Intention	Chao (2019); Hooda et al., (2022)	Trust influences behavioral intention
Perceived Compatibility on Switching Intention	Kanchanatane, et al (2014); Rafferty and Fajar (2022)	Perceived compatibility influences intention to use (intention to switch)
Price on Switching Intention	Limanan (2021)	Price influences behavioral influences intention to use (intention to switch)
Attitude towards Switching on Switching Intention	Bansal and Taylor (1999); Sivakumaran and Peter (2020)	Attitude towards Switching influences intention to switch
Subjective Norms on Switching Intention	Bansal and Taylor (1999); Sivakumaran and Peter (2020)	Subjective norms influence switching intention
Perceived Behavioral Control on Switching Intention	Ajzen (1991); Rahmah et al. (2020); Sivakumaran and Peter (2020)	Perceived behavioral control influences switching intention
Perceived Behavioral Control on Switching Behavior	Ajzen (1991); Sivakumaran and Peter (2020)	Perceived behavioral control influences switching behavior
Personality Traits on Switching Intention	Siddiqui (2011); Sivakumaran and Peter (2020)	Personality traits influence switching intention
Switching Intention on Switching	Ajzen (1991); Hino (2017)	Switching intention influences switching behavior



Technology, Information and Innovation Fig. 2. Conceptual Framework

Source: (Ajzen, 1991; Ambarwati et al., 2020; Bansal and Taylor, 1999; Bansal and Taylor, 2002; Chao, 2019; Hino, 2017; Hooda et al., 2022; Kanchanatane, et al., 2014; Limanan, 2021; Rafferty and Fajar, 2022; Rahmah et al., 2020; Siddiqui, 2011; Sivakumaran and Peter, 2020)

Hypotheses:

- H1:** Facilitating Conditions have a significant influence on switching intention
- H2:** Trust has a significant influence on switching intention
- H3:** Perceived compatibility has a significant influence on switching intention
- H4:** Price has a significant influence on switching intention
- H5:** Attitude towards switching has a significant influence on switching intention
- H6:** Subjective norms have a significant influence on switching intention
- H7:** Perceived behavioral control has a significant influence on switching intention

H8: Perceived behavioral control has a significant influence on switching behavior

H9: Personality traits have a significant influence on switching intention

H10: Switching intention has a significant influence on switching behavior

III. RESEARCH METHODOLOGY

a. Research Design

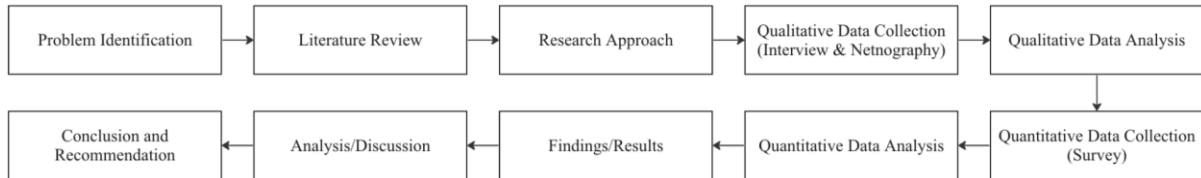


Fig. 3. Research Design Flowchart

A framework is developed to analyse the effect of QRIS towards payment-switching method in e-wallet and m-banking usage in Indonesia. The first step is to identify the phenomenon of QRIS potentially threatening e-wallet service providers and causing a shift towards mobile banking. The author conducted a literature review to understand existing knowledge in the field and synthesized it into a conceptual framework, which forms the basis for hypotheses explored prior in this study. The data collection process includes qualitative and quantitative approaches, using interviews for qualitative data and surveys for quantitative data. The analysis and discussion of the collected data will lead to conclusions and recommendations.

b. Data Collection

1. Qualitative Approach

To gain a deeper understanding of the issue and validate the data findings, the author employed semi-structured interviews as a qualitative research method. Semi-structured interviews were chosen for their effectiveness in collecting open-ended data and exploring participants' thoughts, feelings, beliefs, and personal experiences. The semi-structured interviews participant were selected using purposive sampling, which is a non-probability sampling technique (Heath, 2023). This sampling method allowed for the selection of participants based on specific attributes relevant to the study's objectives. The criteria for the interview participants are individuals who had used e-wallet and m-banking for QRIS payments and chose to switch to m-banking. The interviews included QRIS users from various age groups, starting from 17 years old with respondents being students, employees, and entrepreneur. The purpose of this diverse selection was to capture different perspectives and experiences related to the switch in payment methods. By employing semi-structured interviews and purposive sampling, the author aimed to gather comprehensive qualitative data and gain insights into the motivations and experiences of individuals who had switched from e-wallets to m-banking for QRIS payments.

Table 2. Interview Questions

No	Questions
1	How long have you used QRIS as a payment option?
2	Before QRIS, did you use brand-specific QR payments via e-wallet applications?
3	What makes you choose QRIS over other payment forms?
4	What are the factors that you consider in choosing a payment platform for QRIS payments?
5	Are there any benefits that you get from paying QRIS with e-wallets?

6	Are there any difficulties/negative remarks that you get from paying QRIS with e-wallets?
7	Are there any benefits that you get from paying QRIS with m-banking?
8	Are there any negative remarks that you get from paying QRIS with m-banking?
9	What triggered you to switch from paying QRIS with e-wallets to paying QRIS with m-banking?
10	Are there any concerns that you wish could be addressed by e-wallets or m-banking applications as a method of paying QRIS?

The researcher also uses netnography to further validate the interview results. Netnography is a data validation method that relies on observation through the internet, specifically using online resources such as websites, social networks, and other digital platforms (Kozinets, 2015, as cited in Fenton and Procter, 2019). The author focuses on engaging in Social Network Analysis (SNA) as part of netnography with an aim to understand the relationship between variables (Fenton and Procter, 2019).

2. Quantitative Approach

The author also utilizes quantitative research to gain a deeper understanding of the topic. According to Aliaga and Gunderson (2002, as cited in Apuke, 2017), quantitative research involves collecting numerical data and analyzing it using statistical methods to elaborate on an issue or phenomenon. In this study, the authors actively choose a quantitative approach to test variables derived from the qualitative findings and to mutually validate the results with both approaches. The method used for the quantitative approach is survey/questionnaire distribution. The questionnaire respondents will be targeted for people in the age range of 17 to 55 years old referring to prior research by Wiryawan et al. (2023). Malhotra (2010) stated that problem-solving research in marketing research studies should have a minimum size of 200 with a 300-500 typical range. In this study, the author uses purposive sampling with respondents required to have used QRIS and switched from e-wallet to m-banking as their payment method.

c. Data Analysis

1. Qualitative Approach

Interview data that has been collected will be analysed with an open coding technique. According to Khandkar (2023) open coding is one of the processes of analysing textual content which includes labelling concepts, defining and developing categories based on their properties and dimensions. In this study, the researcher will use automatic coding using NVivo by transcribing word-by-word of the interview results to avoid interpretation errors. NVivo is a program used for qualitative methods produced by QSR International (Kent State University, 2023). The data aforementioned will be validated through a triangulation method after the coding process. According to Patton (1999, as cited in Carter et al., 2014), Triangulation in qualitative research refers to the employment of various methods or data sources to gain a holistic comprehension of a phenomenon. In this research, the author validates data results with data triangulation approach by comparing interview, netnography literature review results related to studies of QRIS behavioral and switching factors.

2. Quantitative Approach

The data obtained from the questionnaire survey is analysed and extracted into insights using descriptive statistics and PLS-SEM. The data in PLS-SEM is processed using Reliability Analysis, Validity Analysis, Collinearity Test, Coefficient of Determination (R²), Stone Geisser (Q²), and F Square Effect Size (F²). Furthermore, mediation test is done to assess the role of mediating variable to see whether its full mediation, partial mediation, or no mediation along with the suppression and inconsistent mediation (Sidhu et al., 2021).

IV. RESULT / FINDING

1. Qualitative Approach

Variables of Price, Attitude towards Switching, Perceived Compatibility, Trust, Facilitating Conditions, Subjective Norms, Personality Traits, and Perceived Behavioral Control were identified within the interview results coded into NVivo. Each variable was identified in the range of 8 to 24 times overall within the 12 interview transcript. Price emerged as the most mentioned variable, with 11 out of 12 respondents agreeing that it influenced their choice of QRIS payment system provider, additional indicator of promotion and admin fee was also found as insights from the interview. Attitude towards switching was identified among 11 respondents, with a focus on efficiency that adds additional indicators of process efficiency and time efficiency. Perceived compatibility was discussed by 10 respondents, highlighting the alignment of m-banking with daily activities. Safety was considered by 9 respondents, emphasizing trust in m-banking's security. Facilitating conditions, particularly familiarity with the platform, were mentioned by 9 respondents. External factors, such as subjective norms, influenced 9 respondents. Personal traits played a role for 9 respondents, with curiosity and comfortability being mentioned. Lastly, 8 participants found switching from e-wallet to m-banking to be easy and within their control. Some interesting findings show how some of the respondents see facilitating conditions as a factor influencing their experience of paying QRIS but not necessarily a factor in choosing a platform or the other due to notable similarities within the applications.

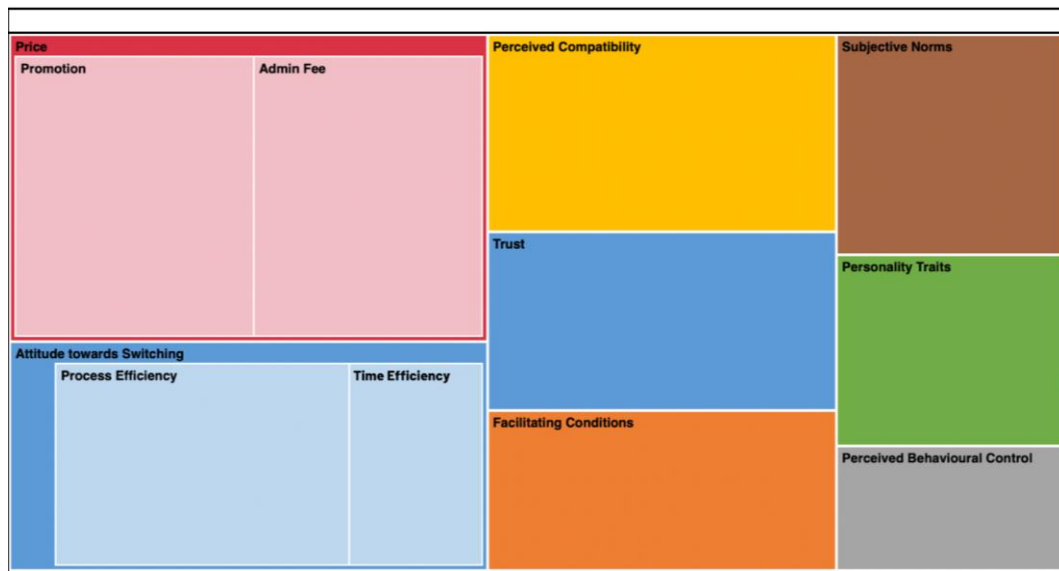


Fig. 4. Independent Variables Coding Results

There were also multiple times the respondents mentioned their wanting to switch, otherwise categorised as switching intention, and their decision to switch, otherwise categorised as switching. An interesting finding is arguments made by some respondents noting how perceived behavioural control ignites their thought of switching but is not a trigger to their decision to switch. All of the qualitative approach findings were validated through data source triangulation from the interview, netnography, and literature review. The findings within the qualitative approach are then used to adapt the questionnaire for the quantitative approach.

Table 3. Data Triangulation Matrix

Variable	Interview	Netnography	Literature Review
Facilitating Conditions	✓	✓	✓
Trust	✓	✓	✓
Perceived Compatibility	✓	✓	✓

Price	✓	✓	✓
Attitude towards Switching	✓	✓	✓
Subjective Norms	✓	✓	✓
Perceived Behavioral Control	✓	✓	✓
Personality Traits	✓	✓	✓
Switching Intention	✓	✓	✓
Switching	✓	✓	✓

2. Quantitative Approach

Using SmartPLS and the PLS-SEM method, quantitative data analysis was conducted to examine the effect of QRIS as a unified cashless payment on payment switching in e-wallet and m-banking usage in Indonesia. All of the metrics discussed below refers to studies by Hair et al. (2021) and Wong (2013). The reliability of the constructs was assessed through internal consistency, with composite reliability values above 0.7, indicating satisfactory to good reliability. Convergent validity was evaluated using Average Variance Extracted (AVE), and all constructs had AVE values above 0.5 after the removal of three indicators, demonstrating convergent validity. Discriminant validity was confirmed as the constructs showed low correlation and non-overlapping variables. Collinearity testing using Variance Inflation Factor (VIF) revealed no multicollinearity issues, with VIF values below 3 for all indicators. Finally, the relevance of each indicator was examined through outer loading numbers, with all indicators having values above 0.5, indicating their relevance to the constructs. Moreover, the author analyses latent variables relationship. If the T-statistics for the structural path are above 1.96, it proves that the structural path is significant. In addition to the structural path significance, the author also wanted to see whether the relationship has a positive or negative value. Since collinearity is not an issue in this study, assessment criterias such as the Coefficient of Determination (R^2) and Cross-Validated Redundancy (Q^2) are also taken into consideration.

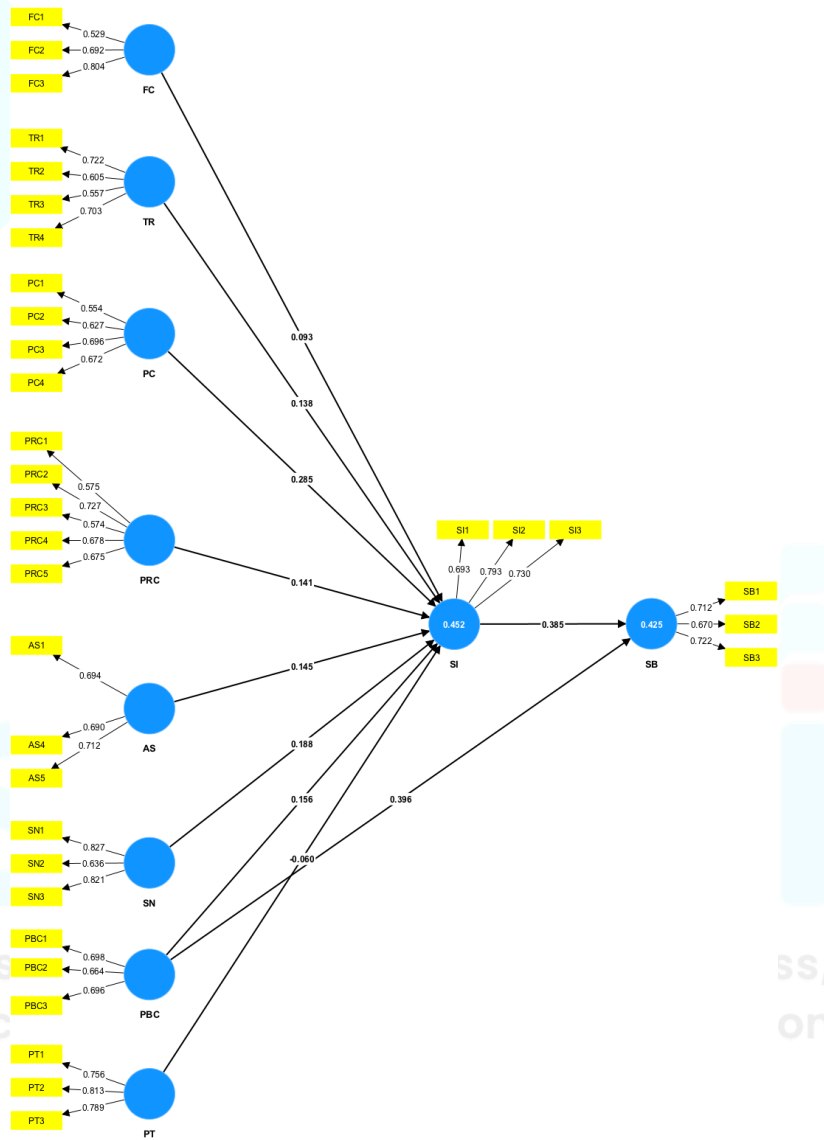


Fig. 5. Structural Path Significance Graph

Table 4. Structural Path Significance Matrix

Structural Path	Path Coefficient	T statistics (O/STDEV)	Coefficient of Determination (R ²)	Cross-Validated Redundancy (Q ²)
Facilitating Conditions-> Switching Intention	0.093	1.341	0.452	0.372
Trust -> Switching Intention	0.138	2.214		

Perceived Compatibility -> Switching Intention	0.285	4.357		
Price -> Switching Intention	0.141	2.175		
Attitude towards Switching -> Switching Intention	0.145	2.239		
Subjective Norms -> Switching Intention	0.188	3.041		
Perceived Behavioral Control -> Switching Intention	0.156	2.15		
Personality Traits -> Switching Intention	-0.06	0.757		
Perceived Behavioral Control -> Switching Behavior	0.396	5.49	0.425	0.769

Table 4 showcases 8 out of the 10 structural paths in this model to be proven significant with T statistic values above 1.96. The two structural paths that failed the minimum criteria are Facilitating Conditions-> Switching Intention and Personality Traits -> Switching Intention with T statistic scores 1.341 and 0.757 respectively. For the significant structural paths, all of the significant structural paths show positive relationships through positive path coefficient numbers. The matrix includes the Coefficient of Determination (R^2) and Cross-Validated Redundancy (Q^2) values. R^2 measures the explanatory power of the model, with higher values indicating greater explanatory power. In this study, the R^2 value for switching intention is 0.452, indicating that the independent variables explain 45.2% of the variance. The R^2 value for switching behavior is 0.425, representing 42.5% of the variance explained by perceived behavioral control and switching intention combined. Q^2 is used to evaluate the predictive accuracy of the model. Q^2 values over zero indicate a predictive accuracy of the structural model. In this study, the Q^2 value for switching intention is 0.372, and for switching behavior, it is 0.769, both indicating large predictive relevance. The final step is calculating the Goodness of Fit (GoF) index, which measures the predictive performance of the research model. The GoF index ranges from 0 to 1 and is calculated by multiplying the square roots of the R^2 and Q^2 average values.

Table 5. Goodness of Fit Result

Variables	R^2	Q^2
Switching Intention	0.452	0.372
Switching	0.425	0.769
Average	0.4385	0.5705
Goodness of Fit	0.502	

The Goodness of Fit (GoF) number for this study is 0.502. Since the number is over 0.1, the PLS-SEM model can be stated to significantly explain the empirical data.

F square effect size is also measured to see the strength of the relationship between variables (Chen and Chen, 2010). As a rule of thumb, values higher than 0.02, 0.15, and 0.35 depict small, medium, and large F2 effect sizes (Cohen as cited in Hair, 2021). From the result, it can be derived that facilitating conditions and personality traits have low strengths in explaining switching intention since both have scores below the small threshold of 0.02. On the other hand, trust, perceived compatibility, price, attitude towards switching, subjective norms, and perceived behavioral control have medium strength influence to switching intention. For switching behavior, it is also depicted as a medium influence from both perceived behavioral control and switching intention.

Table 6. Hypothesis Testing Matrix

Hypothesis	Structural Path	T Values	P values	Result
H1	Facilitating Conditions-> Switching Intention	1.341	0.18	Rejected
H2	Trust -> Switching Intention	2.214	0.027	Accepted
H3	Perceived Compatibility -> Switching Intention	4.357	0	Accepted
H4	Price -> Switching Intention	2.175	0.03	Accepted
H5	Attitude towards Switching -> Switching Intention	2.239	0.025	Accepted
H6	Subjective Norms -> Switching Intention	3.041	0.002	Accepted
H7	Perceived Behavioral Control -> Switching Intention	2.15	0.032	Accepted
H8	Perceived Behavioral Control -> Switching Behavior	0.757	0.449	Rejected
H9	Personality Traits -> Switching Intention	5.49	0	Accepted
H10	Switching Intention -> Switching Behavior	5.609	0	Accepted

The Hypothesis Testing results are as follows:

- Hypothesis 1: Facilitating Conditions - Rejected, no significant influence on switching intention.
- Hypothesis 2: Trust - Accepted, significant influence on switching intention.
- Hypothesis 3: Perceived compatibility - Accepted, significant influence on switching intention.
- Hypothesis 4: Price - Accepted, significant influence on switching intention.
- Hypothesis 5: Attitude towards switching - Accepted, significant influence on switching intention.
- Hypothesis 6: Subjective norms - Accepted, significant influence on switching intention.
- Hypothesis 7: Perceived behavioral control - Accepted, significant influence on switching intention.
- Hypothesis 8: Perceived behavioral control - Rejected, no significant influence on switching behavior.

- i. Hypothesis 9: Personality traits - Accepted, significant influence on switching intention.
- j. Hypothesis 10: Switching intention - Accepted, significant influence on switching behavior.

To better understand the phenomenon in this study, the author analyses the mediator variable that mediates the independent variables to the dependent variable. The objective of this mediation analysis is to reveal how the predictor (independent variable) indirectly impacts the outcome (dependent variable) through the mediator. After the three-step analysis, the author found that switching intention has a partial mediation effect. The independent variables (perceived compatibility, price, attitude towards switching, subjective norms, and perceived behavioral control) has a significant effect on the mediating variable (switching intention). At the same time, the mediating variable (switching intention) also has a significant effect on the dependent variable (switching behavior).

V. DISCUSSION

a. *H1: Facilitating Conditions have not significantly influence switching intention*

Hypothesis 1 assumes that facilitating conditions significantly influence switching intention. However, the statistical analysis reveals a T-value of 1.341, which is below the minimum threshold of 1.96 at a significance level of 0.05 (5%). This contradicts previous research by Rafferty and Fajar (2022), which supports facilitating conditions' positive influence on intention to use (in this study, intention to switch), and Ambarwati et al. (2020), which emphasizes the notable effect of facilitating conditions on behavioral intention (in this study, switching intention). The interviews conducted in this study also provide contradictory results, where 9 out of 12 respondents mentioned familiarity as a factor in wanting to switch from e-wallet to m-banking. However, some respondents stated that facilitating conditions did not affect their intent to switch, and familiarity was only a minor factor. The disagreement on facilitating conditions was also observed in the netnography result, where the lack of knowledge about QRIS acceptance by various applications and merchants providing different QRIS codes contributed to varying perspectives on facilitating conditions. Therefore, this research are not able to confirm a relationship between facilitating conditions and switching intention.

b. *H2: Trust has a significant influence on switching intention*

Hypothesis 2 assumes that trust significantly influences switching intention. After analyzing the statistical data, the T-value for this hypothesis is 2.214, surpassing the minimum threshold of 1.96 at a significance level of 0.05 (5%). This result aligns with previous studies by Chao (2019) and Hooda et al. (2022), where both researchers highlight the direct effect of trust on behavioral intention (in this study, switching intention). The interview findings further support this, as respondents considered trust in safety as one of the key factors in choosing a QRIS payment platform. M-banking, in particular, is perceived as safer due to its affiliation with major banks or government institutions (BUMN), longer presence in the transaction industry, and continuous development and updates. Netnography results also indicate Twitter users expressing their concerns about safety and seeking recommendations for trustworthy QRIS platforms. Some users even expressed a preference for using specific m-banking applications over e-wallets for safety reasons. With all the evidence aligned, it can be concluded that trust has a significant influence on switching intention.

c. *H3: Perceived compatibility has a significant influence on switching intention*

Hypothesis 3 assumes that perceived compatibility significantly influences switching intention. After analyzing the statistical data, the T-value for this hypothesis is 4.357, surpassing the minimum threshold of 1.96 at a significance level of 0.05 (5%). This relationship is also supported by previous research conducted by Kanchanatane et al. (2014), who analyzed e-marketing and found that perceived compatibility directly affects the intention to use (in this study, intention to switch) to e-marketing. Rafferty and Fajar (2022) also suggest that perceived compatibility positively influences the intention to use QRIS. The interview results further validate this argument, as the respondents mentioned that their intention to switch to m-banking from e-wallet for QRIS payments is driven by the perceived compatibility of m-banking with their daily activities. They specifically mentioned the convenience of having their transactions centralized in one application. Similar sentiments were found on the internet, where users expressed their dissatisfaction with using e-wallets for cashless payments due to the need to transfer funds between different applications. These findings from multiple sources provide comprehensive support for the significant influence of perceived compatibility on switching intention.

d. H4: Price has a significant influence on switching intention

Hypothesis 4 assumes that price significantly influences switching intention. After analysing the statistical data, the T-value for this hypothesis is 2.175, surpassing the minimum threshold of 1.96 at a significance level of 0.05 (5%). These findings align with the preliminary study conducted by Yesidora (2022), who states that price, particularly administration fees, is a factor in switching intention for cashless payment methods in Indonesia. Limanan's study (2021) also supports the positive effect of price on the behavioral intention to use digital wallets (in this study, intention to switch). In the interviews conducted for this research, 11 out of 12 participants agreed that price is a significant factor in choosing a QRIS payment platform, with promotions and administration fees being two indicators repeatedly mentioned. Netnography also reveals that individuals express their intention to switch to m-banking due to the lack of appealing promotions in e-wallets and the bothersome nature of administration fees. Thus, the hypothesis is well supported by the arguments, indicating that price has a significant influence on switching intention.

e. H5: Attitude towards switching has a significant influence on switching intention

Hypothesis 5 assumes that attitude towards switching significantly influences switching intention. After analyzing the statistical data, the T-value for this hypothesis is 2.239, exceeding the minimum threshold of 1.96 at a significance level of 0.05 (5%). Therefore, the hypothesis is accepted, concluding that attitude towards switching has a significant influence on switching intention. This finding aligns with the research conducted by Bansal and Taylor (1999), who proposed a similar relationship in the Service Provider Switching Model (SPSM), where a more positive attitude towards switching service providers leads to a lower willingness to switch. Sivakumaran and Peter (2020) also emphasized the impact of attitude towards switching on the intention to switch in their model for assessing consumer switching behavior. In the research interviews, 11 out of 12 respondents indicated that attitude towards switching played a role in their switching intention. The interviewees expressed their belief that switching to m-banking would offer more efficiency in paying for QRIS compared to e-wallets, emphasizing the importance of process and time efficiency. Netnography findings further support this significant relationship, as individuals compare QRIS payment platforms on social media, sharing their pain points and discussing the potential benefits of alternative applications. Based on these arguments, it is evident that attitude towards switching has a significant influence on switching intention.

f. H6: Subjective norms have a significant influence on switching intention

Hypothesis 6 assumes that subjective norms significantly influence switching intention. After analysing the statistical data, the T-value for this hypothesis is 3.041, surpassing the minimum threshold of 1.96 at a significance level of 0.05 (5%). This aligns with research conducted by Bansal and Taylor (2022), which emphasizes the influence of subjective norms on switching intention, indicating that customers may not switch to a new service provider if significant others do not support the switch. Sivakumaran and Peter (2020) also propose that subjective norms play a role in evaluating the intention to switch. Analysis of the research interviews further supports the hypothesis, with 75% of respondents indicating the impact of external factors on their choice of payment system service provider. Some interviewees mentioned how the influence of friends and family sparked their desire to explore other applications (switching intention). Additionally, netnography findings reveal instances where users expressed their intention to switch based on observing strangers paying with QRIS in m-banking, highlighting the significant influence of subjective norms. Based on these justifications, it can be concluded that subjective norms have a significant influence on switching intention.

g. H7: Perceived behavioral control has a significant influence on switching intention

Hypothesis 7 assumes that perceived behavioral control has a significant influence on switching intention. After analysing statistical data, the T-value for this hypothesis is 2.15 which is higher than the minimum 1.96 threshold at a significance point of 0.05 (5%). This result correlates with the theory of planned behavior where perceived behavioral control has effect on intention (Ajzen, 1991). In addition to that, other research by Rahmah et al. (2020) also Sivakumaran and Peter (2020) stated how perceived behavioral affects switching intention. Perceived behavioral control can also be found within the interview findings as an additional factor that boosted them towards switching intention. It serves as to how the interview participants feel like they have total control over which application they would end up choosing for QRIS payments, thus they can just try out and switch to any application. Very similar results are found in the netnography where people implied in their tweets to having confidence and believe that the ultimate end decision, or the control, are theirs. For that reasons, the author believes that perceived behavioral control has a significant influence on switching intention.

h. H8: Perceived behavioral control has not significantly influence switching behavior

Hypothesis 8 assumes that perceived behavioral control significantly influences switching behavior. However, upon analysing the statistical data, the T-value for this hypothesis is 0.757, falling below the minimum threshold of 1.96 at a significance level of 0.05 (5%). These findings contradict previous research conducted by Sivakumaran and Peter (2020), who found that perceived behavioral control, particularly in cases such as billing problems, can lead to switching behavior if individuals believe the problem will persist. Additionally, Ajzen (1991) argued in the theory of planned behavior that perceived behavioral control has a significant predictive power over behavior. Upon reviewing the interview findings, the author observes that although perceived behavioral control is mentioned in relation to both switching intention and switching behavior, the responses tend to lean more towards its influence on the intention to switch. It appears to act as a motivator for individuals to try a new QRIS payment platform rather than directly driving the final decision to switch. The netnography findings reflect similar results, with perceived behavioral control helping users choose whichever application they prefer, alongside other factors, but none explicitly mentioning it as the decisive factor for switching. Therefore, these reasons justify conclusive relationship between perceived behavioral control and switching behavior cannot be established in this research.

i. H9: Personality traits have a significant influence on switching intention

Hypothesis 9 assumes that personality traits significantly influence switching intention. Statistical analysis confirms this hypothesis with a T-value of 5.49, surpassing the 1.96 threshold at a 0.05 significance level. Siddiqui (2011) and Sivakumaran and Peter (2020) also support this finding, indicating the impact of personality traits on consumer switching intention. The interview data further reinforces this relationship, with respondents mentioning their personality traits as a factor in their desire to switch. Traits such as curiosity, risk aversion, and long-held habits emerged as motivations for switching. These findings align with the netnography results, where users sharing their experiences highlighted the trait of openness. Therefore, it can be concluded that personality traits significantly influence switching intention.

j. H10: Switching intention has a significant influence on switching behavior

Hypothesis 10 assumes that switching intention has a significant influence on switching behavior. The statistical analysis supports this hypothesis, yielding a T-value of 5.609, exceeding the 1.96 threshold at a 0.05 significance level. Previous research by Hino (2017) and Ajzen (1991) also establishes a meaningful relationship between switching intention and actual switching behavior. The interview analysis echoes this relationship, with respondents describing the process of transitioning from intention to action in their switching behavior. The netnography findings further illustrate this flow, as users shared their decision to switch after encountering difficulties with their current payment platform. Based on the presented arguments, it can be concluded that switching intention significantly influences switching behavior.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

This study explores the impact of QRIS (Quick Response Code Indonesian Standard) on the switching of payment methods from e-wallets to mobile banking (m-banking) in Indonesia. The research employs a combination of qualitative and quantitative approaches to gain comprehensive insights into the topic.

Qualitative data was collected through semi-structured interviews, allowing for in-depth exploration of factors influencing the selection of payment system service providers. The interviews revealed several key factors, including facilitating conditions, perceived behavioral control, perceived compatibility, personality traits, price, subjective norms, and trust. E-wallet users highlighted the integration of e-wallets within existing ecosystems, while m-banking users emphasized the compatibility of their existing savings and the ability to track transactions easily. Both platforms had advantages and disadvantages, with e-wallets offering promotions but lacking relevance in QRIS payments, while m-banking provided a sense of safety and improved transaction recording but faced limitations in specific scenarios.

Quantitative data was collected through surveys, and the findings were analyzed using partial least squares structural equation modeling (PLS-SEM) and descriptive statistics. The analysis revealed that QRIS had a significant impact on switching intention and behavior. Factors such as trust, perceived compatibility, price, attitude towards switching, subjective norms, perceived behavioral control, and personality traits played significant roles in influencing switching intention. However, the relationship between facilitating conditions and switching intention, as well as perceived behavioral control and switching behavior, yielded contradictory insights from the research methods employed.

Based on the data analysis, several areas for improvement in QRIS payment platforms were identified. These include the need to enhance the value propositions offered to users and address pain points experienced during

QRIS transactions. Suggestions for improvement include providing transaction reports for better financial management, implementing loyalty programs to incentivize platform selection, enabling offline QRIS transactions, and focusing on creating positive user experiences. Effective communication strategies and brand building efforts were also recommended to strengthen the platforms' overall image and attract and retain users.

In conclusion, this study provides valuable insights into the factors influencing the switching of payment methods from e-wallets to m-banking in the context of QRIS. The findings highlight the significance of trust, perceived compatibility, price, attitude towards switching, subjective norms, perceived behavioral control, and personality traits in shaping users' intentions and behaviors. The recommendations put forth can assist QRIS payment platforms in enhancing their offerings, improving user experiences, and effectively retaining and attracting customers.

Recommendation

a. E-wallet as QRIS Payment Service System Provider

Specific to e-wallets, the platform could address its promotion driven users. Apart from the marketing recommendation given in RQ3, e-wallet could instead try partnerships that might help to increase each brands' credibility. Furthermore, e-wallets could be the agent of change in payment digitalisation by leading QRIS education in QRIS less/unexposed areas and teaching the technology of paying QRIS using e-wallet to its surrounding community.

b. M-banking as QRIS Payment Service System Provider

Specific to m-banking as a QRIS payment platform, the platform could address the wishes of participants with their chosen m-banking application. Some praise Livin' by Mandiri with its very simple and straightforward QRIS feature at the home page. This is something worth exploring for other banking in providing an easier process and overall efficiency for QRIS payments.

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Factors Affecting Tourist Intention to Revisit: Awareness, Image, Tourist Motivation and Word Of Mouth

Andika Maulana Somantri¹, Heppy Millanyani²

^{1,2} Telkom University: ICT Business, School of Economy and Business, Bandung, Indonesia

Abstract

Introduction/Main Objective This study aims to examine the influence of destination awareness, destination image, tourist motivation, and word of mouth on the intention to revisit. **Background of the Problem** Tourism is a vital industry for economic stimulation, but it faces hurdles like COVID-19, which reduces travel interest. This study focuses on enhancing tourist intentions to revisit through destination awareness, image, motivation, and word-of-mouth. **Research gaps/Novelty** Despite previous studies, gaps exist in understanding how awareness, image, tourist motivation, word of mouth, and travel intentions to revisit interact. This research is conducted to fill in the gap mentioned by previous literature that is needed to explore these interactions using PLS mediation test software, enhancing our comprehension of their impact. This research can help the tourism industry and destination management offices develop effective marketing strategies for increasing visitor numbers. **Research Methods:** Partial least squares structural equation modeling was adopted to examine the data collected from 77 international student of Telkom University who followed Edutrip in 2019 and 2022. **Findings/Results:** The findings show that destination awareness and tourist motivation influence tourist intentions to revisit. Meanwhile, destination image has no positive effect on tourist intentions to revisit. The results also show that WOM significantly mediates awareness, image, and tourist motivation on tourist intentions to revisit. **Conclusions and implications:** Based on the results, word of mouth directly influences tourist intentions to revisit or through mediation variables. So that DMO can increase woms by show tourist objects through brochure or pamflet to increase revisiting intentions for tourists

Keyword: Destination awareness; destination image; motivation; word of mouth; tourist revisits

I. INTRODUCTION

Tourism is crucial in driving economic development and supporting local economies (Rahmafritria et al., 2019). Traveling has evolved from being a hobby to a lifestyle society embraces (Suhendra & Millanyani, 2021). However, tourism faces various challenges, such as epidemic diseases, natural disasters, and global economic crises, leading to "travel risk" (Garg, 2013). The COVID-19 pandemic, originating in Wuhan, China, has further exacerbated these challenges and profoundly impacted global tourism (Huang & Hsu, 2009). Tourists' perception of the risk of infection during travel is influenced by the type and level of the outbreak (Rosselló et al., 2017; Leggat & Franklin, 2013). Understanding the risk and threat of infection significantly affects tourists' decision-making process and their likelihood of visiting destinations (Hakim, 2020). Outbreaks and health issues significantly impact the tourism sector, primarily when they directly affect destinations (Hakim, 2020). Attitudes toward outbreaks during such times can indicate the likelihood of future visits.

This is also because, according to Rahmafritria, Purboyo, and Rosyidie (2019), tourism still supports local economic life; therefore, it is critical to study the intention to return during tourist visits. According to Cahyanti and Anjaningrum (2018), a person's natural attraction to something can trigger interest rather than intention, in which the concept of intention will focus on the tourist's potential interest experience in a particular destination.

Studying the intention to revisit is crucial in understanding consumer behavior following a visit. This intention holds particular significance during the COVID-19 pandemic as it plays a vital role in sustaining the viability of tourist destinations. According to Stylos et al. (2016), return intention is defined as the desire to visit the same destination for a second time within a specific timeframe. Previous researchers such as Ahmad Ab. (2018), Khansa and Farida (2019), Listyowati (2018), and Atika et al. (2016) have also explored the concept of intention to return in their studies.

Bandara Utama	berangkatan pada Penerbangan Internasional							
	2022							
	Juni	Juli	Agustus	September	Oktober	November	Desember	Tahunan
Polonia	23 176	31 716	57 612	63 034	69 972	66 127	84 790	415 270
Soekarno Hatta	301 893	300 055	396 039	445 680	463 463	443 264	509 441	3 751 993
Juanda	43 037	28 674	52 999	71 917	76 741	75 726	80 144	478 325
Ngurah Rai	170 746	250 747	298 043	312 284	336 915	316 073	356 398	2 212 531
Hasanudin	-	-	-	-	-	-	-	-

Source: bps.go.id

From the data shows the results of figure, explaining that the number of passengers for overseas departures in 2022 based on BPS statistics is 6,858,119 people traveling abroad. This is still below the total number in 2019, which reached 11 million people. Even though the number is still below 2019, this number is good news for the decline in 2020-2021. The increase in interest in post-pandemic travel is based on the motivation of tourists to visit again. Because, motivation is one form of an potential encouragement within an individual or from outside, namely the environment that can influence a person's behavior in his activities Mulyadi in (Khoirunnisa, 2019). Motivation also plays a significant role in tourists' interest and intention to travel, influencing their behavior and decision-making process (Khoirunnisa, 2019). Travel motivation is crucial for tourism marketing and management (Kong & Chang, 2016). It encompasses the needs and desires that drive individuals to participate in tourism activities (Pizam & Mansfield, 1999). Tourists' motivation influences the relationship between tourists, tourism businesses, and destinations (Cohen, 1972). Perception and destination image also play a vital role in tourists' intentions to revisit a destination (Khairani, 2009). The ability of a destination to provide a positive and memorable experience during a trip influences tourists' decision-making (Kozak et al., 2007; Lepp et al., 2011).

Perceived risks and destination image must be studied together to shape and strengthen positive perceptions among tourists (Sönmez & Graefe, 1998). Tourist choices are often influenced by the perception of a destination's image, which can be shaped by external stimuli and personal characteristics (Baloglu & McCleary, 1999; Stabler, 1995). External stimuli include various sources of information, while personal characteristics such as age, education, and motivation form a destination image (Gartner, 1993; Hosany et al., 2006).

In achieving tourist intention to revisit, there are influencing factors in the form of word of mouth, another form of marketing promotion. Before deciding to use a product or service, most potential customers or visitors will seek information about the product or service first, as well as in terms of tourism. Before deciding to visit a tourist destination, visitors will first seek information regarding the tourist attractions they will visit and whether they meet their needs, one of which is through word of mouth.

Reported by the official website of the Indonesian Director General of Civil Aviation, in connection with the issuance of SE Task Force No. 25 of 2022, the Ministry of Transportation through the Directorate General of Civil Aviation has also issued the latest circular SE No. 88 of 2022 concerning Guidelines for Implementing Foreign Travel by Air Transportation During the COVID-19 Pandemic which mention about requirements for foreign travel that must be met for Foreign Travelers (PPLN) who depart from Indonesia such as:

- Foreign travelers (PPLN) with Indonesian citizen status aged 18 years and over must have received the third dose of vaccine (booster)
- PPLN going abroad must show a vaccine card or certificate or can use the PeduliLindungi application
- For PPLNs with Indonesian citizen status with special or comorbid health conditions, they cannot get the vaccination; they must attach a doctor's certificate from a Government Hospital stating that they have not or cannot participate in the Covid-19 vaccination.
- For PPLN with Indonesian citizen status who have just finished Covid isolation but have not been able to get the third dose of vaccine (booster), you can include a letter that is not actively transmitting Covid-19.

By loosening the rules for traveling abroad from the government and increasing revisits and intentions to travel abroad. Universities, like Telkom University, have implemented programs to support students' intentions to visit destination countries through international exchange programs, summer and winter schools, double degrees, and

Edutrips. With the relaxation of travel restrictions and increased mobility, the year 2022 is expected to mark the recovery of the tourism industry after the devastating impact of COVID-19. Programs like Edutrips offered by the International Office have attracted student interest due to their affordability and short duration.

This research is essential to understand the factors influencing tourist intentions to revisit, specifically among students, and provide valuable insights for destination management offices in the post-pandemic era. It aims to uncover the reference and basis for tourists, particularly students, in making travel intentions for future return trips. The findings will contribute to developing and enhancing tourism in a post-pandemic context.

II. LITERATURE REVIEW

Marketing

Marketing is the strategic procedure through which organizations generate value for their customers and establish robust connections, aiming to benefit from the value exchange mutually (Kotler & Armstrong, 2008). Another definition of *marketing* is "an activity aimed at achieving company goals, carried out by anticipating customer or client needs and directing the flow of goods and services that meet the needs of customers or clients from producers" (Cannon et al., 2008: 8). Meanwhile, according to Kotler and Keller (2009), Marketing is a social phenomenon where individuals and groups fulfill their needs and desires by creating, offering, and voluntarily exchanging valuable products with other products.

Anticipating customer needs is a crucial aspect of marketing, which guides decisions regarding product development, including design, packaging, pricing, storage, shipping, advertising, sales strategies, and post-sales activities such as installation, customer service, warranties, and even disposal policies (Cannon et al., 2008, p. 8).

Destination Awareness

According to Woodside and Lysonski, awareness is an unaided recall from long-term memory and aided recognition. Milman and Pizam (2016) define that destination awareness as a picture of someone after hearing about a tourist destination. Furthermore, destination awareness refers to tourists' knowledge of the destination's product. Milman & Pizam (2016) suggest that achieving tourist awareness must be followed by a positive image. Awareness also represents the strength of brand presence in the minds of consumers (Aaker, 1996). Therefore, destination awareness becomes essential to brand identity. Awareness is important before someone builds a desire and finally buys a product or service. Awareness is the first and necessary step, and then it is hoped that there will be a desire to try and make a purchase (Hakala & Lemmetyinen, 2013). The reasons tourists can remember or are not aware of a tourist attraction are related to several things, for example, beautiful weather, natural beauty, and others. So, the desire or motivation of tourists is formed by finding out from various sources about the tourist attractions they want to visit. After searching for various reference materials, an overview of these tourist attractions arises so that tourists can choose them. According to Isa & Ramli (2014), destination awareness can be measured based on location, beautiful objects, location, operating hours, availability of lodging, and price.

So, the following hypothesis are formulated:

H1 Destination Awareness will positively effect tourist intention to revisit

Destination Image

According to the Tourism Law No. 10 of 2009, tourist destination areas, also known as "tourist destinations," are defined as geographical regions within one or more administrative areas. These areas encompass tourist attractions, public facilities, tourism facilities, accessibility, and interconnected communities contributing to tourism development. A destination refers to a cohesive geographical area with diverse tourist attractions, facilities, and convenient access, allowing tourists and residents to enjoy these facilities throughout the year.

Robert (2013) defines "image" as "a general picture or perception held by the general public about a company, unit, or product." In tourism, the development of the image of the destination area occurs from a combination of the information heard and the perception of the destination, such as the description of nature, the politeness of the people, the culture, and so on.

The destination's image in the assessment can differ from one tourist to another. Coban (2012) explained in his study that the image of a destination is made up of rational judgments, cognitive images, and emotional assessments, or effective images, of the destination itself. In his research on destination image, Li (2015) explained that it could be assessed using rational judgments, cognitive images, and emotional assessments, or affective images, of the destination itself.

According to Çoban (2012) "Cognitive image" pertains to an individual's perceptions and knowledge regarding a specific destination. The six cognitive factors encompass various dimensions: tourist attractions, essential amenities, cultural landmarks, accessibility and transportation, the overall tourism infrastructure, the natural surroundings, and economic aspects. Mental attributes are linked to tangible factors and the experiential aspects encompassing entertainment, infrastructure, lodging options, shopping amenities, cleanliness, safety, cost, and pricing levels. Tourists' perceptions of these attributes play a significant role in shaping and evolving the image of a particular tourist destination. (Kaur et al., 2016).

According to Artuger et al. (2013), an The concept of "effective image" pertains to tourists' emotional or affective responses toward a destination. This compelling image can be categorized into three dimensions: perceiving the destination as vibrant, exhilarating, and enjoyable (Artuger et al., 2013). The effective model suggests that when evaluating a product, individual customers consider rational considerations and factors such as their aspirations, learning behavior, specific emotional responses (such as satisfaction or aversion), mood, and other relevant aspects.

So, the following hypothesis are formulated:

H2 Destination Image will positively effect tourist intention to revisit

Tourist Motivation

Etymologically, motivation or "motive" comes from the Latin word "movere," which means to move. *Motives* in tourism science are defined as a need that influences a person to participate in tourism activities (Yuan & McDonald, 1990). The notion of tourist motivation is adapted from motivation theory, which is a condition that moves tourists to achieve their goals. According to Ching (2015), motivation is an internal state that causes people to behave in a certain way to achieve specific goals. Meanwhile, according to Purwanto (2007), motivation encourages someone to act to do something. While the notion of tourist motivation is adapted from motivation theory, according to Pandian Vasant & Kalaivanthan M (2016), Tourist motivation refers to an individual's internal state characterized by specific needs and desires, which plays a significant role in influencing tourists' behavior and decision-making process. It is recognized as one of the most influential psychological factors impacting tourist behavior. According to Mahika (2011), *tourist motivation* can be a psychological stimulus determining the desire to travel. In this case, tourists carry out the process of selecting specific destinations, forms of travel, or specific travel agents.

From the explanation above regarding motivation and tourist motivation, an understanding can be obtained that tourist motivation is a condition experienced by an individual who is on vacation visiting another area where it is influenced by factors from within and from outside the individual that can encourage, stimulate, and move to decide to do something or visit a destination. Meanwhile, Yoo et al (2018) stated that basically, Tourists make destination choices by evaluating the interplay of internal and external influences. Their decision-making process involves considering factors that originate both within themselves and from external sources.

In this Sense, the following hypothesis can be define:

H3 Motivation will positively effect tourist intention to revisit

Word Of Mouth

According to Andreas (Priansa, 2017: 388), Word of mouth refers to transmitting information or opinions about a company, its products, or its services through personal conversations. This form of communication typically involves individuals sharing their experiences, impressions, and feedback regarding product performance, customer service, reliability, efficiency, and other aspects. These messages are based on personal encounters and are then shared with others. According to the word-of-mouth marketing association Priansa (2017: 328), word-of-mouth is a consumer activity providing information about a product or service to other consumers. Rosario et al. (Mukerjee & Shaikh, 2019) explain that word of mouth is a consumer action that provides information about goods, brand services, or companies to other consumers.

Wangenheim (Ahmadi, 2019) explains that Word of mouth is widely acknowledged as a significant influence in the market, shaping attitudes, preferences, intentions, and choices. So:

H4 : Destination Awareness has effect on tourist intention to revisit even through WOM

H5 : Destination image has effect on tourist intention to revisit even through WOM

H6 : Motivation has effect on tourist intention to revisit even through WOM

Intention to Revisit

According to Fishbein and Ajzen (1975), as cited in Huang et al. (2015), the intention to revisit refers to the willingness of tourists to return to the same destination. On the other hand, Cole and Scott (2004), as cited in Stylos et al. (2016), define return intention as the desire to visit the exact destination for a second time within a specific timeframe. Return intention is the act of revisiting a tourist destination in the future as a direct outcome of post-visit behavior within a defined timeframe. It occurs when tourists have a positive impression and satisfaction from their initial visit and decide to return in the future. Therefore, tourists revisit a destination because they experience pleasure or greater satisfaction than their initial expectations (Ross, 1993, as cited in Yang, 2011). Based on the various definitions of intention to return mentioned above, it can be concluded that the intention to return refers to the willingness or desire of tourists to revisit the identical tourist destination for a second time within a specific timeframe as a direct response to their post-visit behavior. The model framework in this study can be visually depicted as follows:

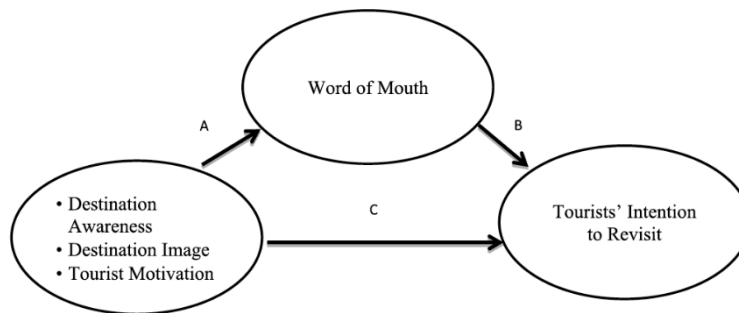


Figure 2.1

Source: Sheellyana Junaedi and Jason Harjanto (2020)

The theoretical framework are Awareness (X1), Image (X2), Tourist Motivation (X3) as independent variable Intention to Revisit (Y) as dependent variable, and Word of mouth as Mediating variable (Z1)

III. METHODOLOGY

This research uses quantitative methods. According to Sugiyono (2020), *Quantitative methods* are research approaches grounded in the positivist philosophy, employed to investigate a specific population or sample. These methods involve data collection through research instruments and utilize quantitative data analysis techniques, such as statistics, to test the formulated hypotheses. Type of this research uses the causality method. According to Sugiyono (2016: 37), The causality method is an approach that elucidates the connection between two variables, highlighting the cause and effect relationship. In this method, certain variables exert influence while others are influenced. This study employs several sub-variables to capture different aspects of the main variables. Specifically, within the context of destination awareness, the sub-variables include unawareness of the brand, brand recognition, brand recall, and top of mind. Another set of sub-variables pertains to the destination image, encompassing both cognitive and affective aspects. Lastly, the tourist motivation variable comprises sub-variables such as scenery, relaxation, physical refreshment, self-actualization, and pleasure-seeking. Furthermore, finally, the WOM sub-variable contains talking, promote, recommend, and selling.

This research will use a Likert scale. This scale measure opinions or perceptions from respondents based on the level of agreement or disagreement (Purwanto & Sulistyastuti, 2011: 63). A Likert scale is a commonly used method to assess attitudes, allowing individuals to indicate their agreement or disagreement with specific statements about a particular object or topic. It involves a series of carefully crafted statements ranging from strongly positive to strongly negative, and respondents are asked to indicate their level of agreement or disagreement with each statement (Zikmund et al., 2010). Avoiding a bias because the respondents tend to choose an alternative answer that is in the middle, it is used for four choices by respondents by eliminating "Neutral" in the questionnaire. According to Corper, Donald R, Schindler, and Pamela S (2014:167), The population refers to the entire group of elements we want to infer. Each individual element within the population is the subject or unit of study on which measurements are conducted. This study's population is Telkom University international

students who followed the edutrip program in 2019 and 2022. According to Sugiyono (2020), Samples represent a portion of the population, encompassing a specific number of individuals with similar characteristics within the larger population. A sample is a selected subset of the population, where all members of the sample are also members of the population. The minimum sample size is determined using the Yamane formula, ensuring an appropriate population representation.:

$$n = \frac{N}{1 + N e^2}$$

Information :

n = Number of samples required

N = Total Population

e = Sampling error rate minimum of 5%

This study uses a precision level of 10 n with a confidence level of 90%, so that the value of e is determined at 10%. Based on the Yamane formula above, the researcher uses the following sample calculations for:

$$n = \frac{314}{1 + 314 \cdot 0,1^2} = 75,84$$

The number of samples obtained based on the calculation of the Yamane formula is 75,84 and rounded up to 76, so that in this study, a minimum sample of 76 respondents was required. The total population was gained from international office data listing the name of international students who followed the edutrip program in 2019 and 2022. The researcher used a questionnaire framework that included a list of participants from the Edutrip program in 2019 and 2022 as a guide. Therefore, the sampling technique employed in this study was probability sampling, which allows each element or member of the population to have an equal chance of being selected as a sample. Specifically, Simple Random Sampling was chosen as the type of probability sampling. Simple Random Sampling involves randomly selecting samples without considering any existing strata in the population. Given this understanding, the researcher utilized a probability sampling technique with Simple Random Sampling. The criteria for respondents in this study were international class students who had participated in the Edutrip program in both 2019 and 2022. The author's method of carrying out simple random sampling is by writing all participants data list that collected from International Office data and conducting a draw using the wheels of name, until 76 participants have been collected out of 314 total participants who took part in the Edutrip program for the 2019 and 2022 periods, then the author will contact and provide a questionnaire to fill in.

Data collection techniques are crucial in research as they aim to gather the necessary data. Various contexts, sources, and approaches are available for data collection (Hadanai et al., 2020). Common methods for data collection include observation, interviews, questionnaires, documentation, and literature studies (Radjab & Jam'an, 2017). In this study, the survey method was employed to collect data by administering questionnaires directly to the respondents through a Google Form. Social media platforms like Instagram, Line, and WhatsApp were utilized to distribute the Google Forms to international class students at Telkom University. The research utilizes the partial least squares (PLS) approach as the data analysis method. PLS is a variant-based structural equation modeling (SEM) technique that differs from the traditional covariance-based SEM approach. While covariance-based SEM focuses on testing predictive relationships between constructs, PLS is a powerful analysis method that does not rely on stringent assumptions such as normal data distribution or large sample size.

According to Ghozali (2015), PLS offers an alternative approach for researchers to predict their research model. The formal model is obtained by defining *latent variables* as linear combinations of their indicators. The parameter estimation in PLS involves three key aspects, as mentioned by Lahmoller (1989) cited in Yamin and Kurniawan (2011:16). First, weight estimation is used to create latent variable scores. Second, path estimation reflects the connections between latent variables and their indicators and the relationships among latent variables. Finally, the estimation includes means and co-parameters, which are constant regression values for indicators and latent variables. These three estimates are obtained through a three-stage iteration process in PLS, where each stage produces estimates for analysis. The stages involve analyzing the outer and inner models and conducting hypothesis testing.

IV. RESULT / FINDING

Description of research object

Table 4.1

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	50	64.9	64.9	64.9
	FEMALE	27	35.1	35.1	100.0
Total		77	100.0	100.0	

From the table above, there are 50 (64.9%) male respondents and 27 (35.9%) female respondents.

Table 4.2

HAVE_YOU_FOLLOWED_EDUTRIP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	77	100.0	100.0	100.0

The question given to the respondent is "have you followed Edutrip?" as many as 77 people or 100% answered "Yes".

Table 4.3

WHEN_YOU_FOLLOWED_EDUTRIP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2019	23	29.9	29.9	29.9
	2022	54	70.1	70.1	100.0
Total		77	100.0	100.0	

The question given to respondents was "When did you follow Edutrip?" 23 people or 29.9% answered in 2019 and 54 people or 70.1% answered in 2022.

Table 4.4

WHICH_COUNTRY_YOU_CHOOSE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALAYSIA	25	32.5	32.5	32.5
	MALAYSIA-SINGAPORE	39	50.6	50.6	83.1
	KOREA	4	5.2	5.2	88.3
	JAPAN	9	11.7	11.7	100.0
	Total	77	100.0	100.0	

The question given to the respondent is "which country do you choose as your main destination?" As many as 25 people or 32.5% chose Malaysia, 39 people or 50.6% chose Malaysia-Singapore, 4 people or 5.2% chose Korea and the remaining 9 people chose Japan or around 11.7%.

4.2 Descriptive Statistic Based on Variable

Table 4.5

Descriptive Statistics				
	N	Minimum	Maximum	Mean
DESTINATION_AWARENESS	77	1.00	4.00	3.3506
DESTINATION_IMAGE	77	1.00	4.00	3.4935
TOURIST_MOTIVATION	77	1.00	4.00	3.3506
WORD_OF_MOUTH	77	1.00	4.00	3.2857
TOURIST_INTENTION_TO_REVISIT	77	1.00	4.00	3.5584
Valid N (listwise)	77			

- The indicator of Destination Awareness ranges from a minimum value of 1 ("strongly disagree") to a maximum value of 4 ("strongly agree"). The average value is 3.3506, which is close to 3. This suggests that, on average, respondents agree with the indicators related to destination awareness.
- The indicator of Destination Image ranges from a minimum value of 1 ("strongly disagree") to a maximum value of 4 ("strongly agree"). The average value is 3.4935, which is also close to 3. This indicates that, on average, respondents agree with the indicators related to the destination image.
- The indicator of Tourist Motivation ranges from a minimum value of 1 ("strongly disagree") to a maximum value of 4 ("strongly agree"). The average value is 3.3506, again close to 3. This suggests that, on average, respondents agree with the indicators related to tourist motivation.
- The indicator of Word of Mouth ranges from a minimum value of 1 ("strongly disagree") to a maximum value of 4 ("strongly agree"). The average value is 3.2857, close to 3. This indicates that, on average, respondents agree with the indicators related to word of mouth.
- The indicator of Intention to Revisit ranges from a minimum value of 1 ("strongly disagree") to a maximum value of 4 ("strongly agree"). The average value is 3.5584, which is close to 4. This suggests that, on average, respondents strongly agree with the indicators related to visit intention.

Table 4.6

Descriptive Statistics

	N	Mean
DA1	77	3.0390
DA2	77	3.1558
DA3	77	3.1688
DA4	77	3.3117
DA5	77	3.2987
DA6	77	3.2857
DA7	77	3.1948
DA8	77	3.1558
Valid N (listwise)	77	

The average value for Destination Awareness is 3.3506, indicating that the average respondent in the study agrees with the statements provided. The lowest value, 3.0390, corresponds to the statement "I can picture what the destination looks like," suggesting that the average respondent agrees. On the other hand, the highest score, 3.3117, corresponds to the fourth statement, "I can differentiate one destination from another destination of Edutrip," indicating that the average respondent agrees with this statement.

Table 4.7. Descriptive Statistics

Descriptive Statistics

	N	Mean
DI1	77	3.4416
DI2	77	3.4675
DI3	77	3.4545
DI4	77	3.3896
DI5	77	3.3636
DI6	77	3.3377
DI7	77	3.3766
DI8	77	3.3766

DI9	77	3.4675
DI10	77	3.4286
DI11	77	3.2987
DI12	77	3.4026
DI13	77	3.4805
DI14	77	3.2987
AI1	77	3.4935
AI2	77	3.4156
AI3	77	3.4805
AI4	77	3.4675
Valid N (listwise)	77	

The average value for Destination Image is 3.4935, indicating that the average respondent in the study agrees with the statements provided. The lowest values are observed for the 11th and 14th statements, "I prefer to choose a destination with natural attractions" and "I prefer to choose a destination which is good value for money," with an average of 3.2987. This value is close to 3, indicating that the average respondent agrees with these statements. On the other hand, the highest value, 3.4935, corresponds to the AI1 statement, "I would like to arouse mood rather than sleepy." This value suggests that the average respondent agrees with this statement.

Table 4.8. Descriptive Statistics

Descriptive Statistics		
	N	Mean
S1	77	3.1169
S2	77	3.3247
RL1	77	3.2468
RL2	77	3.2857
PR1	77	3.2468
PR2	77	3.1169
SA1	77	3.2727
SA2	77	3.2338
PS1	77	3.1688

PS2	77	3.1429
Valid N (listwise)	77	

The average value for Tourist Motivation is 3.3506, indicating that the average respondent in the study agrees with the statements provided. The lowest values are observed for the first and sixth statements, "I want to enjoy the beauty of nature at the destination" and "I want to feel and enjoy fresh air," with an average of 3.1169. This value is close to 3, indicating that the average respondent agrees with these statements. On the other hand, the highest value, 3.3247, corresponds to the 2nd statement, "I want to gain new experiences." This value suggests that the average respondent strongly agrees with this statement.

Table 4.9. Descriptive Statistics

Descriptive Statistics		
	N	Mean
P1	77	3.3247
P2	77	3.4675
R1	77	3.3766
R2	77	3.3896
SL1	77	3.4156
SL2	77	3.3506
SL3	77	3.3247
T1	77	3.2597
T2	77	3.1948
Valid N (listwise)	77	

The average score for Word of Mouth is 3.2857, indicating that the average respondent in the study agrees with the statements provided. The lowest value is observed for the 9th statement, "I received much positive information regarding this destination," with an average of 3.1948. This value is close to 3, indicating that the average respondent agrees. On the other hand, the highest value, 3.4675, corresponds to the 2nd statement, "Some people have promoted this destination to me." This value suggests that the average respondent strongly agrees with this statement.

Table 4.10

Descriptive Statistics		
	N	Mean
TB1	77	3.0779
TB2	77	3.1558

TD1	77	3.1948
TD2	77	3.1429
TS1	77	3.2338
TS2	77	3.2208
Valid N (listwise)		77

The average score for Intention to Revisit is 3.5584, close to the number 4. This indicates that the average respondent in this study strongly agrees with the statements related to Visit Intention. The lowest value is observed for the 1st statement, "I want to buy some stuff," with an average of 3.0779. This value is close to 3, suggesting that the average respondent agrees with the statement. On the other hand, the highest value is found in the 5th statement, "I want to see something unique things," with a score of 3.2338. This value indicates that the average respondent agrees with the statement.

Table 4.11

	Destination Awareness	Destination Image	Tourist Motivation	Word Of Mouth	tourist intention to revisit
DA1	0,837				
DA2	0,812				
DA3	0,783				
DA4	0,823				
DA5	0,845				
DA6	0,851				
DA7	0,877				
DA8	0,837				
DI1		0,845			
DI10		0,861			
DI11		0,805			
DI12		0,819			
DI13		0,847			
DI14		0,740			
DI15		0,853			
DI16		0,833			
DI17		0,801			
DI18		0,877			
DI2		0,792			
DI3		0,847			
DI4		0,864			
DI5		0,797			
DI6		0,793			
DI7		0,827			
DI8		0,810			
DI9		0,795			

P1		0,848
P2		0,752
PR1	0,882	
PR2	0,768	
PS1	0,835	
PS2	0,898	
R1		0,836
R2		0,763
RL1	0,861	
RL2	0,867	
S1	0,880	
S2	0,852	
SA1	0,872	
SA2	0,893	
SL1		0,772
SL2		0,816
SL3		0,836
T1		0,806
T2		0,760
TB1		0,851
TB2		0,802
TD1		0,877
TD2		0,852
TS1		0,893
TS2		0,903

The table reveals that the loading factor values for several research variables meet the necessary criteria, indicating their validity.

Table 4.12

	Destination Awareness	Destination Image	Tourist Motivation	Word Of Mouth	tourist intention to revisit
DA1	0,837	0,591	0,642	0,683	0,701
DA2	0,812	0,489	0,451	0,575	0,635
DA3	0,783	0,541	0,629	0,621	0,655
DA4	0,823	0,677	0,605	0,700	0,771
DA5	0,845	0,612	0,629	0,691	0,748
DA6	0,851	0,613	0,620	0,688	0,708
DA7	0,877	0,559	0,602	0,717	0,756
DA8	0,837	0,566	0,517	0,605	0,661
DI1	0,635	0,845	0,633	0,660	0,641
DI10	0,566	0,861	0,626	0,692	0,605

DI11	0,564	0,805	0,557	0,630	0,573
DI12	0,569	0,819	0,631	0,651	0,624
DI13	0,543	0,847	0,660	0,657	0,628
DI14	0,539	0,740	0,420	0,527	0,511
DI15	0,543	0,853	0,632	0,631	0,599
DI16	0,547	0,833	0,598	0,635	0,569
DI17	0,457	0,801	0,619	0,598	0,562
DI18	0,619	0,877	0,628	0,701	0,618
DI2	0,484	0,792	0,573	0,623	0,537
DI3	0,677	0,847	0,698	0,670	0,638
DI4	0,674	0,864	0,642	0,777	0,682
DI5	0,562	0,797	0,671	0,662	0,615
DI6	0,643	0,793	0,682	0,674	0,673
DI7	0,648	0,827	0,619	0,645	0,625
DI8	0,587	0,810	0,691	0,690	0,594
DI9	0,461	0,795	0,521	0,576	0,509
P1	0,727	0,677	0,704	0,848	0,771
P2	0,567	0,613	0,670	0,752	0,659
PR1	0,649	0,647	0,882	0,697	0,692
PR2	0,616	0,629	0,768	0,680	0,668
PS1	0,585	0,643	0,835	0,707	0,720
PS2	0,605	0,590	0,898	0,721	0,747
R1	0,667	0,685	0,683	0,836	0,743
R2	0,513	0,578	0,672	0,763	0,668
RL1	0,584	0,627	0,861	0,652	0,656
RL2	0,583	0,671	0,867	0,737	0,728
S1	0,578	0,611	0,880	0,753	0,714
S2	0,647	0,712	0,852	0,717	0,685
SA1	0,642	0,688	0,872	0,765	0,740
SA2	0,604	0,669	0,893	0,706	0,718
SL1	0,630	0,613	0,579	0,772	0,665
SL2	0,662	0,595	0,613	0,816	0,710
SL3	0,699	0,659	0,689	0,836	0,787
T1	0,635	0,657	0,689	0,806	0,720
T2	0,602	0,620	0,669	0,760	0,659
TB1	0,708	0,715	0,736	0,768	0,851
TB2	0,705	0,646	0,659	0,751	0,802
TD1	0,710	0,534	0,689	0,748	0,877
TD2	0,723	0,612	0,678	0,778	0,852
TS1	0,734	0,653	0,761	0,766	0,893
TS2	0,809	0,635	0,733	0,794	0,903

According to the cross-loading output table, it is evident that the indicators exhibit stronger correlations with their respective constructs compared to other constructs. This indicates that the latent constructs effectively predict the indicators within their block rather than those in other blocks.

Table 4.13

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Destination Awareness	0,937	0,939	0,948	0,695
Destination Image	0,972	0,973	0,974	0,678
Tourist Motivation	0,961	0,962	0,966	0,742
Word Of Mouth	0,929	0,931	0,941	0,639
tourist intention to revisit	0,932	0,933	0,946	0,746

According to Table 4.13, all constructs exhibit an AVE value exceeding 0.50, with the lowest value being 0.639 for the construct of word of mouth. This indicates that the AVE values meet the requirements set for the minimum AVE threshold of 0.50 or higher.

Table 4.14

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Destination Awareness	0,937	0,939	0,948	0,695
Destination Image	0,972	0,973	0,974	0,678
Tourist Motivation	0,961	0,962	0,966	0,742
Word Of Mouth	0,929	0,931	0,941	0,639
tourist intention to revisit	0,932	0,933	0,946	0,746

Table 4.14 of the SmartPLS output reveals that the composite reliability values for all constructs exceed 0.50. These values indicate that all constructs are reliable, meeting the minimum requirement. Hair et al. (2017) suggested that a composite reliability value of ≥ 0.60 -0.90 is considered reliable, while a value of ≤ 0.60 indicates that each indicator may measure something different. Additionally, a value of ≥ 0.95 implies that the item is not expected to measure the same construct.

Table 4.15

	VIF
DA1	3.485
DA2	3.593
DA3	2.466
DA4	2.781
DA5	3.413
DA6	3.267
DA7	3.736
DA8	3.124
DI1	4.160
DI10	4.053
DI11	3.345
DI12	3.525
DI13	4.391
DI14	2.631
DI15	4.106
DI16	3.893
DI17	3.642
DI18	4.532
DI2	3.062
DI3	3.659
DI4	4.938
DI5	3.428
DI6	2.816
DI7	3.256
DI8	3.889
DI9	4.191
P1	3.014
P2	2.088
PR1	4.834
PR2	2.250
PS1	3.104
PS2	4.692
R1	3.100
R2	2.298
RL1	3.588
RL2	3.494
S1	4.013
S2	3.458
SA1	3.922
SA2	4.954
SL1	2.169
SL2	2.809
SL3	2.835
T1	2.514
T2	2.157
TB1	2.675
TB2	2.231
TD1	3.745
TD2	2.970
TS1	3.435
TS2	3.874

According to the table, the VIF values are below 5, indicating the absence of collinearity issues.

Table 4.16

	R Square	R Square Adjusted
Word Of Mouth	0,801	0,793
tourist intention to revisit	0,860	0,852

Based on the R-Square value in table 4.16 it shows that the independent variables have an effect of 86 % on Tourist travel Intention, this finding is evidenced by an r square coefficient of 0.860 and other independent variables have an effect of 80,1 % on WoM, this finding is evidenced by the coefficient r square = 0.801

Table 4.17

	SSO	SSE	Q ² (=1-SSE/SSO)
Destination Awareness	616,000	616,000	
Destination Image	1386,000	1386,000	
Tourist Motivation	770,000	770,000	
Word Of Mouth	693,000	350,513	0,494

tourist intention to revisit	462,000	171,637	0,628
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The computed Q^2 value is 0.628, indicating that the model and parameter estimates generate the observed values well. According to Ghozali (2014), a Q^2 value greater than 0 indicates that the model is considered satisfactory, while a Q^2 value less than 0 suggests a lack of predictive relevance. In this research model, the endogenous construct or latent variable has a Q^2 value greater than 0, indicating that the predictions made by the model are relevant.

Table 4.18

	Destination Awareness	Destination Image	Tourist Motivation	Word Of Mouth	tourist intention to revisit
Destination Awareness				0,237	0,332
Destination Image				0,129	0,007
Tourist Motivation				0,297	0,109
Word Of Mouth					0,287

The table shows that the variable "awareness" has an F value of 0.332, indicating a substantial influence on tourist intention to revisit. The variable "destination image" has an F value of 0.007, suggesting a minor influence on tourist intention to revisit. On the other hand, "tourist motivation" has an F value of 0.109, indicating a significant influence on tourist intention to revisit. Lastly, "word of mouth" has an F value of 0.287, significantly influencing tourist travel intention.

Table 4.19

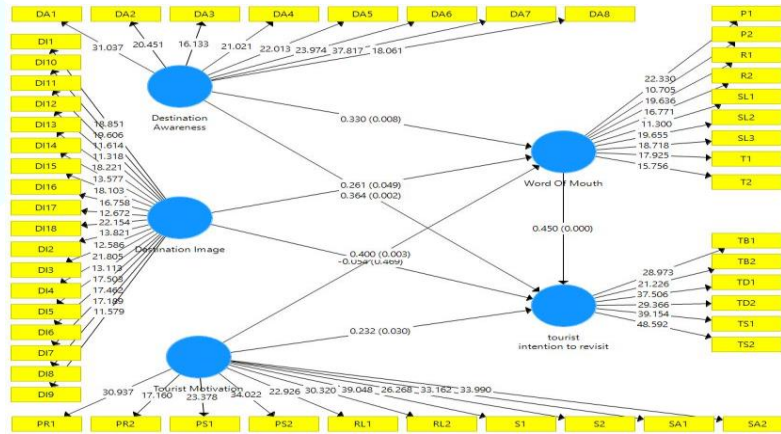
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Destination Awareness -> Word Of Mouth -> tourist intention to revisit	0,148	0,153	0,078	1,906	0,057
Destination Image -> Word Of Mouth -> tourist intention to revisit	0,117	0,113	0,071	1,658	0,098
Tourist Motivation -> Word Of Mouth -> tourist intention to revisit	0,180	0,176	0,071	2,536	0,012

1. The results indicate that Awareness has a significant and positive influence on Tourist intention to revisit through Word of Mouth (WoM), as evidenced by the original sample value of 0.148 and a p-value of 0.043, which is less than the significance level of 0.1.

2. The findings reveal that Image has a significant and positive influence on Tourist intention to revisit through Word of Mouth (WoM), with an original sample value of 0.117 and a p-value of 0.071, which is less than the significance level of 0.1.

3. The results suggest that Motivation has a significant and positive influence on Tourist intention to revisit through Word of Mouth (WoM), with an original sample value of 0.180 and a p-value of 0.011, which is less than the significance level of 0.1.

Table 4.20



	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
Destination Awareness -> Word Of Mouth	0,330	0,337	0,123	2,683	0,008
Destination Awareness -> tourist intention to revisit	0,364	0,352	0,116	3,146	0,002
Destination Image -> Word Of Mouth	0,261	0,254	0,132	1,974	0,049
Destination Image -> tourist intention to revisit	-0,054	-0,053	0,074	0,725	0,469
Tourist Motivation -> Word Of Mouth	0,400	0,401	0,132	3,029	0,003
Tourist Motivation -> tourist intention to revisit	0,232	0,246	0,106	2,182	0,030
Word Of Mouth -> tourist intention to revisit	0,450	0,446	0,125	3,585	0,000

1. The findings support the hypothesis that destination awareness has a positive effect on tourist intention to revisit. This is evidenced by the coefficient p-value of 0.001, which is less than the significance level of 0.1, and the coefficient of the original sample is 0.364. Therefore, hypothesis 1 is accepted.
2. The findings not supported the hypothesis that destination image has a positive effect on tourist intention to revisit. This is evidenced by the coefficient p-value of 0.493, greater than the significance level of 0.1, and the coefficient of the original sample is -0.054. Therefore, hypothesis 2 is rejected.
3. The findings support the hypothesis that tourist motivation has a positive effect on tourist intention to revisit.

This is evidenced by the coefficient p-value of 0.031, which is less than the significance level of 0.1, and the coefficient of the original sample is 0.232. Therefore, hypothesis 3 is accepted.

4. The mediation test shows that destination awareness indirectly affects tourist intention to revisit through word of mouth. This is supported by the coefficient p-value of 0.043, which is less than the significance level of 0.1, and the coefficient of the original sample is 0.148. Therefore, hypothesis 4 is accepted.

5. The mediation test shows that destination image indirectly affects tourist intention to revisit through word of mouth. This is supported by the coefficient p-value of 0.071, which is less than the significance level of 0.1, and the coefficient of the original sample is 0.117. Therefore, hypothesis 5 is accepted.

6. The mediation test shows that tourist motivation indirectly affects tourist intention to revisit through word of mouth. This is supported by the coefficient p-value of 0.011, which is less than the significance level of 0.1, and the coefficient of the original sample is 0.180. Therefore, hypothesis 6 is accepted.

V. DISCUSSION

1. Awareness has a positive effect on tourist intention to revisit

The study result shows awareness has a positive effect on tourist intention to revisit. This study's findings are consistent with previous research conducted by Carvalho (2022) who found that awareness positively affects tourist intention to revisit. As explained in the study, awareness of the Portuguese city, which was used as the object of the study, had a very positive effect on tourist intention to revisit. Meanwhile, in this study, the awareness side of trip destinations includes Malaysia having its most popular destinations in the form of the twin towers, Singapore with its Merlion Park, Japan with its natural attractions, and Korea has unique destinations for Korean idol fans. This makes the awareness in this study in each trip destination country have positive results with the intention of traveling, which aligns with previous research. Destination awareness has a significant positive value on tourist attention. It means that the higher the awareness of a tourist spot, the more people will want to visit it.

2. Destination image has a positive effect on tourist intention to revisit

The findings of the study indicate that there is no positive impact of destination image on the intention of tourist intention to revisit. These results must align with Anggraeni, Antara, and Sari's research (2022), which explains that image positively affects tourist intention to revisit. What is explained in this study is that the image of Jatiluwih Village, which is used as the object of research, has a positive perception of the uniqueness of its environment, which makes the image of Jatiluwih Village in research influence the intention of visiting tourists. There are differences between previous studies. This study's P value 0.493, it is greater than 0.1. Furthermore, the value of the F-square Effect on destination image to intention to revisit is only 0.007, which means a slight influence trend to no significance. However, in another study conducted by Rohmania (2022). where in this study destination image is not positive and significant effect partially between destination image and repeat visit of tourists at Gemah Beach, Kab. Tulungagung did. The destination's image must be more critical for tourist intention to revisit. So that tourist interest does not only depend on the positive or negative image of trip destinations but other factors make these trip destinations increase tourists' interest in traveling, such as tourist attractions, basic facilities, cultural attractiveness, accessibility, natural environment, and economic factors that support each tourist destination country.

3. Motivation has a positive effect on tourist intention to revisit

The finding of research shows that motivation positively affects tourist intention to revisit. This study's findings are consistent with previous research conducted by Chasanah and Wijaya (2020), who found that motivation positively affects tourist intention to revisit. This study refers to tourist motivation based on destination awareness and a good image destination at "New Bali" as their object. This will support awareness and image, motivating tourists to visit the place. This is also in line with this research where the awareness possessed by each edutrip country, such as the twin towers in Malaysia, the Merlion Park in Singapore, beautiful natural attractions in Japan, and destinations for Korean idol lovers, is a motivation for tourists visits increased significantly. This is also

supported by tourist attractiveness, basic facilities, cultural attractiveness, accessibility, natural environment, and economic factors that support each edutrip tourist destination so that tourist motivation to visit increases and has a positive effect.

4. Destination Awareness has affected tourist intention to revisit even though WOM

The mediation test revealed that word of mouth (WOM) is a partial or complementary mediator. This implies that the independent variables, namely destination awareness, image, and motivation, indirectly influence the dependent variable, tourist intention to revisit, through the mediating variable of word of mouth (WOM). The result of this study is that destination awareness still affects tourist intention to revisit through Word-of-mouth. It is found with an original sample value of 0.148 and a p-value of $0.043 < 0.1$, This study's findings are consistent with previous research conducted by Junaedi and Harjanto (2020), which states that a higher word indicates the level of relationship between awareness and intention to revisit. In another sense, WOM is also a significant value, significantly influencing tourists' interest in traveling. The reason is, if analogous to someone wanting to take a vacation to a destination, then the first thing to pay attention to is awareness of that destination. By knowing the interesting spots or tourist attractions in each tourist destination, tourists' awareness of related destinations will increase. Besides that, Tourists can obtain this through third parties, namely other people's reviews, word-of-mouth promotions, and perceptions from other people of the tourist attractions to be visited; this impacts the awareness relationship and increases tourist attention to revisit, which WOM supports in it.

5. Destination image has affected tourist intention to revisit even though WOM

The mediation test revealed that word of mouth (WOM) is a partial or complementary mediator. This implies that the independent variables, namely destination awareness, image, and motivation, indirectly influence the dependent variable, tourist intention to revisit, through the mediating variable of word of mouth (WOM). The result of this study is that images have an effect on tourist intention to visit through word-of-mouth with an original sample value of 0.117 and P value of $0.071 < 0.1$, This study's findings are consistent with previous research conducted by Ho and Ngo (Ho et al., 2021), which states that Destination image positively impacts satisfaction and revisit intention (Similar to the results of Shafiee et al., 2016). the study also found that word of mouth is the mediating factor of satisfaction relationship and revisit intention (Similar to the results of a study on tourism in 5 major cities in Iran by Shafiee et al., 2016 and research on medical tourism in Istanbul (Turkey) by Abu bakar,2017). a more excellent WOM value indicates the level of relationship between image and tourist attention. This underlies that WOM still has a influence on the relationship between destination image and tourist intention to revisit

6. Tourist Motivation has affected tourist intention to revisit even though WOM

The mediation test revealed that word of mouth (WOM) is a partial or complementary mediator. This implies that the independent variables, namely destination awareness, image, and motivation, indirectly influence the dependent variable, tourist intention to revisit, through the mediating variable of word of mouth (WOM). The result of this study motivation affects tourist intention to revisit through WOM with an original sample value of 0.180 and P value of $0.011 < 0.1$, This study's findings are consistent with previous research conducted by Junaedi and Harjanto (2020), which states that a more excellent WOM value indicates the level of relationship between tourist motivation and tourist reattention. In this case, WOM still positively and enormously influences the relationship between travel motivation and tourist intention to revisit. WOM discusses awareness and image of a destination, increasing tourist motivation from tourists which impacts tourist intention to revisit.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

1. Destination awareness has positive effect on tourist intention to revisit
2. Destination image has no positive effect on tourist intention to revisit
3. Tourist motivation has positive effect on tourist intention to revisit

4. Destination awareness still have a positive effect tourist intention to revisit through word-of-mouth
5. Destination image still have a positive effect tourist intention to revisit through word-of-mouth
6. Tourist motivation still have a positive effect tourist intention to revisit through word-of-mouth

Recommendation

1. For the Destination Management Office

Based on the analyzed research results, recommendations can be provided to the destination management office to enhance word of mouth among tourists revisiting the destination. It is suggested to implement marketing strategies aimed at increasing word of mouth by providing any information regarding these destination such as provide the poster, brochure. This will enable tourists and potential visitors to easily know the destination based on information shared by tourists that have visited the destination beforehand. This will increase tourist motivation to revisit. In addition, from an internal perspective, it is recommended that the destination management office maintain the quality of the destination so that tourists can be satisfied with the hope that visitors can become marketers through word of mouth, which will impact to the intention to revisit.

2. For Further Researchers

One of the disadvantages of this study is that it only tested the hypothesis on one kind of responder (international class students). Therefore, the generalizability of the results is restricted. For example, Seabra et al. (2021) discovered considerable disparities in how citizens in different nations reacted to COVID-19 limits and safety measures. However, they discovered that the route was less dependent on the country of domicile. As a result, future studies might look at various cultural situations to see how attitudes and behavior toward intention change.

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Feasibility Study Of Housing Project PT.Alfarisi Quadra Sejahtera

Daffa Radhya Ravenska¹, Atika Irawan²

^{1,2} School of Business and Management Institut Teknologi Bandung, Bandung, Indonesia

Abstract

In an increasingly densely populated world, the need for affordable housing is needed by the community. The increasing house prices every year are not directly proportional to the income received by the community, especially in Jabodetabek. PT Alfarisi Quadra Sejahtera as a company engaged in the property sector plans to build a subsidized housing project in Sumberjaya, South Tambun, Bekasi Regency to fulfill low-income community's needs. The total cost to undertake the project is IDR23,671,403,082.97. The objective of this research is to analyse the feasibility study of a company project, based on the financial aspect and the risk that the company faces. To identify company project feasibility, researchers used several tools and methods such as, NPV, IRR, Payback Period, and Profitability Index. The risk assessment for this project will be conducted using sensitivity analysis. All the tools to determine this project showed a positive result. The project NPV is IDR IDR4,909,884,233.87 which is greater than zero, the IRR 26% is higher than the cost of capital 5.38%, the profitability index 1.554 is higher than 1.0, the payback period is 1.9 years, and the risk analysis succeeds to indicate the risk that needs to be considered by the company. Regarding the suggestion, PT Alfarisi Quadra Sejahtera needs to consider the duration to sell the house by increasing the house sale per month. To increase house sales, companies must pay attention to their marketing strategy and their cost of construction so that they can maximize profits.

Keywords: Capital Budgeting, Feasibility Study, Housing, Risk Analysis.

I. INTRODUCTION

The global population consistently rises over time, even as available land for human habitation diminishes. The World Bank's data (2021) indicates that the Earth's total human population has surged to 7.89 billion and this upward trajectory persists. In the year 2020, population density registered at 60 individuals for each square kilometer of land. In the case of Indonesia, its population density is notably high at 144.8 people for every square kilometer of land, ranking among the world's highest (World Bank, 2020). This phenomenon of uneven population density within Indonesia is particularly pronounced in its major urban centers.

The world's population growth and Indonesia's rising population density will undoubtedly have an impact on aspects of lives, including housing. The need for housing, especially in metropolitan areas such as *Jabodetabek* (Jakarta, Bogor, Depok, Tangerang, and Bekasi) is increasing. Data from the Ministry of Public Works and Public Housing (PUPR) shows that the number of housing needs in Jakarta is 11 million units. In term of pricing, according to the most recent Residential Property Price Survey (RPPS) conducted by Bank Indonesia in the third quarter of 2022, residential property prices are still rising on an annual basis, with the Residential Property Price Index (RPPI) increasing to 1.94% from 1.66% in the previous period (Bank Indonesia, 2022). The average price of land in Jakarta in 2022 is IDR15,258,601 per square meter, and it is predicted to rise in line with infrastructure development such as highways, MRT, and LRT. However, income figures of people that live and work in the area do not correspond to rising property prices in Indonesia, particularly in Jakarta. It raises the trend of renting a house rather than owning their own house due to financial limitations. Aside from that, some people prefer to reside in government-subsidized housing or in Jakarta suburbs, one of which being Bekasi Regency.

The demand for housing is set to experience continuous growth in tandem with the expanding population. This is driven by the populace's inclination towards compact, convenient, and uncomplicated living spaces, such as subsidized homes or apartments. This preference stems from the elevated population density and the upward trajectory of land costs. Positioned at the border of Jakarta, Bekasi Regency emerges as a promising locale for habitation, catering to Jakarta's workforce, Bekasi Regency inhabitants, and those employed in the Cikarang industrial sector.

Recognizing this potential, PT Alfarisi Quadra Sejahtera, a residential property enterprise, has identified an opportunity to establish a cluster of subsidized residences across a 1.8-hectare expanse in South Tambun, Bekasi Regency. The endeavour by PT Alfarisi Quadra Sejahtera offers modern subsidized housing strategically located and available at an attractive price point of IDR 181,000,000. Anchored in the belief that the competitive pricing, coupled with the comprehensive amenities both within the cluster and its vicinity, will yield substantial returns, this project is anticipated to be financially rewarding.

However, prior to embarking on the implementation of this endeavour, PT Alfarisi Quadra Sejahtera must diligently assess its feasibility and conduct a comprehensive risk analysis. Although the company has achieved success in executing previous housing projects, there are various critical considerations that warrant attention. Notably, the annual escalation of the inflation rate and the dynamic fluctuations within the market pose potential challenges. Additionally, the inflationary impact has led to an elevation in land and construction material costs, which, in turn, has strained the alignment between the maximum selling price for subsidized housing and the escalating expenses borne by developers.

Furthermore, PT Alfarisi Quadra Sejahtera's lack of experience in managing a project of this magnitude, having hitherto focused on selling clusters encompassing 40 to 100 houses without achieving full optimization, constitutes another significant facet to contemplate. The domain of property projects is rife with inherent risks, encompassing market volatility, financial vulnerabilities, operational intricacies, and legal complexities. Ensuring the viability of this undertaking demands meticulous strategic planning, aimed at optimizing the company's gains.

Moreover, the proposed project necessitates a substantial capital outlay, specifically amounting to IDR 24,582,072,086.91, a considerable sum in relation to the company's existing capital and investments totaling IDR 7,255,000,000. Consequently, the organization will need to explore alternate avenues of funding or potentially secure a loan. In light of these circumstances, PT Alfarisi Quadra Sejahtera is compelled to rigorously undertake a thorough assessment of feasibility and risk prior to embarking on this ambitious initiative.

II. LITERATURE REVIEW

Subsidized House

Housing is a fundamental requirement for humans, playing a significant role in enhancing their prosperity and dignity. To ensure adequate housing availability for all segments of society, it is essential to establish favorable conditions that promote construction activities. This approach aligns with the guidelines set forth in Ministerial Decree No. 403/KPTS/M/2002, which emphasizes healthy and straightforward home development.

In Indonesia, a considerable segment of individuals with limited incomes encounters challenges when it comes to obtaining permanent housing. In response to this issue, the government has introduced a subsidized housing initiative called KPR *sejahtera*. This program is designed to extend support to individuals through accessible, long-term financing or housing subsidies, and it operates within both traditional banking systems and those adhering to sharia principles. The primary aim of this program is to facilitate homeownership and mitigate the housing difficulties experienced by low-income residents of Indonesia (as outlined in Ministerial Regulation No. 20/PRT/M/2019).

Subsidized Public Houses are residences intended to cater to the housing needs of low-income communities. These subsidized houses encompass various types, including landed houses, sharia-compliant properties, flats, and sharia flats. Notably, subsidized housing differs from regular commercial housing in numerous aspects, encompassing house size, pricing, payment methods, developers, and buyers. A fundamental prerequisite for prospective buyers of subsidized housing is a maximum monthly income of IDR 8,000,000. In the *Jabodetabek* area, the maximum allowable price is IDR 181,000,000 in 2023 and IDR 185,000,000 in 2024. Additionally, the minimum land area requirement is 60 square meters, with a maximum of 200 square meters.

Feasibility Study

A business feasibility study is a systematic and structured approach aimed at identifying both obstacles and prospects, establishing objectives, scrutinizing present conditions, outlining desired outcomes, and appraising the potential advantages and drawbacks of various strategies to tackle challenges or harness opportunities

(Thompson, 2005). Essentially, a feasibility study constitutes a comprehensive exploration of a business venture or project to ascertain its viability for operation, as explained more succinctly by Kasmir and Jakfar (2012). In simpler terms, a feasibility study, also referred to as business feasibility, serves as a tool encompassing recommendations and constraints, which are utilized to assist decision-makers in gauging the viability of business concepts (Thompson, 2005).

Capital Budgeting

Capital budgeting is a many-sided activity that includes searching for new and more profitable investment proposals, investigating engineering and marketing considerations to predict the consequences of accepting the investment, and making economic analyses to determine the profit potential of each investment proposal (Bierman & Smidt, 2012). There are several techniques and tools to conduct capital budgeting such as:

4. Net Present Value

Utilizing Net Present Value (NPV) is a method to bring various alternatives to a unified standpoint, accomplished through the application of a decision-making instrument. Specifically, Net Present Value serves as a means to grasp the ramifications of making or abstaining from decisions pertaining to investment evaluation. Additionally, NPV can aid project managers in selecting the most optimal course of action within the existing parameters, facilitated by the execution of sensitivity assessments (Wetekamp, 2011).

$$NPV = \sum_{t=1}^t \frac{CF_t}{(1+r)^t} - CF_0 \quad (1)$$

Where

NPV : Net Present Value
 CF_0 : Initial Investment
 r : Discount Rate
 CF_t : Cash Flow at t time
 t : Number of Time Period

The decision rule related to net present value:

- If $NPV > 0$, The investment project favorable and accept the project
- If $NPV < 0$, The investment project rejected

5. Profitability Index

The profitability index (PI) refers to the ratio of discounted benefits over the discounted costs. It is an evaluation of the profitability of an investment and can be compared with the profitability of other similar investments which are under consideration.

$$\text{Profitability Index} = \frac{\text{Present Value of Future Cash Flows}}{\text{Initial Investment}} \quad (2)$$

The decision rules related to profitability index are:

- If the profitability index > 1 , then accept the project
- If the profitability index < 1 , then reject the project

6. Internal Rate of Return

As outlined by Hartman & Schafrick (2004), the internal rate of return (IRR) is a mathematical concept characterized as the interest rate at which the total value of a sequence of cash flows becomes equivalent to zero. Within the realm of decision-making, the IRR serves as a benchmark for appraising projects and determining their acceptance or rejection, comparable to the discount rate. Effectively, the IRR signifies the anticipated rate of return a company stands to gain upon investing in a specific project (Gitman & Zutter, 2015).

$$NPV = \sum_{t=0}^t \frac{CF_t}{(1+IRR)^t} = 0 \quad (3)$$

Where,

IRR : Internal Rate of Return
 CF_t : Cash Flow at t time

CF_0 : Initial Investment

The decision rules related to internal rate of return are:

- If $IRR > \text{The investment project cost of capital}$, then accept the project.
- If $IRR < \text{The investment project cost of capital}$, then reject the project.

7. Payback Period

Payback Period is the time taken by the project to recover the initial investment that is calculated from the cash inflows and inform implicit consideration of the cash flow in a firm and therefore to the time value of money (Gitman & Zutter, 2015).

The decision rules related to payback period are:

- If $\text{payback period} < \text{the maximum payback period projected by the company}$, then accept the project.
- If $\text{payback period} > \text{the maximum payback period projected by the company}$, then reject the project.

Capital budgeting Cash Flow

A considerable portion of investment ventures are evaluated through the projection of anticipated cash inflows for the firm (Bierman & Smidt, 2012). As defined by Richardson (2006), free cash flow encapsulates cash flow that exceeds the requisites for asset maintenance and projected new investments. The utilization of free cash flow can be approached via two methods: free cash flow to the firm (FCFF), encompassing cash accessible to both debt and equity stakeholders, and free cash flow to equity (FCFE), which exclusively pertains to equity stakeholders (Steiger, 2008). In the domain of property business, the prevalent approach has shifted toward the cash basis method, except in cases where landowners either opt out or exceed the stipulated rental payment threshold (Potton, 2017). PT Alfarisi Quadra Sejahtera, operating within the property sector, will adopt the cash basis technique as the foundation for its capital budgeting procedures.

Weighted Average Cost of Capital

Weighted Average Cost of Capital (WACC) reflects the expected average future cost of capital over the long run, it is calculated by multiplying the cost of each type of capital by its proportion in the firm's capital structure." WACC is calculated by multiplying the individual cost of each financing by its proportion in the firm's capital structure and adding the weighted values (Gitman, 2015). The equation is written as follows:

$$WACC = \left(\frac{D}{V} \times k_d\right) + \left(\frac{E}{V} \times k_e\right) \quad (4)$$

Where,

- D : The size of borrowed capital
- E : The size of own company capital
- V : The size of the total financing
- k_d : Cost of debt after tax
- k_e : Cost of equity

Risk Analysis

Risk analysis serves as a valuable tool in facilitating decision-making processes. This analysis plays a pivotal role in striking a well-informed equilibrium between various concerns, such as safety and costs. Furthermore, risk analysis offers the advantage of identifying elements, circumstances, systems, and illustrating the impact of diverse measures on risk outcomes (Aven, 2015).

According to Saltelli (2002), Sensitivity analysis entails a study of how the uncertainty inherent in a model's output, whether numerical or otherwise, can be attributed to distinct sources of uncertainty embedded within the model's input. Sensitivity analysis is regarded by many as an essential precursor to constructing models in any context, whether diagnostic or prognostic, and across various domains where models find application. To gauge the sensitivity of variables, the use of a tornado chart is employed, which aids in the preliminary assessment of the key variables influencing the analysis.

III. RESEARCH METHODOLOGY

Within this segment, the investigator deliberates on the blueprint of the research and the methodology employed for data collection in the course of this study. The initial stride involves pinpointing the issues to form research problems and objectives. Subsequently, the methods employed for data gathering are delineated. The data collection process is compartmentalized into three phases: commencing with the formulation of cash flows, progressing to feasibility analysis, and culminating in the evaluation of project risks. The ultimate stride encompasses the culmination of this study along with pertinent recommendations tailored for PT Alfarisi Quadra Sejahtera.

For data collection, this research will conduct both main types of data collection, primary and secondary. For the primary data collection, researcher will conduct an interview with CEO and board of director PT Alfarisi Quadra Sejahtera to acquire information about current conditions of this project planning such as location, unit, target market, and company strategy. For the financial data research aim to collect company historical sales, target sales, budget plan, and revenue stream. While, the secondary data collected through an online database to know market risk, market demand, risk-free rate, and beta coefficient.

For data analysis, the researcher will conduct a step by step data analysis after managing to collect all the necessary data. The first step or stage of this research is constructing the company cash flow stream and then the second stage is feasibility analysis by analyzing the project NPV, IRR, and payback period. The last stage is analyzing the risk of this project using sensitivity analysis.

IV. RESULT / FINDING

Project Analysis

As the population density increases, the need for housing also increases. *Jabodebatek* as the area with the highest population density in Indonesia really needs safety, comfortable, and affordable housing. PT Alfarisi Quadra Sejahtera as a housing developer sees this as an opportunity to provide strategic modern homes at affordable prices. With the development experience carried out by PT Alfarisi Sejahtera, they want to create a new investment plan and expand the Alfarisi Cluster project. This is evidenced by the company's historical sales data which is able to sell 76 subsidized houses in 2020. This expansion project will take place in Sumberjaya, South Tambun, Bekasi Regency which is considered a strategic location for the sale of subsidized houses. The land that will be used is 1.8 hectares to build 171 subsidized modern houses. The type of house to be built is a type 27 house with a land area of 6 x 10 meters.

The Cost of building the house is IDR50,000,000 and will be sold according to government law for subsidized house which is IDR181,000,000. PT Alfarsi Quadra Sejahtera plan to sell all 171 houses in three years. In making this project PT Alfarisi Quadra Sejahtera will use a debt financing system of IDR3,000,000,000 and Equity IDR7,255,000,000. The debt will be paid in four years with 11% interest. Based on the previous experience, the company target to sell all the 171 houses within three years.

Constructing Cash Flow

The initial stage of building the cash flow involves establishing assumptions for each account. To gather all the necessary assumptions, researchers conduct semi-structured interviews with PT Alfarisi's Board of Directors. These assumptions are crucial for creating a financial projection for the company, encompassing cash flow, income statement, and balance sheet over the next three years, aligning with the company's goal of selling houses. Based on all the assumption The following is the annual projected cash flow stream.

Yearly Cash Flow Projection Stream				
Years	0	1	2	3
Project Development Cash Flow				
Quantity Sold		76	60	35
Cash In				
Cash In DP (5%)		Rp 687,800,000.00	Rp 555,000,000.00	Rp 323,750,000.00
Cash In KPR (95%)		Rp 10,488,950,000.00	Rp 10,488,000,000.00	Rp 8,787,500,000.00
Total Cash In		Rp 11,176,750,000.00	Rp 11,043,000,000.00	Rp 9,111,250,000.00
Cost				
Land Cost				
Land	Rp 6,300,000,000.00			
BTPH	Rp 312,000,000.00			
Land Preperation	Rp 288,000,000.00			
Construction Cost				
House Building		Rp 3,800,000,000.00	Rp 3,089,460,000.00	Rp 1,855,926,156.70
Infrastructure Facilities				
Roads and Sewers	Rp 427,500,000.00		Rp 440,248,050.00	
Gate	Rp 50,000,000.00			
Residents Facilities	Rp 50,000,000.00			
House Electricity		Rp 190,000,000.00	Rp 150,000,000.00	Rp 87,500,000.00
Entrance Road Repairment	Rp 25,000,000.00			
General Cost				
Legal Permit	Rp 1,395,500,000.00			
Certificate		Rp 305,000,000.00	Rp 300,000,000.00	Rp 250,000,000.00
Salary Expense		Rp 420,000,000.00	Rp 441,000,000.00	Rp 385,875,000.00
Pre-Marketing Expense	Rp 15,000,000.00			
Notary Fee Expense		Rp 762,500,000.00	Rp 750,000,000.00	Rp 625,000,000.00
Sales and Marketing Fee Expense		Rp 512,400,000.00	Rp 504,000,000.00	Rp 420,000,000.00
Operasional Expense		Rp 60,000,000.00	Rp 61,789,200.00	Rp 53,026,461.62
Utilities Expense		Rp 24,000,000.00	Rp 24,715,680.00	Rp 21,210,584.65
Rent Office Expense		Rp 60,000,000.00	Rp 61,789,200.00	Rp 63,631,753.94
Total Cost	Rp 8,863,000,000.00	Rp 6,133,900,000.00	Rp 5,823,002,130.00	Rp 3,762,169,956.91
Net Cash Flow Development	-Rp 8,863,000,000.00	Rp 5,042,850,000.00	Rp 5,219,997,870.00	Rp 5,349,080,043.09
Final Tax	Rp -	Rp 111,767,500.00	Rp 110,430,000.00	Rp 91,112,500.00
Investing Cash Flow				
Net Cash Flow Investing	Rp -	Rp -	Rp -	Rp -
Financing Cash Flow				
Loan	Rp 3,000,000,000.00			
Equity	Rp 7,255,000,000.00			
Repayment of Loans		Rp 1,000,000,000.00	Rp 1,000,000,000.00	Rp 1,000,000,000.00
Net Cash Flow Financing	Rp 10,255,000,000.00	-Rp 1,000,000,000.00	-Rp 1,000,000,000.00	-Rp 1,000,000,000.00
Net Cash Flow	Rp 1,392,000,000.00	Rp 3,931,082,500.00	Rp 4,109,567,870.00	Rp 4,257,967,543.09
Cumulative Cashflow	Rp 1,392,000,000.00	Rp 5,323,082,500.00	Rp 9,432,650,370.00	Rp 13,690,617,913.09

Figure 1 Yearly Cash Flow Projection Stream

Free Cash Flow to the Firm

The free cash flow to the firm calculated based on the monthly cash flow, yearly cash flow, income statement projection and, balance sheet projection. In free cash flow to the firm there are several components that must be considered as follows:

- Operating Cash Flow

Operating cash flow is a measure of the cash generated or spent by a company's core operations over a given time period. Operating cash flow is calculated by deducting non-cash expenses and changes in working capital from net income. However, the company used cash basis for the cash flow stream, so the depreciation and amortization will not be recorded in this free cash flow to the firm.

- Net Fixed Asset Investment (NFAI)

A company's net fixed asset investment is required to generate cash flow by investing in fixed assets. Since, the company operates on a cash basis, no fixed assets are recorded because purchases are charged directly to expense.

- Net Current Asset Investment (NCAI)

PT Alfarisi Quadra Sejahtera only record the transaction when the cash is actually in or out because the company used cash basis method. In cash basis, current asset, liability, and accruals are not recorded.

Free Cash Flow to the Firm	Year			
	0	1	2	3
Net Operating Profit	-Rp 8,863,000,000.00	Rp 5,042,850,000.00	Rp 5,219,997,870.00	Rp 5,349,080,043.09
Tax	Rp -	Rp 111,767,500.00	Rp 110,430,000.00	Rp 91,112,500.00
Depreciation and Amortization				
Operating Cash Flow	-Rp 8,863,000,000.00	Rp 4,931,082,500.00	Rp 5,109,567,870.00	Rp 5,257,967,543.09
Net Current Asset Investment	Rp -	Rp -	Rp -	Rp -
Net Fixed Asset Investment	Rp -	Rp -	Rp -	Rp -
Free Cash Flow to the Firm	-Rp 8,863,000,000.00	Rp 4,931,082,500.00	Rp 5,109,567,870.00	Rp 5,257,967,543.09
Terminal Cash Flow				
Total Cash Flow	-Rp 8,863,000,000.00	Rp 4,931,082,500.00	Rp 5,109,567,870.00	Rp 5,257,967,543.09

Figure 2 Projection Free Cashflow to the Firm

This is the projected calculation free cash flow to the firm PT Alfarisi Quadra Sejahtera Project useful for Calculating Cost of Capital (WACC)

In calculating cost of capital using weighted average cost of capital, there are several aspects to consider, such as:

1. Cost of Debt

This project is fund using long term debt and equity. PT Alfarisi Quadra Sejahtera loan IDR 4,000,000,000 from Bank BTN with 11% interest. The company already applied the final tax, so the company do not need to pay corporate tax. Below is the calculation of cost of debt.

$$\text{Weight of debt} = \frac{3,000,000,000}{3,000,000,000 + 7,255,000,000} = 29.25\% \quad (5)$$

For the after-tax cost of debt calculation is provided below.

$$\text{After tax cost pf debt} = 11\% \times (1 - 0\%) = 11\% \quad (6)$$

2. Cost of Equity

Apart from debt, this project will also use the company's equity of IDR 7,255,0000,000 and to find the cost of equity, the weight of equity and leverage beta to similar the company needs to be known first.

$$\text{Weight of equity} = \frac{7,255,000,000}{7,255,000,000 + 3,000,000,000} = 70.75\% \quad (7)$$

After calculating the weight of equity, the Capital Asset Pricing Model (CAPM) is used to calculate the cost of equity. To calculate unlevered beta, beta from similar company in property sector need to be found because PT Alfarisi Quadra Sejahtera is a private company. Only PT Bekasi Asri Pemula sells subsidized housing and the company beta is -0.39. Using Ciputra Development Tbk beta, the calculation for unlevered beta PT Alfarisi Quadra Sejahtera is -0.38. To calculate cost of equity, the risk-free rate (r_f) and market return (r_m) needed to be found. The risk-free rate is determine using three years government bond ORI023 T3 with 5.9% fixed return. For the

market return the writer calculated using the compound annual growth rate of Jakarta Composite Index from 1 June 2020 to 1 June 2023 which the amount is 11.7%.

$$\text{Cost of Equity} = 5.9\% + (-0.49(11.7\% - 5.9\%)) = 3.06\% \quad (8)$$

After calculating cost of debt and cost of equity, the next step is calculating the weighted average cost of capital.

$$\text{WACC} = (29\% \times 11\%) + (71\% \times 3.06\%) = 5.38\% \quad (9)$$

Calculating the financial Parameter Tools

Capital Budgeting				
Years	0	1	2	3
Net Cash Flow	-Rp 8,863,000,000.00	Rp 4,931,082,500.00	Rp 5,109,567,870.00	Rp 5,257,967,543.09
Cumulative Cash Flow	-Rp 8,863,000,000.00	-Rp 3,931,917,500.00	Rp 1,177,650,370.00	Rp 6,435,617,913.09
WACC	5.38%			
PV Cash Flow	-Rp8,863,000,000.00	Rp4,679,216,954.65	Rp4,600,933,953.25	Rp4,492,733,325.97
Cummulative PV Cash Flow	-Rp8,863,000,000.00	-Rp4,183,783,045.35	Rp417,150,907.90	Rp4,909,884,233.87
Payback Period	1.909333428			
Net Present Value	Rp4,909,884,233.87			
Profitability Index	1.55397543			
IRR	26%			

Figure 3 Financial Parameter Result

Above is all the result of financial parameter tools including payback period, net present value, profitability index, and internal rate of return. Based on result all the parameter shown a positive result.

V. DISCUSSION

Financial Parameter Analysis

Based on the calculation below are the analysis of financial parameter tools aspect.

- **Net Present Value**
The Net Present Value (NPV) of the PT Alfarisi Quadra Sejahtera Project is IDR4,909,884,233.87, as calculated in the table above. This positive NPV result signifies that the project's investment surpasses its initial investment, making it a financially favourable venture. Since the NPV is greater than zero, it indicates that the project should be accepted.
- **Internal Rate of Return:**
The Internal Rate of Return (IRR) calculation shows a positive value of 26%. This IRR value exceeds the project's cost of capital, which is 5.38%. Consequently, the company accepts this project based on the IRR parameters, as the IRR is deemed attractive and financially beneficial.
- **Payback Period:**
The project's payback period is determined to be 1.9 years, indicating a positive outcome. Notably, this duration is shorter than the maximum payback period projected by the company, which is three years. As a result, the company should proceed with accepting this project since it offers a quicker payback period than anticipated.
- **Profitability Index**

The profitability index, calculated using Microsoft Excel, yields a favourable result of 1.554, which is greater than 1. This outcome signifies that the project's benefits outweigh the costs and suggests that the company should accept the project based on its profitability index.

Sensitivity Analysis

Sensitivity analysis is needed so that the company can identify the factors that influence the project's NPV. By conducting sensitivity analysis, the risks that may be faced by the company are identified so that the company can develop a strategy to mitigate all the risks. Following is the sensitivity analysis result.

Sensitivity Analysis	Swing In Input (+10%)	Swing In Input (-10%)	Swing In NPV (+10%)	Swing In NPV (-10%)	Absolute
Average Indonesia Inflation	10%	10%	0%	0%	1%
Swing in Debt	10%	10%	-1%	1%	1%
Road and Sewers Expense	10%	10%	-2%	2%	3%
Long Term Debt Interest	10%	10%	-2%	2%	3%
Salary Expense	10%	10%	-2%	2%	5%
Sales and Marketing Fee Expense	10%	10%	-3%	3%	5%
Percentage Quantity Sold Per Month from Total Units	10%	10%	7%	-3%	10%
Land Expense	10%	10%	-13%	13%	27%
House Building Expense	10%	10%	-16%	16%	32%
Price Per House	10%	10%	0%	-57%	57%

Figure 4 Sensitivity Analysis Result

The table above shows what risks or variables affect the project's NPV. The researchers chose the 10 variables that are most likely to have an effect on the NPV. Of the 10 variables, there are three variables that are categorized as sensitive variables because the NPV swings have exceeded input swings, namely land expense, house building, and price per house. Swings in land expense, will impact the NPV swings by 13%. Meanwhile, house building expense also has NPV swings that exceed input, which is 16%, so it is categorized as a sensitive variable. The last sensitive variable is the price per house which has an NPV swing effect of -57%, this variable does not have a +10% NPV impact because there is a maximum price limit for selling subsidized houses set by the government. For a clearer description of sensitive variables, see the tornado chart below.

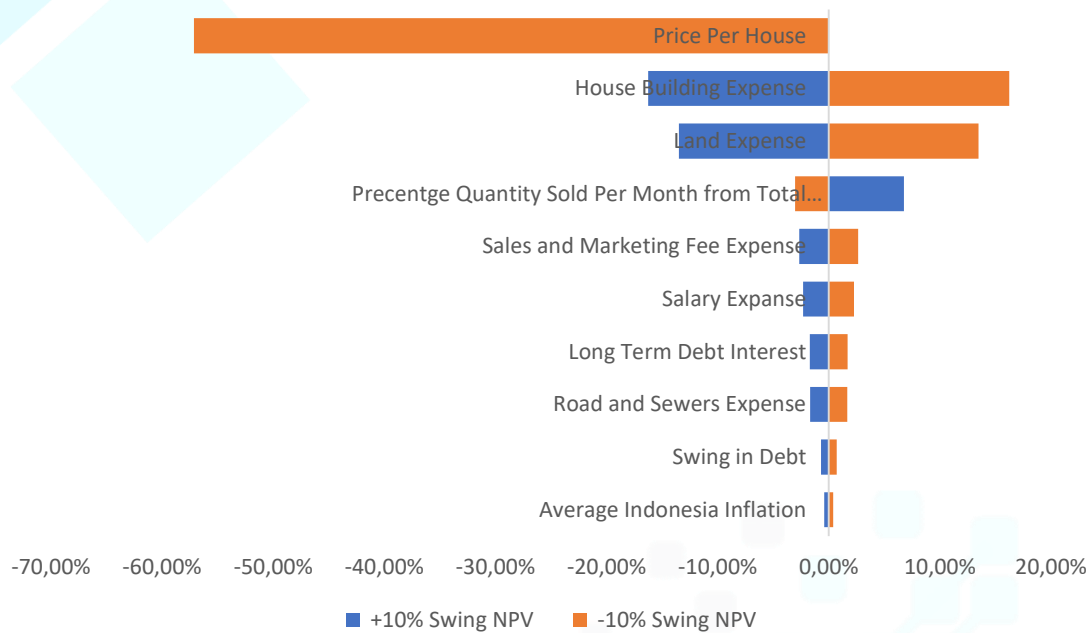


Figure 4 Tornado Chart Result

Tornado chart above shows clearer results from the sensitivity analysis that has been done. It can be seen that the three variables can affect the Net Present Value of the project and can be a risk that must be mitigated by PT Alfarisi Quadra Sejahtera.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

PT Alfarisi Quadra Sejahtera, a company in the real estate sector, is strategically planning to construct subsidized housing targeted at low-income individuals in the South Tambun region of Sumberjaya. This ambitious endeavor involves utilizing a 1.8-hectare plot of land to create a cluster of 171 contemporary subsidized houses. The proposed housing units will adhere to a Type 27 design, featuring dimensions of 6 by 10 meters each. With an attractive price tag of IDR 181,000,000, PT Alfarisi Quadra Sejahtera is poised to provide subsidized modern housing in prime locations, bolstered by a comprehensive range of amenities within the cluster. To assess the viability of executing this project, a meticulous feasibility and risk analysis is deemed imperative.

In light of the comprehensive evaluation carried out using feasibility analysis, employing capital budgeting methodologies such as Net Present Value, Profitability Index, Internal Rate of Return, and Payback Period, the prospects for this undertaking appear promising. The project's Net Present Value stands at IDR 4,909,884,233.87, signifying a positive value, while the Internal Rate of Return surpasses the cost of capital by 26% (5.38% versus 26%). Moreover, the Profitability Index exceeds 1.0, registering at 1.554, and the Payback Period is projected at 1.9 years. In light of these outcomes from capital budgeting analyses, the project earns a favourable green light, aligning harmoniously with the company's objective of maximizing revenue.

Following the comprehensive assessment of project feasibility, the subsequent step necessitates a meticulous risk analysis to uncover potential vulnerabilities. Employing a sensitivity-based risk analysis, three pivotal variables necessitate PT Alfarisi Quadra Sejahtera's careful attention in order to optimize profitability. These variables encompass the cost associated with house construction, land expenses, and the pricing per housing unit.

Recommendation

The sensitivity analysis underscores a trio of pivotal factors warranting thorough consideration—namely, house construction costs, land expenses, and housing unit prices. For the first variable, namely house construction cost per unit, it is prudent for the company to explore economical alternative materials in order to trim down these costs. Additionally, prudent management of construction-related expenditures, including reasonable compensation for construction workers and contractors, relative to the tasks and duration of construction, stands to amplify revenue generation.

Regarding the subsequent variable, land expenses, PT Alfarisi Quadra Sejahtera should undertake a meticulous location analysis and an exhaustive market survey. These steps are vital in determining the congruence between land pricing and the associated costs. Should a strategic locale coupled with substantial customer interest justify a seemingly expensive land price, the resultant higher revenue and abbreviated payback period could potentially offset the elevated costs.

As for the concluding variable, namely house prices, it appears that the company's manoeuvrability is relatively limited due to the government's predetermined cap on subsidized housing prices. Consequently, a prudent approach would be to align the selling prices of houses with the government's stipulated maximum price of IDR 181,000,000. This strategic alignment ensures the optimization of profits while adhering to the government's regulatory framework.

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Optimal Capital Structure Of PT TBS Energi Utama Tbk

Farrell Justin Wismanto¹, Mandra Lazuardi Kitri²
^{1,2} Institut Teknologi Bandung, Bandung, Indonesia

Abstract

PT TBS Energi Utama Tbk is one of the Indonesian coal mining companies that plans to enter renewable energy industries, while also building electric vehicle ecosystem. The company requires USD 500,000,000 to support this expansion plan, the sources of which have yet to be determined. Its current capital structure consists of 54.22% debt and 45.78% equity, implying 118.4% debt-to-equity ratio. This ratio greatly contrasts from both coal and renewable energy industry average in Indonesia of 22.03% and 78.36%, respectively. Therefore, before choosing the source of funding for the projects, it is essential to examine if the current capital mix is already optimal ideal, given that the industry average is occasionally considered in targeting capital structure. This study utilizes the Cost of Capital approach in analyzing optimal capital structure, which can be found by identifying the lowest cost of capital in each debt level using Weighted Average Cost of Capital (WACC) formula. To simulate the cost of capital, this study uses Damodaran Synthetic Rating to estimate cost of debt and Capital Asset Pricing Model (CAPM) to estimate cost of equity. Based on the calculation, the current capital structure is already optimal since the current cost of capital is lower than those in all debt levels. Hence, the appropriate financing strategy is to apply the current capital mix to the investment amount, leading to USD 271,107,056 debt raised and USD 228,892,944 equity raised. Additionally, it is proper for PT TBS Energi Utama Tbk's capital structure to differ significantly from the industry average.

Keywords— Cost of Capital; Optimal Capital Structure; PT TBS Energi Utama Tbk

I. INTRODUCTION

Coal has been the key contributor of the world's electricity (36.7%, Fig. 1) and energy consumption (27.0%, Fig. 2), thanks to its characteristic as a stable and secure source of energy (Our World in Data, 2019). As the biggest coal exporter globally, Indonesia plays a significant role in the industry, with 478 million tons of coal exported in 2022 or 31.4% contribution (Statista, 2021). In addition, Central Bureau of Statistics (BPS) revealed that coal contributed greatly (33%) to Indonesia's GDP in mining sector with IDR 283 tn in 2022.

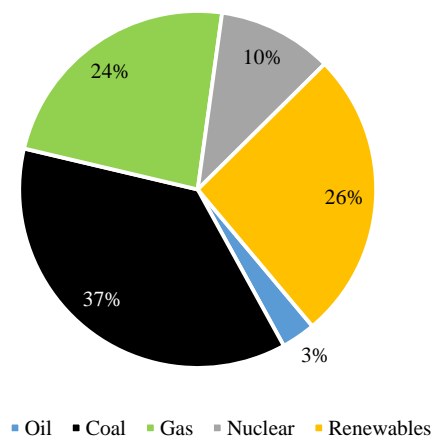


Fig. 1. World Electricity Mix (Our World in Data, 2019)

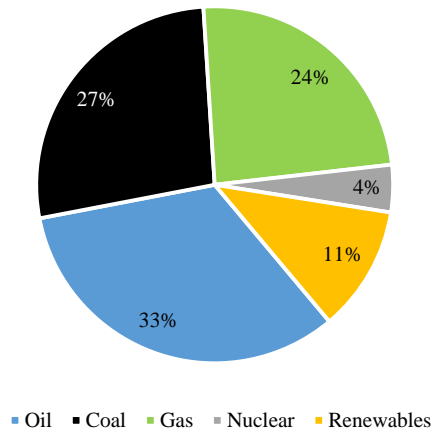


Fig. 2. World Energy Mix (Our World in Data, 2019)

However, the coal industry is currently under imminent threat due to its nature to cause global warming and various dangerous diseases through carbon dioxide emissions it releases (Munawar, 2018). Countries all around the world are on their way to shifting into renewable energy and shutting down their coal-fired power plants, according to the Paris Agreement in 2016. Twenty-one countries have established dates for the complete phase-out of coal-fired energy generation before 2040 with Austria, Belgium, Portugal, and Sweden having completed their phase-outs in 2021 (International Energy Agency, 2022). Indonesia is also impacted and compelled to reduce its reliance on coal as soon as possible despite its tremendous income potential through its significant coal reserves.

To achieve this, the country has gained some supports, one of which through Just Energy Transition Partnership (JETP) in G20 summit, where Indonesia will receive a USD 20 bn financing from U.S, Japan, Denmark, Canada, EU, France, Germany, Italy, Norway, and United Kingdom. The main purpose of JETP is for Indonesia to develop a comprehensive investment plan to achieve significant new targets and policies to reduce Green House Gas (GHG) emissions and support impacted communities. Two of the key takeaways are green energy transition and electric vehicles (EV) development (Ulfiana, 2022). The green energy transition will be powered by significant increase in renewable energy resources, including geothermal, solar, wind, and hydro power. The State Electricity Company (PLN) has set an ambitious target of adding 21GW sourced from renewable energy, which will account for ~29.1% in the overall energy mix by 2030, up from only 12.5% in 2020.

On the other hand, the government has been proactively preserving Indonesia's abundance of nickel resources, which leads to electric vehicles end-to-end supply chain blueprint. Ministry of Energy and Mineral Resources (ESDM) targets the number of EV to be 15 million (13 million of 2W EV and 2 million of 4W EV) which will reduce fossil fuel consumption by 6.03 million kiloliters in 2030 (Kementerian ESDM RI, 2021). To accomplish those goals, Indonesia needs a lot of support from local companies, one of which is PT TBS Energi Utama Tbk. It is a coal company that has announced its intention to shift its business towards renewable energy and the EV ecosystem in Indonesia. The company requires approximately USD 500 million or IDR 7.5 trillion (assuming USD/IDR exchange rate of IDR 15,000). It is critical for the company to determine the appropriate financing resources to ensure its financial performance continues when it fully phases out coal usage as the green industry in Indonesia is still at the early stage and faces several major challenges (International Renewable Energy Agency, 2022).

Given the expansion plan amount makes up almost all the company's total capital, the author believes it is necessary to analyze the current capital structure, and how the plan is financed to achieve the optimal capital structure. As of fiscal year 2022, the company's interest-bearing liabilities are USD 366,872,235 while its total equity is USD 309,746,515, implying a debt-to-equity ratio of 118% (or about 54% of the capital is financed by debt). This ratio is far higher than the coal industry's average of 29% (Table 1) and the renewable energy industry's average of 69% (Table 2, S&P Capital IQ, 2023), raising questions about the company's optimal capital structure and whether they truly have the urgency to reduce their debt portion and raise equity by issuing new shares, especially given the company's plan to raise USD 500 million. Although the industry averages may not reflect the optimal condition of each company, the behavior of other firms is appealing to managers and is too strong to ignore (Damodaran, 2014).

Table 38. Debt to Equity Comparison with Coal Industry

Percentage of Capital	Total Debt	Total Equity	Debt to Equity Ratio
PT Adaro Energy Indonesia Tbk	19.5%	80.5%	24.2%
PT Harum Energy Tbk	13.4%	86.6%	15.4%
PT United Tractors Tbk	3.2%	96.8%	3.4%
PT Bukit Asam Tbk	4.5%	95.5%	4.7%
PT Indika Energy Tbk	45.0%	55.0%	81.9%
PT Indo Tambangraya Megah Tbk	2.5%	97.5%	2.6%
Coal Industry Average	14.7%	85.3%	22.0%
PT TBS Energi Utama Tbk	54.2%	45.8%	118.4%

Source: S&P Capital IQ

Table 39. Debt to Equity Comparison with Renewable Industry

Percentage of Capital	Total Debt	Total Equity	Debt to Equity Ratio
PT Pertamina Geothermal Energy Tbk	43.8%	56.2%	78.0%
PT Dian Swastatika Sentosa Tbk	35.4%	64.6%	54.7%
PT. Arkora Hydro Tbk	53.1%	46.9%	113.1%
PT Sky Energy Indonesia Tbk	52.9%	47.1%	112.1%
PT Kencana Energi Lestari Tbk	37.6%	62.4%	60.3%
PT Semacom Integrated Tbk	34.2%	65.8%	51.9%
Renewable Industry Average	42.8%	57.2%	78.4%
PT TBS Energi Utama Tbk	54.2%	45.8%	118.4%

Source: S&P Capital IQ

Through this research, the author plans to estimate the optimal capital structure in the needs of the company's financing for its project of renewable energy and electric vehicle ecosystem. This can provide insight for the company on how to make the best decision possible regarding project financing and reorganizing the firm's debt-to-equity ratio.

II. LITERATURE REVIEW

Capital Structure

According to (Brealey et al., (2009), capital structure is the firm's mix of debt and equity financing. Different types of capital can have different benefits and drawbacks depending on the financial goals of the firm. The choice of capital structure is critical as has a significant impact on the company's financial performance (Hanım & Firdausi Nuzula, 2018).

The choice of capital structure depends on various factors such as the cost of capital, the firm's profitability and growth prospects, and market conditions. Financial managers need to carefully analyze and manage their capital structure to ensure long-term financial sustainability and success.

1. Debt Capital

Debt capital is the funds that are raised by a company by borrowing money from lenders, such as banks or bondholders, which the company must pay back with interest over time. It can take many forms, such as bonds, bank loans, or convertible debt, and can be either short-term or long-term (Geddes, 2006).

According to Damodaran (2003), one of the key benefits of debt capital is that it can provide tax shields, since interest payments on debt are tax-deductible. Additionally, debt capital can lower a company's overall cost of capital as debt is less expensive than equity financing. Moreover, debt financing involves fixed repayment obligations, which can help companies plan their cash flows more effectively and manage their financial risks (Brealey et al., 2009). As debt does not dilute the ownership of existing shareholders, debt also gives benefits to the existing shareholders so they can retain control of the company.

2. Equity Capital

Equity capital is funds coming from investors (individual/institutional) in exchange for ownership shares in the business which are in the form of preferred or common stock. Companies can raise equity capital through public offerings of stock, private placements, or by selling shares to existing shareholders through rights offerings. Unlike debt that entitles the holder a fixed claim of cash flows (interest and principal payments), equity capital offers a residual claim on the cash flows which means that investors can get what is left over after the interest payments have been made (Damodaran, 2003).

Another advantage of equity capital is the infinite life it entails, while debt has a fixed maturity date, at which point the principal is due. Equity investors are generally given a role in the operation of the firm. Debt investors, on the other hand, play a much less active role in management, exercising at most veto power over significant financial decisions.

Capital Structure Theories

Capital theory has developed over the years with some significant ones are Miller and Modigliani Model and Trade-off Theory that is divided into Static Trade-off Theory and Dynamic Trade-off Theory. Optimal capital structure theory was not developed until the second proposition of Miller and Modigliani that incorporate tax in the model.

1. Miller and Modigliani Model

Miller and Modigliani Model (1958) is named after the researchers Franco Modigliani and Merton Howard Miller. Their first proposition states that the value of a firm is independent of the composition of its capital structure under perfectly efficient markets, and it is irrelevant to consider internal and external sources of funding (Jaros & Bartosova, 2015). What MM means by perfect capital market is the state where all information is perfectly symmetrical and the taxes, subsidies, and contracting costs are absent. This theory is considered irrelevant since the world condition without taxes is not possible.

Later, MM developed their second proposition to better suit real-world conditions. This proposition is also known as the capital structure irrelevance proposition with taxes, expands on the first proposition by incorporating the effect of taxes on a firm's capital structure decision. It recognizes that tax deductibility of interest payments creates a tax shield, providing a benefit to debt financing. According to the second proposition, in the presence of corporate taxes, the value of a leveraged firm is greater than that of an all-equity firm due to the tax advantages associated with debt financing (Abeywardhana, 2017). It further defines the cost of equity increases as debt portion expands (with rising risk of default) from a certain level of debt. However, the higher cost of equity is offset by cost of debt in the presence of tax shields (Asghar Khan et al., 2021).

2. Trade-Off Theory

Trade-off theory serves as the extension of MM theorem where firms will maximize the benefit of debt, while also consider the cost incurred by issuing debt (Bradley et al., 1984). The benefit of debt includes the tax deduction of interest, while the cost of debt financing is the cost associated with bankruptcy and agency issues (Fama & French, 2002). Both the Modigliani-Miller (MM) second proposition and the trade-off theory recognize the impact of debt capital on a firm's value and the associated costs. As debt capital increases in the capital structure, the weighted average cost of capital (WACC) declines until reaching an optimal gearing level. This aligns with the trade-off theory's premise that there exists an optimal capital structure balancing the benefits of debt, such as tax shields, with the costs, including the risk of financial distress.

Optimal Capital Structure

Optimal capital structure refers to the mix of debt and equity in a firm with the objective of maximizing the firm's value. According to Damodaran (2014), there are four ways to find an optimal mix of capital structure.

i. Operating Income Approach

This method determines affordability of a firm in borrowing by analyzing its default probability and then operating income and cash flows.

ii. Cost of Capital Approach

In this approach, the maximum value of the firm is estimated by the lowest cost of capital yielded by a certain ratio of debt and equity. It requires the calculation of cost of debt and cost of equity at different debt levels.

iii. Adjusted Present Value (APV) Approach

The APV approach considers the main benefit of borrowing is tax and the consequential cost is bankruptcy cost. It starts with estimating the value of the firm without any debt or leverage and then adds debt gradually while looking at the net effect of borrowing.

iv. Comparative Analysis

Comparative analysis looks at other firms in the same industry as the benchmark for the firm to determine its debt ratio. This approach is not suitable, however, if there are only a few companies in the industry in which the company works or high disparities exist among comparable companies.

There are some factors that influence firms in achieving optimal capital structure such as CEO characteristics and ambiguity inversion. A study on 100 Indonesian publicly traded firms finds that hiring CEOs with the right qualifications can contribute to achieving an optimal capital structure (Chua et al., 2022). Meanwhile, a model developed by (Attaoui et al., 2021) finds empirical evidence of a negative relationship between ambiguity and leverage ratio, suggesting that as perceived ambiguity increases, managers tend to choose lower levels of leverage.

1. Weight of Debt

The weight of debt measures how much of the firm's overall interest-bearing liabilities are in proportion to its capital structure. Since investors in bonds and loans are compensated with returns that have been adjusted to reflect current market conditions, the market value of debt should serve as the basis when determining the weight. However, it is sometimes impossible to estimate the market value due to insufficient information and non-traded debts that a business owns. In that case, book value of debt may be used (Geddes, 2006).

2. Cost of Debt

Cost of debt measures how much it currently costs the company to borrow money to support its business or finance expansions (Ross et al., 2003). One way to estimate pre-tax cost of debt is to calculate the yield to maturity (YTM) on the companies' existing bonds or bonds with similar risk issued by other companies (Gitman & Zutter, 2015). Damodaran then created an alternative called synthetic rating for firms that do not have bonds or are not rated by credit rating agencies. Damodaran started by assessing existing rated companies and scrutinizing their financial ratios within each rating or classification. Synthetic rating applies the use of interest coverage ratio as the basis for estimating the company's spread. Then, pre-tax cost of debt is computed by adding up risk-free rate and the spread.

As interest payments are tax deductible, the pre-tax cost of debt has to be reformulated to arrive at the after-tax cost of debt. As effective tax rates may include nonrecurring items, the marginal tax rate is used to accurately capture the tax advantage of debt (Damodaran, 2014). The marginal tax rate is the tax rate on the last dollar of income earned by the company. The tax regulation of the country where the company receives its operating income is the best source of marginal tax.

But to realize the advantage, firms must be profitable or does not incur operating losses. Therefore, no tax benefits will be provided in the years of operating losses and the benefits are only started to be adjusted in later years when the company is anticipated to generate operating profits.

3. Weight of Equity

The weight of equity measures how much of the firm's overall equity is in proportion to its capital structure. Since new investors cannot buy shares at book value and have to pay at the market price, the market value of equity is used (Geddes, 2006). The formula is the last closing price of the company's share multiplied by the total shares outstanding.

4. Cost of Equity

Cost of equity measures the rate of return required for investors to invest in a company's equity (Gitman & Zutter, 2015). There are two common ways of computing cost of equity, capital asset pricing model (CAPM) and constant-growth valuation model (Ross et al., 2003).

Constant-growth valuation model or Gordon Growth model (GGM), proposed by Gordon & Shapiro (1956), assumes that the company pay out dividends over an infinite time, growing at a constant rate. The dividends' present value equals the share's value (Gitman & Zutter, 2015).

III. RESEARCH METHODOLOGY

Research Design

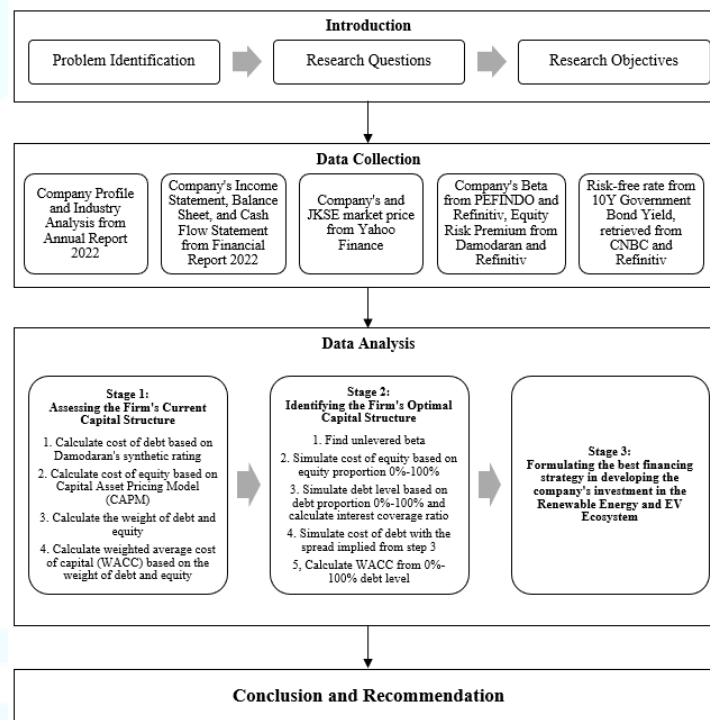


Fig. 3. Research Design

The research design starts with problem identification, where PT TBS Energi Utama Tbk need financing access on USD 500 million expansion on renewable energy and 2W EV ecosystem and the fact that the firm's capital structure largely deviates from the industries' average. From that point, research questions and objectives are formulated to determine the optimal capital structure of the firm. Some theories are used as the basis in this research to define optimal capital structure and how to calculate weighted average cost of capital (WACC), including its components which are cost of debt and equity. Moving forward to data collection, the author gathers relevant data from publicly available information. The author then proceeds to examine further the data in order to arrive at the conclusions required to respond to research questions. Afterwards, the author calculates existing WACC and new WACC to compare the condition of capital structure and the research is ended by the author's conclusion and recommendation for the company.

Data Collection

In this research, the author only utilizes secondary data. Investor Daily provided the information on the amount of financing needed by PT TBS Energi Utama Tbk to support its expansion plan. Then, the data containing both the company and the industry which it operates in are retrieved from the company's data, which includes Annual Report, Financial Report, and Public Expose Presentation. Meanwhile, the relevant data for calculating the firm's WACC, comprising of 10-year government bond yield, beta, pre-tax cost of debt, and equity risk premium are collected through various sources, which are CNBC Indonesia, Refinitiv Eikon, Market Risk Premia, and Damodaran Webpage.

Data Analysis

In order to reach the research objectives, the author calculates the current and optimal capital structure of the company as well as formulates the strategy needed to achieve that optimal capital structure.

1. Stage 1: Assessing the Firm's Current Capital Structure

In calculating the capital structure of PT TBS Energi Utama Tbk, the author employs the WACC method by making use of the financial statement for the fiscal year of 2022 and debt-to-equity ratio. Following that, the author will show the adjustment required on the company's debt and equity to achieve optimal capital structure. The calculation steps are as follows:

i. Cost of Debt using Synthetic Rating by Damodaran

In applying synthetic rating, the company has to be classified first whether as small market capitalization or high market capitalization company. Damodaran argues that larger companies tend to have better financial performance, hence lowering both risk and cost of borrowing. He defines small market capitalization companies are those who have market capitalization of lower than USD 5 billion (Damodaran, 2023). Market capitalization of a firm is calculated through the following formula:

$$\text{Market Capitalization} = \text{Share Price} \times \text{Total Shares Outstanding} \quad (1)$$

The last closing price of PT TBS Energi Utama Tbk on December 2022 is IDR 605, and the total shares outstanding is 8,049,964,000 shares. Hence, the market capitalization of PT TBS Energi Utama Tbk is:

$$\text{Market Capitalization} = \text{IDR } 605 \times 8,049,964,000 \text{ shares}$$

$$\text{Market Capitalization} = \text{IDR } 4,870,228,220,000$$

Using the USD/IDR exchange rate of 15,243.9 retrieved from the 2022 financial statement, the market capitalization of PT TBS Energi Utama Tbk is USD 319,487,022. Thus, the company belongs to small capitalization group and will use the following table for calculating cost of debt.

Damodaran utilizes interest coverage ratio as the basis for determining the spread a company has. Interest coverage ratio is obtained by dividing the EBIT by the interest expense on interest-bearing liabilities of the firm as shown by the following formula:

$$\text{Interest coverage ratio} = \frac{\text{Earnings Before Interest and Tax (EBIT)}}{\text{Interest Expense}} \quad (2)$$

Table 40. Damodaran Synthetic Rating

For all emerging market companies and developed market companies with market capitalization < USD 5 billion			
If interest coverage ratio is			
Greater than	Less than or equal to	Rating is	Spread is
12.5	100000	AAA	0.69%
9.5	12.499999	AA	0.85%
7.5	9.499999	A+	1.23%
6	7.499999	A	1.42%
4.5	5.999999	A-	1.62%
4	4.499999	BBB	2.00%
3.5	3.999999	BB+	2.42%
3	3.499999	BB	3.13%
2.5	2.999999	B+	4.55%
2	2.499999	B	5.26%
1.5	1.999999	B-	7.37%
1.25	1.499999	CCC	11.57%
0.8	1.249999	CC	15.78%
0.5	0.799999	C	17.50%
-100000	0.499999	D	20.00%

Source: Damodaran, 2023

To calculate the pre-tax cost of debt, first take the spread from the table 3 and add it by the risk-free rate, as shown by the equation below:

$$\text{Pre-tax Cost of Debt } (r_d) = \text{Risk-free Rate} + \text{Default Spread} \quad (3)$$

Pre-tax cost of debt is adjusted to marginal tax rate to arrive at after-tax cost of debt through the following formula:

$$\text{After-tax Cost of Debt} = r_d \times (1 - T) \quad (4)$$

ii. Cost of Equity using Capital Asset Pricing Model (CAPM)

The author decides to use the capital asset pricing model (CAPM) as PT TBS Energi Utama Tbk does not pay dividends; hence, the GGM model cannot be used. Besides, this model is widely used with around 81% firms has been using CAPM to approximate the cost of equity (Bruner et al., 1998). CAPM indicates that the cost of equity is the required return as compensation for the firm's non-diversifiable risk, represented by beta coefficient (Gitman & Zutter, 2015). CAPM requires several variables, which are thoroughly detailed below.

1. Risk-free rate is an investment security that investors expect to be risk-free without any default risk and uncertainty about reinvestment rates. The 10-year government bond yield is frequently used as the proxy for the risk-free rate as it represents the time horizon for most long-term investments (Damodaran, 2014). In this research, Indonesia government bond yield will be used where PT TBS Energi Utama Tbk is located.
2. Beta is a measure of a security response towards systematic risk. The market as a whole, by definition has a beta of 1.0 and stocks with betas lower than 1.0 tend to be less volatile than the market to systematic changes in the economy.
3. Equity risk premium is the additional return that investors demand over a risk-free asset, such as government bonds, as compensation for holding a diversified market portfolio and taking on the associated market risks (Kumar, 2016).

Cost of equity is calculated through the Capital Asset Pricing Model (CAPM) using the following formula:

$$r_e = R_f + [\beta \times (r_m - R_f)] \quad (5)$$

where: r_e = Cost of equity
 R_f = Risk-free rate
 β = Beta coefficient
 r_m = Market return
 $r_m - R_f$ = Equity risk premium

Risk-free rate is obtained from the 10-year Indonesia government bond yield as of 31 December 2022. Meanwhile, beta is calculated by regressing the stock returns with the market returns or expressed through the formula provided below:

$$\beta_L = \frac{Cov(R_i, R_m)}{Var(R_m)} = \frac{\sigma_{im}}{\sigma_m^2} \quad (6)$$

where: β_L = Regression beta or levered beta
 Cov = Covariance
 Var = Variance
 R_i = Return of stock i
 R_m = Market return
 σ_i = Standard deviation of stock i
 σ_m = Standard deviation of the market

Damodaran believes that the higher the debt a company owns, the higher the beta it has, as the fixed interest payments on debt should boost earnings per share in good times and decline it in bad with leads to the concept of an unlevered beta. The beta in the previous calculation is called levered beta as it incorporates the risk of having debt in the market. Estimating the unlevered beta is necessary to isolate the risk of leverage and only measure the firm's market risk if it were completely equity-financed. The equations to calculate both unlevered and levered beta are as follows:

$$\beta_U = \frac{\beta_L}{\left[1 + (1 - T) \times \left(\frac{Debt}{Equity}\right)\right]} \quad (7)$$

$$\beta_U = \frac{\beta_L}{\left[1 + (1 - T) \times \left(\frac{Debt}{Equity}\right)\right]} \quad (8)$$

where: β_U = Unlevered beta
 β_L = Levered beta

In general, equity risk premium can be obtained using historical data through the formula below. However, the significant standard error in almost all range of historical data make it useless (Damodaran, 2014). To address this, some trusted financial data providers, such as Refinitiv Eikon, Damodaran, and Market Risk Premia presents other methods in calculating equity risk premium.

$$\text{Equity Risk Premium} = r_m - R_f \quad (9)$$

where: r_m = Market return
 R_f = Risk-free rate

iii. Weight of Debt and Equity

Debt: The book value of the interest-bearing liabilities will be used in this research as market value is not feasible to determine since PT TBS Energi Utama Tbk does not have debt in the form of bonds that are traded in the market and bank loan maturity is not specified in the financial statements.

Equity: Total equity is derived from the market value by calculating the market capitalization. Thus, the weight of debt and equity are obtained by the following formulas:

$$W_d = \frac{\text{Total Debt}}{\text{Total Debt} + \text{Total Equity}} \quad (10)$$

$$W_e = \frac{\text{Total Equity}}{\text{Total Debt} + \text{Total Equity}} \quad (11)$$

Equity: Total equity is derived from the market value by calculating the market capitalization. Thus, the weight of debt and equity are obtained by the following formulas:

iv. Weighted Average Cost of Capital (WACC)

For this research, the author uses the cost of capital approach in determining its capital structure as it is suitable for current and future conditions for PT TBS Energi Utama Tbk, especially in finding the right financing sources for its upcoming expansion. As of 2022, the company has both debt and equity in its capital structure. By utilizing this approach, the author evaluates the cost of debt and cost of equity on each debt level to find the minimum weighted average cost of capital (WACC). The weighted average cost of capital is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted to finance a project or firm. Using the components above, WACC in current condition is calculated through the formula shown below.

$$WACC = (W_e \times r_e) + (W_d \times [r_d \times (1 - T)]) \quad (12)$$

where: W_e = Weight of equity
 W_d = Weight of debt
 r_e = Cost of equity
 r_d = Cost of debt
 T = Marginal tax rate

2. Stage 2: Identifying the Firm's Optimal Capital Structure

The optimal capital structure will be determined by finding the lowest WACC among all debt levels ranging from 0% – 100%. It starts by simulating the proportion of debt and equity with a multiple of 5% and then narrowing down to 1% multiple.

3. Stage 3: Formulating the Best Financing Strategy

After knowing the optimal percentage of debt and equity, the author adds the investment value of USD 500 million to the total capital of PT TBS Energi Utama Tbk. The new total capital is then multiplied by the percentage of each debt and equity obtained through the previous steps. The author will give recommendations for the company on how much debt financing and equity financing are required to arrive at its optimal capital structure, including its USD 500 million investment. The process flow is shown in the following figure:

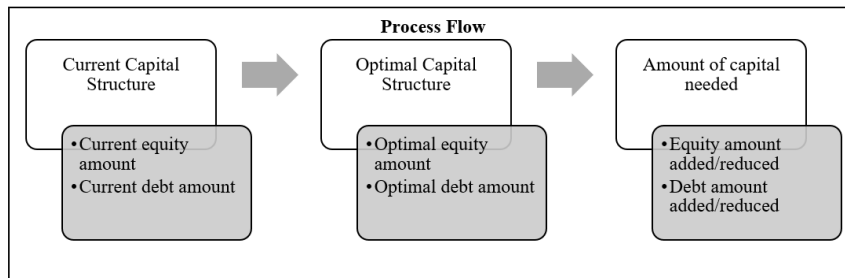


Fig. 4 Process Flow Diagram

IV. RESULT / FINDING

Stage 1: Assessing the Firm's Current Capital Structure

The first stage of data analysis is to find the firm's current cost of capital and capital structure, which will subsequently be compared to the optimal capital structure condition. The cost of capital calculation involves computing firm's current cost of debt, current cost of equity, and current weight of debt and equity.

1. Current Cost of Debt

The interest coverage ratio calculation based on the latest financial statement shows that PT TBS Energi Utama Tbk's interest coverage ratio is 4.84x, which is shown by the calculation below. Based on the synthetic rating displayed in Table 3, the company is rated as A- and implies 1.62% default spread.

$$\text{Interest coverage ratio} = \frac{\text{Earnings Before Interest and Tax (EBIT)}}{\text{Interest Expense}}$$

$$\text{Interest coverage ratio} = \frac{\text{USD } 137,724,883}{\text{USD } 28,453,044}$$

$$\text{Interest coverage ratio} = 4.84x$$

Hence, the firm's current pre-tax cost of debt is 8.55% as shown by the calculation below (see Equation 3).

$$\text{Pre-tax Cost of Debt } (r_d) = \text{Risk-free Rate} + \text{Default Spread}$$

$$\text{Pre-tax Cost of Debt } (r_d) = 6.93\% + 1.62\%$$

$$r_d = 8.55\%$$

As the debt interest is deductible, the cost of debt has to be adjusted with the marginal tax rate to arrive at the after-tax cost of debt. The marginal tax rate in Indonesia is 22% (Damodaran, 2023). Using the Equation 4, the firm's after-tax cost of debt is 6.67%, as presented below.

$$\text{After-tax Cost of Debt} = r_d \times (1 - T)$$

$$\text{After-tax Cost of Debt} = 8.55\% \times (1 - 22\%)$$

$$\text{After-tax Cost of Debt} = 6.67\%$$

2. Current Cost of Equity

The cost of equity is calculated through the Capital Asset Pricing Model (Equation 5), as illustrated in Table 4 with following inputs: 1) risk-free rate (Rf) of 6.61% derived from 10Y Indonesian Government bond rate, 2) levered beta of 0.85 from 3Y weekly regression between JKSE and TOBA stock price (Equation 6) obtained from PT Pemeringkat Efek Indonesia (PEFINDO), and 3) equity risk premium of 9.31% derived from Refinitiv Eikon.

There are three relevant sources in obtaining equity risk premiums, which are Damodaran, Market Risk Premia, and Refinitiv Eikon. Since historical equity risk premium presents significant standard errors, the author chooses to use the equity risk premium from Refinitiv Eikon as it utilizes forward-looking calculations.

Table 41. Cost of Equity Calculation

Cost of Equity Calculation (CAPM Model)	Value
Risk-free rate (A)	6.93%
Levered beta (B)	0.58
Equity risk premium (C)	9.31%
Cost of equity (A + (B x C))	12.32%

3. Weight of Debt and Equity

As of 31 December 2022, PT TBS Energi Utama Tbk has interest bearing liabilities of USD 366,872,235 and equity of USD 309,746,515, bringing its total capital to USD 676,618,750.

Table 42. Current Weight of Debt and Equity

Capital Structure	
Total Interest-Bearing Liabilities (USD mn)	366.9
Total Equity (USD mn)	309.7
Total Capital (USD mn)	676.6
Weight of Debt	54.22%
Weight of Equity	45.78%

The weight of debt is calculated using Equation 10, which is shown in the calculation below:

$$W_d = \frac{\text{Total Debt}}{\text{Total Debt} + \text{Total Equity}}$$

$$W_d = \frac{\text{USD } 366,872,235}{\text{USD } 676,818,750} = 54.22\%$$

Total equity is calculated by multiplying TOBA's share price on 31 December 2022 by the total shares outstanding. In other words, the market value of equity is the market capitalization of the company. The weight of equity is calculated using Equation 11, which is presented below:

$$W_e = \frac{\text{Total Equity}}{\text{Total Debt} + \text{Total Equity}}$$

$$W_e = \frac{\text{USD } 309,746,515}{\text{USD } 676,818,750} = 45.78\%$$

Hence, the company's debt proportion of total capital is 54.22% while the equity accounts for 45.78% of total capital.

4. Current Cost of Capital

The current cost of capital is 9.256% which is computed using the WACC formula (Equation 12) with the calculation as follows:

$$WACC = (W_e \times r_e) + (W_d \times [r_d \times (1 - T)])$$

$$WACC = (45.78\% \times 12.32\%) + (54.22\% \times [8.55\% \times (1 - 22\%)])$$

$$WACC = 9.256\%$$

Stage 2: Identifying the Firm's Optimal Capital Structure

In calculating the optimal capital structure, the incorporated assumptions in cost of debt and cost of equity are the same as the current capital structure calculation. The difference is in the proportion of each capital where they will be simulated from 0% to 100% with multiples of 5%. The calculation with the multiple of 1% will then be performed to obtain a more price estimate of the cost of capital.

1. Cost of Debt

The author utilizes Damodaran Synthetic Rating (Table 3) to capture the change in cost of debt as debt levels increase or decrease. The first step is to multiply the percentage of debt level by the total capital to arrive at total debt. Initially, the debt level is at 0%, hence, there is no interest expense which leads to the highest rating of AAA and implies a 0.69% spread. Afterwards, the cost of debt is obtained by adding the spread to the risk-free rate of 6.93%, arriving at 7.62% cost of debt. To calculate the interest expense in the next debt level, this rate will be used in order to avoid circular reference as interest rate is required to calculate the interest coverage ratio, and the coverage ratio is needed to compute the interest rate (Damodaran, 2014). When the estimated interest rate does not match with the cost of debt resulting from synthetic rating, another iteration must be performed until the rate matches up. This procedure is then repeated for each debt proportion from 5% to 95%. The table below summarizes the cost of debt calculations for all debt levels.

Table 43. Cost of Debt Calculation (5% Margin)

Debt Level	Debt (USD mn)	Interest Expense (USD mn)	Interest Coverage Ratio	Implied Rating	Spread	Pre-tax Cost of Debt	Tax Rate	After-tax Cost of Debt
0%	-	-	∞	AAA	0.69%	7.62%	22.00%	5.94%
5%	34	3	53.46	AAA	0.69%	7.62%	22.00%	5.94%
10%	68	5	26.73	AAA	0.69%	7.62%	22.00%	5.94%
15%	101	8	17.82	AAA	0.69%	7.62%	22.00%	5.94%
20%	135	10	13.36	AAA	0.69%	7.62%	22.00%	5.94%
25%	169	13	10.47	AA	0.85%	7.78%	22.00%	6.06%
30%	203	17	8.32	A+	1.23%	8.16%	22.00%	6.36%
35%	237	20	6.97	A	1.42%	8.35%	22.00%	6.51%
40%	271	23	6.10	A	1.42%	8.35%	22.00%	6.51%
45%	304	26	5.29	A-	1.62%	8.55%	22.00%	6.67%
50%	338	29	4.76	A-	1.62%	8.55%	22.00%	6.67%
55%	372	33	4.15	BBB	2.00%	8.93%	22.00%	6.96%
60%	406	38	3.63	BB+	2.42%	9.35%	22.00%	7.29%
65%	440	44	3.11	BB	3.13%	10.06%	22.00%	7.84%
70%	474	54	2.53	B+	4.55%	11.48%	22.00%	8.95%
75%	507	62	2.23	B	5.26%	12.19%	22.00%	9.50%
80%	541	66	2.09	B	5.26%	12.19%	22.00%	9.50%

85%	575	82	1.68	B-	7.37%	14.30%	22.00%	11.15%
90%	609	87	1.58	B-	7.37%	14.30%	22.00%	11.15%
95%	643	146	0.94	CC	15.78%	22.71%	20.76%	17.99%
100%	677	154	0.90	CC	15.78%	22.71%	19.72%	18.23%

2. Cost of Equity

To simulate cost of equity, the unlevered beta must be calculated first (Equation 7) using the regression beta obtained from Pefindo of 0.580.

$$\text{Unlevered Beta } (\beta_U) = \frac{0.580}{\left[1 + (1 - 22\%) \times \left(\frac{\text{USD } 366,872,235}{\text{USD } 309,746,515}\right)\right]}$$

$$\text{Unlevered Beta } (\beta_U) = 0.301$$

Consequently, the unlevered beta is re-levered (Equation 8) at all debt levels in 5% margin. Note that in 0% debt level, the unlevered beta is equal to levered beta due to zero value in debt-to-equity ratio. Taking 5% margin as an example, the calculation is as follows:

$$\text{Levered Beta } (\beta_L) = 0.301 \times [1 + (1 - 22\%) \times 5\%]$$

$$\text{Levered Beta } (\beta_L) = 0.314$$

The CAPM formula (Equation 5) is then used to compute the cost of equity at each level. The full calculation is shown in Table 7.

Levered beta grows in tandem with the debt level since it represents the risk of additional borrowing, which sequentially increases the cost of equity. It shows that shareholders expect a bigger return in exchange for taking on more risk with the bigger amount of borrowing that the company has.

Table 44. Cost of Equity Simulation (5% Margin)

Debt Level	D/E Ratio	Levered Beta	Cost of Equity
0%	0%	0.301478287	9.73%
5%	5%	0.313854764	9.85%
10%	11%	0.327606405	9.98%
15%	18%	0.342975886	10.12%
20%	25%	0.360266553	10.28%
25%	33%	0.379862641	10.46%
30%	43%	0.402258171	10.67%
35%	54%	0.428099167	10.91%
40%	67%	0.458246996	11.19%
45%	82%	0.493876248	11.52%
50%	100%	0.53663135	11.92%
55%	122%	0.588887587	12.41%
60%	150%	0.654207882	13.02%
65%	186%	0.738191119	13.80%
70%	233%	0.850168768	14.84%
75%	300%	1.006937477	16.30%
80%	400%	1.242090541	18.49%
85%	567%	1.634012314	22.14%

90%	900%	2.417855859	29.44%
95%	1900%	4.840363838	51.99%
100%	-	-	-

3. Optimal Capital Structure

After simulating both cost of debt and cost of equity, the cost of capital can be simulated using the WACC formula (Equation 12). The simulation of 5% margin is shown in the table below:

Table 45. Cost of Capital Simulation (5% Margin)

Debt Level	Equity Level	D/E Ratio	Pre-tax Cost of Debt	After-tax Cost of Debt	Cost of Equity	Cost of Capital
0%	100%	0%	7.62%	5.94%	9.73%	9.732%
5%	95%	5%	7.62%	5.94%	9.85%	9.652%
10%	90%	11%	7.62%	5.94%	9.98%	9.571%
15%	85%	18%	7.62%	5.94%	10.12%	9.491%
20%	80%	25%	7.62%	5.94%	10.28%	9.411%
25%	75%	33%	7.78%	6.06%	10.46%	9.362%
30%	70%	43%	8.16%	6.36%	10.67%	9.377%
35%	65%	54%	8.35%	6.51%	10.91%	9.370%
40%	60%	67%	8.35%	6.51%	11.19%	9.318%
45%	55%	82%	8.55%	6.67%	11.52%	9.337%
50%	50%	100%	8.55%	6.67%	11.92%	9.293%
55%	45%	122%	8.93%	6.96%	12.41%	9.412%
60%	40%	150%	9.35%	7.29%	13.02%	9.580%
65%	35%	186%	10.06%	7.84%	13.80%	9.927%
70%	30%	233%	11.48%	8.95%	14.84%	10.717%
75%	25%	300%	12.19%	9.50%	16.30%	11.203%
80%	20%	400%	12.19%	9.50%	18.49%	11.301%
85%	15%	567%	14.30%	11.15%	22.14%	12.798%
90%	10%	900%	14.30%	11.15%	29.44%	12.979%
95%	5%	1900%	22.71%	17.99%	51.99%	19.691%
100%	0%	-	22.71%	18.23%	-	18.227%

Based on the table, the lowest cost of capital of PT TBS Energi Utama Tbk is at 50% debt level. To get a more detailed view, a calculation of 1% margin is conducted in the range 45% to 55%.

Table 46. Cost of Capital Simulation (1% Margin)

Debt Level	Equity Level	D/E Ratio	Pre-tax Cost of Debt	After-tax Cost of Debt	Cost of Equity	Cost of Capital
45%	55%	82%	8.55%	6.67%	11.52%	9.337%
46%	54%	85%	8.55%	6.67%	11.60%	9.328%
47%	53%	89%	8.55%	6.67%	11.67%	9.319%
48%	52%	92%	8.55%	6.67%	11.75%	9.311%
49%	51%	96%	8.55%	6.67%	11.84%	9.302%
50%	50%	100%	8.55%	6.67%	11.92%	9.293%
51%	49%	104%	8.55%	6.67%	12.01%	9.284%

52%	48%	108%	8.55%	6.67%	12.10%	9.276%
53%	47%	113%	8.93%	6.96%	12.20%	9.424%
54%	46%	117%	8.93%	6.96%	12.30%	9.418%
55%	45%	122%	8.93%	6.96%	12.41%	9.412%

Based on the simulation above, it is shown that the optimal capital structure of PT TBS Energi Utama Tbk is achieved when the company's capital consists of 52% debt and 48% equity where the firm's cost of capital is 9.276%, derived from 6.67% after-tax cost of debt and 12.10% cost of equity. This number, however, is still greater than the current cost of capital of 9.256%. Hence, with a very small difference in debt level (less than 2%), it is appropriate to assume that the current company's state is already optimal.

V. DISCUSSION

After the optimal capital mix is found, the calculation of PT TBS Energi Utama Tbk's capital for its expansion plan can be conducted. Based on the table below, total capital of PT TBS Energi Utama Tbk is USD 1,176,618,750 which includes the additional USD 500 million for its renewable energy and EV ecosystem future investments.

Table 47. Total Capital

Capital Structure	Value (USD)
Total Debt	366,872,235
Total Equity	309,746,515
Additional capital	500,000,000
Total Capital	1,176,618,750

Consequently, the optimal amount of the company's debt is USD 637,979,291, which is obtained from multiplying the optimal debt weight of 54.22% by total capital of USD 1,176,618,750. Likewise, the company's optimal equity amount is USD 538,639,458, which is derived from multiplying the optimal equity weight of 45.78% by the total capital. The difference between the company's capital structure before and after additional capital is shown in the table below:

Table 48. Expected Capital Structure

Variable	Optimal Capital Structure (Before Additional Capital)	Optimal Capital Structure (After Additional Capital)	Difference
Weight of Debt	54.22%	54.22%	0.00%
Weight of Equity	45.78%	45.78%	0.00%
Total Debt (USD)	366,872,235	637,979,291	271,107,056
Total Equity (USD)	309,746,515	538,639,458	228,892,944
Total Capital (USD)	676,618,750	1,176,618,750	500,000,000

Hence, in order to maintain optimal capital structure, PT TBS Energi Utama Tbk has to finance its expansion plan by adding both debt and equity with the amount of USD 271,107,056 and USD 228,892,944, respectively. It can be concluded that PT TBS Energi Utama Tbk's capital structure does not follow the industry average as it is already optimal. It is appropriate to say that the company has to deviate from the industry average as it does not match the company's nature and financial condition. Damodaran (2014) also mentioned that although the industry average is too strong to be ignored, it is important to check the optimal debt ratios emerged from simulating the capital structure.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

The current capital structure of PT TBS Energi Utama Tbk consists of 54.22% debt and 45.78% equity. Utilizing the Damodaran Synthetic Rating and Capital Asset Pricing Model (CAPM), the current cost of capital of the firm is 9.256% by applying WACC method. The existing debt level appears to be considerably out of range to the industry in which the company operates in. However, based on the analysis, the current capital mix is already optimal for the company. Hence, it is reasonable for PT TBS Energi Utama Tbk to differ from the industry average. Although the industry average is frequently used as a guideline, the company should not follow it as it does not correspond with the company's financial condition. Consequently, the company's expansion plan of USD 500,000,000 to develop renewable energy power plants and electric vehicle ecosystem should be financed with the same proportion of 54.22% debt and 45.78% equity to maintain its optimal capital structure and maximize the firm's value.

Recommendation

According to the optimal capital structure analysis, the company should preserve the current capital mix as it is considered to already be optimal where the current WACC is lower than the lowest WACC found in the simulation. Therefore, in determining the financing required for its USD 500,000,000 expansion plan, the company should utilize the current capital proportion, resulting in USD 271,107,056 debt raised and USD 228,892,944 equity raised. It is recommended that careful consideration be given to raising debt financing for the expansion plan. The company should take into account the limitations imposed by lenders, such as maintaining a specific debt/EBITDA ratio, and the impact on its credit rating when issuing bonds. Adhering to these limitations is crucial to ensure the company maintains a healthy financial position and can fulfill its debt obligations.

On the other hand, for equity financing, it is advised that the company calculates the fair value of its shares before determining the issuance price and quantity. This will enable the company to make informed decisions about the equity issuance, ensuring that the offer is fair to both the company and its investors. By carefully considering these recommendations in both debt and equity financing, the company can strike a balance between its expansion needs and financial stability.

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Empowering Employees to Go Green: The Influence of Green HRM Policies

Khalid Farooq, Zikri Muhammad¹, Mohd Yusoff Yusliza², Abdur Rachman Alkaf³

^{1,2,3}Affiliation: Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia

Abstract

Introduction: This study examines the impact of green human resource management (GHRM) practices on academics' ecological behavior (EEB) in Malaysian universities. As academics' EEB is critical in transitioning universities towards sustainability. **Background of the Problem:** There is a need to investigate the factors that influence academics' EEB and how green human resource management practices can be utilized to enhance their ecological behavior and improve the organization's environmental efficiency. **Research Gaps/Novelty:** The research novelty of this study lies in its focus on the impact of green human resource management practices on academics' EEB in Malaysian universities. While the link between HRM practices and EEB has been explored in previous studies, this research contributes to the current literature by specifically examining the factors that shape academics' EEB and how it can be improved through green HRM strategies in the context of Malaysian universities. **Research Methods:** The research methods used in the study are qualitative. Data collection methods include semi-structured face-to-face interviews and focus groups of academics from Malaysian universities. **Findings/Results:** The study found that green human resource management strategies significantly affect employee ecological behavior. Green training, green rewards and compensation, and green empowerment are the more influential factors shaping EEB at the workplace. **Conclusions and Implications:** The conclusion is that academics' high EEB will facilitate universities in becoming more sustainable and environmentally friendly. The study's implications are that implementing green human resource management practices can improve employees' ecological behavior, which will contribute to the organization's environmental efficiency.

Keywords— Employee ecological behavior, Green HRM, Sustainability, Malaysia universities

1. INTRODUCTION

Promoting a green culture and practices that prevent or minimize environmental damage has been found to be good for businesses and essential for society (Rayner and Morgan 2017). Universities are referred to as "little towns" due to the volume and variety of dynamic events on campus, which significantly affect the community both explicitly and indirectly (Alshuwaikhat and Abubakar 2008). On the other side, the principal responsibility of universities is training next-generation leaders, decision-makers, and managers (Alshuwaikhat and Abubakar 2008). In the struggle to achieve low carbon emission and proper resource utilization, higher educational institutes must develop an environmentally friendly atmosphere through academician ecological behavior (Fawehinmi et al. 2020).

Employee behavior, which supports environmental initiatives' protection and management, refers to employee ecological behavior (Zhang et al. 2019). Employees show different opinion levels for in-role and extra-role behavior in the workplace (Dumont, Shen, and Deng 2017). In addition, organizational sustainability policies shape employees' in-role and ecological behavior differently through different psychological and social processes (Norton, Zacher, and Ashkanasy 2014). Researchers must focus on behavioral changes of employees rather than just recycling and upgrading technological advancements (Anwar et al. 2020).

Individuals form associations with groups and identify with teams to cultivate a strong self, and social membership conditions a person's associations. According to social identity theory, individuals are comfortable and affirmative when they associate with constructive teams and communities. This feeling of identity contributes to the reinforcement of their self-concept of collective membership. Theoretical frameworks assist with explaining the interaction between the organization and its workers (Ashforth and Mael 1989). Researchers discovered that workers incorporated into an organization's constructive practices and ideals demonstrate a high level of corporate engagement (Scott 2007). Employees that have a favorable attitude toward an organization's sustainability policies demonstrate a strong degree of eco-friendly activity (Kim et al., 2019). Additionally, employee social identification theory postulated employee loyalty to the company by their actions (Su and Swanson 2019). Studies have confirmed that an employee who is more environmentally conscious and identifies with his/her company's efforts for environmental sustainability is more devoted to extra effort for ecological behavior (Chaudhary, 2019; Kim et al., 2019).

To the best of our knowledge, no study has examined the role of green HRM practices for EEB of academicians. In addition, Cho (2019) said that the behavior of faculty from higher educational institutes must be investigated as staff and students have different behaviors related to environmental management. Dumont, Shen, and Deng, (2017) called for research to investigate organizational level factors related to EEB.

The current study advances knowledge of employee ecological behavior in three ways. First, this study extended understanding of the concept of EEB by examining the role of academicians at Malaysian top green universities ranked in UI GreenMetric. Different universities can implement this research framework to get better environmental management. Second, the study filled a research gap by investigating the impact of different Green HRM practices in performing EEB. By focusing on green HRM practices, an organization can focus on different strategies to achieve targeted outcomes from EEB. Third, this is the first known research to measure Green HRM practices' role to foster EEB employing a qualitative technique in Malaysian top-ranked research universities, which required further attention (Anwar et al. 2020; Fawehinmi et al. 2020).

II. LITERATURE REVIEW

A. *Employee Ecological Behavior*

Employee ecological behavior is described as "scalable acts and behaviors that employees take or initiate that are connected to and contribute to environmental sustainability" (Ones and Dilchert 2012 p.456). Workplace behavior is distinct from overall pro-environmental behavior, often referred to as general behavior or at-home behavior (Stern 2000). Ones and Dilchert (2012) suggested a model for workplace EEB research. Although different techniques have emerged for shaping environmental behaviors, limited interventions by factors have been studied in workplace behavior (Dumont et al. 2017; Fawehinmi et al. 2020; Kim et al. 2019; Norton et al. 2015). Environmental behaviors of individuals differ at home and work. Changing contextual and contingencies means antecedents for environmental behaviors differ at home and work (Davis et al. 2019). This phenomenon means that factors that influence behavior in the home may not be effective in the workplace.

B. *Green HRM Practices*

Valued green recruitment process of organization enables to become more sustainable and environmental friendly (Fawehinmi et al. 2020). Through green training processes, they acquire more abilities and skills to understand environmental initiatives better (Ren, Tang, and Jackson 2018). Green compensation, performance management, and involvement boost behavioral intentions for environmental sustainability (Saeed et al. 2019). GHRM practices are essential for aligning the environmental behaviors of employees with organizational objectives (Anwar et al., 2020). The findings of GHRM practices on Employee ecological behavior have been contradictory. For example, Fawehinmi et al. (2020) and Kim et al. (2019) found no direct relationship between GHRM and EEB, while Anwar et al. (2020) and Dumont et al. (2017) found a positive relationship. This qualitative study will help determine the actual role of GHRM practices on academicians regarding their ecological behavior.

C. *Green Recruitment and Selection*

In the recruiting and hiring procedures, an organization expresses its corporate values and objectives to potential employees, stating that the work description may represent the relevance of environmental reporting (Renwick, Redman, and Maguire 2013). In comparison, an interview can be organized to identify applicants who are likely to adopt the organization's green stance. Additionally, prospective hires should be educated about the organization's practices, ideals, and dedication to environmental stewardship (Yusliza, Othman, and Jabbour 2017). The importance of green recruiting is founded on internal attribution criteria. By implementing these measures, workers become more receptive to environmental values and demonstrate more ecological behavior (Ojo, Tan, and Alias 2020).

D. *Green Training and Development*

Training is critical in establishing and fostering an organization's green consciousness and culture. Training has been shown to significantly improve workers' attitudes about and interest in pro-green activities (Bissing-Olson et al. 2013). Nonetheless, without an adequate understanding of the requirements and future use of the expertise and skills in the workplace, the environmental training curriculum can be unsuccessful at stimulating ecological activity within an organization (Jackson et al. 2011). Training is important for arming staff with the requisite knowledge and experience to make autonomous choices on sustainable activities. As a result, teaching exposes workers to pertinent environmental awareness, which can pique their interest in ecological behavior (Ojo et al. 2020).

E. *Green Performance Management and Appraisal*

An organization can develop appropriate metrics and performance indicators to monitor the impact and involvement of its employees in pro-green practices (Bissing-Olson et al. 2013). Environmental benchmarks help to hold workers responsible for environmental stewardship. Environmental metrics are a critical component of performance improvement in GHRM because they allow workers to gain timely input on their pro-environmental conduct (Masri and Jaaron 2017). Thus, an employee may compare his or her results to the ideal environmental performance on an individual basis. According to Ojo et al. (2020), getting timely input on employees' pro-environmental success will pique their curiosity and motivation to participate in the required conduct. Employees will adjust their behaviors following the key indicators for assessing task performance.

F. Green Reward and Compensation

According to a holistic strategy to salary administration, green incentives and compensation are a scheme of financial and non-financial benefits aimed at recruiting, encouraging, and maintaining workers to contribute to environmental objectives (Jabbour et al., 2013). Incentives can be more effective at aligning workers' success with the organization's priorities than most human resource management strategies. However, most scholars agree that a combination of monetary and nonmonetary incentives motivates workers more effectively (Jackson et al. 2011). Green appreciation is a scheme of nonmonetary incentives for workers, including companywide public recognition, compensated holidays, and gift cards. These green appreciation incentives foster a sense of belonging among co-workers and successfully promote ecological behavior (Saeed et al. 2019).

G. Green Empowerment

Employees will be given chances to engage in environmental protection, which encourages them to contribute to waste control and identify environmental opportunities. Employee empowerment is the mechanism by which managers delegate jurisdiction to resolve environmental issues to workers (Daily and Huang 2001). Numerous studies have shown that workforce interest in sustainability initiatives is critical for optimizing the efficiency of environmental management processes, such as eliminating waste and emissions in the workplace and maximizing resource use (Renwick et al. 2013). By different mechanisms, a company will improve its environmental efficiency by encouraging workers to engage in green initiatives. These procedures involve deepening employees' tacit awareness, encouraging and empowering employees to generate suggestions for resolving environmental problems, and cultivating an environment-friendly workplace. (Ojo et al. 2020).

III. RESEARCH METHODOLOGY

A. Research Method and Sample

Interview and focused group discussion comprise with academicians. This qualitative method is suitable due to the nature of drivers under consideration, based on perceptions of informed individuals (Jabbour et al., 2020). Moreover, Jabbour et al. (2020) argued that qualitative research was appropriate for finding the nuances of respondents. The four selected universities are recognized for their good reputation for sustainability efforts and low carbon emission by Universitas Indonesia (UI) Green Metric World University Ranking.

B. Data Collection

Each respondent was delivered with an interview protocol that the ethics committee of each university approved. The anonymity of all participants and universities was ensured. The duration of the interview was between 60-90 minutes, which were conducted between February and August 2020. From each university several academicians were approached. And at the end we were able to collect responses from 10 academicians from each university as per their willingness and convenience.

C. Data Analysis

Interviews were recorded and subsequently transcribed in full for further analysis. Content analysis, defined as "research method for subjective interpretation of the content of text data through the systematic process of coding and identifying themes or patterns," was used (Shannon 2005). The analysis comprised two steps. First, the coders distributed relevant passages as suggested in the research framework. After that, the coders deductively analyzed these extracts to different factors with quotations to analyzed behaviors, and different factors emerged as drivers of ecological behaviors in the workplace.

IV. RESULT / FINDING

Each category's results are presented in Table 1, which summarizes relevant responses obtained from interviews, which are then interpreted and discussed.

D. Green HRM Practices

Green HRM has rapidly developed in the business and academic fields over the past decade. The role of GHRM has become a major factor for environmental sustainability because of the vital role of employees regarding environmental initiatives in an organization (Anwar et al. 2020). Increasing environmental practices through GHRM derived employees allows for the more efficient utilization of natural resources.

Table 1. Responses obtained from interviews.

University	GHRM Practices	Respondents	Quotations
University A	Green Recruitment and Selection	Respondent 1	“For me, it is voluntary because it is my personality. I could say from my perspective that it is more of a personal effort. I mean, lecturers are busy doing research and meeting students. When we have the policy, the Sustainable Campus, we are more aware of that.”
	Green Training	Respondent 4	“There was training for the administrative staff. I did not remember when, but I had to go to that place, organized by a professional team. They make series and courses for lecturers and staff, a mixture between environment and sustainability.”
	Green performance Management	Respondent 5	“We will try to do it. There will be people who monitor and give out penalties.”
	Green rewards & Compensation	Respondent 4	“I think the university should give rewards.”
		Respondent 2	“We have the Excellent Service Award, but I don’t know the criteria as you mentioned.”
	Green Empowerment	Respondent 4	“Even during Orientation Week, they have one of the segments. I was involved in it once. They held a campus explorer, where students identified recyclable things. There is a visit to Lestari for new students.”
University B	GHRM Practices	Respondents	Quotations
	Green job description	Respondent 2	“I do them voluntarily, not because of my job descriptions. I do them because I want to. I want to save paper; I want to go paperless.”
		Respondent 7	“We do them voluntarily. They are also emphasized following some instructions which came from the top, to make sure that everybody does them. From now on, everybody has the awareness.”
	Green Training	Respondent 8	“I have never participated, but I’m sure that they have the training.”
		Respondent 7	“There is CPD, but it is not stress. There is no green training at all. There has never been any specific green training. At least there is CPE, but no green technology.”
	Green performance Management	Respondent 9	“When they designed the blueprint, they should include these kinds of things. They did not encourage people to do that. I wish they did because many lecturers do research related to green practices.”
	Green pay & rewards	Respondent 1	“No, UNIVERSITY B does not do that. It is different compared to University A.”
Green Involvement	Respondent 10	“Sometimes, we also hold “gotong-royong” (communal work), involving students and staff. It is a program under the school.”	
University C	GHRM Practices	Respondents	Quotations
	Green training	Respondent 1	“EMS covers the environment, so it is done by the responsible centers. I am with the committee for energy, and every six months, we have to submit a report. We have several activities.”

	Green pay & rewards	Respondent 5	“Responsibility Centres are given points. We will email the details on the total points for each center to the Ministry of Higher Education. At the end of the year, the faculty that wins will get some money.”
	Green Involvement	Respondent 6	“If we want to enforce students to go green, it must involve the lecturers.”
University D	GHRM Practices	Respondents	Quotations
	Green training	Respondent 11	“We are a training center, so we normally serve food and beverages. We have to think about how to get rid of them. At the office, there are many Tupperware containers. In terms of traveling, I own two bicycles.”
	Green Involvement	Respondent 3	“We ask for support from the development unit since it involves premises. We communicate through announcements. Every month, we encourage the faculties to reuse paper. Announcements are made through circulars. Some of the items involved are paper, bottles, and cooking oil.”

V. DISCUSSION

The results reveal the need to coordinate resources and capabilities to meet challenges and opportunities for environmental change. The findings highlighted the interdependent relationship among individual, organizational, and environmental factors and their capabilities for adopting EEB. Among four universities, EEB is the most important factor in overcoming environmental issues, which can be achieved by developing capabilities and efficient resource utilization. In addressing the adoption of EEB, it was observed that universities feel the need to invest in environmental forces and capabilities like attitude, awareness, consciousness, and knowledge.

Respondents 2 and 7 both expressed a sense of voluntary commitment to green practices that extend beyond their formal job descriptions. The respondents mentioned a personal motivation to contribute to environmentally friendly initiatives, such as going paperless to save paper. This suggests that there is intrinsic motivation among some employees to engage in green practices. Additionally, the emphasis on these practices from top management indicates a top-down approach to encouraging green behaviors. This alignment of personal values and organizational directives signifies a positive step towards fostering a green culture within the workplace.

A. Green Training

Respondent 8 mentioned a lack of awareness regarding green training, while Respondent 7 acknowledged the presence of continuing professional development (CPD) opportunities but noted the absence of dedicated green training initiatives. The absence of specialized green training programs indicates a potential gap in the universities' efforts to equip employees with the necessary skills and knowledge to engage in sustainable practices. Incorporating specific green training modules could bridge this gap and contribute to a more environmentally conscious workforce.

B. Green Performance Management

Respondent 9 highlighted the need for integrating green practices into the university's performance management system. The respondent's suggestion to include green practices in the blueprint during the design phase indicates that a proactive approach in integrating sustainability goals into performance expectations can foster a culture of accountability and responsibility for sustainable actions. The desire expressed by the respondent for greater encouragement from the university indicates that there might be room for improvement in terms of leadership support and communication around green practices.

C. Green Pay & Rewards

Respondent 1 mentioned a contrast between the approach to green pay and rewards between University A and University B. While the details provided are limited, this observation suggests variations in how different universities incentivize and reward green behaviors. Further investigation into the specific mechanisms of green pay and rewards at both institutions would provide a more comprehensive understanding of their effectiveness in promoting sustainable actions among employees.

D. Green Involvement

Respondent 10 mentioned a program involving communal work, which implies a collaborative approach to engaging both students and staff in green initiatives. This approach not only promotes a sense of community but also indicates that the university recognizes the importance of involving multiple stakeholders in sustainability efforts. Such programs can contribute to a holistic approach to green practices and enhance the overall impact of sustainability initiatives.

Furthermore, results indicate that GHRM practices influence EEB, aligning with Dumont et al. (2017) and Saeed et al. (2019). This study found that rewards and training of employees directly promote EEB but have no direct effect on other practices. This may be because workplace behaviors are monitored in organization systems and policies. Further, other major reasons may be that rewards and training enhance employee intrinsic motivation to get involved in ecological behavior. As one respondent noted,

“As a research Centre, we can do training on awareness or conduct studies. But then, you [...] You can enforce all you want, [...] (Respondent 5).

In terms of employee ecological behavior, the results show the positive effect of behavior on three dimensions of sustainability. The finding reveals that ecological behaviors enhance environmental commitment, which contributes to saving energy, utilization of natural resources, and the well-being of society.

“Well, we tried to minimize the use of paper in this office. Sustainability encompasses everything; it is about the way of life. Sustainability actually is the branding, not focusing on religion” (Respondents 4).

Educational institutes and universities can align strategies and sustainable goals; henceforth, resolving carbon emissions can be managed through this mechanism of prioritizing and coordinating management for low carbon emission. Universities can make investments in EEB practices despite expenses if management and stakeholders can show interest in environmental management. By adopting EEB practices, these universities strengthen their image as institutes that are more committed to environmental and social responsibilities.

VI. CONCLUSION AND RECOMMENDATION

The study extended the current state of knowledge of employee ecological behavior by investigating how universities deal with green HRM practices to adopt ecological behavior. It proposed a framework for institutions to guide management to utilize resources and capabilities to meet the challenges and opportunities for being green. Institutions can gain advantages for sustainable development by focusing on the EEB of academicians.

A. Academic Contribution

This paper contributed to the literature on employee ecological behaviors and strategies to enhance EEB by focusing on Green HRM practices and addressing the call for additional research (Dumont et al. 2017). A new analytical approach was proposed to gain a managerial framework for institutions to orchestrate employees to meet challenges and opportunities for low carbon campus.

B. Managerial Implications

This research will help management to identify and explore utilizing organizational capabilities to develop EEB. It also outlined a process for establishing low carbon campuses. The study highlighted the role of green HRM practices for low carbon emission targets. In this scenario, Malaysian universities may help policymakers and government institutions deal with environmental degradation.

C. Research Limitations

The findings were understood deductively, and the data gathered from academicians was compared to the pertinent literature. The research was undertaken in a particular national sense, with data obtained from four of Malaysia's largest public universities. As a result, considering the cultural background is important. Additionally, because EEB is a novel term developed by interviews and concentrated group dialogue, academicians could have varying perceptions.

D. Future Research

Future studies can concentrate on and apply the answer mechanisms identified in this study to comprehend in various contexts. Future studies can perform empirical research on human, organizational, and environmental variables. Qualitative research is needed to determine the outcomes of EEB in low carbon institutions, such as resilience (Yong et al. 2020) and competitive advantage (Malsha, Anton Arulrajah, and Senthilnathan 2020), as this will improve the willingness to pursue green campuses.

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Examining the Impact of Various Internal Financial and Market Ratios on Return on Equity (ROE) in Publicly Listed Non-Financial Firms in Indonesia: A Firm Size Perspective

Mohammad Risyad Rachman¹

¹Institut Teknologi Bandung, Bandung, Indonesia

Abstract

Financial statements and analysis have evolved, with ratios gaining popularity as tools to assess relationships between variables. Ratios, including Return on Equity (ROE), aid in evaluating company performance and guiding investor decisions. Due to its practical and widespread use, numerous studies have focused on ROE, highlighting its importance. This study investigates the factors affecting ROE based on internal financial ratios and market ratios, taking into account the firm's size perspective. Panel data analysis with a robust standard error method is employed, analyzing a sample of 284 non-financial publicly listed firms in Indonesia from 2018 to 2021. The research divides the sample into three groups based on firm size, represented by the respective total assets of each company. The classification of each group is determined using quartiles, sorting the companies based on their total assets. This study examines a total of seven ratios: Net Profit Margin, Assets Turnover, Financial Leverage, and Current Ratio as internal financial ratios, and PBV & PER ratios as market ratios. The findings of this research reveals that different financial ratios have varying degrees of influence on the financial performance of publicly listed non-financial firms in Indonesia, specifically on ROE. While traditional ratios like the Current Ratio may not provide significant insights, DuPont-based ratios (Financial Leverage, Net Profit Margin, and Asset Turnover) exhibit a stronger relationship with ROE. Market ratios, particularly the Price to Book Value (PBV) ratio, significantly impact ROE for firms with lower asset values. Consequently, an emphasis of Du-Pont based ratios are critical in assessing non-financial firm's profitability in Indonesia for firms for all assets sizes.

Keyword: Company Performance; Financial Ratios; Firm size; Return on Equity (ROE); Profitability

I. INTRODUCTION

The main goal of a firm is to maximize shareholder value. This is achieved through three types of management decisions: investing, financing, and asset management. These decisions are undertaken through an iterative process of analysis and determination to decide the best course of action for the company. The analysis for these decisions often relies on information derived from a company's financial statements, which provide crucial data about the company's financial health and performance.

From early bookkeeping and the double-entry system to the standardization of financial statements, the establishment of GAAP & IFRS, and the incorporation of financial ratios as part of financial analysis in Benjamin Graham & David Dodd's book "Security Analysis", as well as the development of the Capital Asset Pricing Model (CAPM), financial analysis has always been an important aspect in understanding a company's financial performance. Regulators, investors, company management, creditors, academics, and researchers use financial analysis for various purposes in order to understand the financial health and performance of the companies they are investigating.

While there has been extensive progress in the development of financial statements and financial analysis, the use of ratios has begun to gain fame. Ratios act as a tool to identify the relationship between two variables and their impact on one another, while ratio analysis provides a method to effectively detect financial and operational issues in a business (Doorasamy, 2016). Ratios are also used to detect areas that need further investigation. Managers use financial statements, accompanied by ratios, to aid their decision-making process. Through the process of analyzing and interpreting financial statements, the use of ratios assists in evaluating company performance and offering investors insights regarding the associated information on the firm's condition.

Nowadays, the use of financial ratios is incorporated with financial analysis techniques such as trend analysis, horizontal analysis, and vertical analysis. These methods paint a more comprehensive picture and provide a deeper understanding of a company's financial condition. One of the most important financial ratios analyzed by many analysts is Return on Equity (ROE). The calculation of ROE is done by dividing net income by total amount of shareholder's equity. ROE is a crucial financial metric in financial analysis and use of ratios since it measures the profitability of a company in relations towards the amount of equity held by its shareholders.

There are many studies investigating the influence of financial indicators on ROE, prior research reveals conflicting findings and an existing knowledge gap (Ohlson 1980; Altman's, 1968; Beaver, 1996; Fama, 1992; Richardson 2005; Bunea, 2019). Firstly, there is a shortage of studies examining the effects of multiple financial indicators on ROE across diverse industries and on a broader scale. Several studies that have been conducted focus only on specific industries, while there has not been any research assessing overall companies. Therefore, this research will consider both specific industries and overall companies in Indonesia. The results of the research will provide an overall assessment of which financial indicators have the most significant effect on ROE in Indonesia, while also taking into consideration the effects on respective industries within the country.

Secondly, there is not any literature that becomes an extension of previous DuPont analysis in Indonesia. Firm size is considered one of the factors that influence Return on Equity (ROE). A study conducted in Romania demonstrated that companies of varying sizes, as determined by their asset size and employee count, exhibit distinct financial ratios that influence ROE (Bunea et al., 2019a). Inspired by this literature, the current research will investigate the effect of financial ratios on ROE based on total assets class classification. The result of the research would give a new perspective on how management of companies assess the effectivity of generating ROE based on each class of the classification.

Third, the research of how financial indicators affecting ROE is still growing. There are several extension and development of how financial ratios based on DuPont model affects ROE. Some researches shows a different result on which financial indicators give significant result towards ROE as mentioned in the first paragraph. This is caused by the difference of characteristic of the people, business competitiveness, and overall traits of respective countries. Therefore, this research would enrich the international debate on the use of DuPont model by examining overall Jakarta Composite Index (JCI) and respective industry in Indonesia context.

This research would like to validate and evaluate the previous research of how the difference in firm size affects the ROE of publicly listed companies in Indonesia. The firms taken as the sample are listed public companies in Indonesia and is classified as non-financial firms since financial firms have a different way of assessing its Return on Equity (ROE). The study would use purposive sampling, classifying all publicly listed non-financial companies in Indonesia based on its total assets and based on its industry. Moreover, the firms must also have a positive shareholder's equity account as of 2021. Eventually, 284 firms yearly data are gathered thorough 2018-2021. There are much unavailable data that makes the several companies to be crossed out from the research.

II. LITERATURE REVIEW

This research is constructed by information and theories found in the literature review. An overview of Financial ratios, Financial Ratios, Development of DuPont Analysis, Financial Performance of non-financial listed enterprises in Indonesia, and the usage of DuPont Analysis & Market Ratios in Evaluating ROE are the main points of this research.

2.1. Financial Ratios

Financial ratios represent numerical assessments derived from different categories or accounts within a financial statement (Barnes, 1987). Financial ratios are classified into four types of ratio: 1) liquidity evaluates company based on its ability to pay its short-term debt, 2) profitability assess the ability of a firm in generating profits based on sales, equity, and assets, 3) solvency refers to the company ability to meet its long-term financial obligations and 4) turnover refers to the efficiency of a company in utilizing its assets in compared to sales. The use of financial ratios are divided into two principal uses, namely normative and positive use (Whittington, 1980). The normative use of financial ratios is related to prediction goals, whereas the positive use is related to the measurement function of the firm's ratio in comparison to the standard. Furthermore, the positive usage of financial ratios is used by two sorts, each with its unique objective. The first type is used by accountants and analysts to forecast financial variables, whereas the second is used by researchers to develop statistical models for predictive purposes such as risk assessment, company failure, and credit rating (Barnes, 1987).

There has been ongoing debate in past literature to find out which ratios are most useful (Barnes, 1987). Chang (Chang et al., 2014) states that argues that neither profit margin and asset turnover had a predictive value on future

profitability. This is strengthened by the study by Saleem (2011) that states ROE is not influenced by current ratio, quick ratio, and liquidity ratio. However, a recent study by Bunea (2019) shown an opposite results, showing a significant correlation of Asset Turnover, Financial Leverage, Price to earnings, and Price to book value towards return on equity. The existing study suggests that the effect of financial ratios is differ based on the characteristic of the business and its respective country environment and regulation.

2.2 Development of DuPont Analysis

The DuPont Corporation developed the performance measurement method known as Dupont analysis in 1920. It functions by dissecting the three elements of the financial ratio known as Return on Equity (ROE) into profit margin, asset turnover, and financial leverage. The ROE of a company can be broken down using DuPont Analysis to show which factors have the biggest impact on the ROE. This provides a thorough analysis of the company's financial performance (Bragg, 2012). By focusing only on the financial health of the business, it is now possible to determine which factors have a significant impact on the company's overall performance. Further breakdown of the traditional Dupont analysis is as shown below:

$$\text{Return on Equity} = \frac{\text{Net Profit}}{\text{Sales}} * \frac{\text{Sales}}{\text{Average Total Assets}} * \frac{\text{Average Total Assets}}{\text{Average Shareholder's Equity}} \quad (1)$$

As shown, the Return on Equity (ROE) is divided into three components as explained earlier. ROE reflects the amount of stipend of shareholders in the company's profits. A higher ROE is more preferable for shareholders as it means that it generates more financial return for them. As the time goes by, the development of Dupont model becomes more advance and sophisticated. This allows for an in-depth understanding of factors influencing Return on Equity.

The main idea of the extension from the traditional DuPont model is due to the leverage effect that will subsequently reach a point where the cost of debt would decrease both profit margins and assets turnover. Thus, this limitation led the invention of five-steps DuPont Analysis. This model break downs futher the net profit margin to assess the impact of high financial leverage. Moreover, this model also considers tax-deductible since it could become a tax-deductible items.

2.3 Firm size effect to Financial Performance

By its characteristic, a firm with a higher size has a competitive advantage as it could have access to a lower cost of capital to source its financing, a more efficient supply chain management, and a larger economies of scale that could potentially leads into a higher profitability. Some studies shown that the increase in firm size could lead into higher financial performance (Philip, 2013; Ashraf et al., 2017; Mohsin Hassan Alvi, 2015; Prasetyantoko et al., 2009). However, its turns out that it was not always the case. As every companies has their own risk, having an enormous amount of assets could lead into a two-edged sword as it is more prone towards the changes on macroeconomic condition. Several studies shown that firms size does not have significant effect towards its financial performance (Prasetya Margono et al., 2021; Rusdiah Hasanuddin et al., 2021; Sudrajat et al., 2020).

2.3 Internal Financial Ratios & Market Ratios in Evaluating ROE

The combination of internal and financial ratios found to present a holistic view of a company financial statement. Analyzing these ratios altogether allows decision makers in gaining in-depth understanding on company's operational efficiency, financial stability, and profitability, and market perception (Brigham, 2019). The study suggests that strong liquidity and profitability ratios with low price-earnings ratios signals undervalued investment opportunities. This result supported prior research by Fabozzi (2018) who emphasized the need of combining several ratio types in order to improve the overall financial analysis and produce a more accurate evaluation of the firm's performance and worth.

Although the use of internal financial and market ratios in assessing financial success is widely acknowledged, a body of literature exists that highlights conflicting findings. In contrast to Ohlson (1980) contention that the predictive potential is limite , Altman's foundational study demonstrated that financial ratios may reliably forecast bankruptcy (1968). Similar to Beaver (1996), Deakin (1972) disagreed with Beaver's conclusions that ratios might be used to forecast financial trouble. The research of Fama and French (E. F. , & F. K. R. Fama, 1992) and Richardson et al. (2005) discovered differences in the effectiveness of utilizing ratios to forecast future profitability in the field of profitability analysis.

The market ratios are also subject to this contradictory evidence. While studies like Basu (1977) and Campbell (1998) indicated that the price-earnings (P/E) ratio frequently fails to convey future earnings possibilities, the P/E ratio is still widely regarded as a valid measure of stock value (Graham et al., 1934) Another common market ratio, the dividend yield, has also been criticized. Black (1976) suggested that it was irrelevant.

In conclusion, while widely acknowledged, the use of internal financial and market ratios in assessing financial success is not without conflicts, raising questions about their broad application and dependability. Thus, this research will become an extra literature where it assesses the influence of internal financial ratios and market ratios toward non-financial listed companies in Indonesia. Furthermore, this research will also assess the effect of firms' classification on the financial performance on each classification.

2.4 Research Hypothesis

Prior research has not specifically examined the impact of market ratios and internal financial performance on a firm's financial profitability based on its size classification in Indonesia. Furthermore, there is a lack of consensus regarding the influence of financial and market ratios on Return on Equity (ROE). Therefore, this study aims to propose a hypothesis that addresses the research question, which will expand our knowledge of how financial and market ratios affect ROE in publicly listed non-financial companies in Indonesia.

2.4.1 Financial Performance Metrics to Return on Equity

Firstly, this research developed hypotheses of the relationship between each financial indicators based on DuPont model added with current ratio towards the Return on Equity (ROE) in the same year. This research will use four proxies to measure its effect to ROE. Those proxies are Net profit Margin (NPM), Financial Leverage (FL), Assets Turnover (AT), and Current Ratio (CR). The hypothesis on each proxy are as follows:

H01= There is no significant effect of overall Independent variable on a firm's Return on Equity (ROE) in the same year

H1= There is a significant effect of overall Independent variable on a firm's Return on Equity (ROE) in the same year

H02= There is no significant effect of Net Profit Margin (NPM) on a firm's Return on Equity (ROE) in the same year

H2= Net Profit Margin (NPM) has a significant effect on a firm's Return on Equity (ROE) in the same year

H03 = There is no significant effect of Financial Leverage (FL) on a firm's Return on Equity (ROE) in the same year

H3 = Financial Leverage (FL) has a significant effect on a firm's Return on Equity (ROE) in the same year

H04 = There is no significant effect of Assets Turnover (AT) on a firm's Return on Equity (ROE) in the same year

H4 = Assets Turnover (AT) has a significant effect on a firm's Return on Equity (ROE) in the same year

H05 = There is no significant effect of Current Ratio (CR) on a firm's Return on Equity (ROE) in the same year

H5 = Current Ratio (CR) has a significant effect on a firm's Return on Equity (ROE) in the same year

2.4.2 Market Ratios to Return on Equity (ROE)

Subsequently, this research also developed hypotheses of the relationship between each market ratio to Return on Equity (ROE). This research will use two commonly used market ratios proxies in Indonesia, which are Price to Book Value ratio and Price to Earnings ratio. The hypotheses are as follows:

H06 = There is no significant effect of Price to Book Value (PBV) on a firm's Return on Equity (ROE) in the same year

H6 = Price to Book Value (PBV) has a significant effect on a firm's Return on Equity (ROE) in the same year

H07 = There is no significant effect of Price to Earnings (PE) on a firm's Return on Equity (ROE) in the same year

H7 = Price to Earnings has a significant effect on a firm's Return on Equity (ROE) in the same year

2.4.2 Research Framework

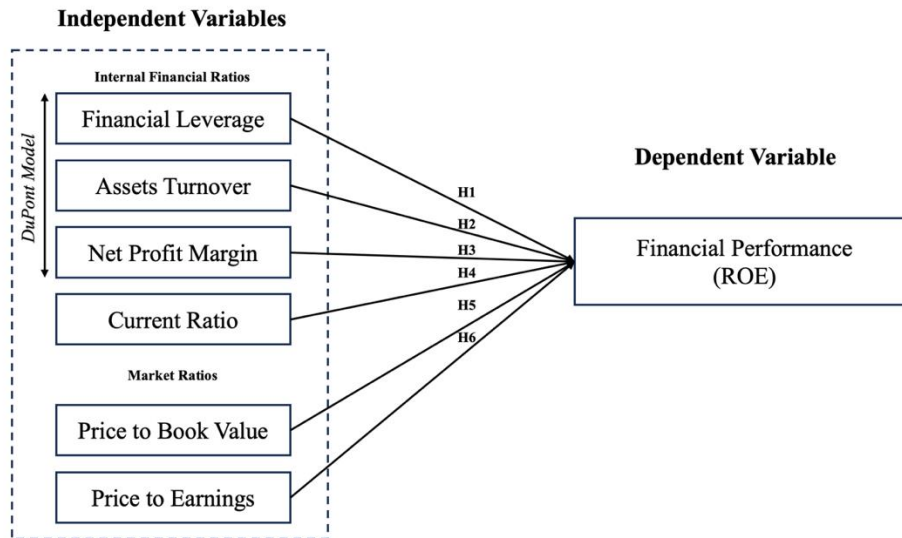


Figure 2.1 Research Framework

All of the following hypothesis leads into the construction of the conceptual framework as shown above. Inspired by Bunea's (2019) innovative approach, this research aims to apply the same methodology of firm classification in the context of non-financial publicly listed firms in Indonesia. It is anticipated that this study will contribute valuable insights into the relationship between financial ratios and firm performance, particularly within the Indonesian market.

III. RESEARCH METHODOLOGY

3.1 Research Design

This study starts with a research question. As indicated in Chapter 1, the research would concentrate on non-financial listed firms in Indonesia. Furthermore, various criteria for the firm's inclusion will be covered in this research. This research use 3 years yearly time series from 2017 to 2019, since it has the sweet spot based on the economics condition, time, and amount of firms required to do the research. Also, Companies with incomplete report will be excluded from this research. After determining the scope and limitations on variables, sample, and time frame of the research, the theoretical foundations are constructed to support the development of hypothesis. The next process is to process the secondary data and analyzed it. Finally, the conclusion and recommendation are build based on the result of the analysis.

3.2 Operations Variable

There will be two types of variables that will be discussed in this research. Those are independent and dependent variables. Independent variables impact the values of other variables, whereas dependent variables have their values affected by other variables (Andrade, 2021). Provided below it the summary of all variables used in the research:

Table 3.1 Operations Variable

Types	Variable	Code	Units	Expected Relationship
Independent Variable				
Internal Financial Ratios	Net Profit Margin	NPM	%	Positive Correlation

Market Ratios	Financial Leverage	FL	€	Positive Correlation
	Assets Turnover	AT	€	Positive Correlation
	Current Ratio	CR	€	Positive Correlation
	Price to Book Value	PBV	€	Positive Correlation
	Price to Earnings	PE	€	Negative Correlation
Dependent Variable				
Firms Financial Performance	Return on Equity	ROE	%	n/a

3.3 Independent Variable

Several firm ratio metrics will be used to assess the financial performance proxy of companies in Indonesia. The use of Net Profit Margin, Financial Leverage, Assets Turnover, Current Ratio, Price to Book Value, and Valuation Ratios to assess financial performance are aligned with the study previous study (Bauman, 2014; Bawono et al., 2023; Bunea et al., 2019a; Doorasamy, 2016; Prabowo et al., 2020). Inspired by these previous study, each of the independent variable used in the research are discussed further below:

3.3.1 Net Profit Margin

Net Profit Margin is a metric that calculates the proportion of each penny earned from sales that remains after all costs and expenses, including interests, taxes, and preferred stock dividends, have been subtracted (Gitman et al., n.d.). A higher net profit margin indicates meaning that the company is more efficient in allocating at transforming the sales into profits. Oftentimes, this metric is used as the gauge calculation of company's efficiency success.

3.3.2 Financial Leverage

Financial leverage measures a company's use of debt to finance its operations and investments. Financial leverage refers to the utilization of external, borrowed funds to invest in a business's fixed assets, allowing the company to finance its operations and growth (Taqi et al., n.d.). It is an indicator of the company's financial risk, as it reflects the extent to which a company relies on borrowed funds to finance its activities. High financial leverage can increase the potential for higher returns on equity but also increases the risk of financial distress or bankruptcy in the event of economic downturns or financial difficulties.

3.3.3 Assets Turnover

Assets Turnover indicates the efficiency the firm uses its assets to generate sales (Gitman et al., n.d.). It is calculated by dividing sales with total assets during a given period. This calculation communicates the amount of revenue produced per unit of assets owned by the company. A higher assets turnover ratio indicates that a company is utilizing its assets more efficiently to generate revenue, while a lower ratio suggests that the company may not be using its assets effectively. The importance of Assets turnover not only stops on operational efficiency. It also has an implications for a company's Return on Equity (ROE) where there is a significant relationship between asset turnover to ROE as it is embedded inside of the DuPont models (Helfert, 2001).

3.3.4 Current Ratio

Current ratios measures the firm's ability to meet its short-term obligations. It is calculated by dividing the current (liquid) assets towards the current liability during a given period. It reflects the degree of liquidity of a company (Gitman et al., n.d.). Liquidity refers to the solvency of a firm's financial position to pay its bill. A higher liquidity indicates that the company has enough assets to cover its short-term operational obligation. A low current ratio might creates concern as it indicates potential issues in meeting short-term obligations, which may concerns creditors, investors, and other stakeholders. It is need to be noted that each industry has their own benchmark on a sweets spot on the current ratio based on its business model. The importance of firm's current ratio goes beyond liquidity evaluation. A study by Padachi suggest that current ratio is linked with company's financial stability, the end-to-end operational efficiency of the supply-value-chain, and the profitability of the company.

3.3.5 Price to Book Value ratio

Price to book value ratios is calculated by dividing the market value of equity to the book value of equity. In practices, it is being used as one of the mismatch indicator for undervalued company. The rationale behind PBV ratio stems from fundamental investing that market value should ideally valued at its book value. A higher PBV ratio (>1) indicates that the company is valued higher than its book value. Investors usually find companies with lower value of equity in accordance to its book value of equity. It is considered as an investment opportunities as there is a mispricing of the company stock price. Conversely, a higher PBV might deter some investors as they consider the company valued higher than its intrinsic value. A study by Fama suggest that PBV is an effective predictor of future returns, creating a 'value effect' that influence company to generate higher future returns.

3.3.6 Price to Earnings ratio

The Price-to-Earnings (PE) ratio is a financial valuation indicator used by investors to evaluate a company's stock value relative to its earnings per share. From the investor perspective, it gauges the market expectation towards the company future growth. In essence, the investor will be willing to buy the company stock in a higher PE ratio if they expect that the future earnings would be higher as well. Conversely, a low PE also indicates that the market has a lower expectations for the company's future earnings growth. A study by Campbell reveals that the P/E could predict long-term stock returns. The study showed that high P/E ratio will make the future long-term returns to be lower, vice versa. the P/E ratio could be calculated by dividing the market price per share of a stock by its earnings per share (EPS).

3.4 Dependent Variable

The dependent variable on the research will use ROE (return on equity) as a proxy towards the firm's profitability aspect.

3.4.1 Return on Equity (ROE)

Return on Equity measures the return earned on the common stock-holder's investment in the firm. It is calculated by dividing the earnings available for common stockholder by common stock equity. ROE is considered one of the most important ratios for investor as it gauges the dollar return on every penny that they invested.

3.5 Data Source and Collection Method

After examining & defining the theoretical foundation & hypothesis, data was gathered. This research used secondary data through Refinitiv platform. Refinitiv is an open access platform where users could access real-time market data gathered by the platform. The reason on using the platform is to since this platform is aligned with the main objective to examine the publicly listed firms that have open data. Thus, the research has the same perspective on how retail investor obtained and received information on publicly listed companies in Indonesia.

All of the independent and dependent data was gathered using Refinitiv database. However, there are several data that needed to be calculated through combination of the data gathered to obtain the preferred variables.

3.5.1 Population Sample

Table 3.2 Sample of Population

Research Sample	
All Indonesia listed firms that went for an IPO before 1st January 2018	548
Excluded financial listed firms	456
Excluded firms with negative equity	418
Excluded delisted firms & firms with incomplete financial data	284
Final Sample	284
Total observations (4 x 284)	1136

This research will focused on non-financial firms in Indonesia Stock Exchange with several reasons as below:

1. Financial firms have different characteristics in terms of its financial structures, regulations, and profitability measurement.
2. All non-financial firms are included as there the research will assess based on the overall market and industry specific.

As the reseach will use purposive sampling method to assess the effect of firm size classification on return on equity, there are several additional criterias that will be included such as follows

1. Firms must continuously achieve positive earnings throughout the designated time period
2. Firms must not been delisted throughout the designated time period.

Thus, the main object of this research this research will be a set of 284 non-financial listed firms in Indonesia.

3.6 Data Analysis

This research examines 284 firms with a time period of 2018- 2021 in a yearly basis. From this specification, the method analysis that will be used is Panel data analysis since it assess the correlation between the independent and dependent variable with time series and cross-sectional data. Below are some advantages of using Panel Data analysis.

3.6.1 Statistical Model

Before performing further statistical analysis, the research construct the statistical model of this research, The statistical model of this research using panel data as follows:

$$ROE_{it} = a_0 + a_1CR_{it} + a_2AT_{it} + a_3FL_{it} + a_4NPM_{it} + a_5PBV_{it} + a_6PE_{it} + \epsilon_{it} \quad (2)$$

Where:

ROE _{it}	= Return on Equity for firm I at time t that is represented by Return on Equity
a ₀	= intercept parameter
a ₁ ,a ₂ ,a ₃ ,a ₄ ,a ₅ ,a ₆	= slope parameter
AT _{it}	= Assets Turnover for firm i at year t
FL _{it}	= Financial Leverage for firm i at year t
NPM _{it}	= Net Profit Margin for firm I at yeat t
PBV _{it}	= Price to book value for firm i at year t
PE _{it}	= Price to earnings for firm i at year t
ε _{it}	= error term

IV. RESULT/FINDING

4.1 Data Summary

Drawing inspiration from the Fama French model, the author has classified the research sample into three categories based on total assets, as elaborated in detail in Table 4.1. This classification aims to shed light on the underlying determinants that influence which financial ratios significantly affect the return on equity in the overall model as well as the top, middle, and low asset models.

Table 4.1 Firms Classification

Types	Description
Overall	Overall non-financial listed firms in Indonesia
Top	Firms with an average total asset value above 7 trillion Rupiah
Middle	Firms with an average total asset value between 1.5 trillion and 7 trillion Rupiah
Low	Firms with an average total asset value below 1.5 trillion Rupiah

Table 4.2 Descriptive Statistics

Overall Model						
Variable	Labels	Observation	Mean	Std. Dev.	Min.	Max.
Return on Equity	ROE	1136	0.031142	0.3420287	-4.135638	3.386199
Financial Leverage	FL	1136	2.369	2.4318602	-12.291	36.466
Net Profit Margin	NPM	1136	-0.017884	0.4939868	-7.550504	2.218024
Assets Turnover	AT	1136	0.830281	0.7197609	0.004245	5.035922
Current Ratio	CR	1136	2.21011	2.3392173	0.04706	32.21454
Price to Book Value	PBV	1136	1.7231	2.3671929	-3.58	28.8839
Price to Earnings	PE	1136	13.099	40.2234452	-179.324	286.49

Table 4.2 Descriptive Statistics (Cont.)

Top

Variable	Labels	Observation	Mean	Std. Dev.	Min.	Max.
Return on Equity	ROE	392	0.06029	0.2604573	-2.89665	2.18155
Financial Leverage	FL	392	2.592	2.1813245	-12.291	25.849
Net Profit Margin	NPM	392	0.0507	0.3614382	-2.41129	2.21802
Assets Turnover	AT	392	0.652516	0.5954979	0.004245	3.255245
Current Ratio	CR	392	1.9099	1.6578041	0.1737	16.0662
Price to Book Value	PBV	392	1.7195	1.8573791	-3.58	16.1283
Price to Earnings	PE	392	15.286	34.2027962	-122	270.783

Middle

Variable	Labels	Observation	Mean	Std. Dev.	Min.	Max.
Return on Equity	ROE	420	0.031663	0.4215072	-4.135638	3.386199
Financial Leverage	FL	420	2.234	2.6380745	-1.797	36.466
Net Profit Margin	NPM	420	-0.038381	0.5017962	-5.612004	0.855972
Assets Turnover	AT	420	0.9082	0.7716788	0.0154	5.0359
Current Ratio	CR	420	2.24804	2.0885053	0.04706	19.06741
Price to Book Value	PBV	420	2.0701	3.1490346	-0.21	28.8839
Price to Earnings	PE	420	11.78	41.5686972	-179.324	225.195

Low

Variable	Labels	Observation	Mean	Std. Dev.	Min.	Max.
Return on Equity	ROE	324	-0.004801	0.3100836	-2.194003	1.431472
Financial Leverage	FL	324	2.274	2.4290798	-2.171	24.917
Net Profit Margin	NPM	324	-0.07429	0.6027078	-7.5505	1.86478
Assets Turnover	AT	324	0.94437	0.7479068	0.01567	4.51002
Current Ratio	CR	324	2.52416	3.1674384	0.07609	32.21454
Price to Book Value	PBV	324	1.2778	1.5150154	-2.13	11.8826
Price to Earnings	PE	324	12.161	44.9298264	-119.095	286.49

Overall Findings:

The dataset encompasses a broad range of firms, exhibiting considerable variation across key financial measures. The firms show a mean Return on Equity (ROE) of 0.031, though this metric ranges from a minimum of -4.136 to a maximum of 3.386. The mean Financial Leverage (FL) is 2.369, with a minimum and maximum of -12.291 and 36.466, respectively. Net Profit Margin (NPM) displays a mean value of -0.018, with a large variation seen from -7.55 to 2.218. The average Assets Turnover (AT) is 0.83, Current Ratio (CR) is 2.21, Price to Book Value (PBV) is 1.72, and Price to Earnings (PE) is 13.1, all demonstrating wide-ranging values within the dataset.

First Quartile (Top):

The top quartile (Q1) of firms, representing those with the largest assets, demonstrates specific trends. The mean ROE is slightly higher than the overall mean at 0.060. FL, at a mean of 2.592, is slightly above the overall mean, whereas NPM is significantly positive at 0.051, contrasting the overall negative mean.

Firms in the first quartile, those with the largest assets, seem to be more profitable (as indicated by a higher ROE and NPM) and leverage more compared to the overall average. This could suggest that these firms are effectively using their financial resources to generate profit and are more comfortable taking on debt to finance their growth, possibly due to better access to credit markets or stronger creditworthiness.

Second Quartile (Middle):

The second quartile (Q2), or mid-sized firms, reveal a slightly lower mean ROE of 0.032 and an NPM of -0.038. These firms also possess a slightly lower mean FL of 2.234. Nevertheless, the mean PBV and PE of these firms are slightly higher than the overall figures, suggesting a higher valuation or potential overvaluation.

Mid-sized firms (Q2) have a slightly lower profitability (as indicated by ROE and NPM) and use less leverage (as indicated by FL) than their larger counterparts. However, their slightly higher PBV and PE ratios suggest that these firms are valued more highly in the market, possibly due to perceived growth potential, lower risk, or other non-financial factors that are positively viewed by investors.

Third Quartile (Low):

The bottom quartile (Q3) encompasses firms with the smallest assets. These firms display a negative mean ROE of -0.005 and an even lower NPM of -0.074. However, they do maintain a relatively high mean FL of 2.274 and an increased mean CR of 2.52, suggesting a higher short-term liquidity relative to the other quartiles.

Firms in the third quartile, those with the smallest assets, seem to struggle with profitability but maintain higher liquidity, as evidenced by the higher CR. The negative ROE suggests they are not effectively generating profit with shareholders' equity, and the negative NPM points to challenges in translating sales into net profit. The high liquidity might be a conservative approach to ensure they can meet short-term obligations, especially in the face of profitability challenges.

V. DISCUSSION

This section discusses the result of the research from the development of the theoretical foundation collected in the Chapter 2. The discussion will be divided into two sections, which are internal financial ratios and market ratios. In each of the section, there will be a further analysis based on each of the firm size classification.

Before digging deeper into each section, the result of the analysis based on the hypotheses are as follows:

Table 5.1 Result Summary

Hypothesis	Result			
	Overall	Top	Middle	Low

H1	There is a significant effect of overall Independent variable on a firm's Return on Equity (ROE) in the same year	v	v	v	v
H2	Net Profit Margin (NPM) has a significant effect on a firm's Return on Equity (ROE) in the same year	v	v	v	-
H3	Financial Leverage (FL) has a significant effect on a firm's Return on Equity (ROE) in the same year	v	v	v	v
H4	Assets Turnover (AT) has a significant effect on a firm's Return on Equity (ROE) in the same year	v	v	v	-
H5	Current Ratio (CR) has a significant effect on a firm's Return on Equity (ROE) in the same year	-	-	-	-
H6	Price to Book Value (PBV) has a significant effect on a firm's Return on Equity (ROE) in the same year	-	-	-	v
H7	Price to Earnings (PE) has a significant effect on a firm's Return on Equity (ROE) in the same year	-	-	-	-

Based on the overall result of the analysis, there are two variables that lead into an insignificant result. The first variable is current ratio and the second one is price to earnings ratio. Referring to the previous research, this results contradict the linear relationship of Price to Earnings ratio toward firms financial performance which in this case is represented by Return to Equity. On the contradict, the non-significant result of Assets Turnover aligned with the prior researches. Furthermore, this research aligned with the research conducted by Bunea where ROE indicators influenced differently based depending on the firm size. The results give a new perspective on the condition of how financial ratios affect non-financial publicly listed firm's profitability in Indonesia. The overall result shows the characteristics of financial ratios in Indonesia.

5.1 Relationship between Internal Financial Ratios and Return on Equity

Based on the relationship, a hypothetical situation in which the increase of internal financial ratios would have a favorable impact on the firm's financial performance. Referring to previous research, internal financial ratios based on DuPont analysis have a significant impact on the firm's financial performance, while the Current Ratio does not. Our research also supports this, as the Current Ratio is the only indicator that leads to an insignificant result. On the other hand, the DuPont analysis model has proven to be a useful indicator for non-financial listed firms in Indonesia, as Financial Leverage (FL), Net Profit Margin (NPM), and Assets Turnover (AT) have a significant relationship with ROE in the industry, top, and middle levels.

Based on the results of the previous sub-chapter regression, the effect of internal financial ratios on ROE differs depending on the size of the firms. Furthermore, this result aligns with Bunea's findings, where only one internal financial ratio (Financial Leverage) has a significant effect on ROE. In Bunea's study, none of the indicators showed a significant relationship with ROE. This suggests that the impact of DuPont-based financial ratios has a weaker relationship with companies categorized as having the lowest amount of assets in the context of non-financial listed firms in Indonesia.

For investors looking to invest in publicly listed non-financial firms in Indonesia, these findings offer insights into their decision-making option. Our research suggest that traditional financial ratios, such as the Current Ratio, may not be as indicative of a firm's financial performance for publicly non-financial listed firms in Indonesia. Instead, investors should pay closer attention to DuPont-based financial ratios, particularly Financial Leverage, Net Profit Margin, and Asset Turnover, as these have shown a significant relationship with ROE, especially for larger firms.

However, it's important to note that these ratios may not be as predictive for smaller firms with lower asset levels. In these cases, investors may need to consider other factors, such as the firm's market position, growth potential, and the broader economic and regulatory environment in Indonesia.

5.2 Relationship between Market Ratios and Return on Equity

Market ratios are influenced by public sentiment, which determines a company's valuation based on the collective belief of its worth. This perception varies across countries, as individuals' traits, cultural backgrounds, and investment considerations differ. Our analysis reveals that among all market ratios, only the Price to Book Value (PBV) has a significant impact on the Return on Equity (ROE) on the low segment.

This suggests that the PBV ratio, which compares a company's market price to its book value, plays a crucial role in influencing the profitability of a company in terms of its equity for firms with low assets value. Therefore, investors might want to pay particular attention to this ratio when making investment decisions. It's also worth noting that while other market ratios may not directly affect ROE, they could still provide valuable insights into other aspects of a company's financial health and performance.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The purpose of this research is to investigate the effect of several financial ratios to the firm's financial performance which is represented by Return on Equity (ROE). The research uses 284 yearly data from publicly listed non-financial firms in Indonesia from 2018 – 2021. The research used panel data with fixed effect and robust standard errors technique. The finding from this research concludes that there are different types of financial ratios that affect firms' financial performance depending on the firm's assets amount classification. This research also classified the independent variable into two types: internal financial ratios and market ratios.

In conclusion, our study reveals that different types of financial ratios have different degrees of influence on the financial performance of publicly listed non-financial firms in Indonesia, as represented by the Return on Equity (ROE). It is found that traditional financial ratios, such as the Current Ratio, may not provide a significant insight into the financial performance of these firms. Instead, DuPont-based financial ratios, specifically Financial Leverage, Net Profit Margin, and Asset Turnover, show a stronger relationship with ROE. However, this association tends to be more pronounced for larger firms and is less predictive for smaller firms with lower asset levels.

Simultaneously, market ratios play an important role in shaping the perception of a company's value, which can, in turn, influence the firm's financial performance. This effect is particularly visible in the case of the Price to Book Value (PBV) ratio, which has shown a significant impact on the ROE for firms with lower asset values. Hence, potential investors may benefit from focusing on DuPont-based financial ratios and market ratios like PBV when making investment decisions concerning Indonesian publicly listed non-financial firms.

6.2 Recommendations

6.2.3 Recommendation for Practitioner

This research finds that both internal financial ratios and market ratios significantly determine a firm's profitability. Their impacts, however, vary based on the size of the firm. Ideally, firms with larger total assets could secure more accessible and lower-cost capital to fund their projects. However, the study indicates that the financial leverage ratio influences all companies, irrespective of their size. This suggests that the capital structure's proportion significantly affects a firm's profitability.

As for the market ratio, it appears to only influence firms within the lowest total assets category. Among all market ratios, the Price to Book Value (PBV) ratio is the only one with a significant impact on a firm's financial performance. This result suggests that investors might want to shift their focus to the PBV ratio, instead of other financial ratios, when selecting companies to invest in. For company management, the focus should be on

improving DuPont-based financial ratios, as these have been found to significantly correlate with a firm's profitability. However, investor should take into account other factors such as macroeconomic and firm's management in making an investment decision.

6.2.4 Recommendation for Future Research

While this research provides valuable insights, it does have some limitations that can be addressed in future studies. Firstly, it does not incorporate macroeconomic conditions such as GDP growth, inflation, extraordinary events, and real interest rates as control variables. Including these macroeconomic indicators could deepen our understanding of the effects of internal financial and market ratios on a firm's profitability.

Secondly, this research does not account for the business cycle each company is in. A more comprehensive analysis that identifies the current business cycle of a company could yield more robust results on how internal financial ratios and market ratios affect the firm's profitability, depending on the company's growth rate and size.

Additionally, this study only focuses on non-financial companies listed in Indonesia without considering industry-specific factors. Since each industry possesses unique characteristics that influence its internal financial ratios and market ratios, a further analysis based on each industry would provide a more comprehensive understanding of the research objectives and enrich the literature of this study.

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Sustainable Collaboration in Business,
Technology, Information and Innovation

Factors Influencing the Intention to Invest in Sharia *Peer to Peer Lending* (P2PL)

Melanie Sri Handayani¹, Nurdin Sobari²

^{1,2} Faculty of Economics and Business Universitas Indonesia, Jakarta, Indonesia

Abstract

Introduction/Main Objective: This study proposes a research framework that consist of two dimensions: behavior and technological attributes, to determine the factors influencing the intention to invest in Sharia P2PL from technology acceptance perspective. The study explores the relationship between these attributes. **Background of the Problem:** Sharia P2PLs have promising potential to grow, since they are expected to be able to participate in meeting MSME funding needs that traditional banks have not met. Various previous studies have discussed the determining factors in the use of fintech in general, but only a few studies specifically discuss the Sharia P2PL. Therefore, this study attempts to fill the gap by conducting a quantitative empirical analysis regarding the determinants to invest in Sharia P2PL from technology acceptance perspective. **Research gaps/Novelty** The work in this study adds to the knowledge by integrating relevant technological and behavioral attributes. This study contributes to the understanding about the factors affecting the intention to invest in Sharia P2PL, as there is scarcity of studies in this area. **Research Methods:** Primary data was collected through an online survey involving 283 internet users who know Sharia P2PL and analyzed by using SEM as the empirical approach. **Findings/Results:** The results demonstrate that social influence, trust perception, usefulness perceptions, security and responsiveness significantly influence the intention to invest in Sharia P2PL. At the same time, technological attributes significantly impact the behavioral attributes. **Conclusions and implications:** The result of study will help Sharia P2PLs to expand their business. Sharia P2PL should improve its technology (security and responsiveness) aspect and concentrate more on educating potential investor about the benefit, to create trust and social affirmations to invest in Sharia P2PL.

Keywords: Financial Technology; Peer to Peer Lending; Sharia Peer to Peer Lending, Technology Acceptance Model (TAM).

I. INTRODUCTION

The rapid development of technology and the Covid-19 pandemic have encouraged the increasing innovation in Indonesian daily life, including in the financial sector. One innovation that has increased is the adoption of financial technology (fintech) that offers technology in financial products and services. The characteristics of fintech, which are more dynamic, faster, flexible, and easily accessible, are more attractive than traditional banking (Singh et al., 2020). In Indonesia, fintech's development is relatively fast. Peer to Peer Lending (P2PL) has the largest share among other types of fintech (payment, blockchain/crypto, personal finance, insurtech, crowdfunding, comparison, and POS services), which is 50% (FintechNews, 2021).

According to data published by Otoritas Jasa Keuangan (Statistic Fintech, 2023), lending to the productive sector through P2PL continues to increase. In February 2023, there were 102 registered P2PL; among that, 7 were Sharia P2PL. The growth of total asset is increasing for Sharia P2PL (45% yoy) and conventional P2PL (55% yoy). Sharia P2PL has promising potential to grow and is expected to be able to participate in meeting MSME funding needs that traditional banks have not met.

There are number of studies that examine the factors that influence people intention to invest in conventional P2PL, like (F. Puteri et al., 2018), (I. Ichwan & R. Kasri, 2019), (Susanti et al., 2020) and (Vitriani & Gayatri, 2021). In term of sharia, only a few studies have been performed to explores the factors influence people intention to use sharia fintech services, like Shaikh et al.(2020), (Darmansyah et al., 2021), (Khan et al., 2022) and (Zakariyah et al., 2023). However, there are not many studies that specifically discuss the intention to invest in Sharia P2PL. Therefore, this study attempts to contribute to the gap in knowledge by gardening the perception of internet user in Indonesia regarding the intention to invest through Sharia P2PL.

II. LITERATURE REVIEW

In Indonesia, the legal basis of P2PL is the OJK's Regulation No.10/POJK.05/2022 concerning Information Technology-Based Co-Funding Services. This regulation applies to every type of fintech lending, both sharia and conventional. For Sharia P2PL, other provisions referred to the Fatwa of DSN MUI No.117/2018 concerning Information Technology-Based Financing Services Based on Sharia Principles. According to this fatwa, Sharia P2PL connects lenders with borrowers through an electronic system using the internet network, based on sharia principles. The lending and borrowing mechanism in Sharia P2PL shown in Figure 1 as follows:



Figure 1. Sharia P2PL Mechanism(Baihaqi, 2018)

While conducting the lending and borrowing, there are several options for contract. The lenders can use wakalah bi al-ujrah contract when they invest their money. Meanwhile, the borrower can use wakalah bi al-ujrah, murabahah, mudharabah, musyarakah, ijarah, or qardh contract, depend on the financing model that they used (Baihaqi, 2018).

Studies concerning the intention to adopt fintech are relatively new since fintech only became popular after 2008 (I. Ichwan & R. Kasri, 2019). In Indonesia, the first Sharia P2PL was established on 2019. Numerous studies have been conducted to explore the determinant that influence people's intention to use Fintech. On borrower side, Susanti et al. (2020) found that the factors influencing borrowers in using peer-to-peer lending platform are trust, perceived risk, utilitarian value, and perceived cost. Meanwhile, the ease-of-use factor showed insignificant results. In Malaysia, Shaikh et al.(2020) found that perceived ease of use, perceived usefulness, and consumer innovativeness influence bank users to adopt Islamic Fintech services.

On the investor side, (Zakariyah et al., 2023) found that perceived trust and social norms determined Malaysian waqf institution to adopt fintech as a comprehensive waqf management tool. (F. Puteri et al., 2018) found that potential risk and trust play important role on intention to invest in P2PL. Furthermore, by improving the fintech platform easier to use, increasing literacy, and building trust, Indonesia millennial intention to invest in P2PL might be increased (I. Ichwan & R. Kasri, 2019). Meanwhile, (Abidat et al., 2019) revealed that perceived benefits, investor religiosity level, and trust in the sharia P2PL platform affect people intention to invest through sharia P2PL.

Technological attributes play significant role in fintech adoption. (Khan et al., 2022) found that the higher security level and user friendliness in reaching financial technology services, the higher people intentions to use financial technology service.

With these perspectives, the following subsection will elaborate on hypotheses development.

a. Responsiveness (Rs)

Singh (2020) found that responsiveness and security indirectly influence the actual use of fintech and were mediated through ease of use and usefulness. It has been shown to have significant impact on customer satisfaction and trust (Boonlertvanich, 2019). (Namahoot & Laohavichien, 2018) found that responsiveness or service quality significantly influence risk and trust, and indirectly influence the intention to use internet banking in Thailand. Therefore, the authors proposes:

H1: *Responsiveness (Rs) influence Trust (H1a), Risks Perception (H1b), Usefulness Perception (PU) (H1c), Ease of Use Perception (PEOU) (H1d), and Social Influence (SI) (H1e).*

b. Security (Sc)

Skepticism regarding security of online financial transaction is a major deterrent. Because there is no face-to-face interaction while utilizing fintech services, users experience more risk and uncertainty. Security become the main effective tool for reducing risk and uncertainty (Singh et al., 2020). Therefore, fintech must ensure that their platform has sufficient protection against security attacks. (Carlos Roca et al., 2009) found that the improvement of the security aspect will enhance user's trust. (Singh et al., 2020) suggest fintech company to improve the system security features to reassure fintech users that the services are safe to do financial transactions. This suggestion is based on (Pavlou, 2003) which found that the security of online transactions is one of the key factors to influencing belief about safety while doing financial transactions. Thus, the author proposes:

H2: *Security (Sc) influence Trust (H2a), Risks Perception (H2b), Usefulness Perception (PU) (H2c), Ease of Use Perception (PEOU) (H2d), and Social Influence (SI) (H2e).*

c. Trust (Tr)

Trust can be defined as a variable indicating individual confidence level to system (Yohanes et al., 2020). Investor trust in P2PL's platform is a dimension that significantly influences the lender to invest through P2PL (Abidat et al., 2019). Therefore, the platform has to guarantee and maintain investor's trust in it (Vitriani & Gayatri, 2021), (I. Ichwan & R. Kasri, 2019). So, this study proposes:

H3: Trust (Tr) influence the intention to invest through Sharia P2PL.

d. Risk Perception (PR)

Online investments have comparatively high potential risk. Fraud and failure to pay are two possible risk that might eliminate the money that investor has invested. Hu et al. (2019) found that users' perceived risk has a substantial role in reducing the level of trust in Fintech services. Risk may have reduce investor decision to do transaction or invest through Sharia P2PL platform (Abidat et al., 2019). Therefore, this study proposes:

H4: Risk Perception (PR) influence the intention to invest through Sharia P2PL.

e. Usefulness Perception (PU)

This variable reflects how much a person believes that using the technology will enhance one's performance. Usefulness is a crucial factor in deciding the acceptance of new technology (Venkatesh & Davis, 2000). (I. Ichwan & R. Kasri, 2019) found that there is a significant relationship between Indonesian millennial's perceptions of P2PL's benefits to be gained and their intention to invest in it. So, this study proposes:

H5: Usefulness Perception (PU) the intention to invest through Sharia P2PL.

f. Ease of Use Perception (PEOU)

Ease of use perception is the extent to which one believes that using the technology won't require much effort. (Venkatesh & Davis, 2000). During the development process of technology, user shouldn't experience difficulties in understanding and using the technology, or usage will decrease significantly (Yu, 2012). Singh (2020) found that perceived ease of use become the second significant factor in influencing the intention to use FinTech services. Thus, the study proposes:

H6: Ease of use Perception (PEOU) influence the intention to invest through Sharia P2PL.

g. Social Influence (SI)

For disruptive innovations such as Fintech and P2PL, it is assumed that a person will consults their social circle about new technologies and is open to their advice. When people lack first-hand experience, people give more importance to others' opinions and perceptions about new technology (Singh et al., 2020). Alenizi (2022) and Rahi et al. (2019) found that *social influence* play important role to adopt *internet/mobile banking* service. Therefore, it is crucial to consider how peers, family, and friends think and feel about using new technology (Venkatesh & Davis, 2000). Thus, the study proposed:

H7: Social Influence (SI) influence the intention to invest through Sharia P2PL.

The framework research shown in Figure 2 as follow:

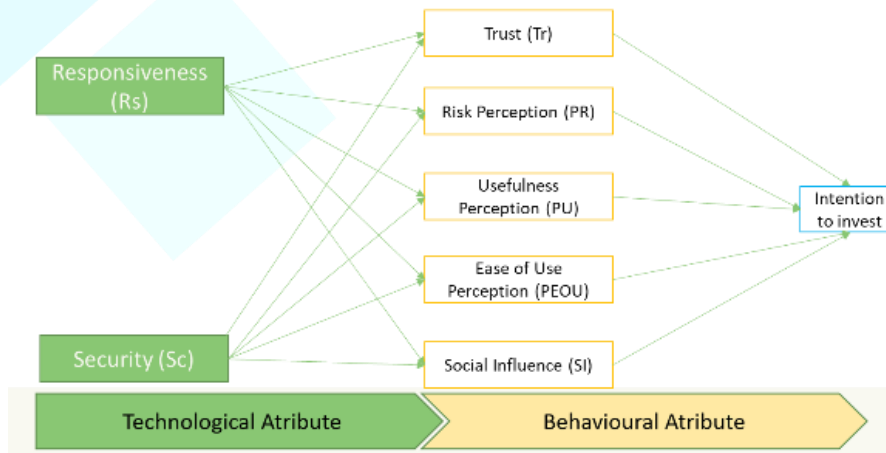


Fig 2. Research Theoretical Framework

III. RESEARCH METHODOLOGY

This study uses quantitative methodology and the target respondents of this research are people who knows Sharia P2PL but never invest in Sharia P2PL. For this study, the purposive sampling method of the non-probability sampling technique is selected as the sampling technique, because the sampling units of the population are unknown. Moreover, purposive sampling is suitable to meet the respondents' requirements.

The questionnaire is used as a research instrument and consist of 27 statements. 5-point-Likert scale is used to assess each statement, with "5" denoting a strong agreement and "1" indicating a strong disagreement. To test whether the statements could be understood and answered by prospective respondents, the readability tests were conducted before the questionnaire distributed online through social media.

Based on (F. Hair Jr et al., 2014) theory, the minimum sample size needed for a 27-item questionnaire is 135 samples. Thus, attempts were made to ensure that this minimum respondent was exceeded. The data collection was placed between 1 to 31 October 2022, and successfully got 361 respondents. However, 78 data are invalid and 283 data is valid and can to be processed further (see Table 1). After data gathering, data processing and data analyzing is conducted. This study use partial least square-structural equation modeling (PLS-SEM) to data processing and analysis are completed using SmartPLS software.

Table 1. The Respondent Demographic

Characteristics		Frequency	%
Gender	Male	109	38.5%
	Female	174	61.5%
Age	18 - 20	32	11,3%
	21-30	151	53,4%
	31-40	75	26,5%
	41-50	23	8,1%
	> 50	2	0,7%
Education	High School	61	21.6%
	Diploma	42	14.8%
	Bachelor	163	57.6%
	Magister and doctoral	17	6.0%
Occupation	Civil Servants	40	15.8%
	Private Employee	127	45.5%
	Student	58	20.5%
	Entrepreneur	34	12.0%
	Professional (doctor lawyer, consultant, etc.)	10	3,5%
	Others	14	4.8%
Religion	Islam	271	95,8%
	Kristen Katolik	7	2,5%
	Kristen Protestan	5	1,8%

IV. RESULT / FINDING

A. Measurement Model Evaluation

Before analysing the hypotheses, the measurement model testing is performed to ensure the reliability and validity of research instruments. The measurement model testing is conducted by calculating the outer loading value, the Composite reliability (CR), the Cronbach's alpha (CA), the average variance extracted (AVE), and the Fornell-Larcker criteria.

With outer loading, CA and CR are greater than 0.7, and the AVE value is above 0.5, Table 2 demonstrate that all variables meet the internal consistency reliability requirements and all indicators meet convergent validity requirement.

Table 2. Result of Measurement Model

Variabel	Indikator	Outer Loading	CR	Cronbach Alpha	AVE
Responsiveness (Rs)	Rs1	0,805	0,872	0,779	0,694
	Rs2	0,837			
	Rs3	0,856			
Security (Sc)	Sc1	0,857	0,895	0,824	0,740
	Sc2	0,858			
	Sc3	0,865			
Trust (Tr)	Tr1	0,905	0,897	0,769	0,813
	Tr3	0,898			
Risk Perception (PR)	PR1	0,884	0,936	0,909	0,785
	PR2	0,901			
	PR3	0,838			
	PR4	0,919			
Ease of Use Perception (PEOU)	PEOU1	0,855	0,890	0,814	0,729
	PEOU2	0,891			
	PEOU3	0,813			
Usefulness Perception (PU)	PU1	0,814	0,890	0,814	0,730
	PU2	0,853			
	PU3	0,894			
Social Influence (SI)	SI1	0,853	0,922	0,888	0,748
	SI2	0,904			
	SI3	0,874			
	SI4	0,827			
Intention to Invest (II)	II1	0,890	0,932	0,903	0,774
	II2	0,876			
	II3	0,892			
	II4	0,861			

Source: SmartPLS

This study also examines validity test using Fornell-Larcker criteria. Table 3 demonstrates that all variables meet the requirement for good discriminant validity, since each latent variable's AVE value is higher than its highest variable correlation of the other variables.

Table 3. Result of Fornell-Larcker criteria

	II	Sc	PEOU	PU	PR	Rs	SI	Tr
II	0,880							
Sc	0,667	0,860						
PEOU	0,684	0,695	0,854					
PU	0,703	0,703	0,814	0,854				

PR	-0,452	-0,466	-0,394	-	0,886		
				0,374			
Rs	0,660	0,788	0,719	0,751	-	0,833	
					0,432		
SI	0,804	0,572	0,578	0,555	-	0,515	0,865
					0,477		
Tr	0,725	0,788	0,704	0,713	-	0,773	0,609
					0,444		0,901

Source: SmartPLS

B. Structural Model Evaluation

After the measurement model evaluation is performed, the next step is evaluation of the structural model for finding the coefficient of determination (R²) and hypothesis testing. For this structural model evaluation, bootstrapping is carried out using SmartPLS software.

According to (Chin et al., 2008), coefficient of determination (R²) can be considered as strong if it has a value of 0.76. In this study II has R² = 0.760, PEOU has R² = 0.557, PU has R² = 0.594, PR has R² = 0.215, SI has R² = 0.386 and Tr has R² = 0.620. This means, 76% of the intention to invest in Sharia P2PL variable (II) can be explained by 5 other variables (Tr, PR, PU, PEOU, and SI), while the remaining 24.0% is explained by other variables outside the model.

To determine whether the proposed hypotheses are accepted or rejected, hypothesis testing is carried out. This study used two-tail hypothesis testing method with significance level 5%. Therefore, the research hypothesis is accepted if it has t-statistics value $-1.96 \geq T\text{-values} \geq 1.96$, with *p*-value smaller than 0.05. After the hypothesis testing is carried out, the study found that among 15 hypotheses, 11 hypotheses are accepted while the rest (4 hypothesis) are rejected (see Table 4 and Figure 3).

Table 4. The Significance Test Result

	Hipotesis	Original Sample (O)	T Statistics	P Values	Result
H1a	Rs → Tr	0,401	5,566	0,000	Accepted
H1b	Rs → PR	-0,169	1,932	0,054	Rejected
H1c	Rs → PU	0,521	8,036	0,000	Accepted
H1d	Rs → PEOU	0,450	6,168	0,000	Accepted
H1e	Rs → SI	0,169	1,665	0,097	Rejected
H2a	Sc → Tr	0,472	6,970	0,000	Accepted
H2b	Sc → PR	-0,333	3,621	0,000	Accepted
H2c	SC → PU	0,292	4,642	0,000	Accepted
H2d	SC → PEOU	0,340	4,387	0,000	Accepted
H2e	SC → SI	0,438	4,329	0,000	Accepted
H3	TR → II	0,213	3,926	0,000	Accepted
H4	PR → II	-0,007	0,273	0,785	Rejected
H5	PU → II	0,213	3,111	0,002	Accepted
H6	PEOU → II	0,058	0,832	0,406	Rejected
H7	SI → II	0,519	10,764	0,000	Accepted

Source: SmartPLS

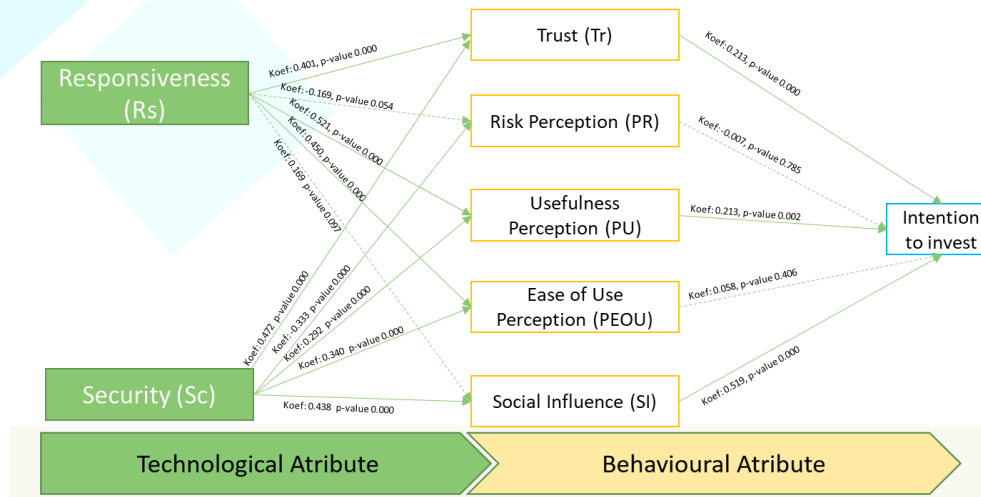


Figure 3. Result of Structural Model Analysis

V. DISCUSSION

H1. Responsiveness (Rs) influence Trust (H1a), Risks Perception (PR) (H1b), Usefulness Perception (PU) (H1c), Ease of Use Perception (PEOU) (H1d), and Social Influence (SI) (H1e).

Table 4 showed the significance analysis between responsiveness and Trust, Risks Perception (PR), Usefulness Perception (PU), Ease of Use Perception (PEOU), and Social Influence (SI). The value coefficient between responsiveness and trust was 0.401 where t-statistics showed $> 1,96$ namely 5,566 dan P value 0,000, so it can be concluded that responsiveness positively influence trust. Maintaining a high level of service is a requirement to meet customers' expectations and to get their trust (Parasuraman et al., 1985). In other word, when Sharia P2PL's responsiveness level increases, people trust about Sharia P2PL will also increase (H1a). This study supports research findings at (Boonlertvanich, 2019) and (Namahoot & Laohavichien, 2018).

This study found that responsiveness did not have a significant effect on people's risk perception (H1b) since t-statistics showed $< 1,96$ namely 1,932 dan P value 0.054, which is in contrast to (Namahoot & Laohavichien, 2018) who found the that responsiveness in can reduce the risk perception on internet banking in Thailand. This indicate that the responsiveness is not the main criteria to reduce the risk perception to invest in Sharia P2PL. (Namahoot & Laohavichien, 2018) found that the first factor the internet banking service should be concerned with is reducing the psychological risk among users, where banks should encourage users to be aware of the ease of use of the internet banking system to help to reduce customers' anxiety.

Meanwhile, this study also found that responsiveness positively influences usefulness perception (H1c) since the value coefficient between responsiveness and usefulness perception was 0.521, t-statistics showed 8,036 dan P value 0,000, which support research finding on (Singh et al., 2020). When Sharia P2PL's responsiveness level increases, people perception that investing in Sharia P2PL will bring usefulness to its investors, will also increase.

This study also found that responsiveness positively influences ease of use perception (H1d) since the value coefficient between responsiveness and ease of use perception was 0.450, t-statistics showed 6,168 dan P value 0,000. When Sharia P2PL's responsiveness level increases, people perception that Sharia P2PL platform is easy to use, will also increase. This finding also support research finding on (Singh et al., 2020). Furthermore, as customers experience quick problem solving, this has made the perception that the technology is easy to use, which maximises benefits for users. (Namahoot & Laohavichien, 2018).

Furthermore, this study also found that responsiveness insignificantly influences social influences (H1e) since the value coefficient between responsiveness and social influence was 0.169 where t-statistics showed $< 1,96$ namely 1,665 dan P value 0.097. This finding is supported by (Singh et al., 2020), which find that there's an insignificantly positive relation between them.

H2. Security (Sc) influence Trust (H2a), Risks Perception (H2b), Usefulness Perception (PU) (H2c), Ease of Use Perception (PEOU) (H2d), and Social Influence (SI) (H2e).

Table 4 showed the significance analysis between security and Trust, Risks Perception (PR), Usefulness Perception (PU), Ease of Use Perception (PEOU), and Social Influence (SI). The value coefficient between

security and trust was 0.472 where t-statistics showed $> 1,96$ namely 6,970 dan P value 0,000, so it can be concluded that security positively influence trust. This finding is supported by (Stewart & Jürjens, 2018) and (Carlos Roca et al., 2009). The security of online transactions as well as the reputation of the service provider are the key factors influencing belief about safety while doing financial transactions (Pavlou, 2003). By improving security protection features and mechanisms, Sharia P2PL can improve user trust by showing their user the efforts made in providing secure transactions and minimizing risks (Abidat et al., 2019). Therefore, the security level perform by Sharia P2PL platform affects people trust in the platform, since the platform must follow strict rules to obtain the Sharia P2PL, among others information security management system certificate as stated in POJK No.10/POJK.05/2022.

This study found that security negatively influence people's risk perception (H2b) since the value coefficient between security and risk perception was -0.333 where t-statistics showed $> 1,96$ namely 3,621 dan P value 0,000. This means that the higher the security level, the lower the people's risk perception to invest in Sharia P2PL. This finding is supported by (F. S. Puteri et al., 2018) which states effective privacy protection can make investor aware of the platform capability. Therefore, Sharia P2PL must pay more attention to the security aspect to decrease the risk perception since the nominal investment made through P2PL is not small. Security is the most effective tool for reducing this risk and uncertainty (Pavlou, 2003).

Meanwhile, this study also found that security positively influences usefulness perception (H2c) since the value coefficient between security and usefulness perception was 0.292 where t-statistics showed $> 1,96$ namely 4,642 dan P value 0,000, so it can be concluded that security positively influence usefulness perception. This finding is supported by (Singh et al., 2020) which stated that security have positive and significant influence to usefulness perception. When the security level of Sharia P2PL increases, the perceived benefits of using Sharia P2PL will also increase.

This study also found that security positively influences ease-of-use perception (H2d) since the value coefficient between security and ease of use perception was 0.340 where t-statistics showed $> 1,96$ namely 4,387 dan P value 0,000, so it can be concluded that security positively influence ease of use perception. This finding is supported by (Singh et al., 2020) which stated that security have positive and significant influence to ease of use perception. When the security level of Sharia P2PL increases, the ease-of-use perception using Sharia P2PL will also increase.

Furthermore, this study also found that security positively influences social influences (H2e) since the value coefficient between security and social influence was 0.438 where t-statistics showed $> 1,96$ namely 4,329 dan P value 0,000. This finding is supported by (Singh et al., 2020) which stated that security have positive and significant influence to social influence. With these features, Sharia P2PL can reassure their users that their platform are safe while doing financial transactions by emphasizing the security features in the marketing campaign (Singh et al., 2020).

H3. Trust (Tr) influence investor intention to invest through Sharia P2PL

Table 4 showed the significance analysis between trust and intention to invest through Sharia P2PL. The value coefficient between trust and intention to invest was 0.213 where t-statistics showed $> 1,96$ namely 3,926 dan P-value 0,000, so it can be concluded that trust positively influence intention to invest through Sharia P2PL. This finding is supported by (Ichwan & R. A. Kasri, 2019) that found the trust perception will affect attitude and the attitude will effect the intention to invest in P2PL. (Susanti et al., 2020) found that trust is a significant factor that determined the intention to borrow through P2PL in Indonesia. (Abidat et al., 2019) also found that trust in Sharia P2PL platform has significant positive influence rather than trust in borrowers, since the P2PL platform in Indonesia generally acts as an intermediary and rarely have features that facilitates direct interaction between borrowers and investor.

The positive relationship of trust and intention to invest explains that when the level of trust of respondents in P2PL Syariah increases, the intention to invest in P2PL Syariah will also increase. This finding also explains the condition where users will not have the intention to invest in Sharia P2PL if they feel they lack confidence in Sharia P2PL.

H4. Risk Perception (PR) influence investor intention to invest through Sharia P2PL.

Table 4 showed the significance analysis between risk perception and intention to invest through Sharia P2PL. The value coefficient between risk perception and intention to invest was -0.007 where t-statistics showed $< 1,96$ namely 0,273 dan P-value 0.785, so it can be concluded that risk perception insignificantly influence intention to invest through Sharia P2PL. This finding is supported by (Ichwan & R. A. Kasri, 2019), that found

that the risk perception variable is insignificant to the Jakarta millennial generation' intention to invest in P2PL, because of their insufficient knowledge regarding P2PL.

Additionally, (Abidat et al., 2019) also discover that user intention to invest in sharia P2PL is not significantly impacted by perceived risk. Investors pay more attention to the benefits obtained compared to the losses that might occur while making investment.

H5. Usefulness Perception (PU) influence investor intention to invest through Sharia P2PL.

In Table 4, the value coefficient between usefulness perception and intention to invest was 0.213 where t-statistics showed $> 1,96$ namely 3,111 dan P-value 0,000, so it can be concluded that usefulness perception positively influence intention to invest through Sharia P2PL. This finding is supported by (Singh et al., 2020) which stated that behavioural intention to adopt the services offered by Fintech is influenced by usefulness. (Ichwan & R. A. Kasri, 2019) discovered that someone would be interest in trying and using new products that provide additional benefits to him, such as convenience when shopping online.

As a result, this finding also explains that users will not have the intention to invest in Sharia P2PL if they believe that the benefits of investing in P2PL Syariah are insufficient.

H6. Ease of use Perception (PEOU) influence investor intention to invest through Sharia P2PL.

Table 4 showed the value coefficient between ease-of-use perception and intention to invest was 0.058 where t-statistics showed $< 1,96$ namely 0,832 dan P-value 0.406. Based on that analysis, it can be concluded that ease-of-use perception insignificantly influence intention to invest through Sharia P2PL. The respondents of this study are internet users who know Sharia P2PL but never invest in Sharia P2PL. Therefore, it's possible that majority of the respondents were unaware about the platform and none of them had ever utilized it. This led to anxiety and doubt on the part of the respondents as to whether P2P lending is easy to use, which affected their interest to invest in Sharia P2PL. This finding is supported by (Ichwan & R. A. Kasri, 2019), and also in line with (Lu & Yu-Jen Su, 2009) which demonstrate that anxiety is an affective barrier to employing innovative systems and will impair people intentions to invest in such a new fintech.

H7. Social Influence (SI) influence investor intention to invest through Sharia P2PL.

Table 4 showed the value coefficient between social influence and intention to invest was 0.519 where t-statistics showed $< 1,96$ namely 10,764 dan P-value 0,000. Based on that analysis, it can be concluded that social influence positively influence intention to invest through Sharia P2PL. This finding is supported by (Rahi et al., 2019) and (Venkatesh et al., 2003). (Alenizi, 2022) stated that the shared reviews and recommendations from opinion leaders, industry experts, famous people, and friends encourages social media user to utilize mobile banking. People are more likely to accept the wisdom of the crowd and close friends, which can generate their engagement and connection with mobile banking.

(Singh et al., 2020) explain how the impact of social norms is magnified for disruptive innovations as it is assumed that individuals would consults to their social circle about new technologies and may be influenced by information they offer. In the absence of their own experience, people give more importance to others' opinions and perceptions about the characteristics of the technology. (Darmansyah et al., 2021) stated that social influence has a close relationship with one's intention in adopting sharia fintech, considering that Indonesia is an emerging country, so that the social environment such as family, close friends, and public figures have an important role in influencing one's point of view and opinion.

Indirect Effect Test

Based on the PLS test results, the indirect effect in Table 5 shows that security and responsiveness significantly influence intentions to invest in Sharia P2PL, since they had a p-value of 0.000, where this value was smaller than the 5% significance level. As for security, it is considered a technological attribute that determines the intention to invest in Sharia P2PL. This finding is supported by Singh et al., (2020).

Table 5. The Indirect Effect Test

	Original Sample (O)	T Statistics	P Values
Security -> Intention to Invest	0,412	6,236	0,000
responsiveness -> Intention to Invest	0,311	4,557	0,000

Source: SmartPLS

VI. CONCLUSION AND RECOMMENDATION

Conclusion

Based on the results of the analysis, it can be concluded that users' intention to invest through Sharia P2PL are influenced by social influence, trust and usefulness perception. Among these three variables, the variable that has the greatest influence on the intention to invest in Sharia P2PL is social influence. This is because in emerging countries where experience and knowledge about new technologies are still limited, people will pay more attention to opinions and perceptions from their social environment (family, friends, and people who are considered important), so that the role of the social environment in influencing one's perspective and opinion is very important.

Meanwhile, security and responsiveness significantly influence the intention to invest in Sharia P2PL which is mediated by trust and perceived benefits. As for security, it is considered a technological attribute that determines the intention to invest in Sharia P2PL. In using technology especially in financial sector, a risk averse will prefer technology that has good level of security and is managed by credible people or groups to minimize the risk of data leakage and fraud.

Recommendation

From the results of hypothesis testing, we found that social influence is a variable that has the greatest influence on the intention to invest in Sharia P2PL. Learning from banking services, it is recommended that Sharia P2PLs have reliable customer service team that can quickly respond to consumer questions/trouble and social media team to campaign and educate potential investors about the benefit using Sharia P2PL. Apart from the service aspect, P2PL Syariah is advised to improve the quality of security and focus on protecting personal data and fraud. With improvements to these technological attributes, high consumer satisfaction will be created, and positive word-of-mouth will increase the intention to invest in Sharia P2PL.

Trust is another factor that determines the investment intention. Therefore, it is important for Sharia P2PL to maintain sharia compliance and provide transparency to its users in carrying out its operations. Complete information regarding borrower's condition (i.e., the borrowing purpose, financial statements, history of financing) and the publication of the 90-day Payment Success Rate (TKB90) is a form of information disclosure and transparency. The existence of a Sharia Supervisory Board to ensure that Sharia P2PL activities and operations are within the sharia corridor, is also important in increasing user trust in Sharia P2PL. Sharia P2PLs is advised to collaborate with various parties (among others the authorities, the Investment Alert Task Force) to monitor and close illegal P2PL so that image of Sharia P2PL will be improved and then increase public interest in investing in Sharia P2PL.

Apart from social influence and trust, usefulness perception is another factor that influence the intention to invest in Sharia P2PL. In the process of developing its products, P2PL Syariah needs to pay attention to the factors of benefits that can be provided to its users, such as fast, efficient investment and attractive profits compared to other types of investment. With this feature, people can use Sharia P2PL as an alternative funding/investment with minimal effort and fast processing.

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Appendix. Variable Operational

No	Variable	Indicator	Source
1	<i>Rs</i>	<ol style="list-style-type: none"> 1. Give information concerning time needed to financing 2. Give fast service. 3. Provide help service when trouble/issue occur. 	Singh (2020)
2	<i>Sc</i>	<ol style="list-style-type: none"> 1. Secure transaction 2. My personal data is securely saved 4. Have adequate <i>security</i> feature. 	Singh (2020)
3	<i>Tr</i>	<ol style="list-style-type: none"> 1. Trusted place to invest 2. The investor face slight problem 3. Reliable to invest 	Ichwan & Kasri (2019)
4	<i>PR</i>	<ol style="list-style-type: none"> 1. Risky place to invest. 2. Have lots of uncertainty. 3. Probability not get the expected return. 4. A very risky place to invest 	Ichwan & Kasri, (2019); Zhai et al (2021)
5	<i>PEOU</i>	<ol style="list-style-type: none"> 1. Easy to learn 2. Easy to use 3. easy to get tools need to operate the platform (i.e mobile phone, app, WIFI, dll) 	(Singh et al., 2020; Venkatesh & Davis, 2000)
6	<i>PU</i>	<ol style="list-style-type: none"> 1. Investment does not take long. 2. Provides attractive benefits. 3. Useful in making investments quickly. 	(Singh et al., 2020; Venkatesh & Davis, 2000)
7	<i>SI</i>	<ol style="list-style-type: none"> 1. Spouse and family influence 2. Close friend influence 3. Colleague influence 4. Other people participation influence 	(Singh et al., 2020; Venkatesh et al., 2003)
8	<i>II</i>	<ol style="list-style-type: none"> 1. Intention to invest in next 3 month. 2. Recommend to invest 3. Prediction will regularly invest 4. If I want to invest, I will invest in P2PL Syariah 	(Ichwan & R. A. Kasri, 2019; Venkatesh & Davis, 2000)

Share Valuation Using The Discounted Cash Flow Method With The Free Cash Flow To Firm And Relative Valuation Approach In The Media And Entertainment Sub-Sectors Listed At The Indonesia Stock Exchange For The 2022 Period Projection

Rizki Bunawan¹, Dwi Fitrizal Salim²

^{1,2} Magister Manajemen, Faculty of Economics and Business, Telkom University Bandung, Indonesia

Abstract

The World Health Organization (WHO) officially announced the outbreak of the corona virus or Coronavirus Disease 19 (Covid-19) in 2020. This has caused several companies to experience a decrease in income so that entrepreneurs make operational savings. As a result of the pandemic, many employees have to work from home, and indirectly increase the need for entertainment at home by streaming television. In the Indonesian industry for media and entertainment. The valuation was carried out using historical financial report data for five years from 2017 to 2021 using the DCF method with the FCFF approach and validated using the RV method with the PER and PBV approaches. Then the company validation used three scenarios to show the results of valuation calculations. The valuation results obtained from the intrinsic value of shares calculated using the FCFF method for MNCN and SCMA companies for all scenarios are obtained in undervalued conditions, then for TMPO companies obtained in overvalued conditions for all scenarios. Based on the results of the valuation calculations carried out, it is recommended that investors purchase MNCN and SCMA companies.

Keywords: Covid-19, Free Cash Flow to Firm, Relative Valuation, Undervalued, Overvalued

I. INTRODUCTION

The World Health Organization (WHO) officially announced that there was an extraordinary incident called the Coronavirus Disease-19 (Covid-19) as a global pandemic in 2020 which would affect the global economy. This was based on the data from the Menkeu (2020), the United States entertainment, accommodation, transportation, trade and manufacturing industry sectors¹. In Indonesia, the media industry is one of those that are affected. Based on data from PWC, the growth of the media and entertainment sub-sector in Indonesia will continue to increase with predictions that in 2021 - 2025 it will grow by 8.7%. Companies in the media and entertainment sub-sector that have experienced positive growth in the last 3 years include MNCN, SCMA and TMPO.

Then, the impact of Covid-19 created the effects of drastic and strict social distancing to the point where almost every individual had to carry out activities from home and entertainment activities came in the form of streaming. This made streaming services a necessity in almost every home. According to data from Nielsen's Streaming Meter (2020), consumers spent 25% of their time streaming and with an average age of over 55 years old. The highest contributors to streaming were Netflix at 34%, Youtube at 20%, and Disney at 4% of the total streaming time.

According to media from Nusantara (2022), the number of consumers that used cable television in Indonesia had decreased. This is due to the transition from one device to streaming applications which are easier to obtain and can be used at any time. Apart from that, consumers can also enjoy the entertainment they want at any time without having to look on television, using just a smartphone at an affordable price for consumers.

As a result of Covid-19, especially in Indonesia in 2020, the Composite Stock Price Index (IHSG) was very volatile as shown in Figure 1, where in March 2022 the return was -16.67% due to the Covid-19 pandemic.

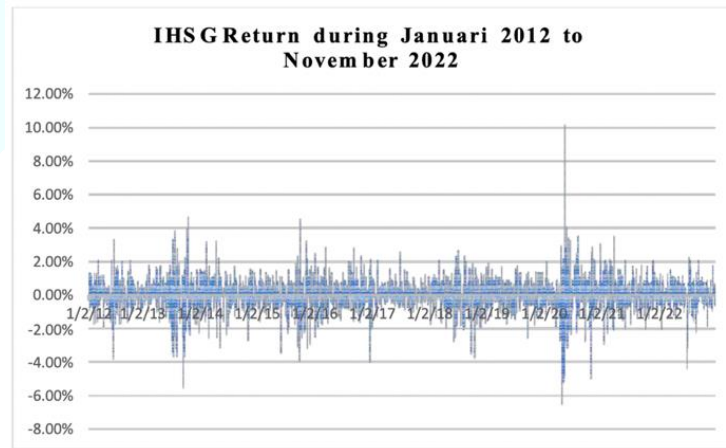


Fig. 1. Movement of IHS Return

MNCN companies experienced fluctuating share price movements from year to year, especially in 2019. Other companies, namely SCMA and TMPO, also experienced fluctuating share prices. The following is a picture of the stock prices from these three companies.

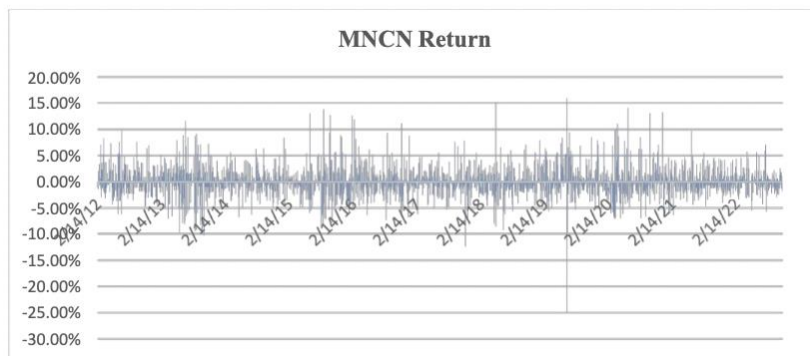


Fig. 2. Movement of MNCN Return from 2012 – 2022

In Fig. 2 it can be seen that there were fluctuating stock prices for MNCN companies from January 2012 to November 2022. The lowest return was on June 17th, 2019 with a return of negative 25.0%. The highest return was on June 18th, 2019. After that the share price of MNCN stabilized and returned proportionally to the movement pattern of returns on MNCN. Based on Fig.3, it can be seen that the lowest return from SCMA in 2019 was negative 79.83%, and on March 20th, 2020 the highest return was 18.11%, and on July 6th, 2021 it reached 18.46%.

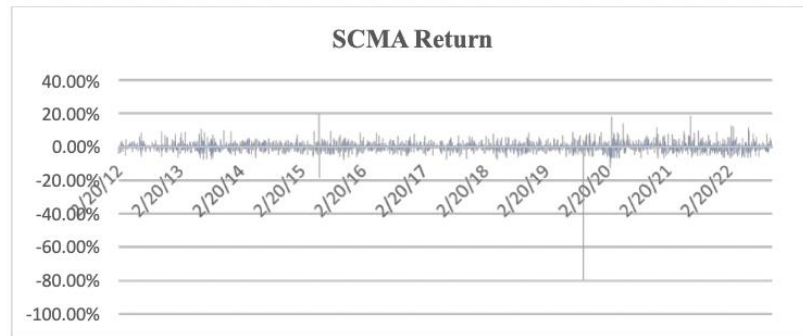


Fig.3. Movement of SCMA Return from 2012 – 2022

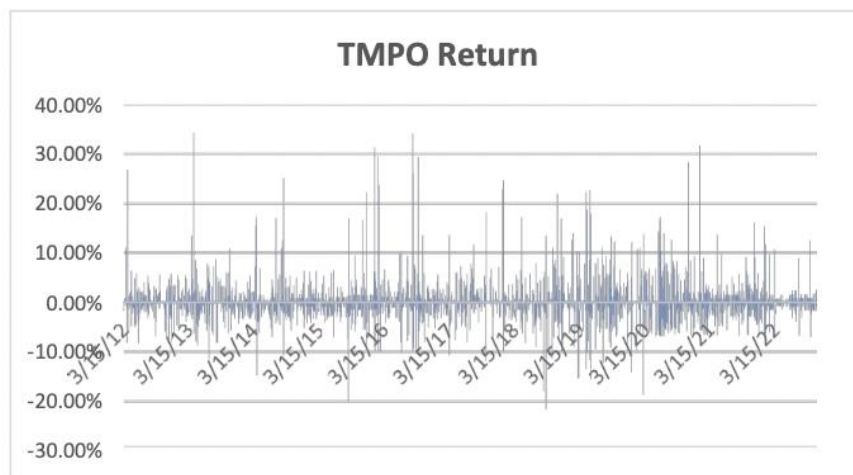


Fig. 4. Movement of TMPO Return from 2012 – 2022

Fig. 4 shows the lowest return from TMPO on September 5th, 2018, and on November 9th, 2021 the TMPO company experienced an increase in returns of 22.7%. When the pandemic occurred, TMPO experienced a decrease in returns of negative 18.75% but on November 9th, 2020 there was an increase in returns of 28.33%. In 2021, the highest return was on January 14th 2021 of 31.72%.

From the returns that occur in the three companies, the fluctuating stock value can give investors a significant profit but can also make significant losses as well, which requires a good assessment of the price of the instruction because an investor will know the shares will be sold, purchased, or maintained based on the results of the share valuation. The valuation uses the Discounted Cash Flow method with Free Cash Flow to Firm approach and is validated using the Relative Valuation method in the media and entertainment sub-sector.

According to Damodaran (2012: 516), there are three approaches used to perform valuations, namely Discounted Cash Flow Valuation (DCF), Relative Valuation (RV) and Contingent Claim Valuation. This study will use the Discounted Cash Flow method with the Free Cash Flow to Firm (FCFF) approach because of the ability to capture future growth potential. The Relative Valuation method has several approaches such as Price Earning Ratio (PER), EBITDA, and Price Book Value (PBV).

II. LITERATURE REVIEW

A. Valuation Theory

Valuation is one of the tools for analyzing fundamental analysis. Fundamental analysis is the company's ability to earn profits and its performance capabilities can be assessed through company financial data (Damodaran, 2012). The following is a valuation approach to the company, Discounted Cash Flow (DCF) is an assessment based on the present value of the expected future cash flow of an asset which is discounted using a certain discount rate. DCF is divided into 2, namely Free Cash Flow to Firm (FCFF) and Free Cash Flow to Equity (FCFE). Relative Valuation, a method by which the value of an asset is found by comparing it to other similar assets on other common variables, such as income, cash flow, sales or book value. And, the Contingent Claim Valuation is a valuation model using options (option price model). Contingent Claim or option is an asset that is paid only on certain contingency conditions such as call options and put options.

B. Discounted Cash Flow

Discounted Cash Flow (DCF) is the valuation of an asset by calculating the present value of the expected cash flows in future assets and then discounted at the same level at the risk of these cash flows. The basic formula used to calculate cash flow can be used with this method.

$$\text{value of firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1 + K_c)^t}$$

Then, part of this DCF is the Dividend Discounted Model (DDM), Free Cash Flow to Firm (FCFF), and Free Cash Flow to Equity (FCFE).

1. Dividend Discounted Model

The Dividend Discounted Model (DDM) is a model that has been practiced for a long time but this method has been characterized as too conservative. Most investors use this method if the company has gone public and has been holding for a long time. The following formula is used.

$$\text{value per share of stock} = \sum_{t=1}^{t=\infty} \frac{E(DPS_t)}{(1 + k_e)^t}$$

2. Free Cash Flow to Equity

Free Cash Flow to Equity (FCFE) is a model based on the results of cash flow after interest payments and loans. There are several steps that must be carried out to estimate the cash flow that can be provided to shareholders. First, every investment issued must be reduced in advance by the net income of a company. Second,

the addition of working capital will reduce the cash flow available to shareholders. Third, if the company gets new debt and the debt has been paid in the company's cash flow, the payment of the principal debt represents cash going out, if new debt will represent money coming in. The following is the basic formula for Free Cash Flow to Equity:

$$FCFE = \text{Net Income} - (\text{Capital Expenditure} - \text{Depreciation}) - (\text{Change in Non-Cash Working Capital}) + (\text{New debt issued} - \text{Debt repayments})$$

3. Free Cash Flow to Firm

Free Cash Flow to Firm (FCFF) is cash flow to all company owners, shareholders, bondholders and preferred stockholders. Free Cash Flow to Firm to calculate the value of the company without debt with all operating costs removed from display and discounted using capital costs or WACC. Thus, FCFF is calculated by subtracting taxes from Earning Before Interest and Tax (EBIT). The following is the basic formula for calculating FCFF:

$$FCFF = (\text{EBIT} (1-\text{Tax})) + \text{Depreciation} - \text{Capital Expenditure} - \text{Perubahan Modal Kerja} (\Delta \text{Working Capital})$$

Then, company value is obtained by discounting Free Cash Flow to Firm, so company value can be calculated by discounting FCFF with the Weighted Average Cost of Capital (WACC) or the weighted average cost of capital³. The formula for company value is as follows:

$$\text{Value of Firm} = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1+WACC)^t}$$

C. Terminal Value

Terminal value is a present value of all future cash flows obtained after a certain period of time with scenario analysis that is more predictable with the assumption that the growth rate is constant over a certain period of time. The formula that can be used is as follows:

$$\text{Terminal value} = \sum_{t=1}^{t=n} \frac{CF_t}{(1 + K_c)^t} + \frac{\text{Terminal value}_n}{(1 + K_c)^n}$$

D. Cost of Capital

The value of a company can be obtained by discounting the Free Cash Flow to Firm with WACC. Weighted Average Cost of Capital (WACC) is an important factor in the DCF model because small changes to WACC will have a big impact on firm value. WACC can be calculated using the weighting of funding sources based on the company's financing structure multiplied by the cost of each source. Formula used³:

$$WACC = \frac{\text{Equity}}{\text{Debt} + \text{Equity}} \times \text{Cost of Equity} + \frac{\text{Debt}}{\text{Debt} + \text{Equity}} \times \text{Cost of Debt}$$

The WACC calculation is a factor of the cost of equity and cost of debt. The following describes the two factors.

1. Cost of Equity

The cost of equity is the level of return expected by shareholders (equity) for their investment in a company. The risk and cushioning model requires a no-risk level and a risk premium. Then, the expected return to shareholders or investors is compensation from the stock market risk in investing is the cost of equity. The cost of equity can be calculated with the help of the capital asset pricing model (CAMP), in this section concentrated on company beta. The company beta in question is the risk that the investment adds to the market portfolio. The formula for the cost of equity is as follows:

$$\text{Cost of equity } (k_e) = R_f + \beta(R_m - R_f)$$

2. Cost of Debt

Cost of Debt measures the current costs for companies to borrow funds in order to finance company assets. So, the interest rate that must be paid by the company on its debt or external capital. The following formula can be used to calculate the cost of debt:

$$\text{Cost of debt} = i \times (1 - t)$$

E. Relative Valuation

Relative Valuation (RV) is a valuation model that assesses an asset through price comparisons of other similar assets. Relative Valuation in general is often done because it can be completed with a few assumptions and is faster than using the DCF method and the RV method better describes market conditions because it can measure relatively, not intrinsically. However, this method has drawbacks such as variables that are not seen such as risk, growth or potential cash flow. The lack of transparency regarding the assumptions underlying the RV method makes it vulnerable to manipulation. The RV method approach uses multiples because it will calculate the earnings value several times. The following multiples approach can be used to perform stock valuation as follows:

- a. Earnings Multiples: Price-Earnings Ratio
Price-Earnings Ratio (PER) is used because it is simple in setting the price of a public offering. The following formula is used:

$$PER = \frac{\text{Market price per share}}{\text{Earning per share}}$$

- b. Book Value multiples: Price to Book Value
Price to Book Value (PBV) is very important for investors to analyze because it provides a relatively stable and intuitive value when compared to market prices. PBV can be interpreted as a comparison between the price per share to the book value. The following formula can be used:

$$PBV = \frac{\text{Market price per share}}{\text{Book value of equity per share}}$$

F. Prior Research

Several previous studies have shown that research on stock price valuation using the FCFF approach has been carried out, but only a few of the company sectors have been studied. However, there is research that approaches the FCFE method but this is different from the current study.

Conducted research on the fair price valuation of shares in cement companies listed on the Indonesia Stock Exchange (IDX)⁴. The companies that were the object of this previous research were *Indocement Tunggal Prakarsa* (INTP), *Holcim Indonesia* (SMCB) and *Semen Baturaja* (SMBR), which are the three big cement companies in Indonesia. This study used financial data from 2013 to 2017 to make a projection of the 2018 fair share price. This research uses the DCF method with the FCFF approach and uses the RV method. The results of this previous study using the FCC method showed overvalued results for all scenarios in INTP companies, while SMCB and SMBR companies showed overvalues in pessimistic scenarios, in Moderate and Optimistic scenarios they showed undervalues. The RV method shows results that fall within the range of industrial values, so the calculation is valid. The conclusion that can be obtained is that INTP, SMCB and SMBR companies are worth buying. Previous research with this research there is a slight difference, namely from the object studied, but the method used is the same as this research.

Previous research conducted by Hendrawan and Rahayu (2020) analyzed the fair value valuations of the four largest banks in Indonesia, namely Bank Central Asia (BCA), Bank Rakyat Indonesia (BRI), Bank Negara Indonesia (BNI), and Bank Mandiri for 2017 using financial data from 2012 to 2016 using the Discounted Cash Flow (DCF) method with the Free Cash Flow to Equity (FCFE) approach and the Discounted Dividend Model (DDM) method. The results of this study using the FCFE method show undervalued results for all scenarios on BBNI, BBKA, BMRI, but the BBRI had overvalued results for all scenarios. The DDM method showed undervalued results for all scenarios for BBNI, BBKA, BMRI and BBRI companies⁴.

Research that was conducted by Nurwinda and Hendrawan (2021) regarding valuation in the food and beverage sub-sector used the DCF and RV method with FCFF approach. The food and beverage sub-sector companies that were the object of this previous study were INDF, ICBP and MYOR using financial data from 2016 to 2020. The results of this study used the DCF method in all scenarios, namely pessimistic, Moderate and Optimistic. INDF and ICBP companies show undervalued results while MYOR shows overvalued results.

However, the results of the relative valuation with the PER and PBV approaches show that they are still in the industrial range based on IDX Statistics Annually 2020 data. The difference in this study is that there is a research object, but the methods used have similarities with previous research and this research.

Based on this research, it is similar to previous research conducted by (Setiawan and Sumirat 2021) where the valuation was carried out at a pharmaceutical company, namely Kalbe Farma. This study used the same calculation method as this study, namely using DCF with the FCFF approach and the RV method with the PER and PBV approaches⁶. The results of this study are overvalued, so investors are advised to buy these shares because the intrinsic value is lower than the price on the stock market. Then, research conducted by Huang (2022) on the Bilibili company used the DCF method with the results of the company's research being in an overvalued condition⁷. Other studies such as those conducted by Wang (2022) examine the success of valuations using the DCF method carried out by the Netflix company⁸. The use of this method is worth considering. Likewise research conducted by Korenkova and Tatiana (2019) regarding the valuation of Disney for acquiring Fox used the DCF method, which supports the use of this method in this research.

III. RESEARCH AND METHODOLOGY

Research is a process of obtaining a solution to a problem found through a thorough analysis process including analyzing the conditions or situations that occurred during the research period. The type of data used in research can be classified into two approaches, namely quantitative and qualitative research. Quantitative research is data used in the form of words obtained from broad questions through interviews or responses from questionnaires. Then, qualitative research is data collected in the form of numbers which are generally obtained through structured questions⁹.

This research used a quantitative descriptive method. The data in this study was in the form of numbers and analysis using statistics. This research is called quantitative because the data used was from the company's financial statements in the form of numbers. This type of research was in a non-contrived setting, namely research conducted in an environment that usually occurs or has not been under normal or natural conditions. Then, the variable in this study is the intrinsic value of shares based on the company's fundamental value. Variables will be calculated using the Discounted Cash Flow method with the Free Cash Flow to Firm approach and Relative Valuation using the Price to Earning Ratio approach and the Price to Book value Ratio approach. This research is reinforced by previous research regarding valuation using the DCF method with the FCFF approach and the RV method with the PER and PBV approaches conducted by Soelistyo and Hendrawan (2022) in the automotive sub-sector. The results of this study used the DCF method which showed overvalued results for ASII and INDS companies in all scenarios, while GJTL showed an undervalue for all scenarios, then SMSM showed an overvalue for persimmon and Moderatee scenarios but in Optimistic scenarios it showed an undervalue. Then, previous research conducted by Julia and Hendrawan (2021) on valuation used the DCF method with the FCFF approach and also used the RV method with the PER and PBV approaches in the retail trade sub-sector. In their research the objects were ACES, MAPI and AMRT companies. The results of this study using the DCF method with the FCFF approach at ACES companies showed an overvalue while MAPI and AMRT showed undervalued results. This DCF research uses the FCFF approach because it is considered to better reflect the actual company because of their cash flow, where the value of an asset now comes from the sum of all the company's cash flows, both positive and negative.

The data used in this research was secondary data. The data consists of financial reports published and audited in the last 5 years from sample companies, namely in the period from January 2017 to December 2021. After calculating using the FCFF and RV methods, it is necessary to determine the projected value of growth revenue using 3 scenarios, namely Optimistic, Moderatee and pessimistic scenarios. After that, investors can suggest to buy, sell or hold the shares¹⁰.

IV. FINDINGS/RESULT:

A. PT Media Nusantara Citra (MNCN)

The following is MNCN's financial behavior and average growth based on historical data from the company's financial statements for the 2017-2021 period as the basic assumption model that will be used for FCFF projections:

Table 1. History of Financial Report of MNCN

Common Size	2021	2020	2019	2018	2017	Average	Max	Min
Revenue	9.621.841	7.956.238	8.353.365	7.443.905	7.052.686			
Historical Growth	20,93%	-4,75%	12,22%	5,55%		8,49%	20,93%	-4,75%
Load programs and content	38,35%	35,46%	33,94%	35,51%	35,26%	35,70%	38,35%	33,94%
Operating Expenses	61,65%	64,54%	66,06%	64,49%	64,74%	64,30%	66,06%	61,65%
General and administrative expenses	19,31%	22,72%	21,61%	21,82%	20,83%	21,25%	22,72%	19,31%
Share of net loss of associates	0,00%	0,00%	0,00%	0,00%	0,15%	0,03%	0,15%	0,00%
EBITDA	80,96%	87,26%	87,67%	86,31%	85,72%	85,58%	87,67%	80,96%
Depreciation and amortization expenses	-6,78%	-6,77%	-5,97%	-6,48%	-6,71%	-6,54%	-	-6,78%
EBIT	74,18%	80,48%	81,70%	79,82%	79,00%	79,04%	81,70%	74,18%
Financial burden	-3%	-5%	-5%	-4%	-3%	-3,88%	-3%	-5%
EBIAT	55%	58%	59%	58%	59%	58%	59%	55%
CAPEX	748.879	1.356.475	626.271	673.599	572.660			
% Capex to Revenue	8%	17%	7%	9%	8%	10%		
Current Assets	9.750.002	8.315.808	7.636.544	7.336.848	6.718.435			
Cash	1.286.276	940.195	630.869	720.247	468.985			
Non Cash Current Asset	8.463.726	7.375.613	7.005.675	6.616.601	6.249.450			
Current Liabilities	3.114.339	2.159.171	2.139.487	2.153.719	1.459.288			
Current Maturities	562.817	2.094.677	2.864.457	3.176.477	3.387.019			
Net Current Liabilities	2.551.522	64.494	(724.970)	(1.022.758)	(1.927.731)			
Working Capital	5.912.204	7.311.119	6.280.705	7.639.359	8.177.181			
Delta Working Capital	(1.398.915)	1.030.414	(1.358.654)	(537.822)	537.822			
% Net Working Capital to Revenue	-15%	13%	-16%	-7%		-6%		

Table 2. MNCN WACC Calculation

<i>Cost of Equity (ke)</i>	<i>Risk free rate = 4,60%</i>	
	<i>Return market = 15,39%</i>	18,63%
	<i>Beta (b) = 1,3</i>	
<i>Cost of Debt (kd) after tax</i>	<i>Kd = 9,20%</i>	7,18%
	<i>Tax = 22%</i>	
<i>Capital Structure</i>	<i>We = 17.518.750</i>	86,74%
	<i>Wd = 2.679.187</i>	13,26%

WACC**17,11%**

Table 3. FCFF Projection of MNCN for 2022 – 2026

Scenario	2022	2023	2024	2025	2026
Pessimistic	1.893.143	1.979.058	2.068.872	2.162.762	2.211.838
Moderatee	1.964.641	2.289.318	2.573.979	2.894.035	3.073.962
Optimistic	2.036.138	2.289.318	2.573.979	2.894.035	3.073.962

Table 4. Valuation of MNCN

Scenario	Intrinsic Value	FCFF				Condition/Analysis
		Share Prices in the Market (January 4 2022)				
Optimistic	2.778	1.150				Undervalued
Moderatee	1.640					Undervalued
Pessimistic	1.424					Undervalued
Scenario	PBV	Min (IDX Annual 2021)	RV-PBV		Within Industry Range	Condition/Analysis
			Average (IDX Annual 2021)	Max (IDX Annual 2021)		
Optimistic	2,4	0,21	3,52	29,655	Yes	Undervalued
Moderatee	1,4				Yes	Undervalued
Pessimistic	1,2				Yes	Undervalued
Scenario	PER	Min (IDX Annual 2021)	RV-PER		Within Industry Range	Condition/Analysis
			Average (IDX Annual 2021)	Max (IDX Annual 2021)		
Optimistic	16	-42	33	370	Yes	Undervalued
Moderatee	10,0				Yes	Undervalued
Pessimistic	8				Yes	Undervalued

B. PT Surya Citra Media (SCMA)

The following is SCMA's financial behavior and average growth based on historical data from the company's financial statements for the 2017-2021 period as the basic assumption model that will be used for FCFF projections:

Table 5. History of Financial Report of SCMA

Common Size	2021	2020	2019	2018	2017	Average	Max	Min
Revenue	5.930.261.093	5.101.113.259	5.523.362.497	5.001.848.767	4.453.848.569			
Historical Growth	16,25%	-7,64%	10,43%	12,30%		7,83%	16,25%	-7,64%
Program and content load	3,82%	2,78%	2,63%	3,29%	1,89%	2,88%	3,82%	1,89%
Operating	96,18%	97,22%	97,37%	96,71%	98,11%	97,12%	98,11%	96,18%

Expenses								
General and administrative expenses etc	17,02%	16,54%	15,23%	14,50%	12,85%	15,23%	17,02%	12,85%
Other operating expenses	2,03%	1,95%	1,10%	1,55%	-0,91%	1,15%	2,03%	-0,91
EBITDA	0,35%	0,59%	3,04%	0,84%	0,53%	1,07%	3,04%	0,35
Depreciation and amortization expenses	59,77%	61,60%	62,78%	65,32%	72,78%	64,45%	72,78%	59,77%
EBIT	3,64%	4,20%	3,41%	3,71%	3,76%	3,74%	4,20%	3,41%
Financial burden	56,13%	57,40%	59,38%	61,61%	69,02%	60,71%	69,02%	56,13%
EBIAT	0,87%	0,15%	0,04%	0,06%	0,36%	0,30%	0,87%	0,04%
CAPEX	43%	45%	46%	48%	53%	47%		
% Capex to Revenue	51.807.916	50.891.700	(52.583.554)	119.172.243	25.228.372			
Current Assets	0,87%	1,00%	-0,95%	2,38%	0,57%	0,77%		
Cash	6.660.356.466	3.609.040.737	3.559.331.643	3.426.795.184	2.708.606.433			
Non Cash	2.519.074.833	124.606.290	(376.894.416)	598.357.021	(276.171.939)			
Current Asset	4.141.281.633	3.484.434.447	3.936.226.059	2.828.438.163	2.984.778.372			
Current Liabilities	1.697.696.732	1.542.474.950	988.970.149	804.149.387	743.336.338			
Current Maturities	605.747.630	1.122.768.759	36.632	-	-			

Table 6. SCMA WACC Calculation

<i>Cost of Equity (ke)</i>	<i>Risk free rate = 4,60%</i>	
	<i>Return market = 15,39%</i>	18,96%
	<i>Beta (b) = 1,381</i>	
<i>Cost of Debt (kd) after tax</i>	<i>Kd = 8,50%</i>	6,65%
	<i>Tax = 22%</i>	

Table 7. FCFF Projection of MNCN for 2022 – 2026

Scenario	2022	2023	2024	2025	2026
Pessimistic	4.072.694.683	4.250.579.044	4.436.232.916	4.629.995.650	4.731.108.535
Moderate	4.207.994.935	4.537.689.825	4.893.216.192	5.276.597.921	5.483.307.697
Optimistic	4.343.295.186	4.834.182.955	5.380.551.826	5.988.672.382	6.327.098.151

Table 8. Valuation of SCMA

Scenario	Mark Intrinsic	FCFF	
		Share Prices on the Market (4 January 2022)	Condition / Analysis
Optimistic	601		Undervalued

Moderate	523			326		<i>Undervalued</i>
Pessimistic	455					<i>Undervalued</i>
PBV						
Scenario	PBV	Min (IDX Annual 2021)	Average (IDX Annual 2021)	Max (IDX Annual 2021)	Within a Range of Industries	Condition / Analysis
Optimistic	7,14				Ya	<i>Overvalued</i>
Moderate	6,23	0,21	3,52	29,655	Ya	<i>Overvalued</i>
Pessimistic	5,41				Ya	<i>Overvalued</i>
RV-PER						
Scenario	PER	Min (IDX Annual 2021)	Average (IDX Annual 2021)	Max (IDX Annual 2021)	Within a Range of Industries	Condition / Analysis
Optimistic	39,92				Ya	<i>Overvalued</i>
Moderate	34,79	-42	33	370	Ya	<i>Overvalued</i>
Pessimistic	30,21				Ya	<i>Undervalued</i>

C. PT Tempo Inti Media (TMPO)

The following is TEMPO's financial behavior and average growth based on historical data from the company's financial statements for the 2017-2021 period as the basic assumption model that will be used for FCFF projections:

Table 9. History of Financial Report of TMPO

Common Size	2021	2020	2019	2018	2017	AVG	Max	Min
Revenue	189.126.313	191.646.866	305.171.707	291.545.184	287.428.993			
Historical Growth	-1,32%	-37,2%	4,7%	1,4%		-8,10%	4,67%	-37,20%
Principal Expense	59,28%	67,43%	62,21%	60,58%	59,82%	61,86%	67,43%	59,28%
Operating Expenses	40,72%	32,57%	37,79%	39,42%	40,18%	38,14%	40,72%	32,57%
General expenses and administration	-32,43%	-42,45%	-31,74%	-32,07%	-28,71%	-33,48%	-28,71%	-42,45%
EBITDA	8,29%	-9,88%	6,05%	7,34%	11,47%	4,65%	11,47%	-9,88%
Depreciation & Amortization	3,43%	6,00%	3,83%	3,86%	3,44%	4,11%	6,00%	3,43%
EBIT	4,86%	-15,88%	2,22%	3,48%	8,03%	0,54%	8,03%	-15,88%
EBIAT	-0,27%	-16,70%	-1,44%	0,92%	1,47%	-3,20%		
	1.608.356	1.055.739	3.000.245	-	5.243.115			
CAPEX								
% Capex to Revenue	0,85%	0,55%	0,98%	0,00%	1,82%	0,84%		
Current Assets	169.676.389	165.017.567	185.224.604	197.648.509	194.271.133			
Cash	(3.014.633)	33.643.187	(1.559.308)	28.433.499	248.798			
Non Cash Current Asset	166.661.756	131.374.380	183.665.296	169.215.010	194.022.335			
Current Liabilities	101.709.631	90.420.528	82.466.448	81.065.235	126.366.031			
Current Maturities	29.318.023	35.863.990	32.841.576	38.408.023	68.208.023			
Net Current Liabilities	72.391.608	54.556.538	49.624.872	42.657.212	58.158.008			
Working Capital	94.270.148	76.817.842	134.040.424	126.557.798	135.864.327			

Table 10. TMPO WACC Calculation

<i>Cost of Equity (ke)</i>	<i>Risk free rate = 4,60%</i>	
	<i>Return market = 15,39%</i>	18,96%
	Beta (b) = 1,381	
<i>Cost of Debt (kd) after tax</i>	Kd = 12,90%	10,06%
	Tax = 22%	
<i>Capital Structure</i>	We = 191.903.403	76,3%
	Wd = 59.558.726	23,7%
	WACC	9,85%

Table 11. FCFF Projection of MNCN for 2022 – 2026

Scenario	2022	2023	2024	2025	2026
Pessimistic	6.858.402	7.157.958	7.470.599	7.796.894	7.967.168
Moderate	6.878.521	7.200.016	7.536.537	7.88.787	8.073.144
Optimistic	6.898.640	7.242.197	7.602.863	7.981.490	8.180.232

Table 12. Valuation of TMPO

FCFF						
Scenario	Mark Intrinsic	Share Prices on the Market (4 January 2022)			Condition / Analysis	
Optimistic	133				<i>Overvalued</i>	
Moderate	128	137			<i>Overvalued</i>	
Pessimistic	122				<i>Overvalued</i>	
RV-PBV						
Scenario	PBV	Min (IDX Annual 2021)	Average (IDX Annual 2021)	Max (IDX Annual 2021)	Within a Range of Industries	Condition / Analysis
Optimistic	0,74				Ya	<i>Undervalued</i>
Moderate	0,70	0,21	3,52	29,655	Ya	<i>Undervalued</i>
Pessimistic	0,67				Ya	<i>Undervalued</i>
RV-PER						
Scenario	PER	Min (IDX Annual 2021)	Average (IDX Annual 2021)	Max (IDX Annual 2021)	Within a Range of Industries	Condition / Analysis
Optimistic	46				Ya	<i>Overvalued</i>
Moderate	44,1	-42	33	370	Ya	<i>Overvalued</i>
Pessimistic	42,1				Ya	<i>Overvalued</i>

V. DISCUSSION

Based on the results of valuation calculations using the Discounted Cash Flow method with the Free Cash Flow to Firm approach and the Relative Valuation method with the PER and PBV approaches. These were then presented in 3 scenarios namely Optimistic, Moderate, and pessimistic scenarios. The calculation of the FCFF will be validated using the RV method so that the results will be more valid.

The results of the analysis that can be done by calculating the FCFF for 2022 to 2026, and the calculation requires data from EBIT, CAPEX, and net working capital and a tax of 22%. Then the calculation is continued by calculating the Weighted Average Cost of Capital (WACC). Furthermore, the calculation of the FCFF projection for the next 5 years and the WACC calculation will be used to calculate the intrinsic value of the shares in 2022. The results of the calculated intrinsic value were then validated using the Relative Valuation method.

The results of the valuation of MNCN companies can be seen in Table.4. The share market price on January 4, 2022, was IDR 1,150, then the result of MNCN's intrinsic value for all scenarios was above the share price so that the company was in an undervalued condition. After calculating the FCFF method, the next is the RV method. Calculations with the PBV approach were obtained in all scenarios in undervalued conditions. Then the PER approach is obtained for all scenarios in undervalued conditions as well.

The valuation results for SCMA companies can be seen in Table 8. The share price on the market on January 4, 2022 was Rp. 326, then the results of SCMA's intrinsic value for all scenarios were above the stock price so that the company was undervalued. Subsequent calculations using the RV method with the PBV and PER approaches. The PBV approach is overvalued for all scenarios, then the PER approach is overvalued for Optimistic and Moderate scenarios, then undervalued for the pessimistic scenario.

Third, the valuation results for the TMPO company can be seen in Table 12. The market share price on January 4, 2022 was IDR 137, so the results of the intrinsic value for all scenarios were below the share price so that TMPO was in an overvalued condition. Then the calculation of PBV is found to be undervalued for all scenarios, and for the calculation of PER it is found to be overvalued for all scenarios. Based on the calculations from the three companies using the RV method on the PBV and PER approaches, the value is still within the industry range of each company, which indicates that this method can be used as validation for the FCFF method.

Based on this study, the results of valuation calculations aim to provide recommendations to investors to buy, hold, or sell the shares to be valued. In this study, the results of FCFF calculations for MNCN companies were undervalued, where the price on the stock market on January 4 was Rp. 1,150, which was less than the intrinsic value of Rp. 2,778 for an Optimistic scenario, Rp. 1,640 for a Moderate scenario, then Rp. 1,424. for the pessimistic scenario. The PBV and PER calculations were found to be undervalued for all scenario conditions. So, the MNCN company investors were recommended to buy the shares. Second, the SCMA company was undervalued for the intrinsic value of the FCFF calculation for all scenarios because the stock price in the market was IDR 326, while the intrinsic value in the optimization scenario was IDR 601, for the Moderate scenario it was IDR 523, and then for the pessimistic scenario it was IDR 455. Then in PBV calculations for all scenarios in overvalued conditions, the PER calculations obtained in overvalued conditions for Optimistic and Moderate scenarios, then in pessimistic scenarios in undervalued conditions, the recommendation to investors is to sell these shares in Optimistic and Moderate scenarios, but in the pessimistic scenario it is recommended to buy the stock. Third, the TMPO company had an overvalued condition for all scenarios in the FCFF calculation, where the share price on the market was IDR 137 while the intrinsic value for the Optimistic scenario was IDR 133, the Moderate scenario was IDR 128, and then the pessimistic scenario was IDR 122. However, in the calculation PBV it obtained an undervalue for all scenarios, while the PER calculation obtained an undervalue for all scenarios. So, from these calculations it is recommended that investors sell the shares, because based on research from Dayag and Trinida (2019) the PER value is an important consideration in long-term investments of a company.

VI. CONCLUSION AND RECOMMENDATION

A. Conclusion

The results of this study show that the intrinsic value of shares calculated using the DCF method with the FCFF approach for MNCN and SCMA companies for all scenarios is obtained in undervalued conditions, while in TMPO companies it is obtained in overvalued conditions for all scenarios.

Then, the calculated intrinsic value of the shares will be validated using the RV method with the PBV and PER approaches. The MNCN and TMPO companies are undervalued for all scenarios, while the SCMA companies are overvalued for all scenarios for PBV calculations.

Meanwhile, in the calculation of RV using the PER approach for MNCN companies, it is found that the condition is undervalued for all scenarios. However, for SCMA companies, the conditions for all Optimistic and Moderate scenarios are overvalued, while for the pessimistic scenario, the conditions are undervalued. Then the TMPO company obtained overvalued conditions for all scenarios. The results of the RV calculation show that all companies are still within the industry range from the PBV and PER approaches.

D. Recommendation

Based on the results of this study, the authors provide several recommendations to investors and to further researchers. Recommendations to the investors is to pay attention to the company's intrinsic value when making decisions to buy or sell these shares. The company's intrinsic value can provide an overview of the company's stock price potential in the future. Then, taking the company's historical data also affects the results of calculating the intrinsic value of the company. Based on these calculations, suggestions for investors to buy shares of the three companies are MNCN and SCMA companies because these companies are in an undervalued condition.

Then, the results of this study use a valuation method which is very dependent on the assumptions used in the study. Thus, for future researchers wishing to examine the same sector, they may use different periods of historical data or different valuation methods, such as the DCF method which has the FCFE and DDM approaches, then the asset based valuation method and the contingent claim method.

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Demographic Factors Towards Financial Literacy: A Study on Teachers in Bandung Raya

Astrie Krisnawati¹, Adela Hasna Khairunnisa²

^{1,2} Faculty of Economics and Business, Telkom University, Bandung, Indonesia

Abstract

This paper examines the impact of demographic factors, including age, gender, education level, income level, and working period, on the financial literacy level of Bandung Raya teachers. Financial literacy is one of the lifelong assets necessary to create a more prosperous financial future. There can be financial illiteracy among all populations, including the educated. However, it would be problematic if it were identified among educators, who play a crucial role in the education of future generations. Teachers are the research object because teachers are intended to be social change agents, particularly in developing financial literacy. An online questionnaire was distributed to 400 teachers in Bandung Raya who were selected using a non-probability sampling technique. Data were analyzed using a linear regression model to assess the influence of demographic factors on financial literacy. The study revealed that two factors, i.e., age and education level, significantly impacted teachers' financial literacy. In contrast, the degree of financial literacy of teachers in Bandung Raya was not affected by gender, income level, or working period. However, simultaneously, demographic factors significantly influence teachers' financial literacy. This study implies that the government and educational institutions must encourage the development and increase of financial literacy for teachers across all demographic groups to resolve their financial issues and enhance their welfare.

Keywords: Demographic Factors; Financial Literacy; Teacher

I. INTRODUCTION

Financial issues have evolved into a distinct urgency that requires attention. Currently, both developed and developing countries are competing to improve their citizens' financial literacy, including Indonesia. Some people are still unaware of the significance of financial management to their well-being. With the fast advancement of technology, particularly in developing financial service products, people should also be more aware and motivated to use it in their daily lives. Financial problems are caused not just by inadequate income, but also by mistakes in financial management, including inappropriate use of credit cards, a lack of financial preparation, and a lack of savings. Financial literacy knowledge will assist people in managing their personal financial planning and raising their living standards (Margaretha & Pambudhi, 2015).

On October 29, 2022, The Financial Services Authority (OJK) published the outcomes of the 2022 National Financial Literacy and Inclusion Survey (SNLIK), which revealed an improvement in the Indonesian people's financial literacy and inclusion index. The survey discovered that the Indonesian population's level of financial literacy was 49.68%. This value improved compared to the 2019 SNLIK results, which revealed that the index of financial literacy had a value of 38.03%. Although it has experienced a fairly large increase compared to 2019, this percentage must still be increased to face the development of financial technology, which will be massive in the future (OJK, 2022).

The lack of access to financial services is one of the leading causes of poverty in developing countries (Krisnawati, 2019). Therefore, financial sector and service expansion are critical for economic growth and poverty eradication. However, the rising number of financial goods and services available, as well as global economic uncertainty, have increased the complexity of financial decisions and exposed the public to economic and financial issues. Recent trends in the financial sector and services emphasize the necessity of financial literacy because bad financial judgements and choices result from a lack of financial understanding, which also can lead to undesirable financial consequences and economic situations (Refera et al., 2016).

Meanwhile, teachers have an important role as educators for future generations since they are at the frontline of implementing education. The participation of teachers is very much needed to accelerate public understanding of financial planning literacy. Teachers play an important role in financial literacy because they are responsible for guiding and educating students about financial literacy. Teachers are also encouraged to disseminate financial literacy material to their students at a young age for them to learn good and planned financial management.

The management of the teacher's personal finances is included in the planning process in management. According to Krisnawati et al. (2018), planning is the cornerstone of management. This entails setting goals and determining how to achieve them. Teachers with strong financial understanding have a greater capacity to make better decisions in managing their own finances, which can be a positive example for their students. In addition, the ability of financial literacy in teachers can also help them to be more financially stable and secure, so they can achieve prosperity.

Research carried out by Nurbaeti et al. (2020) discovered that only 51.5% of teachers have basic financial management knowledge. The outcomes of the research are also in accordance with the research that carried out by Prayulianto (2019), which found that just 1% of teachers understood financial literacy out of 88 respondents. Kadoya & Khan (2019), Bhushan & Medury (2013), and Dewi (2022) found that an individual's level of financial literacy is affected by demographic factors. Demography is the study of the composition and dynamics of a population in a certain place. Demography is the study of population changes in terms of population number, distribution, and composition using demographic data analysis and mathematical computations (Adioetomo & Samosir, 2013). In this study, demographic factors influencing financial literacy were identified as age, gender, education level, income level, and working period.

The gap between this study and previous research lies in the object and location of the research. Previously, a large number of employees, students, university students, and MSMEs were used as the objects of financial literacy research. There are several studies that use teachers as research objects, but their scope is limited to teachers at specific schools or grade levels. While this study encompasses a broader range of research objects, it is not restricted to specific grade levels or schools.

The level of financial literacy in West Java has substantially increased in 2022. The results of the 2022 National Financial Inclusion Literacy Survey indicate that the financial literacy index of the population of West Java has increased from 37.43 percent in 2019 to 56.10 percent in 2022 (OJK, 2022). This study was undertaken in Bandung Raya, West Java's major population contributor, to determine whether the degree of financial literacy in West Java is already at a good level, particularly among teachers. Additionally, it is novel to use Bandung Raya as a research site and teachers as research objects.

II. LITERATURE REVIEW

Financial Literacy

Finance is a crucial factor that is intimately tied to each individual. A person's financial knowledge may assist them in managing their money and optimising the financial assets they have. Financial literacy is defined as understanding, capabilities, and beliefs that may impact attitudes and behaviour in making decisions and managing finances in order to achieve financial well-being (OJK, 2016). Moreover, Saputra & Dewi (2017) define financial literacy as a person's attitude and behaviour in making informed judgements and financial decisions based on knowledge and skills in managing finances for financial well-being.

As one of the fundamental competencies, financial literacy encompasses a variety of knowledge and skills for managing financial resources effectively for the well-being of one's life, as well as the practical requirements for everyone to mitigate, uncover alternatives, and make the best financial choices (Khanza & Krisnawati, 2021).

Demographic Factors

Demography is the study of population changes in terms of population number, distribution, and composition using demographic data analysis and mathematical computations (Adioetomo & Samosir, 2013). In this study, demographic factors influencing financial literacy were identified as age, gender, education level, income level, and working period.

The individual's age is continually rising, and with it, more and more events are heard, seen, and experienced, enhancing the experience of an object. The level of age maturity has also proven to influence the relationship between aspects of financial literacy (Dewi, 2022). This is demonstrated by the findings of the study, which indicate that age influences the sample's decision-making and financial goals.

Gender is defined as the biological distinction between men and women from birth (Hungu, 2016). Based on research carried out by Nurulhuda & Lutfiati (2020), gender has a significant and positive effect on financial literacy. Women have been shown to be better financial managers and to rely more on money management (Dewi, 2022). According to Rellyasari (2019), education is a process in which we are requested or taught to understand anything and to think critically. The greater the degree of education, the greater the access to information, especially financial understanding (Sembiring and Leon, 2021).

Income is money received by individuals, corporations and other entities in the form of wages, salaries, rent, interest, commissions, fees, and profits (Marbun, 2003). As people become older, their income will rise in general.

Therefore, they will have to decide where they will invest their money later (Sembiring & Leon, 2021). This means that the higher a person's level of income, the more conscious he is of his financial management, resulting in an elevated financial literacy level.

The working period is a measurement of how much time a person has spent understanding and carrying out the tasks of a job (Foster & Seeker, 2001). Someone with more job experience will be more financially literate than someone with limited job experience (Chen & Volpe, 1998).

Theoretical Framework

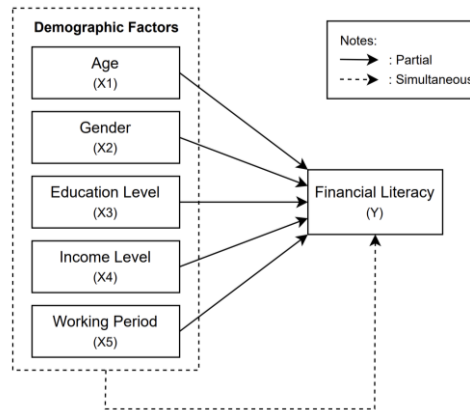


Fig. 1. Theoretical Framework (Processed Data, 2023)

Based on the study of the theory and framework that has been explained, the hypotheses in this study are:

- H1: Age has a significant influence on the financial literacy level of teachers in Bandung Raya
- H2: Gender has a significant influence on the financial literacy level of teachers in Bandung Raya
- H3: Education level has a significant influence on the financial literacy level of teachers in Bandung Raya
- H4: Income level has a significant influence on the financial literacy level of teachers in Bandung Raya
- H5: Working period has a significant influence on the financial literacy level of teachers in Bandung Raya
- H6: Age, gender, education level, income level, and working period have a significant influencesimultaneously on the financial literacy level of teachers in Bandung Raya

III. RESEARCH METHODOLOGY

This study used quantitative methods. This research focuses on understanding the causal relationships between various demographic factors and financial literacy among teachers in Bandung Raya. The study utilized both primary and secondary data, collecting information through an online questionnaire distributed to 400 teacher respondents. The questionnaire employed the Likert scale to assess the respondents' financial literacy levels. The sample criteria were determined through a non-probability sampling process in the form of quota sampling method, with the aim of representing the teacher population in Bandung Raya.

According to Basic Education Data (2022), there are 90,510 teachers in Bandung Raya. Using the Slovin formula, the sample size was 398.24 respondents, but to facilitate calculations, 400 respondents were used as the sample size. This study aims to determine the effect of demographic factors, in the form of age (X₁), gender (X₂), education level (X₃), income level (X₄), and years of service (X₅) on financial literacy (Y) for teachers in Bandung Raya. The independent variables included age, gender, education level, income level, and years of service, while financial literacy served as the dependent variable. The research employed various statistical methods, such as descriptive analysis, classic assumption tests, multiple linear regression, t-test, F test, and coefficient of determination, to analyze the data and establish the effect of demographic factors on financial literacy.

Sugiyono (2013) defines validity as the degree of correctness between the data on the study object and the capability that the researcher can report. This study used the product moment correlation formula with a sample size of 30 respondents to assess the study's validity. The results of the validity test indicate that each question on the financial literacy variable is valid and can be used in research because all thirteen statement items in the questionnaire passed the validity test, as indicated by the evidence that r-count is greater than r-table. Meanwhile, the reliability test was carried out using the Cronbach alpha formula and the results showed that all questions on the financial literacy variable were considered reliable because their Cronbach Alpha value was 0.870, which is greater than 0.7.

IV. RESULT / FINDING

Respondent Characteristics

There were 400 respondents in total who were gathered for this study. This figure corresponds to the Slovin formula's minimal number of respondents. Based on age, gender, education level, income level, and working period, 400 respondents who answered the screening question were profiled.

Table 1. Respondent Characteristic

Respondent Characteristics		Total	Percentage
Age	18 - 25 years	135	25,50%
	26 - 35 years	198	61,25%
	36 - 50 years	55	9,00%
	> 50 years	12	3,50%
Gender	Male	182	45,50%
	Female	218	54,50%
Education Level	Bachelor	332	83,00%
	Master	68	17,00%
Income Level	<Rp 1.851.800	129	32,25%
	Rp1.851.800 - Rp 2.685.000	159	39,75%
	Rp 2.685.500 - Rp 3.820.000	71	17,75%
	Rp 3.820.000 - Rp 4.797.000	32	8,00%
	Rp 4.797.000 - 5.901.200	4	1,00%
	>Rp 5.901.200	5	1,25%
Working Period	<1 year	102	25,50%
	2 years - 10 years	245	61,25%
	11 years - 20 years	36	9,00%
	21 years - 32 years	14	3,50%
	> 32 years	3	0,75%

(Processed Data, 2023)

According to Table 1, the respondents to this study were predominately female, between the ages of 26 and 35, bachelor graduates with incomes ranging from IDR 1,851,800 to IDR. 2,685,000, and those who had been employed for between two and ten years.

Descriptive Statistical Analysis

Respondents for the study were Bandung Raya teachers. Data for this study were gathered through the distribution of questionnaires in the form of Google Forms, both online and offline. Online questionnaire distribution was accomplished by disseminating questionnaires through teachers' social media. However, offline distribution was achieved by physically visiting several schools in Bandung Raya. There were 400 respondents in total who were gathered for this study. This figure corresponds to the Slovin formula's minimal number of respondents. On the basis of age, gender, education level, income level, and working period, 400 respondents who answered the screening question were profiled. The following is a recapitulation of respondents' responses to the financial literacy variable.

Table 2. Respondents' Responses to Financial Literacy Variable

No	Dimension	Percentage	Continuum Line Criteria
1	Financial Knowledge	80.02%	Good
2	Financial Attitudes	84.70%	Very Good
3	Financial Behaviour	84.56%	Very Good
Total Score		21,543	
Total Average Percentage Score		82.86%	

(Processed Data, 2023)

According to Table 2, the dimensions of financial attitudes and financial behavior are already in the "very good" category, while the dimension of financial knowledge remains in the "good" category, and the average score on the financial literacy variable is 82.86%. With this percentage, the responses given by teacher respondents in Bandung Raya fall into the "Good" category. Even though they are categorized as decent, these three aspects must be enhanced further to achieve the best results.

Classic Assumption Test

This investigation was successful in passing several classic assumption tests, including the normality test, the heteroscedasticity test, and the multicollinearity test. In order to conduct a normality test, the p-plot and the Monte Carlo test are examined. Meanwhile, the scatter plot and the result of the Glejser test are inspected to carry out the heteroscedasticity test. Multicollinearity is determined by examining the tolerance value and Variance Inflating Factor (VIF) on the regression test results.

Multiple Linear Regression Analysis

This study employs multiple linear regression to determine the influence of age (X₁), gender (X₂), education level (X₃), income level (X₄), and service years (X₅) on financial literacy (Y).

Table 3. Multiple Linear Regression Test Results

	Unstandardized Coefficients	
	B	Std. Error
(Constant)	49.257	1.561
X ₁	-1.911	.633
X ₂	.312	.513
X ₃	1.674	.681
X ₄	1.022	.554
X ₅	-.034	.644

(Processed Data, 2023)

Multiple linear regression analysis was employed to simultaneously determine the relationship between multiple independent variables and the dependent variable. This analysis was utilized in this study to figure out the linear connection between financial literacy and the demographic factor variables of age, gender, education level, income level, and working period. A multiple linear regression model is derived as follows based on Table 3:

$$Y = 49.257 - 1.991X_1 + 0.312X_2 + 1.674X_3 + 1.022X_4 - 0.034X_5 \quad (1)$$

The following is an explanation of the above equation model:

1. The constant value in the regression equation is 49,257. That is, the financial literacy variable (Y) will be worth 49,257 when the variables age (X₁), gender (X₂), education level (X₃), income level (X₄), and working period (X₅) are equal to zero.
2. The coefficient value for the age variable (X₁) is -1,911. This indicates a negative correlation between age and financial literacy. Therefore, if the age value increases by one-unit, financial literacy will decrease by 1,911 units.
3. The coefficient value for the gender variable (X₂) is 0.312, which is positive. This indicates a direct correlation between gender and financial literacy. In other words, a one-unit increase in the gender variable will result in a 0.312-unit increase in the financial literacy variable.
4. The level of education variable (X₃) has a coefficient value of 1,674. This indicates that there is a direct correlation between education level and financial literacy. Therefore, if the value of education level increases by one unit, the variable representing financial literacy will increase by 1,674 units.
5. The coefficient value for the income level variable (X₄) is 1,022. This indicates a direct correlation between financial literacy and income level. Therefore, a one-unit increase in the income level will result in a 1.022-unit increase in the financial literacy variable.
6. The working period variable (X₅) has a coefficient value of -0.034, which is negative. This indicates a negative correlation between working period and financial literacy. Therefore, if the value of working period increases by one-unit, financial literacy will decrease by 0.034 units.

Hypothesis Test Analysis

t-Test Analysis

This study employed the t-test to determine whether age, gender, education level, income level, and length of employment have a partially or individually significant impact on financial literacy, with a significance value of 0.05. If the significance value is <0.05, then H₀ is rejected and vice versa.

Table 4. t-test results

Variable	t	Sig.
Age (X ₁)	-3.020	.003
Gender (X ₂)	.609	.543
Education Level (X ₃)	2.458	.014

Income Level (X_4)	1.845	.066
Working Period (X_5)	-.054	.957

(Processed Data, 2023)

The conclusion that can be drawn from the t-test results in Table 4 is that:

- The age variable has a value of $-t_{\text{count}} < -t_{\text{table}}$ ($-3.020 < -2.232$) with a significance value of 0.003, which is less than 0.05. This indicates that age significantly influences financial literacy.
- The gender variable has a value of $t_{\text{count}} < t_{\text{table}}$ ($0.609 < 2.232$) with a significance value of 0.543, which is greater than 0.05. In other words, gender has no significant impact on financial literacy.
- The education level variable has a value of $t_{\text{count}} > t_{\text{table}}$ ($2.458 > 2.232$) with a significance value of 0.014, which is less than 0.05. This indicates that education level significantly affects financial literacy.
- The income level variable has a value of $t_{\text{count}} < t_{\text{table}}$ ($1.845 < 2.232$) with a significance value of 0.066, which is higher than 0.05. Consequently, income has no significant influence on financial literacy.
- The working period variable has a value of $-t_{\text{count}} > -t_{\text{table}}$ ($-0.054 > -2.232$) with a significance value of 0.957, which is higher than 0.05. This indicates that working period does not significantly influence financial literacy.

F-Test Analysis

In this study, the F-test was used to determine if age, gender, education level, income level, and working period all have a significant effect on financial literacy simultaneously. If the significance value is < 0.05 , then H_0 is rejected and vice versa.

Table 5. F test Results

	F	Sig.
Regression	3.842	.002b

(Processed Data, 2023)

Table 5 demonstrates that the significance level of the F-test was 0.002 where the value is less than 0.05 and $F_{\text{count}} \geq F_{\text{table}}$ ($3,842 \geq 1,966$). This indicates that age, gender, education level, income level, and working period have a significant impact on financial literacy simultaneously.

Coefficient of Determination

The purpose of this study was to determine the extent to which age, gender, education level, income level, and years of service influence financial literacy. The greater the value of the coefficient of determination, the more variables related to financial literacy can be explained by variables related to demographic factors.

Table 6. Coefficient of Determination Result

R	R Square	Adjusted R Square
.216a	.046	.034

(Processed Data, 2023)

The resulting coefficient of determination is 0.034 or 3.4%, as shown in Table 6. Therefore, it is possible to conclude that teachers' financial literacy will be influenced by age, gender, education level, income level, and working period by 3.4%. The remaining 96.6% of the variance is- caused by factors outside of the research model.

The sampling technique used in this study has an effect on the very low value of the coefficient of determination. The sampling technique used in this study is non-probability sampling in the form of quota sampling technique. According to Bornstein et al. (2013) and Firmansyah & Dede (2022), using the quota sampling technique in research has disadvantages, including selection bias, or in other words, the subjects in the sample do not represent the larger population. Based on the potential bias, it appears that this sampling technique will result in very diverse data. This condition will directly result in a high level of difficulty in formulating research results.

V. DISCUSSION

Financial Literacy Level

The dimensions of financial attitudes and financial behavior are already in the "very good" category, while the dimension of financial knowledge remains in the "good" category, and the average score on the financial literacy variable is 82.86%. With this percentage, the responses given by teacher respondents in Bandung Raya fall into the "Good" category.

The Effect of Age on Financial Literacy

The findings of the study on the age variable are consistent with the first research hypothesis, according to which a person's gender significantly affects financial literacy. This is demonstrated by the t-test findings in Table 4, indicating the age variable has a significance value of 0.003, which is less than 0.05. This result indicates teachers' literacy levels in Bandung Raya are significantly influenced by their age.

This conclusion is consistent with Rahmayanti's (2017) findings that age has a substantial impact on financial literacy. The findings of this study, however, are in direct opposition to studies by Yusnita & Abdi (2018) and Gutti (2020), which found no connection between age and financial literacy. In Addition, the outcomes of the multiple linear regression test in Table 3 demonstrate that age and financial literacy have an opposite relationship, with a negative regression coefficient of -1.991. The direction of this association indicates that Bandung Raya teachers' financial literacy will decline as they get older.

In other words, this suggests that as teachers progress through different stages of their careers and gain more experience, their financial literacy levels may vary. Older teachers might possess a deeper understanding of financial concepts and have accumulated practical knowledge over the years, leading to higher financial literacy levels. On the other hand, younger teachers, who are relatively new to the profession, might have limited exposure to financial concepts and may need more targeted financial education to enhance their financial literacy. Understanding the influence of age on financial literacy is valuable for educational institutions and policymakers, as it allows them to tailor financial literacy programs and interventions to meet the specific needs of teachers at different points in their careers. This can ultimately contribute to improving the overall financial well-being of educators in Bandung Raya.

The Effect of Gender on Financial Literacy

The second research hypothesis, that a person's gender has a significant effect on financial literacy, is not supported by the research findings on the gender variable. Gender study does not support the second research premise that gender affects financial literacy. Table 4's t-test results show that the gender variable's significant value is 0.543, greater than 0.05.

The findings of this research contradict with earlier studies by Irman et al. (2020), which found no gender differences in financial literacy. However, these results are in accordance with Gutti (2020)'s findings that gender significantly affects financial literacy. Meanwhile, Table 3's findings from the multiple linear regression test demonstrate that gender and financial literacy are directly related, with a positive regression coefficient of 0.312. Due to the direction of this relationship, if gender value increases, Bandung Raya teachers will also have higher levels of financial literacy.

As a result, the study does not provide evidence to support the notion that gender plays a significant role in determining financial literacy in this particular population. While gender may still have other socio-economic implications, it does not seem to be a determining factor in their financial literacy levels among teachers in Bandung Raya. This finding highlights the need for further research to explore other potential factors that could influence financial literacy in this context.

The Effect of Education Level on Financial Literacy

The education level variable research does not support the third research hypothesis that education level affects financial literacy. This is supported by Table 4's t-test results, which show that the education level variable's significant value is 0.014. This result suggests that teachers' financial literacy levels in Bandung Raya are significantly influenced by their education level.

The findings of this study are in direct opposition to those of studies by Aziz (2020) and Munthasar et al. (2021), which claim that financial literacy is positively and significantly impacted by a person's level of education. With a positive regression coefficient of 1.674, the findings of the multiple linear regression test in Table 3 demonstrate that there is a unidirectional association between income levels and financial literacy. This relationship indicates that if the level of education increases, the financial literacy of teachers in Bandung Raya will also increase.

This finding is consistent with the notion that a higher level of education provides individuals with the knowledge and skills necessary to make informed financial decisions and navigate complex financial matters. Therefore, it underscores the importance of promoting higher education and financial literacy programs to enhance teachers' financial capabilities and ultimately contribute to their financial well-being.

The Effect of Income Level on Financial Literacy

The income level variable research does not support the fourth study hypothesis that income level significantly impacts financial literacy. Table 4's t-test results show that the education level variable's significant value is 0.066 when $p > 0.05$. This indicates that Bandung Raya teachers' financial literacy is not affected by income. This study is in line with Amaliyah and Witiastuti (2015) study, which found that one's economic level does not substantially influence financial literacy.

This study is in line with Amaliyah & Witiastuti (2015) study, which found that one's economic level does not substantially influence financial literacy. Nevertheless, this study's findings are also contradictory with research by Suryanto & Rasmini (2018) and Mas'adah & Astuti (2022), which found a positive and significant relationship between education level and financial literacy. With a positive regression coefficient of 1.022, Table 3 presents the results of a multiple linear regression test indicating a unidirectional relationship between income levels and financial literacy. Due to the direction of this relationship, if income levels rise, Bandung Raya's teachers will also have greater financial literacy.

This implies that teachers' financial literacy in Bandung Raya is not solely determined by their income level, suggesting that other factors, such as education, personal financial habits, and access to financial resources, may play a more significant role in shaping their financial knowledge and decision-making. Further research could explore these other potential factors to gain a comprehensive understanding of the drivers of financial literacy in this context.

The Effect of Working Period on Financial Literacy

Working period variables support the fifth study hypothesis that working period affects financial literacy. The t-test findings in Table 4 reveal that the working period variable has a significant value of 0.957, higher than 0.05. The working period does not affect Bandung Raya teachers' literacy levels. This result contradicts other studies by Shalahuddinta & Susanti (2014) and Nurulhuda & Lutfiati (2020), which found that a person's working period has a significant impact on financial literacy.

Furthermore, the outcomes of the multiple linear regression test in Table 3 demonstrate that working period and financial literacy have a diametrically opposed relationship, with a negative regression coefficient of -0.034. The direction of this association indicates that the degree of financial literacy would decline as the working period of teachers in Bandung Raya rises.

The discrepancy in findings may be attributed to various factors, such as differences in the study populations, measurement methods, or the inclusion of other influential variables in the analysis. Therefore, further research is warranted to delve into the potential factors contributing to financial literacy in the context of Bandung Raya teachers' working periods to gain a more comprehensive understanding of this relationship.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

This study aims to examine the influence of demographic factors including age, gender, education level, income level, and working period on the financial literacy of teachers in Bandung Raya. Through thorough analysis of the processed data and conducting several tests, various conclusions have been drawn to address the research questions. The findings reveal that age and education level have a significant influence partially on financial literacy level of teachers in Bandung Raya. However, the other demographic factors variable, including gender, income level, and working period have no significant influence partially on financial literacy level of teachers in Bandung Raya. Nevertheless, when considering all demographic factors together, they collectively exhibit a significant influence on the financial literacy level of teachers in Bandung Raya. This comprehensive understanding can inform targeted interventions and educational programs aimed at enhancing financial literacy among this specific group of teachers.

Recommendation For Academics

Based on the obtained results, the researcher suggests that academics use this study as a resource or reference to expand their knowledge of financial management, particularly with regard to demographic factor variables that influence financial literacy.

For Futher Researchers

In accordance with the outcomes, this study has limitations in that the independent variables, which are demographic factors, can only explain or influence the dependent variable, which is financial literacy, by 3.4%. Other variables not investigated in this study influence the remaining 96.6%. As a result, future researchers should be able to include other independent variables that were not included in this study, such as psychological factors, marital status, investment, area of living, and so on.

The sampling technique used in this study has an effect on the very low value of the coefficient of determination. The sampling technique used in this study is non-probability sampling in the form of quota sampling technique. According to Bornstein et al. (2013) and Firmansyah & Dede (2022), using the quota sampling technique in research has disadvantages, including selection bias, or in other words, the subjects in the sample do not represent the larger population. As a result, the authors recommend that samples be chosen using probability sampling in order for the study findings to be more clearly understood, accurate, and appropriately representative of the population being investigated.

For Teachers

The findings of the study indicate on the financial literacy variable that the teachers still have low scores on the instrument regarding knowledge of pension management services in the financial knowledge dimension and understanding about the calculation and benefits of taxation in the financial behaviour dimension. This happened because the research respondents were dominated by teachers aged 26-35 years, and many of them were not aware of the importance of managing pension funds and their understanding of taxes calculation and its benefits.

In this regard, the researchers encourage teachers to learn about the pension fund management services available, both from public and private institutions, so that teachers can secure and safeguard their survival after retirement through various financial guarantees. Furthermore, researchers also recommend that teachers frequently document and maintain personal financial spending in order to correctly manage expenses and income, debts and financial obligations, plan better finances, and facilitate tax filing.

For School Agencies

School agencies, as institutions that accommodate teachers, are also encouraged to continue persuading the increased financial literacy of teachers through financial literacy training programs or workshops, collaboration with local financial institutions to provide financial literacy programs, and financial assistance or counseling for teachers to help them in enhancing the understanding and management of personal finances.

For Financial Services Authorities

The Financial Services Authority (OJK), the entity in charge of supervising and regulating the Indonesian financial services sector, is also recommended to continue monitoring and improving financial literacy among teachers. The Financial Services Authority can collaborate with education offices in various regions to provide programs that can improve teachers' financial literacy.

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Analysis of Bond Ratings at PT Bank Rakyat Indonesia Tbk, 2011 - 2020 Period

Marlina Nur lestari¹, Roni Marsiana Suhendi², Anisa Lisara³, M Apip⁴, Ershanda Adhytia⁵

^{1,2,3} Fakultas Ekonomi, Universitas Galuh, Ciamis, Indonesia

Abstract

Bonds are also something interesting for investors, because it has a low risk. Investor need an information to predict the profit from the investment. The purpose of this study was to find out and analyze how profitability influences bond ratings at PT Bank Rakyat Indonesia (Persero) Tbk, 2011-2020 period. This type of research is descriptive quantitative. The data in this study are secondary data from annual reports and corporate bond ratings. The sample in this study is PT Bank Rakyat Indonesia (Persero) Tbk financial data from 2011-2020 and bond rating data from a rating company (perifindo). The analysis tool in this study uses a simple linear regression test, the coefficient of determination and the T test. The results of this study are that the profitability of companies experiencing fluctuations tends to decrease, and profitability has no significant on bond ratings at PT Bank Rakyat Indonesia (Persero) Tbk, 2011-2020 Period.

Keywords: Corporate Bond; Return On Assets, Profitability

I. INTRODUCTION

Bonds are one component of debt that companies can offer to the public and listed on the Indonesian stock exchange (Ayu Sriary Bhegawati & Putu Yuria Mendra, 2021). Bonds are also something that investors interesting, because it has a low risk compared to other portfolios (Novia et al., 2022). A bonds have a certain maturity according to the agreement with the investors. (Kaltsum & Anggraini, 2021) So investors need a good information to predict the profit from the investment. One such information is a bond rating from a rating agency (Dewi et al., n.d.). The company asks to be rated according to the condition of the company, so that the company can maintain the performance of its bonds in order to attract investors in terms of bond sales. OJK merupakan An institution whose function to organize a regulatory and supervisory system, one of the rules set by the OJK regarding bond ratings, No: 11/PJOK.04/2018 1 August 2018 Concerning Public Offerings of Profitable Securities and Head Rates of Professional Investors.

In Indonesia the rating agency is PT. PEFINDO, this institution based on the initiative of the Indonesian capital market supervisory agency. PT. PEFINDO is affiliated with Standard & Poor Rating Service (S&P), which in turn actively participates with the ASEAN Forum Of Credit Rating Service Agencies (AFCRA) in its efforts to improve the rating issued by PT. PEFINDO 2015.

Bond rating is a level of measuring the quality of a debt based on the financial condition of the bond issuer, it is also an indicator of the bond issuer being able to pay debts and interest in a timely manner (Novia et al., 2022).

PT. Bank Rakyat Indonesia Tbk. Period 2011 - 2020 registered at PT. The Indonesia Stock Exchange is experiencing stability, that it has decreased in a few years of course with such conditions PT. Bank Rakyat Indonesia Tbk, should be able to continue to maintain and even increase the bond rating. This is to show investors that the company's finances are in good condition.

The factors that can affect bond ratings is profitability (YS Setyapurnama & V Norpratiwi, 2020). Because profitability is the company's ability to generate maximum profit, it can be considered safe in paying obligations to third parties. According to Research (FJ Meutianingrum & R Permani, 2022) the return on assets has an influence on bond ratings which can be used as a basis for company considerations.

Table 1. PT Bank Rakyat Indonesia's bond rating. Tbk, Period 2011 - 2020

Year	Obligation Rating	Weight Rating
2011	IdAAA	19
2012	IdAAA	19
2013	idB+	6
2014	idAA+	18
2015	IdAAA	19
2016	IdAAA	19
2017	IdAA	19
2018	IdAAA	19
2019	IdAA	19
2020	IdAAA	19

Source : PT Pefindo, 2021

The factors that can affect bond ratings is profitability (YS Setyapurnama & V Norpratiwi, 2020). Because profitability is the company's ability to generate maximum profit, it can be considered safe in paying obligations to third parties. According to Research (FJ Meutianingrum & R Permani, 2022) the return on assets has an influence on bond ratings which can be used as a basis for company considerations.

Previous research (YS Setyapurnama & V Norpratiwi, 2020) with the title of the effect of good corporate governance on bond ratings. (NMSK Sari & IB Badjra, 2015) with the title influence of liquidity, company size, leverage and collateral on bond ratings. (MP Sari, 2007), The ability of financial ratios to predict bond ratings. Effect of company characteristics, bond characteristics, auditor's reputation on the level of bonds (Dayanti et al., 2019). Effect of company size, Debt To Equity Ratio, Interest rate, Bond Rating on Yield To Maturity (Ytm) of Company Bonds (Nuratriningrum & Komarudin, 2021). Analysis of the impact of liquidity, leverage and company size on bond ratings (Kaltsum & Anggraini, 2021). Effect of retained earnings and bond age on bond ratings of companies listed on the IDX for the 2016 – 2018 period (Novia et al., 2022). The role of earnings management, and institutional ownership of bond ratings in non-financial companies registered with PT PEFINDO (Ayu Sriary Bhegawati & Putu Yuria Mendra, 2021). The effect of company size, company growth and collateral on bond ratings (Empirical studies on manufacturing companies in the industrial sector)(Dewi et al., n.d.). The different in this study is that no one has examined the independent variable in terms of return on assets on bond ratings at PT. Bank Rakyat Indonesia (Persero) Tbk, 2011-2020 period.

Based on the background above, the purpose of this research is to find out and analyze the influence of return on assets on the bond rating of PT. Bank Rakyat Indonesia (Persero) Tbk which is listed on the IDX for the 2011-2020 period

II. LITERATURE REVIEW

Return On Assets

This return on assets looks at the company's ability to earn profits from the value of the capital or assets it invests effectively and efficiently (Sumarsidi & Hairudinor, 2021).

The ROA function itself measures the efficiency of the use of working capital, production efficiency, and sales efficiency, by calculating the ratio of the company's net profit to the company's total assets. This ratio is a benchmark for the company's performance on its ability to earn profits (Imam Hidayat dan Lidya Maulidiyah, 2022).

The objectives of Return On Assets are: (1) To measure or calculate the profit earned by the company in a certain period; (2) To assess the company's profit position in the previous year with the current year; (3) To assess profit development from time to time; (4) To assess the amount of net profit after tax with own capital; (5) To measure the productivity of all company funds used both loan capital and own capital; (6) To measure the productivity of all company funds used both own capital (Sari & Jufrizen, 2019)

The ROA formulation used (Kusuma, 2021)

$$ROA = \frac{\text{Net Profit}}{\text{Total Assets}}$$

Bond Rating

Bond rating is a measure of the quality and security of a bond based on the financial condition of the bond issuer (Akhmad Darmawan et al., 2020).

The objective of bond ratings is to provide accurate information regarding financial performance, industry business position, companies issuing bonds (bonds) in the form of ratings. Here investors can rate the company issuing the bonds is feasible (Akhmad Darmawan et al., 2020; Kepramareni et al., 2021).

Rating from PEFINDO use code like : id AAA; id AA+; id AA; id AA-; id A+; id A; id A-; id BBB +; id BBB; id BBB-; id BB+; id BB; id BB-; id B+; id B; id B-; id CCC; id SD; id D.

The Effect of Return On Assets to bond ratings

Return on assets (ROA) is a comparison between the returns generated by the company and the total assets owned by the company (Kusuma, 2021). This ratio shows the ability of the capital invested in all assets to net profits.

If the profit obtained is good, it will increase the return on assets with a maximum profit compared to the assets, it will affect the company's obligations, including payment of bonds and interest, return on assets has an influence on bond ratings. (MP Sari, 2007).

The results of previous research stated that ROA has a significant effect on bond ratings for service companies listed on the Indonesian Stock Exchange (IDX) in 2021 (FJ Meutianingrum & R Permani, 2022), and than (Hakim & Supeno, 2020) states that there is a significant effect of ROA on bond ratings of mining companies. (Sisca & Pramesti, n.d.) states that ROA partially affects bond ratings. On the basis of the statement above, the hypothesis in this study is an effect of return on assets to bond ratings.

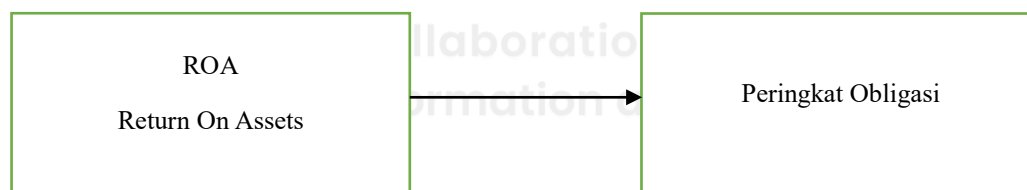


Fig1. Research paradigm

III. RESEARCH METHODOLOGY

Type Of Research

This type of research is quantitative, Quantitative research is empirical research where data is something or form that can be counted and pays attention to the collection and analysis of data in numerical form, with the aim of generalizing research findings so that they can be used to predict the same situation in other populations (Dr. Basuki. M.Si, 2021).

Subjects Of Research

The subjects in this study were PT Bank Rakyat Indonesia Tbk, a company listed on the Indonesian stock exchange and PEFINDO

Variable Operationalization

The variables in this study consist of two, namely:

1. Independent variable is bond ratings
2. Dependent variable is return on assets

Variable operationalization is described in table 2.

Tabel 2. Variable operationalization

Variabel	Definition	Indicator	Scale
Bond Rating	Bond rating is a measure of the quality and security of a bond based on the financial condition of the bond issuer (Akhmad Darmawan et al., 2020).	Bond Rating From a Rating Company	Nominal
Return On Assets	<i>Return on assets (ROA) is a comparison between the returns generated by the company and the total assets owned by the company</i> (Kusuma, 2021)	<ol style="list-style-type: none"> 1. Net Profit 2. Total Assets 	Ratio

Population and sample

The population in this study is the annual report from PT Bank Rakyat Indonesia Tbk and Bond rating from PEFINDO. And the sample in this study is financial report data and bond ratings from 2011 – 2020.

Data Collection Techniques

In this research the data is secondary data obtained through documentation from IDX and PEFINDO in 2022. The sample used is the financial statements and bond ratings from 2011 – 2020 PT Bank Rakyat Indonesia Tbk, 2011 – 2020 period.

Data analysis

Data analysis to find the effect of bond ratings on return on assets used correlation analysis, regression, coefficient of determination, and t test using the help of Microsoft Excel 365.

IV. RESULT / FINDING

Return On Assets at PT Bank Rakyat Indonesia Tbk, Period 2011 – 2020

Return on assets (ROA) is a comparison between the returns generated by the company and the total assets owned by the company. This ratio shows the ability of all invested capital assets to generate net profits.

ROA (Return On Asset) value from PT. Bank Rakyat Indonesia (Persero) Tbk, 2011-2020 period is presented in table 3, fluctuate tends to decrease. In 2020 it experienced a very significant decrease because the value of net profit had increased relatively slightly but total assets had increased quite a lot every year compared to net income. PT. Bank Rakyat Indonesia Tbk has the highest ROA ratio in 2013, is 3.41%. The lowest ratio occurred in 2020, is 1.23%. This shows that the ability of PT. Bank Rakyat Indonesia Tbk to net profits to the total assets.

ROA (Return On Assets) health assessment criteria according to (Kusuma, 2021) must exceed 1.5%, at PT Bank Rakyat Indonesia, Tbk with an average of 10 years is 2.73%, meaning that the return on assets in this company can be said to be healthy.

Table 3. Return On Assets (ROA) of PT Bank Rakyat Indonesia Tbk, 2011-2020 period

Year	Net Profit	Total Asset	ROA
2011	15.087.996	469.899.284	3,21
2012	18.687.380	551.336.790	3,39
2013	21.354.330	626.182.926	3,41
2014	24.253.845	801.955.021	3,02
2015	25.410.788	878.426.312	2,89
2016	26.227.991	1.003.644.426	2,61
2017	29.044.334	1.126.248.442	2,58
2018	32.418.486	1.296.898.292	2,50
2019	34.413.826	1.416.758.840	2,43
2020	18.660.393	1.511.804.628	1,23

Source : Annual Report PT BRI Tbk , 2021

Bond Rating at PT Bank Rakyat Indonesia Tbk, Period 2011 – 2020

Bond rating is a level of quality and safety measurement of a debt based on the financial condition of the bond issuer, specifically, bond rating is the result of an evaluation conducted by a rating agency which is an indicator of the likelihood of the bond issuer being able to pay debt and interest on time (Harisman et al., 2022).

Preliminary data regarding bond ratings taken at the end of the year of observation regarding bond ratings, which is the dependent variable, is measured using the interval ratio of the company bond ratings included in the research sample during the 2011-2020 period presented in table 4.

Table 4. PT Bank Rakyat Indonesia Tbk Bond Rating Data, 2011-2020 Period

Year	Obligation Rating	Weight Rating
2011	idAAA	19
2012	idAAA	19
2013	idB+	6
2014	idAA+	18
2015	idAAA	19
2016	idAAA	19
2017	idAAA	19
2018	idAAA	19
2019	idAAA	19
2020	idAAA	19

Source: PT PEFINDO, 2021

In the table above it can be seen that the bond ratings of PT. Bank Rakyat Indonesia Tbk for the period 2011 - 2020 is in the stable category, it is just decreased in 2013 by (idB+) due to Bank Rakyat Indonesia experiencing the impact of the global economic crisis, but the following year the bond rating of PT. Bank Rakyat Indonesia Tbk experienced stability. So as to make investors interested in investing their funds in the company Bank Rakyat Indonesia Tbk.

At PT. Bank Rakyat Indonesia Tbk period 2011 - 2020 the average bond rating is idAA (ranked 17th). An obligor rated idAA differs from the highest rated obligor to a small degree, and has a strong capacity to meet long-term financial commitments to investors.

The effect of ROA on bond ratings at PT Bank Rakyat Indonesia Tbk, 2011-2020 period

This is the result of calculating the regression analysis of the effect about return on assets on bond ratings at PT Bank Rakyat Indonesia Tbk for the 2011-2020 period presented in table 5.

Table 5. Summary Output The Effect Of Return On Assets To Bond Ratings

Regression Statistics					
Multiple R					0,3905141
R Square					0,1525013
Adjusted R square					0,0465639
Standard Error					3,9916133
Observation					10

ANOVA					
	df	ss	MS	F	Sig F
Regression	1	22,936189	22,936189	1,439542	0,2645372
Residual	8	127,46381	15,932976		
Total	9	150,4			

Source: Results of Data Analysis, 2022

The correlation test showed a positive result of 0.39 it is weak level. The influence in this study was 15.25%, 84.75% was influenced by other factors not examined.

The proposed hypothesis was tested through a T test, with a 5% degree of error, it was found that return on assets did not have a significant positive effect on the bond ratings of Bank Rakyat Indonesia Tbk 2011-2020 period.

V. DISCUSSION

The Effect of Return On Assets to Bond Ratings at PT Bank Rakyat Indonesia Tbk 2011 – 2020 Period.

Return on assets at PT Bank Rakyat Indonesia Tbk 2011 – 2020 period, experienced fluctuations tending to decrease, especially in the last five years. This is due to the increase in company profits accompanied by a significant increase in company assets, so that the profit generated by the company is considered not optimal for the use of relatively high assets. However, the return on assets at PT Bank Rakyat Indonesia Tbk 2011-2020 period is classified as healthy.

Bond ratings at Bank Rakyat Indonesia Tbk for the period 2011 – 2020, according to data from pefindo, can be said to be stable every year except for 2016 where the rating was downgraded, this indicates that Bank Rakyat Indonesia Tbk for the period 2011 – 2020 is able to pay long-term obligations, in this case bonds. This can also be used as good information for investors so they can invest in bonds in PT Bank Rakyat Indonesia Tbk 2011 – 2020 period.

The results of data analysis to see the effect between variables resulted in a large effect of 15.25%, this indicated that 84.75% was influenced by other factors not examined. And the results of the t test conclude that return on assets has no significant positive effect on bond ratings at PT Bank Rakyat Indonesia Tbk 2011 – 2020 period.

The results of this study are in line with the results of previous studies (MP Sari, 2007) which states that if the profit obtained is greater, it will increase its ROA with large profits compared to the amount of assets owned, it

will affect the company's obligations including payment of bonds and interest, with this, ROA has an influence on bond ratings.

The results of this study are not in line with previous research which stated that ROA has a significant effect on bond ratings for service companies listed on the Indonesian Stock Exchange (IDX) in 2021 (FJ Meutianingrum & R Permani, 2022). This is due to different research objects and limited data in this study.

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Analysis Of Break Even Point (BEP) And Margin Of Safety As A Tool In Determining The Selling Price Of Banana Chips Kujang Pas Cikoneng Ciamis MSMEs

Dodi Satriadi¹, Endah Puspitasari², Iwan Setiawan³ and Naqiri Ziani⁴
^{1,2,3,4} Fakultas Ekonomi, Universitas Galuh, Ciamis, Indonesia

Abstract

SMEs Kujang Pas with its owner named Haji Ade Endang is an SMEs engaged in the production and sale of banana chips that grow and develop in the Ciamis area, West Java. This study aims to look at the financial statements in May as a basis for determining sales in the following month. Determining the selling price is important to achieve the desired profit and at least not suffer a loss. By using Break-even Point (BEP) analysis, you can see the break-even point or describe how a company does not make a profit and does not experience a loss. This type of research is descriptive with a quantitative approach. The data analysis method used in this study is the break even point, and the margin of safety. Data collection techniques using interviews, observation, literature and documentation. The results of this study indicate that for May 2023 the calculation of the Rupiah BEP obtained is Rp. 22,291,666, then the BEP Unit is 796 Units and the Margin Of Safety calculation results are 56%. Thus, based on the results of the analysis of BEP calculations and the margin of safety for the following month, Kujang Pas SMEs by selling 796 Units/ 796 Kg of banana chips with total sales of Rp. 22,291,666, the company is already at the breakeven point and if the following month sales decrease by 56% even Kujang Pas SMEs can still run without experiencing losses.

Keywords: SMEs, Break-Even Point (BEP), Margin of Safety (MOS)

I. INTRODUCTION

Micro, Small and Medium Enterprises (MSMEs) are a strong sector in facing the crisis and have an important role in Indonesia's economic activities. MSMEs have a contribution in the formation of Gross Domestic Product (GDP) of 57% -59%, the value of national investment and is a sector that absorbs a lot of labor. Sustainable Development Goals (SDGs) are the goals of sustainable development by maintaining a sustainable increase in the economic welfare of the community by alleviating poverty (Mardjono ES, Setyowati L2023;4:230–230)

Intense competition in the Indonesian food industry requires business people, especially MSME business people, to maximize performance in order to achieve the main goal of entrepreneurship, namely achieving optimal profits. To achieve that profit optimally, business actors need to have good profit planning. Profits are affected by cost, quality, quantity and selling price. The costs in question are fixed and variable costs that must be separated when planning profits and sales. Profit planning is a form of planning to achieve company goals which is used as a benchmark tool for company performance (Liestiana TP, Novianty I 2021;1:549–62). The most important thing in profit planning is making decisions about profit targets to be achieved, because the first step in profit planning is to run a business through decision making.

The costs incurred are the main factor in determining the selling price and income that the company wants. Profit planning is needed by MSMEs to obtain optimal profits. So far, the problems experienced by MSMEs in addition to determining the amount of capital as well as the lack of knowledge of identifying costs that need to be recognized both variable costs and fixed costs along with their depreciation. In addition, MSMEs do not yet have an exact reference for determining the Break Even Point (BEP) in determining the selling price and profit planning, one of which is by using the Margin Of Safety. To determine sales profit, MSMEs need to know exactly how much the BEP (Break Event Point) is, where MSMEs are not in a profit or loss position so they can determine what the best selling price and desired profit are. If the total expenses are equal to the total income then the break even point will be obtained. The relationship between fixed costs, variable costs, profits and sales volume can be identified using BEP analysis (Purnia DS, 2018;3:69–78).

Various research topics on MSMEs have been conducted in Indonesia, but more focused on the growth of MSMEs themselves and their impact on the economy of a region (eg Halim, 2020; Hapsari et al., 2014; Widowati & Purwanto, 2018; Rachman, 2016), where the results mostly show that the growth of MSMEs can improve the economy in a region. Research on SMEs that are focused on managing their business has also been carried out by researchers before, such as the implementation of SAK-EMKM, utilization of financial information, inclusion finance, capital and use of technology (eg Uno et al., 2019; Rohendi, 2019; Hutami et al., 2015; Irmawati et al.,

2013; Panelewen et al., 2020; Diana, 2019; Lubis & Junaidi, 2016 ; Akhmad & Purnomo, 2021), whose results show that most MSME actors have difficulty implementing these variables due to the low quality of human resources. While this research is focused on simple and basic financial systems in a small-scale company, such as determining costs that affect HPP and BEP, planning sales and profits to be achieved. So that MSME actors can understand the concept of sales and profit planning by achieving the BEP point of a product to be sold.

From the background and description of the problems that have been presented above, the formulation of the problem is to determine the costs that are included in fixed, variable, direct and indirect costs, then determine the BEP and can also determine the MOS (Margin of safety).

II. LITERATURE REVIEW

According to Hansen et al, the break even point (2011: 4) is the point where total revenue equals total cost, the point where profit is zero. Halim et al (2011: 74) define break even as a term used to describe a business condition, when a company does not make a profit but does not suffer a loss.

Meanwhile, as Mulyadi said, break-even (1997: 230) is a business condition where there is no profit and no loss. So it can be concluded that the break even point is a point, where the total cost is equal to the total income. The breakeven point is related to the margin of safety. The margin of safety according to Abdul Halim and Bambang S (2005:57) says that the Safety Margin is the difference between the sales plan (in units or units of money) and break-even (in units or units of money) sales. The margin of safety provides information about how far the actual sales can fall from the sales plan so that the company does not suffer losses. The decrease in sales realization from the maximum sales plan must be as large as the mag of safety so that the company does not suffer losses. The margin of safety according to Bambang Riyanto (2010: 366) is: "the margin of safety is a number that indicates the distance between planned sales or budget sales with break even sales. Thus, the margin of safety also describes the distance limit, where if sales exceed this limit, sales will suffer a loss.

Mulyadi (2010: 230) explains that break even analysis is an analytical technique to study the relationship between fixed costs, variable costs, profits and volume of activity. Because this analysis studies the relationship between the cost-profit volume of activity, this analysis is often called "Cost Profit Volume analysis" (CPV analysis). In profit planning, break-even analysis is a "profit-planning approach" which is based on the relationship between costs (cost) and sales revenue (revenue). Break even point analysis is a way to find out the minimum sales volume so that a business does not suffer a loss, but also has not earned a profit, in other words equal to zero.

There are many benefits of break event point analysis, one of which was stated by Rony (1990:357), namely:

1. 1. Considerations about new products in determining how many levels sales that must be achieved in order for the company to make a profit.
2. As a basic framework for research on the effect of expansion on levels operational.
3. Assist management in analyzing the consequences of shifting costs variable into fixed costs due to the automation of working mechanisms with sophisticated equipment.

Rumanintya Lisaria Putri in Astrin Kusumawardani (2020: 120) states that break-even analysis is used to determine the level of product sales needed only to cover all costs incurred during a certain period. According to Horngren et al in Heru Maruta (2018: 11) said that the break-even point or break-even point is a sales level where the operating profit is zero. Total income equals total expenses. Meanwhile, according to Henry Simamora (2012: 170) BEP is sales volume where the total revenue and total expenses are the same, there is no net profit or loss.

The margin of safety combined with the break-even analysis is to determine how much to reduce sales so that the company does not suffer losses. Mozart Weston Tarakuya et al (2017:50) Companies use margin of safety (MoS) when making decisions about business opportunities and sales mix changes. Yulistia (2017: 281) Margin of safety, namely overselling where the budget is higher than the volume of break-even sales. The margin of safety is the amount of (actual) sales that are budgeted to exceed the break-even point. The margin of safety describes how much revenue can be reduced before losses start to occur. Rachmina and Sari, 2017: 142 in Rachel Tangerang et al (2018: 375). Safety margin information can be expressed as a ratio (percentage) between budgeted and break-even sales, or as a percentage (ratio) of the difference between budgeted and break-even sales. Budgeted break-even rate and sales

Equations

Equations and formulae BEP and Margin Of safety

$$\text{BEP (Unit)} = \frac{FC}{\text{Price per unit} - \text{VC per unit}}$$

$$\text{BEP (Rp)} = \frac{FC}{1 - \text{VC per unit} : \text{Price per unit}}$$

where: FC = Fixed Cost
VC = Variable Cost

Margin Of safety

$$\text{MOS} = \frac{\text{Sale} - \text{BEP}}{\text{Sale}} \times 100\%$$

III. RESEARCH METHODOLOGY

The approach used is a quantitative approach method using data in the form of numbers through a calculation process. The descriptive research method with a quantitative approach aims to describe a current event in the form of meaningful numbers (Margareta S repository.upi.edu; 2013). And the method used is a descriptive method that explains the condition of the research object based on the actual situation in the field by describing or analyzing the results of the research but not to draw broader conclusions (Liestiana TP, Novianty I 2021;1(3):549–62). The basic steps used in solving the problem begin with a preliminary study with literature studies and field studies and observations. Because the formulation of the problem and the determination of research objectives have been determined, the next step is to collect data and then the data is processed using ratios to get answers to the problems that have been made.

This study uses two types of data sources, namely primary and secondary data. Primary data was obtained by means of direct interviews and observations with MSME owners of Banana Chips at the business location.

Secondary data was obtained by means of literature study, which is one of the techniques used to obtain data and information by studying several written sources including books, research results, journals, articles, as well as the results of reports that are relevant/related to this research.

IV. RESULT / FINDING

From the results of direct observations in the field, data was obtained that in May 2023 UMKM Kujang Pas Banana Chips were able to collect a total income of IDR 50,960,000 with a selling price per kg of IDR. 28,000 and sales volume of 1820 kg. besides that, information was obtained that the Fixed Cost of Kujang Pas chips production was Rp. 10,700,000 and the variable cost is Rp. 26,500,000. With this information, the BEP and MOS can be determined using the formula described above as follows:

$$\text{BEP (Unit)} = \frac{10.700.000}{28.000 - 14.560}$$

$$\text{BEP (Unit)} = 796 \text{ Unit}$$

$$\text{BEP (Rp)} = \frac{10.700.000}{1 - 14.560 : 28.000}$$

$$\text{BEP (Rp)} = \text{Rp.}22.291.666$$

Margin Of Safety

$$\text{MOS} = \frac{50.960.000 - 22.291.666}{50.960.000} \times 100\%$$

$$\text{MOS} = 56 \%$$

V. DISCUSSION

The results of this study indicate that for May 2023 the calculation of the Rupiah BEP obtained is Rp. 22,291,666, then the BEP Unit is 796 Units and the Margin Of Safety calculation results are 56%. Thus, based on the results of the analysis of BEP calculations and the margin of safety for the following month, Kujang Pas SMEs by selling 796 Units/ 796 Kg of banana chips with total sales of Rp. 22,291,666, the company is already at the

breakeven point and if the following month sales decrease by 56% even Kujang Pas SMEs can still run without experiencing losses.

VI. CONCLUSION AND RECOMMENDATION

With the results obtained using the calculations above, it can be seen that the production and sales of Kujang Pas banana chips are on the track, because in the BEP calculation the minimum Unit Kujang Pas Kerpik must produce 796 uni/kg in a month while Kujang Pas in May has been able to produce 1820 kg, for BEP Rupiah the calculation results show the figure Rp. 22,291,666 while Kujang Pas itself in May was able to earn IDR 50,960,000. As for the safe point of sale or MOS, the calculation results show a figure of 56% which shows that with only 56% of total sales from this month's sales, Kujang Pas will not experience a loss and the business will continue.

So from these results, the author only provides suggestions and input so that the patterns and business activities of Kujang Pas Banana Chips if they want their business to run continuously at least they maintain the performance that has been carried out so far or at least even in difficult conditions Kujang Pas must be able to achieve 56% sales from current conditions This.

And from this research it is hoped that there are theoretical benefits that can be drawn, although there are certainly still many shortcomings, at least at least it can be a basis for subsequent researchers to develop theories that have not been studied and discussed more deeply regarding Break Event Points and Margins of Safety, and practically the results of the discussion In this research, we hope that it will become the basis for MSME actors in any area in determining business development plans that are in accordance with the targets set by business owners so that business progress continues to increase and is stable from time to time.

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SCBTII
Sustainable Collaboration in Business,
Technology, Information and Innovation

Capital Market Reaction Analysis Before and After The Announcement of The Indonesian-Japan Economic Partnership Agreement (IJEPA) at The Bali G-20 Summit (Empirical Study of Basic Materials Sector Companies)

Dhian Wahyuni¹, Mirza Aulia N Fajri², Aldini F Fahrezi³, Sri Rahmayani⁴, and Bintang J Airlangga⁵
^{1,2,3,4,5}:Faculty of Economic and Business, Telkom University, Bandung, Indonesia

Abstract

This study examines the significance of abnormal returns and analyzes the differences before and after the Indonesian-Japan Economic Partnership Agreement (IJEPA) announcement at Bali G20 Summit. The agreement of IJEPA impacts the economy, especially in the field of trade and the stability of stock prices. The high range of bilateral cooperation and export-import activities in the IJEPA positively impacts economic activity in Indonesia. The G20 Summit in Bali provided an on the object of study in the field of event study analysis. The sampling uses a non-probability method. Using the population of basic materials sector companies from the Indonesia Stock Exchange and data collection of a 2022 JCI historical report. The data analysis technique used in this study is One Sample Wilcoxon and Paired Wilcoxon Test. This finding shows differences in abnormal returns before and after the IJEPA announcement at the Bali G20 Summit, and there is also a difference in the average abnormal return before and after the announcement of the IJEPA. The announcement of the cooperation agreement between Indonesia and Japan made a positive and significant response from investors in the primary material sector companies. Research on capital market reactions to the IJEPA is expected to make investors cautious and make government cooperation events a capital market analysis tool. For the government, this research is expected to evaluate the cooperation carried out on the response of the general public and investors.

Keywords : abnormal Return. capital market reaction, event study

I. INTRODUCTION

This study examines the significance of abnormal returns and analyzes the differences before and after the Indonesian-Japan Economic Partnership Agreement (IJEPA) announcement at Bali G20 Summit. The capital market is one of the indicators that can be used to see how the wheels of a country's economy are turning. The capital market serves as a source of business funding and a channel for corporations to obtain funds from third parties for the continuance of working capital enterprises (Kusnandar & Bintari, 2020). One of the reasons people invest is to profit from their investments (Ivani, 2020). People can invest in tradable long-term financial instruments (securities) through the capital market. Securities, according to Capital Markets Law Number 8 of 1995, include promissory notes, commercial paper, stocks, bonds, credit securities, evidence of debt, rights, warrants, options, and derivatives. Capital owners must be able to examine and determine the choice of financial instruments as an investment tool in order to acquire the expected rate of return in securities trading (Raya & Paramita, 2020).

Investors make judgments based on capital market analysis and knowledge, both personal and derived from public events, which will be important in determining these decisions when studying the rise and fall of stock prices (Hotimah & Astawinetu, 2020). The JCI, which reflects the ups and downs of economic development and includes share prices for both state-owned and private enterprises, can be used to track the fluctuation of share prices. If the company's financial performance is volatile, it will have an impact on the JCI's increase or fall (Raya & Paramita, 2020).

The existence of the Indonesia-Japan Economic Partnership Agreement (IJEPA) is one event that can indicate stock price volatility. Through the Indonesia-Japan Economic Partnership Agreement (IJEPA), the Indonesian government adopted a number of diplomatic strategies and trade policies. The trade agreement has the potential to assist the new economic sector. The IJEPA aspires to increase trade and investment between Indonesia and Japan, as well as regional markets, through three primary pillars: liberalization, facilitation, and capacity building. The purpose of IJEP is to increase market access, commerce, and investment. Japan ranks third as Indonesia's main export destination country, with a 10.5% share, and third as Indonesia's main import source country, with a 9% share (Directorate General of International Trade Negotiations, 2022). Japanese investment in Indonesia was USD 4.9 billion, with the key sectors being gas and water, transportation and transportation equipment, metal goods, and so on (Ministry of Trade, 2018). The agreement's of bilateral import and export cooperation The Indonesia-Japan Economic Partnership Agreement (IJEPA) has a positive impact on Indonesian economic activity. When

Indonesia and Japan collaborate with one another, this can be a hint of a strong stock trend. Investors perceive prospects for enterprises in the basic materials sector, which is the main focus of bilateral investment between Indonesia and Japan.

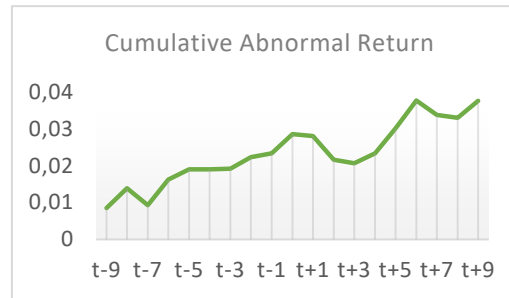


Figure 1. Movement of CAAR around the IJEPa Cooperation Announcement
Source: Data processed by the author (2023)

Based on the phenomena that occur, it can be seen that the development of the CAAR is obtained from the stock market prices and stock prices of basic material sector companies listed on the Indonesia Stock Exchange. There was a market reaction on 11 November 2022-25 November 2022 or around the agreement Indonesia-Japan Economic Partnership Agreement (IJEPa).

This study research on capital market reactions to the IJEPa is a consideration materials that can help investors cautious and make government cooperation events a capital market analysis tool. For the government, this research is expected to evaluate the cooperation carried out on the response of the general public and investors

In this research we present a theoretical study or literature review in Section II, methodology in section III. Section IV will present the findings and section V provides the discussion of the results. Closing in section VI is

II. LITERATURE REVIEW

A. Signal Theory

The relevance of information issued by a firm as a result of investment decisions made by investors outside the company is emphasized by signal theory. In 1973, Michael Spence transformed signal theory into signal balancing. How a corporation delivers signals to readers of financial statements or investors is described by signal theory. Signals are pieces of information that indicate that the company is superior to competitors. This theory explains how financial statements can be used to reflect both positive and negative signals. Signal theory is concerned with how the agent's success or failure must be communicated to the principal. Information can be used as a tool to determine whether the company is sending out positive or negative signals (Tuvadaratragool, 2013). In this study, signal theory assumes that an investor in a company makes an investment decision based on available information. Positive signals may encourage the market to react, but negative signs won't trigger the market to react to an investment decision. If an investor has sufficient knowledge and understanding of the information acquired, the investor's offer will be more powerful, and vice versa (Gratias & Mustanda, 2015).

B. Event Study

Studying events is a popular research strategy that serves as a significant instrument in the world of finance (El Ghoul et al., 2022). Event study is a method in capital market research that focuses on the reaction of the capital market, which can be seen in the share price of an event both at the time of the incident and some time later (Maharani & Putra, 2022). Event studies track abnormal fluctuations in stock prices that occur in response to a specific event, such as the release of a company decision. They are founded on the ultimate principle (El Ghoul et al., 2022): (1) A semi-strong variant of the efficient market hypothesis stating that prices fully represent all information; and (2) An asset equals the present value of all future free cash flows. As a result, the price impact of an event can disclose the event's effect.

C. Capital Market Efficiency

Capital market efficiency, according to Sujana (2017), is a condition in which stock prices are swiftly changed with additional information, such that stock prices contain all available information. The closer the stock price is to market information, the better the market conditions will be. Market prices are generally modified in response to new information. As appropriate, this adjustment can be over- or under-adjusted. This occurs because investors make decisions about whether to buy or sell stocks based on the information they receive. According to Sujana

(2017), an efficient market assessment may be validated by two factors: the existence or complete availability of information and investor decisions or actions based on the collected information.

If there is an occurrence that carries information, the market will react. A surprise or something unexpected might be imagined as an event. Something that is not a surprise or was expected will not cause a market reaction (Dwianto & Yulita, 2020). To determine whether the capital market is weak, strong enough, or efficient in its strongest form, it must be tested. This test is based on a premise known as the efficient market hypothesis.

D. Abnormal Returns

The market reaction to an event is projected with an abnormal return. Changes in stock prices can be used to measure market reaction by using abnormal returns as the value of price changes. The excess of realized return above predicted return is known as abnormal return. The difference between the present and historical prices is the realized return, which occurs in the future. Meanwhile, the return that must be estimated is the expected return (Christy & Wulandari, 2019). Investors who make long-term investments can expect a bigger return than stock risk (Ratnaningsih, 2020). An event study can be used to test atypical returns, which can be used to measure market reaction. The anomalous return formula is as follows:

$$RTN_{it} = Rit - E(Rit)$$

Information:

RTN_{it} : abnormal return the i -th security on the t -th event

Rit : returns actually for the i th security on the t th event

$E(Rit)$: returns the expectation of the i th security for the t th event period

E. Hypothesis

The existence of the Indonesia-Japan Economic Partnership Agreement (IJEPA) is one event that can indicate stock price volatility. Through the Indonesia-Japan Economic Partnership Agreement (IJEPA), the Indonesian government adopted a number of diplomatic strategies and trade policies. The trade agreement has the potential to assist the new economic sector. The IJEPA aspires to increase trade and investment between Indonesia and Japan, as well as regional markets, through three primary pillars: liberalization, facilitation, and capacity building. The agreement's of bilateral import and export cooperation The Indonesia-Japan Economic Partnership Agreement (IJEPA) has a positive impact on Indonesian economic activity. When Indonesia and Japan collaborate with one another, this can be a hint of a strong stock trend. In this study, we have the following hypotheses.

H1: There is a significant abnormal return on the surrounding day announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) at the Bali G20 Summit.

H2: There are differences in abnormal returns before and after the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) at the Bali G20 Summit.

III. RESEARCH METHODOLOGY

This is a quantitative study, which means it involves numbers and statistical analysis. In this study, the variable was abnormal return. Companies in the basic materials sector are utilizing the populace. sample employs a non-probability strategy, as well as a purposeful sample method and a sampling method based on certain features. As research samples, 42 companies that met the criteria were chosen:

Table 49. Population and Sample

No	Company Sample Criteria	Total
1	Basic Materials Sector Company listed on the Indonesia Stock Exchange	96
2	Companies in the Basic Materials Sector that are included in the Main Board	(52)
Total sample of Research Final		42

Source: Data processed by the author (2023)

Secondary data for this study was gathered in the form of a 2022 JCI historical report from a materials firm. The data collection period is 10 days before and 10 days after the announcement of the Indonesia-Japan economic partnership agreement. The data analysis technique utilized in this study is one sample Wilcoxon (Noether, 1992). to determine the significance of the first hypothesis and paired Wilcoxon samples to determine differences in anomalous returns on the second hypothesis. The analytical process includes normalcy testing and research hypothesis testing.

Table 2 shows the operational variables used in this study are:

Table 50. Operational Variable

Equation	Measurements	
Return of Shares	$R = \frac{Pt - (Pt_{-1})}{(Pt_{-1})}$ (Jogiyanto, 2009: 201)	R = Rate of return on shares Pt = the price of the stock in the period t Pt-1 = the price of the stock in the previous period
Expected Retrun	$ER = \frac{\sum y}{N}$ (Husnan, 2023:47)	Y = return ratio N = Total period of retention
Abnormal rertun	Expected Return – Return Saham $RTN_{it} = R - ER$ (Hartono, 2010:580)	Expected return = expected return Return of stock = return of realisation / real return

Source:Data processed by the author (2023)

IV. RESULT / FINDING

A. Descriptive Statistical Analysis

In this study, closing price and JCI data are used to calculate abnormal returns. Below are the results of abnormal return descriptive statistics which show the minimum, maximum, mean, and standard deviation values for abnormal returns before and after the Indonesian-Japan Economic Partnership Agreement (IJEPA).

Table 51. Descriptive Statistic

	N	Minimum	Maximum	Means	std. Deviation
Abnormal returns before	42	-.0412855	.0287528	.002337413	.0118386193
Abnormal returns after	42	-.1070093	.0462982	-.001493897	.0191964834

Source:Data processed by the author (2023)

Table 3 reveals that the average anomalous stock return for 42 samples is 0.002337413. This demonstrates a decline in anomalous returns following the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) implementation at the Bali G20 Summit, specifically -0.001493897. It had a standard deviation of 0.0118386193 prior to the announcement that the Indonesian-Japan Economic Partnership Agreement (IJEPA) will be enacted at the G20 Summit, but it climbed to 0.0191964834 after the announcement. The minimal value is -0.0412855 prior to the announcement and -0.1070093 after the announcement. Before the announcement, the maximum value is 0.0287528, and after the announcement, the maximum value is 0.0462982.

B. Normality Test

The normality test is used to determine the normalcy of data on abnormal returns both before and after the Indonesian-Japan Economic Partnership Agreement (IJEPA) was announced at the Bali G20 Summit. The Shapiro-Wilk test was used in this investigation to determine normalcy. Because the sample size was 42, the Shapiro-Wilk test was employed. The findings of the data normality test on abnormal returns before and after the introduction of the Indonesian-Japan Economic Partnership Agreement (IJEPA) during the Bali G20 Summit are shown in table 4.

Table 52. Normality Test

	Shapiro-Wilk Statistics	df	Sig.
Average Abnormal Return Before	.777	42	.000
Average Abnormal Return After	.505	42	.000

Source: Data processed by the author (2023)

Table 4 shows the outcomes of data processing. The prior abnormal return is 0.000, while the subsequent abnormal return is 0.000. Because the Sig. Value is greater than 0.05, it is clear that the data is not normally distributed, so a non-parametric test, the Wilcoxon signed rank test, is performed to examine the hypothesis

further. The purpose of testing this hypothesis is to determine the importance of abnormal returns on the day of the announcement and to compare abnormal returns before and after the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) during the Bali G20 Summit. The first hypothesis was tested using a one sample Wilcoxon signed ranked test, and the second hypothesis was tested using a paired sample Wilcoxon signed ranked test.

Table 53. Results of the Wilcoxon One-Sample Hypothesis Test

Null Hypothesis	test	Sig.	decision
The median of Abnormal Return Prior equals ,0000000.	One-Sample Wilcoxon Signed Rank Test	.006	Reject the null hypothesis.
The median of Abnormal Return After equals ,0000000.	One-Sample Wilcoxon Signed Rank Test	.694	Retain the null hypothesis.

Source: Data processed by the author (2023)

Table 5 shows the results of the first hypothesis calculation. The first hypothesis in this study is that there was a significant abnormal return on the day around the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) at the Bali G20 Summit. Table 3. describes the results of testing the first hypothesis. Based on these results, the significance value of the abnormal return after the announcement is Sig. 0.694 > 0.05 which means there is no significance after the announcement. However, at the time before the announcement, the value of Sig 0.006 < 0.05 was obtained, then H₀ was rejected and H₁ was accepted, which means that there was a significant abnormal return on the day around the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) at the Bali G20 Summit.

Table 54. Wilcoxon Paired Samples Test Results

Statistics test	
	<i>Abnormal Return After- Abnormal Return After</i>
Z	-2.107b
asymp. Sig. (2-tailed)	.035
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

Source: Data processed by the author (2023)

The second hypothesis in this study is that there is the difference in abnormal returns before and after the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) at the Bali G20 Summit. Table 6 explains the results of research testing, namely the Asymp value. Sig. (2-tailed) of 0.035 < 0.05, then H₀ is rejected and H₁ is accepted, which means that there are differences in abnormal returns before and after the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) at the Bali G20 Summit. This shows that the market is reacting to the Indonesian-Japan Economic Partnership Agreement (IJEPA) cooperation event.

V.DISCUSSION

The significant value before and after the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) was 0.006 or < 0.05, and it was 0.505 or > 0.05, according to the results of the first hypothesis test. Based on these findings, the first hypothesis was adopted due to the relevance of the day preceding the

announcement, namely, before the announcement. The second hypothesis test findings provided a significance value of 0.035, indicating that there is differentiation and the market reacts to the event of an agreement.

The first hypothesis calculation revealed that the day surrounding the introduction of the Indonesian-Japan Economic Partnership Agreement (IJEPA) at the Bali G20 Summit had an anomalous significance of return. This shows that there was a signature difference prior to the agreement's announcement but no major difference after the notice. Significant disparities in reactions occurred prior to the agreement because markets were normal before the Bali G20 summit. People have the expectation that an agreement will have a positive impact on their stocks as the Bali G20 Summit raises hopes for economic growth following the covid-19 pandemic. The inter-state conference was supposed to boost Indonesia's storage capacity in international affairs, consequently it was of great importance before the Bali G20 Summit. Investors' investment decisions are altered by an agreement. Research on abnormal returns has been performed by Erica P. Akbar et al (2019); Ismanto (2020).

Furthermore, the results of the second hypothesis calculation reveal that the market reacts to the occurrence of an agreement event. According to Tuvadaratragool (2013) signal theory, events preceding and following the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) during the Bali G20 Summit were interpreted as good news that signals investors to make investment decisions. This event contains information that causes the market to react because there is an abnormal return on companies listed on the Indonesian stock exchange in the basic materials sector. Capital markets are included in the efficient market requirements from a decision-making standpoint in the theory of market efficiency, since changes in stock price are based on accessible information that are going to influence recent price movements. Investors reacted rapidly to the occurrence, causing the price of assets to fluctuate.

IV. CONCLUSION AND RECOMMENDATION

According to the research findings, there was a considerable abnormal return on the day of the announcement of the Indonesian-Japan Economic Partnership Agreement (IJEPA) during the Bali G20 Summit. This is demonstrated in the test table by employing a one-sample Wilcoxon signed ranked test, which results in the acceptance of the first hypothesis. Shares of companies in the basic materials sector rose considerably the day before the announcement of the agreement. This demonstrates that there is a considerable positive prediction for Indonesia and Japan's cooperation.

Furthermore, the second hypothesis testing shows that the average abnormal return differs before and after the introduction of the Indonesian-Japan Economic Partnership Agreement (IJEPA) during the Bali G20 Summit. This is demonstrated in the table of test results obtained using the paired sample Wilcoxon signed rank test, which demonstrates that the second hypothesis is accepted. The collaboration agreement has an impact on the volatility of share prices. It may be inferred that the announcement of the Indonesia-Japan cooperation agreement elicited a positive and considerable response from investors in basic material sector enterprises. Investors are encouraged by the news of this collaboration. The Indonesia-Japan Economic Partnership Agreement (IJEPA) signed at the G20 Summit in Bali is expected to deliver significant returns to shareholders of basic material companies listed on the Indonesia Stock Exchange.

This research is expected to have ramifications for the general public as a means of evaluating and analyzing capital market investments. Some events, such as agreements or any other occurrence, are intended to serve as a cautionary note to investors, as they may result in rising or declining capital markets. Such replies can also help the company's stakeholders prepare for an incident so that they can plan and analyze the next steps. To the government is expected to be a review of the organized activities in order to make a good reaction on the capital market, which would then enhance the activities in capital markets.

This research has limitations including the use of objects that only focus on one sector, namely basic materials, and there is no use of additional variables such as CAAR to strengthen and expand the research. Future study is expected to be able to employ a larger or more diverse sample that is not limited to the basic material sector, as well as additional variables such as trading volume activity and so on, to improve the variety of stock return calculation models. It further hopes that future study will broaden the sample of research instead of focus solely on one area.

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Stock Valuation of Companies in The Consumer Cyclical Industrial Sector Of The Retailing Sub Sector Uses Discounted Cashflow Valuation Method With A Free Cash Flow To Firm Approach And Relative Valuation Methods After The Peak Of The Covid 19 Pandemic.

Yuyun Yuningsih¹, Brady Rikumahu²

^{1,2} Master of Management, Telkom University, Bandung, Indonesia

Abstract

This research focuses on predicting the intrinsic value of four retailing companies in Indonesia for the year 2023 and providing investment decision recommendations. The study considers the impact of the pandemic on the country's economic growth and how it has affected consumer behavior and various industries, including the retail sector. To determine the fair value of the companies' stocks, the research employs the Discounted Cash Flow (DCF) method with the Free Cash Flow to the Firm (FCFF) approach, as well as Relative Valuation (RV) methods using the Price Earnings Ratio (PER) and Price to Book Value (PBV) approaches. Historical financial data from 2017 to 2022 is used to project scenarios for 2023–2027, with pessimistic, moderate, and optimistic scenarios.

The DCF analysis results suggest that in the pessimistic scenario, all four companies (ACES, MAPI, ERAA, and LPPF) are undervalued, recommending buying their stocks. In the moderate scenario, ACES and MAPI are overvalued and should be sold, while ERAA and LPPF are undervalued and worth buying. In the pessimistic scenario, all four companies are overvalued, advising to sell their stocks. The Relative Valuation method using PER and PBV approaches also indicates undervaluations for all companies in the pessimistic scenario. In the moderate scenario, ACES, MAPI, and ERAA are undervalued, while LPPF's PBV is undervalued. In the optimistic scenario, ACES, MAPI, and ERAA remain undervalued based on their intrinsic values of PER and PBV, while LPPF's intrinsic PER value is higher than its market PER value but still below the industry average.

Keywords: Stock Valuation; Intrinsic Value; DCF; FCFF; Relative Valuation; PER; PBV.

1. INTRODUCTION

The pandemic that has rocked Indonesia in the previous two years has had a significant impact on the rate of economic growth. The current pandemic has changed the pattern of living habits in the community, from the company's business patterns to people's purchasing patterns. Consumer behaviour patterns shift into survival mode and become more conservative; as a result, many industries have declined while others have thrived. Stocks are one of the financial instruments with the characteristics of high risk and high return; stock movements are typically volatile. The price of shares traded in the market is decided by supply and demand, making it impossible to predict stock movements in the short term. The organization will be able to attract or retain. Based on the IDX press release on December 30, 2021 (PR No: 095/IDX. SPR/12-2021) This is consistent with the Indonesian government declaring the Corona Virus Disease 2019 (Covid 19) a national disaster on March 14, 2020, but the position is seen to have been reaffirmed on March 21, 2020.

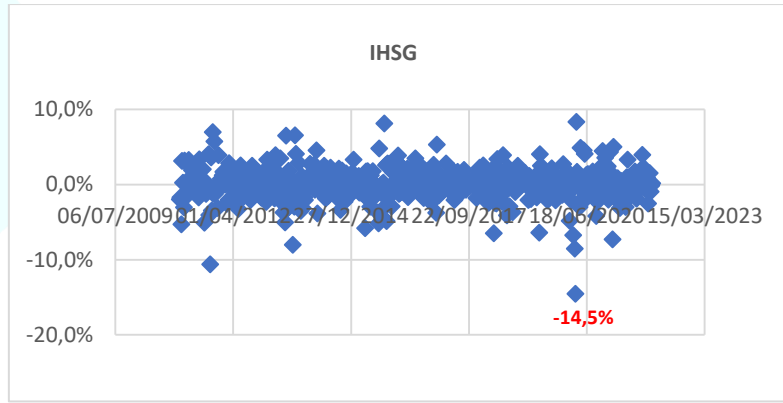


Figure 1: JCI weekly return movement (Jan 2011 – Dec 2021)

This stock volatility is felt by retail companies in Indonesia, which are the subject of this study. The lowest stock price of PT ACES on March 17, 2022, with a return value of -11.9%, and it rebounded on March 26, 2022, with a return value of 17.3%.

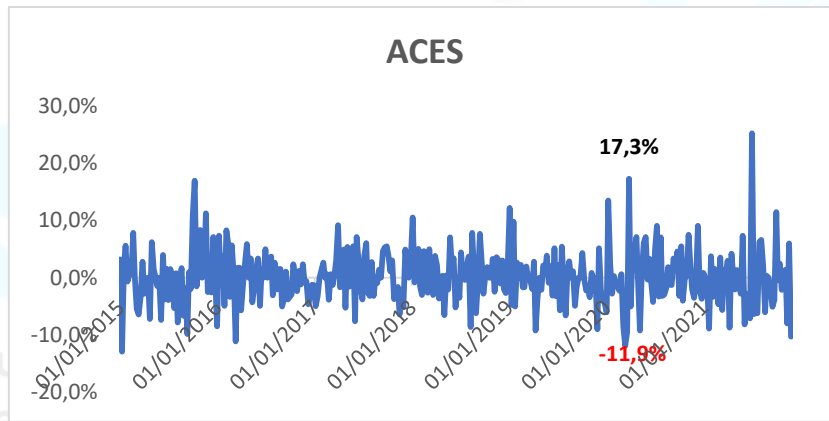


Figure 2: Historical stock returns of PT ACES over the past 5 years.

Source: data processed

The fluctuating stock returns exhibited by PT MAPI were on March 12, 2022, with a return value of -24.3%, and it rebounded on April 2, 2020, with a return value of 20.2%.

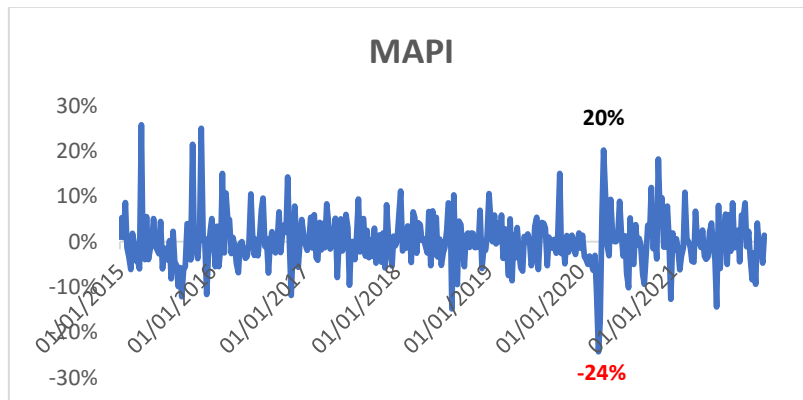


Figure 3: Historical stock returns of PT MAPI over the past 5 years (weekly)

Source: data processed

For PT ERAA, the stock decline was observed on March 12, 2020, with a return value of -20%, and it rebounded on April 2, 2020, with a return value of 29.9%.

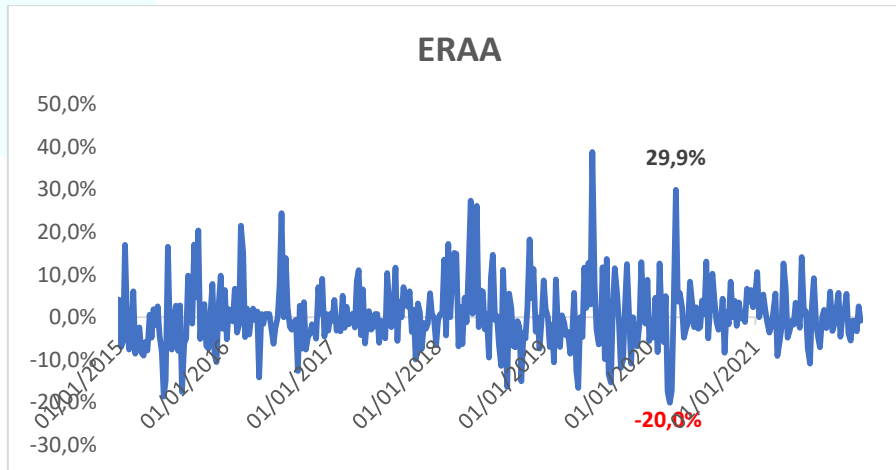


Figure 4: Historical stock returns of PT ERAA over the past 5 years (weekly)
Source: data processed

For PT LPPF, the decline occurred in 2018 and occurred again in 2019 with a greater decline than in 2018. This indicates that the stock volatility of LPPF is highly volatile.

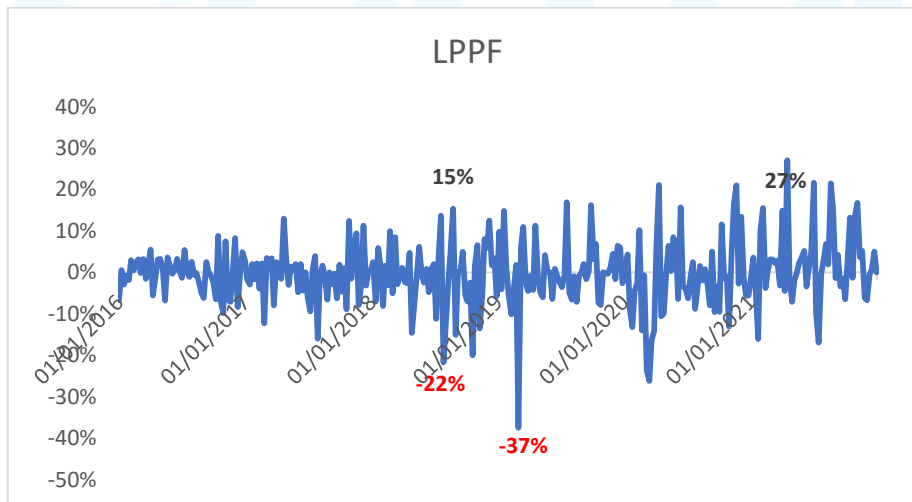


Figure 5: Historical stock returns of PT ERAA over the past 5 years (weekly)
Source: data processed

Based on the data of the fluctuating stock returns of the four researched companies, it illustrates the performance of their stocks in the market during the pandemic. Initially, the stocks were negatively affected and experience a decline, however, in March, they began to rebound as people recognized that the stock prices in the market had become exceptionally low. As a result, investors saw an opportunity and started buying those stocks, leading to an increased demand for them. To minimize risk in investments, investors need to conduct valuations before allocating their capital to a company. Valuation serves the purpose of understanding the company's condition and providing accurate information to the public regarding the market value of its stocks. According to Damodaran, valuation is a fundamental analysis technique that involves discounting future cash flows or using predetermined ratios to assess the intrinsic value of stock.

Valuation through fundamental analysis encompasses three methods. The first method is Discounted Cash Flow (DCF), which establishes a connection between the value of an asset and its anticipated future cash flows. The second method is contingent claim/option model, which relies on option pricing models to evaluate assets with cash flows contingent upon specific events, treating them as options. The third method is Relative Valuation, which calculates the value of an asset in comparison to other companies within the same industry, taking into account variables such as book value, cash flows, and income.

Based on the data and phenomena explained, the objective of this research is to perform a valuation analysis of the fair stock values for ACES, ERAA, MAPI, and LPPF companies for the projected period of 2022. The valuation will be conducted using the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF) approach, as well as the Relative Valuation method using the Price-to-Earnings Ratio (PER) and Price-to-Book Value (PBV) approaches. The analysis will encompass three scenarios: optimistic, moderate, and pessimistic, to provide a comprehensive evaluation of the stocks' fair values.

II. LITERATURE REVIEW

A. Corporate Finance

Corporate finance encompasses various financial management activities within a company. These activities include determining the best sources of funding for the company, managing capital structure decisions, and making investment choices that align with the company's goals and objectives. By effectively managing finances, corporate finance aims to enhance shareholder value and ensure the company's financial health. It involves analyzing investment opportunities, evaluating risks, and making informed decisions to optimize the allocation of resources and generate favorable returns. Additionally, corporate finance is responsible for financial planning, budgeting, and monitoring the company's financial performance to support strategic decision-making.

B. Enterprise Value

Enterprise Value is the present value of future Free Cash Flows at a discount rate corresponding to the weighted average cost of capital. Enterprise value can be increased by increasing operating cash flows, reducing tax expenses, minimizing net capital expenditures, reducing non-cash working capital, enhancing expected growth and the period of growth, as well as reducing the composite cost of funding (Damodaran, 2012).

The formula for calculating enterprise value is as follows:

$$\text{value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1 + k_c)^t} + \frac{\text{Terminal Value}_n}{(1 + k_c)^n} \quad (2.1)$$

Where:

CF_t = Cash Flow in period t

K_c = Discount Rate

n = Predictable period

C. Valuation Theory

Understanding the value of assets and what determines that value is crucial for making informed decisions when selecting investments for a portfolio, determining the appropriate price to pay or receive in an acquisition, and making choices regarding investments, financing, and dividends in business operations (Damodaran, 2012).

The process of valuation involves evaluating risk and return to estimate the intrinsic value of an asset. By determining the fair value of an asset, such as a stock, investors can assess whether it is undervalued or overvalued. This information guides investment decisions, helping investors determine whether to buy or sell shares in the company. The valuation process considers various factors, including financial performance, market conditions, industry analysis, and future growth prospects. (Gidman and Zutter, 2015)

D. Free Cash Flow to Firm (FCFF) in Discounted Cash Flow (DCF)

The DCF (Discounted Cash Flow) method is used to calculate the present value of future cash flows for an asset. It is commonly employed to determine the fair value of a company, particularly when the company's cash flows are stable and predictable (Damodaran, 2012). The DCF model takes into account the projected future cash flows and discounts them back to their present value using an appropriate discount rate.

The formula for the DCF model is as follows:

$$\text{DCF} = \text{CF}_1/(1+r)^1 + \text{CF}_2/(1+r)^2 + \dots + \text{CF}_n/(1+r)^n \quad (2.2)$$

Where:

- DCF represents the discounted cash flow
- $\text{CF}_1, \text{CF}_2, \dots, \text{CF}_n$ represent the expected cash flows in each period (year)
- r is the discount rate, which reflects the required rate of return or the cost of capital

By discounting the future cash flows back to their present value using an appropriate discount rate, the DCF method provides an estimate of the asset's intrinsic value. This allows investors to assess whether the current market price of the asset is overvalued or undervalued, aiding in investment decision-making.

Free Cash Flow to Firm (FCFF) represents the cash available to both equity holders and debt holders of a company after accounting for operating and investment activities (Wira, 2014). FCFF is the summation of cash flows available to all the owners of the company (Damodaran, 2012).

The formula for calculating FCFF is as follows:

$$\text{FCFF} = (\text{EBIT} * (1 - \text{Tax Rate}) + \text{Depreciation} + \text{Amortization} - \text{Change in Operating Assets and Liabilities} - \text{Capital Expenditure}) \quad (2.3)$$

In this formula:

- EBIT represents the company's operating profit before deducting interest and taxes.
- Tax Rate is the appropriate tax rate.
- Depreciation and Amortization represent the non-cash expenses related to the depreciation of assets and the amortization of intangible assets.
- Change in Operating Assets and Liabilities accounts for the net change in the company's working capital requirements.
- Capital Expenditure refers to the investment made by the company in acquiring or upgrading its fixed assets.

By calculating FCFF, investors and stakeholders can assess the cash flows available to both equity and debt holders, which is crucial for evaluating the financial health and value of the company.

When determining the discount rate, a thorough analysis and evaluation of the company's financing structure and market conditions are crucial. The discount rate used in valuation is referred to as the weighted average cost of capital (WACC). The WACC speaks to the normal rate of return required by the company's speculators, taking into consideration the proportionate weights of obligation and value within the capital structure.

By calculating the WACC and using it to discount the future cash flows (such as FCFF), the present value of those cash flows can be determined, providing an estimate of the company's value. The formula for calculating the value of the company using the WACC is as follows (Damodaran, 2012).

$$\text{Value of Firm} = \sum_{t=1}^{t=\infty} \frac{\text{FCFF}_t}{(1 + \text{WACC})^t} \quad (2.4)$$

After calculating the present value of cash flows (FCFF) and the discounted terminal value, the next step is to combine these two values to determine the equity value or the overall value of the company. The formula used to calculate the value of the company using the FCFF method, assuming stable growth in a specific year and constant perpetual growth at a rate of g , is as follows (Damodaran, 2012).

$$\text{Value of the firm} = \sum_{t=1}^{t=\infty} \frac{\text{FCFF}_t}{(1 + \text{WACC})^t} + \frac{\text{TV}}{(1 + \text{WACC})^n} \quad (2.5)$$

$$\text{TV} = \text{FCFF}_{n+1}/(\text{WACC} - g_n)$$

The terminal value is the present value of all future cash flows obtained after a specified time period as determined by scenario analysis. The terminal value is calculated using the constant growth model, as follows (Damodaran, 2012).

$$(2.6)$$

$$TV = \frac{FCF_{t+1}}{(r - g)}$$

The final result of the DCF calculation can be used to determine the intrinsic value of the Price-to-Earnings Ratio (PER) and Price-to-Book Value (PBV).

E. Relative Valuation

According to (Damodaran,2012), the relative valuation model has its advantages and limitations. One of the advantages is its ability to incorporate multiple comparable companies in the analysis, allowing for a broader perspective. However, the model has limitations as it may produce inconsistent estimates of value by overlooking important variables such as risk, growth, or potential cash flows. The use of market sentiment-reflected comparable variables can lead to overvaluation or undervaluation when applying the relative valuation method to a similar company, depending on how the market evaluates that particular company. It's important to consider these factors and exercise caution when using the relative valuation approach to assess the value of an asset or company.

The approach used for valuation with the Relative Valuation (RV) method includes the Price Earnings Ratio (PER). The PER is calculated by dividing the expected earnings per share (EPS) by the PER of the company's stock. The PER represents the intrinsic value of a stock. The formula for calculating the PER is as follows (Tandelilin, 2010:320).

$$Po = \text{Estimasi EPS} \times \text{PER} \quad (2.7)$$

Compare the intrinsic value of a stock with its market price using the Price to Book Value (PBV) approach. PBV compares the stock price with the book value per share. The PBV ratio is calculated by dividing the market price per share (Po) by the book value per share (BV). (Tandelilin, 2010:322).

The formula for calculating PBV is as follows:

$$PBV = \frac{Po}{BV} \quad (2.8)$$

In this formula:

- Po represents the intrinsic value of the stock
- BV refers to the book value of equity per share

By comparing the PBV ratio to industry averages or historical trends, investors can assess whether a stock is undervalued or overvalued relative to its book value.

F. Previous Research

In a previous study by (Soelistyo, 2021), the fair value of stocks in the automotive subsector for the year 2021 was evaluated using the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF) approach and Relative Valuation. The study focused on four companies: ASII, INDS, SMSM, and GJTL, considering pessimistic, moderate, and optimistic scenarios. The results showed that ASII and INDS were consistently overvalued across all scenarios, while GJTL was undervalued. SMSM was overvalued in the pessimistic and moderate scenarios but undervalued in the optimistic scenario.

(Cahyono and Hendrawan, 2019) conducted a study on the intrinsic value of coal mining companies listed on the Indonesia Stock Exchange in 2018. The study used the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF) approach and Relative Valuation with the PER and PBV approaches. The companies analyzed were BYAN, ADRO, and PTBA. The findings indicated that ADRO, BYAN, and PTBA were overvalued in all scenarios, leading the authors to recommend purchasing their stocks.

(Zemba and Hendrawan, 2018) conducted research on whether rapidly growing revenue always translates into good DCF and P/E values for healthcare companies. The study employed the FCFF, PER, and PBV approaches to value four companies: MIKA, SAME, SILO, and SARJ. Historical financial data from the past five years were utilized, and optimistic, moderate, and pessimistic scenarios were considered. The results indicated that MIKA, SAME, and SILO aligned with the research theory, while SARJ could not be analyzed due to insufficient cash

flow generation. The study concluded that high revenue growth does not guarantee a high company value, emphasizing the significance of effective cost management in generating substantial cash flow.

(Lilford et al., 2018) conducted research on the cost of capital and discounted rate in cash flow valuation for resource projects. Their study focused on determining the intrinsic value of stocks using the DCF approach. The findings suggested that the expected equity return for investors could be met at a certain point, allowing the discount rate to approximate the risk-free return rate.

(Cynthia Hutapea et al., 2013) performed a valuation analysis of the fair value of PT Adaro Energy's stock using the FCFE method, Five Forces analysis, and Relative Valuation with the PBV and PER techniques. The research revealed that PT Adaro's stock was undervalued based on the FCFE analysis. The Five Forces analysis indicated moderate rivalry among companies, a low threat of new entrants, a high bargaining power of suppliers, and relatively low bargaining power of buyers.

This research presents novelty by analyzing the intrinsic value of retailing companies in Indonesia for 2023 in the context of pandemic-induced economic changes. While previous studies exist on stock valuation using DCF, FCFE, PER, and PBV, they do not consider the specific impact of the recent pandemic on the retail sector and consumer behavior. This study addresses this gap and offers valuable insights into investment decision-making during uncertain times.

III. RESEARCH METHODOLOGY

This study object was valued using the Discounted Cash Flow (DCF) method of the Free Cash Flow to Firm (FCFF) methodology, because valuing with FCFF gauges the whole value of the organization and can accommodate future growth potential. As a result, while forming assumptions and Three scenarios are used in projections: moderate, pessimistic, and optimistic scenarios.

The valuation results were then validated by comparing them to analyses performed utilizing the Relative Valuation (RV) method with the PER and PBV methodologies. The intrinsic value derived from these fundamental estimates was then compared to the market price of the company. Based on the stock's condition.

The research object is a company in Retailing sub-industry. The selected sample companies are:

Table 1. List of Research Samples

No	Kode Perusahaan	Nama Emiten
1	ACES	Ace Hardware Indonesia Tbk. [S]
2	MAPI	Mitra Adiperkasa [S]
3	LPPF	Matahari Departement Store Tbk. [S]
4	ERAA	Erajaya Swasembada Tbk. [S]

Source: data processed

Purposive sampling is a technique where the researcher deliberately selects specific samples that are believed to represent or provide information to address the research problem (Indrawati, 2015). In this research, the criteria for purposive sampling are as follows:

1. Companies in the retailing sub-sector listed on the Indonesia Stock Exchange (BEI).
2. Companies with publicly available financial reports for the past 5 years.
3. Companies involved in the home living and electronics industry.
4. Companies in the same field as the three largest market capitalization companies.

By using purposive sampling and applying these criteria, the researcher aims to select samples that are relevant to the research objectives and can provide valuable insights into the chosen industry.

Data Gathering.

The research used secondary data, which include:

1. Published and audited financial report from the sample companies over the past five years, from January 2017 to December 2022. The www.idx.co.id website and the websites of the pertinent companies were used to gather the data.

- Weekly stock price data for the sample companies and the Composite Stock Price Index (IHSG) from January 2010 to December 2022 were taken from www.finance.yahoo.com, while the stock beta was obtained from Pefindo.
- Macro-economic variables data for Indonesia, including the Bank Indonesia (BI) interest rates from www.bi.go.id and the Gross Domestic Product (GDP) growth rate, can be obtained from www.bps.go.id.
- PER and PBV industry data were taken from the annual reports of companies for the year 2022.

IV. RESULT / FINDING

The intrinsic value of a stock is established through the valuation phase based on the sample criteria and historical data that have been collected. This technique necessitates at least four essential inputs: cash flow, expected growth, cost of capital, and the projected value of the company.

G. Historical Performance

Table 2. Historical Performance

Event	ACES	MAP	ERA	LPPF
Revenue	3%	17.5%	19%	7%
Cost of Sales	52%	52.9%	90%	37%
General & Administrative Expenses	32%	36.2%	7%	36%
Total Operating Expenses	84%	89.1%	97%	73%
EBITDA	16%	10.9%	3%	27%
Depreciation & Amortization	0%	4.2%	0%	6%
EBIT	16%	7.4%	3%	21%
CAPEX	2%	4.5%	1%	6%
Change Working Capital	2%	1.3%	1%	-5%

Source: data processed

H. Projection

Data processing was conducted on the revenue of companies listed in retailing sub-industry during the period of 2017 to 2022. It was found that the average industry growth rate is 5%. This average is then used as the assumption for industry growth in this sector for the projection period of 2023 to 2027.

Table 3. History Average Growth Industry

Keterangan	2017	2018	2019	2020	2021	2022	Growth Avg
Mega Printis	397,676	456,501	601,725	326,772	463,876	663,496	15%
Tunas Ridean	9,837,807	13,403,619	13,000,217	8,397,772	12,151,643	16,789,212	16%
Trikonsel Oke	2,028,660	1,671,866	966,725	494,470	475,955	613,551	-17%
Sona Topas Tourism	1,582,767	1,977,016	1,748,820	245,552	67,871	230,780	19%
Gaya Abadi Sempurna	353,584	294,680	459,996	411,798	448,364	475,901	9%
Ramayana Lestari	5,622,728	5,739,553	5,596,398	2,527,951	2,592,682	2,547,477	-11%
Putra Mandiri Jembar	7,004,161	9,976,470	8,729,487	6,076,431	9,778,583	11,239,851	15%
Mitra Pinasthika Mustika	14,290,131	15,893,585	16,560,129	11,181,671	12,908,103	11,418,471	-3%
Mitra Komunikasi Nusantara	6,334,114	4,748,404	4,294,710	3,452,545	2,016,806	2,110,686	-18%
Mitra Adiperkasa	16,305,733	18,921,123	21,637,309	14,847,398	18,423,803	25,094,900	12%
MAP Aktif Adiperkasa	5,076,181	6,245,547	7,472,911	4,781,480	6,042,002	9,097,427	17%
Matahari Department Store	10,023,961	10,245,173	10,276,431	4,839,058	5,585,975	6,619,299	-3%
Indomobil Sukses Internasional	15,417,256	17,878,272	18,615,130	15,230,426	19,174,995	24,500,055	11%
Globe Kita Terang	621,534	514,434	238,615	30,672	46,271	65,444	-13%
Erajaya Swasembada	24,229,915	34,744,177	32,944,903	34,113,455	43,466,977	46,587,961	15%
Electronic City Indonesia	1,818,471	2,003,209	1,978,632	1,618,491	1,811,359	2,072,478	3%
Catur Sentosa Adiprana	9,639,479	10,889,163	12,079,939	12,659,547	14,236,423	15,221,360	10%
Industri Dan Perdagangan Bintraco Dharma	7,202,318	7,777,729	7,459,212	4,153,281	5,295,162	5,925,460	0%
Bintang Oto Global	395,398	692,195	790,812	478,026	556,343	656,865	17%
Ace Hardware Indonesia	5,938,576	7,239,754	8,142,717	7,412,767	6,543,363	6,526,786	3%
Caturkarda Depo Bangunan	2,586,462	2,586,462	2,734,732	2,443,372	2,329,490	4,854,823	20%
Damai Sejahtera Abadi	593,175	593,175	630,226	695,949	699,754	728,450	4%
							Avg 5%

Source: Data processed

In addition to historical growth projections, the future growth of the industry for the next five years is derived from the Indonesia retail sector size and share analysis, which includes growth trends and forecasts from 2023 to 2028.

Study Period	2018 - 2028
CAGR	5.00 %

Figure 6: Forcase Revenue Growth Industry

Once the average growth rates of individual companies and the industry have been identified, the next step is to project the growth rates for pessimistic, moderate, and optimistic scenarios.

Table 4. Corporate Growth Projection 2023-2027

Keterangan	Avg. Corporate Growth	Forcase Growth Industry	Spread	Skenario		
				Pesimis	Moderate	Optimis
ACES	3%			1%	3%	6%
MAPI	18%	5%	2.5%	15%	18%	20%
ERAA	19%			16%	19%	21%
LPPF	7%			4%	7%	9%

Source: Data processed

I. Cost of capital

The calculation of the Weighted Average Cost of Capital (WACC) is obtained by multiplying the cost of equity by the equity amount of the company and adding it to the product of the cost of debt, the debt amount of the company, and one minus the tax rate. With this calculation, the WACC is as follows:

Table 4. Cost Of Equity

Variable	ACES	MAP	ERAA	LPPF
Rf	4.00%	4.00%	4.00%	4.00%
Rm-Rf	11.73%	11.05%	10.34%	11.05%
Beta	0.857	1.398	1.606	1.417
Cost Of Equity	14%	19.45%	20.61%	19.66%

Sources: Data processed

Table 5. WACC calculation

Variable	ACES	MAP	ERAA	LPPF
Rd	8.0%	8.0%	8.0%	8.4%
Re	14.0%	19.4%	20.6%	19.7%
Tax	22.0%	22.0%	22.0%	22.0%
Xe	92.3%	83.4%	57.9%	100.0%
Xd	7.7%	16.6%	42.1%	0.0%
WACC	13.4%	17.3%	14.6%	19.7%

Sources: Data processed

J. DCF Analysis with FCFF

DCF analysis with FCFF (Free Cash Flow to Firm) is a valuation method that involves discounting the future cash flows generated by a company, considering all stakeholders including equity holders and debt holders. The FCFF represents the cash flows available to all capital providers, including both equity and debt. The DCF analysis with FCFF provides an estimate of the intrinsic value of the company based on its future cash flow potential. It is important to note that the accuracy of the analysis depends on the quality of the assumptions and projections used in the model.

Table 6. Intrinsic value summary

FCFF	Scenario	Fair Share value	Share Price 30 Dec 2022	Condition	Deviasi	Recomendation
ACES	Pesimist	354.9	496	Overvalued	-28%	Sell
	Moderate	425.7		Overvalued	-14%	Sell
	Optimistic	571.3		Undervalued	15%	Buy
MAP	Pesimist	1,010.9	1,445	Overvalued	-30%	Buy
	Moderate	1,390.2		Overvalued	-4%	Sell
	Optimistic	1,710.0		Undervalued	18%	Buy
ERAA	Pesimist	365.84	392	Overvalued	-7%	Sell
	Moderate	430.64		Undervalued	10%	Buy
	Optimistic	445.31		Undervalued	14%	Buy
LPPF	Pesimist	3,882.74	4,256	Overvalued	-9%	Sell
	Moderate	4,754.14		Undervalued	12%	Buy
	Optimistic	6,021.67		Undervalued	41%	Buy

Sources: Data processed

Based on the DCF analysis with a pessimistic scenario for ACES, MAPI, ERAA, and LPPF, the results indicate that the companies are overvalued, with a recommendation to sell the investments. In the moderate scenario, ACES and MAPI are also overvalued, while ERAA and LPPF are undervalued. The investment decision would be to sell ACES and MAPI stocks, and buy ERAA and LPPF stocks. In the pessimistic scenario, ACES, MAPI, ERAA, and LPPF are all undervalued, with a recommendation to buy the stocks.

K. Relative Valuation with PER and PBV

By analyzing the PER and PBV ratios of a company, investors can assess whether the stock is overvalued or undervalued compared to its peers. If the PER or PBV ratio is higher than that of similar companies, the stock may be considered overvalued, indicating that the market has priced it higher relative to its earnings or book value. Conversely, if the PER or PBV ratio is lower than that of comparable companies, the stock may be considered undervalued, suggesting that it is priced lower relative to its earnings or book value.

RV PER				
Scenario	PER Industry Q4	Analisa	Condition	Recommendation

		PER		Min	Max	Company			
		Intrinsic	Avg						
MAPI	Pessimist	6.6					Undervalued	Valid	Buy
	Moderate	8.3	16.1	(2.1)	38.5	11.9	Undervalued	Valid	Buy
	Optimise	9.4					Undervalued	Valid	Buy
ACES	Pessimist	6.9					Undervalued	Valid	Buy
	Moderate	7.3	16.1	(2.1)	38.5	11.6	Undervalued	Valid	Buy
	Optimise	8.7					Undervalued	Valid	Buy
ERAA	Pessimist	2.7					Undervalued	Valid	Buy
	Moderate	2.8	16.1	(2.1)	38.5	6.4	Undervalued	Valid	Buy
	Optimise	2.9					Undervalued	Valid	Buy
LPPF	Pessimist	6.9					Undervalued	Valid	Buy
	Moderate	7.5	16.1	(2.1)	38.5	7.4	Overvalued	Valid	Sell
	Optimise	8.4					Overvalued	Valid	Sell

Table 7. Intrinsic value PER

Sources: Data processed

Table 8. Intrinsic value PBV

		RV PBV							
Scenario	PBV Intrinsic	PER Industry Q4				Analisa	Condition	Recommendation	
		Avg	Min	Max	Company				
MAPI	Pessimist	0.6				Undervalued	Valid	Buy	
	Moderate	0.8	2.7	(3.1)	26.0	2.7	Undervalued	Valid	Buy
	Optimise	1.0					Undervalued	Valid	Buy
ACES	Pessimist	0.7					Undervalued	Valid	Buy
	Moderate	0.9	2.7	(3.1)	26.0	1.5	Undervalued	Valid	Buy
	Optimise	1.2					Undervalued	Valid	Buy
ERAA	Pessimist	0.9					Undervalued	Valid	Buy
	Moderate	1.1	2.7	(3.1)	26.0	0.9	Undervalued	Valid	Buy
	Optimise	1.1					Undervalued	Valid	Buy
LPPF	Pessimist	0.9					Undervalued	Valid	Buy
	Moderate	1.1	2.7	(3.1)	26.0	26.0	Undervalued	Valid	Buy
	Optimise	1.4					Undervalued	Valid	Buy

Sources: Data processed

For the results based on the Relative valuation method with the PER and PBV approaches, In the pessimistic scenario, ACES, MAPI, ERAA, and LPPF companies are in an undervalue condition. In the Moderate scenario, ACES, MAPI and ERAA companies are undervalued, while for LPPF companies LPPF's PBV value is undervalued. In the Optimistic scenario, ACES, MAPI and ERAA companies are undervalued because the intrinsic value of PER and PBV is smaller than the market PER value and the industry average IDX data for the 2022 period, while for LPPF companies, it produces an intrinsic PER value more significant than the LPPF Market PER value but still below the industry average PER, while LPPF's PBV value is undervalued.

V. DISCUSSION

The results of the stock valuation calculations conducted in the consumer cyclicals sector, specifically in the retailing subsector listed on the Indonesia Stock Exchange, using the discounted cash flow method with the free cash flow (FCFF) approach and relative valuation with the PER and PBV approaches are as follows:

1. Calculation using the Discounted Cash Flow method: According to the pessimist scenario, the stock market prices for the firms ACES, MAPI, ERAA, and LPPF on December 30, 2022, are greater than their intrinsic values, making these companies overvalued. The intrinsic PER and PBV values of these companies are lower than the PER and PBV market values and the industry average data for the IDX period in 2022 making these companies undervalued.
2. Using the discounted cash flow approach, ACES and MAPI are considered overvalued in the moderate scenario because their stock market prices on December 30, 2022, are more than their intrinsic value. However, as their intrinsic values are greater than the stock market prices on December 30, 2022, with a divergence of 10% for ERAA and 12% for LPPF, the firms ERAA and LPPF are considered undervalued. Additionally, the companies ACES, MAPI, and ERAA are undervalued according to the Relative Valuation method using the PER and PBV approaches as their intrinsic PER and PBV values are lower than the PER and PBV market values and the industry average data for the IDX period in 2022. When it comes to LPPF, the intrinsic PER value is greater than the market PER value but still falls short of the industry average PER value. Meanwhile, the PBV value of LPPF is cheap because it is lower than both the market PER and the industry average PER.
3. Calculation based on the discounted cash flow approach, In the optimist scenario, the companies ACES, MAPI, ERAA, and LPPF are deemed undervalued since their stock market prices on December 30, 2022, are lower than their intrinsic values. Like this, companies ACES, MAPI, and ERAA are undervalued according to the Relative Valuation method using the PER and PBV approaches since their intrinsic PER and PBV values are lower than the PER and PBV market values and the industry average data for the IDX period in 2022. Regarding LPPF, its intrinsic PER value is better than its market PER value but still falls short of the industry average PER value, and its PBV value is undervalued because it is.

VI. CONCLUSION AND RECOMMENDATION

Investors cannot assess the value of stocks in a cheap or expensive market without conducting a company valuation first. Through the analysis of valuation calculations using the discounted cash flow (DCF) method with the free cash flow to firm (FCFF) approach, as well as relative valuation using the price-to-earnings ratio (PER) and price-to-book value (PBV) approaches, the resulting recommendations are as follows: investors are advised to purchase stocks in MAPI, ACES, and ERAA, while it is recommended to sell stocks in LPPF.

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Sustainable Collaboration in Business,
Technology, Information and Innovation

ESG Score Impact on Indonesia Listed Firms' Financial Performance: Evidence From Sri Kehati Listed Firms During Pre-Pandemic Period

Kevin Bernanda Bethran¹, Acip Sutardi²

^{1,2} School of Business and Management Institut Teknologi Bandung, Bandung, Indonesia

Abstract

ESG (Environmental, Social, and Governance) is a framework used to evaluate sustainability and ethical impact of businesses based on its environmental practices, social responsibility, and corporate governance. ESG is getting more awareness especially due to the United Nation agenda in sustainability. ESG itself is a topic that constantly develops over time. Now, ESG is seen as one of the factors when evaluating companies' performance. Prior researches have sought to see the relationship between ESG to firms' financial performance in many countries. However, the results show contradicting findings. In addition, there has been limited research about ESG in emerging economies countries, including Indonesia. Uncertainty of prior research results creates complexity to understanding ESG impact in these countries. Therefore, this research aims to unfold how ESG has impacted Indonesian firms' financial performance, represented by exemplary sustainable companies listed in SRI KEHATI index, prior to the covid pandemic. This research uses secondary data, collected through Refinitiv Workspace. Publicly traded firms listed in the SRI KEHATI index with complete ESG and financial data in Refinitiv are selected from 2010 to 2018. However, due to the lag one year concept of the research, data for financial performance are collected during 2011 to 2019. The research deployed the Panel Data Regression method. The result shows that ESG, collectively and as individual pillars, have no significant impact on SRI KEHATI firms' financial performance during the timeline of the research. This research can serve as reflective material for firms and investors in Indonesia to their approach on investing.

Keywords: ESG, Financial Performance, Panel Data Regression

I. INTRODUCTION

The UN Sustainable Development Goals (SDGs) call for investments in sustainability with the estimated amount of USD 5 trillion to USD 7 trillion annually until 2030, a sum well beyond what governments can afford, warranting a significant amount of private funding (Uzsoki, 2020). This creates an important gap to be filled with sustainable investing. The narrative is progressing rapidly with the rise of both Socially Responsible Investment (SRI) and Environment, Social, and Governance (ESG) investing. SRI itself is an investment philosophy that combines profit maximization with social endeavours. On the other hand, ESG Investing offers a pragmatic approach to addressing financially material issues through a broader information set by taking into account climate hazards, investments in human capital, and good governance characteristics, among other aspects along with the firm's financial performance (S&P Global, 2020). The primary difference between the two types of investing is that one (ESG investing) emphasizes how environmental, social, and governance factors may affect the performance of a specific investment while the other only concentrates an investment opportunity based on the environment and social impact an investment may produce (SRI investing). However, in the end, each investing approach integrates all three (environmental, social, and governance) factors to make investment decision.

Forum for Sustainable and Responsible Investment (US SIF), United Nation Principles of Responsible Investment (UNPRI), European Sustainable Investment (Eurosif), Global Reporting Initiative (GRI), among many others are indicators that address sustainability in financial markets. This creates pressure for companies to apply sustainable approach in their businesses. This also applies to companies in Indonesia as the country's Financial Service Authority (OJK) has decreed regulation no.51/POJK.03/2017 which demand publicly traded companies to publish sustainability report as a compliance to sustainability standards with the hope of drawing more investors, including foreign investors. In accordance with the mandate, it becomes an integral part for companies to address ESG integration into their firm's business operation and future strategy. Thus, with the ever-increasing importance of ESG element continue to rise, it is logical to assume that it has an effect on firms' financial performances.

With all that said, does supporting ESG measures genuinely benefit firms in Indonesia? Some may agree that investing in ESG could improve a company's long-term performance and profitability as well as its potential to attract more financial capital (World Economic Forum, 2023). It may be the case since the current condition of our world suggest that risk which correspond to ESG factors are growing as days goes by. A study suggest that economic sustainability is put in jeopardy by the global warming effect, which increases the frequency of disasters like floods and cyclones while also dramatically raising the sea level (Ameur et al., 2022). However, it is also important to acknowledge the fact that adhering to ESG initiatives is not a low-cost investment which means that firms will need to put a substantial amount of capital to start the project. One recent example is the investment made by PT Vale Indonesia and its partners, who committed 2.1 billion USD for the construction of a gas power plant as part of their commitment to global sustainability (Kontan, 2022). Logically, such investment may create diminishing impact to firms' financial performance. So, which side of the coin does Indonesian firms gets from investing in ESG initiatives?

Sadly, even though sustainable investing keeps getting more recognition, the answer to the question above is still unavailable. While many researchers have tried to test the relationship between sustainability aspects with firms' financial performances, all of the research tend to be conducted in the developed country. Studies regarding this topic is very limited in emerging economy countries, Indonesia included. This happens mainly due to the difference in focus between the both of them, since emerging economy countries' companies favour to focus on operating excellency rather than sustainable values. Thus, a sense of urgency emerges to understand the current relation of sustainability importance and firms' financial performance in Indonesia. If Indonesia lag behind in terms of ESG practices it may not bode well for our country since big institutions will not be putting money on unsustainable countries which in the end will decrease the Foreign Direct Investment (FDI) of our country. In addition to that, we also need to remember that during the Paris Agreement, Indonesia is among the 190 countries that has committed in restraining the global warming by ensuring that the earth's temperature will not be higher than 2.0°C and if possible, put an extra effort to make it below 1.5°C. Thus it further escalates the urgency to test whether Indonesia has done what is needed to uphold the commitment agreed in Paris Agreement.

Keeping the motivation in mind, this research will be focused on Indonesian firms with exemplar track record on sustainability conducts. Companies listed in the SRI KEHATI index is one of the best grouping of companies that has put up tremendous effort into sustainability. Companies listed in the SRI KEHATI index indicates that those companies possess the best credibility on the 6 fundamental factors (environmental, community, corporate governance, human rights, business behaviour, labour practices & decent work) required by the management. This research will be observing the impact ESG performance gives to these model companies' financial performance, represented by their profitability index of ROA and ROE. The reason to why ROA and ROE are treated as proxies to the firms' financial performance is because both of those indexes are important for investors to look at before making an investment decision. ROA shows how effective a company can turn its asset into economic returns. While, ROE represents how well a company manage its equity to generate return. In the end, the researcher aspires to grasp the significance for companies to devote their capital to ESG initiatives given the recent landscape of Indonesia state of economy.

II. LITERATURE REVIEW

2.1 ESG Significance to Financial Performance

This study's primary objective is to evaluate the effects of environmental, social, and governance (ESG) factors on financial performance in Indonesia. Before delving further into the study's analysis, it is essential to have a good comprehension of the development of the topic from earlier research. This is because the analysis will be based on the findings of the previous research. A significant amount of investigation has been focused on determining the nature of the ESG aspects that are associated with commercial achievement. Despite this, the findings of the investigations have been somewhat varied, which has led to a diversity of results from the investigations.

Recent studies suggest that ESG have significant impact on financial performance, while also having a positive relationship between them (Bruna et al., 2022; Naeem et al., 2022). One of those studies also suggest that ESG impacts are felt more by companies on developed countries compared to those in emerging economics country (Naeem et al., 2022). The study (Naeem et al., 2022) was conducted by using regression model, taking ESG score and financial performance data of environmentally sensitive industry from Refinitiv Eikon. In addition to completing the analysis on the influence of the total ESG score, the research also evaluates the impact of the score

assigned to each ESG pillar on the company's financial success. The findings from each independent pillar reveal that it has a positive and significant impact on the organization's overall financial success.

That being said, different research studies have reached different conclusions about the relationship between ESG factors and financial performance. A study by Duque-Grisales & Aguilera-Caracuel (2021) reported a negative correlation between ESG as a whole and financial performance. This implies that a higher ESG score, indicating a firm's strong commitment to environmental, social, and governance criteria, could potentially lead to a decrease in its financial performance. The authors suggest that this might be due to the high cost of implementing and maintaining ESG practices, which may outweigh the financial benefits in the short to medium term.

More contradictive findings also appear on other researches. For instance, Ekatah et al. (2011) found no significant relationship between environmental performance and financial performance. This indicates that companies with good environmental credentials do not always outperform or underperform their competitors who have worse environmental practises. Rather, this demonstrates that there is no correlation between the two. Additional perspective also comes from Brine et al. (2006) and Orlitzky & Benjamin, (2001), who argue that environmental and social performance are not significant determinants of a company's financial performance. Furthermore, (Wang & Sarkis, 2017) conducted a study on corporate governance and found no discernible effect on a company's financial performance. Despite the ethical and transparency advantages associated with good corporate governance, it does not necessarily guarantee that it will improve the financial health of a firm or increase its profitability. Collectively, these studies cast doubt on the notion that ESG factors would always lead to improved financial results for businesses.

Lastly, another study proposed a nuanced perspective, suggesting that corporate sustainability does influence firms' financial performance, but the effects are mostly observable in the long term. This study implies that the benefits of adopting sustainable practices might not be immediately apparent in a company's financial statements. Instead, they might accrue over time, contributing to improved financial performance in the long run. Simply said, corporate sustainability affects firms' financial performance in the long run, but not in the short term (Eccles et al., 2014).

Based on the preceding studies described above, not only do the findings of the researchers inconsistent, but they also contradict the findings of one another. This may occur as a consequence of the fact that the observed groups vary from study to study. Due to the contradictory findings, the researcher is compelled to find out how ESG scores impacted the financial performance of Indonesian firms in the past years and ultimately determine whether it has a significant impact on the financial performance of the Indonesian businesses.

Table 55: Past Research Summary

Year	Author	Title	Findings
2022	Nasruzzaman Naeem, Serkan Cankaya, Recep Bildik	Does ESG performance affect the financial performance of environmentally sensitive industries? A comparison between emerging and developed markets	ESG Score has positive and significant impact on firms' financial performance. The impacts of ESG are felt more in developed countries compared to emerging economics countries.
2022	Maria G. Bruna, Salvatore Loprevite, Domenico Raucci, Bruno Ricca, Daniela Rupo	Investigating the marginal impact of ESG results on corporate financial performance	ESG Score has a positive and significant impact to firms' financial performance.
2022	Zhongfei Chen, Guanxia Xie	ESG disclosure and financial performance: Moderating role of ESG investors	ESG disclosure attracts ESG investors. In addition to that, ESG investors also play a positive moderating role in the connection between ESG ratings and financial performance.

2017	Zhihong Wang, Joseph Sarkis	Corporate social responsibility governance, outcomes, and financial performance	Corporate governance does not directly influence firms' financial performance. However, environment and social performance help firms generate superior financial performance.
2014	Robert G. Eccles, Loannis Loannou, George Serafim	The Impact of Corporate Sustainability on Organizational Processes and Performance	ESG Score may have an impact firms' financial performance in the long-term, but it has no impact on their short-term performance.
2011	Innocent Ekatah, Martin Samy, Roberta Bampton, Abdel Halabi	The relationship between corporate social responsibility and profitability: the case of Royal Dutch Shell plc	Environment performance have no significant impact on Royal Dutch Shell profitability.
2006	Matthew Brine, Rebecca Brown, Greg Hackett	Corporate Social Responsibility and Financial Performance in the Australian Context	Both environment and social performance have no significant impact on firms' financial performance in Australia.
2001	Marc Orlitzky, John D. Benjamin	Corporate Social Performance and Firm Risk: A Meta-Analytic Review	The relationship between corporate social (including environmental) performance and financial performance is non-linear, suggesting that there might not always be a significant positive correlation.

2.2 Conceptual Framework

The researcher is able to determine the variables that will be employed in the study and conceptualize a hypothesis regarding how one set of variables may impact another variable based on the discussion that was presented in the preceding parts of this article. The following is a representation of the overall structure:

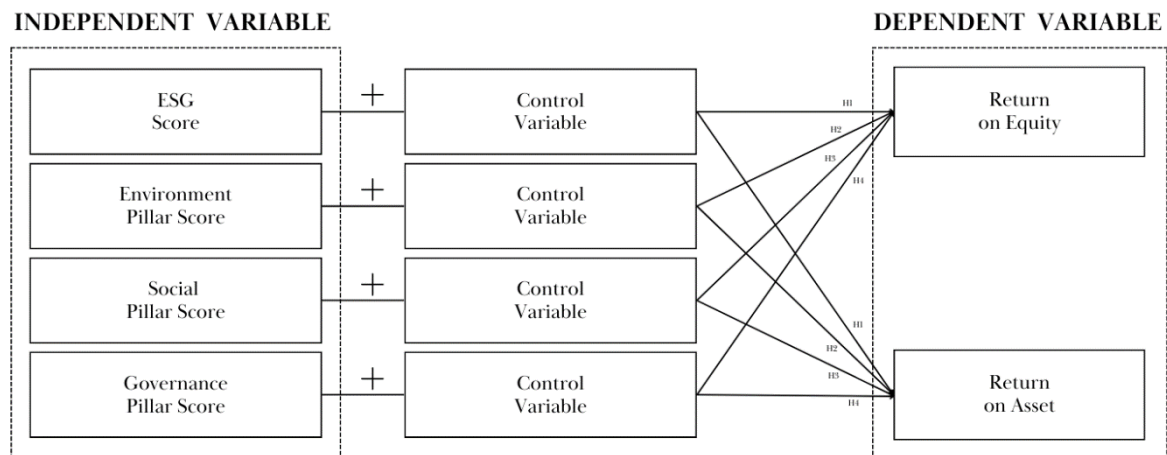


Figure 6: Conceptual Framework

(Researcher's Interpretation)

This illustration of conceptual framework above depicts how ESG score, both as a collective score and as an individual pillar, would affect the financial performance (ROA and ROE) of Indonesia companies, represented by firms listed in the SRI KEHATI index, when combined with several other control variables.

2.3 Research Hypothesis

Based on the conceptual framework above, it is clear that this research aims to address the hole left by previous studies regarding the relationship between ESG score to firms' financial performance in Indonesia.

2.3.1 ESG Score to Firms' Financial Performance

The first hypothesis that will be developed in the research will be the relationship between the ESG Score taken from Refinitiv Workspace to the firms' financial performance in the following year.

H_{01} = There is no significant effect of Refinitiv ESG Score to firms' financial Performance in the following year.

H_1 = Refinitiv ESG Score has significant impact on firms' financial performance in the following year.

2.3.2 Environment Pillar Score to Firms' Financial Performance

The second hypothesis for the research will focus on examining the potential impact between the environmental pillar score, obtained from the Refinitiv Workspace, to companies' financial performance in the subsequent year.

H_{02} = There is no significant effect of Refinitiv Environmental Pillar Score to firms' financial Performance in the following year.

H_2 = Refinitiv Environmental Pillar Score has significant impact on firms' financial performance in the following year.

2.3.3 Social Pillar Score to Firms' Financial Performance

The probable impact between social pillar score, as determined by the Refinitiv Workspace, on enterprises' financial performance the following year will be the third focus of the research hypothesis.

H_{03} = There is no significant effect of Refinitiv Social Pillar Score to firms' financial Performance in the following year.

H_3 = Refinitiv Social Pillar Score has significant impact on firms' financial performance in the following year.

2.3.4 Governance Pillar Score to Firms' Financial Performance

The last research hypothesis will be focused on examining any impact between the Governance Pillar Score, according to the Refinitiv Workspace, on companies' financial performance in the following year.

H_{04} = There is no significant effect of Refinitiv Governance Pillar Score to firms' financial Performance in the following year.

H_4 = Refinitiv Governance Pillar Score has significant impact on firms' financial performance in the following year.

III. RESEARCH METHODOLOGY

3.1 Research Design

This particular method of conducting research work is structured so that it begins with the study topic and ends with the findings. The steps that were taken to find solutions to the problems that arose throughout the course of this research are outlined in Figure 2. It is crucial to have the knowledge necessary to respond appropriately to the research question and successfully complete the study objectives. In addition to that, the particular methods of data collection and analysis that were applied to this study are broken down in the figure.

In order to accomplish research goals, this study starts with a research question. The research is focused on publicly traded companies in Indonesia that are listed in the SRI KEHATI index, as was mentioned in the introduction. The ESG score period employed as a measurement in this study will run from 2010 to 2018. However, the firms' financial performance data will lag one year from the ESG score data, as previous research did, to ensure that the study will assess the appropriate impact of ESG performance on corporate financial performance and to eliminate the endogeneity issue (Z. Chen & Xie, 2022; Naeem et al., 2022). The foundations

of theory are then built in order to support the hypothesis development after the scope of limitations have been established. Then, the secondary data is gathered through selected collection to produce the results, which are then examined to provide a response to the study question. Finally, depending on the findings of the data analysis, a conclusion and recommendation are developed.

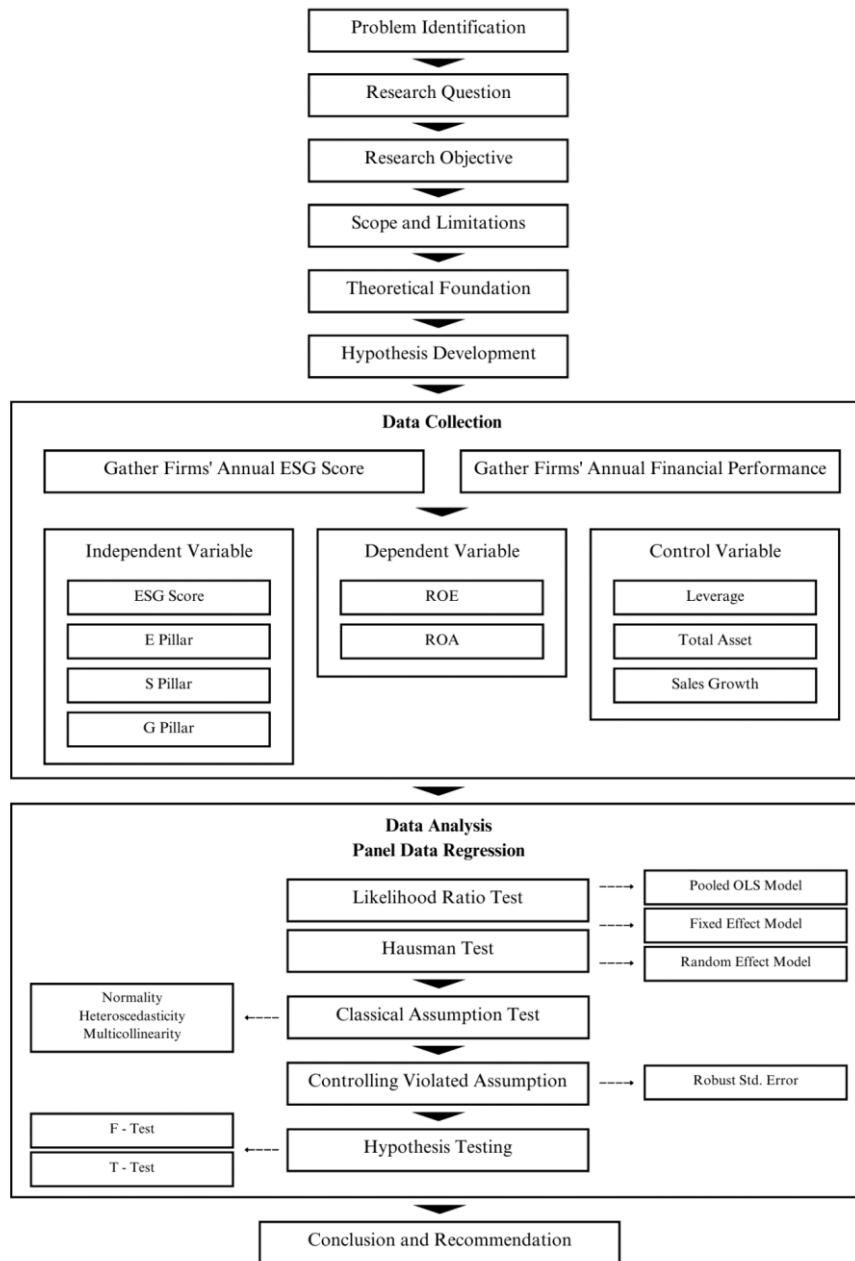


Figure 7: Research Design (Researcher's Interpretation)

3.2 Operation Variable

There will be 3 categories of variables in this research: independent variable, dependent variable, and control variable. Independent variable is the variable that is being utilized to predict or explain the dependent variable; dependent variable is the outcome variable that is being forecasted or explained; control variables are utilized to take into consideration additional variables that could be affecting how the dependent and independent variables are related (Newbold et al., 2023). The summary of all variables used in the research is presented in table 2.

Table 56: Variables Summary

Variable	Code	Measurement
Independent Variables		
ESG Combined Score	ESG	
	E	Taken Directly From
ESG Pillar Score	S	Refinitiv Workspace
	G	
Dependent Variables		
Firms' Financial	ROA	Net Income / Total Asset
Performance Proxy	ROE	Net Income / Total Common Equity
Control Variable		
Leverage	LEV	Total Debt / Total Asset
Firm Size	SIZE	Ln (Total Asset)
Sales Growth	GROWTH	% Changes in Revenue

3.2.1 Independent Variable

ESG performance ratings will be used as independent factors in this study to examine how they influence the dependent variables (financial performance evaluations of the sample firms). The ratings used are in line with previous studies (Broadstock et al., 2021; H.-M. Chen et al., 2022; Z. Chen & Xie, 2022; Naeem et al., 2022). Those variables are discussed briefly, based on Refinitiv Workspace elaboration:

ESG Combined Score: overall company score based on the reported information in the environmental, social, and corporate governance pillars with an ESG Controversies overlay.

Environmental Pillar: measures a company's impact on living and non-living natural systems, including air, land, and water, as well as complete ecosystem. Reflects how well company uses best management practice to avoid environmental risks and capitalize on environmental opportunities to generate long term shareholder value.

Social Pillar: measures a company's capacity to generate trust and loyalty within its workforce, customer, and society, through its use of best management practices. Reflection of the company's reputation and health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.

Governance Pillar: measures a company's system and processes, which ensure that its board members and executives act in the best interest of the long-term shareholders. Reflects a company's capacity, though its use of best management practices, to direct and control its right and responsibilities through the creation of incentives, as well as check and balances in order to generate long term shareholder value.

3.2.2 Dependent Variable

The dependent variable of this research will be firms' financial performance. As proxy of the firms' financial performance, the researcher will use ROA and ROE as previously used by prior studies (H.-M. Chen et al., 2022; Naeem et al., 2022). Those variables are discussed briefly below.

Return on Asset (ROA): an accounting-based metric that can be used to assess the financial performance of a company. Additionally, it demonstrates how effectively and efficiently a company uses all of its resources during production and operation processes to generate profit, reflecting the operational performance of the company.

Return on Equity (ROE): a measure of a company's financial performance derived from accounting. Additionally, it is a profitability ratio that demonstrates the company's ability to generate revenue and perform well financially.

3.2.2 Control Variable

To avoid distorted assessments and determine the true influence of ESG performance on the corporate financial performance of environmentally conscious firms, this research will include control variables such as corporation characteristics in line with prior research (H.-M. Chen et al., 2022; Z. Chen & Xie, 2022; Naeem et al., 2022; Rettab et al., 2009). With the integration of the three-control variable, the research will have a more robust regression model in order to find out the impacts of ESG scores to Indonesian firm's financial performance.

3.3 Sample Selection

The research focuses on publicly traded firms listed in the SRI KEHATI index. However, not all companies listed in the index have complete ESG ratings and financial disclosure since the year 2010. Here is the screening process done by the researcher to determine the sample companies that will be used throughout this research:

Table 57: Sample Filtering Process

Research Sample Size	
SRI KEHATI Listed Companies	25
Firms listed since 2010	22
Firms with complete ESG Rating	12
Final Sample	<u>12</u>

The research will do an annual time-series analysis of firms' ESG Ratings since 2010 up to 2018. As for the financial data, the researcher applies a one-year lag, 2011 to 2019, to ensure that the study would accurately examine the influence of ESG performance on corporate financial performance, building on the prior research (Z. Chen & Xie, 2022; Naeem et al., 2022). The time period used in this study considers the pandemic period which may cause unaccounted variable if included. In conclusion, there will be 12 objects of observation within 9 years creating 108 points of observation throughout the research development.

3.4 Data Processing Method

The study will measure 12 firms within the time period of 2010 to 2018 on an annual basis. According to that definition, this study fits the element of panel data because each cross-sectional unit (firms) is polled from 2010 to 2018.

The researcher builds the statistical model for this research before moving on to the next statistical analysis. The following are the statistical model that was produced:

Model 1 & 2: A regression model used to investigate how businesses' financial performance is impacted by overall ESG Performance Score.

$$ROE_{it} = \alpha + \beta_1 ESG_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 1})$$

$$ROA_{it} = \alpha + \beta_1 ESG_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 2})$$

Model 3 & 4: A regression model used to investigate how businesses' financial performance is impacted by overall Environmental Pillar Score.

$$ROE_{it} = \alpha + \beta_1 E_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 3})$$

$$ROA_{it} = \alpha + \beta_1 E_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 4})$$

Model 5 & 6: A regression model used to investigate how businesses' financial performance is impacted by overall Social Pillar Score.

$$ROE_{it} = \alpha + \beta_1 S_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 5})$$

$$ROA_{it} = \alpha + \beta_1 S_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 6})$$

Model 7 & 8: A regression model used to investigate how businesses' financial performance is impacted by overall Governance Pillar Score.

$$ROE_{it} = \alpha + \beta_1 G_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 7})$$

$$ROA_{it} = \alpha + \beta_1 G_{it-1} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \epsilon_{it} \quad (\text{Model 8})$$

Where:

- α : refers to intercept parameter in the regression model;
- ROE_{it} : refers to ROE of firms i in time t ;
- ROA_{it} : refers to ROA of firms i in time t ;
- ESG_{it} : refers to overall ESG Score of firms i at the time $t - 1$;
- E_{it} : refers to Environmental Pillar Score of firms i at the time $t - 1$;

it	: refers to Social Pillar Score of firms i at the time $t - 1$;
Git	: refers to Governance Pillar Score of firms i at the time $t - 1$;
$LEVit$: refers to Debt to Asset Ratio of firms i in time t ;
$SIZEit$: refers to \ln (Total Asset) of firms i in time t ;
$GROWTHit$: refers to Sales Growth of firms i at the time t ;
ϵit	: refers to the error term in the regression model.

After building a statistical model, estimating the parameters of the utilization function is crucial. Panel data combines cross-sectional and time-series data, which crates advantages as well as some limitations. To handle these limitations, there are three main methods for running panel data (Gujarati & Porter, 2009): Pooled OLS Model, Fixed Effect Model (FEM), and Random Effect Model (REM).

To determine which model describes the model best, several test will be conducted. The first test to be conducted will be the Likelihood Ratio Test between Pooled OLS Model and Fixed Effect Model, which will determine the better approach to describe the model (Baltagi, 2006). The hypothesis of the test is:

H₀, Coefficients estimated from the Pooled OLS Model are consistent and efficient

H₁, Coefficients estimated from the Fixed Effects Model are consistent and efficient

If the test statistic value is less than the critical value, we reject the null hypothesis and conclude that the Fixed Effects Model provides a better fit for the data. This means that there are individual effects, or random effects present in the data. However, if the test statistic value is greater than the critical value, we fail to reject the null hypothesis, which indicates that the OLS Pooled Model provides an adequate fit for the data. This implies that there are no individual effects, or random effects present in the data.

The next test to find the best fitting approach is the Hausman Test. This test is also known as the Durbin-Wu-Hausman or DWH test, which is use to compare the Fixed Effect Model and Random Effect Model. The test hypothesis is:

H₀, Coefficients estimated from the Random Effects Model are consistent and efficient

H₁, Coefficients estimated from the Fixed Effects Model are consistent and efficient

The Hausman test is used to determine whether the Fixed Effects Model or Random Effects Model provides a more appropriate fit for panel data. If the Hausman statistic, which is the difference between the coefficients estimated from the Fixed and Random Effects Models, is smaller than its critical value, it suggests that the Fixed Effects Model is more appropriate, and we reject the null hypothesis that the coefficients estimated from the Random Effects Model are consistent and efficient. Conversely, if the Hausman statistic is greater than its critical value, it suggests that the Random Effects Model is more appropriate, and we fail to reject the null hypothesis.

3.5 Classical Assumption

To ensure data used in this research are free of bias, several classical assumption tests are needed (Gujarati & Porter, 2009). In accordance with prior research, three tests will be run for the panel data analysis: the normality test, the multicollinearity test, and the heteroscedasticity test (Almeyda, 2019). By conducting these three tests, researcher can ensure that the panel data analysis is robust and reliable, and that the findings are based on valid assumptions and accurate statistical models.

Normality test, classical assumption test used to assess whether the data is distributed normally (Gujarati & Porter, 2009). There are several ways to test normality, but this study will utilize the Shapiro-Wilk test in particular. The normality test result should say that the data being used is normally distributed to ensure the assumption is fulfilled. Thus, the $prob > Z$ should be higher than the significant level being used in this research to make sure the hypothesis of normality is accepted.

Multicollinearity test, classical assumption test used to validate whether there is any linear correlation between the independent and control variable being used in the study (Gujarati & Porter, 2009). This research will utilize the VIF (Variance Inflation Factor) test to ensure that each variable is independent and not influencing one another. The VIF helps to identify the extent to which the presence of collinearity affects the accuracy of the regression coefficients. When VIF result is below or equal to 10, it indicates issues of multicollinearity. Thus, the value of VIF of each variable used in this research should be lower than 10 when the test is conducted to ensure the assumption is fulfilled.

Heteroscedasticity test, classical assumption test used to examine whether there are any systematic differences in the variability of the data across different groups or time periods, which can affect the accuracy of the statistical tests (Gujarati & Porter, 2009). This study will utilize the Breusch-Pagan test to ensure the assumption is fulfilled. Thus, the test result should be higher than the significant level being used in this research to make sure that there is no heteroscedasticity in the data set. In a case where heteroscedasticity is present, the result will not be efficient due to the biased standard error (Baltagi, 2006). It happens regularly in a panel data analysis and can be resolved by utilizing robust standard error correction to ensure accurate statistical inference based on true parameter values.

3.6 Hypothesis Testing

When classical assumptions are met, it means that the model are optimized and qualified to be interpreted. Two common statistical tests used to assess hypotheses are the T-test and F-test.

T-Test, statistical tool used to evaluate the impact of individual independent variables on the dependent variable in a regression model (Wooldridge, 2010). The significance level used in this research is 1%. If the probability value of T-Test is smaller than the significance level, it means the specific independent variable has significant effect on the dependent variable. Otherwise, it implies that the specific independent variable has no significant effect on the dependent variable.

F-Test, statistical tool used to determine whether the independent variables, as a group, have a significant effect on predicting the outcome variable. This research utilizes a significance level of 1%. If the probability value obtained from the F-test is less than the significance level, it indicates that the group of independent variables has a significant effect on the dependent variable. Otherwise, it suggests that none of the independent variables have a significant effect on the dependent variable, and the overall model is not a good fit.

IV. RESULT / FINDING

Testing the study's hypothesis will be the very last part of the statistical analysis that will be done. To begin, an F-test was performed on each of the models to determine whether or not they accurately represent the outcome of the dependent variable when examined collectively. The researcher will then look at the T-test of the independent variable to decide if it has a significant impact to the dependent variable or not. At the same time, the researcher will look at the estimate of the independent variable to understand how it impacts the dependent variable regardless of the variable significancy. The significance level used to test all hypothesis is 1%.

Table 58: Hypothesis 1 Analytics

Model 1	Estimate	P-Value	Model 2	Estimate	P-Value
Observation	108		Observation	108	
R ²	0.5714		R ²	0.4389	
Adjusted R ²	0.5015		Adjusted R ²	0.3474	
ESG	0.0003	0.6087	ESG	0.0004	0.4069
LEV	-1.0376	0.4317	LEV	-0.1928	0.0678
SIZE	-0.1300	8.34E-05***	SIZE	-0.6932	0.0045**
GROWTH	0.1580	5.50E-05***	GROWTH	0.1072	0.0004***
F Statistic	1.89E-05		F Statistic	7.90E-03	

The first hypothesis aims to analyses whether or not ESG Score has significance impact on SRI KEHATI firms' financial performance. This hypothesis will be represented by Model 1 and Model 2 since both models test the significancy of ESG Score to ROE and ROA consecutively. In the F-test, neither model has a F statistic that exceeds the level of research significance. So, the model does a good job of describing the dependent variable. T-test in model 1 shows a number of 0.60, higher than 0.01 (the study's significance level), which indicates that ESG score have no significant impact on ROE. In addition to that, the T-test in model 2 also shows a higher number (0.40) compared to the significance level which indicates that ESG score also do not have significant impact on ROA. Ultimately this shows that ESG score does not impact firms' profitability. Having a high or low ESG score will not affect the companies' profit in any way. Rather, the variable that seems to be impacting companies' profitability is its size and growth. Thus, this confirms the null hypothesis that ESG score have no significant impact on firms' financial performance.

Table 59: Hypothesis 2 Analytics

Model 3	Estimate	P-Value	Model 4	Estimate	P-Value
Observation	108		Observation	108	
R ²	0.5831		R ²	0.4338	
Adjusted R ²	0.5151		Adjusted R ²	0.3415	
E	-0.0007	0.1691	E	5.81E-05	0.9007
LEV	-0.1453	0.3121	LEV	-0.2230	0.0726
SIZE	-0.1109	5.19E-05***	SIZE	-0.0597	1.13E-02
GROWTH	0.1530	1.23E-05***	GROWTH	0.1060	0.0001***
F Statistic	0.0002		F Statistic	8.30E-03	

The second hypothesis aims to analyse whether or not Environment Pillar Score has significant impact on SRI KEHATI firms' financial performance. This hypothesis will be represented by Model 3 and Model 4 since both models test the significance of Environment Pillar Score to ROE and ROA consecutively. In the F-test, neither model has a F statistic that is statistically significant. Therefore, the model adequately describes the dependent variable. As for the T-Test, in model 3, it shows a number of 0.16, higher than the significance level, which indicates that Environmental Pillar score has no significant impact on ROE. In addition to that, the T-test in model 4 also shows a higher number (0.90) compared to the significance level which indicates that Environmental Pillar score also does not have significant impact on ROA. Ultimately this shows that Environmental Pillar score does not impact firms' profitability. So, whether companies contribute to the betterment of environment through their program or not, it will not have any impact on the companies' profitability. On the other hand, based on the model, the size and growth of the companies is the variable that will have significant impact on their profitability. Ultimately, this confirms the null hypothesis that ESG score has no significant impact on firms' financial performance.

Table 60: Hypothesis 3 Analytics

Model 5	Estimate	P-Value	Model 6	Estimate	P-Value
Observation	108		Observation	108	
R ²	0.5800		R ²	0.3824	
Adjusted R ²	0.5115		Adjusted R ²	0.3584	
(Intercept)			(Intercept)	0.5554	2.29E-10***
S	0.0006	0.2743	S	1.25E-05	0.9753
LEV	-0.0627	0.6497	LEV	-0.1905	0.1390
SIZE	-0.1426	3.18E-08***	SIZE	-0.0397	3.88E-08***
GROWTH	0.1572	7.59E-05***	GROWTH	0.1168	2.64E-05***
F Statistic	3.93E-05		F Statistic	6.32E-14	

The third hypothesis aims to analyse whether or not Social Pillar Score has significant impact on SRI KEHATI firms' financial performance. This hypothesis will be represented by Model 5 and Model 6 since both models test the significance of Social Pillar Score to ROE and ROA consecutively. Neither model has a statistically significant F statistic in the F-test. As a result, the dependent variable is well described by the model. As for the results of the t-tests in both Model 5 and Model 6 indicate that the Social Pillar score has a p-value of 0.27 and 0.97, respectively, which is higher than the predetermined significance level of 0.01 used in the study. This suggests that the Social Pillar score does not have a statistically significant impact on either ROE or ROA of the firms under investigation. In simpler terms, it means that social program done by companies will not have a meaningful effect on its profitability. Contrarily, according to the model, it is the size and the growth of the companies that demonstrates a significant impact on their profitability. As a result, the findings support the null hypothesis, indicating that the Social Pillar score does not significantly influence the financial performance of the companies being studied.

Table 61: Hypothesis 4 Analytics

Model 7	Estimate	P-Value	Model 8	Estimate	P-Value
Observation	108		Observation	108	
R ²	0.3327		R ²	0.3861	
Adjusted R ²	0.3067		Adjusted R ²	0.3623	
(Intercept)	0.4965	9.48E-06***	(Intercept)	0.5582	4.22E-08***
G	-0.0008	0.1669	G	-8.56E-05	0.8342
LEV	-0.3235	0.0499	LEV	-0.2024	0.0853
SIZE	-0.0223	0.0355	SIZE	-0.0039	1.05E-05***
GROWTH	0.1872	1.93E-05***	GROWTH	0.1143	0.0002***
F Statistic	2.22E-16		F Statistic	2.86E-09	

The fourth hypothesis aims to analyse whether or not Governance Pillar Score has significant impact on SRI KEHATI firms' financial performance. This hypothesis will be represented by Model 7 and Model 8 since both models test the significance of Governance Pillar Score to ROE and ROA consecutively. In the F-test, neither model has statistically significant F statistic. Thus, the model accurately describes the dependent variable. Moving to the results of the t-tests, both Model 7 and Model 8 reveal p-values of 0.16 and 0.83, respectively, which are both higher than the study's significance level of 0.01. This suggests that the Governance Pillar score does not have a significant effect on either the ROE or ROA of the firms analyzed. Consequently, it can be concluded that the way these companies are governed seems to have no impact on the performance of their profit. If we look further in the analysis, it is the size and growth of the firm that seems to be significantly impacting their profitability index. Therefore, these findings support the null hypothesis, indicating that the Governance Pillar score does not play a significant role in determining firms' financial performance.

V. DISCUSSION

The result of the analysis above shows that ESG Score, both as a whole and as individual pillars, have insignificant impact on SRI KEHATI firms' financial performance. Implicitly, this shows that in current time of the research, ESG still has little to no impact on firms' financial performance in Indonesia, given that the company said to have an exemplary sustainable practice in the country (SRI KEHATI index) when compared to the other listed firms is not significantly impacted by their ESG Score.

The case where ESG Score, collectively and individually, has no significant impact to firms' financial performance also happens in past researches (Orlitzky & Benjamin, 2001; Wang & Sarkis, 2017). This shows that the research findings are not something new, but something that has happened previously. This also indicates that although ESG has been sounded by the UN as a global initiative, the speed of ESG initiative growth differs from region to region, sadly in Indonesia it seems that ESG is still not appreciated enough which results in them not being able to impact the firms' profit.

The researcher has a couple of supporting explanations on why ESG Score has yet to impact firms in Indonesia significantly in the timeline of this research. First, government in Indonesia just started to put emphasis on sustainability by 2017 where the country's Financial Service Authority (OJK) has just decreed regulation no.51/POJK.03/2017 about sustainability reporting. Second, there has been little to no public awareness about sustainability. A study reported that many environmental destructions in Indonesia happen due to the low level of environmental awareness among the Indonesian populace (Parker, 2018). Lastly, in the timeline of the research, stakeholders in Indonesia care more about economic return compared to sustainability. One of the damages being Indonesia lost 2.1 hectare of its forest in 2015-2020 (Vannia, 2021). The country only manages to tackle the deforestation rate in 2019-2020 period, decreasing it by 75% compared to previous year (Indonesian Ministry of Environment and Forestry, 2021). This shows the horrendous deforestation rate in the country prior to 2019. These three reasons mainly display the undeveloped state of ESG impact in Indonesia.

If we analyze deeper, we can also see that the variable that seems to be impacting the firms' profitability in Indonesia is their size and more than that, their growth. This further confirms that throughout the period of the research, Indonesia as a developing economic country really does emphasize on economic growth compared to the world sustainability. Although it is understandable for a developing economic country to put emphasis on

economics growth, we must balance the emphasis on sustainability too. Right now, our world temperature is on 1.3°C which is alarming. 190 Countries in the Paris Agreement have agreed to restrain the global warming by maintaining mother earth temperature under 2.0°C by 2050 and if possible, put extra effort to keep it below 1.5°C. The margin between the current condition of 1.3°C to the target of 1.5°C is very slim. Thus, we need to put more effort. One of the most integral parts to ensure target's feasibility is to push companies to integrate ESG initiatives in their businesses since most carbon emission of the world actually come from them. To ensure that companies really comply to sustainable practice we need to urge them while also simultaneously appreciates their effort and one of the ways is actually by investing using the SRI approach. That way, it will be a win-win situation for all of us: companies will be more sustainable and appreciated financially from their ESG initiatives; Investors will in the end get their return from investing since the companies has become more sustainable and will be profitable in the long run; Mother earth will be spared from global warming thus ultimately and most importantly benefitting all of us, inhabitants of earth, since we will get to live in a more stable and beautiful condition with less fear of natural disasters looming in our future.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The objective of this study is to examine the effect of ESG Score, both as a whole and as individual pillars, on the financial performance of Indonesian firms listed on the SRI KEHATI index the following year. This study utilizes ESG scores obtained from Refinitiv Workspace for twelve companies as study subjects annually from 2010 to 2018, as well as their annual financial performance data from 2011 to 2019. To reach its conclusion, the research employs both fixed and random effects panel data regression. To account for their heteroscedasticity, a few of the models are created using a rigorous standard error technique.

All estimations indicate that the ESG Score, collectively and individually, has no significant impact on the following year's financial performance of businesses. ESG and Environment Pillar have a positive correlation with financial performance, Social Pillar has contradictory correlations between each financial performance proxy (negative on ROE and positive on ROA), and Governance Pillar has a negative correlation with financial performance. However, due to their insignificance on financial performance, the correlation status has little to no value.

The insignificant impact of ESG Score on Indonesia firms listed in SRI KEHATI index can be explained by several factors, including: limited regulation, little public awareness, and economic priorities. However, contradictory to the research findings, the researcher still emphasizes business leaders in Indonesia to put importance in sustainability aligning with the UN global goal. Although, companies in Indonesia have yet to profit from ESG initiatives, the researcher still believes that eventually it will change just as how it has changed in other country with more sustainability awareness. This must happen if we want to stop the global warming which has caused the disturbing climate change in our beloved earth.

6.2 Recommendation

This research provides information to company board members and investors in Indonesia, who are interested in comprehending ESG related behaviour of Indonesian businesses. This research put into light that ESG score has no impact on SRI KEHATI firms' financial performance in the pre covid pandemic. The study utilizes a 9-year timeframe to ensure that it captures the long-term impact of ESG initiatives. This indicates that ESG initiatives does not directly translates to positive impact on financial performance or may never will.

The first recommendation is for board member of Indonesia companies. Board members should carefully evaluate since firms have no choice but to push through ESG efforts in order to realize the United Nations' vision of a better world. Thus, the only thing board members can do is conduct rigorous due diligence on their ESG initiatives to verify that it effectively addresses the issue and eventually yield incremental benefits for the company's financials. Board members of Indonesian firms can use benchmarks from other corporations in countries where ESG has successfully give positive impact on firms' financial performance.

The second recommendation is for Indonesia investors. Investors should now understand the state of ESG in Indonesia capital market. When investors put their money based on firms' ESG performance, they need to recognize that they may not get positive return swiftly. Thus, investors need to decide thoroughly on their investment objective. The decision to use SRI approach must come from the heart as means of contribution for a better future, as opposed to being driven by the desire to make quick money on the market.

Lastly the researcher also has several recommendations for future researches. Future research could explore this topic on a different timeline, especially post covid pandemic, to check the updated state of ESG impact on firms' financial performance. Another option is to try and continue this research by confirming the discussion on why ESG score has insignificant impact on financial performance of firms in Indonesia by doing qualitative research, asking expert perspective.

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Middle school student numerical literacy through the application of e-learning on numbers

Dina Pratiwi Dwi Santi¹, Setiyani², S.B. Waluya³, Y.L. Sukestiyarno⁴, A.N. Cahyono⁵

¹ Pendidikan Guru Sekolah Dasar, Universitas Swadaya Gunung Jati, Cirebon, Indonesia

² Pendidikan Matematika, Universitas Swadaya Gunung Jati, Cirebon, Indonesia

^{3,4,5} Pascasarjana, Universitas Negeri Semarang, Semarang, Indonesia

Abstract

This study aims to describe the numeracy literacy ability of junior high school students in terms of learning independence based on the PISA and GLN TIM modification indicators. This research is a descriptive research with a qualitative approach. The population of this study was the students of class VIII A of SMP Negeri 4 Cirebon as many as 27 students. Research subjects were obtained through purposive sampling technique by taking two students each based on the categories of high, medium, and low learning independence. The results of this study indicate that: (1) students with high learning independence category are able to fulfill all indicators of numeracy literacy ability; (2) students with moderate learning independence are only able to meet indicator 5, quite able to meet indicators 1, 2, 3 and have not been able to meet indicator 4; (3) students with low learning independence have not been able to fulfill all indicators of numeracy literacy

Keywords: numeracy, project, e-learning, number material

I. INTRODUCTION

According to Cockroft, numeracy literacy is the ability of individuals to utilize various numbers to solve everyday problems more quickly and easily (Goos Merrillyn, 2011). In daily life, for example, when buying goods, organizing schedules, planning finances, constructing buildings, or in a medical environment, all of these require good numeracy skills. Rifqi (2019) suggests that numeracy literacy is believed to provide solutions to unsystematic and unstructured problem-solving. Based on this opinion, students need high diligence and consistency in order to develop practical and effective thinking when facing various irregular problems. Sayekti (2021) states that numeracy literacy is the ability that equips students with skills in applying numerical concepts, computational skills, and the ability to interpret quantitative information. Furthermore, numeracy literacy is needed to make strong decisions in solving everyday quantitative problems. As stated by Alberta (2018), with numeracy literacy, students are able to make decisive decisions regarding quantitative problems.

Numeracy skills are among the components tested in the Programme for International Student Assessment (PISA). Indonesia obtained a mathematics score of 379 with an average participant score of 489. Based on the test results, it can be seen that Indonesia has not been able to achieve a good position, as it is far below China, which obtained an overall score of 591 (Tim Gerakan Literasi Nasional, 2018). According to Yalcin (2012), international-scale evaluations serve as important indicators for improving the education system of a country. The low PISA scores as indicators of numeracy literacy skills can be attributed, among other factors, to the lack of understanding of problem contexts that involve real-life situations.

The scope of numeracy, according to the National Literacy Movement Team (2017), revolves around the capability to apply mathematical principles and rules in various relevant situations in daily life where problems are often unstructured, have multiple approaches, and may not have comprehensive solutions, and are related to various unsystematic factors.

From the various explanations regarding numeracy literacy mentioned above, it can be concluded that numeracy literacy plays a significant role in supporting various issues in fulfilling human needs. This is in line with Andreas Schleicher of the OECD (2017), who stated that good numeracy skills are the best solution to prevent or even reduce the percentage of unemployment, low income, and poor health. In addition to the cognitive aspect, the affective aspect is also needed to support learning. As stated by Totiana (2013), affection plays an important role in the cognitive development of individuals. In this case, the cognitive aspect of numeracy literacy is closely related to independent learning as an affective aspect that is useful for supporting continuous learning. Independent learning, including in the affective domain, is included in the scope of the 2013 curriculum, which emphasizes that students should be able to improve and enhance their quality (Komala, 2017).

According to NCTM, there are at least three positive impacts of integrating technology in mathematics learning, namely improving learning achievements and the effectiveness of mathematics teaching, influencing

what and how mathematics should be learned and taught (27). One of the applications of technological advancements is the development of digital learning materials as e-learning. Through e-learning, students can engage in self-directed and collaborative learning anywhere and anytime without being limited to a physical classroom. Considering the background of the problem that has been outlined, this research is conducted to describe the profile of numeracy literacy skills among junior high school students in terms of their independent learning.

II. RESEARCH METHODOLOGY

This research is a development study. The development model used is ADDIE, which stands for Analysis, Design, Develop, Implement, Evaluate (Prawiradilaga, 2009: 21). The research only reached the development stage because the purpose of this study is limited to developing and producing a valid electronics project (e-project) to be implemented based on the validator's assessment. The ADDIE stages can be seen in the following figure:

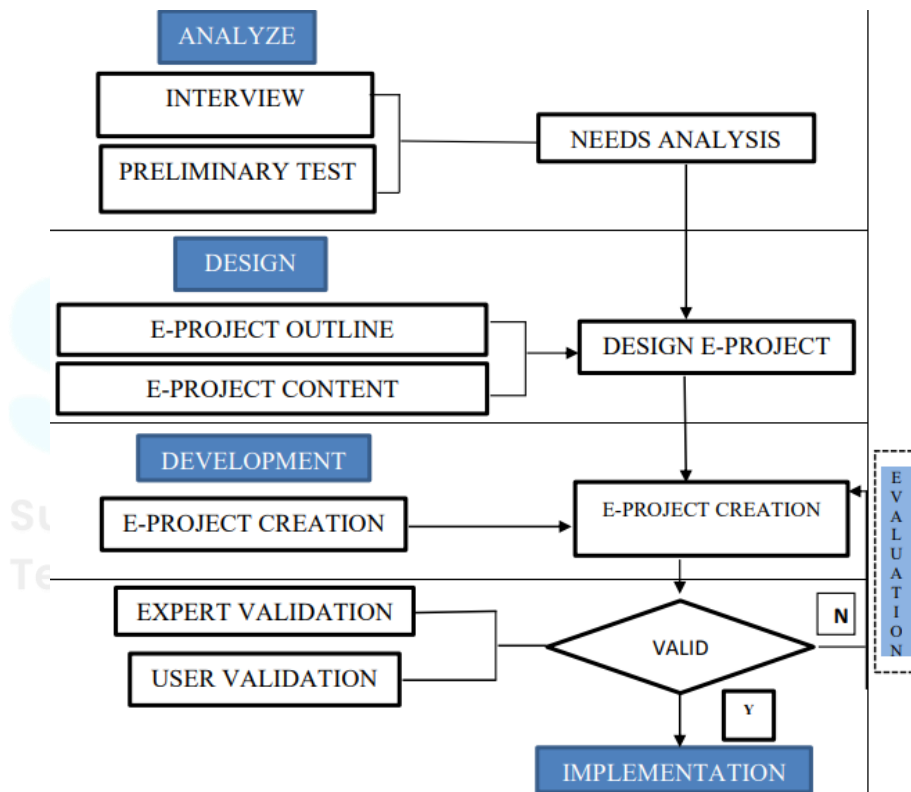


Fig 1. ADDIE Model

Based on Figure 3, the analysis stage is the initial stage in the development process of e-learning in the form of digital teaching materials, with the aim of identifying student problems and needs. The instruments used in this research include validation sheets, interview guidelines, and numeracy questions on the topic of numbers. Furthermore, the numeracy questions in this research refer to the following indicators: the ability to use various types of numbers and symbols related to basic mathematics to solve practical problems in different everyday life contexts, analyze information presented in various forms (graphs, tables, maps, etc.), use interpretation to predict and make decisions. To determine whether the created e-learning is valid or not, the product is validated by validators. The validators consist of 24 mathematics teachers in Cirebon city and 2 lecturers. To analyze student needs, a pre-test is conducted. In this research, one class was selected as the research subject, namely class VIII A, which consisted of 36 students, and 6 students were selected as research samples. The instruments used in this research are self-learning questionnaire, mathematical literacy test, interviews, and documentation.

The questionnaire is used to obtain data on the self-learning independence of class VIII A students at SMP Negeri 4 Kota Cirebon. The questionnaire used in this research is a closed questionnaire. The questionnaire is prepared based on indicators of self-learning independence. Each indicator has two positive questions and two

negative questions with five answer choices: Strongly Agree (SA), Agree (A), Sometimes (S), Disagree (D), and Strongly Disagree (SD). The statements provided are closed-ended, regarding students' opinions, consisting of positive and negative statements. The test instrument is used to determine students' numeracy literacy abilities. This test consists of one descriptive question on number topics, covering three indicators of numeracy literacy abilities. The numeracy literacy test is conducted once with a time allocation of 60 minutes, and the test results are used for analysis purposes. The numeracy literacy test questions are taken from the PISA question development.

Interviews in this research are conducted by asking a series of questions related to numeracy literacy to 6 selected students as research samples, consisting of 2 students with high self-learning independence, 2 students with moderate self-learning independence, and 2 students with low self-learning independence. The type of interview conducted is a structured interview with a pre-made interview guide. Documentation in this research aims to make the research results more reliable. Documentation in this research includes pictures, writings, or test results required by the researcher.

III.RESULT / FINDING

Based on the analysis of student data regarding numeracy literacy skills that has been conducted with reference to modified indicators from PISA and Team G.LN, the following conclusion can be drawn regarding the percentage of achievement indicators of numeracy literacy in terms of students' independent learning in mathematics.

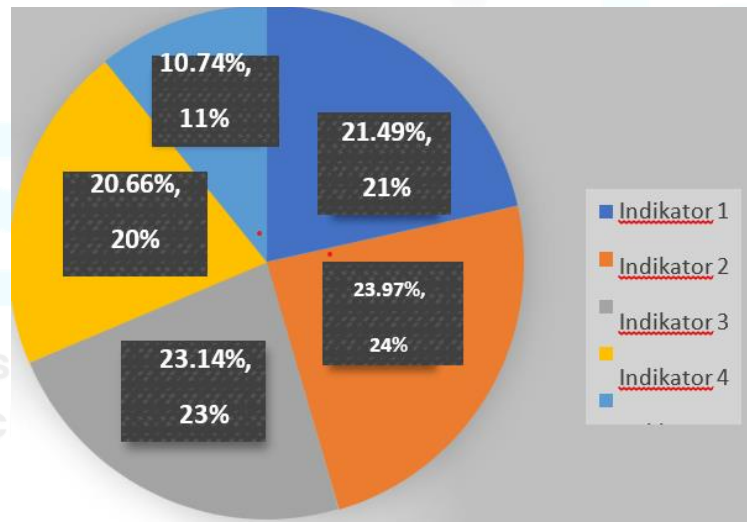


Fig. 2. Percentage of Numeracy Literacy of Junior High School Students

Information :

Indicator 1: students' ability to use numbers or symbols to solve problems.

Indicator 2: students' ability to write the process to reach a solution.

Indicator 3: students' ability to summarize mathematical results accurately and completely.

Indicator 4: students' ability to interpret analysis results to predict and make decisions.

Indicator 5: students' ability to analyze information presented in various forms of tables or graphs.

Based on the pie chart presented in Figure 1 above, it can be concluded that the most frequently occurring numeracy literacy indicator is Indicator 2 at 23.97%, which is related to students' ability to write the process to reach a solution. Next, the indicators that frequently appear after Indicator 2 are, in order, Indicator 3 at 23.14% related to students' ability to summarize mathematical results accurately and completely, Indicator 1 at 21.49% related to students' ability to use numbers or symbols to solve problems, and Indicator 4 at 20.66% related to students' ability to interpret analysis results to predict and make decisions. In this case, the indicator that rarely appears and occupies the lowest position is Indicator 5 at 10.74% related to students' ability to analyze information presented in various forms of tables or graphs. The frequent appearance of Indicator 2 indicates that students already have good skills in writing the process to reach a solution. They are able to describe the process well and in a structured manner, accurately present the known components, articulate the required components effectively, and explain the solution process clearly and accurately until they obtain the final solution. This is consistent with Rohim's opinion (2021) that students with good numeracy literacy have better abilities in describing mathematical processes and principles in relevant life situations. Conversely, the infrequent occurrence of Indicator 5 indicates

that students are still not proficient enough in analyzing information presented in tabular form. This finding aligns with Nahdi's (2019) study, which found that students still face difficulties in interpreting information presented in tables and graphs. Furthermore, based on the obtained needs analysis, the research team developed e-learning. The validation results of the e-learning can be seen in the following table.

Table 2. Assessment Results Validation

Validator (V)	Scores Achieved on Each Aspect							Total Achieved Score	Validation Criteria
	1	2	3	4	5	6	7		
V-1	4.0	3.9	3.7	3.8	4.0	4.0	4.0	23.4	83
V-2	4.0	3.9	3.7	3.8	4.0	4.0	4.0	23.4	83
V-3	4.0	4.0	4.0	4.0	3.8	4.0	4.0	23.8	85
V-4	4.0	3.9	3.8	4.0	4.0	4.0	4.0	23.7	85
V-5	3.9	3.8	3.5	4.0	3.8	4.0	3.7	22.9	82
V-6	3.7	3.9	3.7	4.0	3.3	3.7	3.5	22.2	79
V-7	3.3	3.4	3.3	3.8	3.5	3.3	3.2	20.7	74
V-8	3.6	3.9	3.7	3.8	3.5	4.0	4.0	22.4	80
V-9	3.4	3.6	3.7	3.8	4.0	3.7	3.2	22.2	79
V-10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	18.0	64
V-11	4.0	4.0	4.0	4.0	4.0	4.0	3.5	24.0	86
V-12	4.0	4.0	4.0	3.8	4.0	4.0	4.0	23.8	85
V-13	4.0	4.0	3.8	4.0	3.8	4.0	4.0	23.6	84
V-14	4.0	3.9	4.0	4.0	3.8	4.0	4.0	23.6	84
V-15	4.0	4.0	3.7	3.5	3.0	4.0	4.0	22.2	79
V-16	3.9	3.8	3.8	3.5	3.0	4.0	4.0	21.9	78
V-17	3.9	3.6	3.8	3.5	3.5	4.0	4.0	22.3	80
V-18	3.4	3.6	3.7	4.0	4.0	4.0	3.8	22.7	81
V-19	3.6	3.8	3.5	3.5	3.3	4.0	3.7	21.6	77
V-20	3.1	3.0	3.0	3.2	3.0	3.3	3.0	18.6	67
V-21	4.0	4.0	3.7	3.8	3.0	4.0	4.0	22.5	80
V-22	4.0	4.0	3.7	4.0	3.3	4.0	3.7	22.9	82
V-23	4.0	3.6	3.7	4.0	3.8	3.7	3.7	22.7	81
V-24	4.0	4.0	4.0	4.0	3.5	4.0	3.5	23.5	84
V-25	4.0	3.9	3.7	3.8	4.0	4.0	4.0	23.4	83
V-26	4.0	3.6	3.7	4.0	4.0	4.0	4.0	23.4	83

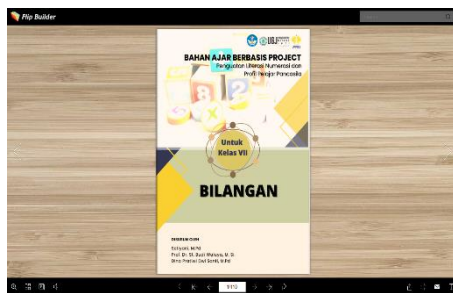
Next conducted calculation analysis by whole for knowing that learning media interactive is it valid or no. In the calculation conducted with use formula as following .

$$V_{gabungan} = \frac{\sum V_i}{n} = 77\%$$

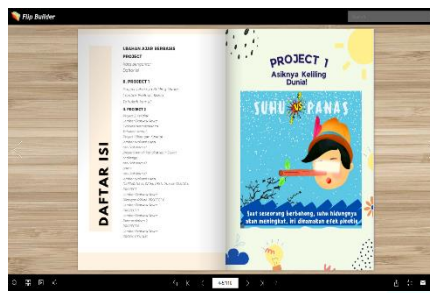
Based on the suggestions from the validators, then researcher To do revision for e-project improvement. The final e-project can be seen in table 4 below .

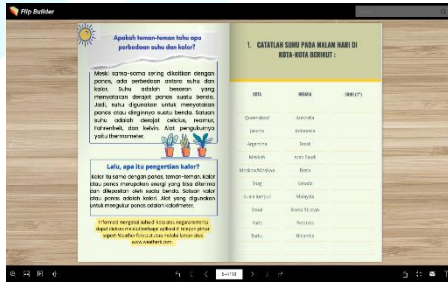
Table 3. Final E-Project

Cover Interface

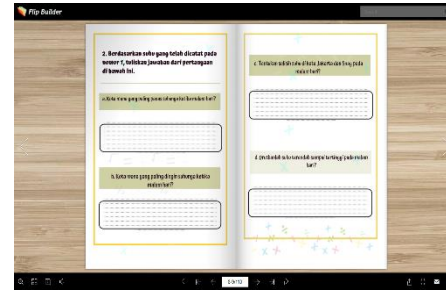
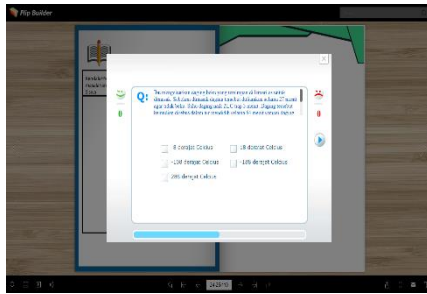


Project Interface

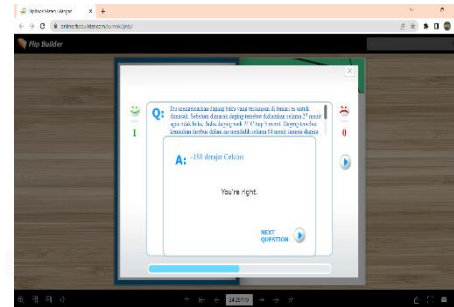




Quiz Interface



Quiz Interface



The project developed in this study has a potential effect on improving the numeracy skills of junior high school students in number material. This is supported by the theory that technology-integrated projects will change the paradigm of teacher-centered learning to students, there will be a shift in resources from local to global and accommodate the complexity of tasks and the use of various abilities (53). One of the factors affecting the limitations of numeracy literacy skills in Indonesia is that the models, methods, or learning strategies used by teachers are not appropriate (Indah, 2016). To improve numeracy literacy, teachers are required to be able to use appropriate strategies and methods in learning. As Yulianti (2019) argues, an appropriate learning strategy will be able to optimize numeracy literacy skills.

IV. CONCLUSION AND RECOMMENDATION

The numeracy literacy of SMPN 4 Cirebon City students indicates the existence of student abilities related to indicators that have been and have not been achieved. Of the five indicators that have been mentioned, indicator 2 that appears frequently is 23.97%, and the indicator that rarely appears is indicator 5 of 10.74%. Often indicator 2 appears indicating that students already have good abilities in writing down the process of reaching a solution, are able to describe the process in a good and structured manner, are able to describe the components that are known correctly, describe the components that are asked well, and are able to describe the solution to get the final solution with clear and precise. Speaking of learning strategies, special assistance is needed to improve the numeracy skills of junior high school students in the moderate and low learning independence categories and to maintain the achievements of students with high numeracy literacy. Regarding assistance or scaffolding that can be used, including using e-learning, this strategy is considered effective for increasing numeracy literacy skills independently.

Acknowledgement

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Measurement Of E-Wom, Brand Image, Halal Product Image, Purchase Intention, And Purchase Decisions Variables

Indrawati¹, Afrafara Syadza Syivana², and Subhas K.B. Pillai³

^{1,2} School of Economics and Business, Telkom University, Bandung, Indonesia

³ Goa Business School, Goa University, Goa, India

Abstract

Wardah is an original Indonesian halal cosmetic brand that was founded in 1995 under PT. Paragon Technology and Innovation. The company launched the Wardah cosmetic brand because the Muslim community has a need to consume halal products in accordance with Islamic religious law. Muslims feel safe and comfortable when using halal products, so this is a great opportunity for companies to market halal products that have received halal certificates from the Indonesian Ulema Council (MUI). With the rise of the halal image, Muslims are flocking to get cosmetic products that have guaranteed halal images. Therefore, it is important to find out the right model to describe how purchasing decisions made by consumers in buying halal products are influenced by the variable E-WOM (Information Quality, Information Quantity, Information Credibility) and Brand Image. The purpose of this research is to find out the measurement of variables Brand Image, Information Quality, Information Quantity, Information Credibility, Halal Product Image, Purchase Intention, and Purchase Decisions. A set of Questionnaires was distributed through online surveys and data were collected from 30 respondents who live in Indonesia. The collected data were analyzed by using IBM SPSS Statistics and showed that 35 items from 7 variables met the validity and reliability requirements. Therefore, the measurement tool is ready to be used in further research.

Keywords: Halal Product Image; E-WOM; Purchase Decision; Purchase Intention.

I. INTRODUCTION

Data from the Ministry of Industry indicates that there were 153 additional companies operating in Indonesia's cosmetic industry in 2017, bringing the total to over 760, (Kurniawan, 2019). The export value of the cosmetics sector climbed by 29.8% to US\$677 in 2018 according to the Ministry of Industry, up from US\$521 in 2017 [2]. The need for halal products in Indonesia undoubtedly rises with the development of increasingly advanced skincare and cosmetics. Halal cosmetic products have long been a favorite of nearly all Indonesians, and the cosmetic brand's reputation is excellent, so many people trust it. In addition to Wardah, other local cosmetics companies, including Somethinc, Avoskin, Safi, Sariayu, BLP, and many others, have received the halal certification. Due to consumer confidence, electronic word of mouth that has grown along with marketing, the existence of safe and good for the skin ingredients, and customer trust, all of these companies have been successful in snagging a portion of the cosmetic market. Indonesia will have a sizable market together with an expanding population of the younger generation, or millennial generation, making the cosmetic business advantageous and promising for manufacturers who wish to develop it locally (Lionita, 2020). The Association of Indonesian Cosmetics Companies' prediction that the nation's cosmetics industry will continue to expand favorably supports this (Wijayanto, 2020).

Halal cosmetics must receive a halal certificate from the Indonesian Ulema Council's Institute for the Study of Food, Drugs, and Cosmetics. With the help of this institution, the general public will find it simpler to purchase halal goods since customers, particularly Muslims, can confirm whether goods have a halal label and are acceptable for usage. Wardah is one of the many diverse brands that has received halal certification. As a pioneer in the development of halal-certified beauty products, Wardah upholds the belief that the halal way of life and cosmetics may coexist harmoniously. The halal dietary and lifestyle standards are followed by all Wardah products. www.Paragon.com.

Shabrina as Wardah's brand manager, also said that Wardah's market position in early 2020, for the e-commerce segment experienced a significant increase and for development in retail and beauty product stores also experienced growth so that PTI remained focused on both sales channels (Hidayat, and Handoyo, 2020). Wardah will keep innovating in the face of these market obstacles in order to deliver better products and to keep Wardah's position as the industry leader (Rahayu, and Tendi, 2019). Conclusion Given Wardah's position as a market leader in the cosmetics sector, the company falls into the category of sales that generate high income, with high sales coming from a high level of consumer interest in the Wardah brand.

PT. Paragon Technology and Innovation launched the cosmetic brand Wardah because the Muslim community has a need to consume halal products according to Islamic law. Muslims feel safe and comfortable when using halal products, so this is a great opportunity for companies to market halal products that have received halal certificates from the Indonesian Ulema Council (MUI). With the rise of the halal image, Muslims are flocking to get cosmetic products that have a guaranteed halal image. Therefore, it is important to know the right model to describe how purchasing decisions are made by consumers in buying halal products. The purpose of this research is to find out the measurement of variables Brand Image, Information Quality, Information Quantity, Information Credibility, Halal Product Image, Purchase Intention, and Purchase Decisions.

II. LITERATURE REVIEW

Apply the Information Adoption Model (IAM) to analyze how e-WOM affects customers' propensity to buy. The electronic spread of information is referred to as "e-word-of-mouth" (E-WOM), and its effects might change based on the attitudes and behaviors of the recipients. The information analysis methodology (IAM) is suggested for the investigation of the effects of data on users of digital communication channels. Indrawati et al, (2022) went to the Information Adoption Model to predict how information quality, information credibility, information usefulness, information quantity, and information adoption will affect pros to make a buy intention. They found a suitable framework for studying E-WOM.

It has been demonstrated that the volume of E-WOM has a beneficial impact on its usefulness. Information related to E-WOM's influence on the purchasing decision-making process is backed by the volume, quality, and credibility of the information. Consumers analyze their alternatives before making a purchase by taking the brand's reputation into account. Muslim women place a high value on Wardah because it was an innovator in Indonesian halal cosmetics. Consumers in Indonesia, a Muslim-majority nation, appreciate halal components in cosmetic products, both in terms of their composition and how they are processed, in addition to the benefits of harmony and beauty items products Wardah has received halal certification from the Food, Drug and Food Assessment Institute of the Indonesian Ulema Council i. Wardah emerged as an answer to consumers' needs and desires to use care products that are halal and safe in terms of the ingredients they are made.

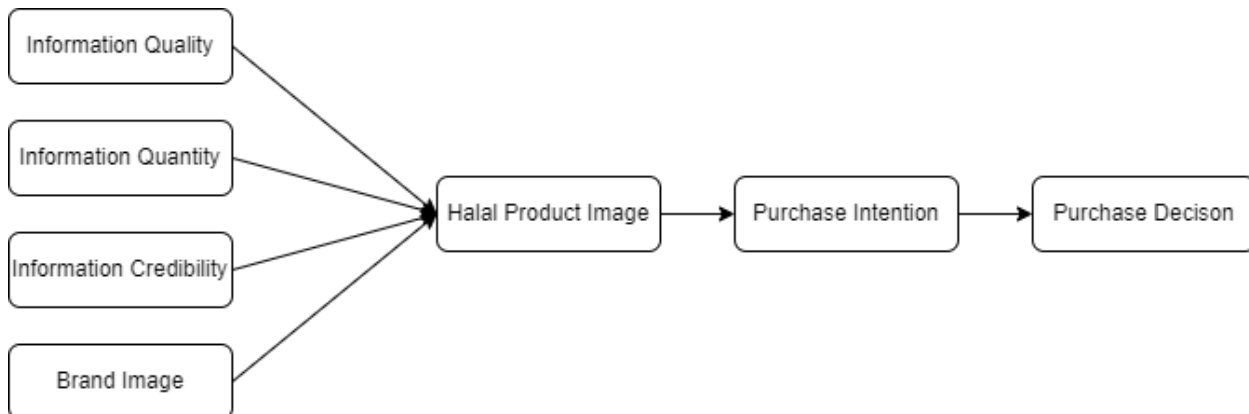


Figure 1 Theoretical Framework

Source: Data Processed by Author

Based on the requirements of this investigation, the authors of this study are considering applying the theory or modifying the model for the theoretical framework (**Figure 1**). A theoretical framework that eliminates or adds constructs depending on the findings of a literature study and initial data collection with the reasons given is known as a theory or model modification (Indrawati et al, 2015). Following the justification given, this

study will take into account the model framework from earlier research Indrawati et al, (2022) and add a number of variables, including brand image, halal product image, and purchase decision in the scenario.

III. RESEARCH METHODOLOGY

In this research, the authors need to test the measurement material that valid and reliable. First, the authors conducted a content validity (Indrawati et al, 2015) content validity is obtained by checking on each item that will be used on questionnaire logically valid to measure items from definition and indicator that has been applied.

In this study, before the questionnaire published and ready to share with the respondent, the authors conducted a readability test to few persons and the results is they could understand the questionnaire and without any confusions while filling the questionnaire. The items of each variable are presented in **Table 1**.

Variable	Item in Research	No Item
Information Quality	I understand information about Wardah on Social Media	IQ1
	I feel that information about Wardah on social media is very relevant	IQ2
	I feel Wardah's information on social media is based on facts	IQ3
	I feel that Wardah's information on social media is detailed	IQ4
	I feel that the information on social media about Wardah is exactly what I need	IQ5
	I feel that Wardah's information on social media is of good quality	IQ6
Information Quantity	I feel that the amount of information about Wardah is quite a lot	IQn1
	I feel that the amount of information about Wardah makes it easier for me to understand the product	IQn2
	I feel that the large amount of information about Wardah can convince me of this product	IQn3
Information Credibility	I feel Wardah's information on social media can be trusted	IC1
	I feel Wardah's information is true	IC2
	I feel that information from social media about Wardah makes me believe in the quality of its products	IC3
	I feel that the information on social media about Wardah can convince me	IC4
Brand Image	Wardah products are popular	BI1
	Wardah products have 'halal' characteristics	BI2
	Wardah products have a good reputation in the society	BI3
	Wardah products are easy to recognize because they are well known in the market	BI4
	Wardah products give a positive impression on consumers	BI5
Halal Product Image	Wardah has a halal composition that is certified by the MUI	HPI1
	Wardah has been registered as the best-selling halal product	HPI2

Purchase Intention	Wardah has a halal certificate from LPPOM MUI	HPI3
	Wardah received an award from the World Halal Council	HPI4
	Wardah is a pioneer of halal cosmetics in Indonesia	HPI5
	Wardah becomes my consideration to buy in the future	PI1
	Next time I need a Cosmetics, it is likely I consider purchasing Wardah	PI2
	Next time I need a Cosmetics, it is likely I will use Wardah	PI3
	It is very likely that I will buy the Wardah product	PI4
	I will try Wardah product	PI5
	I am sure to buy wardah products	PD1
	I am compatible with Wardah products	PD2
Purchase Decision	I am used to using wardah products	PD3
	I am happy with my decision to buy wardah products	PD4
	I often buy wardah products	PD5
	With various considerations, I always choose wardah products	PD6
	Overall I am satisfied with the purchase of Wardah products	PD7

Table 1 Operational Variable

Source: Data Processed by Author

Table 1 is the operational variable of this study, the questionnaire items were obtained from several previous studies Indrawati. (2015), Shantanu et al, (2019), Kenneth, and Donald (2018), this operational variable consists of 35 items from 7 variables.

IV. RESULT / FINDING

The authors use a pilot study. Using pilot study means that the researcher conducts a small sample with the sample size is 30 respondents and only for testing the validity and readability items. The data is processed by using IBM SPSS 24. To conducting the validity test is using "Corrected Item – Total Correlation" (CITC) method, Each statement in the questionnaire needs to be evaluated for its validity (Indrawati et al, 2015). The correlation coefficient is needs to be > 0.3 to be valid*. To test the reability of the items, Cronbach-Alpha technique is the most widely used and a good Cronbach-Alpha is > 0.70 [9]. The result of pilot test presented in Table below.

Item	Correlated Item-Total Correlation	Cronchbach Alpha
IQ1	0,581	0,75
IQ2	0,500	
IQ3	0,580	
IQ4	0,317	
IQ5	0,405	

IQ6	0,550	
IQn1	0,477	
IQn2	0,644	0,719
IQn3	0,509	
IC1	0,726	
IC2	0,426	
IC3	0,670	0,774
IC4	0,574	
BI1	0,335	
BI2	0,695	
BI3	0,506	0,74
BI4	0,392	
BI5	0,615	
HPI1	0,658	
HPI2	0,557	
HPI3	0,420	0,787
HPI4	0,748	
HPI5	0,527	
PI1	0,572	
PI2	0,676	
PI3	0,642	0,814
PI4	0,537	
PI5	0,614	
PD1	0,772	
PD2	0,616	
PD3	0,853	
PD4	0,646	0,921
PD5	0,815	
PD6	0,844	
PD7	0,768	

Table 2 Validity and Reliability Test
Source: Data Processed by Author

As shown in **Table 2**, the results of the pilot study in this study revealed that all the 7 variables and 35 items of this measurement model fulfil the requirements of validity and reliability.

V. DISCUSSION

The variables in this study are measuring tools to find which model is right as an influence on purchasing decisions through halal product image and purchase intention, and this research has produced valid and reliable measuring tools (Information Quality, Information Quantity, Information Credibility, Brand Image, Halal Product Image, Purchase Intention and Purchase Decision) results obtained from the pilot test, so they are ready to continue in the next research.

VI. CONCLUSION AND RECOMMENDATION

The measurement criteria of this study have been tested with 30 respondents as pilot study samples. The respondent is the user of Wardah in Indonesia. The pilot test proven that the measurement material which consist of 35 items proposed in this study are valid and reliable. Therefore, this proposed measurement material is ready to be used in further study.

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Financial Performance Of Rural Banks In Bandung City Before And During The Pandemic

Aldilla Iradianty¹, Rizki Kusuma Priyatna²

^{1,2} School of Economics and Business, Telkom University, Bandung, Indonesia

Abstract

Banking in Indonesia is divided into Commercial Bank and Rural Bank. Like commercial banks, Rural banks in Indonesia also collect public funds through deposits and can provide loans in the form of credit. Their function is to introduce banking services to the wider community. When the Covid-19 pandemic occurred, rural bank activities in carrying out their duties and functions were slightly hampered due to layoffs, decreased imports, increased prices or inflation and increased customer inability to fulfill their obligations, thus affecting the financial performance of rural banks. Rural banks in Bandung during the pandemic experienced an increase in the number of branch offices in 2021, totaling 52 branch offices, an increase compared to 2020, which only amounted to 46 of the 29 rural banks in Bandung. Therefore, this study will compare financial performance before and during the pandemic at rural banks in Bandung. The research results show that financial performance based on profitability ratios as measured by ROA, solvency ratios as measured by CAR and liquidity ratios as measured by LDR are different before and during the pandemic, while profitability ratios as measured by OER and solvency ratios as measured by NPL are not different before and during the pandemic.

Keywords: Rural Bank, Financial performance, Pandemic Covid-19

I. INTRODUCTION

The impact of the pandemic on the economic sector in Indonesia occurs, among others, in Small and Medium Enterprise (Yamali & Putri, 2020) and also occurs in rural banks by experiencing a decrease in the ability of their customers to pay obligations and an increase in withdrawal of funds, the majority of which work in the SME sector (Sofyan, 2021), this also has an impact on rural bank profits (Wangsit Supeno, 2020). Rural banks do not provide payment traffic services, such as accepting current account deposits, insurance and foreign exchange activities (Financial Services Authority, 2017). Hence, profits are very limited from lending to SMEs. In addition, rural banks have a very strong new competitor during the pandemic due to the ease of providing loans online, namely peer-to-peer lending (Sofyan, 2021). However, during the pandemic, the number of rural bank branch offices in the city of Bandung has increased by 14.29% (Central Bureau of Statistics, 2022), and the growth of this branch office affects profits (Hati et al., 2017). Therefore it greatly affects the performance of rural banks, 2017), therefore it greatly affects financial performance. However, there is no difference between before & after the pandemic in rural banks (Fitriani, 2020) and other sectors related to SMEs, such as agriculture (Xu & Jin, 2022). There is also no difference in stock indexes such as Srikhati (Isyuardhana, 2021). Even after the pandemic, the financial literacy index increased (Rabbani et al., 2021).

Apart from new competitors, the problem that must be faced is the number of rural bank closures due to mismanagement and the number of rural banks that have merged to be able to strengthen capital during a pandemic (Ramli, 2021). rural banks still use traditional business models while developing businesses adopting digital technology. During the pandemic, digital adoption has increased in the industrial sector (Muhamad et al., 2021). Rural banks need to transform digital services to improve performance and be able to compete with competitors (Santoso et al., 2020).

Comparing financial performance before and during the pandemic and research related to the impact of the pandemic on financial performance has been widely carried out, such as a decrease in financial performance (Heriyanto & Oliyan, 2022) and a negative impact on company assets (Shamali & Weereasinghe, 2023) and a decrease in financial performance this will worsen the previous financial condition (Wójtowicz et al., 2022), 2022), the negative impact of the pandemic on rural banks decreased Return On Assets and Loan to Deposit Ratio (Ngatno & Aprianti, 2022) a decrease also occurred in the financial performance of the Operational Efficiency Ratio (Srinadi & Dwija Putri, 2022) and also a decrease in the value of the Capital Adequacy Ratio after the pandemic (Saparinda, 2021). The results of previous studies show inconsistencies. Therefore, this study will compare financial performance as measured using ROA, OER, LDR, CAR and NPL before and during the pandemic.

II. LITERATURE REVIEW

Predicting future financial statements by looking at the position of past financial statements is called financial performance (Putra et al., 2021). Financial performance can see the business that has been carried out, financial performance analysis can be carried out by paying attention to rules and regulations effectively (Fahmi, 2018), and financial performance can see the achievements achieved within a certain period, financial performance can be carried out, these achievements are obtained by managing company assets effectively. Thus financial analysis is carried out by companies to describe the company's condition by looking at capital, liquidity and profitability at a certain time (Hayat et al., 2018).

Profitability is a company capable of generating profit or profit within a certain period, with the profitability ratio being the benchmark considering the return on assets Return On Asset (Kasmir, 2019). The ability possessed by the company to increase profits through its operational activities, and profitability provides an indicator that generates public interest and trust in the company (Tampubolon & Prima, 2020).

Apart from using ROA to assess performance, it can be measured by the Operational Efficiency Ratio. Ratio to measure how effective the operational activities carried out by rural banks are so that the smaller the percentage of OER illustrates, the more effective the activities carried out (Yasin & Fisabilillah, 2021). This ratio measures the costs incurred by banks in operating activities. In contrast, operating income is the main income owned by banks, such as fund income in loans and operations (Khamisah et al., 2020).

The liquidity ratio is an analysis conducted by the company to measure the company's ability to meet short-term debt. Failure to pay short-term debt can reduce investor interest in investing capital so that it can reduce company value (Fahmi, 2018). LDR is one of the ratios used to measure the company's ability to meet short-term obligations. The LDR ratio compares credit with third-party funds, including demand deposits, savings, and deposits that are not interbank (Yusriani, 2018).

The ability of a company to meet its obligations is known as the solvency ratio (Devi et al., 2020). In this study, assessing the bank's ability to fulfill its obligations can be seen with the CAR ratio. CAR is a capital adequacy ratio that functions as a container in case of risk to the company. The higher the CAR, the better the company's performance (Tampubolon & Prima, 2020). CAR is the bank's ability to capitalize to support its activities (Sudarmawanti & Pramono, 2017).

In rural banks, credit performance can determine the health of credit quality to evaluate non-performing loans can be measured by the Non-Performing Loan ratio (Wangsit Supeno, 2020) how compare non-performing loans with total loans, the NPL ratio, the NPL ratio reflects higher non-performing loans compared to the total loans provided with an NPL value of less than or equal to 5% can be said to be healthy, while if the NPL value is above 5%, it is not healthy (Pinasti & Mustikawati, 2018).

III. RESEARCH METHODOLOGY

Rural banks in Bandung City amounted to 29 companies which became the population in the study. The sampling technique used in this study was nonprobability with purposive sampling type. Purposive sampling is a sampling technique with certain considerations. The researcher deliberately selected the sample selected to represent the population, and 27 rural bank companies were selected with consideration of the sample size with a sampling error of 5% of the total population. The characteristics of the sample are the annual report of rural banks in the city of Bandung from 2018 to 2021, published on the Financial Services Authority website.

In researching the impact of the Covid-19 pandemic on the financial performance of rural banks in Bandung, researchers conducted research stages starting with observing the phenomena happening. Then researchers collected information by determining the objects used in the study. This study uses independent variables, namely ROA, OER, LDR, CAR and NPL, at rural banks in Bandung before and during the Covid-19 pandemic. After the data is collected, the next step is descriptive statistics to describe the data and data processing using SPSS. The next step is to test the data for normality so that normally distributed data will be processed using the paired sample T-Test test, while if the data is not normally distributed, it can be continued by conducting the Wilcoxon Signed Rank Test.

IV. RESULT / FINDING

Table 62 Statistik Deskriptif

Statistik Deskriptif

	N	Minimum	Maximum	Mean	Std. Deviation
ROA Before (2018 – 2019)	54	-29,32	10,06	1,01	5,68
ROA After (2020 – 2021)	54	-20,94	7,34	0,27	4,40
OER Before (2018 – 2019)	54	65,16	179,16	96,10	22,75
OER After (2020 – 2021)	54	63,83	207,09	102,11	29,20
CAR Before (2018 – 2019)	54	5,26	82,40	27,86	15,36
CAR After (2020 – 2021)	54	12,51	88,78	35,04	19,25
LDR Before (2018 – 2019)	54	32,91	108,00	68,19	17,18
LDR After (2020 – 2021)	54	21,40	90,45	60,99	20,02
NPL Before (2018 – 2019)	54	0,19	39,60	8,82	8,98
NPL After (2020 – 2021)	54	0,00	36,13	8,33	8,50

Source: Authors' own (2023)

In Table 1, information can be obtained that the number of samples in each variable is 54. ROA and NPL have a Mean value below the standard deviation value, so the data does not vary and can be said to be accurate. While OER, CAR and LDR Mean values are above the standard deviation value, the data varies and can be considered not good. The normality test results :

Table 63 Normality Test

Variable	Sig.	Decisions
ROA Before	0.000	Abnormal
ROA After	0.000	Abnormal
OER Before	0.001	Abnormal
OER After	0.000	Abnormal
CAR Before	0.064	Normal
CAR After	0.047	Abnormal
LDR Before	0.200	Normal
LDR After	0.200	Normal
NPL Before	0.000	Abnormal
NPL After	0.001	Abnormal

Source: Authors' own (2023)

Table 2 shows that LDR Before and LDR After having a Sig value > 0.05 so that the data is normally distributed, the Paired Sample T-Test test is carried out for hypothesis testing. At the same time, ROA, OER, CAR and NPL have a Sig value < 0.05 , so the data is not normally distributed for hypothesis testing done with the Wilcoxon signed ranks test.

Table 64 Paired Sample T-Test

Variable	T	Df	Sig. (2-tailed)
LDR Before – LDR After	3,741	53	0,000

Source: Authors' own (2023)

In Table 3, it can be seen that Sig. (2-tailed) on CAR has a value of 0.000. This states that the value of Sig. (2-tailed) < 0.05 , it can be stated that there is a difference in the average financial performance of rural banks in Bandung City before and during the pandemic. In LDR, the value of Sig. (2-tailed) of 0.000 so that the value of Sig. (2-tailed) < 0.05 , it can be stated that there is a difference in the average financial performance of rural banks in Bandung before and during the pandemic.

Table 65 Wilcoxon Signed Ranks Test

Variable	Z	Asymp Sig (2-tailed)
ROA Before – ROA After	-2,208	0,027
OER Before – OER After	-0,982	0,326

CAR Before – CAR After	-3,500	0,000
NPL Before – NPL After	-0,680	0,496

Source: Authors' own (2023)

Based on Table 4, it is known that the ROA Asymp sig. Value of $0.027 < 0.05$, so there is a difference in ROA before with ROA during the pandemic. OER Asymp sig. Value of $0.326 > 0.05$, so there is no difference in OER before the pandemic with OER during the pandemic and CAR Asymp sig. of $0.000 < 0.05$, so there is a difference in the average CAR before the pandemic with CAR during the pandemic and the NPL value Asymp sig. of $0.496 > 0.05$, so there is no difference in NPL before the pandemic with NPL during the pandemic. Based on the Wilcoxon signed ranks test results on OER and NPL, there are no differences before and during the pandemic, while ROA and CAR have differences before and during the pandemic.

V. DISCUSSION

The research results on the financial performance of rural banks in Bandung before and during the pandemic. The profitability ratio measured using OER rural bank in Bandung has customers who can pay obligations, so operating income is not disturbed (Winarso et al., 2020). Credit quality, measured using NPL, shows no difference before and during the pandemic. The NPL ratio compares non-performing loans with the total loans given. The higher the NPL value, the healthier the rural bank is from bad credit (Winarso et al., 2020).

Profitability ratios measured using ROA occur differences during the pandemic decrease in the bank's ability to earn a profit, and job losses impact society. The decrease in ROA is due to the decrease in loan disbursements, so profits are not maximized while the main source of rural banks is lending (Candera & Indah, 2021). As measured using LDR, the liquidity ratio shows differences before and during the pandemic. This happened before the pandemic took place. LDR increased, but the occurrence of the LDR pandemic event gradually decreased. With results like this, rural banks must be careful in providing short-term credit (Winarso et al., 2020). Likewise, the solvency ratio measured using CAR shows a significant difference before and during the pandemic. This is a warning for rural banks to be more vigilant in providing credit (Fitriani, 2020).

VI. CONCLUSION AND RECOMMENDATION

This study uses financial ratios to determine the performance of rural banks in Bandung City before and during the pandemic. Five financial ratios are used to analyze the financial performance of rural banks, namely ROA, OER, LDR, CAR, and NPL. This study's results indicate differences in ROA, CAR and LDR before and during the pandemic. This illustrates that rural banks are more careful in providing credit and the decreasing ability of customers to pay their obligations during a pandemic so that the profits obtained are not maximized. At the same time, OER and NPL have no difference in rural banks in Bandung before and during the pandemic. Rural banks are expected to improve performance after a pandemic. To keep up with the times and the competition, rural banks must transform from conventional business models to digitalization for efficiency and obtain greater profits. Future researchers can measure the performance of rural banks by testing more financial ratios and other research samples to find out the financial performance that affects or does not affect if extraordinary events such as a pandemic occur again.

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Public acceptance and use of Jaklingko application in jakarta metropolitan area (Jabodetabek)

Hana Aqila¹, Yos Sunitiyoso²

^{1,2} School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

Jakarta has recently made strides to change its car-centric city planning paradigm and offer seamless mobility through the "Jaklingko" concept, which provides a passenger with an integrated transportation journey. As a part of this journey, Mobility-as-a-Service is implemented by establishing a JakLingko application in March 2022. With one year of implementation of the JakLingko application, this study aims to identify the success factor and evaluate the benefit of JakLingko application adoption from economic, social, and environmental aspects. This research has proposed the integration of the TAM and D&M ISS model to validate the data. The questionnaire was adopted in this study to collect data with a total of 300 responses among JakLingko users across Jabodetabek. The proposed factors of perceived usefulness, system quality, and user satisfaction have been found to have a positive impact on the actual use of the JakLingko application, with intention to use as a mediating variable. Conversely, the factors of information quality and service quality did not demonstrate a positive impact on the actual use of the JakLingko application. The study also revealed that user satisfaction does not have a positive impact on the net benefit perceived. The findings highlighted the importance of addressing application responsiveness and optimizing real-time data, including the accurate estimation of walking distances and total-trip durations. Furthermore, this research bridges the gap between public acceptance before and after the application's launch, providing an initial evaluation of its usage, and the perceived benefits by its users.

Keywords: Mobility-as-a-Service (MaaS); Public Acceptance; Mobile Application

1. INTRODUCTION

Overcoming congestion in the Greater Jakarta Area has remained a persistent challenge for the government over the years. A study conducted by ITS Indonesia stated that by 2020, the economic loss caused by congestion in Jakarta will amount to US\$6.5 billion or approximately 84.5 trillion IDR, which is a 6.5-fold increase compared to 2010 (ITS Indonesia, 2022). While the government and business actors have made efforts to address transportation issues, these initiatives have often been implemented in a silo way and lack a comprehensive approach.

To promote innovation and digital transformation in the transportation sector, the Ministry of Transportation issued Regulation No.76 of 2021, which focuses on Intelligent Transport Systems (ITS). This regulation aims to facilitate public transportation users in Indonesia through the development of ITS. Within the framework of ITS in Indonesia, there are 11 main systems that have the potential to be implemented over the next ten years (2020-2030). The Advanced Public Transport System (APTS), including Mobility as a Service (MaaS), is considered a crucial component for the development of the transportation system in Indonesia (Resdiansyah, 2022). PT Jakarta Lingko Indonesia, also known as JakLingko, plays a major role in implementing APTS in Indonesia.

While MaaS has predominantly been implemented in developed countries, it is important to consider that developing countries possess distinct characteristics in terms of their economy, culture, infrastructure, and social standards. Consequently, there is limited research on the acceptance of MaaS in developing countries. MaaS not only promotes a transition towards more sustainable behaviors but also relies on public acceptance. Therefore, it is essential to evaluate the public perspective to create a user-centric mobility model (Lyons et al., 2019; Lopez-Carreiro et al., 2020). Sunitiyoso et al. (2022) employed the Technology Acceptance Model (TAM) to assess the "acceptance" of MaaS in the Jakarta Metropolitan Area (JMA). The study findings reveal a positive attitude towards the willingness to use MaaS, with four strong predictors: expectations of MaaS, technophilia, privacy concerns, and current public transportation usage. The study also identifies higher and lower willingness clusters to use MaaS.

However, the TAM theory, which primarily focuses on behavioral intention, is limited in its evaluation of actual system use and its associated benefits. To address this gap, DeLone and McLean (1992) developed a framework that examines the acceptance of technology across three dimensions of success: technical success, semantic success, and effectiveness success. Additionally, the implementation of MaaS should be evaluated by quantifying the economic, social, and environmental benefits derived from its adoption (Lopez-Carreiro et al., 2020). In conclusion, research on Mobility as a Service (MaaS) in Indonesia remains relatively scarce. With one year of implementation of the JakLingko Application, further investigation is needed to examine the utilization and success of MaaS implementation, particularly in developing countries. Therefore, this study aims to enhance the understanding of the attitudinal factors influencing users' intention to use MaaS, their actual usage behavior, user satisfaction, and the net benefits derived from economic, social, and environmental perspectives.

Research Objectives

1. To evaluate user satisfaction toward JakLingko application after one year of implementation
2. To measure the technical, semantic, and effectiveness success of Mobility as a Service (MaaS) JakLingko application
3. To determine the relationship between the variables affect the success of the system information in Mobility as a Service (MaaS) JakLingko application

Scope and Limitations

1. The research will be limited for respondents who live and do mobility within Jakarta Metropolitan Area
2. The research will only discuss user perception about JakLingko Application and their preferences for JakLingko Application
3. The research will be conducted within the time frame of September 2022 to June 2023

II. LITERATURE REVIEW

This section will provide a comprehensive overview of the theoretical underpinnings and the development of hypotheses for the current study. The variables examined in this research encompass Perceived Usefulness, Information Quality, System Quality, Service Quality, Intention to Use, Actual Use, User Satisfaction, and Net Benefit. Furthermore, this section will present the hypotheses formulated for this study.

Perceived Usefulness

In Davis's seminal work (1989), perceived usefulness is defined as an individual's perception of how using a specific technology will enhance their job performance. Mardiana et al. (2015) conducted a meta-analysis of studies conducted between 2003 and 2010, specifically examining the relationship between Perceived Usefulness (PU) and Behavioural Intention (BI). The results of their study revealed a strong correlation between BI, as conceptualized within the Technology Acceptance Model (TAM), and the intention to use construct within the DeLone-McLean Information System model.

Hypothesis 1: Perceived usefulness has a positive impact on the Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Semantic Success

The evaluation of information quality, specifically its ability to accurately convey intended meaning, is measured at the semantic level according to Shannon and Weaver (1949). In the revised DeLone and McLean's Information Systems Success (D&M ISS) model (DeLone & McLean, 2003), there exists a relationship between information quality, system usage, and user satisfaction. Research conducted by Seddon (1997) confirmed a significant correlation between perceived satisfaction, usage, and the quality of information.

Hypothesis 2: Information Quality has a positive impact on Intention to Use toward JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypothesis 3: Information Quality has a positive impact on User Satisfaction of JakLingko application in Jakarta Metropolitan Area, Indonesia

Technical Success

As per the research on communication by Shannon and Weaver (1949), technical success pertains to the precision and efficiency of an information-producing communication system, and its measurement is achieved through system quality. The revised DeLone and McLean Information Systems Success (D&M ISS) model (DeLone & McLean, 2003) establishes associations between system quality, system usage, and user satisfaction.

Hypothesis 4: System Quality has a positive impact on Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypothesis 5: System Quality has a positive impact on User Satisfaction of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Service Quality

The quality of service provided to users is manifested in the dimension of service quality. This aspect has been extensively investigated in studies related to information systems, as exemplified by the research conducted by Chen and Cheng (2009), which reveals a positive association between user satisfaction and service quality. Similarly, a prior study conducted by Wang (2008) identified a significant correlation between the adoption of an e-government system and the perceived level of service quality.

Hypothesis 6: Service Quality has a positive impact on Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypothesis 7: Service Quality has a positive impact on User Satisfaction of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Effectiveness Success

The impact of the information on the recipient is the efficacy level which is being measured by four dimensions of success in D&M ISS (Shannon and Weaver, 1949). These four dimensions are:

Intention to Use

In the modified DeLone-McLean model (DeLone and McLean, 2003), the variable known as intention to use serves as an indicator for Behavioral Intention (BI) and precedes actual use. Information quality, system quality, and service quality are factors that influence the intention to use in this model.

Hypothesis 8: Intention to Use has a positive impact on the Actual Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Actual Use

In the T.A.M. model (Davis, 1989) and the DeLone & McLean (2003) model, the Actual Use construct evaluates acceptance of the information system. According to earlier research (Garcia-Smith & Effken, 2013; Hou, 2012), the system's use was highly correlated with the benefits it offered.

Hypothesis 9: Actual Use has a positive impact on the Net Benefit of JakLingko Application in Jakarta Metropolitan Area, Indonesia

User Satisfaction

According to the information systems success model developed by DeLone and McLean in 2003, benefits were highly impacted by perceived satisfaction (Al-Fraihat et al., 2020). Kanaani, Elahi, and Hassanzadeh (2012), in addition, user satisfaction is triggered by system use, and sustained user satisfaction leads to a continuing use intention.

Hypothesis 10: User has a positive impact on the Net Benefit of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypothesis 11: User Satisfaction has a positive impact on the Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Net Benefit

MaaS fosters sustainable mobility by offering diverse transportation options (Alonso-Gonzalez et al., 2020). The integration of multimodal transportation encourages a shift away from individual vehicle-centric mobility behavior. The impact of the JakLingko application on individuals, groups, organizations, industries, or communities is termed as net benefit. Over time, communities and organizations experience the advantages of using the system, breaking the monopoly of singular perspectives (DeLone & McLean, 2003). To assess the net benefit of utilizing the JakLingko application, the researcher adopts the concept of the Triple Bottom Line (TBL) of Sustainability.

Conceptual Framework

This study adopts and modifies the extended DeLone–McLean model proposed by Mardiana et al. (2015). The modification involves separating the intention to use and actual use of the technology. This change is necessary as the intention to use construct is suitable for measuring individual-level behavioral intention, while actual use can assess both individual and organizational levels. The model also integrates the Technology Acceptance Models (TAMs) into the DeLone–McLean IS model, providing a stronger foundation. However, the study excludes the Unified Theory of Acceptance and Use of Technology (UTAUT) since it is designed for mandatory technology use, while the JakLingko Application is used voluntarily.

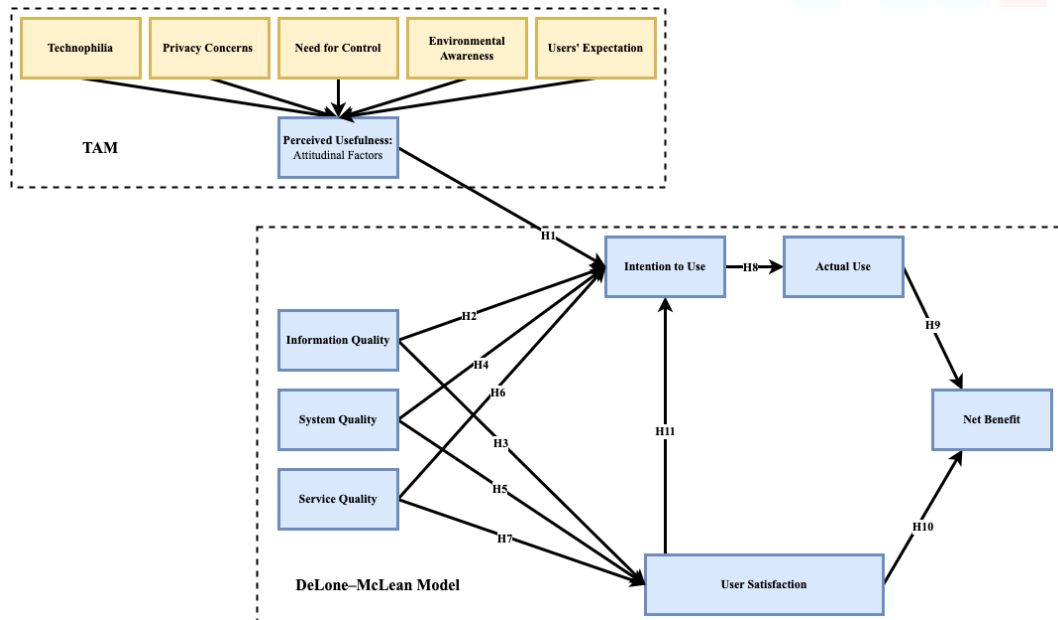


Fig. 1. Proposed Research Model (Mardiana, et al., 2015)

III. RESEARCH METHODOLOGY

Research Design Flowchart

In general, the research design encompasses three layers: research strategies, research choices, and time horizons. These steps, as outlined by Robson (2002), transform the research questions into a concrete research project. According to Saunders (2006), the study design functions as an overarching strategy to address the research questions, specifying data sources, research objectives, and any constraints. In this study, the examination of public acceptance, benefits, and usage factors will determine the success of the JakLingko application in the Jakarta Metropolitan Area (Jabodetabek).

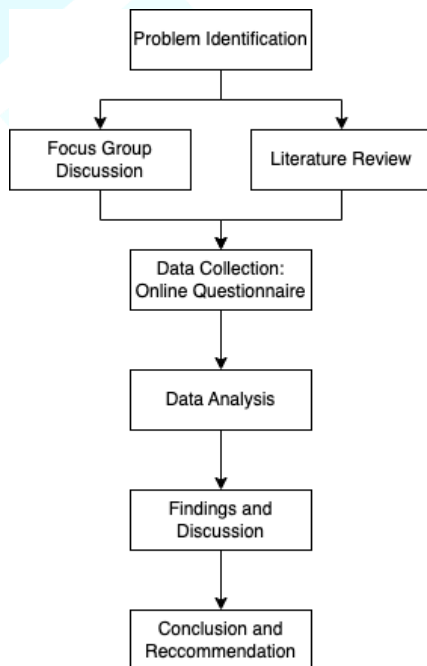


Fig. 2. Research Design Flowchart

Data Collection and Sample

This study adopts the survey research strategy, employing the questionnaire data collection technique. The primary target respondents are Indonesian individuals residing and conducting regular activities in Jabodetabek (Jakarta Metropolitan Area) who use the JakLingko Application. The minimum sample size for the model structure is calculated using A-priori sample size for structural equation models (Soper, 2020). Based on the calculation, the minimum sample size is 100, while the recommended sample size with 8 latent variables and 40 observed indicators is 218. For business purposes, non-probability sampling is utilized, providing a range of alternative techniques to select samples based on subjective judgment, as stated by Saunders (2006).

Data Analysis

In recent times, the use of PLS-SEM has significantly surpassed CB-SEM in published articles, particularly in management information systems and other social science fields (Hair et al., 2017b). PLS-SEM offers the advantage of estimating complex models with multiple constructs, indicators, and structural paths without imposing data distribution. It also provides a causal-predictive approach for causal explanation when estimating statistical models. Unlike CB-SEM, which considers only common variance using the covariance matrix of the data, PLS-SEM utilizes the total variance to estimate parameters (Hair et al., 2017b). Through this analysis, the researcher aims to identify the process of attitudinal factors that influence users' intention to use the JakLingko application, their actual usage, user satisfaction, and net benefits, considering economic, social, and environmental aspects at both individual and organizational levels.

Measurement

The questionnaire consists of Likert scale questions to ask respondents about their agreement within a scale of one to five with one indicating a strong disagreement while five show a strongly agreed answer. The questionnaire will assess Perceived Usefulness, System Quality, Information Quality, Service Quality, Intention to Use, Actual Use, User's Satisfaction, and Net Benefits of JakLingko application using a five-point Likert scale.

Table 1. Operational Questionnaire Variable

Constructs	Indicators	Questions	Source
	Technophilia	TC1 I find it exciting to try new apps	(Martnez-Córcoles et al., 2017)
		TC2 I regularly use apps for payment, reservations, etc.	
	Privacy Concerns	PC1 I agree that my personal information is used to get travel recommendations according to my needs (route or mode)	(Cottrill, 2020)
		PC2 I agree to share my personal information with the application companies I use	
Perceived Usefulness (PU)	Needs for control	NC1 Before the trip, I always check real-time information about traffic conditions and the route I will be taking	(Chowdhury, 2014)
		NC2 I always check and compare travel information from various sources (google maps, moovit, trafi, jaklingko, etc.)	
	Environmental Awareness	EI1 I am using public transportation because it is more environmentally friendly	(Ramsey et al., 1992; Collines et al., 2005)
		EI2 To help improve air quality, I avoid travelling by private mode	
	Expectation for the JakLingko application	EX1 I hope JakLingko application will integrate travel accessibility information	(Caiati et al., 2020)
		EX2 I hope JakLingko application will integrate information about transportation facilities & infrastructure development activities (construction of bus stops, new routes, etc.)	
System Quality (SY)	Good structure of layout	SY1 JakLingko application has a good user interface design (UI), including layout size, visual journey, and color	(Lee and Jeon, 2020)
	Reliable operation	SY2 The response time of JakLingko application is acceptable	

Information Quality (IQ)	Provides a complete set of information	IQ1	The JakLingko application provides real-time timetables of next departures, interchange possibilities, and approaching vehicles.
		IQ2	JakLingko application provides a real-time position tracking (Lee and Jeon, 2020; He and Csiszár, 2020)
		IQ3	JakLingko application provides an accurate estimation of total travel time
Service Quality (SQ)	User Evaluation	IQ4	JakLingko application provide a user evaluation by creating a satisfaction feedback
		SQ1	JakLingko application offers information about the number of transfers in my trip
		SQ2	JakLingko application offers walking distance information for total and each transfer in my trip
		SQ3	JakLingko application allows me to use multimodal transportation for my trip
	A sincere interest in solving a problem	SQ4	JakLingko application allows to pay with electronic payment (without physical tickets)
		SQ5	JakLingko application provides an affordable tariff by integrating multi-mode transportation (He and Csiszár, 2020; Lee and Jeon, 2020)
		SQ6	JakLingko application offers an appropriate concession fare (e.g. discount for students, elderly, people with disabilities)
		SQ7	JakLingko application offers electronic payment system that make the payment easier and efficient
Availability of assistance with system difficulties	SQ8	JakLingko application provides a report features to help with system difficulties	

	Respond promptly	SQ9	JakLingko application provides an interactive customer care to help with system difficulties	
Intention to Use (IU)	Access	IU1	Assume I have access to use JakLingko application, I intend to use it	(Gable et al., 2008; McKinney et al, 2002; Davis, 1989; Wang, 2008)
	Dependency	IU2	I will depend on JakLingko application for my mobilization	
Actual Use (AU)	Use frequency	AU1	I use JakLingko application frequently	(Almutairi and Subramanian, 2005; Iivari, 2005;
	Dependency	AU2	I depend on JakLingko application in my mobilization	Davis, 1989; Wang, 2008)
User's Satisfaction (US)	Performance	US1	I am satisfied with the performance of JakLingko application	(Lee and Jeon, 2020)
	Meets the expectation	US2	The use of JakLingko application is meet my expectation	
		NB1	With only a single-platform, the use of JakLingko application makes it easier for me to plan mobilization	
Net Benefits (NBs)	Social	NB2	JakLingko application eliminate user concerns since its protection of user information	(Bakker, S., 2019; JakLingko, 2022; Lomax et al., 2000)
		NB3	With using JakLingko application, my total number of trips using public transportation is increasing	
		NB4	With JakLingko application, intermodal transfer/transit time is minimalized	
	Economic	NB5	The multiple payment options available make JakLingko application more convenience	(Lomax et al., 2000; JakLingko, 2022)
		NB6	With JakLingko application, I'm able to estimate end-to-end journeys, including route, mode of transportation, time, and fare.	

Environment

- NB7 The construction of pedestrian facilities supports my journey, especially in intermodal transfers (TOD Standard 3.0, 2017; Bakker, S., 2019;
- NB8 The intermodal public transportation reduce noise pollution (JakLingko, 2022)
- NB9 The intermodal public transportation reduce air pollution

IV. RESULT / FINDING

Hypothesis Testing

Hypothesis testing involves examining the T statistics and p-values of the path coefficients in both the inner and outer models. These calculations are conducted in PLS-SEM, and the results are presented in the following table.

Table 2. Hypothesis Testing Result

Hypothesis	Structural Path	T statistics	P values	Result
H1	Perceived Usefulness → Intention to Use	7.138	0.000	Accepted
H2	Information Quality → Intention to Use	0.429	0.668	Rejected
H3	Information Quality → User Satisfaction	3.192	0.001	Accepted
H4	System Quality → Intention to Use	2.264	0.024	Accepted
H5	System Quality → User Satisfaction	4.966	0.000	Accepted
H6	Service Quality → Intention to Use	1.257	0.209	Rejected
H7	Service Quality → User Satisfaction	2.638	0.008	Accepted
H8	Intention to Use → Actual Use	19.549	0.000	Accepted
H9	Actual Use → Net Benefit	4.951	0.000	Accepted

H10	User Satisfaction → Net Benefit	1.386	0.166	Rejected
H11	User Satisfaction → Intention to Use	11.385	0.000	Accepted

Mediation Test

Mediation analysis involves investigating how an antecedent variable influences a mediating variable, which in turn affects a dependent variable. By adopting this analytical approach, researchers can uncover the underlying process or mechanism by which one variable exerts its impact on another (MacKinnon et al., 2007).

Table 3. Mediation Test Result

Mediation Variable	Paths	Result
Intention to Use (IU)	Information Quality (IQ), System Quality (SY), Service Quality (SQ) → Intention to Use (IU) → Actual Use (AU)	Partial
	Perceived Usefulness (PU) → Intention to Use (IU) → Actual Use (AU)	Partial
	User Satisfaction (US) → Intention to Use (IU) → Actual Use (AU)	Partial
User Satisfaction (US)	Information Quality (IQ), System Quality (SY), Service Quality (SQ) → User Satisfaction (US) → Intention to Use (IU)	Partial
	Information Quality (IQ), System Quality (SY), Service Quality (SQ) → User Satisfaction (US) → Net Benefits (NB)	Partial
	Intention to Use (IU) → Actual Use (AU) → Net Benefit (NB)	Partial

User Satisfaction Evaluation

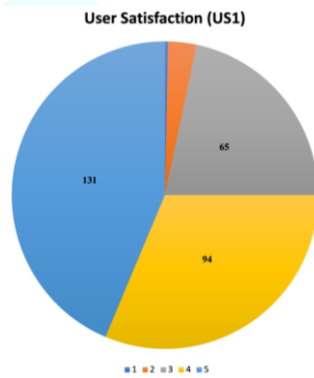


Fig. 3 User Satisfaction 1 (US1)

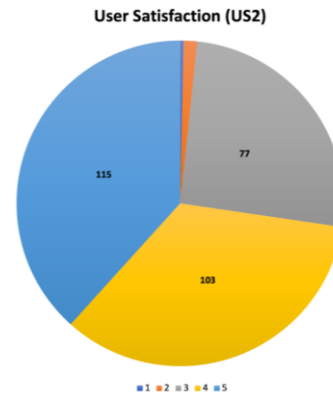


Fig. 4 User Satisfaction 2 (US2)

The latent variable User Satisfaction is measured using two indicators, US1 and US2. Indicator US1 reflects the statement "I am satisfied with the performance of JakLingko application." The data analysis reveals that a significant majority of respondents (43.67%) gave a perfect score of 5 out of 5, representing 131 individuals. Furthermore, 31.33% of respondents rated it with a score of 4, 21.67% gave a score of 3, and the rest (3.33%) provided scores in other categories.

The latent variable User Satisfaction also includes an indicator, US2, which assesses how well the JakLingko application meets the respondents' expectations. The data analysis indicates that a significant majority of respondents (38.33%) assigned a perfect score of 5 out of 5, totaling 115 individuals. This suggests that the JakLingko application has successfully met the expectations of most users. Additionally, 34.33% of respondents rated it with a score of 4, 25.67% provided a score of 3, and the remaining 1.66% fell into other score categories.

Information Quality (IQ)

Figure 5 displays an analysis of respondents' scores for specific indicators related to Information Quality. The majority of respondents gave perfect scores to the indicator IQ4, which assesses the provision of user evaluation and satisfaction feedback within the JakLingko application. This finding is consistent with the descriptive statistics, indicating that IQ4 obtained the highest mean score of 4.28 among all indicators in the Information Quality construct. On the other hand, the majority of respondents assigned a low score of 2 to the indicator IQ3, representing the accuracy of total travel time estimation. These findings align with the results presented in Table 4.33, which revealed that respondents with low levels of User Satisfaction (both US1 and US2) also assigned low scores to IQ3. This suggests that PT JakLingko needs to address the accuracy of total travel time estimation in the application.

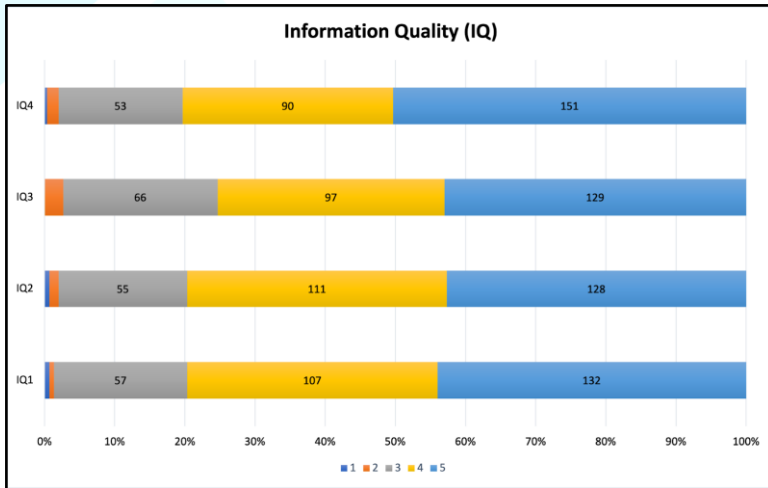


Fig. 5. Information Quality (IQ)

System Quality (SY)

Figure 6 analysis indicates that a significant proportion of respondents gave perfect scores for indicators related to user interface design (SY1) in the JakLingko application. This indicator covers aspects like layout size, visual journey, and color. The descriptive statistics table confirms this finding, showing that SY1 has a higher average score compared to SY2, with a mean score of 4.17. Conversely, the majority of respondents who assigned a low score of 2 were associated with the indicator SY2, representing application responsiveness. These findings align with the results presented in Table 4.33, where respondents expressing dissatisfaction with the application's performance also gave a low score to SY2. As a result, improving the responsiveness of the JakLingko application requires significant attention.

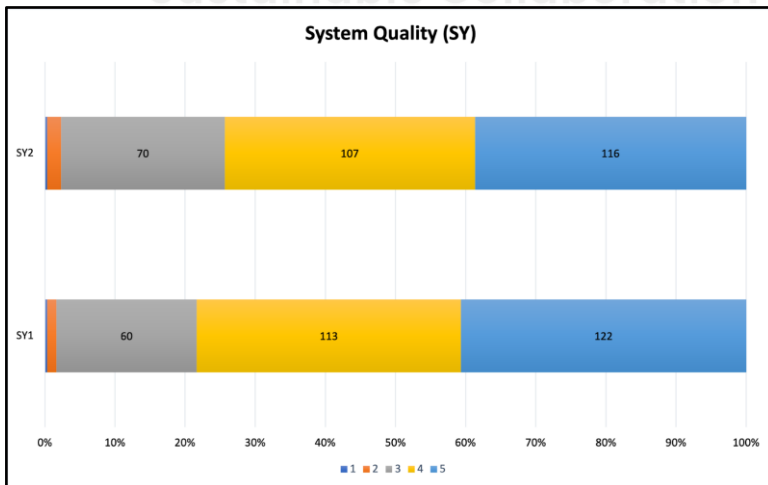


Fig. 6. System Quality (SY)

Service Quality (SQ)

Based on the analysis of Figure 7, a substantial number of respondents awarded perfect scores to indicators related to the electronic payment system's availability (SQ7) within the JakLingko application. This feature streamlines payment processing, resulting in enhanced convenience and efficiency. These findings are consistent with the results presented in the descriptive statistics table, which indicate that SQ7 has a higher average score compared

to other Service Quality (SQ) indicators, with a mean score of 4.52. Additionally, these outcomes align with the data in Table 4.33, which reveals that respondents expressing lower levels of user satisfaction (both US1 and US2) concurrently assigned higher scores to SQ7. This indicates a positive perception of the electronic payment service provided by JakLingko. Conversely, the majority of respondents who assigned a low score of 2 were associated with the indicator SQ2, which focuses on the provision of walking distance information within the application. This discovery also corresponds with the data in Table 4.33, where respondents expressing lower levels of user satisfaction (both US1 and US2) assigned a low score to SQ2. Consequently, it is evident that the walking distance information provided by the application requires significant attention.



Fig. 7. Service Quality (SQ)

Success Measurement

Semantic Success

The box plots representing Information Quality indicators exhibit a consistent level of agreement among respondents, suggesting a shared perception of Information Quality. All indicators are relatively situated at similar levels, with no significant variations in their positions. Mild outliers, represented by dots, are observed, with respondent number 292 identified as a mild outlier for all Information Quality indicators in the dataset.

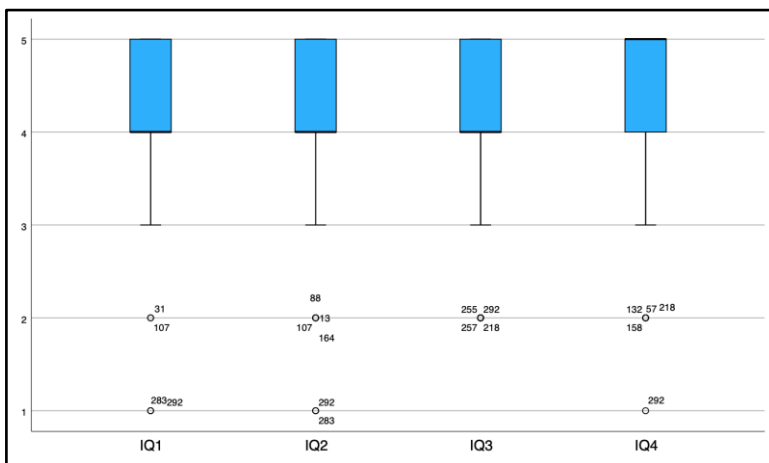


Fig. 8. Semantic Success

Technical Success

Based on the literature review conducted in the previous chapter, the evaluation of technical success in information systems can be determined through System Quality examination. The box plot analysis reveals that the SY2 indicator stands out as relatively taller, indicating varying opinions among respondents regarding the acceptability of the JakLingko application's response time. This emphasizes the need for significant attention to enhance the application's responsiveness, as corroborated by Figure 9.

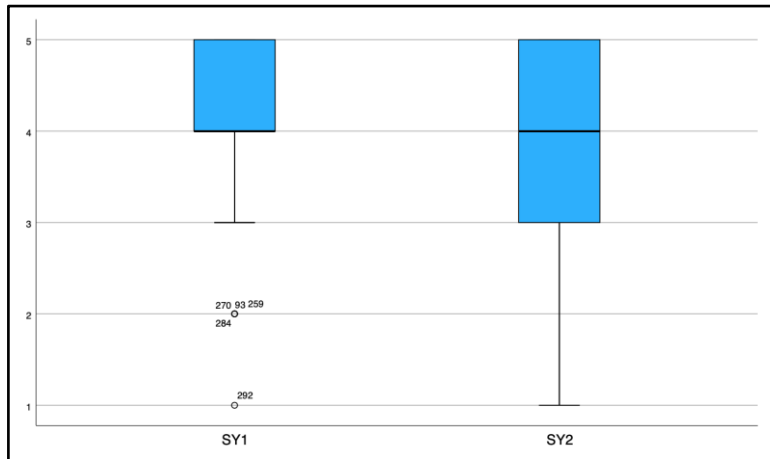


Fig. 9. Technical Success

Effectiveness Success

Based on the findings from the literature review in the previous chapter, the evaluation of effectiveness in information systems can be assessed through multiple dimensions, including Intention to Use (IU), Actual Use (AU), User Satisfaction (US), and Net Benefit (NB). The box plot analysis indicates varying opinions among respondents for indicators IU2, AU1, AU2, US2, NB2, NB3, NB4, and NB8. These indicators respectively pertain to dependency, use frequency, user expectations, security and safety, total number of trips, time cost, and noise pollution.

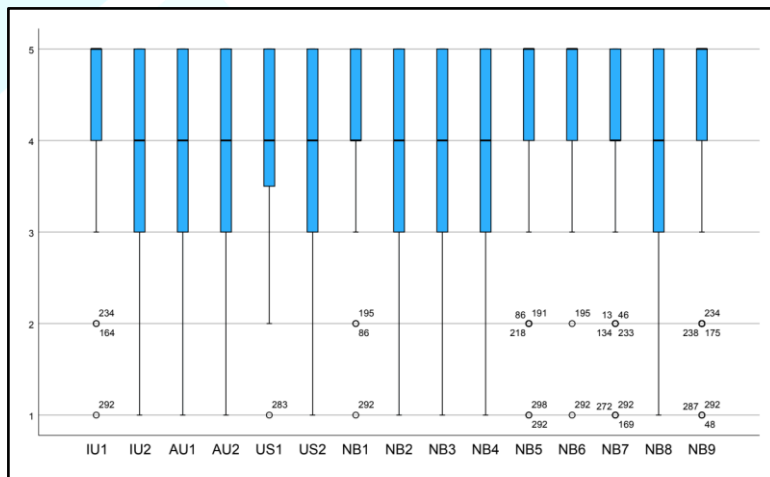


Fig. 10. Effectiveness Success

V. DISCUSSION

H1: Perceived Usefulness has a positive impact on the Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

The first hypothesis, which posits that Perceived Usefulness has a positive impact on the Intention to Use, is supported by the analysis results. The T Statistic value for this hypothesis is 7.138, exceeding the minimum threshold of 1.96, with a p-value of 0.000. The findings indicate that factors such as technophilia, need for control, and user expectations significantly influence users' intention to use the JakLingko application. Privacy concerns and environmental awareness factors were not found to be significant indicators in this hypothesis. These results align with a previous study by Sunitiyoso et al. (2022) on predictors of behavioral intention to adopt MaaS in the Jakarta Metropolitan Area (Jabodetabek).

H2: Information Quality has a positive impact on Intention to Use toward JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypothesis 2, which suggests that Information Quality has a positive impact on Intention to Use, was found to be statistically insignificant. The T Statistic value of 0.429 is below the minimum threshold of 1.96, and the p-value of 0.668 exceeds the significance level of 0.05. These results indicate that the quality of information provided to users does not significantly influence their usage of the JakLingko application. Users may not necessarily prioritize information quality in their decision to use the application. The study also observed low scores in the accuracy of travel time estimation, indicating the need for PT JakLingko to improve the accuracy of total travel time estimation within the application. The rejection of this hypothesis may be attributed to the non-mandatory use of the application, as users may find similar information quality in other applications. For instance, while users may appreciate the provision of user evaluation and satisfaction feedback in the JakLingko application, this may not significantly impact their intention to rely on the application, considering other applications may offer similar features.

H3: Information Quality has a positive impact on User Satisfaction of JakLingko application in Jakarta Metropolitan Area, Indonesia

Hypothesis 3 posited that Information Quality has a positive impact on User Satisfaction. The T Statistic value of 3.192 and p-value of 0.001 provide empirical evidence supporting this hypothesis, suggesting that Information Quality indeed positively affects User Satisfaction of the JakLingko Application in Jakarta Metropolitan Area.

These results indicate that the quality of information provided by the JakLingko application influences users' satisfaction. The success of operational integration, including real-time information and satisfaction feedback, is reflected in the quality of information offered. However, the accuracy of total travel time estimation within the application requires significant attention from PT JakLingko. These findings are consistent with previous studies (Seddon & Kiew, 1994; Seddon, 1997) which also identified a strong correlation between perceived satisfaction and the quality of information provided.

H4: System Quality has a positive impact on Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

H5: System Quality has a positive impact on User Satisfaction of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypotheses 4 and 5 have been statistically validated. The fourth hypothesis, stating that System Quality has a positive impact on Intention to Use, was accepted as the T Statistic value (2.264) surpassed the minimum threshold of 1.96, and the p-value (0.024) indicated significance. Likewise, hypothesis 5 was also significant with a T Statistic of 4.966 and a p-value of 0.000, suggesting that System Quality influences the Intention to Use and User Satisfaction of the JakLingko application. The system quality, encompassing a well-structured layout and application responsiveness, was found to be a determinant for Intention to Use and User Satisfaction. These findings align with previous studies (Halawi, McCarthy, and Aronson, 2008; Hsieh and Wang, 2007; Iivari, 2005) which demonstrated correlations between system quality, use, and user satisfaction. However, respondents' opinions regarding system quality, especially concerning the acceptability of the response time of the JakLingko application, varied. Therefore, addressing and enhancing the responsiveness of the JakLingko application require considerable attention.

H6: Service Quality has a positive impact on Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypothesis 6, which suggests that Service Quality positively affects Intention to Use, was found to be statistically insignificant. The T Statistic value (1.257) falls below the minimum threshold of 1.96, and the p-value (0.209) exceeds the significance level of 0.05, indicating that the quality of services provided does not significantly influence the usage of the JakLingko application. The study also revealed a positive sentiment towards the electronic payment service offered by JakLingko, while emphasizing the need for improvement in the walking distance information provided. The rejection of this hypothesis may be attributed to the non-mandatory nature of the application, allowing users to opt for alternative methods with similar service quality. For instance, although users expressed positive sentiment towards the electronic payment service, they have the option to use other payment methods, reducing their dependency on the application.

H7: Service Quality has a positive impact on User Satisfaction of JakLingko Application in Jakarta Metropolitan Area, Indonesia

The seventh hypothesis, which suggests that Service Quality positively influences User Satisfaction, is supported by the statistical analysis. The T Statistic value (2.638) exceeds the minimum threshold of 1.96, and the p-value (0.008) indicates a significant result. This finding implies that the quality of services provided to users impacts their satisfaction with the application. Service quality encompasses factors such as the number of transfers, journey planning, availability of assistance with system difficulties, and prompt responsiveness. This study's results are consistent with previous research by Chen & Cheng (2009) in the field of information systems, which also found a positive relationship between user satisfaction and service quality.

H8: Intention to Use has a positive impact on the Actual Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

This hypothesis is statistically accepted. This indicates that the user's intention to use the application is considered as discriminant for the actual use. User's intention to use it is to include the access available and dependency to the application. The association between BI and actual system use has been verified by numerous studies that have been done to validate TAM (Yousafzai et al., 2007a).

H9: Actual Use has a positive impact on the Net Benefit of JakLingko Application in Jakarta Metropolitan Area, Indonesia

The ninth hypothesis, proposing that Actual Use positively impacts Net Benefit, is statistically significant based on the result of the T Statistic (4.951) and p-value (0.000). This suggests that the actual use of the JakLingko application significantly influences the perceived net benefit by the user. The study also found that Actual Use accounts for 29.10% of the variation in Net Benefit. These results align with earlier research (Garcia-Smith & Effken, 2013; Chen & Tseng, 2012; Hou, 2012), which showed a strong correlation between the use of a system and the benefits it offers. The indicators of Actual Use (AU1 and AU2) have relatively small means and high standard deviations, indicating diverse opinions among respondents regarding these aspects. This variation may be due to the non-mandatory nature of the JakLingko application, as users may have other mobility options that influence their frequency of use and dependency on the application.

H10: User Satisfaction has a positive impact on the Net Benefit of JakLingko Application in Jakarta Metropolitan Area, Indonesia

Hypothesis 10, suggesting a positive impact of User Satisfaction on Net Benefit, was found to be statistically insignificant with a T Statistic value of 1.386 and a p-value of 0.166. These results indicate that there is insufficient evidence to support the idea that increased usage of the JakLingko application results in corresponding benefits, as measured by Net Benefit. The lack of significance may be attributed to the difference in measurement levels, where User Satisfaction is assessed at the individual level, while Net Benefit includes indicators reflecting organizational and community-level outcomes, such as the reduction of noise and air pollution through intermodal public transportation.

H11: User Satisfaction has a positive impact on the Intention to Use of JakLingko Application in Jakarta Metropolitan Area, Indonesia

The final hypothesis, which proposes a positive impact of User Satisfaction on the Intention to Use, is statistically significant with a T statistic value of 11.385 and a p-value of 0.000. The results indicate that users who are satisfied with the JakLingko application are more likely to have the intention to continue using it. User satisfaction indicators encompass the application's performance and meeting users' expectations. This study's findings are consistent with the research conducted by Kanaani, Elahi, and Hassanzadeh (2012), which also demonstrated that user satisfaction is influenced by system use and leads to a sustained intention to continue using the system.

VI. CONCLUSION AND RECOMMENDATION

RQ 1: How is user satisfaction toward JakLingko application after one year of implementation?

The overall findings indicate that a significant percentage of respondents (around 50%) gave the JakLingko application a perfect rating (5 out of 5) for its performance. Additionally, 38.33% of respondents expressed that

the application met their expectations, as evident from their perfect score ratings. Several key insights arise from the analysis. Firstly, there is a notable positive sentiment towards JakLingko's tariff integration program, known as #CumaCeban, highlighting the successful implementation of its multimodal transportation services. Furthermore, the study reveals that users highly appreciate the excellent user interface design, including aspects like layout size, visual journey, and color. Lastly, the electronic payment service provided by JakLingko is perceived as a valuable feature, facilitating convenient and efficient payment processing for users.

RQ 2: How is the technical, semantic, and effectiveness success of Mobility as a Service (MaaS) JakLingko application?

In terms of semantic success, the majority of the participants gave favorable scores for the Information Quality variable, with an average rating of 4.21. Moreover, more than half of the respondents provided a perfect score for the provision of user evaluation and satisfaction feedback within the JakLingko application. For technical success, most respondents rated System Quality positively, resulting in an overall average score of 4.1 for this variable. However, there were concerns regarding the responsiveness of the JakLingko application, indicating a need for improvements in this area. In regard to effectiveness success, the study demonstrated positive outcomes, as most participants gave favorable scores for Intention to Use, Actual Use, User Satisfaction, and Net Benefit, leading to a total average score of 4.17.

RQ 3: What is the relationship between variables that support the success of the system information in Mobility as a Service (MaaS) JakLingko application?

The results of hypothesis testing showed that most hypotheses were supported, indicating a significant relationship between the variables. However, three hypotheses, specifically those related to Information Quality, Service Quality, and User Satisfaction, were found to have insignificant results in their impact on Intention to Use and Net Benefit. These findings suggest that the non-mandatory use of the JakLingko application may lead to variations in user preferences and behaviors, and different levels of user perception and expectations may influence their satisfaction and perceived benefits from the application.

Recommendation

The primary recommendation suggested by the researcher is the implementation of mandatory use of the JakLingko application to achieve successful integration of public transportation in the Jakarta Metropolitan Area. This recommendation is based on the observation of a relatively low score in Actual Use, which encompasses user frequency and dependency on the application for mobility planning. The non-compulsory nature of the application allows users to explore other mobility planning options, which may lead to lower usage rates. To address this, centralizing various mode-specific applications, such as MRT-J, LRTJ Apps, and TIJE, under the JakLingko integration program is proposed. By consolidating these modes into a single application, namely the JakLingko application, efficiency and convenience in accessing different modes of transportation can be improved, potentially increasing the application's net benefit impact for both individuals and organizations.

To ensure seamless integration of transportation services, several recommendations are provided by the researcher:

Tariff integration

- PT JakLingko should expand the current tariff integration program to include additional modes of transportation. While the current program covers MRTJ, LRTJ, and Transjakarta, considering users'

frequent use of multiple modes of transport within a single trip, adding Mikrotrans as a mode of transportation for first and last-mile connectivity is strongly advised.

- Establish a collaboration between the JakLingko application and online service transportation providers like Gojek or Grab to integrate first and last-mile transportation options. This partnership, although distinct from tariff integration, can offer special pricing exclusively for JakLingko application users when utilizing online service transportation options. To streamline the user experience, redirection from the JakLingko application to the respective online service transportation application can be implemented for the ordering process.

Operational Integration

- **Application Responsiveness.** Address user complaints about the slow response and occasional errors in the JakLingko application, which have been reported on social media platforms. This entails optimizing the application's performance to ensure smoother and more efficient user experiences, reducing instances of forced closures.
- **Real-Time Data Optimization.** Prioritize the optimization of real-time data to enhance operational efficiency. This includes improving the accuracy of walking distance information and enhancing the estimation of total trip time. These enhancements are vital for increasing the operational reliability of the JakLingko application.

Future Research

To enhance future research studies, several recommendations are provided. Firstly, it is suggested to differentiate the assessment of net benefit levels between individuals and organizations. This would allow for a more comprehensive understanding of the impact and effectiveness of the JakLingko application on both user satisfaction and organizational outcomes. Additionally, future research efforts should consider reassessing the public acceptance of the JakLingko application, expanding beyond just the user population. This could involve comparing behavioral intentions and attitudes towards the application before and after its launch, providing insights into the overall perception and adoption of the application among the public. Furthermore, it is recommended that future research quantifies the net benefits derived from the implementation of the JakLingko application from a sustainability perspective. This could include evaluating travel time savings, emissions reduction, and the overall increase in the number of trips made using the application. By examining these aspects, a more comprehensive understanding of the environmental, social, and economic impacts of the JakLingko application can be obtained.

Research Implication

Practical Implication

The research findings emphasize the impact of Information Quality, System Quality, and Service Quality on User Satisfaction within the JakLingko application context. Additionally, the study highlights the mediating role of Intention to Use between User Satisfaction and Actual Use of the application. As users' actual usage, including frequency and dependency, increases, their perception of net benefit improves. These insights can serve as a strategic framework to enhance service, information, and system quality in Mobility as a Service (MaaS) applications. The recommendations provided are expected to facilitate the successful implementation of MaaS applications, especially in developing countries like Indonesia.

Theoretical Implication

The research findings offer a significant contribution to the information systems field, especially in the context of implementing Mobility as a Service (MaaS) in developing countries. Through the empirical evidence on the

success measurement of the JakLingko application in the Jakarta Metropolitan Area, this study addresses existing knowledge gaps and enhances understanding in this domain.

Acknowledgement

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Determinant Factors of Credit Risk in Indonesian Conventional Bank

Muhammad Alvino Nurfalalah¹, Atika Irawan²

^{1,2} School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

During Covid-19 pandemic, the Non Performing Loan (NPL) in Indonesian bank is increasing. Reflecting from this phenomenon, this research focused on investigating the determinant factors of credit risk in Indonesian conventional bank to make sure the risk mitigation can be done in accurate manners. The methodology used in this research is panel data regression analysis using 16 conventional banks categorized in KBMI IV and KBMI III from 2018-2022. The data in this research sourced from bank financial publication data published by OJK, disclosure published in banks' sustainability report, and macroeconomic data published by BI and BPS that collected from their official website. The result shows that there are several bank specific factors and macroeconomic factors that influenced credit risk. Bank size that is measured by total assets is significantly positively related to the credit risk. Economic, environmental, and social disclosure that is measured using GRI index disclosure, profitability that is measured using ROE, and CAR is significantly negatively related to the credit risk. However, efficiency that is measured by cost to income ratio is not significantly related to the credit risk. Inflation rates is significantly positively related to the credit risk. Interest rates and real GDP significantly negatively related to the credit risk. Meanwhile, exchange rates not significantly related to the credit risk. Based on these result, this research suggests several inputs to be considered by banks and regulators to control credit risk in bank.

Keywords—Bank Specific Factors; Credit Risk; Indonesian Conventional Bank; Macroeconomic Factors; NPL

I. INTRODUCTION

The global outbreak of COVID-19, attributed to the novel coronavirus SARS-CoV-2, has rapidly spread across the world, resulting in illness, death, and severe respiratory complications, primarily transmitted through respiratory droplets (Cucinotta and Vanelli, 2020). On March 2, 2020, the initial case of COVID-19 was reported in Indonesia (WHO, 2020). Since then, the government in Indonesia set an activity restriction policy to protect Indonesian citizens from COVID-19, namely “Pembatasan Sosial Berskala Besar” (PSBB). However, the restriction itself also dramatically affects the economic activities in Indonesia. According to Misno et al. (2020), the effectuation of the PSBB in the relatively long run, which forces offices and most of the industry to stop doing their operation, can disrupt the supply chain of goods and services and will cause economic losses. The domestic Indonesian economy during the early breakout of COVID-19 which is in the second quarter of 2020 showed a decline in real GDP up to minus 5.32% (BPS, 2020).

Economics in Indonesia is hardly supported by Micro, Small, and Medium Enterprises (MSMEs). According to Kementerian Koordinator Bidang Perekonomian Republik Indonesia (2022), MSMEs in Indonesia account for 99% for all business units. MSMEs account for 60.5% of the total GDP contribution and employ 96.9% of the national workforce. In terms of financing their business, some rely on bank loans, in which banks as financial intermediaries provide funds from depositors to businesses in need of fresh money.

When businesses have a bank loan, they are obliged to pay back the debt and its interest. One of the concerns in relation to the bank loan is credit default. Credit default occurs when a borrower is unable to fulfill their payment obligations on a loan or debt, resulting in a default or non-payment event. With the current economic conditions, it is hard for businesses to pay their debts and some use debt structuring to secure their operation, as stated by Asosiasi Pengusaha Indonesia (2021) that 59.4% of businessmen face difficulty in debt repayment. It leads to an increase in credit default and exposes banks to higher risks.

According to Victoria (2022), Rohmah, which is the Indonesian Financial Service Authority or Otoritas Jasa Keuangan (OJK) Sharia Banking Regulation and Development Director, state that the market share of banking industry in Indonesia is highly dominated by conventional banks with 92.91% market share compared to Islamic banks with only 7.09% market share. In addition, according to OJK (2023), funds distributed by conventional banks accounted for 95.70% of the funds distributed in banking industry in Indonesia compared to 4.30% by the

Islamic banks. It shows that the banking industry in Indonesia is still highly influenced by conventional banks. Therefore, the study related to conventional banks is very necessary.

There is one risk related to credit default in banking, namely credit risk. According to 65/POJK.03/2016, credit risk refers to the potential risk arising from the inability of external entities to meet their responsibilities towards a bank. This encompasses various forms of credit risk such as debtor default, concentration of credit risk, risk associated with counterparties, and the risk related to settlement. Since the outbreak of COVID-19, the Non Performing Loan (NPL), which is the indicator of the credit risk, in the Indonesian banking sector has increased considerably, as shown in the table from KataData (2021) below.

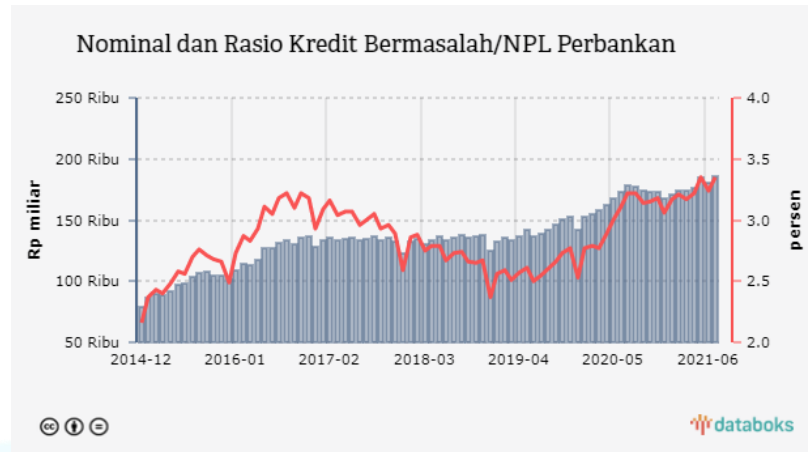


Fig. 5. Graph of NPL Rate in Indonesian Bank (KataData, 2021)

The COVID-19 pandemic reminds us of how a change in economic conditions could impact the banking industry. It is necessary to have good risk management to prepare for what will happen in the future. The significance of risk management, particularly in relation to credit risk, is a matter of concern not only during the COVID-19 pandemic but also in the aftermath of other past crises. There is a need to understand the determinants of credit risk so that risk management could be done in an accurate manner. Previous research regarding the determinants of credit risk has shown different result across different region. Therefore, the most updated and specific determinants in Indonesia is studied in this research.

II. LITERATURE REVIEW

Credit Risk

When businesses have a bank loan, they are obliged to pay back the debt and its interest. One of the concerns in relation to the bank loan is credit default. Credit default occurs when a borrower is unable to fulfill their payment obligations on a loan or debt, resulting in a default or non-payment event. With the current economic conditions, it is hard for businesses to pay their debts and some use debt structuring to secure their operation, as stated by Asosiasi Pengusaha Indonesia (2021) that 59.4% of businessmen face difficulty in debt repayment. It leads to an increase in credit default and exposes banks to higher risks.

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Bank Specific Factors

The first bank specific factor that want to be studied in this research is bank's disclosure in economic, environmental, and social. Freeman (2010) said that in addition to shareholders, stakeholder theory acknowledges the existence of various other parties who bear responsibility for the company or organization. Stakeholders have the ability to exercise control or exert influence over the utilization of economic resources for the operational

activities of the company. Therefore, the level of disclosure being published by bank may have relationship with the credit risk. The measurement of economic, environmental, and social disclosure in this research will be using Global Reporting Initiative (GRI) framework indicator.

The second bank specific factor that want to be studied in this research is the size of the bank. In the case of the size of the bank, which measured by total assets, banks possessing substantial assets have the capacity to extend significant amounts of credit. According to Trad, Trabelsi, and Goux (2017), as the bank provides a larger volume of credit, there is an increased opportunity to decrease the level of spreads, resulting in a lower interest rate level given to the borrowers. According to Salas and Saurina (2002) bank size and credit risk has a significant negative relationship because with bigger size, banks will have more reserves to support the credit provided to clients. This finding also supported by Fakhrunnas, Dari, and Mifrahi (2018) and Huan et al. (2020). However, Wiryono and Effendi (2018) found that bank size has a significant positive relationship with NPL. The bank's total asset information is derived from bank's balance sheet. In this research the measurement of bank size will use the bank's total assets and used in its ln form.

The third bank specific factor that want to be studied in this research is efficiency. In the study of the relationship between NPL and cost efficiency in US commercial banks by Berger and DeYoung (1997), they found two hypotheses that explain the casualty between cost efficiency and NPL. The first hypothesis is the "hypothesis of bad management", this hypothesis suggests that when cost efficiency is low, it indicates inadequate management practices, thus implying that loan underwriting, monitoring, and control is poor and the NPL are likely to increase. This hypothesis is supported by findings from Williams (2004), Podpiera and Weil (2008), and Louzis, Vouldis, and Metaxas (2010). The alternative hypothesis is the "hypothesis of skimping", this hypothesis suggests that there is a possible positive relationship between high cost efficiency and NPL as high cost efficiency may reflect little amount of resources allocated to monitor the risk, thus the NPL are likely to increase. This hypothesis is supported by findings from Rossi, Schwaiger, and Winkler (2005). Cost to Income Ratio (CIR) is a comparison between operating cost and operating income. CIR is employed as a metric to assess the efficiency and operational capabilities of a bank.

The fourth bank specific factor that want to be studied in this research is profitability. Banks generate profits by earning interest income from loans provided to customers. Consequently, the greater the loan amount disbursed, the higher the interest income generated, leading to increased profitability for the bank. However, granting larger loans also entails a higher level of credit risk, as there is an increased likelihood of loans defaulting. Klein (2013) found that Return on Equity (ROE) has a significant negative effect on NPL. However, Huan et al. (2020) found that the bank's performance has no significant effect on NPL. In this research the measurement of profitability will use the ROE.

The fifth bank specific factor that want to be studied in this research is capital adequacy. The Capital Adequacy Ratio (CAR) represents the proportion of a bank's capital to its Risk Weighted Assets (RWA). It is a measure of the bank's financial stability that used to safeguarding depositors again unexpected losses. In addition, banks must uphold a minimum level of capital to ensure their capacity to meet debt and deposit obligations when required, thereby reducing the risk of banking instability. As per the Basel Committee on Banking Supervision in 2015, there exist two categories of capital that banks must maintain. The first is Tier 1 capital, which serves to absorb losses incurred by the bank without necessitating the suspension of its trading activities. The second is Tier 2 capital, which absorbs bank losses but may require the bank to halt its operations or provide protection to depositors. Huan et al. (2020) found that CAR has a significant negative relationship with credit risk.

Macroeconomic Factors

The first macroeconomic factor that want to be studied in this research is inflation. According to Bank Indonesia (2023), Inflation is defined as a rise in the prices of goods and services within a specified time frame. The term "inflation" cannot be attributed to a mere price increase in one or two goods, unless it is pervasive and leads to a broader escalation in prices across various goods. During high inflation time, the increase in prices could make customers face difficulty in paying their loans since the increase in cost of living. However, it also can be seen that higher inflation will cause the real value of the debt to be reduced, resulting in the increase in payment capacity of the borrower. Therefore, the effect of inflation on NPL can be positive or negative in different countries. Farhan et al. (2012), who studied economic determinants of NPL in Pakistani banks found that inflation has a significant positive effect on NPL. This is also supported by findings of Klein (2013), who studied macroeconomic determinants of NPL in Central, Eastern, and Southeastern Europe (CESEE) banks which found that inflation has a significant positive effect on NPL. Meanwhile, Shingjergji (2013) who studied the impact of macroeconomic variables to NPL in Albanian banks found that inflation has a significant negative effect on NPL.

Finding of Shingjergji is also supported by findings of Ahmad, Abbas, and Bashir (2013) and, Fakhrunnas, Dari, and Mifrahi (2018), and Wiryono and Effendi (2018).

The second macroeconomic factor that want to be studied in this research is interest rate. According to Nkusus (2011), A rise in interest rates reduces the borrower's ability to make loan payments. Consequently, a positive relationship is established linking interest rates and NPL. Dash and Kabra (2010) found that banks with aggressive lending practices who charge higher interest rates have greater NPL. This finding is also supported by Farhan et al. (2012) who found that interest rate has a significant positive effect on NPL.

The third macroeconomic factor that want to be studied in this research is Real Gross Domestic Product (Real GDP. Typically, when GDP expands, it tends to raise income level which improve the capacity of the borrowers to repay loans. As a result, this contributes to a decrease in NPL. Conversely, when GDP growth is limited, it can have the opposite effect, leading to increase in NPL (Khemraj and Pasha, 2009). Fakhrunnas, Dari, and Mifrahi (2018) who studied macroeconomic and risk taking behavior of Indonesian banks found that GDP growth has a significant negative effect on NPL. This finding also supported by Shingjergji (2013), Ahmad and Bashir (2013), Klein (2013), and Wiryono and Effendi (2018).

The fourth macroeconomic factor that want to be studied in this research is real effective exchange rate. According to Seeberg (2015), a change in exchange rate will influence financial stability in a country. When monetary policy is tightened, it can draw in an abundance of capital flows. This excessive capital flows can result in an appreciation of the exchange rate and trigger excessive borrowing in foreign currency. Consequently, the financial system becomes increasingly exposed to vulnerability, as both domestic and international shocks diminish the repayment capacity of financial institutions. Farhan et al. (2012) found that exchange rate has a significant positive effect on NPL. This finding is also supported by Shingjergji (2013), Klein (2013), and Fakhrunnas, Dari, and Mifrahi (2018).

Research Hypothesis

Based on the discussion above, the subsequent hypotheses have been formulated to be examined and evaluated in this research:

H_{1A}: Economic, environmental, and social disclosure has a considerable relationship with the credit risk in conventional bank in Indonesia

H_{1B}: Bank size has a considerable negative relationship with the credit risk in conventional bank in Indonesia

H_{1C}: Efficiency has a considerable relationship with the credit risk in conventional bank in Indonesia

H_{1D}: Profitability has a considerable negative relationship with the credit risk in conventional bank in Indonesia

H_{1E}: Capital adequacy has a considerable negative relationship with the credit risk in conventional bank in Indonesia

H_{1F}: Inflation rates has a considerable positive relationship with the credit risk in conventional bank in Indonesia

H_{1G}: Interest rates has a considerable positive relationship with the credit risk in conventional bank in Indonesia

H_{1H}: Real GDP has a considerable negative relationship with the credit risk in conventional bank in Indonesia

H_{1I}: Exchange rates has a considerable relationship with the credit risk in conventional bank in Indonesia

III. RESEARCH METHODOLOGY

Research Design

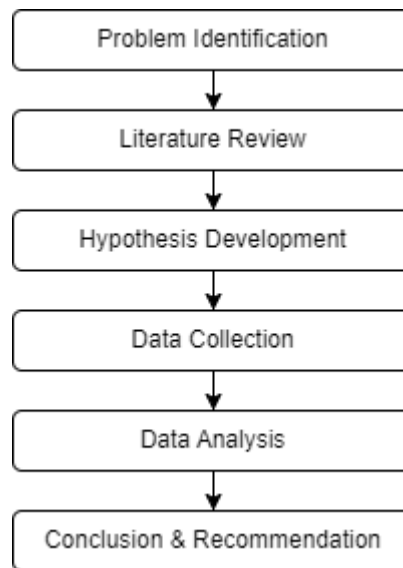


Fig. 2. Research Design

In this study, the researcher employs a diagram as a roadmap to steer the progress of the research and attain its objectives. The research diagram encompasses several key components, including identifying the problem and objectives, conducting a literature review, generating hypotheses, collecting data, analyzing the data, and drawing conclusions along with providing recommendations.

Data Collection

The data that used in this study sourced from bank financial publication data published by OJK, disclosure published in banks' sustainability report, and macroeconomic data published by BI and BPS that collected from their official website. The sample for this research is 16 conventional banks with the period 2018-2022. The selected banks are conventional banks categorized as KBMI IV and KBMI III.

Data Analysis

In order to reach the research objectives, the author use panel data regression to find relationship between independent variables and dependent variables. According to Gujarati (2003), panel data refers to a combination of time series and cross-sectional data. In panel data, the same cross-sectional unit, such as a firm or a state, is observed over a period of time. Therefore, regression analysis conducted on panel data is referred to as a panel data regression model.

Panel data offers certain advantages in comparison to time series and cross-sectional data. First, the techniques used for panel data estimation have the ability to explicitly consider heterogeneity by incorporating individual-specific variables. Second, panel data provides more informative data by combining time series and cross-sectional observations. It offers greater variability, reduced collinearity among variables, increased degrees of freedom, and improved efficiency. Third, panel data is well-suited for examining the dynamics of change as it enables the study of repeated cross-sectional observations. Fourth, panel data has the advantage of being able to identify and quantify effects that cannot be observed adequately in purely cross-sectional or time series data. Fifth, panel data allows for the study of more complicated behavioral models. Sixth, panel data helps mitigate the potential bias that may arise when aggregating individuals or firms into broader aggregates. According to Zulfikar (2018), the method in estimating the model in panel data regression can be done in three approaches:

The first approach is Common Effect Model. In this model, the time and individual dimension is not considered. This assumes that the behavior of corporate data is the same over various periods. Ordinary Least Square (OLS) approach or the least squares technique can be used to estimate the panel data model.

The second approach is Fixed Effect Model. In this model, different intercepts can accommodate the differences between individuals. To estimate the Fixed Effects Model with distinct intercepts for different individuals, the dummy variable technique is employed. This estimation model is also known as the Least Squares Dummy Variable (LSDV) model.

The third approach is Random Effect Model. This model is utilized in panel data analysis, where variables can exhibit interconnections across time and individuals. By allowing for different error terms for each individual, this model can accommodate variations in intercepts. The Random Effect Model, also known as the General Least Squares (GLS), offers the advantage of eliminating heteroscedasticity.

IV. RESULT / FINDING

Descriptive Statistics

Table 1. Descriptive Statistics

Variable	Obs	Mean	Med	Min	Max	St. Dev
NPL	80	0.02549	0.028	0.0022	0.0478	0.0102947
DISC	80	0.3054573	0.3076923	0.0659341	0.72528	0.1581278
LnSize	80	33.20086	32.87671	31.67195	35.09896	0.9398816
CIR	80	0.77671	0.7898	0.4654	0.9812	0.1157538
ROE	80	0.10515	0.0942	0.01	0.2349	0.0562554
CAR	80	0.23198	0.2279	0.1537	0.3568	0.0442759
INF	80	0.02982	0.0272	0.0168	0.0551	0.013807
IR	80	0.0475	0.05	0.035	0.06	0.0098083
LnGDP	80	35.56413	35.55753	35.50917	35.63359	0.0429927
ER	80	99.848	99.12	98.57	102.99	1.6114671

Source: Author

Descriptive statistics shows the characteristics of the data that is used. There are some notable characteristics that can be seen. For bank size, there are trends for most of the banks where the assets grow over years but decline in 2021. For CAR, there are trends for most of the banks where the CAR is increasing in 2020 and 2021 period, this might be because the banks are preparing to increase their financial stability in the unstable economic condition. For disclosure score, the score of 0 occurs because those banks have not published sustainability reports in that period. For inflation rate, in 2020, the economy is slowing down because of the pandemic so the inflation rate is relatively low and in 2022, the economy start to bounce back so the inflation rate is relatively high. For interest rate, in 2021, as a result of the pandemic, the economy is slowing down and the inflation rate is low, so Bank Indonesia lowered the interest rate to boost the economy.

Classical Assumption Test

Before conducting the regression analysis, several tests should be conducted to check whether the classical assumption for regression analysis is fulfilled. If the selected estimation model is the common effect model, all the classical assumptions should be fulfilled. If the selected estimation model is the fixed effect model, homoscedasticity and no multicollinearity assumptions should be fulfilled. If the selected estimation model is the random effect model, only no multicollinearity assumption should be fulfilled.

The first test is normality test using Shapiro Wilk test is used to check whether the residual of the regression is normally distributed. Based on the Shapiro Wilk test, the p-value is 0.08653, which means that the residual of the regression is normally distributed.

The second test is heteroscedasticity test using residual vs fitted plot is used to check whether the variance of residual is constant or not. Based on the plot the variance is not constant in a straight line. Therefore, the data is not fulfilling the homoscedasticity assumption

The third test is autocorrelation test using Wooldridge test is used to check whether there is autocorrelation in the variables used in the regression. Based on the Wooldridge test, the p-value is 0.0003, which indicates autocorrelation. Therefore, the no autocorrelation assumption is not fulfilled.

The fourth test is multicollinearity test using correlation matrix is used to check whether there is multicollinearity between variables used in the regression. Based on the correlation matrix, no correlation is higher than 0.8. Therefore, the no multicollinearity assumption is fulfilled.

Deciding Estimation Model

To decide the model of estimation to be used in panel data regression whether it is common effect model, fixed effect model, or random effect model. Three tests can be done:

Chow Test is used to check whether the fixed effect model is more appropriate than the common effect model. Based on the Chow Test result, with p-value of 0.0000, which is lower than 0.05 significance level, the fixed effect model is more appropriate than the common effect model.

Hausman Test is used to check whether the random effect model is more appropriate than the fixed effect model. Based on the Hausman Test result, with p-value of 0.4109, which is higher than 0.05 significance level, the random effect model is more appropriate than the fixed effect model.

Breusch-Pagan Lagrange Multiplier Test is used to check whether the random effect model is more appropriate than the fixed effect model. Based on the Breusch-Pagan Lagrange Multiplier Test result, with p-value of 0.0000, which is lower than 0.05 significance level, the random effect model is more appropriate than the common effect model.

Based on three tests that have been done, the most appropriate model of estimation to be used in panel data regression in this research is the random effect model. With the selected model, the assumptions needed already fulfilled.

Random Effect Model Result

The selected estimation method in panel data regression for this research is the random effect model. For the random effect model, the only assumption needed is no multicollinearity and it is already fulfilled. The $\text{prob} > \chi^2$ in this model is 0.0000, lower than the significance level 0.05 which means that the joint variables in this regression are significant to the dependent variable. The overall R-square in this model is 0.2921 which means that 29.21% of variation in the dependent variable is explained by the variation in the independent variables. The result of the random effect model is shown in the following table.

Table 2. Random Effect Model Result

Variable	Coefficient	Probability	Significant
Economic, Environmental, and Social Disclosure (DISC)	-0.006313	0.381	
Size (SIZE)	0.0033068	0.122	
Efficiency (CIR)	0.0302895	0.154	
Profitability (ROE)	-0.0759282	0.021	**

Capital Adequacy Ratio (CAR)	-0.0520218	0.023	**
Inflation Rate (INF)	-0.3908787	0.202	
Interest Rate (IR)	0.344655	0.331	
Real GDP (GDP)	0.1391071	0.042	**
Exchange Rate (ER)	-0.0011359	0.049	**
Cons	-4.923253	0.041	**

*, **, *** refers to significant at $\alpha = 10\%$, $\alpha = 5\%$, and $\alpha = 1\%$

Source: Author

V. DISCUSSION

Relationship Between Bank Specific Factors and Credit Risk

The result of the regression shows that there is a negative relationship between economic, environmental, and social disclosure and the bank's credit risk. The stakeholder theory state that there are several stakeholders that can influence the utilization of the company's resource. With this result, it can be seen that bank that have higher level of concern to its stakeholder have lower credit risk. However, the relationship is not significant enough.

The result of the regression shows that there is a positive relationship between the bank's size measured by total assets and the bank's credit risk. It is quite surprising as it is different with the theory from Trad, Trabelsi, and Goux (2017) that banks with higher size can provide greater volume of credit, reduce the level of interest rate, and have lower credit risk. This result is also not aligned with the findings of Salas and Saurina (2002), Fakhrunnas, Dari, and Mifrahi (2018), and Huan et al. (2020). However, the relationship is not significant enough.

The result of the regression shows that there is no significant relationship between the bank's cost efficiency and the bank's credit risk. With this result, both the hypothesis of bad management and hypothesis of skimping from Berger and DeYoung (1997) are not applied in the Indonesian banks. Even if the result is not significant, the regression coefficient for this variable is positive, so it supports the hypothesis of bad management where if the efficiency is low it shows that the management does not have a good performance and they cannot manage its credit risk.

The result of the regression shows that there is a significant negative relationship between ROE and the bank's credit risk. With this result, it can be seen that banks that can generate higher profitability tend to be more able to manage their credit risk. This result is aligned with the founding of Klein (2023).

The result of the regression shows that there is a significant negative relationship between CAR and the bank's credit risk. Banks with higher CAR can be interpreted as having higher financial stability in safeguarding its depositors from unexpected losses. The ability to manage its financial stability is also reflected with its ability to manage its credit risk. This result is aligned with the founding of Huan et al. (2020).

Relationship Between Macroeconomic Factors and Credit Risk

The result of the regression shows that there is no significant relationship between inflation rates and the bank's credit risk. This result denies both theory that during high inflation periods, the cost of living is increased so that the capability of loan repayment decreased and that during high inflation period, the real value of debt is decreased so that the capability of loan repayment increased. This result is different from the findings of Farhan et al. (2012), Klein (2013), Shingjergji (2013), Ahmad and Bashir (2013), Wiryono and Effendi (2018), and Fakhrunnas, Dari, and Mifrahi (2018).

The result of the regression shows that there is no significant relationship between interest rates and the bank's credit risk. When the interest rates is high, banks will increase the rates they give to the borrower resulting in the decrease of capability of loan repayment. However, since that the relationship is not significant, the reality is not the same according to the theory. This might show that interest rates is not affecting bank's credit risk directly in the same period. This result is different from the findings of Farhan et al. (2012).

The result of the regression shows that there is a significant positive relationship between real GDP and the bank's credit risk. This result denies the theory from Khemraj and Pasha (2009) who states that expansion of GDP

tends to raise the income level and improve the capability of loan repayment. This result is different from the findings of Shingjergji (2013), Ahmad and Bashir (2013), Klein (2013), Wiryono and Effendi (2018), and Fakhrunnas, Dari, and Mifrahi (2018).

The result of the regression shows that there is significant negative relationship between exchange rates and the bank's credit risk. This result is different from the findings of Farhan et al. (2010), Shingjergji (2013), Klein (2013), and Fakhrunnas, Dari, and Mifrahi (2018).

VI. CONCLUSION AND RECOMMENDATION

Conclusion

Based on the result of panel data regression, several bank-specific factors significantly affect the credit risk. Profitability that is measured using ROE, and CAR is significantly negatively related to the credit risk. However, economic, environmental, and social disclosure that is measured using GRI index, bank size that is measured using total assets and efficiency that is measured using cost to income ratio is not significantly related to the credit risk.

Several macroeconomic factors also significantly affect the credit risk. Real GDP is significantly positively related to the credit risk. Exchange rates significantly negatively related to the credit risk. Meanwhile, inflation rates and interest rates are not significantly related to the credit risk. It is quite surprising as the previous literature shows different results for the real GDP. This might happen because the real GDP do not directly affect the credit risk in the same period.

Recommendation

Considering the result for the bank-specific factors, there are some recommendations for banks in Indonesia to control their credit risks. First, as the profitability is significantly negatively related to the credit risks, banks should continue to reach their goals as a business which is to improve profitability. Management that can make the bank have high profitability tends capable enough to manage their credit risk. Second, as the CAR is significantly negatively related to the credit risks, banks should be more concerned about their capital, if they can manage to have high CAR, most likely the credit risk will decrease. Economic, environmental, and social disclosure, bank size, and efficiency is not significantly related to the credit risk. Therefore, banks should focus on maintaining the management when it comes to profitability and CAR.

Considering the result for the bank-specific and macroeconomic factors, there are some recommendations for regulators in Indonesia. The result of this research can be an input to set regulations regarding ratios that banks should maintain. Profitability and CAR should be regulated by the regulators. Currently, Bank Indonesia already set the minimum ratio of CAR to be 8%. It should be maintained well and followed by all banks in Indonesia. Regarding macroeconomic factors, real GDP and exchange rates can be indicators to predict credit risk. Therefore, those two variables can be consideration for the regulators in creating regulation. Even if interest rates are not significantly related to the credit risk, it is still an instrument that is widely used by regulators. There should be further research specifically related to interest rates to make sure the input for regulators is confirmed.

In addition, there are some recommendations for future researchers. As some variables have no significant relationship in NPL or have different direction even when there are many theories supporting it, future researchers can try to use those variables in its lagged version because they might not directly related in the same period. One more recommendation for future researchers is that in this research, the sample used is banks considered as KBMI III and KBMI IV from 2018-2022. In the future, as more banks will publish their sustainability report, additional sample can be used to get a deeper understanding regarding determinants of credit risk in Indonesian conventional banks.

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Modelling The Influencing Of Green Entrepreneurship Orientation On Sustainable Firm Performance: A Moderated Mediation Model

¹Michael Karikari Appiah, ²Gods love Enchill

^{1,2}University of Environment and Sustainable Development, Somanya, Ghana

ABSTRACT

The objective of this paper is to develop a comprehensive model that enhances the correlation between green entrepreneurship orientation (GEO) and sustainable firm performance. This approach aims to promote sustainable consumption and production by integrating the Natural Resource Based View and the Dynamic Capability Theories, with some modifications. The study was conducted utilizing a deductive approach and employing the quantitative research methodology. A meticulously designed questionnaire was employed to gather data from Green Entrepreneurs operating in various sectors in Ghana. The studies were conducted using the SMART-PLS version 3.3.1 software. The Structural Equation Modelling method was employed to evaluate our hypotheses. Based on our findings, it has been determined that the implementation of Green Entrepreneurship Opportunities (GEO) has a positive impact on both the performance of green innovations and the overall success of firms. Furthermore, the correlation between GEO and the success of green innovation was significantly influenced by the potential for green innovation. The relationship between GEO and sustainable company performance was found to be significantly influenced by green creative performance. In summary, the collaboration between GE and Environmental Innovative Performance (EIP) has the potential to contribute significantly towards achieving global sustainability. The utilization of green dynamic potential has the potential to enhance the linkage between GEO and EIP. The study findings encompass the development of an integrated model aimed at enhancing the growth of green businesses and promoting environmental sustainability. Additionally, the study highlights the societal achievement of Sustainable Development Goals 4, 8, 12, and 13 within a developing nation.

Keyword: Green Entrepreneurship Orientation, Firm Performance, Green Innovative Capability, Sustainability Development

I. INTRODUCTION

The Paris Climate Accord is facilitating a gradual transformation of our production and consumption patterns. This is in line with broader endeavours to establish a sustainable equilibrium between the planet, prosperity, and partnership, as outlined in the United Nations 2030 Agenda for sustainable development. These collective actions aim to safeguard both humanity and the environment. It appears that the carrying capacity of the natural environment is diminishing over time due to the extraction of resources surpassing the rate at which they can regenerate (Appiah et al., 2021a; Ferreras-Méndez, et al., 2022; Nezhad et al., 2022; San et al., 2022). Environmental issues have emerged as a significant management challenge for organizations as they strive to mitigate adverse effects on the environment and attain sustainable development. The effectiveness of sustainable development relies on the deliberate endeavours of organizations to effectively implement innovative environmental best practices (Rashid et al., 2015). Consequently, there is a growing trend of heightened environmental consciousness, leading to an increased demand for individuals who possess the skills and mindset to become green entrepreneurs within our society. Green entrepreneurship is a distinct subset of entrepreneurship that focuses on developing and executing strategies to address environmental challenges and drive positive societal transformation while minimizing harm to the environment (Appiah et al., 2022a; Feng et al., 2022; Frare and Beuren, 2022).

Organization for Economic Cooperation and Development (OECD) defined green businesses as entities that actively pursue environmentally sustainable practices. This entails employing clean production technologies and manufacturing green products, thereby establishing a truly eco-friendly operation (Ebrahimi & Mirbargkar, 2017; Krzakiewicz & Cyfert, 2019; Issau et al., 2021). The concept of green entrepreneurship has been widely recognized as a valuable instrument for fostering the development of a sustainable green economy (Wacheux & Roussel, 2005; Huang et al., 2021; Susanto et al., 2021). Green entrepreneurship is an effective approach to promoting the sustainability of our natural resources, typically spearheaded by Small and Medium Enterprises (SMEs). These small and medium-sized enterprises (SMEs) play a crucial role in fostering growth and progress by creating employment opportunities, driving innovation, developing human capital, and generating revenue (Verma and Kumar, 2021; Appiah et al., 2022b; Appiah et al., 2022c; TzeSan et al., 2022). According to the World Bank, small and medium-sized enterprises (SMEs) comprise over 90% of the total number of businesses globally

and contribute to approximately 60% of the total employment opportunities worldwide. The current rise in the number of green entrepreneurs in Ghana is primarily driven by small and medium-sized enterprises (SMEs). The existing literature lacks a suitable baseline model to provide guidance for small and medium enterprises (SMEs) in their investment decisions regarding green entrepreneurship. This study aims to address this gap.

The objective of this paper is to construct a comprehensive model that elucidates the correlation between Green Entrepreneurship and Sustainable Firm Performance. The aim is to promote sustainable consumption and production, while concurrently addressing the pressing issue of climate change. This will be achieved by integrating the Natural Resource Based View and Dynamic Capability Theories within a resource-constrained context. Hence, in this study, Geographic Information Systems (GIS) can be perceived as a dynamic obligation towards the external environment. This responsibility is commonly assessed using four distinct criteria: pollution reduction, product stewardship, and sustainability. This study suggests that the Geographic Environmental Orientation (GEO) is a strategic resource that is deeply ingrained in an organization's culture. It posits that GEO empowers companies to seize opportunities and asserts that it is a dynamic capability that facilitates the attainment of sustainable environmental performance. This viewpoint is supported by various researchers (Afum et al., 2021; Susanto, 2021; Verma and Kumar, 2021; Akomea et al., 2022; Fallah and Soori, 2022; Luu, 2022).

This paper makes a significant contribution to the current body of knowledge on green entrepreneurship, including existing policies, theories, empirical research, and conceptual frameworks. This study is the first of its kind to present a moderated mediation model that aims to enhance environmental sustainability in Ghana. The model incorporates the use of GEO (Green Entrepreneurial Orientation), green dynamic capability, and EIP (Environmental Innovation Performance) as guiding factors for policymakers and practitioners. Furthermore, a novel model has been developed to provide guidance for the implementation of environmental sustainability practices. The aim is to foster corporate environmental commitment and enhance the performance of firms in Ghana, where sustainability initiatives are still in their early stages.

Green entrepreneurs have the opportunity to leverage a model that combines economic profitability, environmental protection, and social value creation. This approach aligns with the pillars of sustainable development and can lead to highly desirable outcomes. Based on our findings, it has been determined that a green entrepreneurship orientation significantly influences both green innovation performance and overall firm performance in terms of environmental, social, and financial aspects. Additionally, the green innovative capability played a significant moderating role in the relationship between green entrepreneurship orientation and green innovation capability. The paper's theoretical implications encompass the emergence of a newly integrated model that aims to enhance the relationship between green entrepreneurship development and environmental sustainability within the context of an emerging country.

Furthermore, through the integration of various competing theories, we have developed a comprehensive model that exhibits a high level of reliability in predicting outcomes. This model has the potential to provide a more thorough understanding of the relationship between GEO and environmental performance. The new model highlights the interconnectedness of pollution prevention, product stewardship, and sustainability. It also emphasizes the importance of enabling a firm to effectively and promptly address the environmental concerns of its stakeholders. This perspective is particularly relevant in an emerging economy where such models are not yet well-established. This objective can be accomplished by implementing clean technologies and enhanced systems that effectively minimize the generation of hazardous waste.

Additionally, the implementation of green education programs, workshops, activities, and products can further augment the value of these environmental initiatives. The study's findings highlight the significant practical and social implications associated with green entrepreneurs. These individuals are instrumental in addressing pressing issues such as unemployment, poverty, and the adoption of sustainable practices and environmental stewardship. In comparison to other businesses, green entrepreneurs demonstrate a greater commitment to these crucial areas. The findings of this study make a significant contribution to the achievement of Sustainable Development Goals 4, 8, 12, and 13, in terms of social awareness and progress. The remainder of the paper is presented in the following format.

Section 2 of this paper provides a comprehensive literature review that encompasses theoretical, conceptual, empirical, and hypotheses development. Section 3 outlines the research methodology that was employed for this study. Moving on, section 4 presents the findings obtained from the research. Section 5 is dedicated to the

discussions and conclusions drawn from the study. Finally, the last section delves into the implications and limitations of this paper.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

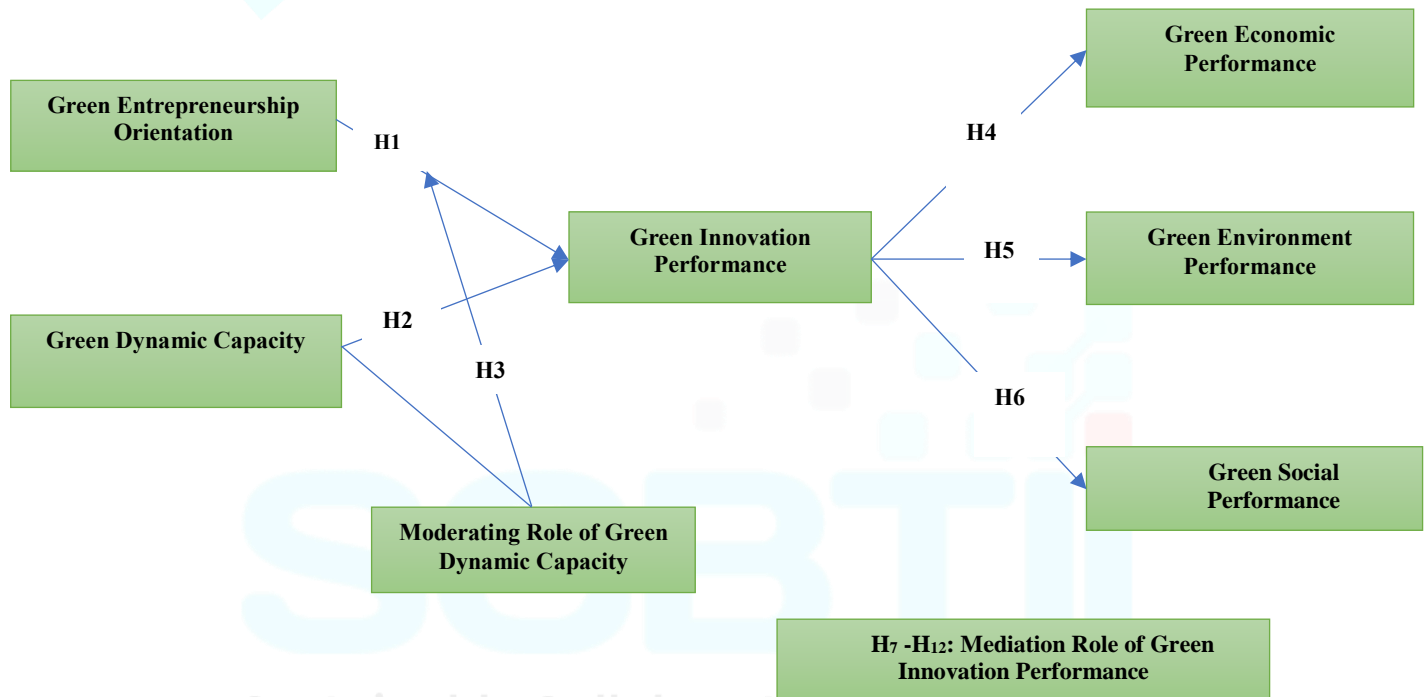


Figure 1: Research Framework

In an effort to develop a core model to guide GEO and sustainable business performance, we brought together. Natural Resource-Based View (NRBV), and Dynamic Capability (DC) theories to form a powerful model. Inspired by traditional resource theory, NRBV argues that prioritising the environment and social context can enhance firm competitiveness (Hart, 1995; Golicic & Smith, 2013). This originally led to the development of three symbiotic resource concepts: pollution prevention, product stewardship and sustainability. Green entrepreneurship is the search for environmentally friendly ways to reduce pollution and increase environmental sustainability; GEO is an active capability (Patel, 2019; Gu, 2022; Luu, 2022; Sebaka and Zhao, 2022). Environmentally friendly products and processes are central to GEO (Demirel et al, 2019). This can be achieved through clean technologies and improved systems that reduce hazardous waste, green education programmes, green workshops, green activities and green products that add value to these environmental activities.

On the other hand, dynamic capability theory helps companies to disseminate green knowledge, conduct research and implement the most appropriate environmental techniques (Cepeda-Carrion et al., 2017; Aboelmaged & Hashem, 2019; Feng et al., 2022; Frare and Beuren, 2022; Martinez-Falco and Sanchez-Garcia, 2022). A green dynamic capability is a resource that enables a firm to respond in a timely and rapid manner to the environmental needs of its stakeholders (Teece, 2018). Zahra et al. (2009) argue that dynamic capabilities enable firms to acquire new business skills and knowledge and reduce the cognitive difficulties associated with finding and identifying green opportunities. Based on these theories, the research framework presented in Figure 1 is used in this study to clarify the links between, green entrepreneurship, green innovation performance and firm performance.

III. METHODOLOGY

This paper is based on a quantitative research approach to create a novel model for green entrepreneurship and sustainable firm performance. The objective is to enhance the number of green entrepreneurs, foster decent work, promote sustainable consumption and production, and address climate change by integrating the theories of

Natural Resource-Based View (NRBV) and Dynamic Capabilities (DC). The present paper operates under the assumption of objectivism, which posits that the researchers maintain independence from the variables under investigation. During the duration of the study, the quantitative approach is advocated for the utilization of mathematical and statistical models in scientific research (Saunders et al., 2012). Prior studies conducted by Appiah et al. (2022b, 2022c) and TzeSan et al. (2022) have employed the aforementioned research methods and techniques. The data utilized for measuring the various structures was sourced from prior studies, as presented in Table 1. All questions were evaluated using a five-point Likert scale, with 1 indicating strong disagreement and 5 indicating strong agreement. The finalized set of questions was forwarded to three (3) experts in the field of green entrepreneurship. Their valuable insights and feedback were instrumental in refining the questions to align with the specific context of this study, which focuses on green entrepreneurship companies in Ghana.

Table 1: Measurement Instruments, Sources and support Theories

Construct (Type of construct)	No. of items	Sources of Items	Underlying Theories
<i>Dependent Variable</i>			
Green Economic Performance	4	Li (2014); Muangmee et al. (2021)	NRBV Theory
Green Environmental Performance	4	Asadi et al. (2020); Muangmee et al. (2021)	NRBV Theory
Green Social Performance	4	Asadi et al. (2020); Muangmee et al. (2021)	NRBV Theory
<i>Independent Variables</i>			
Green Entrepreneurship Orientation	5	Chen (2008) Asadi et al. (2020); Muangmee et al. (2021)	NRBV Theory
<i>Moderating Variable</i>			
Green Dynamic Capability	5	Hung et al. (2010); Singh et al. (2021)	Dynamic Capability theory
Green Innovation Performance	4	Chen (2008) Asadi et al. (2020); Muangmee et al. (2021)	NRBV Theory

Author's Compilation

The study focused on green entrepreneurs in Ghana who have officially registered their businesses with the Registrar General Department within the past five years. A compilation of 1000 entrepreneurs was generated in a random manner from the registered companies' database. Among these, 300 entrepreneurs were identified as operating in sectors such as waste to energy, industrial emission elimination, recycling and waste management, vertical gardens and farms, and solar energy. The chosen companies were contacted via phone to obtain their consent for participation in the survey. Out of the total, 18 companies declined to participate, while 11 companies could not be reached. The questionnaires were distributed to a total of 271 companies that had indicated their interest in participating. Each company's head or owner was provided with a questionnaire to complete. In total, a sum of 239 questionnaires were received, out of which 35 were deemed ineligible for analysis due to incorrect and incomplete responses. A total of 204 questionnaires were utilized in the study, indicating a response rate of 75.3 percent.

This response rate aligns with previous studies conducted by Appiah et al. (2022b; 2022c). The participants were chosen through the implementation of stratified and simple random sampling methodologies. The study employed a stratified sampling technique to classify green entrepreneurs into different strata. Subsequently, samples were drawn from each stratum until a total sample size of 204 was achieved. Random sampling is a highly effective method for ensuring fair representation and minimizing sample errors. To ensure the validity and reliability of our model, we took steps to address common method biases, such as social desirability. We followed the procedures outlined by Podsakoff et al. (2003) to eliminate these biases. The anonymity of the questionnaire was maintained, ensuring that respondents were encouraged to provide honest answers and reassured that there were no correct or incorrect responses. According to Podsakoff et al. (2003), the use of a thoroughly tested and validated scale can effectively reduce task ambiguity. In the conducted study, pre-tested scales were employed to assess the various constructs. During the pilot testing phase, the scale items underwent refinement in order to eliminate any ambiguous concepts, unclear or unfamiliar terms, and ambiguous questions (Podsakoff et al., 2003). A preliminary analysis was conducted on the pilot data to explore the factors present, and it confirmed the multidimensional nature of the data.

The study was analyzed utilizing SMART-Partial Least Square (PLS) and Structural Equation Modelling (SEM) methodologies. One notable distinction between structural equation modelling (SEM) and traditional regression models is the ability of SEM to simultaneously analyze multiple relationships, including mediation and moderation (Hair et al., 2019). Partial Least Squares Structural Equation Modelling (PLS-SEM) offers distinct advantages compared to covariance-based SEM in the context of studying predictive research models and models in the early stages of theoretical development, as demonstrated in the study conducted by Hair et al. (2019). Given that the field of green entrepreneurship and sustainable entrepreneurship is currently in its nascent stage of empirical investigation, the objective of this study was to examine the potential enhancements that can arise from the development of a novel model for green entrepreneurship and sustainable entrepreneurship in terms of actor performance. The PLS-SEM analysis initially presents the outcomes of the measurement model, followed by the results of the complete structural model. This paper employs both mediation and mitigation models. The models underwent thorough analysis, incorporating appropriate checks to ensure that they met the recommended thresholds for a good fit, as outlined by Hair et al. (2019).

The metric weights underwent a thorough evaluation to ensure proper compatibility. As per the recommendation, data points with loads below 0.70 were excluded from the analysis (Hair et al., 2019). The analysis of internal consistency for the constructs indicated that the recommended combined reliability for all items was a minimum of 0.70. When evaluating convergent validity, the Average Variance Extracted (AVE) was found to be greater than 0.5, suggesting satisfactory convergent validity (Hair et al., 2019).

IV. RESULTS

Measurement Model (Discriminant and Convergent Validity)

The assessment of the measurement model has been conducted using discriminant validity and convergent validity measures, as demonstrated in Tables 3 and 4. In order to evaluate the convergent validity, we conducted assessments on the composite reliability (CR), factor loadings, and average variance extracted (AVE) scores. The metric loadings were verified to ensure that they met the required magnitude. The composite analysis of the structures indicates that all items possess a recommended CR (composite reliability) value of 0.70 or greater. In order to validate the CR scores, the factor loadings were evaluated according to recommended guidelines. Items with loadings below 0.70 were excluded from the analysis. The findings indicate that all loadings surpassed the threshold of 0.70, as presented in Table 5 and Figure 2. The assessment of convergent validity involved considering an average variance extracted (AVE) value that exceeds 0.50, which indicates satisfactory convergent validity according to Hair et al. (2019). In order to assess discriminant validity, the square root of the average variance extracted (AVE) scores were evaluated. The results indicated that the scores of the correlated constructs were lower than the values of the square rooted AVEs, which suggests that the discriminant validity is acceptable. The Heterotrait-Monotrait Ratio (HTMT) was employed to validate the AVE measures. In order to establish discriminant validity, it is generally accepted that HTMT ratios should not exceed 0.90. According to Table 4, the HTMT ratio for height was calculated to be 0.766, which is significantly below the threshold of 0.90. Therefore, based on this analysis, it can be concluded that the model demonstrates acceptable discriminant validity (Henseler et al., 2015).

Table 3: Discriminant and Convergent Validity with Fornell and Larcker (1981) Approach

	CA	CR	AVE	GDC	GEP	GEO	GENP	GIP	GSP
GDC	0.889	0.919	0.697	.835					
GEP	0.908	0.936	0.784	.836	.886				
GEO	0.894	0.923	0.706	.652	.785	.840			
GENP	0.899	0.930	0.769	.817	.719	.784	.877		
GIP	0.896	0.928	0.763	.821	.784	.745	.680	.874	
GSP	0.857	0.903	0.699	.814	.809	.765	.715	.685	.836

Note: Square values of the AVEs are shown in the diagonal

Table 4: Heterotrait-Monotrait Ratio (HTMT) Using Henseler et al. (2015) Criteria

	GDC	GEP	GEO	GENP	GIP	GSP
Green Dynamic Capability						
Green Economic Performance	.731					

Green Entrepreneurship Orientation	.052	.746			
Green Environmental Performance	.015	.759	.079		
Green Innovation Performance	.027	.766	.071	.059	
Green Social Performance	.047	.712	.038	.021	.048

GDC=Green Dynamic Capability; GEP=Green Economic Performance; GEO=Green Entrepreneurship Orientation; GENP=Green Environmental Performance; GIP=Green Innovation Performance; GSP=Green Social Performance

Table 5: Output of Variance Inflation Factor (VIF) Test and Cross Loadings

	VIF	GDC	GEP	GEO	GENP	GIP	GSP
GENP	2.534	.308	.329	.425	.888	.275	.249
GENP1	1.834	.321	.313	.525	.820	.219	.215
GENP2	3.017	.229	.486	.397	.892	.296	.386
GENP4	2.401	.242	.490	.60	.904	.239	.241
GDC1	1.806	.719	.409	.319	.593	.299	.286
GDC2	2.617	.910	.130	.271	.568	.210	.234
GDC3	1.876	.788	.227	.221	.541	.103	.256
GDC4	2.886	.902	.197	.220	.535	.228	.248
GDC5	2.179	.839	.120	.369	.459	.273	.209
GEO1	2.569	.342	.190	.860	.404	.339	.341
GEO2	1.765	.432	.171	.753	.449	.650	.454
GEO3	2.248	.429	.386	.897	.492	.396	.486
GEO4	1.754	.498	.403	.780	.439	.456	.333
GEO5	2.998	.450	.421	.899	.476	.376	.445
GEP1	2.964	.422	.884	.338	.472	.357	.399
GEP2	2.434	.433	.864	.385	.435	.207	.383
GEP3	2.933	.436	.886	.483	.468	.373	.305
GEP4	3.161	.467	.908	.371	.488	.235	.277
GIP1	2.641	.429	.249	.381	.455	.901	.211
GIP2	2.051	.430	.311	.350	.492	.814	.262
GIP3	2.921	.435	.359	.312	.373	.856	.259
GIP4	2.816	.221	.113	.225	.120	.919	.815
GSP1	2.732	.242	.290	.160	.204	.239	.841
GSP2	2.502	.329	.349	.281	.255	.301	.911
GSP3	2.034	.220	.342	.338	.314	.194	.787
GSP4	2.275	.141	.214	.475	.239	.242	.800

Structural model

According to Figure 2, the model's predictive accuracy ranged from 0.615 to 0.933. The analysis of the data revealed that the factors of green business attitude and green dynamic capability accounted for 0.933 of the variance observed in green innovation performance. The findings indicate that the adoption of a green business mindset and the possession of green innovation skills account for a significant proportion, specifically 93.3%, of the observed variations in green innovation. The contribution of green innovation performance to the variations in green economic performance is 61.5%. Similarly, it accounts for 91.5% of the differences in green environmental performance and 86.8% of the differences in green social performance. The findings indicate that the model possesses utility and demonstrates substantial predictive capabilities. A forecast relevance test was conducted to verify the accuracy of these results, and the Q-square value of 0.346 indicates that the model is indeed accurate. The results of testing the assumptions and the path coefficients are presented in Table 6 and Figure 3.

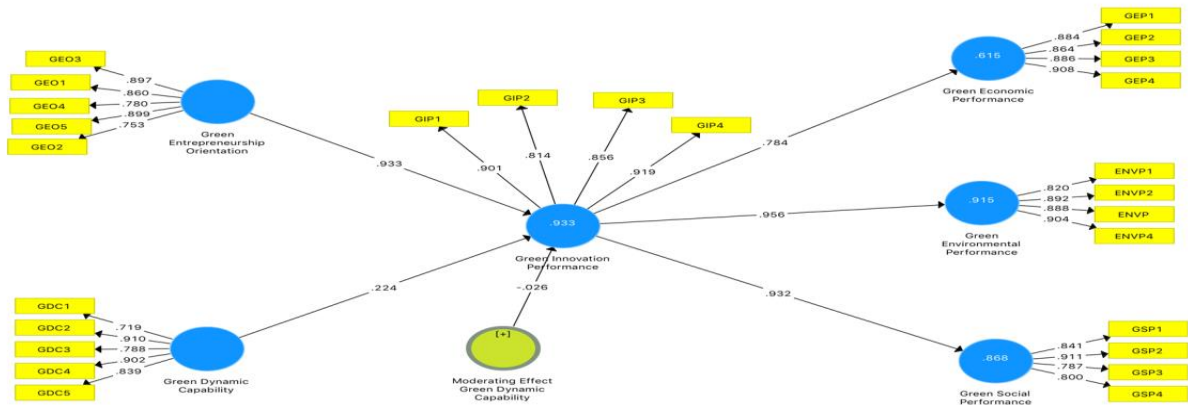


Figure 2: R-square Values and Factor Loadings

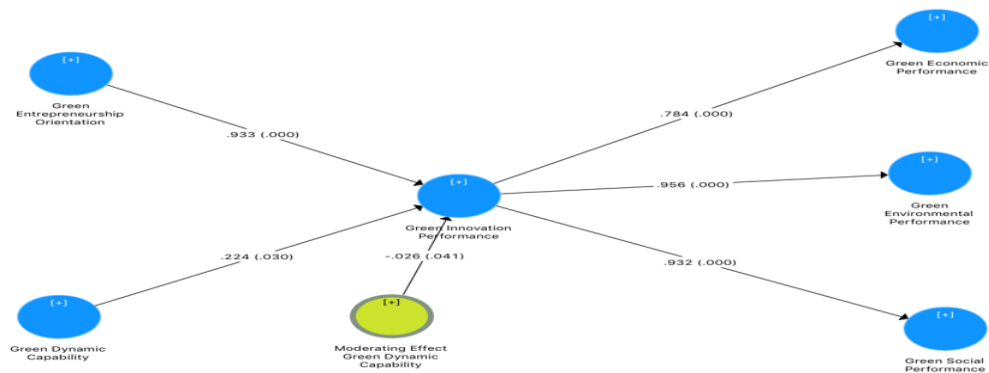


Figure 3: Path-Coefficients and P-values

Table 6: Path Coefficient

Hypothesis	Path-Coefficients	Beta	Mean	Std. D	T-statistics	Decisions
H1	GEO -> GIP	.933	.923	.084	11.050***	Supported
H2	GDC -> GIP	.224	.224	.103	2.181*	Supported
H3	GEO*GIC ->GIP	-.026	-.024	.012	2.055*	Supported
H4	GIP -> GEP	.784	.787	.041	19.180***	Supported
H5	GIP -> GENP	.956	.957	.008	119.338***	Supported
H6	GIP -> GSP	.932	.933	.007	130.965***	Supported
H7	GDC -> GIP -> GEP	.175	.176	.081	2.174*	Supported
H8	GEO -> GIP -> GSP	.869	.861	.079	11.056***	Supported
H9	GEO -> GIP -> GEP	.731	.725	.065	11.221***	Supported
H10	GEO -> GIP -> GENP	.892	.883	.080	11.118***	Supported
H11	GDC -> GIP -> GENP	.214	.215	.098	2.177*	Supported
H12	GDC -> GIP-> GSP	.208	.209	.096	2.177*	Supported

GDC=Green Dynamic Capability; GEP=Green Economic Performance; GEO=Green Entrepreneurship Orientation; GENP=Green Environmental Performance; GIP=Green Innovation Performance; GSP=Green Social Performance; *p<0.05; **p<0.01; ***p< 0.001; ns=not significant

As shown in Table 6, all twelve of the model's assumptions have been proven true. The results, which are shown in Table 6, show that GEO has a significant effect (B=0.899, t-value=11.050) on GIP and that GDC has a significant effect (B=0.224, t-value=2.181) on GIP. The relationship between GEO and GIP is significantly changed by GDC (B = -0.026, t = 2.055). Again, GIP has a significant effect (B= 0.784, t-value= 19.180) on GEP, a significant effect (B= 0.956, t-value= 119.338) on GENP, and a significant effect (B= 0.932, t-value= 130.965) on. Also, the results show that GIP plays a big role in how GDC and Sustainable Performance Dimensions (GEP, GENP, and GSP) relate to each other. Lastly, the data showed that GIP plays a big role in how GEO and Sustainable Performance Dimensions relate to each other.

V. DISCUSSIONS

The purpose of this study was to develop an integrated model that elucidates the relationship between a green business mindset and sustainable company performance. One of the specific research inquiries examines the correlation between Geographic Information Systems (GIS) and the efficacy of environmentally sustainable innovation. Several previous studies (Patel, 2019; Gu, 2022; Luu, 2022; Sebaka and Zhao, 2022) have reached a consensus that a green business mindset positively influences both green innovation performance and firm performance, with environmental, social, and financial factors playing significant roles in this relationship. Additionally, one of the inquiries in the paper aims to examine the impact of environmentally sustainable energy sources on the relationship between GEO and GIP. The findings of our study indicate that the association between an organization's green business attitude and its green innovation capability is notably influenced by its green innovative capability.

The final research question of the paper examines the role of GIP in connecting GEO and sustainable performance dimensions, as well as the role of GIP in connecting GDC and sustainable performance dimensions (Jiang et al., 2018; Habib et al., 2020; Appiah et al., 2022a; Feng et al., 2022; Frare and Beuren, 2022). Based on our initial findings, it is evident that GIP significantly influences the correlation between GDC and sustainable performance factors. Finally, the findings indicate that the Global Innovation Performance (GIP) has a significant impact on the association between Green Entrepreneurial Orientation (GEO) and various aspects of sustainable performance (Wang, 2012; Ahmad, 2015; Rashid et al., 2015; Mancha and Yoder, 2015; Schaltegger et al., 2015; Baumgartner and Rauter, 2017; Adamu et al., 2019). In recent times, numerous developing nations have been rapidly augmenting their energy resources by means of environmentally sustainable business infrastructure. The increasing recognition among policymakers and investors worldwide is attributed to the crucial role of energy in enhancing living standards and sustaining economic growth (Habib et al., 2020; Frare and Beuren, 2022; Appiah et al., 2022a; Feng et al., 2022).

Universities are adapting their curriculum to align with enduring global trends in sectors such as education, healthcare, and sanitation. The concept of green business entails adopting practices that contribute to the preservation of the environment while simultaneously promoting sustainable social and economic development (Sadiku-Dushi, et al., 2019; Sadiku-Dushi et al., 2019). Despite the considerable interest in green business, certain students opt out of pursuing a career in the field due to personal or financial constraints. Given the nascent nature of the green business field, this study contributes novel insights to the existing body of literature on the subject matter. Numerous studies (Miller, 2011; Schaefer et al., 2015; Jiang et al., 2018; Rostain, 2021; Asadi et al., 2020) have demonstrated the significant role of Geographic Information Systems (GIS) in contributing to the sustainability achievements of organizations.

The concept of the Global Entrepreneurship Orientation (GEO) examines the behaviour of companies in relation to risk-taking, innovation, competitive assertiveness, and independence (Covin & Miller, 2014; Guo et al., 2020). The current year is 2019 for Fatoki. GEO facilitates opportunities that contribute to both the economy and the environment by introducing environmentally friendly products and services into the market. According to Pratono et al. (2018) and Feng et al. (2022), The field of GEO encompasses eco-innovation, the pursuit of environmentally friendly opportunities, and a willingness to take calculated risks. In a recent study conducted by Frare and Beuren (2022), the authors examined the impact of green process innovation on the relationship between green business mindset, proactive sustainability strategies, and environmental success within the agri-technology sector. It has been stated that the integration of green process innovation plays a pivotal role in effectively connecting the green business mindset, strategic sustainability strategies, and environmental performance of agri-technology companies.

The study conducted by Nikolaou et al. (2018) examines the factors that motivate entrepreneurs to invest in green business ventures and the impact of such ventures on environmental sustainability. It has been observed that various institutional and resource factors significantly influence the decision-making process of green entrepreneurs. Additionally, specific environmental practices employed by entrepreneurs to address environmental challenges have also been found to be of great significance. Once again, Lăzăroiu et al. (2020a) examine the concept of green procurement within the framework of environmentally beneficial behaviour and the

implementation of sustainable development policies. The authors elucidate the utilization of green procurement as a means to foster the principles of the circular economy, sustainable building materials, and a green and sustainable supply chain. The topics of concern include climate change, pollution, energy, and the carbon footprint. In a comparable study, Sun et al. (2022) examine two emerging nations and ascertain that the adoption of a green business orientation (GBO) plays a pivotal role in fostering the advancement and expansion of green entrepreneurship. The study examined the relationship between intellectual capital (IC) and sustainable business outcomes, specifically focusing on the organizing role of environmental awareness and green technology dynamics. The findings revealed that IC, along with environmental awareness and green technology, significantly influence sustainable outcomes.

VI. CONCLUSIONS AND IMPLICATIONS

Conclusions

The main goal of this study was to build an integrated model that shows how green business mindset and sustainable company performance are related. Our goal is to improve performance by pushing sustainable ways to consume and make things, while also dealing with the urgent problem of climate change. To do this, we'll combine the ideas of the Natural Resource-Based View (NRBV) and the Dynamic Capability Theory, with a focus on situations where resources are limited. The study found that a green business approach improves the performance of green innovation and the total performance of a company in terms of the environment, society, and money. The relationship between green business mindset and green innovation capability is also affected by the green innovative skill in a big way. Again, it's clear that the link between green dynamic capability and sustainable performance is mediated by the appearance of green creative performance. In the link between green business and sustainable performance, the study found that green creative performance played a big role as a middleman. The results of this study have important implications for theory, practice, and society as a whole.

Theoretical Policy and Practical Implications

Policymakers and practitioners can use the new model as a useful tool to teach both young people and adults the skills they need to be successful entrepreneurs. This method is meant to make it easier for people to find good jobs while also solving the urgent need to fight climate change and its effects. The results of this study can be used by green investors to create and share information about sustainability in a useful way. Then, this information can be taken to different operating places and used there. The study has shown that mental constructs like green creative performance and green dynamic capability have a big and good effect on the current link between green business attitude and sustainable firm performance. Entrepreneurs who choose methods that are good for the earth are more likely to do better than their traditional peers. This is because, in addition to making money, they also make important benefits to society and the earth. Because of these things, they have a clear competitive edge in many different businesses. The paper's theoretical effects include the development of a new model that aims to improve the link between green business growth and environmental sustainability in a rising country. Also, by putting together different ideas that don't always agree with each other, we've made a complete model that is very good at predicting what will happen.

This model could help us understand the link between GEO and environmental performance in a more complete way. The new model shows how waste control, product care, and sustainability are all linked. It also talks about how important it is for a company to be able to deal with the environmental worries of its clients quickly and successfully. This point of view is especially important in developing economies, where these kinds of models are not yet well-known. This goal can be reached by using clean technologies and improving systems that make it possible to produce less toxic trash. Green education programs, training, events, and goods can also help promote and improve environmental efforts. The goal of these efforts is to add to the long-term viability of these environmental actions as a whole. The study shows how green business have a lot of important economic and social effects. Researchers have found that these businesses play a key part in solving important problems like unemployment, poverty, and the use of green practices and care for the environment. This makes them different from other businesses in the same field. The results of this study are a big help in achieving Sustainable Development Goals 4, 8, 12, and 13. This makes people more aware of and makes more progress in these areas. The rest of the paper is laid out in the following way.

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Factors Influencing QRIS Feature Acceptance in Bandung Using the Extended UTAUT2

Trracy Nancy Emely Hutagaol¹, Achmad Herlanto Anggono²

^{1,2} School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

As a developing country, Indonesia seeks to improve the welfare of its people and advance national development in several areas, most notably the economy. To achieve this goal, Bank Indonesia has launched QRIS, which promotes financial inclusion and a digital economy. Considering the low level of transaction accounts ownership and use of digital payment in Indonesia, this research aims to identify the significant factors influencing the intention to adopt QRIS among Generation Z in Bandung. By incorporating the UTAUT2 framework and extending the variables of Perceived Security and Trust, this research offers a unique perspective on the adoption of QRIS. The researcher gathered data from 236 respondents through a structured questionnaire and statistical analysis, including PLS-SEM analysis, to assess the factors influencing users' behavioral intention to adopt QRIS. The finding indicates that Habit has the most significant effect on Generation Z's intention to adopt QRIS, with Habit and Behavioral Intention influencing Actual Usage and Trust influencing Behavioral Intention. These results contribute valuable insights to the existing literature by highlighting the specific factors influencing Generation Z's adoption of QRIS and provide valuable insights for policymakers and financial institutions aiming to enhance the adoption of digital payment systems. Strengthening the GNNT requires addressing the substantial influence of Habit on users' willingness to adopt QRIS and fostering trust among users. Implementing the strategies suggested in this research can promote QRIS adoption, enhance financial inclusion, and contribute to Indonesia's national development goals.

Keywords: Extended UTAUT2; E-wallet; Generation Z; QRIS

I. INTRODUCTION

The rapid advancement of digital technology has become a catalyst for economic development and welfare improvement in countries worldwide. In line with this trend, Indonesia has recognized the potential of digitalization to enhance national growth and promote financial inclusion. To address these objectives, Bank Indonesia introduced the National Non-Cash Movement (GNNT) in 2014, aimed at fostering the adoption of digital payment systems and establishing a secure and seamless financial landscape (Bank Indonesia, n.d.). Subsequently, the emergence of the COVID-19 pandemic further accelerated the digitalization process, highlighting the importance of digital payment systems (Fabris, 2022). In response to the growing need for a unified payment standard, Bank Indonesia, in collaboration with the Indonesian Payment System Association, introduced the Quick Response Code Indonesian Standard (QRIS) in 2019. QRIS serves as a comprehensive solution for achieving financial inclusion and accelerating non-cash transactions within the digital economy (Bank Indonesia, n.d.). Currently, five leading e-wallet applications in Indonesia, including Go-pay, Dana, OVO, LinkAja, and Shopee Pay, have adopted the QRIS system, indicating its potential for widespread use (Bank Indonesia, 2019).

The success of the GNNT can be measured through various indicators, including financial inclusion, fiscal health, and economic efficiency (Bank Indonesia, n.d.). In terms of financial inclusion, equal access to transaction accounts is crucial (The World Bank, 2022). However, statistics from the World Bank reveal that only 51.76% of Indonesians possess transaction accounts, while in East Asia & Pacific is 82.85% (The World Bank, 2021). Additionally, digital payment adoption among Indonesians stands at 41.6%, significantly lower than the 72.7% observed in the East Asia and Pacific region. These figures show that there are still a large

number of people who have not adopted digital payments, highlighting the need to improve the utilization of digital payment systems and maximize the adoption rate of the GNNT. Given that the usage level of the payment system influences the GNNT, this research aims to identify the key factors influencing the intention to adopt QRIS on e-wallets. The research utilizes the Extended UTAUT2 model and focuses explicitly on the Generation Z population in Bandung. Generation Z, characterized by their tech-savviness, represents a segment of the population expected to be the key driver of mobile payment adoption in Indonesia. By comprehensively understanding the influential factors shaping their intention to adopt QRIS can strengthen the GNNT, address adoption concerns, and guide the development of mobile payment systems based on public intention.

II. LITERATURE REVIEW

2.1 Electronic Wallet with QRIS Feature

The use of electronic wallets, or e-wallets, has gained popularity as a digital alternative to cash transactions (Duy Phuong et al., 2020). E-wallets can be accessed through mobile devices, such as smartphones, and allow users to deposit money for later transactions. With the advent of QRIS feature, e-wallets have been further enhanced to provide a convenient and efficient payment solution.

QRIS is a QR code-based digital payment service introduced by Bank Indonesia, the central bank of Indonesia. It is recognized for its potential in promoting economic efficiency, financial inclusion, and supporting micro, small, and medium enterprises (Bank Indonesia). Since its establishment as the national standard for QR code payments, QRIS has simplified and accelerated transactions, making them easier, faster, and safer (Bank Indonesia, n.d.).

The implementation of QRIS in Indonesia has gained significant traction, with a growing number of users. Bank Indonesia aims to expand QRIS adoption as a digital payment method to other countries (Yolandha, 2023). QRIS offers two payment methods: Merchant Presented Mode (MPM) and Customer Presented Mode (CPM) (Bank Indonesia, 2019). In MPM, merchants display QR codes for consumers to scan using their mobile phones. CPM allows consumers to present their own QR codes for merchants to scan. Additionally, QRIS introduces the QRIS *Tanpa Tatap Muka* (TTM) feature, enabling users to conduct payment transactions by scanning a QRIS image stored in their smartphone gallery (QRIS.id). This innovation offers convenience and accessibility for remote payments, as long as users have a mobile device, internet connection, and the merchant's QRIS code image.

2.2 Generation Z

Generation Z refers to individuals born between 1997 and 2012 (Dimock, 2019). This generation is characterized as "tech-savvy" due to their exposure to electronic devices from a young age, leading to a reliance on technology. Generation Z utilizes technology for various purposes such as making payments, communicating via text and phone, and engaging on social media platforms (Afgani et al., 2021). In Indonesia, Generation Z represents a significant portion of the population, accounting for approximately 27.94% (Badan Pusat Statistik, 2020). Given their sizable presence, it becomes crucial to understand their attitudes and behaviors towards cashless payments, particularly in the context of transitioning towards a cashless society and adopting digital payment methods like QRIS. This understanding is essential for policymakers, businesses, and financial institutions operating in Indonesia.

2.3 The Unified Theory of Acceptance and Use of Technology (UTAUT)

Focusing on the QRIS feature, which encompasses information technology and systems, it is crucial to construct a research model for technology adoption by drawing upon previous studies. Numerous theoretical frameworks have been developed to analyze the intentions of adopting various types of IT/IS, including TRA, TAM, MM, TPB, C-TAM-TPB, MPCU, IDT, SCT, and UTAUT (Venkatesh, Smith, et al., 2003). UTAUT is a comprehensive theoretical framework investigating the factors influencing user acceptance and usage of IT, aiming to predict the likelihood of technological success (Venkatesh, Smith, et al., 2003). Initially, UTAUT identified four fundamental factors in technological adoption: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Condition (FC). However, Venkatesh, Thong, and Xu (2012) note that the original UTAUT is limited to the organizational environment. To expand the generalizability of UTAUT, they propose the inclusion of three essential constructs: Hedonic Motivation (HM), Price Value (PV), and Habit (HT). Consequently, UTAUT2 becomes more suitable for explaining the consumer context in terms of Behavioral Intention (BI) and Actual Use (AU) of the QRIS feature by customers at merchants. Additionally, Venkatesh, Thong, and Xu (2012) encourage the application of the UTAUT2 model in various contexts by identifying additional relevant characteristics that enhance its applicability. In this study, the researcher integrates the proposed model by (Afgani et al., 2021b) and (Slade et al., 2014), which introduced Perceived Security (PS) and Trust (T) as additions to UTAUT2. The studies stated that Perceived Security (PR) and Trust (T), respectively, affecting behavioral intention of the usage of mobile and proximity payment.

2.4 Hypothesis Development

2.4.1 Performance Expectancy

PE measures individual's belief that utilizing a technology system will enable them to improve work performance (Venkatesh et al., 2003). In the correlation of e-wallets, individuals believe that adopting technology, such as QRIS, to make payments will improve their performance in purchasing transactions. As a result, the following hypothesis emerges.

H1: PE has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

2.4.2 Effort Expectancy

EE describes how easily people use technology, implying each individual will utilize new technology if they believe it will allow them to spend less effort on it (Venkatesh et al., 2003; Rahadi et al., 2020). As a result, the following hypothesis emerges.

H2: EE has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

2.4.3 Social Influence

SI is the extent to which people believe their environment thinks they should adopt a certain technology (Venkatesh et al., 2003). In the implementation, individuals frequently seek more information about a product from others (Megadewandanu et al., 2016). As a result, the following hypothesis emerges.

H3: SI has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

2.4.4 Facilitating Condition

FC is the extent to which people perceive sufficient resources or access exists to support technology adoption (Venkatesh et al., 2003). Moreover, according to Venkatesh, Thong and Xu (2012), in the context of consumer use, a consumer with access to an adequate set of FC is more likely to use technology. As a result, the researcher associates facilitating conditions with both behavioral intention and actual use.

H4a: FC has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

H4b: FC has a positive influence on consumers adoption to use (AU) the QRIS feature on their E-wallet at merchants.

2.4.5 Hedonic Motivation

HM is characterized as the enjoyment or pleasure received when utilizing technology (Venkatesh et al., 2003). It has been proven that HM plays a significant role in adopting and using a technological system (Brown & Venkatesh, 2005). As a result, the following hypothesis emerges.

H5: HM has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

2.4.6 Price Value

The PV represents the consumers' cognitive trade-off between the ostensible advantage of the technology and the financial charge of utilizing them (Dodds et al. 1991, cited in Venkatesh et al., 2012). In the e-wallet context, the PV will be positive when the consumer perceives that the technology's benefits outweigh the financial cost, and according to a prior study such PV positively impacts the intention to use the QR Code payment (Suo et al., 2021). As a result, the following hypothesis emerges.

H6: PV has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

2.4.7 Habit

HT is equivalent to automaticity (Kim et al. 2005, cited in Venkatesh et al., 2012). It examines the degree to which a person behaves automatically as a result of acquiring knowledge (Limayem et al. 2007, cited in Venkatesh et al., 2012). Previous research has implemented a survey and perception-based method for habit measurement. This operationalization of habit has been shown to have a direct impact on technology use in addition to the effect of intention, as well as to moderate the impact of intent on technology use so that intention becomes less critical as habit increases (Limayem et al. 2007, cited in Venkatesh et al., 2012). Therefore, the researcher associates habit with both behavioral intention and actual use.

H7a: HT has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

H7b: HT has a positive influence on consumers adoption to use (AU) the QRIS feature on their E-wallet at merchants.

2.4.8 Perceived Security

Security is a set of computer mechanisms that guarantee information source authentication and safeguard the confidentiality of related parties to prevent losses to specific parties (Afgani et al., 2021). In the correlation of E-

wallets, PS is the degree to which individuals feel secure when using certain technology systems to make payment transactions (Lim 2003, cited in Lonardi and Legowo, 2021). As a result, the following hypothesis emerges.

H8: PS has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

2.4.9 Trust

Trust is an essential factor associated with “uncertainty” and “dependency”. In the context of online transactions, this factor assumes critical importance since they must exchange their personal and financial information with the seller. The payment system would struggle to attract users if it didn't gain users' trust (Lonardi & Legowo, 2021). As a result, the following hypothesis emerges.

H9: T has a positive influence on consumers BI in using the QRIS feature on their E-wallet at merchants.

2.4.10 Trust

BI is a circumstance in which an individual's behavior influences the actual usage of a technology (Venkatesh et al., 2003). As a result, the following hypothesis emerges.

H10: BI has a positive influence on consumers adoption to use (AU) the QRIS feature on their E-wallet at merchants.

2.5 Conceptual Framework

This study will present a conceptual framework, depicted in Figure 1, derived from a thorough examination of various literary sources.

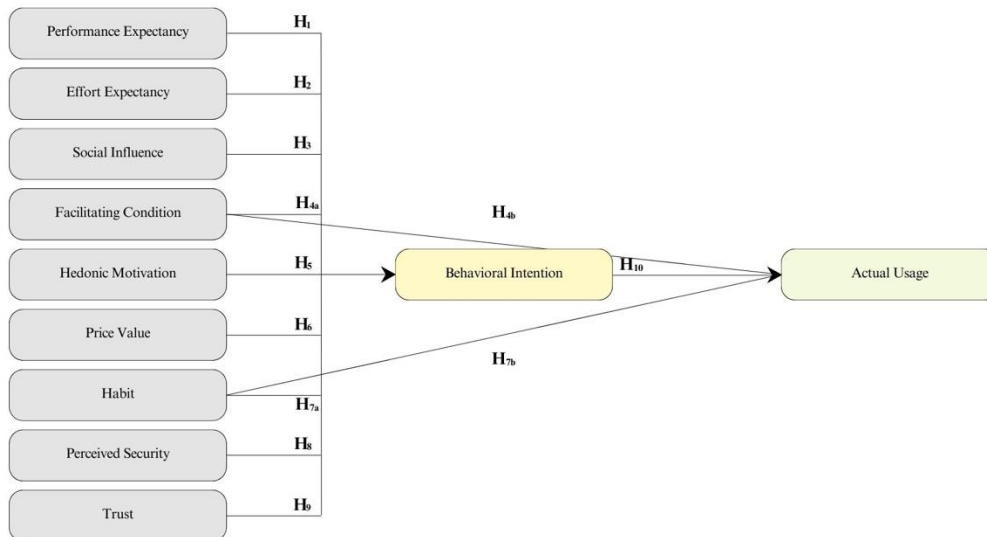


Figure 8. Conceptual Framework (Afgani et al., 2021a; Slade et al., 2014; Venkatesh et al., 2012)

III. RESEARCH METHODOLOGY



Figure 1.. Research Design

The research begins by identifying the current issues related to mobile payment services in Indonesia, supported by secondary data from journals, conference proceedings, and websites. The study's primary goal is to explore the factors influencing the adoption of the QRIS feature on e-wallets among Generation Z in Bandung City after the COVID-19 pandemic. To examine these factors, the research utilizes the Extended UTAUT2 framework proposed by Venkatesh et al. (2012), incorporating an additional construct of Perceived Security and Trust to gain insights into the underlying reasons for the actual usage of the feature.

The researcher employs a primary data approach using a quantitative method by disseminating an online survey to at least 200 targeted respondents (Wong, 2013). Furthermore, the population for this study comprises Generation Z individuals in Bandung City, defined as those born between 1997 and 2012 (Dimock, 2019). These individuals have engaged in purchasing transactions using the mobile payment system, particularly the QRIS feature. Additionally, the use of e-wallets requires a national ID card as part of the user's identity. As stated in Perpres Nomor 96 Tahun 2018 article 15, individuals must be at least 17 years old to have a KTP-el (JDIH BPK RI, 2018). Therefore, the population will consist of individuals aged 17 to 26. Given the specific criteria that respondents must fulfil, the researcher uses non-probability sampling techniques, specifically purposive sampling. The questionnaires are accessible on Google Forms and distributed through various communication channels, including civitas email, LINE, WhatsApp, and Instagram direct messengers.

The online survey consists of two sections with different sets of questions. The first section primarily focuses on gathering information about the respondent's profile. The second section pertains to the adoption of QRIS. In this section, there will be 31 questions rated on a 5-Point Likert scale, where 1 indicates "Strongly Disagree" and 5 represents "Strongly Agree." Question 31 will utilize a scale from 1, indicating "Never", to 5 representing "Very Often". Below is an outline of the questionnaire.

Table 66. Socio-demographic variable

Variable Description
Email Address
Gender
Age Educational Level
Domicile
QRIS User
QRIS Monthly Expenses

Table 67. Questionnaire Items

Variable	Code	Questionnaire Items	Source
PE1		The usage of the QR Code feature is useful for my life	(Venkatesh et al., 2012)

Performance Expectancy	PE2	By using the QR Code feature, it makes it easier for me to complete payment transactions faster	
	PE3	Using the QR Code feature can increase my productivity	
	EE1	It is easy for me to learn how to use the QR Code feature	
Effort Expectancy	EE2	The use of the QR Code feature is clear and easy to understand	(Venkatesh et al., 2012)
	EE3	It is easy for me to become skilled in using the QR Code feature	
	SI1	People around me use the QRIS feature	
Social Influence	SI2	The people around me think that I should use the QRIS feature	(Venkatesh et al., 2012)
	SI3	The people around me influence me to use the QRIS feature on my E-wallet	
	FC1	I have sufficient resources to use the QR Code feature	
Facilitating Condition	FC2	I have sufficient knowledge to use the QR Code feature	(Venkatesh et al., 2012)
	FC3	The use of the QR Code feature is supported & compatible with other technologies that I use (Example: Internet Connection)	
	HM1	Using the QR Code feature is fun for me	
Hedonic Motivation	HM2	I enjoy using the QR Code feature	(Venkatesh et al., 2012)
	HM3	I am entertained using the QR Code feature	
	PV1	QRIS offers reasonable administrative fees to use when transacting	
Price Value	PV2	I get affordable service prices when making transactions using the QRIS feature	(Venkatesh et al., 2012)
	PV3	The administration fee offered by QRIS is equivalent to the service I got	
	HT1	Using the QR Code feature has become a habit for me	
Habit	HT2	I feel addicted to using the QR Code feature	(Venkatesh et al., 2012)
	HT3	I have to use the QR Code feature	
	PS1	I feel that using the QR Code is safe because of security assurance	
Perceived Security	PS2	I feel that my data privacy is guaranteed when using the QR Code feature in transactions	(Afgani et al., 2021a)
	PS3	I feel safe using the QR Code because assistance is provided from the Call Center if there are problems in the transaction process	
	T1	I find the QR Code feature to be trusted	
Trust	T2	I feel that the QR Code feature lives up to the promise and commitment that is offered in the feature	(Lee, 2005; Zhou, 2013)
	T3	I feel the QR Code feature maintains the interest of its users	
	BI1	I intend to continue using the QR Code feature in the future	
Behavioral Intention	BI2	I predict that I will always use the QR Code feature in my daily life	(Venkatesh et al., 2012)
	BI3	I plan to frequently use the QR Code feature as a payment method	
	Never		
Actual Usage	AU	Rarely: 1x in 2 months	
		Sometimes: 1-3x in 1 month	(Venkatesh et al., 2012)
		Often: 1-3x in 2-3 days	

Very Often: Several times in 1 day

Once the required number of respondents is reached, the subsequent step involves data analysis, divided into descriptive and statistical analysis. Descriptive analysis is utilized to examine the distribution of the data. For statistical analysis, the methodology employed is PLS-SEM, as it allows for assessing a complex model with multiple paths, indicators, and constructs (Hair et al., 2019).

IV. RESULT / FINDING

4.1 Descriptive Analysis

Table 3 summarize socio-demographic information or the profile of the respondents. The criteria for participants include having already used the QRIS feature, being born between 1997 and 2006, and residing in Bandung City. The researcher successfully obtained a total of 243 respondents. However, out of those, only 236 met the specified criteria, which is still satisfactory as the minimum required sample size is 200 respondents.

Table 68. Socio-demographic Respondent

Demographic	Frequency	%	
Gender	Male		
	Female		
Age	17	2.5%	
	18	9.9%	
	19	21.4%	
	20	21.4%	
	21	29.2%	
	22	5.8%	
	23	3.3%	
	24	4.5%	
	25	0.8%	
	26	1.2%	
Educational Level	Senior High	9	
	Diploma	1	
	Bachelor Degree	205	
	Master Degree	10	
	Employee	17	
Domicile in Bandung	Employee and Student	1	
	Yes	239	98.4%
	No	4	1.6%
QRIS Usage Status	Yes	236	98.7%

	No	3	1.3%
	< Rp 100.000	35	14,80%
	Rp 100.000 - Rp 300.000	61	25,80%
QRIS Monthly Expenses	Rp 300.001 - Rp 500.000	58	24,60%
	> Rp 500.000	82	34,70%

4.2 Statistical Analysis

4.2.1 Measurement Model

This test evaluates the relationships between observed variables and their underlying constructs (Hair et al., 2014). In this study, the Extended UTAUT2 model is assessed for validity and reliability through four test phases: indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. The PLS Algorithm in SmartPLS 4.0 is utilized to obtain the validity and reliability values.

Table 4. Indicator Loadings Result

	Outer loadings	Indicator loadings
AU <- Actual Usage	1	1
BII <- Behavioral Intention	0,923	0,851929
BI2 <- Behavioral Intention	0,905	0,819025
BI3 <- Behavioral Intention	0,937	0,877969
EE1 <- Effort Expectancy	0,941	0,885481
EE2 <- Effort Expectancy	0,947	0,896809
EE3 <- Effort Expectancy	0,914	0,835396
FC1 <- Facilitating Condition	0,889	0,790321
FC2 <- Facilitating Condition	0,904	0,817216
FC3 <- Facilitating Condition	0,879	0,772641
HM1 <- Hedonic Motivation	0,942	0,887364
HM2 <- Hedonic Motivation	0,927	0,859329
HM3 <- Hedonic Motivation	0,858	0,736164
HT1 <- Habit	0,839	0,703921
HT2 <- Habit	0,879	0,772641
HT3 <- Habit	0,821	0,674041
PE1 <- Performance Expectancy	0,926	0,857476
PE2 <- Performance Expectancy	0,914	0,835396
PE3 <- Performance Expectancy	0,782	0,611524

PS1 <- Perceived Security	0,923	0,851929
PS2 <- Perceived Security	0,936	0,876096
PS3 <- Perceived Security	0,877	0,769129
PV1 <- Price Value	0,889	0,790321
PV2 <- Price Value	0,833	0,693889
PV3 <- Price Value	0,901	0,811801
SII <- Social Influence	0,825	0,680625
SI2 <- Social Influence	0,845	0,714025
SI3 <- Social Influence	0,741	0,549081
T1 <- Trust	0,892	0,795664
T2 <- Trust	0,934	0,872356
T3 <- Trust	0,9	0,81

In the indicator reliability test, the square of each outer loading is examined, with a preferred minimum value of 0.70 (Wong, 2013; Hair et al., 2019). However, a value of 0.4 or greater is still considered acceptable (Wong, 2013). The results of the indicator reliability test in this study indicate that all indicator loadings are reliable as they exceed the minimum requirement of 0.40.

Table 5. Internal Consistency Reliability and Convergent Validity Result

Indicators	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance Extracted (AVE)
BI	0,912	0,914	0,944	0,85
EE	0,927	0,928	0,954	0,873
FC	0,87	0,871	0,92	0,793
HT	0,805	0,818	0,883	0,717
HM	0,896	0,916	0,935	0,827
PS	0,899	0,901	0,937	0,833
PE	0,846	0,865	0,908	0,768
PV	0,847	0,861	0,907	0,765
SI	0,74	0,779	0,846	0,648
T	0,894	0,894	0,934	0,825

Next, the internal consistency reliability of the construct measures is assessed using composite reliability. The minimum accepted value for composite reliability is 0.7 (or 0.6 for exploratory studies) (Hair et al., 2019). According to the results, all constructs in this research surpass the required minimum value, indicating a high internal consistency reliability.

Convergent validity is then evaluated by analyzing the average variance extracted (AVE) value. An acceptable AVE value is 0.5 or greater (Hair et al., 2019). The outcomes indicate that all AVE values exceed the acceptable threshold, confirming the convergent validity of the latent variables.

Table 69. Discriminant Validity Result

	AU	BI	EE	FC	HT	HM	PS	PE	PV	SI	T
AU											
BI	0,47										
EE	0,289	0,651									
FC	0,31	0,721	0,879								
HT	0,509	0,758	0,45	0,527							
HM	0,275	0,676	0,736	0,791	0,661						
PS	0,191	0,62	0,548	0,591	0,561	0,61					
PE	0,325	0,74	0,858	0,875	0,624	0,847	0,599				
PV	0,191	0,636	0,648	0,762	0,642	0,821	0,646	0,695			
SI	0,29	0,533	0,474	0,575	0,709	0,65	0,563	0,58	0,68		
T	0,294	0,779	0,702	0,777	0,644	0,744	0,889	0,756	0,759	0,687	

Finally, the researcher assesses discriminant validity, which measures the distinctiveness of each construct from others. This research uses correlations' heterotrait-monotrait ratio (HTMT) to evaluate the validity. A maximum value of 0.9 is recommended when latent variables are conceptually similar (Hair et al., 2019). The result shows that all values are below the maximum threshold of 0.9, implying that each variable fulfils the discriminant validity test and the measurement model test overall.

4.2.2 Multicollinearity Assessment

Table 70. VIF Result

AU	BI1	BI2	BI3	EE1	EE2	EE3	FC1	FC2	FC3	HMI	HM2	HM3	HT1	HT2	HT3
1,0	3,3	2,7	3,6	4,6	4,8	2,8	2,4	2,6	2,1	3,8	3,2	2,2	1,5	2,3	2,0
PE1	PE2	PE3	PS1	PS2	PS3	PV1	PV2	PV3	SI1	SI2	SI3	T1	T2	T3	
3,3	3,2	1,5	3,4	3,8	2,2	2,1	1,9	2,3	1,3	2,0	1,7	2,5	3,5	2,7	

The researcher employed the VIF to assess the presence of multicollinearity among the indicators. The findings show that all VIF values are less than 5, indicating no multicollinearity issue with the indicators.

4.2.3 Structural Model and Hypotheses Testing

A structural model is employed to evaluate the relationships of latent variables (Hair et al., 2014). As stated by Hair et al. (2019), the standard assessment criteria are the R^2 , the Stone-Geisser Q^2 measure, and the path coefficients (β). The following is the result of the evaluation model.

Table 71. Structural Model Result

Variables	R-square	SSO	SSE	$Q^2 (=1-SSE/SSO)$
AU	0,254	236	181,871	0,229
BI	0,648	708	327,412	0,538

The R-squared value (R^2) is used to measure the amount of variance explained by independent variables on dependent variables (Hair et al., 2019). Guidelines suggest that an R^2 value of 0.25 is weak, 0.50 is moderate, and 0.75 is substantial. In this study, the R^2 value for Behavioral Intention is 0.648 or 64.8%, indicating a moderate level of variance explained. This means that PE, EE, SI, FC, HM, PV, HT, PS, and T collectively explain 64.8% of Behavioral Intention. On the other hand, the R^2 value for Actual Use is 0.254 or 25.4%, indicating a weak level of variance explained. FC, HT, and BI together explain 25.4% of Actual Use. The remaining percentage of variance in each endogenous variable is explained by other independent variables not included in this research framework.

Cross-validated Redundancy (Q^2) is used to evaluate the predictive relevance of the inner model (Hair et al., 2019). Q^2 values should be greater than 0 for a specific endogenous construct to demonstrate the predictive accuracy of the structural model. The researcher performs the Blindfolding procedure to obtain the Q^2 value. In this study, both Behavioral Intention and Actual Usage have Q^2 values above 0, indicating that they pass the predictive relevance test. The values of BI and AU are 0.538 and 0.229, respectively, indicating large and medium predictive relevance.

Table 72. f^2 Result

	AU	BI	EE	FC	HT	HM	PS	PE	PV	SI	T
AU		0,039		0	0,069						
BI			0,004	0,019	0,213	0	0	0,012	0,001	0,011	0,081

The effect size (f^2) is calculated to assess the strength of relationships (Hair et al., 2019). According to the general rule of thumb by Cohen, a value of 0.02 indicates a small effect size, 0.15 indicates a medium effect size, and 0.35 indicates a large effect size. In this study, the relationship between HT and BI has a medium f^2 effect size of 0.213. The remaining relationships have small f^2 effect sizes towards the relevant variables.

Table 73. Hypothesis Testing

Hypothesis	Path coefficients	T statistics (O/STDEV)	P values	Result	Conclusion
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H1	PE → BI	0,119	1,399	0,162	Insignificant	Rejected
H2	EE → BI	0,066	0,809	0,419	Insignificant	Rejected
H3	SI → BI	-0,083	1,174	0,241	Insignificant	Rejected
H4a	FC → BI	0,155	1,486	0,137	Insignificant	Rejected
H4b	FC → AU	-0,023	0,233	0,816	Insignificant	Rejected
H5	HM → BI	0,001	0,009	0,993	Insignificant	Rejected
H6	PV → BI	-0,022	0,305	0,76	Insignificant	Rejected
H7a	HT → BI	0,37	5,791	0	Positively Significant	Accepted
H7b	HT → AU	0,303	3,765	0	Positively Significant	Accepted
H8	PS → BI	-0,018	0,221	0,825	Insignificant	Rejected
H9	T → BI	0,35	3,488	0	Positively Significant	Accepted
H10	BI → AU	0,264	2,708	0,007	Positively Significant	Accepted

In this section, the researcher performs the bootstrapping procedure to obtain the structural values using SmartPLS 4.0. A two-tailed t-test with a 5% significance level and 95% confidence interval is used (Wong, 2013). A path coefficient is considered significant if the p-value is below 0.05 and the t-value is greater than 1.96.

The results in Table 10 indicate that eight relationships have a t-value less than 1.96 and a p-value greater than 0.05, leading to the rejection of those hypotheses. The rejected hypotheses include EE→BI, FC→AU, FC→BI, HM→BI, PS→BI, PE→BI, PV→BI, and SI→BI. However, there are four hypotheses that meet the significance criteria: BI→AU, HT→AU, HT→BI, and T→BI. Therefore, the researcher concludes that 4 out of 12 hypotheses are accepted.

The path coefficient test measures the influence of independent variables on dependent variables. The results show that Habit has the largest path coefficient value of 0.37, indicating its strong influence on Behavioral Intention. Trust also has a significant influence on Behavioral Intention, with a path coefficient value of 0.35. In the case of Actual Usage, Habit has the strongest influence, followed by Behavioral Intention, with path coefficient values of 0.303 and 0.264, respectively. These findings imply that a one-point increase in each independent variable leads to an increase in the dependent variable by the value indicated by the path coefficient. The remaining path coefficient results do not represent the population of QRIS users in Bandung as the path significance test confirms their insignificant influence on Behavioral Intention and Actual Usage.

V. DISCUSSION

5.1 PE towards BI

PE did not significantly affect BI. PE measures an individual's belief that adopting the QRIS feature will increase their work performance. The result indicates that the usefulness and quickness of utilizing QRIS do not significantly affect the user's intention to adopt the technology. Moreover, the productivity gains by adopting the

technology also have no contribution to influencing the intention to use the QRIS feature. In other words, even though the respondents perceive the QRIS feature positively and express the will to use it, their intention is not influenced by their expectations of performance. This finding occurred because people may feel that if QRIS had become ingrained in someone's routine, they would use it without giving too much attention to whether or not there was an improvement in work performance. Conversely, if QRIS is not part of someone's daily life, they still have other alternative digital payment systems, such as debit or credit cards. The result is in line with previous research (Afgani et al., 2021a; Megadewandanu et al., 2016)

5.2 EE towards BI

EE did not significantly influence BI. EE describes how easily people use QRIS, implying each individual will utilize the feature if they believe it will allow them to spend less effort on it. This research found that EE does not significantly influence users' intention to adopt QRIS. The easiness of the learning process, the clear understanding, and the simplicity of using the feature proficiently are found insignificant. It may happen because the target respondents of this research are Generation Z, who tend to rely on technology. The generation is regarded as tech-savvy since they have been exposed to technology since birth making them familiar with it. As a result, EE is not taken into consideration when determining whether a person will adopt the QRIS feature on e-wallets. This finding is aligned with prior studies which concluded that PV has no significant influence towards BI (Afgani et al., 2021a; Slade et al., 2014; Suo et al., 2021; Tiara Imani & Herlanto Anggono, 2020; Widodo et al., 2019).

5.3 SI towards BI

SI did not significantly influence BI. SI shows the extent to which individual believes their environment thinks they should adopt a certain technology. According to the result, SI does not significantly drive users to use the QRIS feature on e-wallets. It occurred because QRIS is a well-known technology in Indonesia, considering that the Central Bank of Indonesia launched and mandated the use of this product in 2020, and several sectors have already adopted this payment system. Without their significant others, users could still intend to adopt the feature. Other than that, the users may not value their surrounding people's opinions about using a certain technology because they will still adopt QRIS due to the habits formed in their daily activities. This finding aligns with prior research (Batoro, 2020; Puasa et al., 2021; Tiara Imani & Herlanto Anggono, 2020; Widodo et al., 2019).

5.4a FC towards BI

FC did not significantly influence BI. FC is associated with the extent to which people perceive sufficient resources or access exists to support QRIS adoption. The result indicates that the adequacy of knowledge and resources are not significantly affecting the intention to use QRIS. This can happen because the user values trust more than their facilitation condition. If the user does not trust the payment system, they will not intend to use it even though they have sufficient knowledge and resources. The finding is in line with previous research (Batoro, 2020; Megadewandanu et al., 2016; Slade et al., 2014; Suo et al., 2021).

5.4b FC towards AU

FC did not significantly influence AU. FC is also found to have no significant influence on the actual adoption of the QRIS feature. Although, according to the descriptive statistic result, the average user may have the resources and knowledge needed, it is not enough to convince them to actually utilize the feature. The reason behind it is, as previously mentioned in H4a, the user values trust more than their current facilitation condition.

Users only intend to adopt the QRIS feature if the system is credible and trusted. This finding is aligned with prior research (Batoro, 2020; Lonardi & Legowo, 2021; Tiara Imani & Herlanto Anggono, 2020).

5.5 HM towards BI

HM did not significantly influence BI. HM depicts the enjoyment received when utilizing the QRIS feature. The result indicates that the feeling of fun, joy, and entertainment of QRIS does not statistically influence users' intention to use QRIS. It can happen because the user focuses on the function of QRIS as their daily payment system rather than a thing that gives them entertainment. Aside from that, it is possible that the user did not utilize the QRIS feature to purchase valuable or pleasurable items, preferring to use a different payment method like a credit card instead because it enables them to make instalments. This reason is strengthened by the fact that 65.3% of the respondents spend less than IDR 500,000 on QRIS payments per month. The result aligns with prior studies that concluded that HM does not significantly affect consumers' intent to utilize QRIS (Slade et al., 2014; Suo et al., 2021; Widodo et al., 2019).

5.6 PV towards BI

PV did not influence BI. PV represents the consumers' cognitive trade-off between the apparent advantage of the QRIS feature and its financial charge. The result indicates that reasonable administration fees, affordable service prices, and equality between services and administration fees from QRIS do not contribute and significantly affects the user's intention to adopt the technology. It can happen because when QRIS has become widely adopted and integrated into daily life, users may already be familiar with their usage and benefit. In such cases, the administration fees and service prices may have a lesser impact on behavioral intention since consumers have already recognized the value and trustworthiness of the QRIS payment system. This finding is aligned with prior research who concluded that PV has no significant influence towards BI (Batoro, 2020; Megadewandanu et al., 2016; Slade et al., 2014; Tiara Imani & Herlanto Anggono, 2020; Widodo et al., 2019).

5.7a HT towards BI

HT significantly influenced BI. HT shows how a person behaves automatically because of acquiring knowledge. According to Table 4.14, HT has the most significant positive effect on the intention to adopt the QRIS feature. This result may occur as the target respondents are Generation Z, who are accustomed to being exposed to technologies since birth and have made using technology part of their habit. The finding aligns with prior studies (Megadewandanu et al., 2016; Slade et al., 2014; Suo et al., 2021; Tiara Imani & Herlanto Anggono, 2020; Widodo et al., 2019).

5.7b HT towards AU

HT significantly influenced AU. As discussed in H7a, a person's interest in intending to employ technology in their daily activities increases as they become more familiar with it. The result demonstrates that HT positively impacts the actual adoption (AU) of the QRIS feature. This may occur since the survey found that 42.6% of respondents have already utilized the QRIS feature several times a day (Very Often), followed by 30.40% of respondents who used it one to three times in two to three days (Often). It indicates that users have developed a habit of using QRIS on e-wallets. When a behavior becomes a habit, it requires less conscious effort and decision-making, making it more likely for people to adopt QRIS in their life and increasing the likelihood of continued usage. The finding is consistent with prior research who found that HT positively influences the user behavior of the electronic wallet (Batoro, 2020).

5.8 PS towards BI

PS did not significantly influence BI. PS indicates how individuals feel secure when using QRIS to make payment transactions. The result shows that security assurance, data privacy guarantees, and customer service from QRIS insignificantly influence the user's intention to adopt the feature. It may happen since the user's trust in the payment provider, including financial institutions and regulatory bodies, might overshadow the importance of Perceived Security for QRIS. If they have a high level of trust in this overall payment system, they may assume that QRIS operates in the same secure framework. The finding contrasts with a previous study which concluded that PS significantly affects Behavioral Intention to adopt a mobile payment system and QRIS (Afgani et al., 2021a; Lonardi & Legowo, 2021)

5.9 T towards BI

T significantly influenced BI. The level of user trust in the QRIS feature is closely linked to their perception of the e-wallet service. Since using the feature requires personal and financial information, mobile payment providers must gain and maintain users' trust to attract them to utilize their services. When users trust the QRIS payment system, they are more likely to have positive behavioral intentions and willingly adopt it in practice. The finding underscores that the intention to utilize the QRIS feature is influenced by the payment provider's credibility, commitment, and adherence to keeping the interest of users who use the technology. This outcome aligns with previous studies on adopting proximity mobile payments and digital wallets (Slade et al., 2014; Widodo et al., 2019).

5.10 BI towards AU

BI significantly influenced AU. BI depicts an individual's intention to actually and continually utilize the QRIS feature in the future. The survey findings show that the consumers intend to persistently utilize this feature, express a willingness to use it daily and plan to adopt it as their preferred payment method frequently. This finding aligns with previous studies (Batoro, 2020; Lonardi & Legowo, 2021; Tiara Imani & Herlanto Anggono, 2020; Venkatesh, Morris, et al., 2003).

VI. CONCLUSION AND RECOMMENDATION

The research on QRIS adoption in e-wallets concludes that H and T are the key factors influencing the BI and AU of QRIS among Generation Z in Bandung City. Users who form habits and have trust in the payment system are more inclined to adopt QRIS and utilize it regularly. Conversely, factors such as PE, EE, SI, FC, HM, PV, and PS do not significantly influence QRIS adoption. Furthermore, H emerges as the most critical factor, exerting a positive influence on both BI and AU of QRIS. By focusing on habit formation and building trust, payment providers can promote greater acceptance and utilization of QRIS. Based on the findings, the researcher offers several recommendations to strengthen GNNT. Hence, financial inclusion will be increased.

6.1 Recommendation for Industry

This research has important implications for the adoption of QRIS features, and the researcher provides several recommendations based on the statistical results and the current state of QRIS. It is recommended that the industry conducts further research and adjusts strategies according to market conditions.

Given that habit is the strongest influencing factor, the industry should aim to integrate the QRIS feature into people's daily habits. This can be achieved by simplifying the scanning process, ensuring user-friendliness

across different platforms and devices, and incentivizing frequent usage through discounts, loyalty programs, or other incentives. Moreover, habit directly affects the actual usage of the QRIS feature, so the industry should collaborate with a wide range of merchants, including SMEs, fashion retailers, and service providers, to encourage the formation of habits towards utilizing QRIS in real-life transactions.

Building trust is another critical variable influencing users' intention to use QRIS. To address this, the industry should provide transparent information about privacy and data protection, alleviating users' concerns about sharing personal information during transactions. Establishing partnerships with reputable stakeholders can also enhance trust and credibility. Additionally, the researcher proposes that continuous user feedback collection and analysis is crucial. This will aid in developing strategies to make the QRIS feature more inclusive and accessible to all, thereby strengthening users' behavioral intention to actively utilize the feature in their daily lives.

6.2 Recommendation for Government

The result of the conducted research has implications for the Indonesian government's efforts to enhance the adoption of a cashless society. In order to build trust, the researcher recommends that the government strengthen the enforcement of existing data protection regulations. This would ensure financial institutions adhere to security standards when handling user data. The laws should clearly define the responsibilities of businesses regarding data handling, storage, encryption, and breach notification. Furthermore, the government should establish penalties for fraudulent activities or hacking incidents aimed at QRIS payments. The government can also allocate resources to improve the infrastructure required to support QRIS. This may involve enhancing internet connectivity and expanding mobile network coverage.

6.3 Recommendation for Further Research

Based on the result, the researcher recommends modifying the Extended UTAUT2 model by incorporating other constructs to increase the level of significant variance. Through this analysis, a deeper understanding of the context of Actual Usage can be obtained, particularly regarding the frequent use of QRIS in daily life. Furthermore, the identified significant constructs can serve as a reference for determining the adoption of QRIS features based on existing literature.

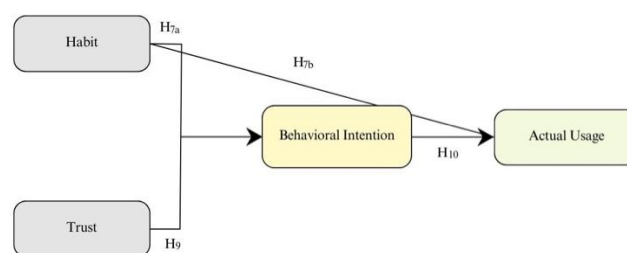


Figure 9. Modified Conceptual Framework

Additionally, researchers need to compare the target of QRIS usage and current industry and government programs. This comparative analysis will offer valuable discernment into the efficacy of the current strategy in achieving its intended goals, as well as how QRIS aligns with broader industry and government initiatives. Lastly, since the research was limited to Generation Z in Bandung City, future studies are encouraged to broaden their scope to a national level and include a larger sample size. This more comprehensive approach will result in a more robust, reliable, representative, and applicable understanding of the subject matter in the real world.

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Sustainable Collaboration in Business,
Technology, Information and Innovation

The Impact of Environmental, Social, and Governance (ESG) Towards Corporate Financial Performance in The Energy Sector

Fa'iq Ezza Sadewa¹

¹Institut Teknologi Bandung, School of Business and Management, Bandung, Indonesia

Abstract

This study aims to understand the relationship between corporate sustainability (ESG) and corporate financial performance of companies in the energy sector. In total, there are 138 companies in energy sector from 30 countries observed. The author used ESG performance score, Environmental performance score, social performance score, and Governance performance score as the independent variables. The dependent variables are ROA, ROE, and Tobin's Q. There are three control variables, which are firms' size, firms' leverage, and GDP growth. For data analysis, the author utilized panel data regression by using Stata and Rstudio to reach the conclusion of this study. The author generated 12 models. Among those models, corporate sustainability indicators are significant in 8 models. However, the findings show a mixed relationship of corporate sustainability impact on corporate financial performance. There is a robust finding that ESG performance score, Environmental performance score, Social performance score, and Governance performance score are significant and positively correlated with the financial performances, which are ROA and ROE. Meanwhile, the result of the data analysis in Tobin's Q shows that ESG performance score, Environmental performance score, Social performance score, and Governance performance score are either insignificant or negatively correlated with the financial performances. However, despite the mixed result, the findings indicate a strong tendency to accept the hypothesis that corporate sustainability has a positive impact on the financial performance of companies in the energy sector.

Keyword: corporate sustainability; corporate financial performance; energy sector

I. INTRODUCTION

In an era marked by growing concerns about sustainability and the imperative transition to a low-carbon economy, the importance of Environmental, Social, and Governance (ESG) factors in the energy sector cannot be overstated. With sustainability focusing on meeting present needs without compromising future generations, and ESG providing non-financial measures to evaluate an organization's impact on society, the environment, and stakeholders, both concepts are central to contemporary business strategies (Armstrong, 2020).

Recent research emphasizes the intricate relationship between ESG performance and financial risks and rewards in the energy sector. Firms exhibiting strong ESG practices may experience decreased financial risks and improved customer loyalty, whereas weak ESG management may result in reputational damage and reduced investment (Białkowski & Sławik, 2022; Wong & Zhang, 2022). Despite substantial progress, gaps persist in comprehensively understanding the complexity and dynamics between ESG and financial performance. Disparate findings across various studies reveal an incomplete picture, demanding a more nuanced exploration (Domanović, 2021).

With an accelerating transition towards sustainability, understanding the multifaceted relationship between ESG performance and financial outcomes becomes a crucial concern for companies. This research is particularly urgent, given the growing global commitment to sustainability, consumer behavior towards low-carbon emissions, and Net Zero pledges.

This study addresses three primary objectives within this context. Firstly, it aims to analyze the impact of corporate sustainability on the financial performance of companies in the energy sector.

Understanding this connection can provide insights into how sustainability practices affect profitability and growth. Secondly, the research focuses on determining the specific factors of corporate sustainability that influence financial performance in the energy sector. This involves a nuanced look into which elements of sustainability have the most substantial impact on financial outcomes. Lastly, the study sets out to recommend strategies for companies in the energy sector, considering the balance between corporate sustainability, financial performance, consumer behavior towards low-carbon emissions, and Net Zero commitments. These recommendations will provide actionable insights for aligning business practices with broader sustainability goals.

II. LITERATURE REVIEW

The incorporation of corporate sustainability in the energy sector is increasingly recognized as a pivotal factor that encompasses not only ethical imperatives but also strategic advantages for energy companies. Emphasizing sustainability enables energy firms to align with international treaties such as SDGs, UNGC, and The Paris Agreement (Sovacool, 2022), manage environmental risks (Gitelman et al., 2017), foster stakeholder engagement, and align with investor expectations (Paganin, 2021). Additionally, the relationship between corporate sustainability and financial performance has been explored, with evidence showing benefits in terms of cost reduction (Russo & FOUTS, 1997), innovation (Hart, 1995), positive brand reputation (Luo & Bhattacharya, 2006), and attracting sustainable investments (Riedl & Smeets, 2017). However, the feedback suggests that further empirical evidence from previous research would provide more robust substantiation of these findings. Integrating case studies or quantifiable results from existing literature could reinforce the understanding of how sustainability practices translate into financial performance and strategic advantage in the energy sector.

Return on Assets (ROA)

Return on Total Assets (ROA), also referred to as Return on Investment (ROI), serves as a metric to assess the efficiency with which a company's management generates profits from its available assets. A higher ROA indicates a stronger financial performance (Gitman & Zutter, 2015). ROA is considered a vital financial ratio used by investors, analysts, and other stakeholders to evaluate a company's financial performance. It provides insights into how effectively a company utilizes its total assets to generate profits and is widely utilized as a benchmark to compare the profitability of different firms. The formula is shown below:

$$\text{Return on Assets} = \frac{\text{Earnings available for common stockholders}}{\text{Total assets}} \quad (1)$$

Return on Equity (ROE)

Return on Equity (ROE) is a fundamental financial ratio that measures the profitability and efficiency with which a company generates returns for its shareholders. It provides insight into how a business successfully generates profits with its equity capital. Understanding the importance of ROE and its determinants is essential for assessing financial performance in the energy sector. Essentially, the formula is shown below:

$$\text{Return on Equity} = \frac{\text{Earnings available for common stockholders}}{\text{Common stock equity}} \quad (2)$$

Tobin's Q

Tobin's Q, a concept developed by Nobel Laureate James Tobin, is a ratio calculated by dividing a company's market value by the cost to replace its assets (Tobin & Brainard, 1976). It is interpreted as a measure of market expectations regarding the company's growth potential and the success of its investment strategies (Lang & Stulz, 1994). When the Tobin's Q ratio is greater than one, it indicates that the market places a higher value on a company's future earnings potential than on its current assets, indicating that it is a good investment. On the other hand, a Q value less than 1 implies that the market value is lower than the replacement cost, indicating potential undervaluation (Chung & Pruitt, 1994). The relationship between ESG factors and Tobin's Q may be complex and affected by a number of variables, including the existence of ESG initiatives, market expectations, and the broader economic and regulatory environment. The formula for calculating Tobin's Q is shown below:

$$Tobin's\ Q = \frac{Total\ market\ capitalization}{Total\ assets} \quad (3)$$

III. RESEARCH METHODOLOGY

The research explores the relationship between corporate sustainability and financial performance in the energy sector, starting with problem identification, which involved challenges such as data quality and sample selection. A literature review was conducted to understand previous work in this area and form the basis for the hypotheses that corporate sustainability (including environmental, social, and governance performance) impacts corporate financial performance. The four hypotheses collectively propose that corporate sustainability (including environmental, social, and governance performance) positively impacts the corporate financial performance (CFP) of companies in the energy sector. Data from 1723 companies was initially collected, but after filtering for validity, only 138 companies were used for analysis. The data processing was done using Stata for Mac, and the analysis involved multiple standard tests and regression methods to ascertain the relationships. These structured and detailed steps provided a comprehensive and reliable foundation for the research, ensuring its accuracy.

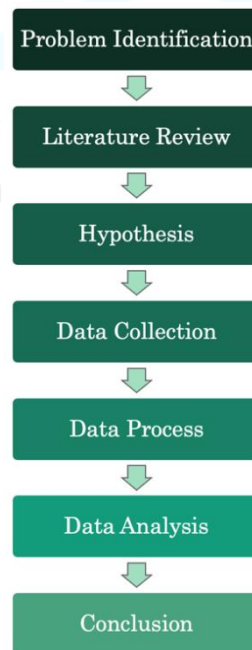


Figure 1. Research Design

IV. RESULT/FINDINGS

The author utilized a primary model to examine the connection between financial performance and corporate sustainability. The model investigates this relationship for the duration of the observation period, from 2018 to 2022. The independent variables in this model consist of ESG (Environmental, Social, and Governance)

scores and individual scores for Environmental (E), Social (S), and Governance (G) dimensions. There are three dependent variables: Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q. Consequently, a total of 12 models are estimated, with each model corresponding to one of the four panels based on the particular dependent variable.

Models 1-4 in Panel A investigate the relationship between the independent variables and the dependent variable ROA. The relationship between the independent variables and the dependent variable ROE is the focus of Panel B, which consists of Models 5 through 8. Tobin's Q serves as the financial performance indicator for Panel C, with Models 9 through 12 examining its relationship with the independent variables. Each model within these panels represents a distinct combination of independent variables related to corporate sustainability, such as the ESG score, E score, S score, and G score.

In addition, the author conducts classical assumption tests to guarantee the models' validity. These tests consist of those for normality, multicollinearity, heteroscedasticity, and autocorrelation. In addition, the author used the Chow test, the Hausman test, and the Lagrange Multiplier test to estimate regression. The data is treated with clustered standard errors to address potential issues of heteroskedasticity and autocorrelation, resulting in a more robust analysis. Table 74. Panel A

	Model 1	Model 2	Model 3	Model 4
Chow	0.0000	0.0000	0.0000	0.0000
Hausman	0.0001	0.0025	0.0001	0.0023
Mean VIF	1.0828	1.0887	1.0823	1.0321
BP Test	0.0000	0.0000	0.0000	0.0000

Variables	Labels	VIF	Coef.	P-value	VIF	Coef.	P-value	VIF	Coef.	P-value	VIF	Coef.	P-value
Constant													
ESG	ESG	1.15	0.0015	0.000***									
E	EP				1.16	0.0009	0.0004***						
S	SP							1.11	0.0013	0.0000***			
G	GP										1.03	0.0616%	0.0136*
Total assets	TA	1.15	0.0000	0.003**	1.16	0.0000	0.0023**	1.11	0.0000	0.0025**	1.03	0.0001%	0.0017**
Debt-to-equity	DTE	1.02	-0.0108	0.1388	1.02	-0.0106	0.1408	1.02	-0.0109	0.1301	1.02	-1.0040%	0.1494
GDP Growth	GDP	1.02	0.0036	0.000**	1.02	0.0036	0.0000***	1.02	0.0037	0.0000***	1.02	0.3729%	0.0000***
N			2.2650			2.2650			2.2650			2.2650	
R-squared			14.38%			12.93%			14.39%			12.31%	
Adjusted R-squared			-7.65%			-9.48%			-7.64%			-10.25%	

* 5%
 ** 1%
 *** 0.1%

The provided table illustrates a panel data regression analysis conducted to examine the relationship between Return on Equity (ROE) and corporate sustainability. The dependent variable in this analysis is expressed as a ratio. For models 5, 6, 7, and 8, the independent variables include ESG score, E score, S score, and G score, respectively. These variables are measured as decimal values, with the previous year's score (t-1) being utilized. Additionally, the measurements for total assets are in billions of US dollars, debt-to-equity is represented as a ratio, and GDP growth is expressed as a decimal. The sample for this analysis consists of 138 companies from 30 countries, covering the fiscal years 2018 to 2022. The regression is estimated using methods such as pooled least squares, fixed effects, or random effects, and the Chow, Hausman, and Lagrange Multiplier (LM) tests are employed. It is important to note that all the models do not exhibit normality, however, due to the large sample size, the credibility of the study is not compromised. The mean Variance Inflation Factor (VIF) is used to detect any issues related to multicollinearity, while the Breusch-Pagan (BP) test is employed to identify heteroskedasticity. To address heteroskedasticity and autocorrelation problems, the author employs clustered standard error. Statistical significance levels are denoted by *, **, and ***, representing 5%, 1%, and 0.1% significance levels, respectively.

Model 1: The Relationship between ESG and ROA

The relationship between ESG and ROA in Model 1 is established through the coefficient of 0.0015, which is statistically significant at the 0.001 level. It signifies that with an increase in the ESG score by one unit, there is an increase in ROA by 0.1463%. This result is in line with the stakeholder theory proposed by Freeman (1984), which asserts that companies considering the interests of all stakeholders, including environmental, social, and governance aspects, are more likely to perform better financially. This theory further emphasizes the importance of socially responsible actions and governance structures in maintaining good relationships with stakeholders, subsequently benefiting the firm's long-term growth and sustainability. The logical justification for this positive association lies in the growing consumer preference for companies that demonstrate social responsibility. This paradigm shift in consumer behavior can be attributed to the increasing awareness about environmental and social issues. Companies that invest in ESG initiatives not only contribute positively towards these global concerns but also enhance their reputation. This, in turn, drives customer loyalty and sales, thereby improving their profitability (Fernando et al., 2017).

In addition, total assets are found to have a positive correlation with ROA, established through the coefficient of 0.0000, which is statistically significant at the 0.01 level. It signifies that with an increase in the TA score by one unit, there is an increase in ROA by 0.0001%. It is supported by the resource-based view (RBV) theory by Barney (1991). The RBV suggests that a firm's assets, being unique and valuable resources, give it the capability to formulate and implement strategies that improve efficiency and effectiveness. From a logical standpoint, firms with a larger asset base have more resources at their disposal to generate revenues, leading to higher profitability. This is consistent with the economies of scale concept, which suggests that larger firms are able to achieve cost advantages due to their size, output, or scale of operation.

However, the Debt-to-Equity ratio shows no significant correlation with ROA, established through the coefficient of -0.0108, which is statistically insignificant with P-value of 0.1388. It signifies that with an increase in the DTE score by one unit, there is a decrease in ROA by 1.0824%. This actually aligns with Modigliani and Miller's (1958) theory of capital structure irrelevance. This theory suggests that a firm's financial performance is independent of its capital structure under ideal conditions without taxes, bankruptcy costs, or asymmetrical information. The lack of correlation between leverage and ROA in the model implies that the impact of capital structure on profitability might be contingent on other factors. These could include industry characteristics, firm-specific factors, and macroeconomic conditions, as suggested by Frank and Goyal (2009).

Lastly, GDP Growth presents a positive and significant relationship with ROA, established through the coefficient of 0.0036, which is statistically significant at the 0.01 level. It signifies that with an increase in the GDP score by one unit, there is an increase in ROA by 0.3577%. This suggests that companies perform better during periods of economic growth, providing a logical link to macroeconomic theory of business cycles (Kydland & Prescott, 1982). In periods of economic growth, consumer spending typically increases, creating higher demand for products and services. This increased demand can improve company sales and profitability. The observed association also supports the findings of Nissim and Penman (2001), who noticed that GDP growth and corporate profitability are closely linked, reflecting the broader economic prosperity of individual firms' performance.

Model 2: The Relationship between Environmental Performance (EP) and ROA

The relationship between Environmental Performance (EP) and ROA in Model 2 is demonstrated through the coefficient of 0.0009, which is statistically significant at the 0.001 level. It signifies that with an increase in the EP score by one unit, there is an increase in ROA by 0.0883%. This positive relationship supports Hart's Natural-Resource-Based View (NRBV), which posits that environmentally friendly strategies provide firms with competitive advantages leading to better financial performance (Hart, 1995). Further studies by Luo and Bhattacharya (2006) and Flammer (2013) have shown that high environmental performance enhances a company's appeal to customers, boosting sales and profitability, and also increases its market value. In a logical context, as society grows more conscious of environmental issues, companies demonstrating strong environmental performance can attract greater customer support. This shift in consumer behavior can translate to higher sales and improved profitability.

Regarding the control variables, Total Assets (TA) is found to positively correlate with ROA, established through the coefficient of 0.0000, which is statistically significant at the 0.01 level. It signifies that with an increase in the TA score by one unit, there is an increase in ROA by 0.0001%. It is supported by the Resource-Based View (RBV) theory by Barney (1991). RBV argues that a firm's assets, being unique and valuable resources, enable it to develop and execute strategies that enhance its efficiency and effectiveness (Barney, 1991; Peteraf, 1993;

Wernerfelt, 1984). This theory aligns with the notion of economies of scale, where larger firms, due to their size and scale of operation, can achieve cost advantages (Panzar and Willig, 1981).

In contrast, the Debt-to-Equity (DTE) ratio doesn't have a significant correlation with ROA, established through the coefficient of -0.0106, which is statistically insignificant with P-value of 0.1408. It signifies that with an increase in the DTE score by one unit, there is a decrease in ROA by 1.0603%. It is consistent with Modigliani and Miller's (1958) capital structure irrelevance theory, which postulates that a firm's financial performance is independent of its capital structure in an ideal market (Modigliani and Miller, 1958; Miller, 1977). This suggests that the impact of a company's leverage on its profitability might be contingent on other factors, such as industry-specific factors and macroeconomic conditions (Frank and Goyal, 2009; Harris and Raviv, 1991).

Finally, GDP Growth maintains a positive and significant relationship with ROA, established through the coefficient of 0.0036, which is statistically significant at the 0.001 level. It signifies that with an increase in the GDP score by one unit, there is an increase in ROA by 0.3620%. This observation corroborates the macroeconomic theory of business cycles by Kydland and Prescott (1982), suggesting companies perform better during periods of economic growth. It also aligns with the findings of Nissim and Penman (2001) and Fama (1981) who observed a close linkage between GDP growth and corporate profitability.

Model 3: The Relationship between Social Performance (SP) and ROA

In Model 3, Social Performance (SP) is found to have a statistically significant relationship with ROA, as indicated by a coefficient of 0.0013 at a significance level of 0.0001. It signifies that with an increase in the SP score by one unit, there is an increase in ROA by 0.1324%. This echoes stakeholder theory, which posits that firms that cater to a broad range of stakeholders, including the community and society at large, tend to perform better financially (Freeman, 1984; Donaldson and Preston, 1995). Empirical work by Waddock and Graves (1997) and Margolis and Walsh (2003) also provide evidence for a positive correlation between social performance and financial performance. In terms of logical justification, firms with high social performance often enjoy an enhanced reputation, increased customer loyalty, and a stronger social license to operate. These benefits can result in higher sales and better profitability (Barnett and Salomon, 2006; Du, Bhattacharya and Sen, 2010).

As for the control variables, Total Assets (TA) once again show a positive correlation with ROA, established through the coefficient of 0.0000, which is statistically significant at the 0.01 level. It signifies that with an increase in the TA score by one unit, there is an increase in ROA by 0.0001%. It is supported by the RBV theory (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984), while the Debt-to-Equity (DTE) ratio doesn't exhibit a significant correlation with ROA, established through the coefficient of -0.0109, which is statistically insignificant with P-value of 0.1301. It signifies that with an increase in the DTE score by one unit, there is a decrease in ROA by 1.0854%. It aligns with Modigliani and Miller's capital structure irrelevance theory (Modigliani and Miller, 1958; Miller, 1977). Similarly, GDP Growth continues to demonstrate a positive relationship with ROA, established through the coefficient of 0.0037, which is statistically significant at the 0.001 level. It signifies that with an increase in the GDP score by one unit, there is an increase in ROA by 0.3677%. It aligns with the macroeconomic theory of business cycles by Kydland and Prescott (1982) and the empirical findings of Nissim and Penman (2001) and Fama (1981).

Model 4: The Relationship between Governance Performance (GP) and ROA

In Model 4, Governance Performance (GP) demonstrates a significant relationship with ROA, with a coefficient of 0.0006 at a 0.05 significance level. It signifies that with an increase in the GP score by one unit, there is an increase in ROA by 0.0616%. This aligns with agency theory, suggesting that better governance mechanisms can help mitigate agency problems, thus improving financial performance (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). Prior empirical research by Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2009) also suggests a positive association between governance quality and firm performance. The logical link here is that strong corporate governance can help firms make more efficient decisions, mitigate risks, and build trust with investors and other stakeholders, all of which can lead to improved profitability (Bhagat and Bolton, 2008; Claessens and Yurtoglu, 2013).

The control variables follow a similar pattern to the previous models. Total Assets (TA) are positively associated with ROA, established through the coefficient of 0.0000, which is statistically significant at the 0.01

level. It signifies that with an increase in the TA score by one unit, there is an increase in ROA by 0.0001%. It reinforces the RBV theory (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). The Debt-to-Equity (DTE) ratio again doesn't show a significant correlation with ROA, which is statistically insignificant with P-value of 0.1494. It signifies that with an increase in the DTE score by one unit, there is a decrease in ROA by 1.0040%. It is consistent with Modigliani and Miller's capital structure irrelevance theory (Modigliani and Miller, 1958; Miller, 1977). Lastly, GDP Growth maintains its positive relationship with ROA, established through the coefficient of 0.0037, which is statistically significant at the 0.001 level. It signifies that with an increase in the GDP score by one unit, there is an increase in ROA by 0.3729%. It is supported by the macroeconomic theory of business cycles by Kydland and Prescott (1982) and the empirical findings of Nissim and Penman (2001) and Fama (1981).

Table 75. Panel B

Panel (B) Dependent Variable: Return to Equity (ROE)													
		Model 5			Model 6			Model 7			Model 8		
Chow		0.0000			0.0000			0.0000			0.0000		
Hausman		0.0008			0.0000			0.0000			0.0000		
Mean VIF		1.0858			1.1117			1.0823			1.0321		
BP Test		0.0000			0.0000			0.0000			0.0000		
Variables	Labels	VIF	Coef.	P-value	VIF	Coef.	P-value	VIF	Coef.	P-value	VIF	Coef.	P-value
Constant													
ESG	ESG	1.15	0.0027	0.0075**									
E	EP				1.16	0.0017	0.0264*						
S	SP							1.12	0.0022	0.0084**			
G	GP										1.04	0.0012	0.0818
Total assets	TA	1.16	0.0000	0.0037**	1.17	0.0000	0.0031**	1.12	0.0000	0.0031**	1.04	0.0000	0.0019**
Debt-to-equity	DTE	1.02	-0.0610	0.0311*	1.02	-0.0607	0.0314*	1.02	-0.0610	0.0296*	1.03	-0.0596	0.0308*
GDP Growth	GDP	1.02	0.0088	0.0000***	1.02	0.0089	0.0000***	1.02	0.0090	0.0000***	1.02	0.0091	0.0000***
N		17.2660			17.2660			17.2660			17.2660		
R-squared		20.09%			19.55%			19.95%			19.30%		
Adjusted R-squared		-0.47%			-1.14%			-0.65%			-1.47%		
* 5%													
** 1%													
*** 0.1%													

The provided table illustrates a panel data regression analysis conducted to examine the relationship between Return on Equity (ROE) and corporate sustainability. The dependent variable in this analysis is expressed as a ratio. For models 5, 6, 7, and 8, the independent variables include ESG score, E score, S score, and G score, respectively. These variables are measured as decimal values, with the previous year's score (t-1) being utilized. Additionally, the measurements for total assets are in billions of US dollars, debt-to-equity is represented as a ratio, and GDP growth is expressed as a decimal. The sample for this analysis consists of 138 companies from 30 countries, covering the fiscal years 2018 to 2022. The regression is estimated using methods such as pooled least squares, fixed effects, or random effects, and the Chow, Hausman, and Lagrange Multiplier (LM) tests are employed. It is important to note that all the models do not exhibit normality, however, due to the large sample size, the credibility of the study is not compromised. The mean Variance Inflation Factor (VIF) is used to detect any issues related to multicollinearity, while the Breusch-Pagan (BP) test is employed to identify heteroskedasticity. To address heteroskedasticity and autocorrelation problems, the author employs clustered standard error. Statistical significance levels are denoted by *, **, and ***, representing 5%, 1%, and 0.1% significance levels, respectively.

Model 5: The Relationship between ESG and ROE

The relationship between ESG and ROE in Model 5 is represented by the coefficient of 0.0027, which is statistically significant at the 0.01 level. This suggests that for every unit increase in ESG score, there is an increase in ROE by 0.27%. This result is consistent with the stakeholder theory proposed by Freeman (1984), which posits that firms considering the interests of all stakeholders—including environmental, social, and governance aspects—

are more likely to deliver better financial performance. The logical rationale for this positive association can be attributed to the growing consumer preference for socially responsible companies, reflecting increased global awareness about environmental and social issues (Fernando et al., 2017).

Total assets maintain a positive correlation with ROE, as depicted by the coefficient of 0.0000, statistically significant at the 0.01 level. This means that with each unit increase in total assets, there is an increase in ROE by 0.0001%. This aligns with the Resource-Based View (RBV) theory by Barney (1991), suggesting that a firm's unique and valuable assets enable it to devise and execute strategies that enhance efficiency and effectiveness. In practice, firms with larger asset bases have more resources to generate revenues, leading to higher profitability.

Conversely, the Debt-to-Equity ratio shows a negative correlation with ROE, with the coefficient of -0.0610, which is statistically significant at the 0.05 level. This suggests that with each unit increase in the Debt-to-Equity ratio, there is a decrease in ROE by 6.1%. This aligns with Modigliani and Miller's (1958) theory of capital structure irrelevance under ideal conditions, implying that a firm's financial performance is independent of its capital structure. The lack of correlation between leverage and ROE in the model implies that the influence of capital structure on profitability might depend on other factors such as industry characteristics, firm-specific factors, and macroeconomic conditions (Frank & Goyal, 2009).

Lastly, GDP Growth has a positive and significant relationship with ROE, represented by the coefficient of 0.0088, statistically significant at the 0.001 level. This suggests that with each unit increase in GDP Growth, there is an increase in ROE by 0.88%. This relationship aligns with the macroeconomic theory of business cycles (Kydland & Prescott, 1982). During periods of economic growth, consumer spending usually rises, creating higher demand for products and services. This increased demand can boost company sales and profitability. This association also supports the findings of Nissim and Penman (2001), who observed a close link between GDP growth and corporate profitability.

Model 6: The Relationship between Environmental Performance (EP) and ROE

In Model 6, the relationship between Environmental Performance (EP) and ROE is presented through a coefficient of 0.0017, statistically significant at the 0.05 level. This implies that an increase in the EP score by one unit leads to a 0.17% increase in ROE. This association is supported by the natural-resource-based view (NRBV) advanced by Hart (1995), which suggests that proactive environmental strategies can lead to competitive advantages and improved financial performance. This may be due to increased operational efficiency, innovation, and improved stakeholder relations (Endrikat, Guenther & Hoppe, 2014). The positive relationship could also be attributed to the increasing importance consumers place on environmental stewardship, leading to greater market opportunities for companies with high environmental performance.

The total assets exhibit a positive correlation with ROE, indicated through a coefficient of 0.0000, statistically significant at the 0.01 level. This suggests that with each unit increase in the TA score, there is a 0.0001% increase in ROE. This aligns with the resource-based view (RBV) theory by Barney (1991), suggesting that larger firms, by virtue of their greater assets, have more resources at their disposal to generate revenues, thereby leading to higher profitability.

The Debt-to-Equity ratio shows a negative correlation with ROE, with a coefficient of -0.0607, statistically significant at the 0.05 level. This implies that with an increase in the DTE score by one unit, there is a decrease in ROE by 6.07%. This is consistent with the financial risk theory, suggesting that higher levels of debt can lead to increased financial risk and, hence, can negatively impact profitability (Kraus & Litzenberger, 1973).

Lastly, GDP Growth presents a positive and significant relationship with ROE, indicated by a coefficient of 0.0089, statistically significant at the 0.001 level. This implies that with an increase in the GDP score by one unit, there is an increase in ROE by 0.89%. This result aligns with the macroeconomic theory of business cycles (Kydland & Prescott, 1982), suggesting that firms perform better during periods of economic growth.

Model 7: The Relationship between Social Performance (SP) and ROE

In Model 7, a positive relationship between Social Performance (SP) and ROE is observed through a coefficient of 0.0022, statistically significant at the 0.01 level. This suggests that for each unit increase in the SP score, ROE increases by 0.22%. This supports the social contract theory, which posits that businesses, as part of society, have certain social responsibilities and those who fulfil these responsibilities are rewarded in various ways (Donaldson & Preston, 1995). Companies with strong social performance are likely to have better relationships with their stakeholders, which could result in improved financial performance (Servaes & Tamayo, 2013).

Total assets again show a positive correlation with ROE, indicated by a coefficient of 0.0000, statistically significant at the 0.01 level. This suggests that with each unit increase in the TA score, there is a 0.0001% increase in ROE. This aligns with the resource-based view (RBV) theory by Barney (1991).

The Debt-to-Equity ratio continues to show a negative correlation with ROE, with a coefficient of -0.0610, statistically significant at the 0.05 level. This suggests that with an increase in the DTE score by one unit, there is a decrease in ROE by 6.10%. This aligns with the financial risk theory (Kraus & Litzenberger, 1973).

Lastly, GDP Growth shows a positive and significant relationship with ROE, with a coefficient of 0.0090, statistically significant at the 0.001 level. This suggests that with an increase in the GDP score by one unit, there is an increase in ROE by 0.90%. This result aligns with the macroeconomic theory of business cycles (Kydland & Prescott, 1982).

Model 8: The Relationship between Governance Performance (GP) and ROE

The relationship between Governance Performance (GP) and ROE in Model 8 is observed through the coefficient of 0.0012. However, this relationship is not statistically significant at the traditional 0.05 level, as its p-value is 0.0818. The relationship can be explained theoretically through the agency theory proposed by Jensen and Meckling (1976). This theory asserts that better governance structures align the interests of managers and shareholders, leading to improved company performance. However, this statistical insignificance might suggest that other factors beyond GP might have greater influence over ROE or that there may be variations across industries and companies in terms of how governance practices affect financial performance (Bhagat & Bolton, 2008).

Total assets exhibit a positive correlation with ROE, as established through the coefficient of 0.0000, which is statistically significant at the 0.01 level. It suggests that with an increase in the TA score by one unit, there is an increase in ROE by 0.0001%. This aligns with the resource-based view (RBV) theory by Barney (1991). The theory suggests that firms with a larger asset base have more resources at their disposal to generate revenues, leading to higher profitability. Economies of scale, suggesting that larger firms can achieve cost advantages due to their size, output, or scale of operation, provide a logical justification for this positive relationship (Coad, 2010).

The Debt-to-Equity ratio shows a negative correlation with ROE, as indicated by the coefficient of -0.0596, which is statistically significant at the 0.05 level. This suggests that with an increase in the DTE score by one unit, there is a decrease in ROE by 5.96%. This aligns with the financial risk theory which suggests that higher levels of debt can lead to increased financial risk and hence can have a negative impact on profitability (Kraus & Litzenberger, 1973). This negative relationship could also be due to potential bankruptcy costs associated with higher debt levels, as suggested by Myers (2001).

Lastly, GDP Growth presents a positive and significant relationship with ROE, as indicated by the coefficient of 0.0091, which is statistically significant at the 0.001 level. It suggests that with an increase in the GDP growth rate by one unit, there is an increase in ROE by 0.91%. This supports the macroeconomic theory of business cycles (Kydland & Prescott, 1982), where periods of economic growth typically result in increased consumer spending and higher demand for products and services, which can improve company profitability. This relationship also aligns with the findings of Fama (1981), who found a close association between GDP growth and corporate profitability.

The provided table presents a panel data regression analysis aimed at examining the relationship between Tobin's Q and corporate sustainability. The dependent variable in this analysis is expressed as a ratio. Models 9, 10, 11, and 12 utilize ESG score, E score, S score, and G score, respectively, as the independent variables. These

variables are measured as decimal values, with the previous year's score (t-1) being utilized. Additionally, total assets are measured in billions of US dollars, debt-to-equity is represented as a ratio, and GDP growth is expressed as a decimal. The sample for this analysis consists of 138 companies from 30 countries, covering the fiscal years 2018 to 2022. The regression is estimated using methods such as pooled least squares, fixed effects, or random effects, and the Chow, Hausman, and Lagrange Multiplier (LM) tests are employed. It is worth noting that all the models do not exhibit normality; however, due to the large sample size, the credibility of the study is not compromised. The mean Variance Inflation Factor (VIF) is utilized to detect potential multicollinearity issues, while the Breusch-Pagan (BP) test is employed to identify heteroskedasticity. To address heteroscedasticity and autocorrelation problems, the author employs clustered standard error. The statistical significance levels are denoted by *, **, and ***, representing 5 percent, 1 percent, and 0.1 percent significance levels, respectively.

Table 76. Panel C

Panel (C) Dependent Variable: Tobin's Q													
		Model 9			Model 10			Model 11			Model 12		
Chow		0.0000			0.0000			0.0000			0.0000		
Hausman		0.0360			0.0000			0.0006			0.0000		
Mean VIF		1.0297			1.1117			1.0823			1.0321		
BP Test		0.0000			0.0000			0.0000			0.0000		
Variables	Labels	VIF	Coef.	P-value	VIF	Coef.	P-value	VIF	Coef.	P-value	VIF	Coef.	P-value
Constant													
ESG	ESG	1.03	-0.0003	0.2613	1.03	-0.00002	0.8918	1.15	-0.0001	0.6483	1.04	-0.0004	0.0460*
E	EP												
S	SP												
G	GP												
Total assets	TA	1.03	-0.0000001	0.0091**	1.03	-0.0000002	0.0010**	1.14	-0.0000001	0.0013**	1.04	-0.0000001	0.0299*
Debt-to-equity	DTE	1.02	-0.0002	0.6787	1.02	-0.0004	0.5466	1.02	-0.0003	0.5642	1.03	-0.0003	0.5738
GDP Growth	GDP	1.03	0.0003	0.0888	1.03	0.0003	0.1332	1.02	0.0003	0.1559	1.02	0.0004	0.0906
N		0.4807			0.4807			0.4807			0.4807		
R-squared		0.78%			0.28%			0.32%			2.26%		
Adjusted R-squared		-24.75%			-25.38%			-25.33%			-22.89%		

* 5%
** 1%
*** 0.1%

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Model 9: The Relationship between ESG and Tobin's Q

In Model 9, the coefficient of ESG is -0.0003 with a p-value of 0.2613, which is statistically insignificant. This suggests that there's no significant relationship between the ESG score and Tobin's Q in this model. This also suggests that an increase in the ESG score by one unit corresponds with a decrease in Tobin's Q by 0.03%. This finding deviates from the stakeholder theory suggested by Freeman (1984), which expects a positive association between ESG performance and firm value. It aligns more closely with Friedman's (1970) traditional view that the primary responsibility of businesses is to increase profits and that investing resources in ESG initiatives might not contribute to shareholder value.

The coefficient of Total Assets (TA) in the model is 0.0000, and it is statistically significant with a p-value of 0.0091 and 0.01 level. It suggests that with an increase in the TA score by one unit, there is a decrease in Tobin's Q by 0.0001%.

Similarly, the coefficient for Debt-to-Equity ratio (DTE) is -0.0002 with a p-value of 0.6787, which is statistically insignificant. It suggests that with an increase in the DTE score by one unit, there is a decrease in Tobin's Q by 0.0230%. This also suggests that leverage does not have a significant impact on Tobin's Q in this model. This could be because the advantages of debt (tax shield) and its disadvantages (financial distress costs) offset each other, making the overall effect on firm value insignificant.

Lastly, the coefficient of GDP Growth (GDP) is 0.0003, statistically insignificant with a p-value of 0.0888. This suggests that during periods of economic growth, firms tend to have a higher Tobin's Q. It aligns with the macroeconomic theory that suggests a positive relationship between economic growth and firm value.

Model 10: The Relationship between Environmental Performance (EP) and Tobin's Q

The relationship between Environmental Performance (EP) and Tobin's Q in Model 10 is shown by a coefficient of 0.0000, statistically insignificant with a p-value of 0.8918. This suggests that an increase in the EP score by one unit corresponds with no significant change in Tobin's Q. This result contradicts the natural-resource-based view (NRBV) proposed by Hart (1995), which suggests that proactive environmental strategies can lead to competitive advantages and increased firm value. The negative relationship may be attributed to the immediate costs and investments associated with implementing sustainable practices, which could potentially dilute the firm's current market valuation.

The Total Assets (TA) have a coefficient of 0.0000, which is statistically significant at the 0.01 level. This implies that with each unit increase in the TA score, there is a 0.0001% increase in Tobin's Q. This aligns with the resource-based view (RBV) theory proposed by Barney (1991). It suggests that larger firms, having more assets at their disposal, have more resources to generate revenues, leading to higher market valuation. Logically, firms with a larger asset base can enjoy economies of scale, driving efficiency, and profitability, which can reflect in a higher Tobin's Q.

The Debt-to-Equity ratio (DTE) shows a non-significant relationship with Tobin's Q, evidenced by a coefficient of -0.0004 and a p-value of 0.5466. The absence of a significant relationship aligns with Modigliani and Miller's (1958) capital structure irrelevance theory. This suggests that the market valuation of firms is unaffected by their capital structure under ideal conditions, like absence of taxes, bankruptcy costs, or asymmetric information.

Lastly, GDP Growth (GDP) shows a non-significant relationship with Tobin's Q, with a coefficient of 0.0003 and a p-value of 0.1332. This implies that the model does not provide substantial evidence that GDP growth influences the market-to-book value ratio. This result might contradict the conventional wisdom that firms perform better during periods of economic growth, leading to higher market valuations.

Model 11: The Relationship between Social Performance (SP) and Tobin's Q

In Model 11, Social Performance (SP) shows an insignificant negative relationship with Tobin's Q, indicated by a coefficient of -0.0001 and a p-value of 0.6483. This suggests that an increase in the SP score by one unit corresponds with a decrease in Tobin's Q by 0.01%, which contradicts stakeholder theory (Freeman, 1984). The stakeholder theory posits that companies demonstrating a strong social performance can enhance their reputation, increase customer loyalty, and thereby increase market valuation. The non-significance might be attributed to a myriad of factors affecting SP and Tobin's Q, which are not captured in this model.

Regarding Total Assets (TA), the coefficient is 0.0000, which is statistically significant (p-value = 0.0013). This implies that with each unit increase in the TA score, there is a 0.00001% decrease in Tobin's Q.

The Debt-to-Equity ratio (DTE) has a coefficient of -0.0003, but the p-value of 0.5642 indicates the relationship isn't statistically significant. Modigliani and Miller's (1958) capital structure irrelevance theory suggests that a firm's market valuation is independent of its capital structure, which can justify the observed non-significant correlation in this model.

Lastly, GDP Growth (GDP) has a coefficient of 0.0003 and a p-value of 0.1559, suggesting no significant effect of GDP growth on Tobin's Q. This might be due to the influence of other industry-specific or firm-specific factors, which are not captured in this model.

Model 12: The Relationship between Governance Performance (GP) and Tobin's Q

In Model 12, Governance Performance (GP) shows a negative relationship with Tobin's Q, evidenced by a coefficient of -0.0004 and a p-value of 0.0460. This suggests that an increase in the GP score by one unit corresponds with a decrease in Tobin's Q by 0.04%. This indicates a significant negative relationship between GP and Tobin's Q, which contradicts the agency theory (Jensen & Meckling, 1976). The agency theory asserts that effective governance mechanisms can minimize agency conflicts, thus leading to increased firm value. The observed negative relationship could be due to the increased scrutiny and expectations that come with better governance structures, which might exert pressure on the firm's short-term performance.

For Total Assets (TA), the coefficient is 0.0000, which is statistically significant (p -value = 0.0299). This suggests that an increase in the TA score by one unit corresponds with a decrease in Tobin's Q by 0.00001%. This result aligns with the RBV theory and suggests that larger firms, by virtue of their greater assets, have higher Tobin's Q. Larger firms can utilize their extensive resources to formulate and implement strategies that improve efficiency and effectiveness, thereby leading to higher market valuation.

The Debt-to-Equity ratio (DTE) shows a non-significant correlation with Tobin's Q, indicated by a coefficient of -0.0003 and a p -value of 0.5738. This supports Modigliani and Miller's (1958) theory of capital structure irrelevance, suggesting that the market valuation of a firm is independent of its debt-to-equity ratio under ideal conditions.

Lastly, GDP Growth (GDP) presents a positive, but non-significant relationship with Tobin's Q, with a coefficient of 0.0004 and a p -value of 0.0906. This implies that the model does not provide substantial evidence that GDP growth influences the market-to-book value ratio, which could be due to the influence of other economic or firm-specific factors not captured in this model.

V. DISCUSSION

The findings from the regression results highlight that corporate sustainability, encompassing environmental, social, and governance aspects, generally correlates positively with financial performance, aligning with Stakeholder Theory. This supports the broader global trend that companies investing in sustainability perform better financially. However, an exception occurs with Tobin's Q, where sustainability measures negatively impact this specific financial performance measure. This might indicate market skepticism or a delayed market reaction to sustainable practices. The negative coefficients, although mostly insignificant, echo Friedman's argument about a possible trade-off between sustainability and short-term financial gains. Nevertheless, the overall trend leans towards accepting the hypothesis of a positive impact of corporate sustainability on financial performance, particularly in ROA and ROE measures.

In terms of firm-specific factors, Total Assets consistently correlate positively with firm value, consistent with the resource-based view theory, suggesting that larger firms are seen as more stable and able to generate higher future cash flows. Conversely, the Debt-to-Equity ratio is found to be negatively correlated without significant impact, and GDP growth shows inconsistent results across models. While economic theory suggests firms should perform better during growth, leading to higher market valuations, the results here don't strongly support this relationship, possibly due to unaccounted factors. These findings weave together theories of stakeholder management, market behavior, and firm valuation, uncovering a complex picture where corporate sustainability generally promotes financial performance but also reveals potential trade-offs and nuances that might vary by context or specific measures. The study's analysis further extends to firm-specific factors and macroeconomic conditions. Total Assets consistently display a significant positive relationship with firm value, in line with the resource-based view theory (Barney, 1991), whereas the Debt-to-Equity ratio does not hold a significant relationship and GDP growth's influence is inconsistent. The latter could be attributed to the influence of other unaccounted economic or firm-specific factors (Liu & Zhang, 2015). In Tobin's Q, though positively related, GDP growth is not significant, only showing a significant positive correlation with ROA and ROE. These multifaceted findings underscore the complexity of the relationship between corporate sustainability and financial performance, highlighting the need for context-specific analysis and providing fruitful avenues for further research.

Table 77. Data Analysis Result Summary

Variables	Expected Relationship	Results	Additional Information
<u>Independent Variable</u>			
ESG	+	Mixed	Negative only in Panel C
E	+	Mixed	Negative only in Panel C
S	+	Mixed	Negative only in Panel C
G	+	Mixed	Negative only in Panel C
<u>Control Variables</u>			
Total assets	+	Mixed	Negative only in Panel C
Debt-to-Equity ratio	+	-	Negative in all Panel A-C
GDP Growth	+	+	Positive in all Panel A-C

VI. CONCLUSIONS AND RECOMMENDATIONS

The research aimed to assess the impact of Corporate Sustainability – Environmental, Social, and Governance (ESG) – on Corporate Financial Performance in the energy sector, considering factors such as firm size (Total Assets), leverage (Debt-to-Equity ratio), and GDP growth. The findings affirm that ESG performance is positively linked to Return on Assets (ROA) and Return on Equity (ROE). Specifically, environmental and social performance have a consistent positive impact on these measures, whereas governance performance significantly contributes to ROA but not ROE. Conversely, all ESG components are negatively correlated with Tobin's Q, hinting at a market delay or skepticism towards sustainability practices. Furthermore, Total Assets show a positive relationship with ROA and ROE, aligning with the notion that larger firms are seen as more stable. The Debt-to-Equity ratio and GDP growth have an inconsistent and generally insignificant effect on financial performance, suggesting the need for further exploration of economic and firm-specific factors.

Based on these findings, energy companies should prioritize environmental management, social engagement, and governance practices to enhance ROA and ROE. The negative correlation with Tobin's Q, though, requires careful consideration, potentially warranting further investigation to understand market perceptions. Additionally, strategies focusing on growth and stability, especially for larger firms, can contribute to financial success, while staying mindful of the varying effects of leverage and macroeconomic conditions. This research reinforces the stakeholder theory and provides practical recommendations for improving financial performance through well-aligned ESG practices.

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Analysis of Determinants of Employee Performance After Simplification of Position Policy at the Directorate General of Intellectual Property

Indra Mulyana¹, Muhammad Zilal Hamza², and Rinaldi Rustam³

^{1,2,3}Fakultas Ekonomi dan Bisnis, Universitas Trisakti, Jakarta, Indonesia

Abstract

Introduction/Main Purpose: The Directorate General of Intellectual Property (DJKI) implemented simplification of positions on December 31, 2021, as many as 86 structural positions of echelon III and echelon IV were equalized into functional positions, it is hoped that this will improve the performance of DJKI employees so that they are more effective and efficient by prioritizing expertise and professionalism, which can have an impact on increasing the quality of public services and organizational performance. Analyzing the influence of performance determinants including competence, motivation, compensation, career path, work environment, leadership and organizational culture on structural employee performance which is equated to functional. **Background of the problem:** Implementation of simplification of positions at DJKI is inseparable from constraints and problems in work patterns and employee work systems that are transformed into functional positions, which affect employee performance. Constraints and problems that arise after the job simplification policy cannot be separated from the factors that affect employee performance such as competence, motivation, compensation, career path, work environment, leadership and organizational culture. **Research gaps/ Novelty:** This study analyzes and discusses the influence of competence, motivation, compensation, career path, work environment, leadership and organizational culture on the performance of employees of the Directorate General of Intellectual Property due to job simplification policies. **Research methods:** This study uses a quantitative approach. The data used in this study is primary data sourced from the results of questionnaires which were distributed directly to employees who were affected by the simplification of positions at the Directorate General of Intellectual Property as many as 150 respondents. Withdrawal of respondent data was carried out using purposive random sampling technique through field studies (field studies or surveys). Data were analyzed by SEM (Structural Equation Modeling) using SmartPLS 3.0 software. **Findings/Results:** The results of this study state that the variables of competence, motivation, work environment and organizational culture have a positive and significant effect on employee performance, while compensation, career path and leadership variables have no effect on employee performance at the Directorate General of Intellectual Property after the implementation of the job simplification policy. **Conclusion and implications:** Competence is considered very important and must be fulfilled by every employee to achieve the expected performance, especially for employees affected by the job simplification policy. They are required to have the required competencies in accordance with the competency standards of each functional position, in order to realize adaptive, productive, innovative and professional employee performance. To improve employee competency, the Directorate General of Intellectual Property is required to provide education and training to all employees.

Keywords: Employee Performance, Job Simplification, Performance Determinants, DJKI

I. INTRODUCTION

Public services in Indonesia play a very important, if not crucial, role in economic and political life. The impact of public services is very broad, but the quality of public services in general has so far been poor (Tauhid, et al, 2022)

In 2004, the government emphasized the importance of implementing the generally recognized principles of clean government and good governance as a condition for providing quality services to the public (Adnan, 2013). In this regard, the main program implemented by the government is to build the state apparatus by implementing bureaucratic reform.

Bureaucratic Reform manifests a gradual, systematic and continuous change effort that aims to create a clean governance system, improve public services, professionalism, capacity and accountability for the performance of the human resource bureaucracy. This process manifests a change in current conditions towards the desired condition within the reach of Bureaucratic Reform. (<https://lcbadiklat-jateng.kemenkumham.go.id/>).

President Joko Widodo has repeatedly expressed his dissatisfaction with the performance of the bureaucracy, which according to him cannot keep up with the dynamics and developments of an increasingly rapid era. He

considered the bureaucracy unable to act innovatively, adaptively and responsively. Based on this assessment, President Joko Widodo made bureaucratic reform a priority program during his second term in office. Through bureaucratic reform, convoluted service and licensing processes, eliminating linear, monotonous and rigid ways of thinking, so as to create an adaptive, productive, innovative and competitive bureaucratic atmosphere.

To realize this, the President of the Republic of Indonesia, Joko Widodo, as the highest authority in administering government in Indonesia, issued a policy to reduce government organizations in Indonesia. The policy was conveyed in his inauguration speech on Sunday, October 20 2019, regarding simplification of the government organizational structure into 2 levels and then transferring them to functional positions that look at skills and competencies. (Aide, 2019)

This structural simplification policy cut the level of echelon III and echelon IV at the level of ministries, agencies and local government were transferred to functional positions. The Ministry of State Apparatus Empowerment and Bureaucratic Reform issued a Circular Letter (SE) of the Minister of Administrative and Bureaucratic Reform Number 393 of 2019 concerning Strategic and Concrete Steps to Simplify Bureaucracy. And strengthened by Permenpan RB No 17 of 2021 concerning Equalization of Administrative Positions into Functional Positions. Then Permenpan RB No 25 of 2021 which regulates Simplification of Organizational Structures in state institutions to simplify the bureaucracy. (Setiawan, et al, 2022)

The Directorate General of Intellectual Property (DJKI) is an echelon I unit institution under the Ministry of Law and Human Rights of the Republic of Indonesia which provides public services to the public in the field of Intellectual Property, following up on Permenpan RB Number 17 of 2021 concerning Equalization of Administrative Positions into Functional Positions, through the Decree of the Minister of Law and Human Rights No: M.HH-82.KP.03.04 of 2021 concerning Dismissal from administrative positions and appointments to functional positions through an inpassing mechanism within the Ministry of Law and Human Rights dated 31 December 2021.

There are 86 (eighty six) echelon III and echelon IV structural positions equivalent to functional positions, consisting of 24 (twenty four) echelon III officials equivalent to Associate Functional Officers, and 62 (sixty two) echelon IV officials equivalent to Young Expert Functional Officer. The implementation of the policy of simplification of positions at the Directorate General of Intellectual Property, in practice there are obstacles and problems, both technical implementation constraints and administrative problems. If we describe some of the constraints and problems that accompany this position simplification policy, the determining factors for employee performance include: Competency factors, structural officials who are transferred to functional positions do not match their expertise, skills, experience, educational background and competency standards required in the functional positions they occupy. (Kepmenkumham RI Number M.HH-82.KP.03.04 of 2021)

Motivating factors, the position simplification policy which seems to force administrative officials to switch to functional positions makes these employees less motivated by this policy. Compensation factor, the most prominent problem is that there are differences in income and facilities received when serving as structural officials with functional officials. Career path factors, different structural and functional characteristics in terms of work patterns are separate problems for the careers of employees affected by this policy. Structural has the character of a managerial work pattern while functional has the character of an independent work pattern. (Primary, et al, 2022)

The leadership factor, the mindset or mindset of a structural person who has the authority to regulate and order employees under him or commonly known as superiors and subordinates who carry out their duties and functions following the direction of the leadership, while functional there is no term superiors and subordinates, there are co-workers who carry out duties and functions in accordance with their competence and expertise. (Yudiatmaja, 2013)

Organizational cultural factors, in order to achieve good employee performance and organizational renewal, rotational mutations or structural position transfers are usually carried out, with this position simplification policy making the position transfer mechanism not as flexible as it used to be. A functional to move from functional A to functional B has requirements that must be met, one of which is to take and pass a competency test in accordance with predetermined competency standards. Those are some of the obstacles and problems that occurred after the job simplification policy that affected the performance of employees affected by this policy. (Megantara, et al, 2019)

The need for a dynamic and agile state civil apparatus, changes in work patterns, an emphasis on skilled and skilled work, the need for efficiency and effectiveness, the need for optimal performance and encouraging the creation of ASN professionalism is the reason for the need to simplify the bureaucracy (Tumanggor, 2021).

Based on this background, it is necessary to conduct further research which aims to determine the influence of the determinants of employee performance affected by the job simplification policy on employee performance at the Directorate General of Intellectual Property.

II. LITERARY REVIEW

2.1 Public policy

According to Easton in Abidin, (2004:20), argues that public policy can be understood as: the distribution of values to all members of society through coercion (law). Based on this definition, Easton emphasized that only the government can legally act on society, and that the government's choice to do something or not to do something manifests itself in the form of people's judgments.

The first area of major concern to the national administration is public policy. The description of community understanding can be seen from the process of forming government problems, solving problems, establishing policies, implementing policies and evaluating them. At the same time, the concept of public policy was introduced by Dwijowijoto (2004:3), explaining that it is the result of everything that is done or not done by the government, why it is done, and makes public life different. The government here is just the state.

According to Anderson in Islam (1994:20) suggests the elements contained in public policies which include: (1) Public policies always have specific objectives or are actions or patterns of action of government officials; (2) Public policies contain actions or patterns of action of government officials; (3) Public policy is what the government actually does, not what the government intends to do or says it will do; (4) It is positive in the sense that it is a government official's decision to do something; and (5) Government policy in a positive sense is based or always based on coercive (authoritative) laws and regulations.

2.2 Bureaucratic Reform

The bureaucracy is an element of the government apparatus that comes from civilians and the military which has the duty and function of assisting government affairs in providing public services and receiving rewards from the government for the tasks and functions that have been carried out by Muhaimin in Sulistio and Budi (2009).

Organizations that have the duties and functions of government administrators to serve the community (public services) are a function of the bureaucracy. Reform is aimed at improving the bureaucracy because bureaucracy is something that directly touches the community in the administration of public services. In order to realize the administration of government in terms of providing adequate public services, the government is reforming the bureaucracy in its government affairs.

The description of the measurement of the performance of Ministries and State Institutions can use the approach to achieving the goals of bureaucratic reform that has been regulated in the 2010-2025 Bureaucratic Reform grand design through the assessment of the public administration Reform Index based on Presidential Regulation No. 81 of 2010 concerning the Grand Design of the 2010-2025 Bureaucratic Reform. The Bureaucratic Reform Index is a measurement or description of the value of the extent to which a Ministry/Institution shows performance or performance. In measuring bureaucratic reform, we use guidelines for evaluating bureaucratic reform in government agencies. This has been compiled in PERMENPAN RB Number 14 of 2014. In this regulation the programs used in implementing bureaucratic reform are divided into elements of leverage components and outcome components. Leverage component elements and outcome components which will then be processed into a bureaucratic reform index. (<http://rbkunwas.menpan.go.id/>)

2.3 Performance

According to the level of success of an organization, it cannot be separated from various driving factors in it including workers or employees who play an active role in achieving organizational goals, because employees are the only resource in the organization who have feelings, desires, reason, knowledge and expertise or skills to achieve a certain goal. (Makawi, Normajatun & Haliq, 2015).

Mangkunegara (2011: 67), states that performance is the qualitative and quantitative results achieved by an employee in carrying out their duties in accordance with the tasks assigned. In addition, Moehariono also stated that performance is a person or group of people in an organization, in accordance with the authority and responsibility of their respective duties, to achieve the goals of the organization concerned, both in quantity and quality, legally, morally and ethically (Makawi, 2015:19).

Agree with the statement above, Bangun (2012: 99), assumes that performance is the result of work carried out by someone on the basis of fulfilling job requirements, commonly known as work standards, namely the level expected of certain work to be carried out and in relation to the direction of the goal. what you want to achieve.

Rivai and Sagala (2009), explained that companies can use employee performance appraisals to evaluate employee performance or to evaluate employee work results. Appropriate performance appraisal is beneficial for employees and the company itself. In performance appraisal, the employee's contribution to the organization is evaluated over a certain period of time. Performance feedback lets employees know how they are doing. Within an organization, performance appraisal is an important management mechanism that can be used to clarify goals and is a tool to motivate individuals for future performance. Performance reviews are the basis for decisions affecting pay, promotions, termination, training, and other working conditions.

2.4 Competence

Competence is a basic quality that humans must possess to think and behave, which is equivalent to attitudes and support within a certain period of time (Callista, 2016: 45). Meanwhile, McAshan stated that competence refers to the knowledge, skills, and abilities possessed by a person to become part of himself so that he can carry out cognitive, effective, and psychomotor behavior as well as possible (Sutrisno, 2011: 203).

According to Cahyaningrat et al (2017: 46), competence will shape the professional character of employees by creating good work results and satisfaction, so government or private agencies emphasize organizational requirements for competence.

Moehariono (Makawi, 2012: 10), reveals that there is a relationship between employee performance and competency that is very close, very important, has strong relevance, and even if they want to improve their performance, they must be competent (the right person for the right job) according to their responsibilities his job.

According to the definition above competence is the knowledge, abilities, skills and attitudes needed by a person to work or perform a task in accordance with his job position.

2.5 Motivation

Motivation is a psychological force within a person that determines the direction of a person's behavior in an organization, the level of effort and the level of persistence in facing obstacles (George and Jones 2012). The challenge in a job is to create an environment in which people choose to work with motivation.

Three key elements of work motivation according to George and Jones (2012), include:

1) Behavior Direction

The direction of behavior refers to the behavior the employee chooses to perform out of many potential behaviors that can be performed. This can be exemplified by the behavior of employees who always work on time, carry out tasks that are borne by employees properly and responsibly, and try to convey good ideas for the organization and help other fellow employees if they experience difficulties at work.

2) Business Level

How an employee how much effort in working hard to perform the selected behavior. If for example an engineer's action is to propose the need for a design change, then the engineer's level of motivation determines how far he is convinced of his proposal, so that with new and cost-effective specifications, it does not result in waste.

3) Persistence Level

The level of persistence refers to the behavior of a person who continues to maintain the chosen behavior, despite obstacles, problems and obstacles. This can be exemplified by, for example, an engineer persisting in trying to get a design change fully implemented or giving up even though he has strong beliefs about the importance of the design change.

2.6 Compensation

Dhermawan (2012: 174), compensation is a general terminology that refers to the income a person receives in their working relationship with an agency (Anas, 2014:2). For agencies and companies, compensation means appreciating employees who have contributed to achieving their goals through so-called work activities. The purpose of providing compensation is to grow employee performance, motivation and work happiness (Hidayat, 2021). According to Hasibuan (2013), compensation refers to all income in the form of money, direct or indirect goods received by employees for the services they provide to the company. There are two types of compensation, namely: direct compensation in the form of wages, salaries and incentives, and indirect compensation (pensions or benefits).

Permady (2017), explains that rewards or compensation can be divided into two categories, namely financial rewards that are not directly related to work performance (often referred to as direct compensation) and non-financial rewards (often referred to as complementary compensation or indirect compensation). Financial incentives are incentives that employees receive in the form of salaries, bonuses, insurance premiums, medical expenses and other similar forms of payment by the organization. Non-monetary incentives for long-term

employee retention, such as service programs for employees who wish to create a pleasant working environment and conditions.

2.7 Career path

Mangkunegara (2017), put forward another view that career development is a series of staffing activities to help employees plan their future in the company, so that the company and themselves can get the best development. According to Hasibuan (2013), development parameters are: (1) training, (2) learning, (3) promotion, (4) working period, (5) transfer.

According to Mangkunegara (2017), the goals of career development are as follows: (1) helping achieve personal and organizational goals, (2) demonstrating good relationships. (3) Helping employees discover their potential. (4) Strengthen the relationship between employees and the company. (5) Evidence of environmental responsibility. (6) Strengthen the implementation of organizational plans. (7) Reduction of personnel costs.

2.8 Work environment

Plangiten (2013), means that the work environment is one of the aspects that influence work happiness employees, which can lead to the success or failure of work, because the workplace affects employees, especially areas of work that have a psychological character, the impact itself can be either negative or positive. If employees are positively impacted, then employees have more enthusiasm for their work, which means greater efficiency in achieving goals. Meanwhile, if workers are negatively affected, then the work ethic of workers decreases, resulting in wastage or spending more than they should.

Human resources will function properly if supported by appropriate environmental conditions (Sedarmayanti, 2010: 27). Environmental conditions are considered good or adequate if employees can carry out their work optimally, healthy, safe and comfortable.

The work environment plays an important role in the company's sustainable development, therefore, paying attention to the comfort of the work environment is very important for organizational leaders. In every business activity, it is necessary to design or arrange the work environment, so it is necessary to study and identify the various aspects that make up the work environment itself.

2.9 Leadership

Leadership is the process of influencing one person to another to achieve a common goal. (Kreitner and Kinicki, 2008). Leadership can be explained as the use of power and influence to direct the activities of subordinates to achieve goals. (Colquitt et al., 2009). From the above understanding it can be concluded that leadership is the ability to influence other people to work together to achieve goals that have been set together. Leadership is the ability to influence a group to achieve its goals. (Robbins, 2006). Leadership is the process of influencing group activities aimed at achieving common goals.

2.10 Organizational culture

Organizational culture permeates organizational life and further influences all aspects of organizational life (Saffold dNature Isnada, 2016). Therefore, organizational culture greatly influences the fundamental aspects of organizational performance (Gardner dNature Isnada, 2016). If organizational culture is an important aspect in improving performance, then organizational culture must be managed properly. Good management requires understanding and attention to organizational culture.

According to Mariani in Permadi (2017), the parameters contained in organizational culture are: (1) member identity is a habit that prioritizes company needs above personal needs, (2) group focus is a habit that emphasizes organized team work activities, (3) people centricity is an organizational habit that prioritizing the needs of the people and made in a participatory manner with the needs of the majority of employees, 4) risk taking is the willingness of employees to innovate and take the initiative to take risks.

2.11 Hypothesis

According to Sugiyono (2017), a hypothesis is an allegation that explains a phenomenon that has not been proven true, so it must be tested experimentally to prove its truth. With this hypothesis, we suspect that competence, motivation, compensation, career path, work environment, leadership and organizational culture influence employee performance at the Directorate General of Intellectual Property. The hypothesis in this study are as follows:

Factors that support increased employee performance is competence. Competence in this case is the employee's ability to provide the ability to work neatly and have the attitude to complete the work in accordance with the expertise of the workforce in the field of work which of course already gives a level of hard work.

H1: it is suspected that there is a positive and significant effect of competency on employee performance.

Pramukti (2019) with the title "The Influence of Motivation, Competence, and Career Development on Organizational Commitment and Employee Performance". The results of this research are motivation, competence, and career development that have a positive effect on organizational responsibility. Motivation, competency, and career development have a positive effect on employee performance.

H2: it is suspected that there is a positive and significant influence of motivation on employee performance.

Permadi and Suana (2017) with the research title "The Influence of Compensation, Organizational Culture and Work Environment on Employee Job Satisfaction" The data analysis technique used to test the hypothesis is multiple linear regression analysis. Sourced from the analysis it was found that the variables of compensation, organizational culture and work environment have a significant effect simultaneously on the job satisfaction of employees of PT Indonesia Power Bali.

H3: it is suspected that there is a positive and significant effect of compensation on employee performance.

Rosyidawaty (2018) disclosing career advancement, which means the employee's efforts to achieve a career agenda supported by the director of Human Resources or other parties that describe the situation and indicate an increase in the status of employees in the company

H4: it is suspected that there is a positive and significant influence of career paths on employee performance.

Planing (2013) emphasizes that the work environment is one aspect that can affect employee job satisfaction, success in work performance, otherwise it can cause failure in the implementation of work, because the work space can affect employees, especially the work environment which has psychological characteristics otherwise the influence itself can be negative or positive .

H5: it is suspected that there is a positive and significant influence of the work environment on employee performance.

Sudarmanto (2009: 133) reveals that leadership is a way of inviting employees to do the right thing, achieving commitment and motivating them to achieve common goals.

H6: it is suspected that there is a positive and significant influence of leadership on employee performance.

Pramukti (2019) with the title "The Influence of Motivation, Competence, and Career Development on Organizational Commitment and Employee Performance". The results of this research are motivation, competence, and career development that have a positive effect on organizational commitment. Motivation, competency, and career development have a positive effect on employee performance.

H7: it is suspected that there is a positive and significant influence of organizational culture on employee performance.

III. RESEARCH METHODOLOGY

This research was designed using quantitative methods. Data collection was carried out through collecting questionnaires. Study with a quantitative approach emphasizing the analysis of deductive and inductive inference processes as well as analysis of the dynamics of the relationship between observed phenomena, using scientific logic. Withdrawal of respondents was carried out using a purposive random sampling technique through field studies (field studies or surveys) by distributing questionnaires directly at the Directorate General of Intellectual Property. In this study, a combination of opinion (Gay 1996, p. 125) and opinion (Hair, Black & Babin, 2014) This study took the lowest number as the minimum number of samples. There are 30 indicators that are observed, so the minimum sample that can be used (Hair, Black & Babin, 2014) is: $n = \text{Number of parameters} \times 5 = 30 \times 5 = 150$ respondents.

The data used in this research is primary data. This data is collected from dissemination of questionnaires distributed to employees affected by the structural simplification policy within the Directorate General of Intellectual Property.

Primary data is data obtained directly from collected data sources and is directly related to the concept being researched. Primary data was collected using a structured questionnaire to gather information from respondents. The score for each variable indicator obtained by filling out the respondent's questionnaire is the primary data source for this study.

The scale used in this study to show respondents' responses to each statement given using a Likert scale (Sugiyono, 2017), has a very positive to negative degree in word form, including: (1) Strongly agree, (2) Agree, (3) Neutral, (4) Disagree, (5) Strongly disagree. For analysis purposes, respondents' responses are recorded, for example:

1. Totally agree with point 5
2. Agree with point 4
3. Neutral with 3 points
4. Disagree with point 2
5. Strongly disagree with point 1.

The variables used in this research are the independent variables and the dependent variables. The independent variables consist of: (1) competency, (2) motivation, (3) compensation, (4) career path, (5) work environment, (6) leadership, and (7) organizational culture, while the dependent variable is performance. Variable measurements and indicators for this study are shown in table 1 below.

Table 1 Variable Measurement and Research Indicators

Variable	Indicator	Symbol
Competence	Work experience	X11
	Educational background	X12
	Knowledge	X13
	Skills	X14
Motivation	Intrinsic motivation	X21
	extrinsic motivation	X22
Compensation	Wages and salaries	X31
	Incentive	X32
	Allowances	X33
	Facility	X34
Career path	The treatment and care of superiors	X41
	Promotional opportunities	X42
	satisfaction level	X43
Work environment	Physical environment	X51
	Non-physical environment	X52
Leadership	interpersonal	X61
	Informational	X62
	Decision	X63
Organizational culture	Innovation and courage to take risks	X71
	Attention to detail	X72
	Results oriented	X73
	Human oriented	X74
	Team oriented	X75
	Aggressive	X76
	Stable	X77
Performance	Timeliness of work	X81
	Quantity in work	X82
	Quality in work	X83
	Presence	X84
	Ability to work together	X85

Source: Researcher (2023)

The questionnaire sheet contains a number of questions related to the impact of bureaucratic reform on employees at the Directorate General of Intellectual Property. Questions or statements in the questionnaire will become the basis for conducting descriptive analysis, then testing causal relationships or hypotheses is carried out. The data will be analyzed using the Structural Equation Modeling (SEM) technique based on an assessment of the existence of an interdependence relationship between variables.

Research data were analyzed by univariate and multivariate analysis. Univariate analysis is used to analyze each variable by looking for the central trend. Hypothesis testing was carried out using a multivariate analysis technique, namely Structural Equation Modeling (SEM). SEM determines the strength of individual relationships, model fit, and various parts of the hypothesis. SEM as a tool used to analyze multivariate data uses two types of scales, namely (1) matrix scale (interval and ratio), and (2) non-matrix scale (ordinal). Data analysis in this study used the Windows Statistics program, especially SmartPLS 3.0. (Partial Least Square).

IV. RESULT/FINDINGS

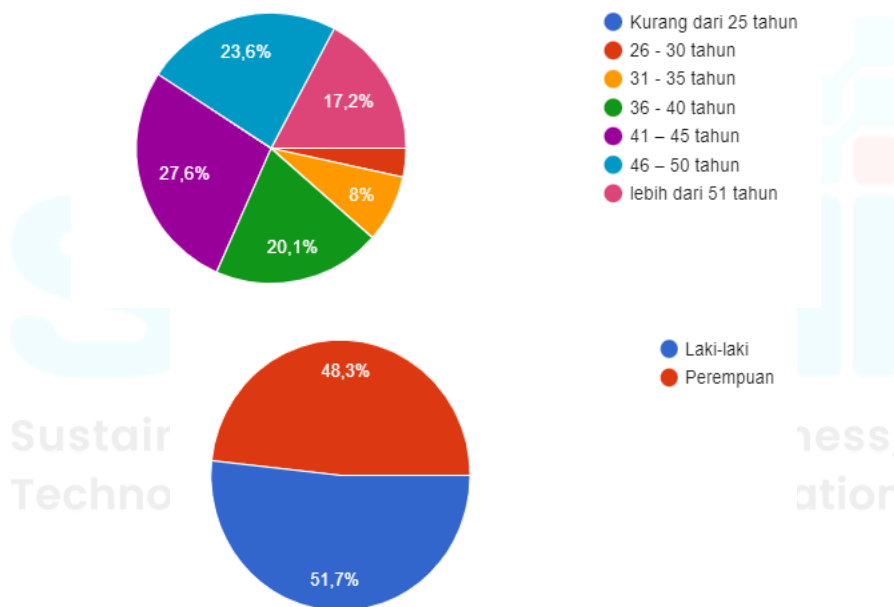
4.1 Research Object Description

The Directorate General of Intellectual Property (DJKI) is an echelon I level unit organization under the Ministry of Law and Human Rights which provides public services to the public in the field of Intellectual Property. In order to realize government programs in terms of Bureaucratic Reform, one of which is simplification of positions to achieve effective and efficient governance, as set forth in Permenpan RB No 17 of 2021 concerning Equalization of Administrative Positions to Functional Positions. The Directorate General of Intellectual Property is one of the government institutions that carries out this equalization policy. There are 86 (eighty six) structural positions of echelon III and echelon IV in the Directorate General of Intellectual Property which are equivalent to functional positions,

4.2 Characteristics of Respondents

This section will explain the descriptive data obtained from the respondents. The descriptive research data describes the profile of the research data and the relationships that exist between the variables used in the research.

Figure 1 Respondents by Age (Data Processed 2023)



Based on age, the majority of respondents were aged between 41 and 45 years or 27.6%, while the smallest proportion of respondents were aged 26-30 years, namely 6%.

Figure 2 Respondents by Gender (Data Processed 2023)

Based on gender, the majority of respondents were male as much as 51.7%. While the percentage of women surveyed was 48.3%

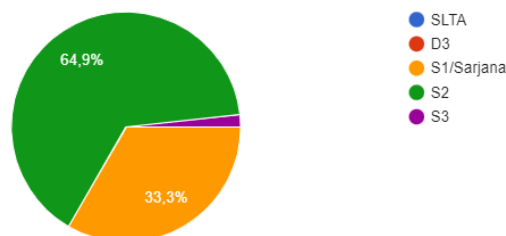


Figure 3 Respondents by Education (Data Processed 2023)

Based on education, the majority of respondents have a master's degree (S2) up to 64.9%. While the smallest percentage of respondents with the last education, doctor (S3) was 1.7%.

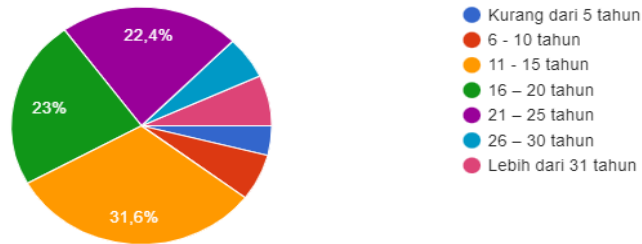


Figure 4 Respondents by Length of Work (Data Processed 2023)

Based on years of service, the majority of respondents had worked for 11-15 years at 31.6%. While the smallest percentage of respondents with less than 5 years of service is 4%.

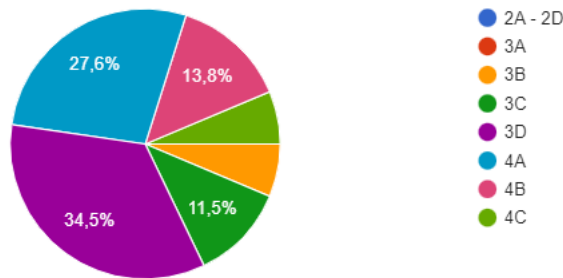


Figure 5 Respondents by Group (Data Processed 2023)

Based on the group, the majority of respondents have a 3D group of 34.5%. While the smallest percentage of respondents with groups 3B and 4C was 6.3%.

Convergent validity used to measure the validity of each latent variable as measured by the AVE value. The expected AVE value is greater than 0.5.

Table 2 Average Variance Extracted

Variable	Average Variance Extracted (AVE)	Mark Square Root AVE
Culture	0.681	0.463
Career	0.812	0.659
Leadership	0.854	0.729
Performance	0.611	0.374
Compensation	0.678	0.460
Competence	0.584	0.341
Environment	0.750	0.563
Motivation	0.756	0.571

Source: Processed Data (2023)

Holmes-Smith (2001) suggests that based on the parameter level $\alpha = 0.05$, the observed variable is also said to be valid if it has a value of $R^2 \geq 0.50$. From the test results it is known that all latent variables produce an AVE value greater than 0.5. Thus, this variable can be said to be valid when viewed through the AVE value.

Composite Reliability helps measure reliability according to the correlation between the observed indicator variables. The expected Composite Reliability value is between 0.6-0.7.

Table 3. Internal Consistency (Composite Reliability)

Variable	Composite reliability
Culture	0.927
Career	0.928

Leadership	0.946
Performance	0.887
Compensation	0.863
Competence	0.848
Environment	0.857
Motivation	0.861

Source: Processed Data (2023)

The Table of Composite Reliability value processing results above, obtained from all very high variables, which is greater than 0.6. This means that the reliability among all high latent variables.

Table 4. Reliability Indicators

	Culture	Career	Leadership	Performance	Compensation	Competence	Environment	Motivation
X11						0.790		
X12						0.718		
X13						0.839		
X14						0.703		
X21								0.896
X22								0.841
X31					0.828			
X33					0.796			
X34					0.845			
X41		0.907						
X42		0.909						
X43		0.887						
X51							0.825	
X52							0.906	
X61			0.936					
X62			0.904					
X63			0.931					
X72	0.783							
X73	0.828							
X74	0.762							
X75	0.855							
X76	0.845							
X77	0.872							
X81				0.804				
X82				0.829				
X83				0.818				
X84				0.744				
X85				0.708				

Source: Processed Data (2023)

To find out the relationship between indicators on latent variables (constructs) through the outer loading value on the reliability indicator. The expected outer loading value is greater than 0.7 or at least 0.5. Processing results, in table 3 above, all indicators have a value of ≥ 0.7 , which means that all indicators have a fairly high level of reliability.

The coefficient of determination describes the degree of accuracy between the actual value and the predicted value of the endogenous latent variable, so that it can be seen whether the prediction accuracy is good enough, or in other words the model is good enough.

Table 5 Adjusted R-Square

Model	R Square	R Square
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		adjusted
JK	0.506	0.485

Source: Processed Data (2023)

Based on the test results in table 5, the Adj R2 value of 0.485 or 48.5% means that the ability of the independent variables in this study to explain performance behavior is 48.5%, the rest are other variables not included in the model.

Discriminant validity aims to determine whether a reflective indicator is indeed a good measure of its structure based on the principle that each indicator must be strongly correlated with its unique structure. Different construct indicators should not be strongly correlated (Ghozali and Latan, 2015), the discriminant validity test uses the Fornell-Larcker Criterion (Henseler et al., 2015).

Table 6 Fornell-Larcker Criterion

	bud	KAR	KEP	KIN	KOM	KTS	LING	MOV
Culture	0.825							
Career	0.542	0.901						
Leadership	0.453	0.591	0.924					
Performance	0.660	0.461	0.397	0.782				
Compensation	0.574	0.642	0.363	0.437	0.823			
Competence	0.611	0.433	0.386	0.562	0.338	0.764		
Environment	0.675	0.600	0.508	0.566	0.662	0.477	0.866	
Motivation	0.623	0.656	0.493	0.575	0.567	0.610	0.667	0.869

Source: Processed Data (2023)

Based on table 6 above, all AVE roots (Fornell-Larcker Criterion) for each construct have a greater correlation with other variables

4.3 Hypothesis testing

In this section, hypothesis testing will be carried out to test the proposed hypothesis. The results of this test are based on research data processing with Partial Least Square (PLS) analysis using Smart PLS 3.0 software. The path diagram for testing the hypothesis based on the Partial Least Square (PLS) analysis using the Smart PLS version 3.0 software is shown in Figure 6

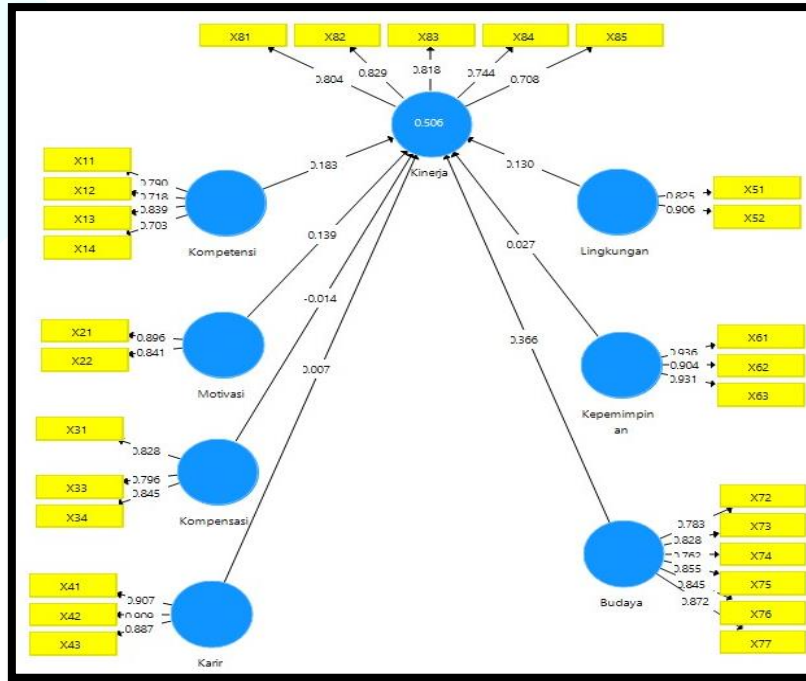


Figure 6. Path Diagram of the Output Results of Hypothesis Testing (Data Processed 2023)

Table 7. Testing the Direct Effect Hypothesis

Variable	Theory	Betas	std Error	Tstat	Sig (1 tail)	Decision
Competition	+	0.183	0.086	2.128	0.009	H1 is accepted
Motivation	+	0.139	0.101	1,374	0.043	H2 is accepted
Compensation	+	-0.014	0.083	0.169	0.217	H3 is rejected
Career path	+	0.007	0.097	0.071	0.236	H4 is rejected
Work environment	+	0.130	0.114	1,139	0.064	H5 accepted
Leadership	+	0.027	0.083	0.322	0.187	H6 is rejected
Organizational culture	+	0.366	0.102	3,591	0.000	H7 accepted

Source: Data Processed 2023

The results of hypothesis testing based on table 6 above are as follows:

1. The competency variable has a coefficient value of 0.183 and a significance level of 0.009, which means it has a positive and significant effect on performance. This is in line with research conducted by Fauzi (2019) with the title "The Influence of Competence on Employee Performance at the Bureau of Government and Cooperation of the Regional Secretariat of West Java Province". The research results show that employee competence has a positive effect on employee performance in the Government Bureau and Regional Secretariat Cooperation of West Java Province.
2. The motivation variable has a coefficient value of 0.139 and a significance level of 0.043, indicating that it has a positive and significant effect on performance. This is in line with research conducted by Sutanjar & Saryono (2019) with the theme "The Influence of Employee Motivation, Leadership and Discipline on Employee Performance". The results of the research explain that employee motivation, leadership, and discipline both simultaneously and partially have a positive and significant influence on employee performance.
3. The compensation variable has a coefficient value of -0.014 and a significant value of 0.217, indicating that there is no effect on performance. This is different from research conducted by Permadi and Suana (2017) in their research entitled "The Influence of Compensation, Organizational Culture and Work Environment on Employee Job Satisfaction." The results of his research stated that compensation factors, organizational culture and work environment have a significant simultaneous effect on job satisfaction. employees at PT Indonesia Power Bali. Compensation, organizational culture and work environment variables also have a

positive and partially significant impact on employee job satisfaction at PT Indonesia Power Bali through work environment factors as variables that have a greater influence on employee job satisfaction at PT Indonesia Power Bali.

4. The career path variable has a coefficient value of 0.007 and a significance of 0.236 indicating a positive but not significant effect on performance. This is in line with research conducted by Pramukti (2019) with the theme "The Influence of Motivation, Competence, and Career Development on Commitment Employee Organization and Performance". The results of the research state that motivation, competence, and career development have a positive impact on organizational commitment. Motivation, competency, and career development have a positive effect on employee performance.
5. The work environment variable has a coefficient value of 0.130 and a significance level of 0.064 indicating that it has a positive and significant effect on performance. This is in line with the research conducted by Greetings (2023) with the title "The Influence of the Work Environment and Compensation on Employee Performance Through Work Motivation (Case Study at Perumda Tirta Mangkaluku, Palopo City)". The results of the study show that the work environment has a positive and significant effect on employee performance at Perumda Tirta Mangkaluku City of Palopo and is in line with Anas (2014) explaining that a pleasant and comfortable work environment in the company will increase employee interest in work, thereby forming a disciplined work attitude to complete work.
6. The leadership variable has a coefficient value of 0.027 and a significance of 0.187, indicating that it has a positive but not significant effect on performance. This is in line with research conducted by Sutanjar & Saryono (2019) with the theme "The Influence of Employee Motivation, Leadership and Discipline on Employee Performance". Research results state that motivation, leadership, and employee discipline both partially and simultaneously have a positive influence on employee performance.
7. The organizational culture variable has a coefficient value of 0.366 and a significance level of 0.000 indicating a positive and significant effect on performance. This is in line with research conducted by Trang (2013) with the research title "Leadership Style and Organizational Culture Influence on Employee Performance (Study on BPKP Representatives of North Sulawesi Province)" with the results of the study showing leadership style has a significance level of 0.447, which means that leadership style has an effect on employee performance but not significant. Significant organizational culture means that organizational culture has a positive and significant influence on employee performance.

V. DISCUSSION

Based on the results of testing, analysis and discussion carried out, there are several points of conclusion:

1. The Effect of Competence on Performance
From table 4.6 it is known that the value of the competition coefficient is 0.183 which means if the perception of competition increases then the perception of performance increases, whereas if the perception of competition decreases then the perception of performance also decreases. The results of the beta coefficient sign are in accordance with the hypothesis proposed in this study, where competence has a positive effect on performance and its significance can be tested further. The P-value is $0.009 < 0.05$ (5% alpha), so H_a is accepted. Statistically, it can be concluded that at the 95% confidence level, competency has a positive effect on performance.
2. The Effect of Motivation on Performance
From table 4.6 it is known that the value of the motivation coefficient is 0.139 which means if the perception of motivation increases, the perception of performance increases, whereas if the perception of motivation decreases, the perception of performance decreases. The results of the sign of the beta coefficient are in accordance with the hypothesis proposed in this study, where motivation has a positive effect on performance, and its significance can be tested further. The P-value is $0.043 < 0.05$ (5% alpha), so H_a is accepted. Statistically, at the 95% confidence level, there is a positive effect of motivation on performance.
3. Effect of Compensation on Performance
From table 4.6 it is known that the value of the compensation coefficient is -0.014 that is, if the perception of compensation increases, the perception of performance will decrease, conversely if the perception of compensation decreases, the perception of performance can increase. The results of the sign of the beta coefficient are not in accordance with the hypothesis proposed in this study, where compensation has a positive effect on performance. Therefore, it cannot continue with the significance test. It is concluded that statistically there is no effect of compensation on performance.

4. The Effect of Career Path on Performance
From table 4.6 it is known that the career path coefficient is 0.007 which means that if the perception of a career path increases, the perception of performance increases, whereas if the perception of a career path decreases, the perception of performance decreases. The results for the beta coefficient sign are in accordance with the hypothesis proposed in this study, where career paths have a positive effect on performance and can be tested for further significance. The P-value is $0.236 > 0.10$ (alpha 10%) then H_a is rejected. Statistically it was concluded that there was no effect of career path on performance.
5. The influence of the work environment on performance
From table 4.6 it is known that the work environment coefficient is equal to 0.130 which means that if the perception of the work environment increases, the perception of performance also increases, whereas if the perception of the work environment decreases, the perception of performance can decrease. The results on the coefficient sign are in accordance with the hypothesis proposed in this study, where the work environment has a positive effect on performance and can be continued to test its significance level. The P-value is $0.064 < 0.10$ (10% alpha), so H_a is accepted. According to statistics, with a 90% confidence level, the work environment has a positive impact on performance.
6. The Effect of Leadership on Performance
From table 4.6 it is known that the value of the leadership coefficient is 0.027 that is, if the perception of leadership increases, the perception of performance also increases, conversely if the perception of leadership decreases, the perception of performance can decrease. The results of this coefficient sign are in accordance with the hypothesis proposed in this study, where leadership has a positive effect on performance and its significance can be tested further. The P-value is $0.187 > 0.10$ (alpha 10%) then H_a is rejected. We conclude that there is no statistically significant effect of leadership on performance.
7. The Influence of Organizational Culture on Performance
From table 4.6 it is known that the value of the organizational culture coefficient is 0.366 which means if the perception of organizational culture increases then the perception of performance also increases, conversely if the perception of organizational culture decreases then the perception of performance decreases. The results of the coefficient sign are in accordance with the hypothesis proposed in this study, where organizational culture has a positive effect on performance, and its significance can be tested further. The P-value is $0.000 < 0.05$ (5% alpha), so H_a is accepted. Statistically, at the 95% confidence level, organizational culture has a positive effect on performance.

VI. CONCLUSIONS AND RECOMMENDATIONS

There are 4 (four) variables that have a positive and significant impact on employee performance at the Directorate General of Intellectual Property, namely competence, motivation, work environment and organizational culture. The competency variable that has the greatest influence is found in the work experience indicator, the motivational variable that has a large influence on performance is the intrinsic motivation indicator (self-generated motivation), the work environment variable that has the most influence on employee performance is in the non-physical environment indicator (the relationship both with superiors and fellow co-workers), and indicators of organizational culture that have a major influence on performance are in innovation and the courage to take risks.

There are 3 (three) other variables that have no effect on employee performance at the Directorate General of Intellectual Property, namely compensation, career path and leadership variables. This is because employees affected by the job simplification policy feel disadvantaged as a result of the policy, such as a decrease in income received by employees and loss of some of the facilities they have received so far, feel they have received different treatment in terms of career development and it is not easy to change the mindset of employees affected by the simplification policy. Positions related to the work system of structural positions with functional positions due to differences in job characteristics.

Competence is considered very important and must be fulfilled by every employee to achieve the expected performance, especially for employees affected by the job simplification policy. They are required to have the required competencies in accordance with the competency standards of each functional position. To improve employee competency, the Directorate General of Intellectual Property is required to provide education and training to all employees by creating education and training needs metrics for human resource development.

The implementation of job simplification policies at the Directorate General of Intellectual Property needs to be evaluated. It is necessary to map the interests of talents, expertise and skills according to the competencies

required by functional positions. It is also necessary to adjust the income received by employees affected by simplification of positions so as not to be detrimental. Policy recommendations obtained from this study are able to provide an overview regarding the impact of job simplification policies on employee performance, how changes that are managed properly and efficiently can have a positive impact on employee performance. The government in general and the Directorate General of Intellectual Property in particular can develop performance management policies that can measure individual performance against organizational performance and are supported by leadership commitment.

In this study there are still limitations that require improvement for future research. This study only uses the independent variable and the dependent variable which only looks at the direct effect. It is hoped that further research can add intervening variables to see the effect of the independent variable on the dependent variable indirectly. This research is limited to the Directorate General of Intellectual Property, if the object of research is added to or compared to other organizations it will be possible to see the impact of job simplification policies on employee performance more broadly.

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Keputusan Menteri Hukum dan Hak Asasi Manusia No: M.HH-82.KP.03.04 Tahun 2021 tentang Pemberhentian dari jabatan administrasi dan pengangkatan dalam jabatan fungsional melalui mekanisme inpassing di lingkungan kementerian Hukum dan Hak Asasi Manusia.

- **Website**

<https://lcbadiklat-jateng.kemenkumham.go.id/> (diakses tgl 30 Mei 2023, pukul 20.00 wib)

<http://rbkunwas.menpan.go.id/> (diakses tgl 1 Juni 2023, pukul 14.00 wib)



The Influence of Zara's Green Marketing in Generating Brand Trust and Brand Loyalty

Loudiva Pramudya¹ and Fitri Aprilianty¹

¹ School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

The number of green marketing practices used in a company continuously increases, especially in the fashion industry, including Zara. As a fast fashion brand, Zara constantly improves business practices and cares more about sustainability in their Join Life movement. In 2020, Zara started an innovation collaboration with many types of startups focusing on sustainability which resulted in increased awareness from customers. However, some customers are skeptical about Zara's sustainability movement as greenwashing. Thus, this study aimed to assess whether Zara's Join Life sustainability movement can influence brand trust and brand loyalty. This research used a quantitative approach by distributing surveys to 306 respondents in Indonesia. The data gathered is analyzed using descriptive statistics and the PLS-SEM. This study found that Zara's Join Life green marketing has a positive impact on brand trust and brand loyalty. This study implies that greenwash is not negatively impact green brand image. However, green brand trust has a positive influence on green brand loyalty. The research findings propose marketing insights for marketers in the retail industry in increasing brand trust and brand loyalty based on green marketing.

Keywords: Brand Trust, Brand Loyalty, Fast Fashion, Greenwash, Green Marketing

I. INTRODUCTION

The fashion industry has undergone a significant shift towards sustainability, driven by the urgent need to address climate change and adopt environmentally friendly practices (Cernansky, 2022). Textile production, one of the most polluting industries globally, has prompted the industry to explore innovative materials and circularity (Bailey et al., 2022). Many fashion brands have embraced sustainable practices, focusing not only on materials and technology but also on ethical considerations and transparent supply chains (Fraser & van der Ven, 2022). Zara, a fast fashion brand, has recognized the importance of sustainability in fashion and has been actively working to become more sustainable (Inditex, 2022).

Zara's sustainability journey began in 2001 when the brand joined the Dow Jones Sustainability Indices (DJSI) and opened its first eco-efficient store in Athens, Greece. For over 20 years, Zara has been committed to its sustainability movement and green marketing campaign called Join Life, which encompasses all of the brand's sustainability efforts (Inditex, 2022). Join Life takes a comprehensive approach, addressing the entire supply chain, including material sourcing, design, production, logistics, and storage. The primary objective of Join Life is to extend the product life cycle through various programs such as repair, resale, and clothing donation (Inditex, 2022). Zara has set specific sustainability goals to be achieved by 2025. These goals include using 100% sustainable materials, reusing 100% of plastic waste, and reducing water usage in production by 25%. Looking towards the future, Zara aims to achieve zero clean emissions by 2040, showcasing its long-term commitment to sustainability and environmental responsibility (Inditex, 2022).

Join Life is divided into two aspects: people and the planet. Under the people aspect, Zara focuses on its responsibility toward workers and the communities in which it operates. The Workers at the Centre strategy empowers workers and ensures their welfare throughout the supply chain. Zara emphasizes ethical and responsible behavior, workers' rights, and safe working conditions. The brand believes in creating a great working environment that embraces gender, race, religion, economic status, and identity. Zara encourages collaboration and respect among its workforce, fosters individual goal development, and provides equal opportunities for all

employees. The brand also participates in humanitarian assistance, providing support to refugees, immigrants, and communities facing emergency situations (Inditex, 2022)

In terms of the planet, Zara actively manages natural resources and aims to reduce its environmental impact. By 2025, Zara plans to reduce its negative water impact by 25% through efficient water management practices. The brand also participates in climate-related activities, which aim to preserve tropical forests and reduce carbon emissions (Inditex, 2022). In 2020, Zara established the Sustainability Innovation Hub (SIH), providing a platform to analyze innovative collaborations with startups that align with sustainability goals. Additionally, Zara launched initiatives like Zara Pre-Owned, which allows customers to repair, reuse, and donate their Zara products, promoting a circular economy and reducing waste (Inditex, 2022).

Zara's sustainability efforts have been well-received by customers. The brand quietly launched its Join Life sustainable collection in 2015, featuring organic cotton, recycled wood, and Tencel. Changes were made to the packaging, with Zara switching from plastic to 100% recycled paper. Customers have expressed support and appreciation for Zara's sustainability initiatives on social media platforms, highlighting the significance of such efforts even within the fast fashion industry. Implementing sustainability practices in the fast fashion sector offers various benefits, including reducing negative environmental impacts, enhancing brand image, cost savings, and accessing new potential markets (Mandarić et al., 2021). Previous research has shown a positive relationship between green marketing and brand trust, with trust playing a crucial role in fostering customer loyalty and commitment (Shin et al., 2019; Wu & Liu, 2022).

Zara has created multiple innovations and changes in their attitude toward the environment in their business practice through its Join Life sustainability movement even though they are categorized as a fast fashion brand. Nevertheless, the change of the fast fashion concept adapting to sustainable fashion has a different perception towards customers. Greenwash, a green non-profit organization based in the UK, has researched Zara items from the Join Life collection to see the material inside, and it turned out that it is made from 100% plastic and uses fossil fuels. However, continuous exposure to brand greenwashing can increase customers' distrust of the brand (Wu & Liu, 2022). Without customers' trust, it will be a high risk for Zara to keep moving to achieve their sustainability goals by 2025. There is also a high possibility that Zara will decrease their sales because of losing their loyal customers from greenwashing. The previous study mentioned that green marketing and brand trust are mediated by brand image (Wu & Liu, 2022) and brand commitment is the mediating factor of brand trust and brand loyalty (Shin et al., 2019). Therefore, this research will focus on how Zara's green marketing will influence its brand trust and brand loyalty by assessing brand image and brand commitment.

II. LITERATURE REVIEW

Zara

Zara is the main brand fast-fashion retailer of Inditex, the international largest fashion retailer. Zara sells fashion products, such as clothes as its main products, perfumes, accessories, bags, and shoes for men and women. It is well known for its elegance and trendy retail products amongst other fast fashion retail (Sitara, 2020). Zara launches a new collection every week and adds up to more than 500 designs per year (Hardcastle, 2022). They use vertical integration to be able to introduce new designs and modify existing designs within two to four weeks. Zara's constant newness, which creates a sense of scarcity and an exclusive environment around the brand's offers, is the retailer's power and consumer attraction (Sitara, 2020). Considered a fast fashion brand, Zara is concerned about sustainability as well. Along with Inditex as their parent company, Zara implements several sustainability strategies, including Join Life as their biggest movement. On the basis of Inditex Annual Report 2022, not only implements the sustainability movement in the process production of the collection, such as using sustainable raw materials but the servers and offices of Zara were also powered entirely by renewable energy sources.

Green Marketing

Green marketing is more than just using renewable materials, eco-friendly packaging, and recycling. A wide range of marketing activities is included in green marketing, which is directed to minimize the environmental impact as the company goal (Groening et al., 2018). The understanding and definition of green marketing will

change over time. Up to the present time, there were three stages of green marketing. The first stage called “ecological” green marketing – focuses on the environmental damage caused by marketing activities and how to solve it; the second stage “environmental” green marketing – focuses on innovating green products; lastly, the last stage called “sustainable” green marketing – focuses on people, planet, and product with long-term sustainability principles (Vilkaite-Vaitone & Skackauskiene, 2019). Thus, green marketing aims to fulfill customers’ needs and wants, as well as protect the environment.

Greenwash

As a part of green marketing, greenwash has a significant impact on green marketing. Greenwash is the combination of positive communication about environmental performance without great environmental performance (de Freitas Netto et al., 2020). Greenwashing practices mislead customers about a company’s environmental practices or product benefits. It will be hard for customers to have environmental purchasing decisions when there is no relevant information available about sustainable practices (Chen et al., 2018). Greenwash could increase the skepticism of customers toward the company’s green claims (Chen et al., 2018).

Based on a study conducted by (Chen et al., 2018), greenwash has a negative impact on green purchase behavior through green brand image and green brand trust as the mediators. Furthermore, the study proves that the firms’ greenwash negatively relates to firms’ green brand image. It means that the firm should lessen greenwash practices to grow the green brand image. Thus, this study will assess whether Zara’s greenwash will influence the green brand image negatively. The hypothesis proposed as follow:

H₁: Greenwash negatively influences green brand image.

Green Brand Image

According to a previous study by (Kotler & Armstrong, 2018), brand image has an important role in consumer buying behavior through their beliefs about a specific brand. It implies that consumers’ perceptions of a brand extend beyond its tangible features to the larger connotations and meanings they associate with it.

Green brand image is the brand perception in the consumer’s mind in relation to environmental concerns and commitments (Chen, 2010). In reference to Tan et al. (2022), the green image concept should be linked to environmental awareness, green brand knowledge, and attitude. Subject to a study by (Martínez, 2015) found that a green overall image has a positive influence on green customer trust. The study also proved that green trust becomes the relationship mediator for green image and green loyalty. In addition, it means that the green overall image increases positive perceptions of brand performance. Moreover, the previous research conducted also stated that brand image significantly influences brand trust (Kim & Chao, 2019). It is believed that a brand will succeed more if more people trust it. Additionally, it is stated that great consistency along with confidence will boost brand trust. Furthermore, this study will assess whether Zara’s green brand image will influence green brand trust positively. The hypothesis proposed as follow:

H₂: Green brand image positively influences green brand trust.

Green Brand Trust

According to Huaman-Ramirez & Merunka (2019), brand trust is a consumer’s expectation that a brand will constantly deliver on its promise while also mentioning that trust and commitment are the centers of a relationship commitment. Therefore, brand trust is important to build and maintain a long-term relationship. According to Chen (2010), green trust is a customer’s readiness to rely on a brand based on the expectation and perception of its environmental performance based on the brand’s credibility, benevolence, and ability. Research conducted by Martínez (2015) stated that green trust is positively associated with green satisfaction. In addition, Hussain & Waheed (2016) proved that green brand trust impacted green brand commitment. Moreover, a high level of green brand trust is necessary to increase green brand commitment and build long-lasting relationships between the brand and customers. In the study of Hariyanto (2018), brand trust positively has a significant impact on brand loyalty. Thus, the hypothesis proposed as follow:

H₃: Green brand trust positively influences green brand satisfaction.

H₄: Green brand trust positively influences green brand commitment.

H₇: Green brand trust positively influences green brand loyalty.

Green Brand Commitment

In accordance with (Osuna Ramirez et al., 2017), brand commitment refers to customer and brand relationships in relation to attitudes and behavioral tendencies with affective and cognitive elements. Commitment is divided into two categories which are affective and continuance commitment (Louis & Lombart, 2010). Affective commitment is more emotional-based compared to continuance commitment which is rational-based. Furthermore, commitment is the principle of relationship, along with trust. According to Hussain & Waheed (2016), green brand commitment is explained as a consumer's likelihood to maintain a long-term engagement with a brand based on environmental concerns and obligations. They also mention that green brand commitment consists of green affective commitment which explains about environmentally conscious customers maintain emotional relationships, and green continuance commitment illustrates the relationship between environmentally conscious customers and brands based on a shortage of choices. The research conducted by Shin et al. (2019) described that there was a beneficial and significant influence of brand commitment on brand loyalty. In addition to that, the study explained that the link between brand loyalty and brand trust is mediated by brand commitment. Hence, this study will assess whether green brand commitment has influenced green brand loyalty positively. The hypothesis proposed as follow:

H₅: Green brand commitment positively influences green brand loyalty.

Green Brand Satisfaction

According to Kotler & Armstrong (2018), customer satisfaction is how much the performance of a product aligns with the customer's expectations. Customer satisfaction is a customer's level of contentment with a product or service offered based on their expectations, desires, and needs (Chen, 2010). Green satisfaction is a pleasant degree of consumption aimed to meet the environmental desires, long-term expectations, and green needs of a customer (Chen, 2010). In addition, customers are satisfied if their expectations are met. Moreover, green customer satisfaction has an effect on green brand loyalty along with empirical evidence that the connection between green image and green loyalty is mediated by green satisfaction and green trust (Martinez, 2015). According to the research, green satisfaction can increase the green loyalty of a brand. Hence, the higher customer's green satisfaction towards a brand, the more desirable the green loyalty is. Hence, this study will assess whether green brand satisfaction has influenced green brand loyalty positively. The hypothesis proposed as follow:

H₆: Green brand satisfaction positively influences green brand loyalty.

Green Brand Loyalty

According to Shin et al. (2019), brand loyalty involves a prominent bond customer has with a brand. In the words of (Rosenbaum-Elliott et al., 2018), the high bond between the brand and customers will not make customers have the urge to switch brands considered as brand loyalty. (Chen, 2010) introduces green brand loyalty as the amount of intention to repurchase caused by environmental attitude and commitment to sustainability towards the brand. The study shows that green loyalty can be influenced by green satisfaction, green trust, and green perceived value and not the general one. Therefore, a company needs to emphasize all green aspects to rise green brand loyalty.

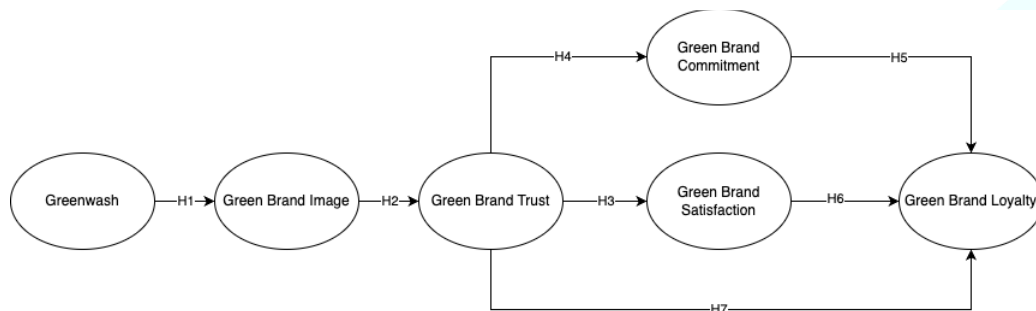


Figure 1 Conceptual Framework

Figure 1 depicts the research model starting from greenwash will negatively influence the green brand image. Continuing with a green brand image will positively influence green brand trust. Furthermore, green brand trust will positively influence green brand commitment and green brand satisfaction toward green brand loyalty and directly influence green brand loyalty.

III. RESEARCH METHODOLOGY

This research will use a quantitative approach to collect the data. The method used to collect data is the survey method. There will be a preliminary survey to collect information regarding customers' knowledge and opinion regarding Zara's sustainability movement. The main survey will assess the impact of Zara's green marketing on brand trust and brand loyalty. The population of this research is Zara's customers located in Indonesia and who know Zara's green marketing. The minimum sample for this research is 200 samples. Besides, a purposive sampling technique is used to narrow the samples chosen in this study. The main survey questionnaire is delivered in Bahasa Indonesia using Google Forms as a tool and divided into several sections with demographic and behavioral questions in the first section. While the rest of the sections are divided into each variable and provide specific questions associated with greenwash, green brand image, green brand trust, green brand commitment, green brand satisfaction, and green brand loyalty. The questionnaire for the main survey is generated from the previous study on a similar topic and adjusted to illustrate Zara's green marketing. The type of questions consists of open questions and seven-point Likert scale questions. The data collected from the main surveys will be analyzed using descriptive analysis and the PLS-SEM technique using SmartPLS 4 software.

IV. RESULT / FINDING

The main survey received 323 respondents with a total of 306 respondents who passed the criteria and screening questions, which surpassed the minimum sample required. Descriptive analysis was used to analyze the characteristics of the data. Meanwhile, PLS-SEM was used to calculate the reliability and validity of the data.

Table 1. Descriptive Analysis, Reliability, and Validity Test Result

Variable	Label	Indicator	Mean	Std. dev	Outer Loading 1	Outer Loading 2	CR	AVE
Greenwash	GW1	Zara exaggerate its green functionality	4.935	1.659	-0.417	-	0.941	0.889
	GW2	Zara presents the green claim in a more favorable light than its actual implications.	4.915	1.508	-0.393	-		
	GW3	Zara mislead the environmental features using words	3.301	1.576	0.777	0.927		
	GW4	Zara mislead the environmental features using visual	3.056	1.715	0.857	0.959		
Green Brand Image	GBI1	Zara is a good example for sustainable movement	5.493	1.389	0.862	0.875	0.917	0.786
	GBI2	Zara is well known for its environmentally conscious	4.846	1.720	0.855	0.877		
	GBI3	Zara is reliable for its environmental claims	5.111	1.587	0.890	0.907		

	GBI4	Overall, Zara has a great brand image for a fashion brand	5.641	1.266	0.631	-		
Green Brand Trust	GBT1	I trust Zara and its environmentally practice	5.389	1.461	0.887	0.888	0.923	0.751
	GBT2	I feel that Zara's concern for the environment met with my expectations	5.163	1.444	0.881	0.881		
	GBT3	I feel that Zara's green marketing (Join Life) is reliable	5.229	1.306	0.835	0.834		
	GBT4	I feel that Zara keep their words for their green marketing (Join Life)	5.320	1.294	0.862	0.862		
Green Brand Commitment	GBC1	I prefer Zara over another fashion brand that is also environmental conscious	4.918	1.830	0.868	0.868	0.929	0.767
	GBC2	The environmental values of Zara have significant amounts of personal meaning for me.	4.902	1.699	0.845	0.845		
	GBC3	I continuously looking for a sustainable fashion products until I found Zara	4.542	1.808	0.879	0.879		
	GBC4	It is hard for me to choose another brand over Zara	4.395	2.035	0.909	0.909		
Green Brand Satisfaction	GBS1	I am satisfied with Zara products because of its environmental consciousness	5.399	1.472	0.873	0.873	0.916	0.732
	GBS2	I believe that I do the right thing to purchase Zara products because of its environmental consciousness	5.222	1.518	0.852	0.852		
	GBS3	Overall, I am satisfied with Zara	5.699	1.227	0.851	0.851		
	GBS4	Overall, I am happy with Zara	5.761	1.207	0.847	0.847		
Green Brand Loyalty	GBL1	I will purchase Zara products the next time I shop for eco-friendly fashion items	5.242	1.617	0.871	0.871	0.943	0.732
	GBL2	I want to keep buying Zara products since it is environmentally friendly	5.134	1.584	0.888	0.888		
	GBL3	Zara is my top choice of fashion brands that is also environmental conscious	4.761	1.796	0.877	0.877		
	GBL4	I am willing to pay more to buy Zara products that environmental friendly	5.007	1.557	0.854	0.854		
	GBL5	I will recommend Zara to others since they care with the environment	5.007	1.690	0.838	0.838		
	GBL6	I consider myself as a loyal customer to Zara	4.748	1.942	0.803	0.803		

Analyzing Table 1. the highest mean value is represented by the green brand image variable indicator “Overall, I am happy with Zara” with 5.761 means that Zara has a positive impression as a fashion brand from the respondents’ perspective. All standard deviations reached more than 0 implying that the answers have varying values. Using the SmartPLS software, the outer loading was done to evaluate all indicators. An outer loading accepted is higher than 0.7 (Hair et al., 2019). In Table 1. it is stated that GW1, GW2, and GBI4 have outer loading below 0.7, thus it needs to be removed because it was not reliable. After removing that three indicators, another

outer loading evaluation was done with the rest of the indicators and passed the minimum value. Then, composite reliability was measured and ranged from 0.916 and 0.943, which passed the requirement. In addition, validity was measured using the Average Variance Extracted (AVE) which has to be higher than 0.5. The AVE ranged from 0.732 and 0.889 and could be concluded that it met the requirements.

Table 2. Hypothesis Testing

Hypotheses	Structural Path	T stat	P Value	Result
H1	Greenwash -> Green Brand Image	0.102	0.919	Rejected
H2	Green Brand Image -> Green Brand Trust	39.680	0.000	Accepted
H3	Green Brand Trust -> Green Brand Satisfaction	31.079	0.000	Accepted
H4	Green Brand Trust -> Green Brand Commitment	30.983	0.000	Accepted
H5	Green Brand Satisfaction -> Green Brand Loyalty	10.420	0.000	Accepted
H6	Green Brand Commitment -> Green Brand Loyalty	9.889	0.000	Accepted
H7	Green Brand Trust -> Green Brand Loyalty	3.526	0.000	Accepted

Table 2. depicts the result of the inner model evaluation by using bootstrapping to see the T-statistics values that can be used to analyze the hypotheses. The T-statistics need to be higher than 1.96 with a p-value below 0.05 to be considered accepted.

Hypothesis 1 argued that greenwash negatively influences green brand image. According to the calculation, the T-stat for H1 is 0.102 which is lower than 1.96 with a significance level of higher than 0.05, the hypothesis is rejected. Thus, it can be confirmed that greenwash is not negatively influences green brand image.

Hypothesis 2 argued that green brand image favorably influences green brand trust. According to the calculation, the T-stat for H2 is 39.680. The hypothesis is accepted if it is larger than 1.96 at a significance level of 0.05. Thus, it is verifiable that green brand image positively influences green brand trust.

Hypothesis 3 argued that green brand trust positively influences green brand satisfaction. According to the calculation, the T-stat for H3 is 31.079. The hypothesis is accepted if it is larger than 1.96 at a significance level of 0.05. Thus, it can be proven that green brand trust positively influences green brand satisfaction.

Hypothesis 4 argued that green brand trust positively influences green brand commitment. According to the calculation, the T-stat for H4 is 30.983. The hypothesis is accepted if it is larger than 1.96 at a significance level of 0.05. Thus, it can be determined that green brand trust positively influences green brand commitment.

Hypothesis 5 argued that green brand satisfaction positively influences green brand loyalty. According to the calculation, the T-stat for H5 is 10.420. The hypothesis is accepted if it is larger than 1.96 at a significance level of 0.05. Thus, it can be found that green brand satisfaction positively influences green brand loyalty.

Hypothesis 6 argued that green brand commitment positively influences green brand loyalty. According to the calculation, the T-stat for H6 is 9.889. The hypothesis is accepted if it is larger than 1.96 at a significance level of 0.05. Thus, it can be verified that green brand commitment positively influences green brand loyalty.

Lastly, Hypothesis 7 argued that green brand trust positively influences green brand loyalty. According to the calculation, the T-stat for H7 is 3.526. The hypothesis is accepted if it is larger than 1.96 at a significance level of 0.05. Thus, it can be proved that green brand trust positively influences green brand loyalty.

V.DISCUSSION

Greenwash negatively influences green brand image

The first hypothesis predicted that greenwash has a negative influence on green brand image. The hypothesis is rejected after examining the study's data since the T-value is less than 1.96 and the significant point is more than

0.05. This finding is contradictory with the previous study by (Chen et al., 2018), who found that greenwash has a negative impact on green brand image.

Based on the questionnaire result, both indicators for the greenwash variable which are “Zara mislead the environmental features using words” and “Zara mislead the environmental features using visuals” has a mean value higher than 3. This suggests that respondents perceive Zara’s green marketing as misleading which leads to greenwashing. The researcher also assessed respondents' preferences regarding what they like and dislike in Zara's green marketing and group them in several keywords. Respondents expressed concerns about the lack of explanation or transparency behind the Join Life initiative, doubts about its tangible impact, insufficient awareness and campaign efforts, and potential greenwashing. It indicates that Zara may not be effectively communicating its genuine sustainability efforts to consumers. Furthermore, the study was also supported by research from Hameed et al. (2021) that greenwash hinders a company’s green brand image. On the other hand, respondents expressed positive sentiments towards sustainability, environmental impact, ethical business practices, circular economy, transparency, employee welfare, and responsible material sourcing as elements they appreciate about Zara's green marketing.

Green brand image positively influences green brand trust

The second hypothesis proposed that green brand image influences green brand trust positively. After analyzing the data of the study, it is found that the hypothesis is accepted since the T-value is higher than 1.96 and with a significant point of 0.05. It is aligned with the finding from Martínez (2015) that a green brand image has a positive effect on green brand trust. Additionally, two indicators of green brand image in the questionnaire have a mean value greater than 5, and one indicator has a mean value near 5 which is 4.846. It implies that a positive green brand image contributes to the establishment of green brand trust. Relating to a green brand image, consumers must be given a genuine and consistent environmental message since it has a positive impact on their green brand trust. Throughout its business journey, Zara continuously conveys its green brand image through its green marketing practices. Positive and transparent reliability in environmental claims can foster positive emotions in customers which will generate their trust in green initiatives.

Green brand trust positively influences green brand satisfaction

The third hypothesis indicated that green brand trust has a favorable influence on green brand satisfaction. After examining the study's data, it is determined that the hypothesis is accepted because the T-value is more than 1.96 and the significant point is 0.05. It is aligned with the previous study by Martínez (2015) that green trust has a positive influence on green satisfaction. Furthermore, the indicator “I feel that Zara’s concern for the environmental met with my expectations” from the green brand trust variable has a mean value of 5.163. It means that Zara’s success in achieving consumers’ environmental expectations that will lead to satisfaction, as seen on the indicator “I am satisfied with Zara products because of its environmental consciousness” from the green brand satisfaction variable has a mean value of 5.399. Customers are far more likely to be satisfied with the products of a brand when they trust and believe the brand cares about the environment as well.

Green brand trust positively influences green brand commitment

The fourth hypothesis argued that green brand trust has a positive effect on green brand commitment. After examining the study's data, it is determined that the study's hypothesis is accepted given that the T-value is more than 1.96 and has a significant point of 0.05. This finding is consistent with the previous study by Hussain & Waheed (2016) who found that green brand trust has a positive impact on green brand commitment. Based on the results of the questionnaire, with a green brand trust indicator of “I trust Zara and its environmental practice” that has a 5.389 mean value score, it can be said that if consumers trust the brand and its green initiatives, they are more likely the consumer will have a strong commitment to the brand. It also can be seen from the indicator “The environmental values of Zara have significant amounts of personal meaning for me” in green brand commitment with a 4.902 mean value. This connection could be influenced by respondents' trust in Zara's environmental efforts.

Green brand commitment positively influences green brand loyalty

The fifth hypothesis predicted that green brand commitment has an advantageous effect on green brand loyalty. After examining the study's data, it is determined that the study's hypothesis is accepted given that the T-value is

more than 1.96 and has a significant point of 0.05. It is aligned with the previous study by Shin et al. (2019) who found that brand commitment has a significant positive influence on brand loyalty. Moreover, in addition to the questionnaire result, there are four indicators that have a mean value greater than 4 in the green brand commitment variable. Specifically the indicator “I prefer Zara over another fashion brand that is also environmentally conscious” describes that respondents have a strong commitment towards Zara. This provides an understanding that there is a positive relationship between green brand commitment and green brand loyalty.

Green brand satisfaction positively influences green brand loyalty

The sixth hypothesis claimed that green brand satisfaction impacts green brand trust positively. After examining the study's data, it is determined that the study's hypothesis is accepted given that the T-value is more than 1.96 and has a significant point of 0.05. This finding is consistent with the earlier study by Martínez (2015) who found that green satisfaction has a positive impact on green loyalty. As seen from the questionnaire result, all indicators in green brand satisfaction have a mean value greater than 5. It depicts that respondents feel satisfied with Zara's green marketing and have the intention to stay loyal to Zara. Furthermore, satisfaction has a role in making consumers more loyal to the brand which is supported by the indicator “Overall, I am happy with Zara” which has the highest mean value of 5.761.

Green brand trust positively influences green brand loyalty

The seventh hypothesis speculated that green brand trust has a favorable influence on green brand loyalty. After examining the study's data, it is determined that the study's hypothesis is accepted given that the T-value is more than 1.96 and has a significant point of 0.05. This finding is consistent with the previous research by (Alhaddad, 2015)), which concluded that brand trust has a positive influence on brand loyalty. In accordance with the outcomes of the questionnaire, there are four indicators of green brand trust with all of them having a mean value of more than 5. The indicator “I feel that Zara keep their words for their green marketing (Join Life)” has a 5.320 mean value reflecting the brand reliability in respondents' perception. When customers trust that a brand is sincere in its attitude toward the environment and keeps its promises, they are more likely to become loyal.

VI. CONCLUSION AND RECOMMENDATION

In conclusion, the study aimed to identify consumer perceptions of greenwashing on Zara's Join Life green marketing and assess the impact of Join Life green marketing on brand trust and brand loyalty. The findings support the research hypotheses and provide valuable insights into the relationship between greenwashing, green brand image, green brand trust, green brand satisfaction, green brand commitment, and green brand loyalty. Some respondents said that Zara's green marketing was considered greenwashing due to its lack of transparency, concerns regarding its real impacts, and limited public awareness. Meanwhile, others also stated that they like environmental impact, ethical business practices, circular economy, transparency, employee welfare, and responsible material sourcing aspect of the Zara Join Life green marketing.

The study concluded that greenwash is not negatively influence green brand image, while green brand image positively influences green brand trust. Green brand trust, in turn, positively influences green brand satisfaction, green brand commitment, and green brand loyalty. Moreover, green brand satisfaction and green brand commitment were found to positively influence green brand loyalty.

The findings in this research might be used as a reference for marketers who intend to put into practice a green marketing strategy. In essence, it is important for a brand to improve transparency to reinforce trust among customers, including what green aspects the brand is still lacking. Additionally, fostering and maintaining consumer trust is crucial for improving consumer green commitment, satisfaction, and loyalty. Green marketing strategies should engage with the customer to enhance the association between customers and the brand.

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Sustainable Collaboration in Business,
Technology, Information and Innovation

Exchange Rate Volatility Impact Between Malaysia and Major Exporter Partners

Nizam Ahmat ¹, Nur Halifah Mohd Ibrahim ¹, Nasir Nawawi ¹, Muhammad Najit Sukemi ¹

¹ Faculty of Business, Economics and Social Development, University Malaysia Terengganu, Terengganu, Malaysia

Abstract

Introduction/Main Objective: The volatility risk through exchange rates on the Malaysian-exporting partners' bilateral trade undoubtedly has an impact on both countries' economies. This article investigates the impact of immediate and long-term of exchange rates on Malaysia's major exporter countries (asymmetry/symmetry). **Research Gap/Novelty:** The current research fills the gap by looking at new empirical evidence on the direction of real exchange rate volatility on trade movement among Malaysia and its biggest trading partners. **Research Methods:** For estimating the exchange rate instability, the GARCH method was applied. Meanwhile, using yearly data from 1972 to 2021, the ARDL model is used for examining the immediate and long-term consequences of the exchange rate volatility. **Finding/Results:** According to the research, there exists an opportunity for real exchange rate volatility between Malaysia and its five major export partners, especially Hong Kong, China, Japan, Thailand, and Singapore. Furthermore, empirical findings show that there are both immediate and long-term asymmetries in exchange rate volatility for almost all of Malaysia's key export partners, such as Hong Kong, China, Japan, Thailand, Singapore, and the US. **Conclusions and implication:** Malaysia's keen interest in global trade might be attributed to these achievements. Malaysia's essential elements of trade policy, which include Free Trade Agreements (FTA), Preferential Trade Arrangements, and Export-Oriented Industrialization, are implemented to strengthen Malaysia's cooperation with other countries and promote regional integration and trade facilitation.

Keywords: Exchange Rate Volatility; Malaysia's Main Export Partner; Bilateral Trade; Exchange Rate Volatility Risk; Asymmetric Impact

I. INTRODUCTION

There is the potential for a connection between trade and exchange rate volatility. International trade flows can be impacted by changes in exchange rates, and trade activities can be affected by the uncertainty of exchange rate volatility. This link has been the subject of research to determine how changes in exchange rates impact global commerce and vice versa. International trade plays a crucial role in economies worldwide, involving the exchange of capital, goods, and services across borders (Workman, 2021). It contributes significantly to a country's gross domestic product (GDP) and facilitates resource specialization, technological progress, and economic growth. Exports and imports shape a nation's economic balance, with exports referring to goods and services produced domestically and sold to foreign customers (Workman, 2021). Access to new markets through international trade expands national income and promotes competitive advantages for countries with superior products. By focusing on products produced efficiently and at lower costs, as proposed by Smith's theory of absolute advantage and Ricardo's theory of comparative advantage, countries can meet their needs and benefit from the exchange of goods and services. For instance, Malaysia's exports to its trading partners have significantly contributed to its export revenue (Workman, 2021).

In general, a high level of volatility of the exchange rate can have both effects on trade either good or bad. On one hand, exchange rate movements can provide opportunities for traders to exploit price differentials and engage in arbitrage. This can lead to increased trade volumes and market efficiency. On the other hand, excessive exchange rate volatility can introduce uncertainty and risk, which may deter trade activities. Fluctuations in exchange rates can make it difficult for exporters and importers to plan and price their goods effectively, potentially reducing trade volumes. This statement is related to research conducted by Bahmani-Oskooee and Arize (2021), where exchange rate volatility significantly and adversely affects bilateral commerce between the United States and Africa. It is discovered that trade volumes between the United States and African countries are decreased by both symmetric and asymmetric exchange rate volatility. The adverse effect suggests that rising exchange rate volatility generates uncertainty and risk, which results in a decline in trade activities.

The real exchange rate, which is determined by the nominal rate of exchange along with the selling prices of goods and services in both countries, plays an important part when calculating a country's import and export levels. To determine the genuine exchange rate, economists analyze measures such as consumer price indexes rather than item prices. Changes in a country's real currency exchange rate affect both exports and imports, as demonstrated by the depreciation of the US dollar, which makes US goods relatively cheaper and supports increasing exports while decreasing imports. Furthermore, changes in interest rates affect currency values together with exchange rates, with rising national interest rates pulling foreign investors and boosting demand for domestic currency (Mankiw, 2021).

The remainder of the paper is organized as follows. The following section presents a summary of previous research. Section three describes our research method, which involves the econometric model, and Section four explains our empirical results. Section five addresses the results of the discussion. Section six pertains to an end with a conclusion and recommendation.

II. LITERATURE REVIEW

Many empirical studies have investigated the connection between trade flows, particularly country exports, and exchange rate volatility. These studies have used a variety of data and methodologies. Unfortunately, there is disagreement on the findings. According to Arize (1997), a country's real exports are influenced by abroad business activity, price relative to other countries, and fluctuations in exchange rates within the specific context that is being examined. Previous research has assumed that there is a symmetric link between volatility in exchange rates and trade movements, suggesting that higher volatility decreases trade, while decreased volatility increases it to an equal extent (Bahmani-Oskooee and Aftab, 2017a). Initially, it was widely assumed that raising volatility in currencies would negatively impact trade between countries. However, theoretical advancements in this field have revealed that higher levels of volatility in exchange rates could potentially enhance trade, depending on the risk-bearing capacity of traders (Bahmani-Oskooee et al., 2020).

The impact of exchange rate shocks is asymmetric, with a greater increase in export levels observed when the exchange rate experiences a positive shock compared to the decrease in exports resulting from an equivalent negative shock (Aye et al., 2015). Furthermore, in the Malaysian context, the adoption of a nonlinear model has shown that the impact of exchange rate volatility is statistically significant across a wider range of industries, showing a stronger relationship between exchange rate volatility and trade (Bahmani-Oskooee & Aftab, 2017b).

Exchange-rate volatility has a detrimental effect on real exports as it impacts the activities of risk-averse exporters, disrupts supply and demand sources, and affects prices, consequently impacting the distribution of output across sectors (Arize, 1997). However, it is worth noting that the influence of negative shocks on the exchange rate on real exports may not be strong enough to be considered statistically significant (Aye et al., 2015). The addition of the third-country effect is insufficiently explained to the observed reduction in the effect of exchange rate volatility. It is the consequence of neglecting the asymmetric effects of exchange rate volatility and the implications of the third-country phenomenon (Bahmani-Oskooee & Aftab, 2017b).

Exchange-rate fluctuations primarily affect export volume in the short term, with evidence of a negative short-run effect of exchange-rate volatility on export flows in Latin American countries (Arize, 1997; Arize et al., 2008). Furthermore, asymmetrical responses to changes in economic conditions or shocks are observed in approximately one-third of Malaysia's exporting businesses, highlighting varied reactions within this significant trade (Bahmani-Oskooee and Aftab, 2017a). Nonlinear analysis has also revealed a higher occurrence of the third-country effect, indicating that economic conditions and trade activities of third countries have a notable influence on trade dynamics (Bahmani-Oskooee & Aftab, 2017b).

A linear trade model estimation shows that the impact of fluctuations in exchange rates on US exports to African trading partners in the short term is significant (Bahmani-Oskooee and Arize, 2021). Similarly, results from both nonlinear and linear models also show that exchange rate volatility influences trade flows in almost all countries, while the nonlinear model provides novel insights into the disparity of this effect (Bahmani-Oskooee et al., 2020). Exchange rate fluctuations significantly affect Tunisia's exports and imports with all 16 trade partners, including its major trading partners, indicating an immediate impact on the quantity and value of

Tunisia's trade (Bahmani-Oskooee & Nouira, 2019). Moreover, the actual exchange rate has a detrimental effect on Indonesia's exports to several countries in the near term, including Australia, China, Germany, India, Malaysia, the Netherlands, Singapore, and South Korea (Heriqbaldi et al., 2022). These findings highlight the significance of short-term changes in exchange rates on trade relationships and outcomes.

According to Arize (1997), there is a definite and significant long-term relationship between a country's exports and exchange rate fluctuation. Similarly, research among eight countries in Latin America discovers a significant and negative long-term relationship between volatility in exchange rates and export flow, suggesting that a greater degree of volatility is statistically linked with lower exports (Arize et al., 2008). Furthermore, the analysis uncovers compelling evidence of substantial asymmetry effects over the long run, highlighting the enduring influence of factors like exchange rate volatility and the third-country effect on trade outcomes (Bahmani-Oskooee & Aftab, 2017b).

The long-term influence of exchange rate volatility on U.S. exports to partner countries is not only temporary but also persists over an extended duration, emphasizing the importance of considering long-term dynamics and implementing suitable strategies to mitigate potential adverse effects of volatility on trade relationships (Bahmani-Oskooee and Arize, 2021). These contrasting long-run effects demonstrate the complex and nuanced relationship between exchange rate volatility and trade outcomes in Asia (Bahmani-Oskooee et al., 2020). Moreover, the short-run effects of exchange rate volatility have enduring consequences, leading to significant long-run effects in nearly half of the partner countries examined, with variations in magnitude and characteristics among different countries (Bahmani-Oskooee & Nouira, 2019).

Furthermore, research shows that real exchange rate volatility has a reducing Indonesian export to China and Germany, underlining the impediment produced by higher volatility in the real exchange rate between Indonesia and these countries (Heriqbaldi et al., 2022). These findings highlight the necessity of assessing the long-term implications of exchange rate volatility on trade partnerships, as well as the need for suitable mitigation strategies.

Implementing economic measures that prioritize exchange rate stability, such as establishing a shared currency region (Arize et al., 2008), can contribute to increased trade between Latin American nations. It is crucial for policymakers to carefully consider the potential advantages and disadvantages, along with the overall economic and financial environment, when implementing capital restrictions and other policy decisions (Aye et al., 2015). By recognizing the partner-specific nature of these effects and tailoring strategies to address the unique challenges and opportunities presented by exchange rate volatility, policymakers can effectively manage trade relationships and enhance overall economic stability in African countries (Bahmani-Oskooee and Arize, 2021). Understanding these effects can also aid firms and governments in developing strategies and regulations that navigate the possibilities and difficulties associated with exchange rate volatility, thereby fostering durable and resilient trade partnerships (Heriqbaldi et al., 2022).

III. RESEARCH METHODOLOGY

In this research, the data resources employed consist solely of quantitative secondary sources spanning the period from 1972 to 2021 for six of Malaysia's major trade partners (China, the US, Japan, Singapore, Thailand, and Hong Kong). All data used in this study was yearly data obtained from World Development Indicator, World Bank. These sources include reputable databases, statistical reports, and publicly available datasets, ensuring a comprehensive and objective analysis of the research topic. By utilizing this quantitative data, this study aims to provide rigorous statistical analysis, identify trends, patterns, and relationships, and draw meaningful conclusions regarding the research problem within the specified time frame.

Table 1. Data Resources

Variable	Explanation (Unit)	Data Resources
<i>EKS</i>	Real Export (current US\$)	WDI
<i>GDP</i>	Real Gross Domestic Product (current US\$)	WDI

RER	Real Exchange Rate (current US\$)	WDI
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Source: World Development Indicator (WDI), World Bank

The GARCH method is used to capture the clustering of volatility and the uncertainty of the real exchange rate for Malaysia and exporters partner real exchange rate between Malaysia and its partner. The GARCH model extends this concept by incorporating lagged values of both squared residuals and conditional variances. GARCH models involve determining the appropriate model order (p and q), fitting the model to the data, and obtaining parameter estimates using methods like maximum likelihood estimation (MLE).

The GARCH model is shown below :

$$h_t^2 = \beta_0 + \beta_1 u_{t-1}^2 + \beta_2 u_{t-2}^2 + \dots + \beta_q u_{t-q}^2 + \phi_1 h_{t-2}^2 + \dots + \phi_p h_{t-p}^2 \quad (1)$$

where,

h_t^2 = Conditional variance

U_t = Conditional standard deviation

p, q = Used to generate the forecast value, h_t^2

β, ϕ = Partner's real export

The models employed in the article are similar to the study of Bahmani-Oskooee and Aftab (2017). We only change the symbols to modify the equations for combining trade relations between two countries. (refer to the model in equation (2)). Then, the ARDL model where appropriate when the variables involved are of multiple orders of integration (i.e., integrated of different orders, such as $I(0)$, $I(1)$, etc.), the ARDL bound testing technique still allows for the estimate of cointegrating connections. When both variables are $I(0)$, $I(1)$, or one is $I(0)$ and the other is $I(1)$, it applies. The main goal of ARDL bound testing is to estimate an autoregressive distributed lag model that takes into account the variables' lagged levels and differences. A long-run relationship's presence may be ascertained by evaluating the importance of the coefficients on the lagged levels, differences, and their combinations. If the calculated F-statistic or Wald statistic is greater than the upper bound critical value, cointegration is present. On the other hand, if the computed statistic is less than the lower bound critical value, it implies that there is no cointegration. The test is not conclusive if the computed statistic is within the boundaries. The ARDL Bound testing model is shown below :

$$\begin{aligned} \Delta \ln EKS_{my,t} = & \beta_0 + \sum_{p=1}^n \beta_1 \Delta \ln EKS_{my,t-p} + \sum_{p=0}^n \beta_2 \Delta \ln GDP_{t-p} + \sum_{p=0}^n \beta_3 h_{t,t-p}^2 \\ & + \sum_{p=0}^n \beta_4 \Delta \ln EKS_{t-p} + \lambda_1 \ln EKS_{my,t-1} + \lambda_2 \ln GDP_{t-1} + \lambda_3 h_{t,t-1}^2 \\ & + \lambda_4 \ln EKS_{t-1} + u_t \end{aligned} \quad (2)$$

where,

$\Delta \ln EKS_{my,t}$ = Malaysia's real export

$\Delta \ln GDP_{t-p}, \ln GDP_{t-1}$ = Partner's real Gross Domestic Product

$\Delta \ln EKS_{t-p}, \ln EKS_{t-1}$ = Partner's real export

$h_{t,t-p}^2, h_{t,t-1}^2$ = Conditional variance variable from GARCH estimation.

$\beta_1, \beta_2, \beta_3, \beta_4, \lambda_1, \lambda_2, \lambda_3$ = Parameters for each variable

u_t = Error term occurring in the model

Moreover, to simultaneously capture short-term dynamics and long-term equilibrium, the ARDL ECM (Error Correction Model) method extends the ARDL bound testing approach. The ECM allows you to examine both the short-term dynamics and the long-run equilibrium relationships. The model is shown below :

$$\Delta \ln EKS_{my,t} = \beta_0 + \sum_{p=1}^n \beta_1 \Delta \ln EKS_{my,t-p} + \sum_{p=0}^n \beta_2 \Delta \ln GDP_{t-p} + \sum_{p=0}^n \beta_3 h_{t,t-p}^2 + \sum_{p=0}^n \beta_3 \Delta \ln EKS_{t-p} + \theta ECM_{t-1} + u_t \quad (3)$$

where,

$\Delta \ln EKS_{my,t}$ = Malaysia's real export

$\Delta \ln GDP_{t-p}$ = Partner's real Gross Domestic Product

$\Delta \ln EKS_{t-p}$ = Partner's real export

$h_{t,t-p}^2$ = Conditional variance

$\beta_1, \beta_2, \beta_3, \theta$ = Parameters for each variable

ECM_{t-1} = Adjustment parameter in long run.

u_t = Error Term occurring in the model

Lastly, the diagnostic tests used to include the LM test, Normality test, RESET test, CUSUM test, and CUSUM of Square test, are valuable tools used to evaluate regression models. The LM test examines the residuals for any patterns or relationships, providing insights into the model's ability to capture data behaviour. The Normality test checks if the residuals follow a normal distribution, which is crucial for reliable statistical inferences and predictions. The RESET test helps identify if the model overlooks important factors or if there are errors in specifying variable relationships. The CUSUM test detects changes in model coefficients over time, highlighting potential shifts or instability in relationships. Lastly, the CUSUM of Square test evaluates the consistency of squared residuals, which can indicate the presence of heteroscedasticity or changing error variance. By analysing the results of these tests, analysts can identify and address issues such as autocorrelation, deviations from normality, misspecification, parameter instability, and heteroscedasticity, leading to improved regression models and more accurate analysis.

IV. RESULTS/FINDINGS

Table 1. Descriptive Statistics results

Variables	Min	Median	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis
<i>lnGDP_{it}</i>							
China	4.44	2.16	1.37	8.71	4.09	0.80	2.14
Hong Kong	1.97	1.86	2.76	9.99	4.92	-0.06	1.89
Japan	4.54	4.72	6.29	2.34	8.32	-0.39	3.69
Singapore	1.67	1.25	3.40	2.80	9.93	0.32	1.70
Thailand	2.68	2.46	4.80	1.03	1.08	0.38	1.93
USA	1.23	1.20	2.32	4.40	5.22	0.22	1.92
<i>lnEKS_{it}</i>							
China	9.89	6.31	2.74	8.00	8.78	0.39	1.54
Hong Kong	3.26	2.96	5.48	1.05	1.49	0.13	1.37
Japan	5.76	5.10	9.23	0.00	2.32	-0.19	2.19
Singapore	3.13	2.55	6.28	4.16	1.87	0.14	1.51
Thailand	1.55	1.27	2.92	2.63	8.38	0.18	1.56
USA	1.49	1.37	2.20	6.39	0.073	4.88	0.04
Malaysia	1.49	1.55	2.46	2.98	6.47	-0.30	1.90
<i>h_{it}²</i>							
China	-0.13	-0.17	0.11	-0.37	0.13	0.01	1.66
Hong Kong	-0.12	0.00	1.73	-2.56	0.75	-0.58	4.84

Japan	-0.05	0.00	11.67	-14.06	2.73	-1.18	22.13
Singapore	-0.01	-0.00	0.04	-0.09	0.02	-1.07	5.17
Thailand	-0.01	-0.06	9.13	-9.14	1.95	0.10	20.67
USA	0.01	0.00	0.09	0.00	0.23	2.10	6.10

Source: Data analysis

Descriptive statistics provide valuable insights into the characteristics of the variables in Table 2. When examining the Gross Domestic Product variable, $InGDP_{it}$, we observe that China has the highest maximum InGDP value of 8.71, indicating a strong economic performance. The standard deviation is relatively low for China, Hong Kong, and Japan, indicating less variability in their InGDP values. Furthermore, the skewness values indicate that the InGDP distributions for all countries are approximately symmetric, with skewness values close to zero. While the kurtosis values suggest that the InGDP distributions for China and Japan are more peaked and have heavier tails compared to a normal distribution.

Turning to the export variable, $InEKS_{it}$, Japan has the highest maximum export value of 9.23, while China has the lowest maximum export value of 2.74. The standard deviation varies across countries, with Singapore and Thailand having relatively low variability in their export values. Additionally, the skewness values indicate that the export distributions for all countries are approximately symmetric, with skewness values close to zero. The kurtosis values suggest that the export distributions for all countries are relatively close to a normal distribution.

Turning to the real exchange rate volatility variable, h_t^2 , Japan has the highest maximum real exchange rate volatility value of 11.67, indicating higher variability in its data compared to other countries. The skewness values for all countries are close to zero, indicating relatively symmetric distributions. However, the kurtosis values suggest that the distribution of exchange rate volatility for all countries have heavier tails and higher peaks compared to a normal distribution, with Japan exhibiting the highest kurtosis.

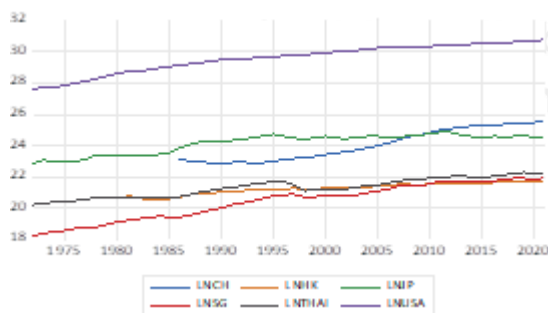


Figure 1: Plot $\ln GDP_{it}$

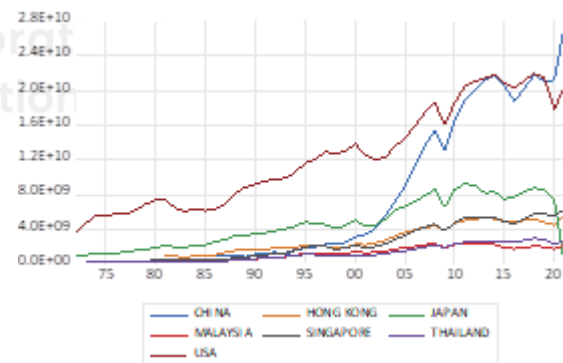
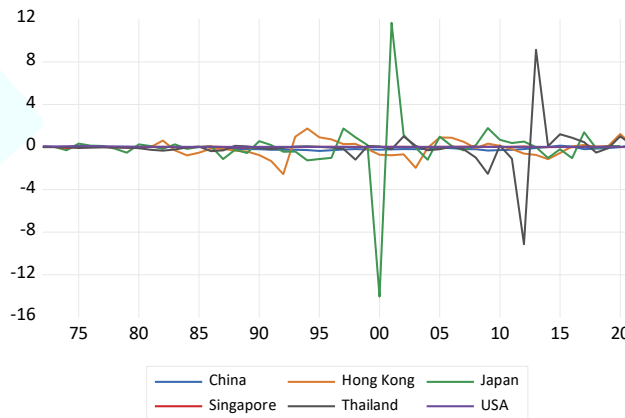


Figure 2: Plot EKS_{it}

Figure 3: Plot h^2_{it}

Source: Author data analysis

Figure 1 shows the plot of Gross Domestic Product (GDP) for every country across shows that most of the countries' GDP are increasing over time. According to the World Bank (2023), the United States, China and Japan are among the top ten countries in terms of GDP in 2021. While Hong Kong, China, Japan, Singapore and other recently industrialized nations in Asia and the Pacific have seen GDP expansion throughout time (Asian Development Bank, 2023).

Figure 2 shows the plot of export in 7 countries including Malaysia, Hong Kong, Japan, China, Thailand, Singapore, and the United States are increasing over time but declined in 2019 due to the spread of Coronavirus. The COVID-19 pandemic in 2020 resulted in a 7.4 per cent reduction in global merchandise trade (UNCTAD 2021b). However, UNCTAD (2021a), again reported that the impressive recovery in Quarter 1 of 2021 was still being driven by the robust export performance, allowed to recover more quickly and to take advantage of the booming global demand for COVID-19-related products.

Figure 3 shows the plot of volatility variables for Hong Kong, Japan, China, Japan, Thailand, and the US. The trend in each country refers to the variation or volatility in the value of a nation's currency concerning other currencies, accounting for global inflation differences. Real exchange rate volatility is generally likely to be greater when there are large macroeconomic imbalances, financial instability, or situations of economic apprehension. Events like financial crises, geopolitical unrest, monetary policy adjustments, and changes in international trade patterns can all enhance the volatility of real exchange rates.

Table 3. GARCH test results

Country	GARCH Effect
Hong Kong	Yes
China	Yes
Singapore	Yes
Japan	Yes
Thailand	Yes
USA	Yes

Sources: Estimation results

The GARCH results are shown in Table 3. The table clearly indicates that all of Malaysia's key trading partners exhibit ARCH impacts on the exchange rate variable. This suggests that fluctuations in the exchange rate do pose risks to the export of goods in Malaysia. This is consistent with the theory that depreciation or appreciation of the Ringgit will impact the trade balance through an increase or decrease in exports. We may proceed to the following step after collecting the volatility/uncertainty proxies, which is testing for stationarity for all variables used in models 2 and 3. ADF unit root tests are used to ensure the stationarity of all series in the model. The results

of the ADF test found that all variables are stationary at $I(1)$ except for the volatility series which is stationary at $I(0)$. Because the variable's stationary level is mixed $I(0)$ and $I(1)$, the ARDL method is more suitable to find out the existence of a dynamic relationship in the long or short term between the variables, the results can be referred to in Table 4.

Table 4. Results of Bound test

Country	10%		5%		1%		Statistic F
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
Hongkong	2.60	3.45	3.1	4.09	4.31	5.54	12.97***
China	Selected Model : ARDL (1,1,4,1)		3.16	4.19	4.43	5.82	1.24
	2.62	3.53					
Singapore	Selected Model : ARDL (4,3,3,4)		3.05	4.00	4.19	5.33	16.68***
	2.54	3.40					
Japan	Selected Model: ARDL (1,0,1,1)		3.08	4.02	4.27	5.41	6.33***
	2.56	3.43					
Thailand	Selected Model : ARDL (3,1,0,2)		3.05	4.00	4.12	5.33	6.08***
	2.54	3.40					
United States	Selected Model : ARDL (1,0,0,3)		3.08	4.02	4.27	5.41	5.65***
	2.56	3.43					
	Selected Model: ARDL (1,0,4,1)						

Notes: ***, ** and * significant at 1%, 5% and 10% respectively. Model selections are based on a small value of AIC criteria. Dependent variable export volume

Sources: Estimation results

The bound test results in Table 4 show the F-statistic values for each country, along with critical values at different significance levels (1%, 5% and 10%) respectively. For Hong Kong, Singapore, Japan, and the United States of America, the F-statistic values exceed the critical values at all significance levels, indicating evidence of cointegration in their respective selected ARDL models. However, for China, the F-statistic value is below the critical values at all significance levels, suggesting no evidence of cointegration in the selected ARDL model. Similarly, for Thailand, the F-statistic value is below the critical values, indicating no cointegration in its selected ARDL model. These findings reveal insight into the presence or lack of long-term relationships between variables in each country. Therefore, this study uses ARDL estimations to investigate the fluctuation of exchange rate on Malaysian exports.

Table 5: ARDL Estimation Results and Diagnostic Test Results

Variables/ Country	$\Delta \ln GDP_{it}$		h_t^2		$\Delta \ln EKS_{it}$		ECM_{t-1}	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Hong Kong	2.69***	0.14	16.22***	0.23	4.19**	0.01	0.65***	0.07
China	2.98***	0.41	6.57***	0.16	5.89***	0.15	-0.27**	0.10
Singapore	1.07***	0.17	-1.29*	0.65	1.16	0.86	0.08	0.16
Japan	-0.32**	0.15	-0.00	0.00	10.47***	0.17	-1.98***	0.44
Thailand	0.28	0.20	7.46***	0.01	8.71***	0.16	0.14	0.16
USA	-0.16	0.03	5.20***	4.16	1.14***	0.19	-0.06***	0.01
Variables/ Country	$\ln GDP_t$		h_t^2		$\ln EKS_{it}$		Intercept	
	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Hong Kong	3.71***	1.18	-0.02	0.03	0.41	0.40	-0.08**	0.03

China	-0.98	1.40	0.94	2.18	2.37	3.37	0.08	0.19
Singapore	0.47*	0.29	-0.13	0.61	0.46**	0.22	-0.01	0.01
Japan	0.35	0.22	-0.00	0.00	0.96**	0.37	-0.00	0.02
Thailand	0.35	0.26	-0.01	0.01	0.74**	0.34	-0.02	0.23
USA	3.73	4.83	119.50	163.37	-3.78	6.84	-2.84	0.90

Variables/ Country	<i>LM</i>	<i>Normality</i>	<i>CUSUM</i>	<i>CUSUM</i> ²
Hong Kong	3.27	0.54	Stable	Stable
China	0.64	0.56	Stable	Stable
Singapore	1.80	0.34	Stable	Stable
Japan	0.33	0.72	Stable	Stable
Thailand	0.25	0.18	Stable	Stable
USA	0.06	0.29	Stable	Stable

Notes: ***,** and * significant level at 1%, 5% and 10%. SE is the standard error of the estimation parameter.

Sources: Estimation of ARDL results

Table 5 reports for short run, long run, and diagnostic test results. Diagnostic result test evaluates the goodness of fit and diagnostic checks for all models are adequate and fulfil error term assumption. Based on the testing, Overall, the models show a reasonably good fit as indicated by the LM statistics, with Hong Kong having the highest value at 3.27. Normality tests suggest some departure from normality, but not significantly so no issue of autocorrelation problem. The RESET scores indicate acceptable model specifications. The CUSUM and CUSUM Of Square tests confirm stability in all cases.

In the short-run result test, the relationship between different variables in various countries was examined. In Hong Kong, changes in GDP were found to have a positive impact, whereas exchange rate fluctuations have a strong positive impact on Malaysian exports. For China, changes in GDP and changes in the exchange rate were both found to have a positive impact on the dependent variable and the lagged error correction term also has a positive effect. In Singapore, changes in GDP were positively associated with the dependent variable, although exchange rate fluctuations had a detrimental impact. In the case of Japan, changes in GDP had a negative impact, whereas changes in the exchange rate and the lagged error correction term had a significant positive influence on the dependent variable. Lastly, In the United States of America, changes in GDP did not have a significant impact, while the lagged error correction term have a significant impact on Malaysia's export. However, changes in the volatility of the exchange rate had a strong positive effect, and another variable had a negative impact.

The ARDL long-run result test reveals the long-term relationships among variables in the specified countries. In Hong Kong, a significant positive coefficient for GDP suggests a substantial long-term impact on Malaysia's export. China does not show statistically significant long-term relationships among the variables. Singapore exhibits a modest positive long-term relationship with GDP, while it is suggested that higher volatility in the real exchange rate has a negative long-term impact. Japan lacks significant long-term relationships, except for the positive effect of inflation volatility on GDP. Thailand does not exhibit statistically significant long-term relationships across the variables, suggesting that in the long run, it will affect Malaysia's export to Thailand. The United States of America shows moderate positive long-term links between Malaysia's export and GDP, also a positive impact of real exchange rate fluctuations, and a positive effect of export on Malaysia's export.

V. DISCUSSION

By using the GARCH method to detect the existence of uncertainty effects in the real exchange rate fluctuations. According to the findings of this study, exchange rate variability exists for all Malaysian trading partners. This analysis confirms up prior research that assumed an equal causal connection between the volatility of exchange rates and trade activity, suggesting that higher volatility decreases trade, while decreased volatility increases it to an equal extent (Bahmani-Oskooee and Aftab, 2017a). Initially, it was commonly believed that increased exchange rate volatility would hurt international trade. However, theoretical advancements in this field have revealed that higher levels of volatility in exchange rates could potentially enhance trade, depending on the risk-bearing capacity of traders (Bahmani-Oskooee et al., 2020).

Exchange-rate changes predominantly affect export volume in the short run, with evidence of a negative short-run effect of fluctuation in exchange rates in Latin America export flows (Arize, 1997; Arize et al., 2008). However, this study reveals an important and positive connection between fluctuations in exchange rates in the short term for Malaysia's export to important trade partners with countries like Hong Kong, China, the United States (USA), and Thailand, except for Singapore, which shows an adverse effect for Malaysia's trade with this country. For example, in Thailand study conducted by Aftab et al. (2017) shows the impact of exchange-rate volatility on the trade of a few industries with Thailand found mixed conclusions either positive or negative. Because of increasing exchange rate volatility, Malaysia's real total export to major trade partners will rise. This finding is in line with and supported by previous study (Wong & Lee; 2016; Bahmani-Oskooee & Arize, 2021). In Singapore, however, a rise in exchange rate volatility will result in a fall in real total Malaysia exports to this country.

Meanwhile, in the long term, the impact of exchange rate volatility shows an ambiguous (positive or negative) and insignificant relationship at the 5% significance level with Malaysia's real export to trade exports partner. This finding is like Heriqbaldi et al., (2022) also found the long-term effects of exchange rate volatility on trade relationships is not significant. Wong & Lee (2016) also found there is no significant impact of exchange rate volatility on real exports to China in the long run. As a result, the current analysis fails to reveal a significantly negative effect or an exact conclusion on the impact of volatility in exchange rates on the flow of trade.

VI. CONCLUSION AND RECOMMENDATION

This study investigated the impacts of volatility in exchange rates on Malaysia's major exporting countries between 1972 and 2020. Malaysia's 6 major trading partners are Hong Kong, Japan, China, Thailand, Singapore, and the US. We used the GARCH to quantify exchange rate uncertainty. The ARDL methodology was used to investigate the short-run and long-run links between exports and currency volatility. The first results show that the GARCH model detects the existence of volatility effects in the real exchange rate. This study found that exchange rate volatility exists for all Malaysian trade partners.

The second conclusion indicates that real exchange rate volatility has an impact on Malaysia's real exports to Hong Kong, China, Singapore, Japan, and Thailand. We identified strong short-run effects of volatility on Malaysia's exports to five partners when we evaluated the linear trade model between Malaysia and each of its six partners: Hong Kong, China, Japan, Singapore, and Thailand. While the United States has a significant favorable impact on the exchange rate for exports to Malaysia. This short-run effect persisted in five Malaysian exporting models: Hong Kong, Japan, Singapore, Thailand, and the United States.

These findings align with theoretical expectations and provide insights into the dynamics of international trade for Malaysia. The traders' expectations and responses to higher volatility compared to decreasing volatility will determine the asymmetric impacts with certain partners but not with all partners. Simply put, they respond differently to elevated vs lowered uncertainty. Overall, although our findings vary by partner, they suggest that a stable exchange rate is good for Malaysian trade since it tends to have negative short- and long-term impacts on Malaysia's exports to and imports from most countries. One reason could be the growing share of international transactions undertaken by multinational firms (MNCs) in the countries. This study adds to our understanding of

the relationship between exchange rate volatility and export success, emphasizing the significance of managing currency fluctuations for long-term economic growth.

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SCBTII
Sustainable Collaboration in Business,
Technology, Information and Innovation

Entrepreneurial orientation and public organization service performance: does digital-based innovation matter?

Rizal Khabibi¹ and Boyke Rudy Purnomo¹

¹ Department of Management, Faculty of Economics and Business, Universitas Gadjah Mada, Yogyakarta

Abstract

Introduction/Main Objective: This study aims to examine the influence of entrepreneurial orientation on public organization service performance. It also investigates how the adoption of digital-based public service innovation mediates the relationship between entrepreneurial orientation and public organization service performance. **Background of the Problem:** Public organizations worldwide are increasingly embracing digital-based innovations in public services, utilizing technologies such as artificial intelligence, big data analytics, cloud computing, e-commerce, and social media. Nonetheless, they encounter challenges and occasional failures in meeting public and stakeholder expectations. **Research gaps/Novelty:** This study employs the RBV theory to demonstrate how entrepreneurial orientation as internal resources, along with the adoption of digital-based public service innovation as an organizational capability, impact the performance of public organization services. **Research Methods:** To test the hypotheses, an explanatory research methodology was utilized, which included the use of a structured questionnaire survey distributed to public organizations in Indonesia. The sampling method employed in this study was purposive sampling, where 98 respondents from various public organizations were selected to participate in the survey. The data collected were subsequently analyzed using the PLS-SEM method. **Findings/Results:** The results reveal a positive correlation between entrepreneurial orientation, the adoption of digital-based public service innovations, and public organization service performance. Therefore, entrepreneurial orientation affects a public organization's service performance both directly and indirectly. **Conclusions and implications:** This study offers valuable insights into how entrepreneurial orientation and the adoption of digital-based public service innovations can improve the performance of public organizations. Our recommendation is for public service organizations to strengthen their entrepreneurial orientation and embrace digital technologies to enhance their service delivery.

Keywords : Digital innovation adoption; entrepreneurial orientation; public organizations; resource-based view; service performance

I. INTRODUCTION

Public organizations worldwide are undergoing a transformative phase in their role as providers of public services (Bretschneider & Mergel, 2011). The advent of digitalization has compelled them to become more adaptive and innovative entities (Bertot et al., 2016; Hong et al., 2022). Digital-based public service innovation has become a prevalent practice implemented in diverse public service contexts across numerous countries (e.g., Kassen, 2022; Kattel et al., 2020; Nam, 2016). Leveraging various digital technologies such as AI, big data analytics, cloud computing, e-commerce, and social media offers public organizations a means to enhance public value creation through innovative service delivery. Nonetheless, the implementation of digital-based public service innovation faces numerous challenges and obstacles (Agarwal, 2018; De Vries et al., 2016, 2018), and even encounters failures (Anthopoulos et al., 2016), as it may fall short of meeting public and stakeholder expectations.

Innovation in the public sector, although not as prominent as in the private sector, has been a longstanding concept. Public organizations are compelled to enhance their performance in meeting citizens' needs and ensuring accountability (Han & Hong, 2019). Adopting innovative practices is a vital strategy for public organizations to improve their delivery of public services by addressing user and citizen requirements (Bekkers et al., 2011). The demands of users and citizens, such as the need for efficiency and transparency, play a significant role in driving the adoption of digital-based public service innovations by public organizations (Hong et al., 2022). While the public sector may not witness the same level of innovation as the private sector, there is increasing recognition of the importance of embracing digital technologies to meet the evolving expectations and demands of the public and stakeholders.

In response to dynamic environmental and technological changes, public organizations recognize the significance of embracing an entrepreneurial spirit (Osborne & Gaebler, 1992). The entrepreneurial aspect has been proven to play a crucial role in the process of adopting innovation in the public sector, which has to confront complex situations (Roberts, 1992). By optimizing entrepreneurial aspect, public organizations can effectively

utilize digital technology to develop innovative solutions that cater to the diverse needs of citizens (Rodrigues & Franco, 2021). One of the construct that explain such aspect is entrepreneurial orientation. Entrepreneurial orientation is a widely used construct in organizational and management literature to predict organizational performance, including in public organization context (see Deslatte & Swann, 2020; Kearney & Meynhardt, 2016; Swann, 2016). Within the realm of public organizations, an entrepreneurial orientation can lead to more efficient resource utilization, responsiveness to changing circumstances, and enhanced collaboration with stakeholders (Swann, 2016). Nevertheless, the discussion of entrepreneurial orientation in the public sector context remains relatively limited, compared to the business or SMEs context (Martens et al., 2016).

The relationship between entrepreneurial orientation and organizational performance has been extensively examined in numerous studies both in public (Al-Dhaafri & Alosani, 2020; Caruana et al., 2002) and business organization context (Arabeche et al., 2022; Purnomo, 2019). However, the existing literature yields conflicting findings on the association between these constructs (Kollmann & Stöckmann, 2012; Kraus et al., 2012). Drawing upon the recommendations of Lumpkin & Dess (1996), the adoption of digital-based public service innovation may serve as a manifestation of public organizations' actualization, thereby elucidating the influence of entrepreneurial orientation on the performance of public organization services. The integration of digital technology into public services provides concrete evidence of public organizations' behavior-driven entrepreneurial orientation. By embracing digital-based public service innovation, public sector organizations can enhance public value while simultaneously improving the efficiency and effectiveness of their service delivery (Bertot et al., 2016; Hong et al., 2022).

Driven by these circumstances, the primary objective of this study is to explore the impact of entrepreneurial orientation and the adoption of digital-based public service innovation on the enhancement of public organization service performance. To investigate this, the study adopts the Resource-Based View (RBV) theory proposed by Barney (1991) as a framework, focusing on entrepreneurial orientation as internal resources and the adoption of digital-based public service innovation as an organizational capability that influences public organization service performance. By examining the role of entrepreneurial orientation and its relationship with digital innovation in the public sector, this study seeks to contribute to the existing body of knowledge in both entrepreneurial orientation and public service innovation domains, particularly about the adoption of digital technologies and its impact on public organization service performance.

The structure of this study is as follows. The following section presents a review of the relevant literature and the development of hypotheses. Subsequently, the methodology, including data analysis and the discussion of findings, is explained in the third section. Finally, the paper concludes with a summary of the study's findings and provides recommendations.

II. LITERATURE REVIEW

Resource-Based View (RBV)

The resource-based view (RBV) theory holds that organizations can achieve performance and competitive advantage by optimizing their internal resources. Competitive advantage can only be attained by firms that possess valuable, rare, imperfectly imitable, and organizational resources (Barney, 1991). Penrose (1959) explains that internal resources owned, utilized, and leveraged by the company are far more important than the industry structure that influences it externally.

The RBV theory is commonly used to explain organizational phenomena in the context of business organizations striving for competitive advantage amidst industry competition. However, in management and organizational literature, the RBV theory is also applied in the context of public sector organizations. RBV can elucidate how internal resources and capabilities of public sector organizations can drive sustainable performance and create public value amid uncertain environmental conditions, such as political pressures and stakeholder demands (Bryson et al., 2007; Szymaniec-Mlicka, 2014). Dynamics and complexities, such as the demand for excellent public services, compel public sector organizations to optimize their existing resources in achieving performance effectiveness and efficiency.

Public Organization Service Performance

The presence of public organizations is expected to address the social issues faced by society. Creating public value is one of the purposes of public sector organizations. Kelly et al. (2002) identified several forms of value creation in the public sector, one of which is through services. In the context of public value creation, services should be directed toward achieving the desired outcomes for the public, thereby providing direct and indirect

benefits to them. Therefore, public organizations need to pay close attention to service aspects to effectively and sustainably create public value.

The service performance of public organizations is a measure used to evaluate how well a public organization can meet the needs of citizens and the community. Agus et al. (2007) stated that the performance of public service can be assessed based on the aspects of: 1) the time taken to respond, provide information, or resolve customer issues; and 2) the quality of service provided by employees. Improving the service performance of public organizations will drive satisfaction among citizens and stakeholders. This is in line with what Bitner et al. (1990) emphasized that service quality can influence customer satisfaction, and customer satisfaction can impact loyalty and the intention to repeat service usage. Thus, a customer-oriented approach may become a crucial aspect of public service management (Chen et al., 2004).

Entrepreneurial Orientation

Entrepreneurial orientation is the tendency or ability of an organization to identify, evaluate, and exploit business opportunities by adopting innovative, proactive, and risk-taking practices (Covin & Lumpkin, 2011; Wiklund & Shepherd, 2005). The original idea of this concept was initially proposed by Miller (1983) and then redefined by Covin & Slevin (1989), referring to the managerial attributes of proactiveness, innovativeness, and risk-taking. The application of this concept is not limited to profit-oriented or business organizations. Entrepreneurial orientation can also be used to explain the decisions and behaviors of public organizations such as governments (Caruana et al., 2002; Kim, 2010). Entrepreneurial orientation in the public sector is indicated by the extent to which top managers tend to favor change and innovation for the organization, take business-related risks, and take proactive action strategies to achieve goals and objectives for the benefit of society (Kearney & Meynhardt, 2016). While in the same nuance, Tremml (2019) describes that entrepreneurial orientation in the public sector context refers to the process within a public enterprise that leads to innovative activities such as the development of new and existing products and services, technologies, administrative techniques, and improved strategies. It also involves risk-taking and proactivity. The focus is on generating positive outcomes for the public enterprise rather than personal goals and objectives.

Entrepreneurial orientation possessed by public organizations influences how they integrate and collaborate, which in turn affects public service performance (Swann, 2016). Entrepreneurial attributes make public sector organizations engage in innovative practices to realize the effectiveness and efficiency of the organization in providing quality public services (Boyne, 2002). Innovative public services (such as those based on digital technology) will provide opportunities for the public to access services more easily, affordably, quickly, and transparently, thereby increasing public satisfaction with the performance of public service organizations. Based on the RBV theory (Barney, 1991), it can be said that entrepreneurial orientation is a strategic internal resource that can drive public organizations to maximize their performance as public service providers as well as create value for the public. Therefore, based on these arguments, the following hypothesis can be formulated:

H1: Entrepreneurial orientation positively affects public organization service performance.

Digital-Based Public Service Innovation

Public sector innovation is a complex concept and has been defined in various ways. Bekkers et al. (2011) define public sector innovation as a learning process in which the government seeks to address specific social challenges by developing new services, technologies, organizational structures, management approaches, governance processes, and policy concepts. In a more specific scope, Pratama (2020) defines public service innovation as the implementation of new ideas or modifications that have been used in other contexts to improve the performance of public services.

Public sector innovation can involve the utilization of technology and creativity to solve complex problems and enhance the quality of public services (Houtgraaf et al., 2021; Lember et al., 2018). The adoption of digital-based public service innovations is perceived to be beneficial for public organizations to improve the delivery of public services more effectively, efficiently, and with a broader impact (Bertot et al., 2016; Hong et al., 2022). In the process of achieving improved performance, the use of digital technology also encourages internal and external collaborations in creating public service innovations (Kattel et al., 2020). Digital technology not only plays a role in improving access to services but also enables transparency in the service processes, such as the use of business licensing portals or civil registration document processing (Cho & Choi, 2004).

To encourage the adoption of digital-based public service innovations, internal motivation from individuals as well as the organization as a whole is also required. Entrepreneurial orientation is believed to influence innovation and the adoption of new technologies. Public organizations with an entrepreneurial orientation will strive to adopt

best practices, including the use of digital technology, to maximize their performance as providers of public services in front of stakeholders and service users (Hong et al., 2022). Elements of entrepreneurial orientation such as being proactive, taking risks, and being innovative enable organizations to adopt new or innovative technologies as part of providing public services (Fan et al., 2021). The opportunity for improving the performance of public service organizations through the adoption of digital-based innovations will drive public organizations to make resource allocation decisions in implementing such policies, despite the uncertainty of the outcomes.

Based on these arguments, the following hypotheses can be formulated:

H2: Entrepreneurial orientation positively affects the adoption of digital-based public service innovation.

H3: The adoption of digital-based public service innovation positively affects public organization service performance.

H4: The adoption of digital-based public service innovation mediates the positive effect of entrepreneurial orientation on public organization service performance.

The conceptual framework is depicted in Fig. 1.

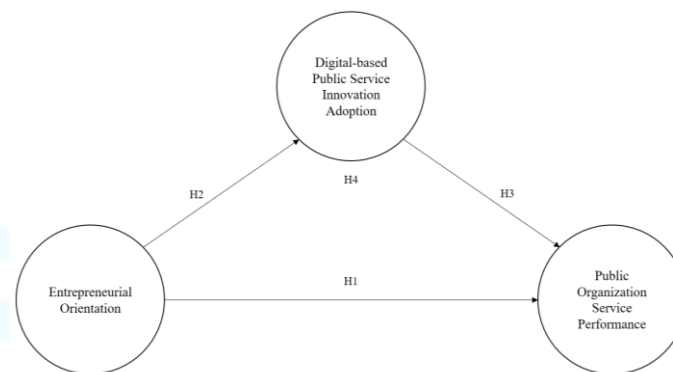


Fig. 10. Research Framework

III. RESEARCH METHODOLOGY

Research Design

This study utilized a quantitative approach within an explanatory research design to examine the relationships between constructs based on established theories. The purpose was to test hypotheses and expand existing knowledge. Data collection was conducted through a survey method, where primary data was gathered directly from the research participants. The focus of the study was to explore respondents' perceptions of digital-based public service innovation adoption in their respective organizations, considering the influence of entrepreneurial orientation on organizational service performance. The questionnaire, administered as an online survey using Google Forms, consisted of two sections: respondent and organizational profiles, and questions related to variable measurements using a 5-point Likert scale. The study adopted a cross-sectional time dimension, capturing perceptions of the research object across multiple cases within the public sector during a specific period. The unit of analysis was at the organizational level, aiming to contribute insights into the phenomenon of digital-based public service innovation adoption within public organizations, including its antecedents and consequences.

Population and Sampling

The population in this study consisted of public organizations in Indonesia that had adopted digital-based public service innovations. The sampling method used was non-probability sampling with a purposive sampling approach. The selected public organizations were those that had implemented digital-based public service innovations within the past two years and provided public services at the central or regional levels. The respondents who were eligible to take part in this study were employees in public organizations or government agencies who were directly involved in the process of adopting digital-based public service innovations, specifically in the phases of creation, design, planning, or implementation (Roberts, 1992). Meanwhile, the data collection method was conducted by distributing online questionnaires to government agencies and through

communication forums for civil servants available on social media.

Measurement

This study used a five-point Likert scale (1 = “strongly disagree”; 5 = “strongly agree”). Entrepreneurial orientation was defined as the tendency of public organizations towards change and innovation, the willingness to take risks associated with organizational processes, and proactive strategic actions to achieve the goals and objectives of the organization for the benefit of the wider society (Kearney & Meynhardt, 2016). This construct was assessed using five items from Deslatte & Swann (2020). Digital-based public service innovation adoption was defined as the activity of creating, adopting, and exploiting public services through the integration of digital technology to add value and novelty to public organizations (Bertot et al., 2016). This construct was assessed using seven items adapted from Bertot et al. (2016). Public organization service performance was defined as the speed and quality of services provided by public sector organizations (Agus et al., 2007). This construct was assessed using four items from Agus et al. (2007).

Data Analysis

This study employed the Structural Equation Modeling (SEM) analysis method due to its advantages in combining multivariate factor analysis and multiple regression analysis, as well as considering measurement errors to enhance statistical estimation and validity of conclusions. The SEM method used was variance-based SEM or Partial Least Squares (PLS), which can tolerate small sample sizes and be applied to both reflective and formative measurement models. The software tool SmartPLS was utilized for analysis due to its user-friendly interface and adequate features.

The PLS-SEM analysis process consisted of two key stages. The first stage involved validating the measurement model (outer model) by examining the relationships between indicators and constructs, addressing missing data or outliers, and ensuring the measurement model's validity and reliability. The second stage focused on evaluating the structural model (inner model), including testing for collinearity among predictor constructs and assessing the significance and relevance of proposed relationships. Bootstrapping techniques were employed in PLS-SEM analysis, allowing for small sample sizes without making specific assumptions about variable distribution. The analysis results in guided hypothesis testing and the assessment of the research model's coefficient of determination (R^2) and predictive relevance (Q^2) for out-of-sample data prediction.

IV. RESULT / FINDING

Descriptive Information

Out of a total of 98 respondents, the majority were male employees (51.02%) within the age range of 25-34 years (53.06%). Most of the respondents had completed their undergraduate education (61.22%) and held staff positions or equivalent at the operational level (82.65%), with less than 5 years of work experience (41.84%). The profile of public sector organizations was predominantly represented by organizations located in Java (81.63%) and engaged in administrative government services (29.59%). In terms of level, the majority of public sector organizations were regional government agencies (59.18%). Most of the organizations had more than 100 employees (36.73%) in their agencies (Table 1).

Table 78. Demographic information

Respondents		Frequency	Percentage
Gender	Male	50	51.02%
	Female	48	48.98%
Age (years)	< 24	1	1.02%
	25 - 34	52	53.06%
	35 - 44	34	34.69%
	45 - 54	11	11.22%
Education	Diploma	4	4.08%
	Undergraduate	60	61.22%
	Master's	33	33.67%
	Doctoral	1	1.02%
Position	Manager	5	5.10%
	Supervisor	9	9.18%
	Staff	81	82.65%
	Functional	3	3.06%
Tenure (years)	<5	41	41.84%

Respondents		Frequency	Percentage
	5 - 10	19	19.39%
	11 - 20	33	33.67%
	21 - 30	5	5.10%
Organization location	Sumatera	3	3.06%
	Java	80	81.63%
	Kalimantan	6	6.12%
	Bali and Nusa Tenggara	3	3.06%
	Sulawesi	3	3.06%
	Papua	2	2.04%
	Other	1	1.02%
Public service type	Administration	29	29.59%
	Healthcare/Public Health	12	12.24%
	Education	10	10.20%
	Community Protection	7	7.14%
	Public Information	6	6.12%
	Urban Planning	5	5.10%
	Permit Service	4	4.08%
	Other	25	25.51%
Organizational level	Central	40	40.82%
	Regional	58	59.18%
No. of employee	<25	10	10.20%
	26-50	19	19.39%
	51-75	20	20.41%
	76-100	13	13.27%
	>100	36	36.73%

Source: Primary data (2023)

Model Analysis

Based on the data analysis using the PLS-SEM method, this study obtained analytical results consisting of the assessment of the measurement model (outer model) and the assessment of the structural model (inner model). The assessment of the measurement model includes validity and reliability, while the assessment of the structural model includes tests for collinearity (VIF), hypothesis testing with path coefficients (β), coefficients of determination (R^2), and predictive relevance (Q^2).

In this study, a reflective approach was utilized for each construct, and the proposed model was assessed through a first-order analysis. The measurement model was evaluated based on various criteria, including individual item reliability (outer loadings), internal consistency, and validity (content, convergent, and discriminant). The constructs, item codes, and descriptive statistics are presented in Table 2.

Table 79. Descriptive statistics and measurement model

Construct	Item Code	Mean	S.D	Skewness	Loading	CA	CR	AVE	Inner VIF
Entrepreneurial Orientation	EO1	3.276	1.235	-0.213	0.721	0.807	0.872	0.631	1.000
	EO2	3.541	1.032	-0.507	0.769				1.763
	EO4	4.102	0.920	-0.845	0.832				
	EO5	3.827	0.904	-0.489	0.849				
Digital-based Public Service Innovation Adoption	DPSI1	4.306	0.629	-0.601	0.741	0.908	0.927	0.645	1.763
	DPSI2	4.000	0.782	-0.389	0.752				
	DPSI3	4.031	0.735	-0.676	0.795				
	DPSI4	3.908	0.893	-1.038	0.834				
	DPSI5	3.510	1.023	-0.290	0.770				
	DPSI6	3.990	0.763	-0.824	0.872				
	DPSI7	4.092	0.784	-0.940	0.846				
Public Organization Service Performance	POSP1	4.102	0.763	-0.737	0.898	0.921	0.944	0.810	
	POSP2	4.224	0.708	-0.707	0.942				
	POSP3	4.153	0.747	-1.155	0.897				
	POSP4	4.276	0.667	-0.596	0.859				

Source: Primary data (2023)

Table 80. Latent variable correlation and Heterotrait-Monotrait (HTMT)

Construct	EO	DPSI	POSP
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Entrepreneurial Orientation (EO)		
Digital-based Public Service Innovation Adoption (DPSI)	0.731	
Public Organization Service Performance (POSP)	0.620	0.755

Source: Primary data (2023)

Individual item reliability was determined by examining the factor loadings associated with specific dimensions. Hair et al. (2017) suggested retaining factor loading values between 0.40 and 0.70, taking into account their impact on average variance extracted (AVE) and composite reliability as well as content validity. Consequently, only item OK3 was removed from the analysis due to its factor loading below 0.40. According to Hair et al. (2017), Cronbach's alpha values should exceed 0.7, and in this study, all values met this criterion (Table 2). Regarding internal consistency, Hair et al. (2019) emphasized that composite reliability (CR) values should be ≥ 0.7 , and all values in this study met this requirement (Table 2). Convergent validity was evaluated using the criterion that AVE should be ≥ 0.5 (Hair et al., 2019) (Table 2). Discriminant validity was assessed by examining the HTMT scores, with a recommended threshold of ≤ 0.85 for intercorrelations among variables in the model (Hair et al., 2019) (Table 3).

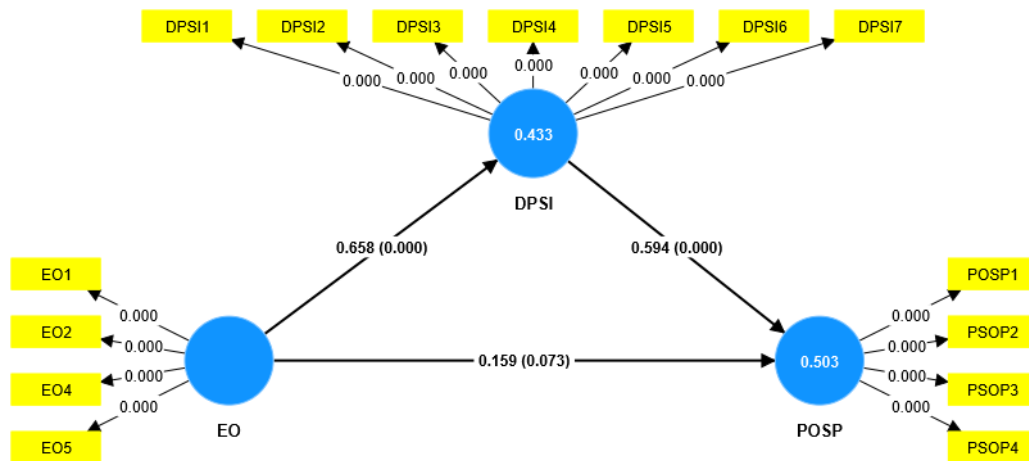


Fig. 11. Structural equation modeling and path coefficient

According to Hair et al. (2017), before assessing the structural model, it is important to examine the potential issue of collinearity by examining the VIF values. They recommend considering VIF values below 5 as indicative of no collinearity problems, and in this study, all values met this criterion (Table 2.). In this study, the bootstrap technique was employed with 5,000 bootstrap samples and 98 cases to obtain path coefficients and their significance levels. The structural model evaluation is depicted in Fig. 2. Evaluation of the structural model involves analyzing path coefficients, t -values, p -values, coefficient of determination (R^2), and predictive relevance (Q^2). R^2 values of 0.75, 0.50, and 0.25 are categorized as substantial, moderate, and weak, respectively. The obtained R^2 value of 0.433 suggests that 43.3% of the variance in digital-based public service innovation adoption occurred due to entrepreneurial orientation, while 50.3% of the performance of public service organizations occurred due to entrepreneurial orientation and digital-based public service innovation adoption. Additionally, Hair et al. (2019) recommended that $Q^2 > 0$ demonstrate that the proposed framework has predictive relevance (Table 4.). All the proposed hypotheses in the model were supported (Table 5.).

Table 81. Model strength

Construct	R^2	R^2 Adjusted	Q^2
Digital-based Public Service Innovation Adoption (DPSI)	0.433	0.427	0.411
Public Organization Service Performance (POSP)	0.503	0.493	0.280

Source: Primary data (2023)

To investigate the mediating role of digital-based innovation adoption, this study employed the concept of indirect effects as described by Hair et al. (2017). Following MacKinnon et al.'s (2002) explanation, Z is considered a mediator between X and Y if both the direct paths from X to Z and from Z to Y are statistically significant. The findings reveal significant positive direct paths from entrepreneurial orientation to digital-based public service innovation adoption, as well as from digital-based public service innovation adoption to the performance of public service organizations. According to Hair et al. (2017), if the indirect effect is significant

while the direct effect is not, it indicates full mediation; if both the direct and indirect effects are significant, it indicates partial mediation. The results of this study demonstrate that digital-based public service innovation adoption partially mediates the relationship between entrepreneurial orientation and the performance of public service organizations, as shown in Table 5.

Table 82. Path coefficient and hypothesis testing

Hypothesis	Relationship	Path Coefficient	SD	t-statistics	p-value	Decision
Direct effect						
H1	EO → POSP	0.159	0.089	1.796	0.073*	Supported
H2	EO → DPSI	0.658	0.017	9.227	0.000***	Supported
H3	DPSI → POSP	0.594	0.105	5.659	0.000***	Supported
Indirect effect						
H4	EO → DPSI → POSP	0.391	0.082	4.788	0.000***	Supported

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Source: Primary data (2023)

V. DISCUSSION

This research employed a quantitative approach to examine the relationship between entrepreneurial orientation and public organization service performance, as well as the mediating role of digital-based public service innovation adoption. The findings of this study revealed interesting results indicating that stronger entrepreneurial orientation encourages increased opportunities for adopting digital-based public service innovation. Furthermore, increased adoption of digital-based public service innovation maximizes the performance of public sector organizations. These findings align with the RBV theory, which assumes that organizational performance advantage can be achieved through a set of internal resources and capabilities possessed by the organization (Barney, 1991).

The findings of this research indicate a positive influence between entrepreneurial orientation and public organization service performance ($p < 0.10$), supporting *H1*. This finding reaffirms that entrepreneurial orientation is a crucial element for public organizations to enhance their service performance. In their efforts to improve organizational service performance, entrepreneurial orientation becomes a critical element that drives organizations to seek the best ways, including adopting digital technology as part of their public services. Based on the RBV theory, entrepreneurial orientation can be described as intangible resources considered the primary source of competitive advantage to enhance organizational performance (Barney, 1991). This finding is consistent with Deslatte & Swann (2020) who studied public organizations in the United States, stating that entrepreneurial orientation is a significant factor in the sustainable performance of public organizations.

Regarding the relationship between entrepreneurial orientation and digital-based public service innovation adoption, entrepreneurial orientation has a significant influence on the adoption of digital-based public service innovation ($p < 0.01$), supporting *H2*. This finding is related to the possession of elements related to innovativeness, risk-taking, and proactiveness in public organizations, which drive the utilization of digital technology as part of their public services. The utilization of digital technology is perceived to enhance public value as it responds to the demands of citizens and stakeholders for quick and convenient public services (Kuziemski & Misuraca, 2020; Ndlovu et al., 2022). The courage and proactive attitude of public organizations increase the opportunities for innovation adoption in managing resistance risks to culture and the status quo within public organizations (Kim, 2010).

Regarding the effect of the adoption of digital-based public service innovation on public organization service performance ($p < 0.01$), *H3* was supported. The adoption of digital-based public service innovation has a positive influence on the effectiveness, efficiency, and performance of public organizational services. By leveraging appropriate digital technologies, public organizations can enhance the accessibility, speed, and quality of services provided to the public (Kuziemski & Misuraca, 2020). This enables more automated and integrated processes, improving productivity and creating a dynamic and responsive work environment (Kassen, 2022; Katsonis & Botros, 2015). Additionally, the adoption of digital innovations facilitates communication, feedback, and understanding of community needs (Criado & Guevara-Gómez, 2021), leading to increased satisfaction and trust (Hong et al., 2022). These findings support the RBV theory, emphasizing the role of internal capabilities in driving organizational performance (Barney, 1991).

The adoption of digital-based public service innovation partially mediated the relationship between entrepreneurial orientation and public organization service performance ($p < 0.01$), supporting *H4*. This study highlights the significant role of digital-based public service innovation adoption in connecting entrepreneurial

orientation with the performance of public service organizations. This study provides support for the notion proposed by Lumpkin & Dess (1996) that in certain situations, the link between entrepreneurial orientation and performance needs to be connected through integrated activities. A strong entrepreneurial orientation drives public organizations to adopt digital technology innovations for delivering services. Digital-based public service innovation adoption acts as a catalyst, translating entrepreneurial spirit into responsive and effective service performance. In the digital era, this adoption presents new opportunities for public organizations to expand their reach and enhance service quality through platforms, mobile applications, and other technologies (Schmidhuber et al., 2019). The adoption of digital-based public service innovation mediates cultural and mindset changes within organizations, fostering a proactive and collaborative environment that encourages continuous innovation and better service quality (Criado & Guevara-Gómez, 2021). This finding also aligns with the RBV theory that emphasizes the role of internal resources such as entrepreneurial orientation and digital-based public service innovation in driving sustainable organizational performance.

VI. CONCLUSION AND RECOMMENDATION

This study provides novel insights into how public sector organizations optimize their internal resources, specifically their entrepreneurial orientation, to enhance the performance of their public service delivery. Our findings indicate that organizations with a strong level of entrepreneurial orientation can promote the attainment of effectiveness and efficiency in public service delivery. Organizations with a stronger entrepreneurial orientation are inclined to leverage existing digital technologies as part of their public service innovation, thereby creating faster and more transparent public services. The process of improvement and renewal in the delivery of public services, whether through incremental or radical approaches, can contribute to the satisfaction of the public and stakeholders regarding the range of services provided by public organizations. The enhancement of performance in public service organizations serves as one of the sought-after legitimacies pursued by public actors.

We suggest that public service organizations should reinforce their entrepreneurial mindset and embrace digital innovations as a means to enhance their service provision. By cultivating a strong entrepreneurial orientation, organizations can foster a culture of innovation, adaptability, and creativity. Embracing digital technologies enables these organizations to improve the efficiency, accessibility, and quality of their services. Through the utilization of digital platforms, mobile applications, and other technological advancements, public service organizations can streamline their operations, respond promptly to citizens' needs, and provide personalized and affordable services. This proactive adoption of digital-based public service innovation catalyzes delivering responsive and effective services to the public, ultimately leading to improved overall performance and increased satisfaction among stakeholders.

Future research can overcome several limitations identified in this study. Methodologically, incorporating control variables in future studies would enable a better understanding of the external factors that may influence organizational service performance beyond the scope of this research. Additionally, exploring additional constructs at the individual, group, and organizational levels could provide valuable insights into predicting the adoption of digital-based public service innovation. By considering alternative antecedents or complements, researchers can enhance their understanding of the adoption behavior in the context of digital-based public service innovation. Conducting further investigations in these areas would contribute to the effectiveness of future research in this field.

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SCBTII
Sustainable Collaboration in Business,
Technology, Information and Innovation

Determinants of Career Development Human Resources Through Competency Improvement Within the Directorate General of Intellectual Property

Dimas Dipraja¹, M. Zilal Hamzah², Rinaldi Rustam³.

^{1,2,3} Faculty of Economics and Business, Trisakti University, Jakarta, Indonesia

Abstract

Introduction / Main Objective, Directorate General of Intellectual Property (DJKI) under the Ministry of Law and Human Rights which has the task of implementing policies in the field of intellectual property in which there are positions that carry out their duties and functions. This study aims to reveal the impact of a form of career development for the State Civil Apparatus (ASN) within the Directorate General of Intellectual Property in depth **Background:** DJKI itself in accordance with the laws and regulations is a supervisory agency that manages functional positions by utilizing variables in the form of Achievement, Competence, Organizational Loyalty, Guidance and Sponsorship, Awards and Knowledge that are mandatory for every ASN to carry out their main duties and functions respectively in order to create superior Human Resources and careers in the Directorate General of Intellectual Property. **Research Method:** This study uses **qualitative**, namely data collection techniques through a questionnaire in the form of a list of written questions compiled by the author regarding Achievement, Competence, Loyalty to the Organization, Mentors and Sponsors, Awards and Knowledge which are then distributed to all functional office holders in DJKI, then all variables are analyzed thoroughly. depth using analytical tools namely Structural Equation Modelling (SEM) PLS with the help of computer systems. The results of this study show that there is a very positive and significant impact on these variables that affect the career development of employees, because the data contains values that show that the perception of each value has increased in number: positive and significant.

Keywords: ASN Employee, Achievement, DJKI, Career Development

I. INTRODUCTION

Civil Servants (PNS) as elements of the State Civil Apparatus (ASN) have an important role in the implementation of the wheels of government and development. In accordance with data from the State Civil Service Agency (BKN) that the number of civil servants within the Government of the Republic of Indonesia in 2022 will reach 4,344,552 people consisting of 3,992,766 civil servants and 351,786 PPPK. However, according to Nur Amrizal, (2018) the large quantity of civil servants is not balanced with good quality. This low competence can affect the performance of civil servants and the quality of public services that must be accepted by the public, which is shown by obtaining data from the World Bank Southeast Asian Government Effectiveness index, (2016) the average value of the Government Effectiveness index, Indonesia is very low average value. Human resource apparatus (HR) is an organizational asset that must be maintained and developed. The current position and role of human resources has shifted to become more strategic in its role.

Within the scope of government organizations, human resource development is an important agenda in government bureaucratic reform. This is as stipulated in Law Number 5 of 2014 concerning the state civil apparatus (ASN) which says that one of the principles in the appointment and development of the state civil apparatus is always based on the principle of professionalism in its position. Professionalism is the fulfillment of the qualifications and competencies of the HR apparatus owned. The goal of HR development is to increase productivity at all levels of the organization. From the results of previous research, it shows that the implementation of competency improvement at the Merauke Regional Civil Service Agency has been effective, however, there are still some improvements so that the implementation results are maximized. This has become a common phenomenon in the country overnment leadership elements always put human resource development above their work programs. However, in its implementation, human resource development did not run smoothly as it should or in other words it was just a slogan at the beginning. This is because the budget they allocate for human resource development is insufficient. They prioritize physical development, because the results will be more visible to the community than human resource development whose results will only be seen decades later, especially in the current reform era, where their existence in these positions or positions will depend on their respective constituents.

According to Syaripuddin, (2016), the organization is basically must build a pattern of the most beneficial relationship, therefore, there must be between the wishes and goals of the organization must be able to pay attention to the needs of human resources in, including compatibility between their fields of duty with different levels of ability. A good career development and coaching system is one of the joints of the organization, because there is a well-implemented career

coaching system that can cause a great sense of responsibility in working for employees. With the presence of employees who meet the requirements and criteria for placement in their field of duty, of course, it guarantees the availability of high-level civil servants who are able to carry out their

¹ ASN Statistical Book, (2020). *Publisher of the State Civil Apparatus*;

² Everitus Rikardus, (2020). *Apparatus Resource Development Strategy at the Merauke District Civil Service Agency*.
duties well so as to advance the organization as a whole

Coaching and developing apparatus resources in organizations basically has a fairly broad scope because an organization includes several units that have their respective functions and tasks, even an important part of the overall management process in the organization, so that an organization runs well it must have quality human resources because it is very important in driving the dynamics of the organization itself. An important apparatus resource of an organization is the ability to carry out the work for which it is responsible. In accordance with data from the State Civil Service Agency (BKN) that the number of civil servants within the Government of the Republic of Indonesia in 2022 will reach 4,344,552 people consisting of 3,992,766 civil servants and 351,786 PPPK Apparatus are human resources that are ready to be used in every challenge to move government organizations. Of all assets, human resources are the only assets that are not depressed or (depreciated), although not developed, human resources are wealth with enormous productivity increase potential.

The formulation of the problem born from the background above is how the determining factors for HR career development through increasing competence. While the purpose of this study is to determine the influence of career development on factors that are directly related to increasing competence.

II. LITERATURE REVIEW

GRAND'S THEORY

Public Policy

The definition of public policy is the formulation of concepts and principles that are used as an outline from the basis of a problem to become a plan in implementing an action, rules and ways of leadership, principles, statements of ideals and in solving problems as a guideline. Policies are also used for management in trying to achieve goals or targets, in other words policies are guidelines in acting for decision making.

Public policy according to *Anderson* in the module Prof. Dr. Muh. Irfan Islamy, MPA (2018), is a relationship between Government units and their environment. Meanwhile, Easton defines public policy as the *authoritative allocation of value to the entire society*. In this case, this value can be in the form of guarantees for the availability of civil servants and regulations issued by the government or other forms that can force the public to comply with what is in the regulation.

Laswell and Kaplan, (2018), also define public policy as *a program of projection of goals, values, and practices or programs of something to achieve goals, value in directed practice*. This means that the policy must have a directed goal where the policy maker must study or calculate the direction of the objectives of the policy taken.

Robert Eyestone, who has been quoted by Leo Agustino (2008: 6), can interpret public policy as "the relationship between government and all of its environment". The relationship between government and its environment can also take any form. Therefore, it can be concluded that anything that can be issued by the government, be it regulations, appeals, laws, regulations and so on, is a policy related to the living environment. The environment here can be interpreted as people in certain regions or countries who have a government.

Taxonomically, public policies are grouped into sectoral policies and regional/territorial policies (Nugroho: 2008),

- Sector Policy which includes the political sector, social sector, economic sector, infrastructure sector.
- Regional policies include central-level policies and regional-level policies.

In the research conducted by the Directorate General of Intellectual Property (DJKI), it is to develop employee competencies and careers through sectoral policies so that their implementation can be evenly distributed and overall which has an impact on the career path of experts in certain fields in accordance with the competence of the position owned.

Medium Range Theory

Middle Range Theory is defined as a series of ideas or ideas that are interconnected and focus on limited dimensions and are closely related to policies to increase human resource development efforts carried out by the DJKI.

Applied Theory

Applied Theory According to experts *Solichin Abdul Wahab* is an action taken by an individual or by an official, government or private group to achieve a goal outlined in a policy decision to achieve a goal. *Purwanto and Sulistyastuti* Conveying that, implementation is essentially the activity of distributing the output of a policy carried out by an implementer to the target group in an effort to achieve the policy.

According to Siagian (2003: 181), human resources are actually the responsibility of two parties, namely; first, leaders at all levels of the organization, second, work units that manage HR, meaning every leader is an HR manager as well. Meanwhile, according to Harvey and Bowin (in Sulistiyani, 2004: 53-54), there are seven values in carrying out a successful HR management strategy, namely:

- Anticipate (anticipate). Organizational units must think about and anticipate possible impacts that will occur in the future.
- Pull. An organization warms up selected Human Resources so that the wheels of the organization run well.
- Development carries out activities that can increase employee capacity for the benefit of the organization.
- Motivation (motivate). Shaping employee mindsets and providing positive motivation for the organization.
- Defend. Open communication is a key tool in maintaining effective employee relationships.
- provide evaluations to employees to explore knowledge and skills that can prioritize performance.

In this study, the author focuses on human resource development which is currently not running smoothly as it should or in other words just a slogan at the beginning. This is due to the lack of budget allocated for human resource development, they prioritize budget allocation for physical development, because the results will be more visible to the community compared to human resource development whose results will only be seen decades later. Some provisions of laws and regulations that are still in force regarding personnel are clearly regulated that the career path of a position will be measured through competencies that are in accordance with the qualifications of the position even and its implementation for all must be facilitated and budgeted gradually.

A. Implementing Regulations

Law of the Republic of Indonesia Number 5 of 2014 concerning the State Civil Apparatus. In the provisions of this regulation, there are articles that prioritize competence as civil servant rights, including :

- a. Article 1 number 22 is a Merit System that uses policies in the management of civil servants to determine qualifications, competencies and performance in a fair and reasonable manner without prioritizing political background, race, culture, skin color, religion, origin, gender, family status, age, or disability condition.
- b. Article 69 paragraph (1) states that civil servant career development uses qualifications, competencies, performance assessments. Article 69 paragraph 2 states that civil servant career development as referred to in paragraph (1) is carried out by considering integrity and morality. Article 69 paragraph (3) the competencies referred to in paragraph 1 are:
The size of Technical Competence can be measured by educational methods and qualifications, functional training, and technical work experience;

The size of Managerial Competence can be measured by education, structural or managerial training, and leadership experience; And

The measure of Social and Cultural Competence is measured from work experience related to multiple duties and functions in terms of religion, ethnicity, and culture then having a deep national insight for organizational needs.

- c. Article 70 paragraph (1) is every civil servant who has the right and will get the same opportunity to develop his competence, Article 70 paragraph (2) is the competency development referred to in paragraph (1) namely through education and training, courses and improvement of technical competence in accordance with duties and functions, Article 70 paragraph (3) is the competency development referred to in paragraph (1) must be evaluated by an authorized official and can be used as one for the appointment and career development of civil servants, Article 70 paragraph (4) is in carrying out competency development as referred to in paragraph (1), Government Agencies are required to plan and carry out in-depth and continuous competency development as stated in the annual budget work plan of each agency.

Government Regulation of the Republic of Indonesia Number 17 of 2020 Amendments to Government Regulation Number 11 of 2017 concerning Management of Civil Servants. In the provisions regulated in this regulation, there are articles that prioritize competency interests, namely rights as civil servants, namely: Article 203 paragraph (1) is competency development which is meant to be implemented to meet the needs of all civil servant competencies with reference to job competency standards and career development plans. Article 203 paragraph (3) is that every civil servant has the same rights and treatment to be included in the implementation of development. competency as referred to in paragraph (1), by looking at the results of the performance appraisal results and the results of the competency values of civil servants, Article 203 paragraph (4) states that the development of the competency of each civil servant as referred to in paragraph (3) can be carried out for at least 20 (twenty) teaching hours Within 1 (one) year, Article 203 paragraph (4) is to carry out the competency development of civil servants as regulated as intended in paragraph (1), PPK is obliged to:

1. Establish needs and competency development plans;
2. Carry out competency development; and;
3. Conduct competency development evaluations.

Regulation of the Minister of Law and Human Rights of the Republic of Indonesia Number 8 of 2021 concerning Career Management of Civil Servants within the Ministry of Law and Human Rights In the general provisions of this regulation, there are articles that prioritize competence as a right as a civil servant, including

- a. Article 1 number 42 is the Education and Training method referred to as technical training is a training process to improve moral integrity, honesty as well as the spirit and motivation of nationalism, superior and responsible personality traits, and also increase professionalism and competence.
- b. Article 1 number 71 is competency such as knowledge, skills and attitudes/behavior that can be fulfilled by all ASN employees to be able to carry out the functions and duties of their position effectively and efficiently.
- c. Article 2 letters c and letter d are Civil Servant Career Management which is aimed at improving and developing the competence and performance of Civil Servants as well as encouraging improvements in the quality of civil servant professionalism.
- d. Article 3 letters b, c, d is that the implementation of Civil Servant Career Pattern management is based on a system of qualifications, competencies, performance assessments, as well as organizational needs in implementing civil servant competency assessments and increasing civil servant competency with the results of expected employee competency and talent assessments.
- e. Article 6 states that the Management of Civil Servant Career patterns as referred to in Article 5 is basically and in principle The Merit System is based on reasonable qualifications, performance and competence and without distinction of skin color, religion, politics, gender, race, age, marital status, origin or disability by considering integrity and morality.

Previous Studies

Several studies have been conducted on the importance of career development, research based on the environment that occurs within its scope mostly discusses the importance of deepening competencies in each position. There are also other studies related to competence and performance. An article written by Eka Wahyuni (2019), entitled "The Influence of Employee Competence on Company Performance in an Islamic Economic Perspective" explains how employees in carrying out duties and functions can go in line with company performance.

In addition to research on competence, there is also previous research on performance on factors that affect employee performance conducted by Sari, Ririn Nur Indah and Hady Siti Hadijah entitled "Improving Employee Performance through Job Satisfaction and Work Discipline" issued by the Journal of Office Management Education Vol. 1, No. 1. Research in the form of factors that can affect performance. The results of his research show that transformational leadership, organizational fairness, work engagement, and motivation have a direct influence on performance.

The authors found that there was no research on the determinants of HR career development. However, there is a previous study with a similar concept, the impact of training as one of the influences of improving quality human resources carried out by Bendesa, I Komang Gde. 2014 entitled "Quality and Character Human Resources" published by Pyramid Journal of Population and Human Resource Development, Vol. X No. 1: 1 – 7. It is concluded that forming quality human resources can be through the formation of positive character and affect employee performance.

In relation to organizations, there have been several studies conducted, especially the relationship between competence and work motivation. The study entitled "The Effect of Competence and Motivation on the Performance of Insurance Company Employees." Nurwin and Kartika Juanita, (2021), published by the Journal of Management Science Volume 9 Number 3, revealed that increasing competence in a company is very important for company management through motivation.

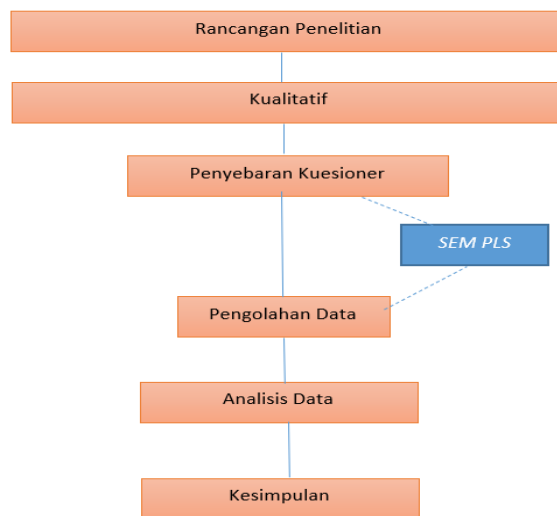
In addition, a study entitled "Analysis of the Application of Management Information Systems and Employee Competencies and Their Effects on Employee Performance" was conducted by Suyitno, S. 2017 and published by the

Journal of Business Administration. Vol.1, No.2 results that the application of management information systems and employee competencies can improve employee performance.

III. RESEARCH METHODOLOGY

This research design uses a qualitative approach and is then processed through questionnaires in the form of questions which then the results are reprocessed through a tool called *Structural Equation Modeling (SEM) PLS* through a computer system. The results of qualitative research emphasize meaning rather than generalization. According to Bogdan and Taylor (1993), qualitative methodology refers to a research procedure that produces qualitative data on the expression or record of the person himself or observed behavior, where this approach, leads to the state of the object of study as a whole. The unit of analysis in research is individual, namely the analysis of the development of apparatus resources within the DJKI which includes several factors through Achievement, Competence, Guidance and Sponsorship, Knowledge, Reward System and loyalty to the organization. The following is a chart showing the design of the study in question:

Gambar 3.1 Rancangan Penelitian



Sumber: Penulis (2023)

¹ Law Number 5 of 2014 concerning State Civil Apparatus;

² Government Regulation Number 17 of 2020 concerning Amendments to Government Regulation Number 11 of 2017 concerning Personnel Management;

³ Permenkumham Number 8 of 2021 concerning Career Management in the Environment of the Ministry of Law and Human Rights;

3.2 Data Types and Sources

In this study conducted has the types and sources of data used are:

a. Document Review

Document review is the collection of data through books, reports, journals or previous scientific writings that have a relationship with the problem under study, the instruments used are the latest regulatory guidelines and review documents in the form of lists that are considered relevant and accurate for research

b. Questionnaire

In this study, questionnaire is a form of data collection carried out by making questions related to variables and distributed to all employees who are *key informants of* this research in terms of Apparatus Resource Development factors, namely the functional positions of holders of Patent Examiners, Brand Examiners, Industrial Design Examiners and intellectual property analysts within the DJKI.

c. Analysis Tools

This research uses qualitative methods, namely by data collection techniques through questionnaires. The questionnaire is a list of written statements compiled by the author of several factors regarding Achievement, Competence, Loyalty to the Organization, Mentors and Sponsors, Awards and Knowledge which then the questionnaire is distributed to all functional stakeholders in the DJKI environment, then all variables are carried out in-

depth analysis using an analytical tool, namely *Structural Equation Modelling (SEM) PLS* with the help of a computer system.

IV. RESULT

In this study, researchers aim to find out how human resource development factors are seen from various aspects consisting of Achievement, Competence, Loyalty to the Organization, Supervisors and Sponsors, Reward System for Knowledge that is influential within the DJKI, and also to realize superior human resources in carrying out their duties and functions for the organization as optimally as possible.

Based on the above, the author concludes that some of the following factors can improve the development of Human Resources which include:

- a. **Achievements** include: Employees within the DJKI have made innovations that can be considered as a basis for consideration for career improvement within the DJKI.
- b. **Human resource competence** : DJKI develops through training, seminars, active teaching and learning so that employees have the ability or excess knowledge in accordance with the position occupied.
- c. **Loyalty to the organization** includes: First, loyalty to the leadership; Second, have an innovative, creative and high integrity nature; Third, Love of work; Fourth, Likes to build and work with teams or colleagues; and Fifth, communicative and active towards the implementation of work duties.
- d. **Mentors and sponsors** are: Continuous interaction between employees with each other and with leaders in the center and region that is useful for getting direction or guidance to do something that builds morale, self-development and work.
- e. **The reward system** is: Innovation – innovations that have been carried out by employees are the results of assessments that have achievements in work which will later be given the opportunity to develop competencies in the form of scholarships and assignments abroad, as well as the careers of the employees themselves.
- f. **Knowledge** is: The DJKI has conducted, First: Formal education levels owned by human resources such as, (Strata 1) S-1, (Strata 2) S-2, (Doctoral) S-3 and non-formal education levels that have been followed such as, National Leadership Training (PKN) Tk. II, Administrator Leadership Training (PKA) Tk. III, and Supervisory Leadership Training (PKP) Tk. IV; and Third, Education and Training for Functional Positions for all Employees.

From some of the descriptions of development factors above, through this research it is expected to know and reveal more clearly about the ability (*competence*) of human resources within the DJKI in carrying out tasks and all functions related to the implementation of organizational programs in the tasks carried out by employees, the implementation of programs in the tasks in question are the implementation of meetings, performance targets, strategic plan, a flagship program that is closely related to administrative supervision tasks, development plans and budgeting in supervisory units implemented by the central government.

Research Results

Convergent Validity (*Average Variance Extracted*)

In this study using an analytical tool called *Structural Equation Modeling (SEM) PLS* so that the data produced is in the form of numbers that can show the *Convergent Validity* test used to measure the level of validity in each latent variable measured through the AVE value. The expected AVE value is greater than 0.5.

Tabel 1. Convergent Validity

Variabel	Average Variance Extracted (AVE)	Nilai Akar Kuadrat AVE
JK	0.615	0.378
KOM	0.589	0.347
PE	0.701	0.491
PK	0.687	0.473
PS	0.636	0.404
SET	0.634	0.402
SP	0.616	0.380

Sumber: Penulis, (2023)

In the test results, all variables can be known produce AVE values greater than 0.5. So it can be said that the variable is valid when viewed through the AVE value.

Internal Consistency (*Composite Reliability*)

This criterion is used to measure reliability based on correlations between observed indicator variables. The expected CR value is between 0.6- 0.7.

Table 2. Internal Consistency

Variabel	Composite Reliability
JK	0.927
KOM	0.851
PE	0.933
PK	0.917
PS	0.924
SET	0.933

Sumber: Penulis, (2023)

Based on the processing results, the CR values generated from all high variables are above 0.6. This means that reliability among all latent variables is high.

Indicator Reliability

This stage is carried out to determine the relationship between indicators in latent variables (constructs) through outer loading values. The expected outer loading value is more than 0.7 or at least equal to 0.5. In processing, all indicators have a value of ≥ 0.7 which means that all indicators have a fairly high level of reliability.

Table 3.Indicator Reliability

	JK	KOM	PE	PK	PS	SET	SP
JK1	0.783						

JK2	0.820						
JK3	0.800						
JK4	0.807						
JK5	0.762						
JK6	0.800						
JK7	0.763						
JK8	0.736						
KOM11		0.724					
KOM2		0.795					
KOM3		0.723					
KOM4		0.824					
PE2			0.848				
PE3			0.847				
PE4			0.860				
PE5			0.768				
PE6			0.814				
PE7			0.880				
PK1				0.824			
PK2				0.830			
SKP				0.787			
PK4				0.871			
PK5				0.832			
PS1					0.849		
PS10					0.748		
PS11					0.769		
PS12					0.813		
PS13					0.730		
PS3					0.761		
PS5					0.899		
SET1						0.797	
SET2						0.831	
SET3						0.819	
SET4						0.818	
SET5						0.778	
SET6						0.827	
SET7						0.765	

SET8						0.732	
SP3							0.745
SP5							0.838
SP6							0.864
SP7							0.678

Coefficient of Determination

Describes the level of accuracy between the actual value and the prediction value in the endogenous latent variable, so that it can be known whether the prediction accuracy is good enough in other words the model is good enough.

Table 4.Coefficient of Determination

Type	R Square	R Square Adjusted
JK	0.451	0.439

Based on the test results, the Adj R2 value of 0.439 or 43.9% means that the ability of the independent variable in this study is able to explain career development behavior by 43.9%, while the rest is explained by other variants that are not included in the model.

Discriminant Validity

Discriminant validity is aimed at finding out whether the reflective indicator is correct so that it is categorized as a good measure of the construct based on the principle that each existing indicator must still have a very high correlation with the construct. Measures in different constructs are actually not highly correlated (Ghozali and Latan, 2015). Therefore, the discriminant validity test used the Fornell-Larcker Criterion (Henseler et al., 2015).

Fornell-Larcker Criterion

In the table below, it is categorized into all the AVE roots (Fornell-Larcker Criterion) that exist in all constructs which can be higher than the correlation with other variables.

Table 5. Fornell-Larcker Criterion

	JK	KOM	PE	PK	PS	SET	SP
JK	0.784						
KOM	0.106	0.767					
PE	-0.080	-0.071	0.837				
PK	0.357	0.051	-0.054	0.829			
PS	0.242	-0.112	-0.025	0.183	0.797		
SET	0.648	0.155	-0.119	0.377	0.255	0.796	

SP	0.100	-0.037	0.010	-0.033	-0.086	0.006	0.785
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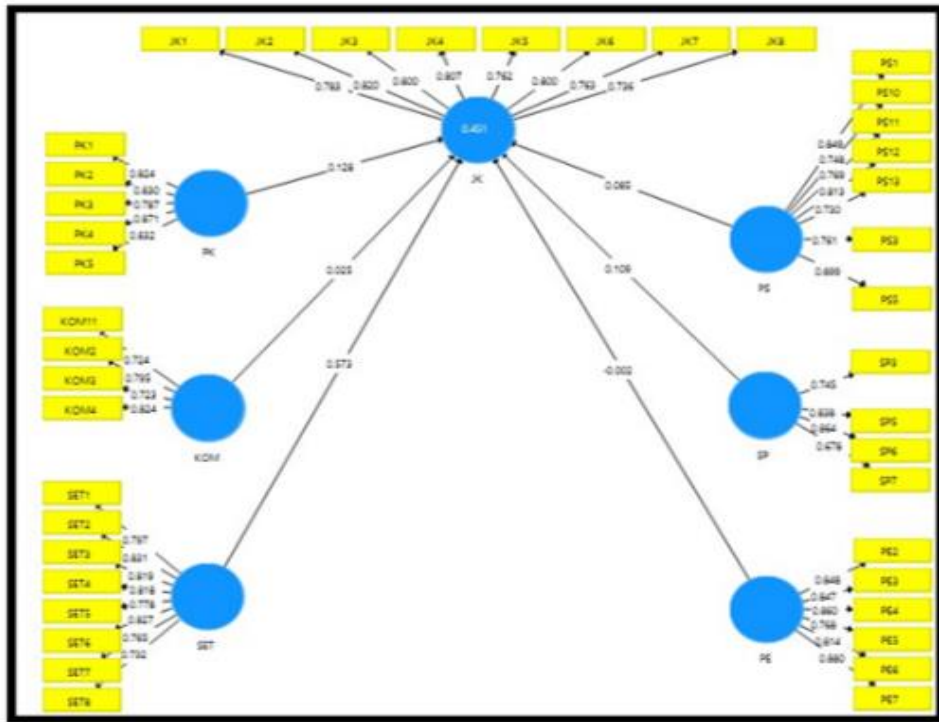
Hypothesis Testing

In this section, hypothesis testing will be carried out which aims to test the hypothesis proposed in this study and the results of this test are based on processing research data using Partial Least Square (PLS) analysis using Smart PLS 3.0 software Path diagram of *the output results of hypothesis testing based on Partial Least Square (PLS) analysis using Smart PLS software Version 3.0 is presented in figure 4.2.*

Table 6. Pengujian Hipotesis Pengaruh Langsung

	Original Sample	Standard Deviation (STDEV)	T Stat	P Values (1 Tail)	Keputusan
KOM -> JK	0.025	0.049	0.503	0.154	H2 ditolak
PE -> JK	-0.002	0.061	0.036	0.243	H6 ditolak
PK -> JK	0.128	0.056	2.284	0.006	H1 diterima
PS -> JK	0.085	0.044	1.924	0.014	H4 diterima
SET -> JK	0.573	0.062	9.196	0.000	H3 diterima
SP -> JK	0.109	0.085	1.283	0.050	H5 diterima

Sumber: Penulis, 2023



Sumber: Penulis, (2023)

Sumber: Hasil pengolahan data, dengan *Software Smart PLS 3.0*
Output hasil pengolahan program Partial Least Square (PLS) pada halaman lampiran

Gambar 4.2. Path diagram hasil output pengujian hipotesis

V. DISCUSSION

H1: There is a positive influence of job performance on career development factors.

From table 4.2 number 3, it is known that value of the work performance coefficient of 0.128 means that if the perception of work performance increases, the perception of career development increases, on the other hand if the perception of work performance decreases it can reduce the perception of career development. The results of the beta coefficient sign are in accordance with the hypothesis proposed in this study, where work performance has a positive effect on career development, and can continue the significance test. P values of $0.006 < 0.05$ (alpha 5%) then H_a is accepted. It was statistically concluded that at a 95% confidence level there is a positive influence of job performance on career development.

H2: There is a positive influence of competence on career development factors.

From table 4.2 number 1 it is known that value of the competency coefficient of 0.025 means that if the perception of competence increases, the perception of career development increases, on the other hand if work

competence decreases it can reduce the perception of career development. The results of the beta coefficient sign are in accordance with the hypothesis proposed in this study, where competence has a positive effect on career development, and can continue the significance test. P values of $0.154 > 0.10$ (alpha 10%) then H_a is rejected. It was statistically concluded that there was no influence of competence on career development.

H3: There is a positive influence of loyalty to the organization on career development factors.

From table 4.2 number 5, it is known that the loyalty coefficient value is 0.573, which means that if the perception of loyalty increases, then career development data will increase, and vice versa if loyalty data decreases, therefore it can reduce career development data. The results of the beta coefficient sign are in accordance with the hypothesis proposed in this research, that loyalty is positive for career development, and can continue with the significance test. P value $0.000 < 0.05$ (5% alpha) then H_a is accepted. Therefore, it can be concluded from statistical data that at a 95% confidence level there is a positive influence of loyalty on career development

H4: There is a positive influence of mentors and sponsors on career development factors.

From table 4.2. Number 4 is known to be value of the mentor and sponsor coefficient of 0.085, meaning that if the perception of mentor and sponsor goes up, the perception of career development goes up, conversely if the perception of mentor and sponsor goes down, it can reduce the perception of career development. The results of the beta coefficient mark are in accordance with the hypothesis proposed in this study, where the supervisor and sponsor have a positive effect on career development, and can continue the significance test. P values of $0.014 < 0.05$ (alpha 5%) then H_a is accepted. It was statistically concluded that at a 95% confidence level on there is a positive influence of mentors and sponsors on career development.

H5: There is a positive influence of the reward system on career development factors.

From table 4.2 number 6, it is known that value of the reward system coefficient is 0.109, meaning that if the perception of the reward system rises, the perception of career development increases, on the contrary, if the perception of the reward system falls, it can reduce the perception on of career development. The results of the beta coefficient sign are in accordance with the hypothesis proposed in this study, where the reward system has a positive effect on career development, and can continue the significance test. P values of $0.050 < 0.10$ (alpha 10%) then H_a is accepted. It was concluded statistically that at a 90% confidence level there is a positive influence of the reward system on career development.

H6: There is a positive influence of knowledge on career development.

From table 4.2 number 6 it is known that value of the knowledge coefficient is 0.109, meaning that if the perception of knowledge goes up, the perception of career development goes down, on the contrary if the perception of knowledge goes down, it can increase the perception of career development. The results of the beta coefficient sign do not match the hypothesis proposed in this study, where knowledge has a positive effect on career development. Therefore it could not continue the significance test and H_a was rejected. It was statistically concluded that there was no influence of knowledge on career development

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSION

On results of research conducted by the author on "Determinants of Human Resource Career Development through Competency Improvement at the Directorate General of Intellectual Property", the results of this study show that there are positive and negative variables to these factors, therefore the author draws conclusions, namely:

1. There are 4 (four) variables that have a positive and significant effect on the determinants of employee career development at the DJKI, namely Achievement, Loyalty to the organization, mentors and sponsors and the reward system.
 - Achievement Variable: has an influence because the DJKI environment has made many innovations that can be considered in career improvement.
 - Variable Loyalty to the organization: based on the values of employee integrity to the organization are very inherent in the organizational environment.
 - Variable guidance and sponsor: this is due to the continuous interaction between employees with each other and with leaders at the center and region which is useful for getting a direction or direction to do something that is morale, self-development and work.
 - Variable reward system: this is directly related to innovation – innovations that have been carried out by employees are an assessment result that has achievements in work which will later be awarded to get more opportunities in competency development in the form of scholarships and assignments abroad, and the career of the employee itself.
2. There are 2 (two) other variables that do not affect the determinants of career development, namely the variables of Competence and Knowledge.
 - Competency Variable: competence is the main thing in determining career, but competence in this case is in accordance with data in the field that competence does not affect only limited to the requirements set by laws and regulations
 - Knowledge Variable: knowledge is something that needs to be considered in determining career development, but knowledge in this case has no influence because the supporting factors are more achievement variables that can have a lot of influence

In this study there are still limitations that require improvement for future research. This study only used the independent variable and the dependent variable only looked at the direct effect. It is hoped that future studies can add intervening variables to see the influence of independent variables on dependent variables indirectly. This research is limited to the DJKI, if the object of research is added or compared with other organizations, it is possible that the development of several factors will be seen more broadly

B. RECOMMENDATIONS

Based on the above conclusions, there are several variables that are appropriate and have a positive influence, therefore the advice of the author to further improve employees in achieving career development goals is as follows:

1. By providing opportunities for employees, both new employees or employees who have worked for a long time to participate in various HR development activities in the form of Training, Education, *Focus Group Discussion* (FGD), Technical Guidance, Sharing Forums and Seminars to provide in-depth debriefing and knowledge.
2. Good communication and relationships between superiors and employees and fellow colleagues that have been well established, so that they continue to be maintained and fostered because they can increase morale towards work and provide positive guidance influences.
3. Conduct annual performance appraisals continuously and reward employees who have good performance and have innovations that have a positive of the impact on the organization.
4. Provide counseling in the form of motivation to employees so that they can work together to do work with work group teams and build effective work teams. More consistent in choosing and mentoring to foster and build HR development performance.
5. Revise regulations to position competency standards to add in-depth competence and knowledge.

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 - Regulation of the Minister of State Apparatus Empowerment and Bureaucratic Reform of the Republic of Indonesia Number 34 of 2013 concerning the Functional Position of Brand Examiners and Their Credit Scores
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Creative Industry Development Strategy for the Craft Subsector in Increasing the Competitiveness of Creative Economy Players

Andini Grace Tinia¹, Yusup Iskandar¹, Wiwin Setianingsih¹, Endang Rustendi¹, and Audrey Salzabilla¹

¹Faculty of Economics: Galuh University, Ciamis, Indonesia

Abstract

The creative industry is the backbone of the economy and the future of the Indonesian nation. Of the 17 creative economy sub-sectors, Indonesian craft products are a creative economy sub-sector which is included in the top three contributors to the national Gross Domestic Product (GDP). Likewise in Ciamis Regency, the craft creative economy sub-sector is a mainstay sub-sector in increasing Regional Original Income (PAD). However, not many creative industries have been able to develop and have high competitiveness in the global industrial market. This research is expected to provide an alternative solution to the problem. Through an in-depth study of the creative industry in the craft sub-sector of Ciamis Regency, this study is expected to be able to develop a competitive strategy model for the country's creative industry, especially the creative industry in the craft sub-sector in Ciamis Regency. The urgency of this research is the need for creative industry development strategies to achieve business growth and sustainability and survive in highly competitive business competition in the era of a dynamic business world. Data collection techniques used were interviews, observation, and literature study. The data analysis technique used is a SWOT analysis (strengths, weaknesses, opportunities, threats) and a SWOT matrix. The results of the research on the mapping of the creative industry in the craft sector conducted in Ciamis Regency based on the SWOT Analysis when viewed from the results of calculating internal strategic factors, the total strengths and weaknesses are 2.97 while the external strategic factors total opportunities and threats are 2.80. This shows that the creative industry in the craft sector in Ciamis Regency has good strengths and opportunities from the weaknesses and threats that occur. Based on the SWOT matrix, the strategy that is suitable for use in the creative industry in the craft sub-sector in Ciamis Regency is the SO strategy, namely using strength to take advantage of opportunities. So that if you are able to take advantage of opportunities as well as possible, you can increase the regional economic income of Ciamis Regency.

Keywords: Development Strategy; Creative Industry; Craft subsector; Competitiveness; Creative Economy Players

I. INTRODUCTION

The development of creative industries in Indonesia is one area that has a significant role in driving economic development. The demand for a more effective economy raises the need for innovation to continue to grow, so the creative economy concept was developed to answer these demands. The creative economy is an economic concept that relies on individual creativity in optimizing one's competitiveness (Mahrina and Yulianasari, 2021). The creative industry is currently considered capable of making a very significant contribution to the regional economy (Ilhamuddin et.al, 2018). According to data from the Central Statistics Agency (BPS), in 2020, the contribution of the creative economy to Indonesia's Gross Domestic Product (GDP) will reach around 7.4 percent with a value of around IDR 1,087 trillion. However, Apart from its role and contribution in improving the national economy, in fact the creative industry sector still has problems that need to be solved in order to maximize the potential of the creative industry in Indonesia. Among the main problems in the creative industries are: the quality and quantity of human resources in the creative industries; capital, technology and infrastructure, market access and network

Behind the potential and problems of creative industries in Indonesia, there is not much literature on the development of creative industries (Rohmanu et.al, 2022). Existing literature is generally still within the limits of pure research. In addition, creative industry research has not yet made partnerships the axis of industrial development to support regional competitive advantage. The majority of developing industries in Indonesia rely on innovation and creativity from the human resources involved in the industry. The main element of the creative industry besides creativity is expertise, talent that has the potential to increase welfare with various intellectual creations (Adiyani et.al, 2022).

Of the 17 creative economy sub-sectors, Indonesian craft products are a creative economy sub-sector which is included in the top three contributors to the national Gross Domestic Product (GDP). Likewise in Ciamis Regency, the craft creative economy sub-sector is a mainstay sub-sector in increasing Regional Original Income (PAD).

However, creative economy actors in Ciamis Regency lack the ability to produce, introduce and apply new and unique crafts or products.

Ciamis Regency has 27 sub-districts, 7 sub-districts and 258 villages of which only around 8,000 creative economy actors have been registered. As for the 17 creative economy sub-sectors, Ciamis Regency has at least superior sub-sectors, namely the craft, culinary and fashion sectors. Ciamis Regency has a variety of cultural arts and extraordinary natural resource potential, one of which is its cultural output in the form of handicrafts (kirya), including: woven, kamuti, kolotok leutik, coconut shell crafts, embroidery crafts, and stick plates (indonesianews bulletin). However, business actors are less able to concretely realize new ideas or solutions so that craft products lack added value. This is indicated by a lack of self-confidence or individual confidence in entrepreneurial abilities, lack of knowledge sharing activities,

One of the reasons for the need for a creative industry development strategy is the positive impact on social life, people's welfare, the business climate, and economic improvement. Craft products in Ciamis Regency should be cared for and maintained as well as an increase in product quality so that they are always competitive and provide a livelihood for residents and give pride to Ciamis Regency both nationally and internationally.

The results of Santosa et.al's research (2020) show that there is an aspect of strength, namely local resources are very supportive, the basis for national cultural / ethnic wealth, production facilities and infrastructure are available. In the opportunity aspect, supporting elements are found, namely the domestic and foreign markets are still open and there is attention and support from the government. For the development of creative industries, it is carried out by developing human resource competencies, developing promotion and marketing of fashion products, developing aspects of financing. Meanwhile, Adiyani et.al (2022) concluded that increasing the competence of human resources is a long-term strategic investment and has broad dimensions in all aspects. Therefore, an integrated step and will is needed from the leadership as a policy maker and workforce that acts as the subject of development. Increasing the competence of Human Resources in the form of mental skills, soft skills, hard skills, social skills, has become an unavoidable demand for organizations in the new normal era to support workforce performance and management in the manual screen printing creative industry. Putra and Maulana's research (2018) illustrates that increasing the competitiveness of creative industries is very dependent on the availability of capital, fostering the creativity of business actors, as well as aspects of technology-integrated marketing. It is necessary to optimize the supporting components of the Porter Diamond creative industry model so that the competitiveness of Indonesia's creative industries will increase in the midst of the world industrial market. has become an unavoidable demand for organizations in the new normal era to support workforce and management performance in the manual filter printing creative industry. Putra and Maulana's research (2018) illustrates that increasing the competitiveness of creative industries is very dependent on the availability of capital, fostering the creativity of business actors, as well as aspects of technology-integrated marketing. It is necessary to optimize the supporting components of the Porter Diamond creative industry model so that the competitiveness of Indonesia's creative industries will increase in the midst of the world industrial market. fostering the creativity of business actors, as well as aspects of technology-integrated marketing. It is necessary to optimize the supporting components of the Porter Diamond creative industry model so that the competitiveness of Indonesia's creative industries will increase in the midst of the world industrial market. fostering the creativity of business actors, as well as aspects of technology-integrated marketing. It is necessary to optimize the supporting components of the Porter Diamond creative industry model so that the competitiveness of Indonesia's creative industries will increase in the midst of the world industrial market. fostering the creativity of business actors, as well as aspects of technology-integrated marketing. It is necessary to optimize the supporting components of the Porter Diamond creative industry model so that the competitiveness of Indonesia's creative industries will increase in the midst of the world industrial market.

Based on the phenomenon above, it is necessary to determine the strategy for the development of creative industries in order to increase competitiveness. The formulation of the problem in this study is: What is the strategy for developing the creative industry in the craft sub-sector in increasing the competitiveness of creative economy actors? Thus the purpose of this study is to find out and analyze the determination of the strategy for the development of the creative industry in the craft sub-sector in increasing the competitiveness of creative economy actors.

II. LITERATURE REVIEW

Industry is a business or activity that processes raw materials or semi-finished goods into finished goods that have added value for profit. Assembling or assembling and repair business is part of the industry. Industrial output is not only in the form of goods, but also in the form of services (Mahrina and Yulianasari, 2021).

The definition of a creative industry according to the Ministry of Trade of the Republic of Indonesia is an industry that originates from the utilization of people's creativity, skills and talents to generate prosperity and employment by creating and utilizing the person's creative power. . Based on the Ministry of Tourism and Creative Economy, the creative economy is grouped into 17 sub-sectors, namely: game development; crafts; interior design; music; art; product design; mode; culinary; films, animations and videos; photocopy; visual communication design; television and radio; Architecture; advertisement; performing Arts; publishing; and applications.

The creative industry is an economic activity whose input and output are ideas. Meanwhile, according to the government's vision, the creative industry is an industry that relies on the creativity, skills and talents of the community to improve living standards and create a workforce through creation (ideas) and exploitation.(Mahrina and Yulianasari, 2021).

The term Creative Economy has been widely discussed since John Howkins, wrote the book "Creative Economy, How People Make Money from Ideas". Creative Economy as an economic activity where the input and output are ideas (Howkins, 2021). Or in one short sentence, the essence of creativity is an idea. So it can be imagined that only with idea capital, a creative person can earn a relatively high income. Thus it can be seen that the creative economy is a new economic era concept that intensifies information and creativity by relying on innovative creative ideas and knowledge from human resources as the main factor of production. The Ministry of Tourism and Creative Economy (kemenparekraf.go.id) divides the creative economy into 17 sub-sectors, namely:

1. Game development
2. Crafts
3. Design interior
4. Music
5. Art
6. Product design
7. fashion
8. Culinary
9. Films, animations and videos
10. Photography
11. Visual communication design
12. Television and radio
13. Architecture
14. Advertising
15. Performing Arts
16. Publishing
17. Application

Crafts or crafts are part of applied art which is a meeting point between art and design originating from traditional heritage or contemporary ideas whose results can be in the form of works of art, functional products, decorative and decorative objects, and can be grouped based on material and exploration of technical tools used. used and also from thematic(kemenparekraf.go.id).

Competitiveness according to Michael Porter in Putra and Maulana (2018) is productivity which is defined as the output produced by the workforce. In general, the notion of competitiveness is the ability of companies, regions, countries or between regions to increase income by utilizing labor and other productive and sustainable resources to face competition by maximizing the potential of their superior products. Therefore, in the context of a district/city as an organization, competitiveness is defined as the ability of a district/city to develop its regional economic-social capabilities in order to improve the welfare of the people in its territory.

III. RESEARCH METHODOLOGY

The method used in this study is a qualitative research method. SWOT analysis is a data analysis technique used to define strengths, weaknesses, opportunities and threats in each strategy which is then summarized into a development action plan (Rangkuti, 2009). The method used is the Strategy Formulation Framework from Fred

R David which combines External Factor Evaluation (EFE) and Internal Factor Evaluation (IFE) data, then a SWOT analysis is carried out. In making the External Factor Evaluation Matrix (EFE) criteria which become Opportunities and Threats, the criteria are based on real field conditions involving Focus Group Discussions as experts. Then do the weighting of each criterion using the Binary Domination Matrix approach. In the Internal Factor Evaluation Matrix (IFE) the criteria are made into strengths and weaknesses, the establishment of criteria is based on real field conditions involving Focus Group Discussions as experts. Then do the weighting of each criterion using the Binary Domination Matrix approach. Matrix of Strengths-weaknesses-opportunities-threats (SWOT), at this stage alternative strategies have been identified that can be used as a continuation of the design. From the results of the formulation of the strategy that has been carried out, the recommendations for the strategy are analyzed. Then do the weighting of each criterion using the Binary Domination Matrix approach. Strengths-weaknesses-opportunities-threats (SWOT) matrix, at this stage alternative strategies are identified that can be used as follow-up designs. From the results of the formulation of the strategy that has been carried out, the recommendations for the strategy are analyzed. Then do the weighting of each criterion using the Binary Domination Matrix approach. Matrix of Strengths-weaknesses-opportunities-threats (SWOT), at this stage alternative strategies have been identified that can be used as a continuation of the design. From the results of the formulation of the strategy that has been carried out, the recommendations for the strategy are analyzed.

IV. RESULTS / FINDINGS

Data analysis in this study includes internal factor analysis and external factor analysis of the creative industry in the craft sub-sector in increasing the competitiveness of creative economic actors in Ciamis Regency through the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices. Furthermore, the results of the IFE and EFE calculations will describe the position of the creative industry in the craft sub-sector in increasing the competitiveness of creative economy actors in Ciamis Regency.

Internal factors originating from within the craft sub-sector industrial environment and external factors originating from outside the craft sub-sector creative industry environment in Ciamis Regency, include:

1. Strength
 - a. Adequate raw materials
The raw materials for making craft products are very adequate because in the Ciamis Regency there are still many forests so that raw materials are not difficult to obtain. Entrepreneurs can buy raw materials from farmers and collectors around the area.
 - b. Craft product innovation
Innovations that are continuously carried out are adjusted to market demand and maintain products that have different characteristics from competitors' products so that people are more familiar with these product brands.
 - c. Skilled workforce
The workforce in the creative industry sector is classified as skilled because craft industry entrepreneurs take advantage of residents around creative industry locations who do not have jobs.
 - d. Affordable craft prices
Affordable prices for craft products can reach all levels of society.
2. Weakness
 - a. Lack of market promotion
Market promotion is still carried out using offline media. In this digitalization era, creative economy actors should be able to use marketing tools with online media or use social media to expand marketing.
 - b. Small business capital
Business capital still uses its own capital and tends to be small.
 - c. Expensive wages
The amount of costs that must be incurred to employ skilled workers.
 - d. Competitive ability
Competition that occurs between craft entrepreneurs requires business actors to have advantages over competitors. But in reality business actors lack the ability to increase business competitiveness.
3. Opportunity / Opportunity
 - a. Acceleration of market development for business premises by the government
Market trends created by the government can accelerate market development as a place of business for craft industry players. By holding exhibitions can promote the craftsmanship of the craftsmen.
 - b. Procurement of training on digital marketing

In an effort to develop the creative industry, the Ciamis District Government is holding training on digital marketing for business people. In the training, there are various directions and strategies in improving promotion and marketing both through print and online media to expand marketing reach.

- c. Selling or making handicraft products that consumers like
Producing and selling handmade craft products that are trending in the market and popular with the public by prioritizing quality.
 - d. Procurement of expos or exhibitions
Promotional support by exhibiting products produced by artisans at exhibitions or expos held by local governments and outside the region.
4. Threats/Threats
- a. Unstable business income
The income earned by entrepreneurs is unstable, making it difficult to pay debts to investors.
 - b. Increase in raw material prices
Raw materials that are increasingly difficult to find cause product prices to increase
 - c. There are competitors from the manufacturing industry.
The low quality of local products and the increasing number of imported products and manufacturing industries are a serious threat to craft entrepreneurs.
 - d. The next generation of skilled workers is hard to find
It is difficult to find the next generation of workers because very few young people want to become entrepreneurs in the local craft industry.

Based on the results of interviews with informants and focus group discussions conducted, several internal and external strategic factors can be obtained as shown in table 1 below:

Table 1. Internal Factor Evaluation (IFE)

No	Internal Strategic Factors	Weight	Ratings	Score
Strength				
1.	Adequate raw materials	0.18	3	0.54
2.	Product craft innovation	0.15	4	0.6
3.	Skilled workforce	0.11	3	0.33
4.	Affordable craft prices	0.13	2	0.26
Total Strength		0.57	12	1.73
Weakness				
1.	Lack of marketing promotion	0.14	3	0.42
2.	Small business capital	0.12	3	0.36
3.	Expensive worker wages	0.12	3	0.36
4.	Competitive ability	0.05	2	0.1
Total Weaknesses		0.43	11	1.24
Total IFE Score		1	23	2.97

Based on the table above, it can be seen that the strength factor of the craft sub-sector industry has a total score of 1.73. While the weakness factor of the craft sub-sector industry has a total value of 1.24. Thus the internal factor evaluation value is 2.97.

Table 2. External Factor Evaluation (IFE)

No	External Strategic Factors	Weight	Ratings	Score
Opportunity				
1.	Acceleration of market development for business premises by the government	0.15	3	0.45
2.	Procurement of training on digital marketing	0.17	3	0.51

3.	Selling or making handicraft products that consumers like	0.17	3	0.51
4.	Procurement of expos or exhibitions	0.14	3	0.42
Total Chances		0.63	12	1.89
Threat				
1.	Unstable business income	0.15	2	0.3
2.	Increase in raw material prices	0.05	2	0.1
3.	There are competitors from the manufacturing industry	0.12	3	0.36
4.	The next generation of skilled workers is hard to find	0.05	3	0.15
Total Threat		0.37	10	0.91
Total EFE Value		1	22	2.80

Based on the table above, it can be seen that the opportunity factor for the craft sub-sector industry has a total score of 1.89. Meanwhile, the threat factor from the craft sub-sector industry has a total value of 0.91. Thus the external factor evaluation value is 2.80.

Based on the results obtained from the internal and external analysis in the tables above, it can be seen that:

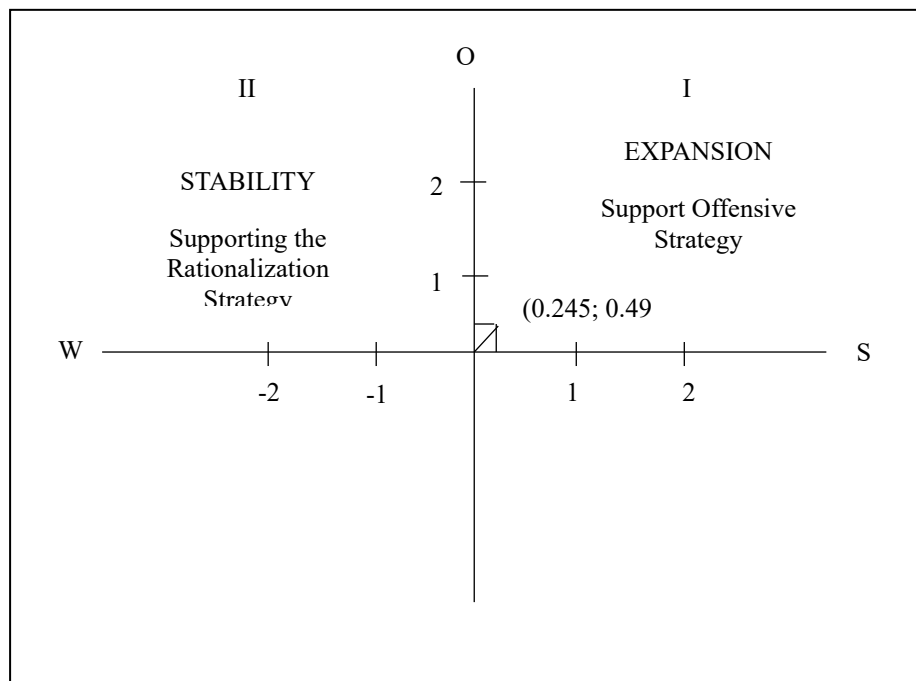
1. Total strength score = 1.73
2. Weakness total score = 1.24
3. Total odds score = 1.89
4. Total threat score = 0.91

The value of the strength factor is greater than the weakness factor, as well as the value of the opportunity factor is greater than the threat factor. This means that the creative industry in the craft sub-sector in Ciamis Regency is in a growth position. The internal condition of this creative industry is quite strong with a slightly threatening environment. To find coordinates in the axis system, you can search in the following ways:

1. Internal Analysis Coordinate
 $(\text{Total Strength Score} - \text{Total Weakness Score}) / 2$
 $= 1.73 - 1.24 / 2 = 0.245$
2. External Analysis Coordinate
 $(\text{Total Opportunity Score} - \text{Total Threat Score}) / 2$
 $= 1.89 - 0.91 / 2 = 0.49$

Thus the coordinates are located at 0.245; 0.49

Next, the results of these coordinates are presented in a SWOT matrix diagram to determine the real position of the creative industry in the craft sub-sector in Ciamis Regency.



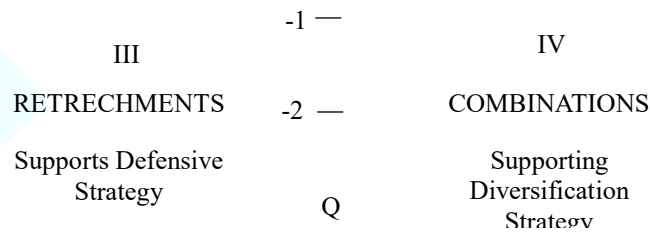


Figure 1. SWOT Matrix Diagram

From the confluence of these diagonal points, it is known that the position of the creative industry is in quadrant I. In quadrant I (SO strategy) the general strategy that can be carried out by the industry is to use strength to take advantage of every opportunity that exists. In quadrant II (WO strategy) the industry can make advantages of existing opportunities as a reference for focusing activities by avoiding weaknesses. In quadrant III (WT strategy) the industry must minimize all weaknesses to deal with every threat. Finally, in quadrant IV (ST strategy) the industry must make every strength to face every threat by creating diversification to create opportunities.

The next stage in the SWOT analysis is to determine the strategy based on the location of the quadrant position. The creative industry in the craft sub-sector in Ciamis Regency is located in quadrant I, so the priority strategy chosen is the SO strategy. The SO strategy is a stable growth strategy, namely a strategy that focuses on market penetration, market development, and product development, integration (forward, backward, horizontal) and diversification (concentric, horizontal, conglomerate).

Referring to the general concept of the SO strategy above, a strategy for the development of the creative industry in the craft sub-sector in Ciamis Regency in increasing competitiveness can be formulated, namely as follows:

1. Penetration and development of foreign markets So far, the largest marketing of craft products in Ciamis Regency is for domestic (domestic) customers. Foreign markets have their own challenges. An effective strategy needed by entrepreneurs in this industry to overcome challenges is to use distributors/agents. Limited knowledge and experience of entrepreneurs to carry out overseas marketing can be overcome by the presence of distributors.
2. Improving promotion and branding must be continuously carried out. The establishment of trademarks for craft products needs to be carried out immediately accompanied by the development of a sales chain both in the domestic and foreign markets. Meanwhile, promotion can be done through any media to introduce new products, attract new customers and network, as well as maintain relationships with old customers.
3. Creative. The progress of the creative industry in the craft sub-sector is inseparable from the creativity of creative economy actors in creating product designs.

V. DISCUSSION

Creative industries from various sectors need to be developed and competitive. This is because the creative industry contributes to the national economy, the creative industry can enhance the image and identity of the Indonesian nation, the creative industry is based on renewable resources, the creative industry is based on creativity which encourages innovation, the creative industry preserves Indonesian culture and increases social tolerance. The basic things of the creative industry are: creativity, innovation, and invention. This research is an attempt to provide an overview regarding the creative industry development strategy, especially the creative economy sub-sector in Ciamis Regency in increasing competitiveness. This study is not intended to describe all efforts to increase the creative industry in all sub-sectors, but the analytical model used can be applied in analyzing the creative industries in the craft subsector. Further research is needed on creative industry development strategies in increasing competitiveness using different data analysis methods and techniques.

VI. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the data analysis that has been done, it can be concluded as follows:

1. Based on the results of the SWOT analysis, when viewed from the results of internal strategic factor calculations, a total strength and weakness of 2.97 was obtained, while external strategic factors obtained a total of opportunities and threats of 2.80. This shows that the craft sub-sector creative industry in Ciamis Regency has good strengths and opportunities from the weaknesses and threats that occur. So that if you are able to take advantage of opportunities as well as possible, you can increase the regional economic income of Ciamis Regency.
2. Based on the SWOT matrix, the strategy that is suitable for use in the creative industry in the craft sub-sector is the SO strategy, namely using strength to take advantage of opportunities.

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The Effect of The Settlement of Infringement on The Amount Intellectual Property Registration at The Directorate General of Intellectual Property

Dwinanto Budi Prasetyo¹, Muhammad Zilal Hamzah², Rinaldi Rustam³
^{1,2,3} Fakultas Ekonomi dan Bisnis, Universitas Trisakti, Jakarta, Indonesia

Abstract

Introduction/Main Objective: Intellectual Property (IP) infringement in Indonesia is not only the country that will be harmed and threatened by investment flows, Indonesia is also threatened with an embargo on its export products. DJKI is one of the institutions that handles intellectual property infringement in Indonesia. **Background of the problem:** Therefore, to improve the economy, namely through the protection of Intellectual Property by taking action against Intellectual Property infringement, not only focusing on increasing registration. **Research gaps/Novelty:** this study aims to analyze and find out the relationship between copyright infringement and economic aspects, the relationship between copyright and the industrial climate and the relationship between copyright and global competitiveness. **Research Method:** This study uses a qualitative approach by collecting journals related to intellectual property infringement. The tool used to analyze is the Systematic Literature Review (SLR). **Findings/Results:** From data processing, studies on the economic impact of copyright infringement were relatively few in all (44) articles that were obtained and met the requirements. In the future steps to suppress Intellectual Property infringement in the form of awareness, improvement of regulations, capacity building, collaboration with authorities, supervision and examination, alternative dispute resolution, legal action and cooperation with international Law Enforcement Officials are needed to ensure protection against threats of Intellectual Property Infringement.

Keywords: Intellectual Property, Completion of Infringements, Enforcement, DJKI

I. INTRODUCTION

Intellectual Property (IP) is essentially the same as other material property rights, namely giving rights to creators or owners to benefit from the investment of their intellectual work. Intellectual Property Rights (hereinafter referred to as IPR) are property rights that arise or are born from human intellectual abilities. IPR indeed makes works that arise or are born because of human intellectual abilities that must be protected. Human intellectual abilities are produced by humans through their power, taste, and intention which are manifested in intellectual works. Intellectual works are also born to be valuable, especially with the inherent economic benefits that will foster the concept of wealth for intellectual works. (Margono, 2001).

This is reflected in the effectiveness of solving Intellectual Property infringement issues that existed during the 2018-2022 period as follows:

Table 1. Settlement of Intellectual Property Infringement at the Directorate General of Intellectual Property Ministry of Law and Human Rights of the Republic of Indonesia for the 2018-2022 period

Periode	Pelanggaran		Persentase	Kriteria
	Masuk	Realisasi Penyelesaian		
2018	27	15	56%	Tidak Efektif
2019	41	28	68%	Kurang Efektif
2020	30	12	40%	Tidak Efektif
2021	33	15	45%	Tidak Efektif
2022	25	46	184%	Sangat Efektif

Source: Directorate General of Intellectual Property, Ministry of Law and Human Rights of the Republic of Indonesia (2023)

Based on Table 1 data. The above during the 2018-2021 period shows that in 2018, 2020 and 2021 it shows an ineffective percentage because it is below 60% while in 2019 it is less effective, while in 2022 it is very

effective with a percentage of 184%. Ineffective in resolving Intellectual Property infringement, this occurs due to several reasons as follows: (Source: DJKI, 2023)

1. Issues related to regulations, namely limited revisions to the Copyright Law to perfect articles to anticipate developments in copyright in the digital era;
2. Issues related to Business Processes (Processes in Performance Achievement):
 - a. Lack of support tools and experience for Intellectual Property investigators in handling cyber cases;
 - b. DJKI cannot move alone in handling cases related to cyber violations;
 - c. Related to PPNS: there is no PPNS functional position, the placement of PPNS is not in accordance with the main tasks and functions, and the structural tasks and functions are still attached to PPNS;

The results of the Community satisfaction index survey show that in 2022 there will be an increase compared to the previous year.

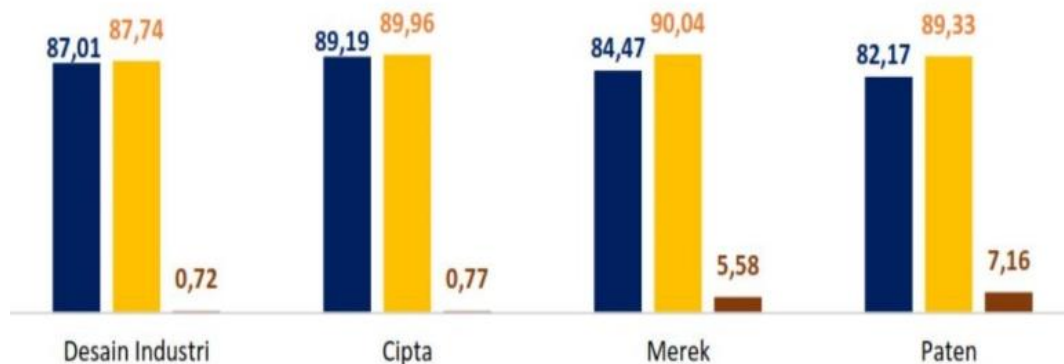


Figure 1.The Gap Between Perceptions and Expectations of the 2022 IC Services SMI Survey by Type of Application (DJKI, 2023)

If observed based on the type of application, applicants for the Brand and Patent category have the highest gap score, which is above 5.00. Meanwhile, in the Cipta and Industrial Design categories, the gap is quite low, which is less than 1.00.

The previous research research gap by Sulistianingsih & Ilyasa, (2022) found that Indonesia also agreed to the Uruguay Round in the GATT by adjusting the intellectual property law that had been regulated in TRIPs which marked the opening of provisions regarding TRIPs in the Indonesian legal system. Therefore, it is Indonesia's obligation to carry out harmonization and synergy of legal instruments and strict law enforcement in the protection of intellectual property in Indonesia. Abduh & Fajaruddin's research, (2021) was found in the field and then compared with legal norms in the form of Law Number 28 of 2014 concerning Copyright. Government Regulation Number 16 of 2020 concerning Registration of Works and Related Products. So that in the end it can be formulated the function of Protection of Intellectual Property Rights in Resolving Copyright Disputes.

Formulation of the problem

Identification of the problem arising from the background mentioned above is whether or not there is a positive impact on increasing registration at the Directorate General of Intellectual Property as a result of the settlement of Intellectual Property Infringement that have occurred. If written in questions, the formulation of the research problem can be seen as follows:

1. How is the Aspect of Copyright Infringement Related to the Economic Aspect?
2. How is Copyright related to an Industry's Climate?
3. How is Copyright related to Global Competitiveness?

II. LITERATURE REVIEW

A. Public policy

Policy is an instrument of government, not only in the sense of government which only concerns the state apparatus, but also governance which touches on the management of public resources. Policies are essentially decisions or choices of action that directly regulate the management and distribution of natural, financial and human resources in the public interest, namely the people, residents, communities or citizens. Policy is the result of synergy, compromise or even competition between various ideas, theories, ideologies and interests that represent a country's political system.

B. Intellectual Property

Purba (2019), defines that Intellectual Property are assets that legally give rise to rights and obligations for their owners, as well as other assets, such as land with certificates, and ownership of movable objects, attached to those who control them. For this reason, a registration process is needed to obtain a certificate of ownership from the state. The awareness that intellectual work is an intangible object that can be used as an asset is the key issue.

C. Directorate General of Intellectual Property

The Directorate General of Intellectual Property (DGIP) is one of the echelon I units out of 11 Main Units at the Ministry of Law and Human Rights is an implementing agency of the Ministry of Law and Human Rights of the Republic of Indonesia which has the task of organizing the formulation and implementation of policies in the field of intellectual property in accordance with statutory provisions. The Directorate of Investigation and Dispute Settlement has the task of carrying out the preparation of the formulation and implementation of policies, providing technical guidance in the fields of investigation, prevention, dispute resolution and evaluation of Intellectual Property crimes.

D. Copyright Infringement (known as piracy)

Is the use of material that is still protected by copyright without the permission of the creator or rights holder, in this case violating certain exclusive rights granted to copyright holders such as duplicating, reproducing, distributing, displaying or exhibiting creations, or making derivative works. The copyright holder is the creator, publisher, or other party who is mandated to hold the work. Copyright holders usually employ certain technological and legal standards to prevent and punish copyright infringers.

E. Performance

Research by Leonard et al., (2020) found that there are factors that determine the occurrence of foreign investment disputes in the field of intellectual property rights and the ISDS mechanism can be a way to resolve foreign investment disputes in the field of intellectual property rights. Research by Liberti, (2010) the IPR provisions found in the RTA sample extend IPR protection beyond the WTO-TRIPS minimum standards, by providing additional coverage of certain standards or additional obligations under the intellectual property chapter. Extended IPR protection may also derive from the unqualified treatment protection provisions found in IIA.

IPR Infringement in the form of piracy, plagiarism, imitation, forgery, use without permission and the like are still not considered serious crimes compared to other crimes so that many Infringement still occur. Counterfeit products are distributed openly and openly without any fear of violating the law. Apart from being caused by the opportunities offered by advances in information and communication technology, these Infringement are also caused by a lack of understanding and awareness of public law, particularly in the field of intellectual property rights. (Riswandi, 2005).

This research contains how the cooperation policy carried out by the Directorate General of Intellectual Property regarding the settlement of violations has an impact on the registration of intellectual property at the Directorate General of Intellectual Property. Brand Rights in the Intellectual Property Rights (IPR) rules are rights owned by companies or MSMEs to protect against all forms of plagiarism. Adequate IPR registration can reduce competitiveness in the market so that the uniqueness that is owned cannot be followed by other competitors. Intellectual Property Rights (IPR) became known in 1450, when Johannes Gutenberg invented a printing press with a movable printing system that required copyright protection. The term intellectual property was only used in court decisions in the United States in 1850. Then Indonesia made Law no. 21 of 1961 concerning Company Marks and Trademarks and ratified the Paris Convention on Protection of Industrial Property (1979) through

Presidential Decree No. 24. After that, in 1982 Law no. 12 of 1982 concerning Copyright, followed by Law no. 6 of 1989 concerning Patents which became effective in 1999.

Protection of intellectual property rights aims to provide copyright protection and to support and reward on the fruit of creativity. This protection is given so that new innovations grow in both the industrial and arts and science fields. The protection of intellectual property rights is also a valuable asset because it provides great economic rights. The existence of these intellectual property rights can even be a catalyst for a country's economic growth. Because of its universal nature, the protection of intellectual property rights must be supported and recognized by countries in the world.

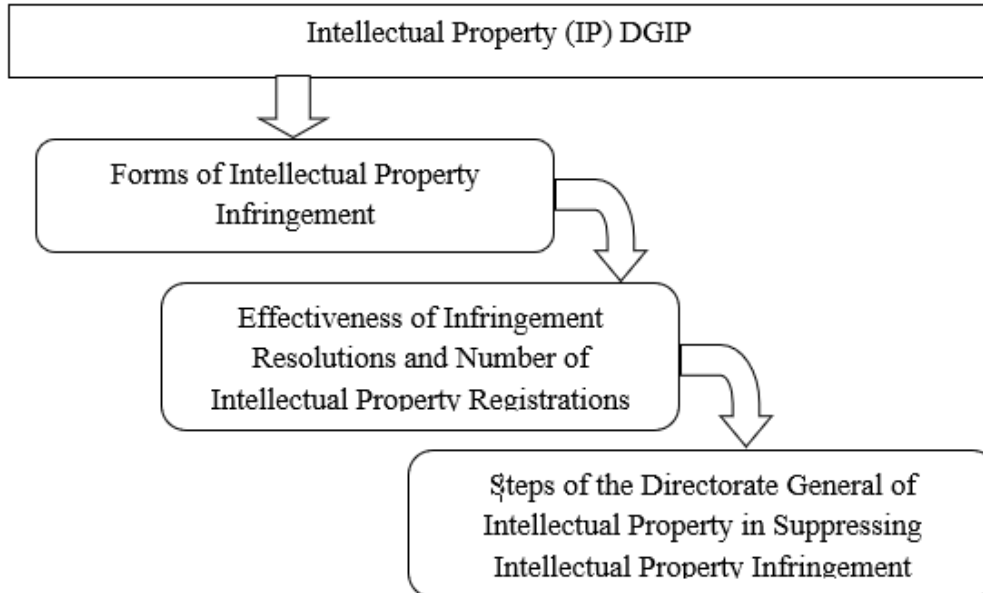


Figure 2: The Framework (Data Processed, 2023)

III. RESEARCH METHODOLOGY

This research uses a qualitative approach, the type of research literature study is done by examining written documents (articles) and journals. Data collection in this study was carried out by obtaining the results of filtering each data source (article) and journals that match the keywords so that they can be analyzed further according to the formulation of the problem through reference sources from scientific work databases such as Google Scholar, Scopus, Web of Science, Semantic Scholar, PubMed, Open Alex and Crossref.

Table 2.Data Source Inclusion & Exclusion tabulation

2013-2022	Keyword Used (Publish or Perish)				
	Copyright Infringement	IP Infringement	Copyright Criminal	Trademark Infringement	OEM Suppliers
Recorded	149	35	23	36	28
Gross Total	271				
Excluded	127	28	21	31	20
Included	22	7	2	5	8
Total Article Included	44				

Source: Data Processed (2023)

Publish or Perish (PoP) is a free application that can be used to collect metadata of scientific works in almost all fields of science. This tool is designed to assist personal or researchers in finding and analyzing the

sources of information needed. Not only that, this tool can also help researchers select articles in online databases according to the quality of the articles.

SLR which is a way of identifying, evaluating, and interpreting all available research that is relevant to the problem formulation or topic area studied. (Calderon and Ruiz 2015). Systematic Literature Review (SLR) is defined as the process of identifying, assessing and interpreting all available research evidence with the aim of providing answers to specific research questions (Kitchenham et al., 2009).

While data analysis was carried out using the Systematic Literature Review (SLR) approach. The purpose of this SLR or Systematic Literature Review research is to find a strategy that will help overcome the problems encountered and identify different perspectives related to the problem being studied and uncover theories relevant to the cases in this study which examine more deeply the effect of benefits Settlement of Copyright Infringement on Intellectual Property Registration at the Directorate General of Intellectual Property (DJKI).

Analisis data dilakukan melalui tahapan (i). Mendeskripsikan informasi terkait data jurnal dengan menggunakan kata kunci; (ii). Memasukan kata kunci ke dalam aplikasi Publish On Perish (POP) untuk mendapatkan hasil metadata dari pengumpulan jurnal dan artikel; (iii). penyaringan artikel melalui sejumlah kriteria inklusi dan eksklusi dilakukan dengan perbantuan diagram Preferred Reporting Items for Systematic Reviews and META Analysis (PRISMA); (iv). Menentukan artikel yang realibel sesuai dengan kesimpulan penelitian.

IV. RESULT / FINDING

In this section, the results and analysis of data processing will be displayed using Publish On Perish (POP). Articles were filtered through a number of inclusion and exclusion criteria with the help of the Preferred Reporting Items for Systematic Review and META Analysis (PRISMA) diagram as follows:

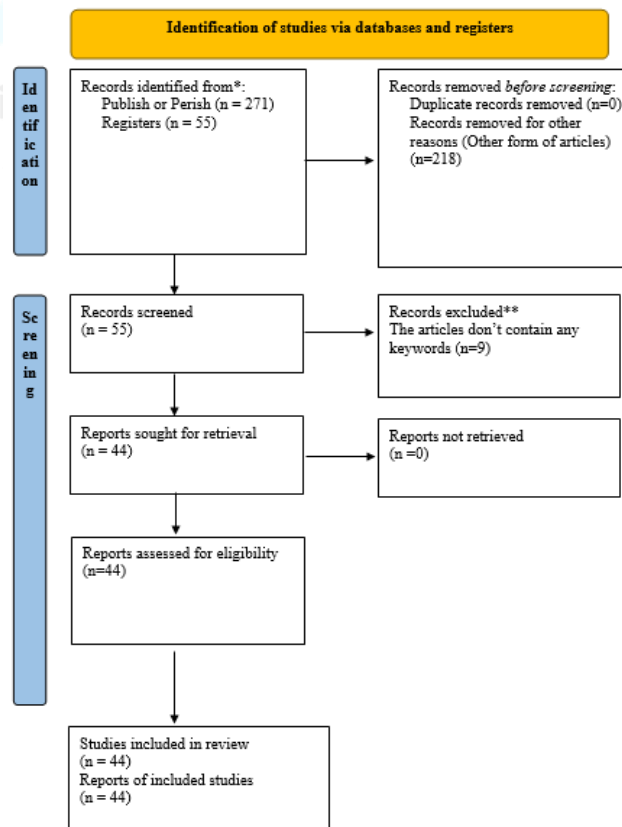


Figure 2. Diagram Article Screening (Data Processed, 2023)

Next, it will be shown the results of using PRISMA in relation to screening the inclusion and exclusion criteria for the data sources to be used:

Table 3 . Data Source Inclusion & Exclusion tabulation

2013-2022	Keyword Used (Publish or Perish)				
	Copyright Infringement	IP Infringement	Copyright Criminal	Trademark Infringement	OEM Suppliers
Recorded	149	35	23	36	28
Gross Total	271				
Excluded	127	28	21	31	20
Included	22	7	2	5	8
Total Article Included	44				

Source: (Data Processed, 2023)

Referring to the table and figure above, it can be explained that the keywords used as input in the search for articles and data sources are used in the Publish or Perish (PoP) software with the publication time criteria between 2013-2022 (10 years). The use of keywords used are: (i). Copyright Infringement; (ii). Intellectual Infringement; (iii). Copyright Criminal; (iv). Trademark Infringements; (v). OEM Suppliers. The reason underlying the use of these keywords refers to the main theme of this study. Based on the search for the keywords used, 271 data were generated ($n = 271$), while each keyword generated data as much as: i). Copyright Infringement – 149 data; (ii). Intellectual Infringement – 35 data; (iii). Copyright Criminal – 23 data; (iv). Trademark Infringement – 36 data; (v). OEM Suppliers – 28 entries. Furthermore, from the 271 available data, the first exclusion criterion was used, namely the data to be used as input must be published in the form of articles and not in other forms (Chapter in Book, Review, Book, Note, and so on). This is done by referring to the keyword network analysis which will be carried out in the next stage. In other words, data that is in the form of other than articles (Chapter in Books, Reviews, Books, Notes, and so on), tends to be minimal or doesn't even have keywords.

As for the first criterion, 218 data were found in the form other than articles, so that in this case the remaining data was ($n = 55$). The next criteria used are articles that have keywords. This was done to be able to carry out Keyword network analysis at a later stage. In this case, as many as 9 articles were filtered which did not have keywords in the data in the form of articles, so that the remaining ($n = 44$) articles were processed for further data processing. Based on these stages (use of 2 criteria) it can be concluded that, there are 44 eligible articles for further analysis. Meanwhile, based on the results of the screening carried out, the following is a table showing the article in question:

Tabel 4. Eligible Articles

No	Title	Author(s)	Year	Journal
1	Copyright compliance and infringement in ResearchGate full-text journal articles	H.R. Jamali		Scientometrics 112 (1), pp. 241-254
2	Copyright infringement online: The case of the Digital Economy Act judicial review in the United Kingdom	R. Mansell	2013	New Media and Society 15 (8), pp. 1312-1328

No	Title	Author(s)	Year	Journal
3	Intermediaries' liability for online copyright infringement in the EU: Evolutions and confusions	T.E. Synodinou	2015	Computer Law and Security Review 31 (1), pp. 57-67,
4	Copyright infringement as user innovation	Y. Arai	2014	Journal of Cultural Economics 38 (2), pp. 131-144
5	Legal protection for creators of cinematographic works against copyright infringement through streaming and free download sites	Pujiyono	2019	Journal of Legal, Ethical and Regulatory Issues 22 (3)
6	Should digital files be considered a commons? Copyright infringement in the eyes of lawyers	J. Hergueux	2019	Information Society 35 (4), pp. 198-215
7	Online and physical appropriation: evidence from a vignette experiment on copyright infringement	M. Krawczyk	2020	Behaviour and Information Technology 39 (4), pp. 481-496
8	Unusual canvasses: Resolving copyright infringement through the lens of community customs	D. Lintaman	2020	Interactive Entertainment Law Review 3 (1), pp. 20-23
9	Early warning of risks of copyright infringement in digital library based on extension theory	C. Li	2016	Electronic Library 34 (2), pp. 250-264
10	Development of Hosting ISPs' Secondary Liability for Primary Copyright Infringement in China – As Compared to the US and German Routes	J. Wang	2015	IIC International Review of Intellectual Property and Competition Law 46 (3), pp. 275-309
11	Conditional access to music: Reducing copyright infringement without restricting cloud sharing	S. Lu	2015	International Journal of Law and Information Technology 23 (3), pp. 235-260
12	Empirical insights into recorded music consumer behavior and copyright infringement	J. Montoro-Pons	2013	Sociology of Crime Law and Deviance 18, pp. 245-267
13	Empirical research on criminal copyright infringement in china	X. Huijia	2018	Queen Mary Journal of Intellectual Property 8 (1), pp. 36-49,
14	Copyright infringement and protection in holographic performances: From the Chinese perspective	J. Hua	2017	Journal of World Intellectual Property 20 (3), pp. 133-142

No	Title	Author(s)	Year	Journal
15	Re-importing the concept of 'authorisation' of copyright infringement to Nigeria from the UK and Australia	B. Faturoti	2017	International Review of Law, Computers and Technology 31 (1), pp. 4-25

Source: (Data Processed, 2023)

Furthermore, in the second stage, partial network mapping will be carried out on each keyword used. First, the mapping results will be shown on keywords that refer to the main research theme, namely *Copyright Infringement* (n = 22), as follows:

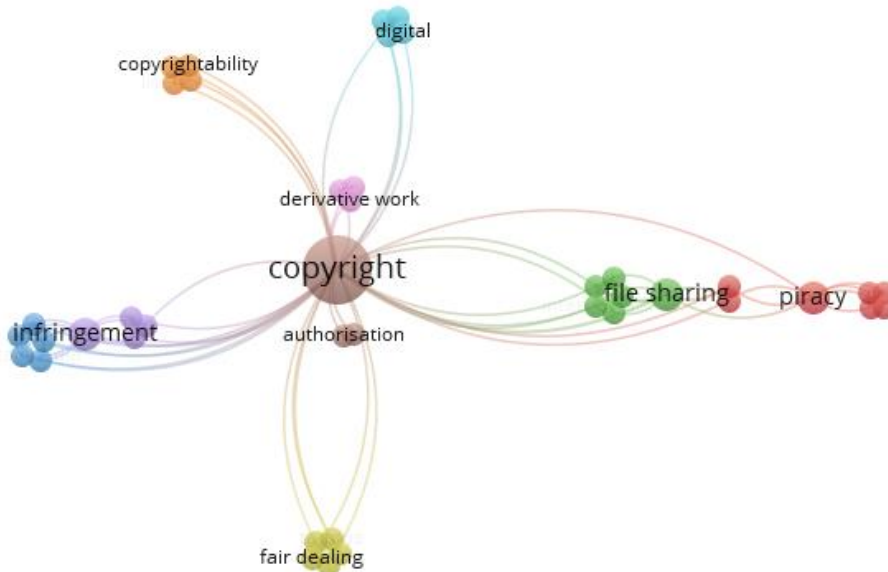


Figure 3. *Copyright Infringement* Keyword Network
Source: (Data Processed, 2023)

Table 4 . *Copyright Infringement* Keywords Clusterization

Cluster	Items	Total Items
1 (Red)	Commons	7
	Digital Ethics	
	Music Consumption	
	Piracy	
	Propensity Score Matching	
	Sampling Effect	
2 (Green)	File Sharing	6
	Intellectual Property	
	Internet Law	
	Legal Rhetoric	
	Morality	

Cluster	Items	Total Items
	Online Copyright Infringement	
3 (Blue)	Digital Media	5
	File-sharing	
	Internet	
	New Media	
	Technological Innovation	
4 (Yellow)	Fair Dealing	5
	Implied License	
	Moral Rights	
	Tattoos	
	Video Games	
5 (Purple)	Authorisation of Copyright	4
	Digital Economy Act 2010	
	Illegal File-Sharing	
	Infringement	
6 (Light Blue)	Digital	4
	Power	
	Reform	
	Threats	
7 (Orange)	Copyrightability	4
	Holographi Performance	
	License	
	Ownership	
8 (Brown)	Authorisation	3
	Copyright	
	Nigeria	
9 (Pink)	Derivative Work	3
	Dojinshi	
	User Innovation	

Source: (Data Processed, 2023)

Based on the table above, it can be seen that there are 9 clusters mapped in the Copyright Infringement keyword network. Cluster 1 (red) consists of 7 items/nodes namely: Commons, Digital Ethics, Music Consumption, Piracy, Propensity Score Matching, Sampling Effect, Substitution Effect. Cluster 2 (Green) also consists of 6 items/nodes namely: File Sharing, Intellectual Property, Internet Law, Legal Rhetoric, Morality, and Online Copyright Infringement. Furthermore, Cluster 3 (Blue) consists of 5 items/nodes: Digital Media, File-sharing, Internet, New Media, and Technological Innovation. The other several nodes in each cluster can be seen in the table above. The link with the economic aspect is only shown through its relationship with digital economy regulations which have an impact on the acceptance (output) of the creative industry (Mansell & Steinmueller, 2010). Here is an image that shows what this means:

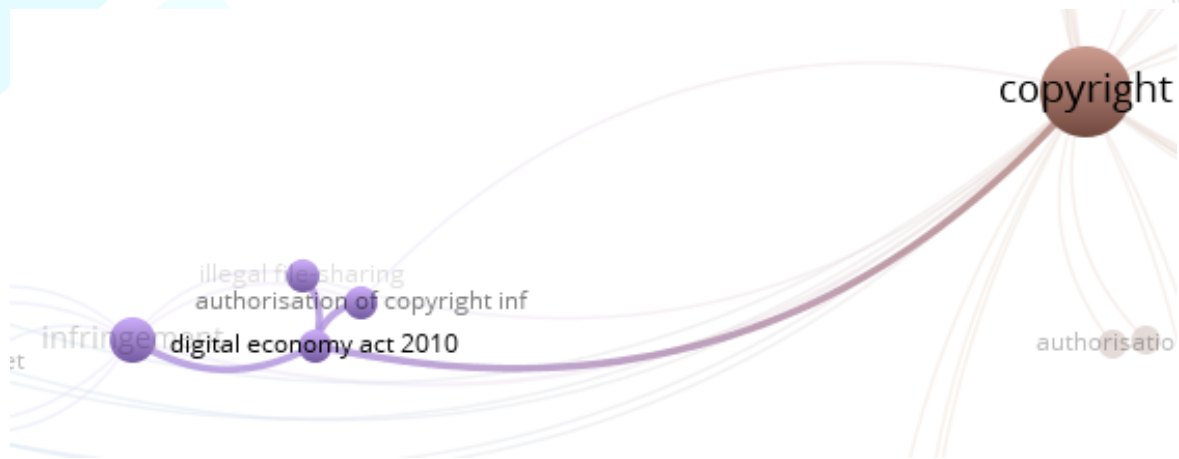


Figure 4. Digital Economy Act 2010 vs Copyright (Data processed, 2023)

Next, the mapping results will be shown on keywords that refer to the main research theme, namely Intellectual Property Infringement (n = 7), as follows:



Figure 5: Intellectual Property Infringement Keyword Network (Data processed, 2023)

Based on the picture above, it can be seen that there are several clusters that are mapped in 7 articles, as follows:

Table 6. Intellectual Property Infringement Keyword Clustering

Cluster	Items	Total Items
1 (Red)	Applicable Law	6
	Brussels Regulation	
	International Jurisdiction	
	Moral Rights	
	Personality Rights	
	Unfair Competition	
2 (Green)	Cross-Border	6
	Infringement	
	Intellectual Property	
	Online	
	Private International Law	
	Ubiquitous	

(Data Processed, 2023)

Based on the table above, it can be seen that 2 main clusters are selected which are mapped in the Intellectual Property Infringement keyword network. Cluster 1 (red) consists of 6 items/nodes namely: Applicable Law, Brussels Regulations, International Jurisdiction, Personality Rights, and Unfair Competition. Cluster 2 (Green) also consists of 6 items/nodes namely: Cross Border, Infringement, Intellectual Property, Online, Private International Law, and Ubiquitous. In this keyword, there is no correlation with economic aspects.

Next, the results of the mapping will be shown on keywords that refer to the investment aspect itself through the keyword Copyright Criminal (n = 2), as follows:

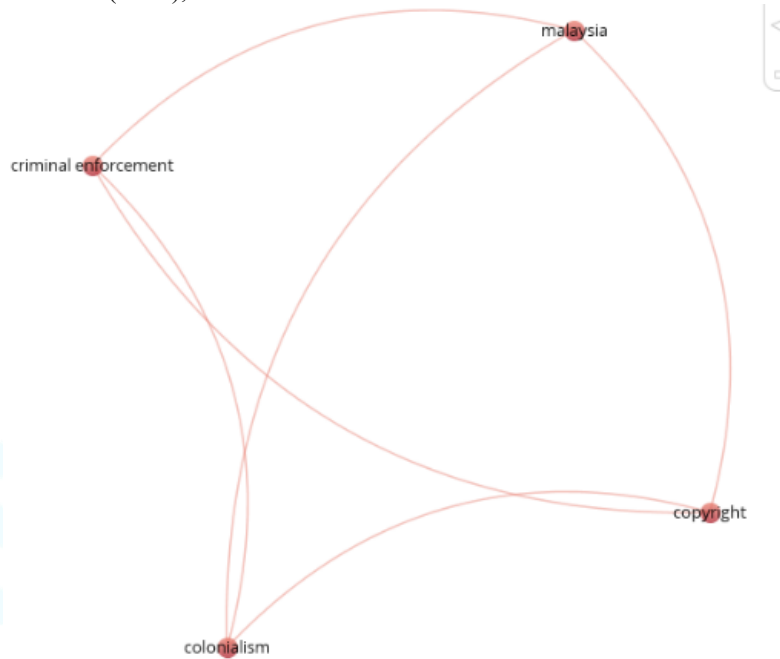


Figure 6. Network of Copyright Criminal Keywords (Data Processed, 2023)

Next, the mapping results will be shown on keywords that refer to aspects of public services through the keywords Trademark Infringement (n = 7), as follows:



Figure 7. Trademark Infringement Keyword Network (Data Processed, 2023)

Based on the picture above, it can be seen that there is only one cluster mapped in 2 articles containing Colonialism, Copyright, Malaysia, and Criminal Enforcement nodes. As for the keyword Copyright Criminal, no nodes related to economic aspects were found.

Table 7. Clustering Keywords Trademark Infringement

Cluster	Items	Total Items
1 (Red)	Damage to Reputation	7

Cluster	Items	Total Items
	Indirect Liability	
	Keyword Advertising	
	Online Service Providers	
	Parallel Importation	
	Third Party Trademark Infringement	
	Trademark use	
2 (Green)	Chinese Judicial Rulings	6
	Counterfelt Products	
	Join Liability	
	Knowledge of Infringement	
	Necessary Measure	
	Online Marketplace	

(Data Processed, 2023)

Based on the table above, it can be seen that, there are 2 clusters mapped in the Trademark Infringement keyword network. Cluster 1 (red) consists of 7 items/nodes namely: Damage to Reputation, Indirect Liability, Keyword Advertising, Online Service Providers, Parallel Importation, Third Party Trademark Infringement, and Trademark Use. Cluster 2 (Green) consists of 6 items/nodes namely: Chinese Judicial Rulings, Counterfelt Products, Join Liability, Knowledge of Infringement, Necessary Measures, and Online Marketplace. Meanwhile, there is a link to the development of the sustainability of the E-Commerce industry through eradicating counterfeit products (Lanfang, 2013). Here is an image that shows what this means:

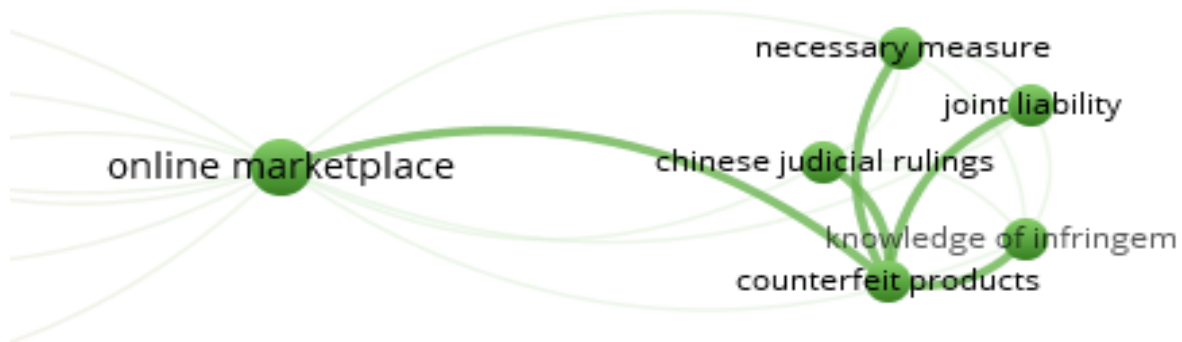


Figure 8. Online Marketplace vs Counterfeit Products (DataProcessed, 2023)

Furthermore, still in the public service aspect, the mapping results will be shown on keywords that refer to health services through the OEM Supplier keywords (n = 6), as follows:

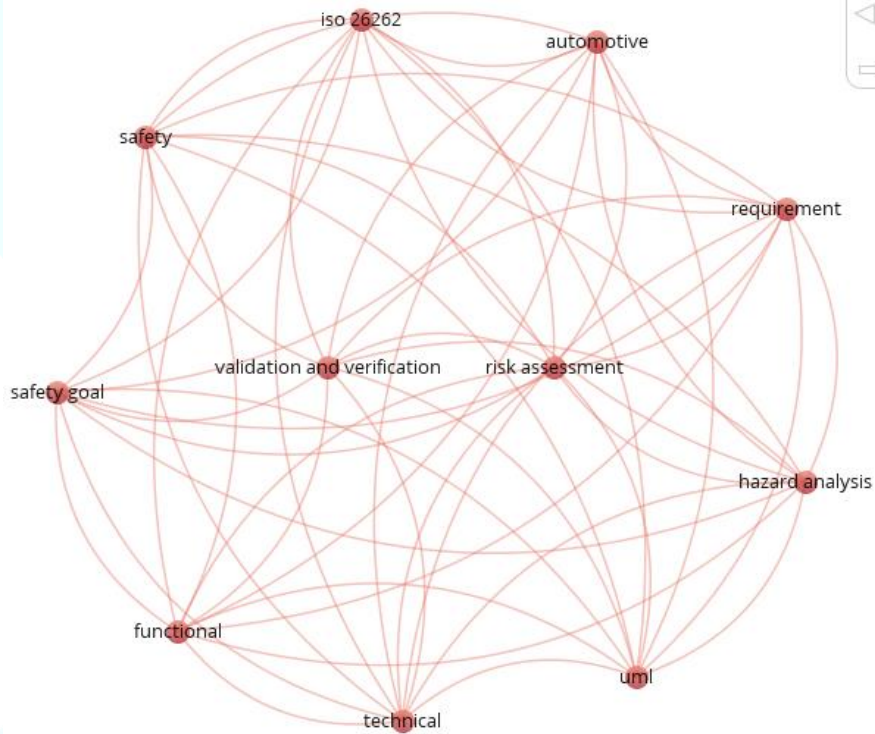


Figure 9. OEM Supplier Keyword Network (Data Processed, 2023)

Based on the picture above, it can be seen that there is only one cluster mapped in 6 articles consisting of the following nodes: Automotive, Functional, Hazard Analysis, ISO 26262, Requirement, Risk Assessment, Safety, Safety Goal, Technical, UML, and Validation & Verification. The results above also do not show any link between economic impact and Copyright infringement through the keyword OEM Suppliers. Furthermore, it will also be shown regarding the mapping of copyright infringement studies through the density analysis below:

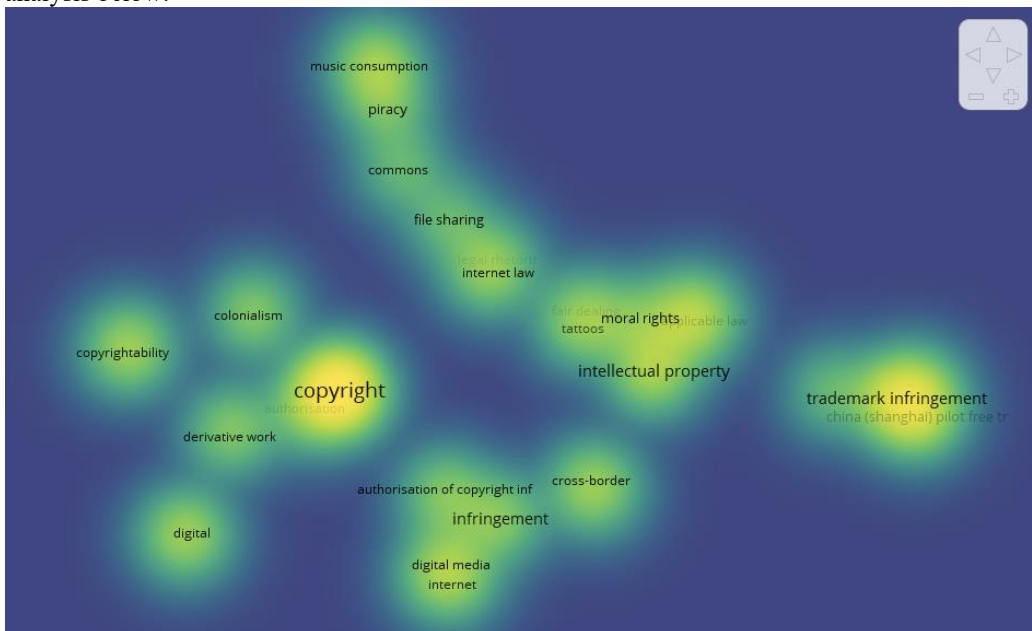


Figure 10. Combined Keyword Density Analysis (Data Processed, 2023)

Based on the picture above, it can be seen that quite a lot of studies using the keyword Infringement have been carried out, but there is no link with economic impact. This means that, studies on the economic impact of copyright infringement are still relatively few in all (44) eligible articles.

V. CONCLUSION AND REKOMENDATION

From the results and analysis that have been described previously, several conclusions can be drawn related to the research, namely as follows:

1. This study uses a Systematic Literature Review (SLR) approach to look at the relationship between aspects of copyright infringement and economic aspects. Therefore, this study uses several keywords as the basis for finding data sources. The keywords in question are: (i). Copyright Infringement; (ii). Intellectual Infringement; (iii). Copyright Criminal; (iv). Trademark Infringements; (v). OEM Suppliers. The five keywords referred to generate as many as 271 data (n = 271). The next stage is to use two main criteria to get articles that are eligible for further processing. The criteria in question are: (i). The data collected must be in the form of articles; and (ii). Each selected article must have keywords. As many as 44 articles were found that could be classified as eligible articles.
2. The results of a search for data sources related to copyright infringement confirm the results that there is a link to the economy, especially in the business climate of an industry, but other impacts are still very minimal to be found from the results of the analysis, especially in the key Corporate Infringement and Trademark Infringement, where product counterfeiting or other forms of copyright infringement have an impact on the sustainability of an industry's business (business climate). Meanwhile for other keywords (Intellectual Property Infringement, Copyright Criminal, OEM Supplier) were not found, either explicitly or implicitly.
3. The results of the density analysis show that there have been many studies using the keyword Copyright infringement, but there is no link with economic impacts. This means that, studies on the economic impact of copyright infringement are still relatively few in all (44) eligible articles.

Rekomendation

After the research has been conducted, the authors provide several policy recommendations that can be implemented by DGIP, namely:

1. DGIP can make improvements in the process of registering intellectual property rights, such as trademarks, copyrights and patents. This includes simplifying procedures, increasing efficiency, and using digital technology to speed up the registration process.
2. DGIP can develop education programs and wider public awareness about the importance of intellectual property, related rights, and the consequences of Infringement. This can be done through educational campaigns, seminars, and collaboration with educational institutions.
3. DGIP can cooperate with law enforcement agencies, such as the police and prosecutors, to improve law enforcement related to intellectual property Infringement. This involves better coordination, adequate training, and concerted efforts to prosecute violators.

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Creative Economy Implementation and BUMDes Optimization In Supporting Small Business Development

Wahyu Wahyudin¹, Dani Usmar², Enjang Nursolih³ and Wayda Kezya Aulia⁴
^{1,2,3,4} Affiliation: Faculty of Economics, Galuh University, Ciamis, Indonesia.

Abstract

The village government can establish Village-Owned Enterprises (BUMDes) in accordance with the needs and potential of the village. The development of the economic base in the countryside has been carried out by the government for a long time through various programs. This research aims to optimize BUMDes through the application of the creative economy to the community by utilizing wood waste as a raw material for crafts into a product that has high economic value that can generate income and can improve the community's economy so that the existence of a creative economy in BUMDes is able to contribute to the existence of BUMDes which is expected to stimulate and move the wheels of the community's economy in supporting the development of small businesses. This research method uses a systematic literature review research method that identifies, assesses, and interprets all findings on a research topic. This research activity is expected to provide opportunities and opportunities for the community to increase their creativity so that they can improve the economy and for Village-Owned Enterprises that gain knowledge related to the creative economy sub-crafts as a strategy to support small business development, this research supports government programs in empowering UMKM to strengthening regional economic stability.

Keywords: BUMDES, Community Economy, Creative Economy, Crafts, Small business development

I. INTRODUCTION

The establishment of BUMDes aims to realize the welfare of village communities. But in practice there are still many regions and villages that do not have the initiative and motivation to develop BUMDes. This is influenced by the economic potential and capacity of the community in designing and managing the rural economy (Rian Aprilia A, Cahyono D, 2021).

BUMDes in its implementation must be able to become a driving force for the economy of rural communities, managed properly and professionally. As a driving force for rural businesses BUMDes will have a very important influence in improving the welfare of rural communities. BUMDes is a plan developed by the government to improve the standard of living of rural communities. (Hayati, 2021a).

The economic assets in the village must be fully managed by the village community, The substance and philosophy of BUMDes must be imbued with a spirit of togetherness and self-help as an effort to strengthen the economic aspects of its institutions. At this stage, BUMDes will move in tune with efforts to increase sources of village original income, driving economic activity (Nuryanti, 2019).

The existence of BUMDes is expected to be able to develop all kinds of village economic development which leads to the welfare of village communities which can increase community income and village original income (Hibatullah & Shodiqin, 2021). BUMDes collaborates on the potential that exists in their village to benefit both parties, from this economic activity economic cooperation will emerge and the presence of a creative economy that can advance village communities so that they are able to change the social, cultural and economic order in society, prosper the community and improve the economy of the village community (O. D. Devi, 2021).

The background of the problems faced related to the sub-craft creative economy is the economic capacity of the community in designing and managing the rural economy, there are still many regional potentials that have not been explored even though they are assisted by government policies through the establishment of BUMDes due to the potential for human resources which are still inconsistent in the field of work so that some people still think deepening the craft has not been able to improve the personal economy, especially oneself, other people and institutions in general.

II. LITERATURE REVIEW

The researcher explained the optimization of village-owned enterprises, through the implementation of the sub-crafts creative economy in improving the community's economy, the difference in this research with previous research is that this research was carried out to optimize BUMDes through the implementation of the sub-crafts creative economy to the community by utilizing wood waste as a raw material into a valuable product high from an economic standpoint that can generate income and can improve the community's economy so that the existence of a creative economy in BUMDes is able to contribute to the existence of BUMDes which is expected to stimulate and move the wheels of the community's economy, including several previous research journals related to optimizing Bumdes, implementing creative economy and economic improvement as follows:

1. Research entitled the impact of the existence of village-owned enterprises (Bumdes) on improving community welfare (a study on village-owned enterprises in the villages of Ponggok, Tlogo, Ceper and Manjung, Klaten district shows that the existence of BUMDes can improve the welfare of the community even though there is one BUMDes that has not been able to contribute to PADes and there is no remuneration yet, the community supports the existence of BUMDes with a high social spirit to take part in advancing the BUMDes and the community feels the difference before BUMDes existed and after BUMDes existed.(Aulia Tafhana Arindhawati, 2020)
2. Research entitled Utilization of Container Wood Waste as a Basic Material for Designing Interior Accessories, written by Aloysia Elvaretta Beatrice resulted in Woodylogy being a creative product in the form of key holders and wall clocks with the main ingredient being container wood intended for all people with the aim of increasing the creative industry by providing products that can benefit its users and at the same time empower SMEs. Woodylogy products are created using container wood waste with the aim that used wood waste is not wasted, reduces environmental pollution, as well as a form of concern for the surrounding environment. (Aloysia Elvaretta Beatrice, Sherly Setiadi, Dwitiya Ken Saraswati, 2018)
3. The Wood Car Mobile Holder product, which is the result of post-production processing of wood waste, has now been registered as a Simple Patent Product at DJKI under the number S00202204792. Currently the product is in the process of market trials to match market needs with product design so that when it is mass-produced, it can truly answer market needs for environmentally friendly products. This Community Service activity is a continuous activity so that it cannot only be completed in one implementation period. In the next Community Service activity, the Abdimas team will provide assistance in entering the market place, so that the economic value that is currently formed will create demand in the market so that it can improve the economy of wood craftsmen in general (Untari et al., 2022)

Based on the results of a literature search using the Harzing's Publish or Perish application. The method used is a systematic review with the following steps. In the early stages, a literature search was carried out with the keywords creative economy, BUMDes and UMKM. The search results found 77 articles relevant to the study of the creative economy, BUMDes and UMKM. The second stage is the filtering process, namely by searching for the most relevant articles. The results of the filtering obtained 15 articles that were most relevant discussing the creative economy with BUMDes and MSMEs. The final stage is to conduct a study that can produce the proposed model

Table 1 : Reference Article

No	Author	Author focus
1	(RATNAWATI & PRAJITNO, 2021)	Ekonomi kreatif dan BUMDes
2	(Laeli & Rusyida, 2021)	Ekonomi kreatif dan BUMDes
3	(Jihan et al., 2021)	Ekonomi kreatif dan BUMDes
4	(Dewita et al., 2022)	Ekonomi kreatif dan BUMDes
5	(Elsi & Bafadhal, 2019)	Ekonomi kreatif dan BUMDes
6	(Fauzi et al., 2020)	Ekonomi kreatif dan UMKM
7	(Pramudya et al., 2021)	Ekonomi kreatif dan UMKM
8	(Rinanto et al., 2022)	Ekonomi kreatif dan UMKM
9	(Niode & Rahman, 2022)	Ekonomi kreatif dan UMKM
10	(Arrizal & Sofyantoro, 2020)	Ekonomi kreatif dan UMKM
11	(Christi et al., 2022)	Bumdes dan UMKM
12	(N. U. K. Devi et al., 2022)	Bumdes dan UMKM
13	(Raharti et al., 2021)	Bumdes dan UMKM
14	(Didah & Mukti, 2022)	Bumdes dan UMKM

15	(Ridwan et al., 2021)	Bumdes dan UMKM
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Previously the author had carried out a literature review method that had something to do with previous research in this period, within a certain period of time the researcher had carried out and would carry out further work, Researchers have carried out from what is the problem mentioned above. In crafts, researchers have carried out fulfilling craft staples as the main ingredient and will carry out fulfillment of inadequate equipment so that the process is more effective, efficient and more economical, in the community's economy with the existence of these crafts can already be able to reduce unemployment and open up job opportunities but have not been able to reduce poverty and inflation, in BUMDes the research has carried out making a roadmap that will maximize human resources and will give birth to a manager so that BUMDes can run as intended, in the creative economy researchers have carried out opening access to raw materials and will seek to protect works through copyright protection and public availability as tools promotion.

III. RESEARCH METHODOLOGY

The method used in this research is Systematic literature review (SLR) or in Indonesian it is called systematic literature review, is a literature review method that identifies, assesses, and interprets all findings on a research topic, to answer research questions (research question). (Rian Aprilia A , Cahyono D, 2021) Systematic Literature Review (SLR) approach with data sources derived from indexed journal literature that has an electronic ISSN (International Standard Serial Number) that has been published via the internet with the E-ISSN code. Systematic review is a research method that reviews a particular topic by emphasizing a single question that has been systematically identified, assessed, selected and concluded according to predetermined criteria based on evidence from quality research that is relevant to the research question.

Systematic review is a systematic research method in identifying literature, explicit in the statement of objectives, materials and methods and develops in research methodology and conclusions (Latifah & Ritonga, 2020). what is meant by systematic literature review or SLR is a method used to carry out assessments that are related objectively and systematically of the research problems discussed so that more specific research is obtained.

Before conducting research, author must understand the object of research as a whole. Therefore, it is necessary to carry out a systematic review of the literature. Research is carried out by identifying, selecting, and assessing relevant research literature that is focused on being discussed. The research was carried out by conducting a systematic review and then the results of the review were stored in a structured manner.

A systematic review is carried out to obtain important information from the research literature so that information from the literature is easy to use later (Isnaini et al., 2018). The object of this study is research on the failure and success of optimizing village-owned enterprises (BUMDes). Meanwhile, the subject of this research is Village Owned Enterprises (BUMDes) in Indonesia. is a method for obtaining information from written texts or soft copy editions, such as books on village governance, publications government, related laws, web browsing, and journals related to variables and problems related to this research. The search process was carried out using a searchengine (Google Chrom) with the site address <https://scholar.google.co.id/> and Harzing's Publish or Perish at <https://www.google.com> chosen because it is currently the basis largest data and publications.

Based on the results of a literature search using the Harzing's Publish or Perish application. The method used is a systematic literature review with the following steps. In the first stage, a literature search was carried out with the keywords creative economy, BUMDes, community economy and crafts, in the second stage, a filtering process was carried out, namely by searching for the most relevant articles. The results of the most relevant filtering, and the final stage is to conduct a study that can produce the proposed model. (Hayati, 2021b).

IV. RESULT / FINDING

The following presents some of the results of a literature review from table 1 articles based on the focus of writing.

Sukamaju Village is a tourist village in Cihaurbeuti District, Ciamis Regency. Located behind the hills and directly adjacent to Mount Sawal is used as several natural tourist attractions such as waterfalls, campgrounds, and others. The intensity of tourists going back and forth in Sukamaju Village brings creative economic opportunities to improve the level of the economy and welfare. However, this opportunity has not been managed optimally due to the lack of public awareness of the potential of the tourism village it has, with entrepreneurship and utilizing the surrounding resources. Therefore, as a form of the "tri dharma" of college, a service is carried

out in Sukamaju Village which aims to increase awareness to local residents about tourism village potential that can be used as entrepreneurial opportunities with a creative economy, to provide an understanding of the urgency of entrepreneurship and the creative economy that can improve the economy, and also the use of digital technology for promotion of creative economy products. The service that has been carried out with several creative economy programs has been giving the Sukamaju community an understanding of the potential of the creative economy as a tourist village with its marketing target that is the tourists, increasing awareness of the urgency of entrepreneurship, and community development for the creative economy management of the craft sub-sector. The last, the Sukamaju Village social media account has been created as a forum for promotion and marketing of Sukamaju village commodities and tourism. (Jihan et al., 2021)

This study aimed to formulate a design for developing the potential of SMEs based on the creative economy and marine tourism as a regional superior sector in Bone Bolango, Gorontalo. The approach in this study used a Mix Method Exploratory approach. This research involved the Tourism Department and the Department of Industry and Trade and SMEs of Bone Bolango, tourism institutions, BUMN/ BUMS, universities, media, creative SMEs, tourists, SME practitioners and companies (non-banking). Collecting data used the Focus Group Discussion (FGD) method, distributing questionnaires, interviews and observations. Data analysis for qualitative used Miles and Huberman approach and for quantitative used SWOT analysis, Stakeholder Role analysis and Analytical Hierarchy Process (AHP) analysis. The results showed that the design of developing the potential of SMEs based on the creative economy and marine tourism as a regional superior sector in Bone Bolango Regency, Gorontalo, resulted in an integration and optimization model, namely the “Pogambango-Hepta Helix Model (PHHM)” which was a development model for optimizing the main tourism products and products. Creativity combined with local wisdom to form an attractive and sustainable Destination Image to be the main choice in improving the welfare of MSMEs based on the creative economy and marine tourism in Bone Bolango Regency, Gorontalo. These some efforts had created the regional economic resilience in form the rising of prosperity of society. (Niode & Rahman, 2022)

Post-covid-19 economic growth experienced significant changes where business actors began to rise from failure in carrying out their new entrepreneurial activities. The community must be creative and provide the latest innovations to create new jobs. In the context of increasing or increasing economic recovery, it is necessary to empower small business actors because they can have a very real impact on production development. The purpose of community service activities through the Entrepreneurship Community Service Program is to increase MSME business actors, BUMDes and cooperatives in the Cijeungjing Village Area, Jatigede District, Sumedang Regency. The method used is mentoring business actors for 3 MSMEs, 1 BUMDes, and 1 Cooperative, surveys with primary and secondary data, workshops or training for entrepreneurship activities to improve quality. The results show that the activities carried out through the Entrepreneurship Community Service program in order to improve the quality of human resources for MSME business actors, BUMDes, and cooperatives in Cijeungjing Village, Jatigede District, Sumedang Regency have been carried out well, this is proven by the success of a series of business actors through the program of activities carried out. The conclusion shows that there has been a significant change in SMEs, BUMDes, and Cooperatives in Cijeungjing Village, Jatigede District after the Entrepreneurship Community Service Program was implemented. Improvement changes occur in the completeness in the permit to establish a business and its feasibility. In addition, the spirit of motivation in the field of entrepreneurship for all village communities is increasing because of the supporting facilities and infrastructure in the area as a tourist attraction. (Christi et al., 2022)

The COVID-19 pandemic has had an impact on the Indonesian economy. The decline in economic performance is not only felt by large multinational and national companies but also by MSME actors. This study aims to examine the MSME survival strategy, especially during the pandemic (Alfrian & Pitaloka, 2020). This method uses the ABCD (Asset Based Community Development) approach model. An asset-based approach is an approach that leads to an independent and maximum understanding and internalization of assets, strengths, potential, and utilization. The weaknesses faced by MSMEs in improving their business capabilities are very complex and include various indicators, one of which is interrelated with each other, among others; lack of capital both in quantity and source, lack of managerial ability and operating skills in organizing and limited marketing. Besides these things, there are also obstacles caused by the pandemic, such as the lack of production due to time restrictions, decreased sales turnover, so that micro and small business actors need to get help from other parties in the form of knowledge and capital from BUMDES. (Ridwan et al., 2021)

V. DISCUSSION

Research Phase 1 (Semarang, n.d.): There are 5 strategies in creative economy development research. First, Empowerment of creative human resources. Second, Increased literacy regarding design mindset. Third, the creation of creative works using cultural heritage. Fourth, Unity and integrity, as well as the existence of the Indonesian nation in international forums and Fifth, Development and utilization of the media as a channel for distribution and presentation of works.

Digital Ecosystem (kemenkraf, n.d.): There are six steps that the government is trying to adapt to a digital ecosystem. First, improve the quality of digital services. Second, improve the quality of human resources. Third, integrating research, design and development with industrial modernization in other productive sectors. Fourth, encourage the development of financial technology. Fifth, strengthening the innovation ecosystem by collaborating between the government, business people, educational institutions, and the community. Sixth, the government seeks to encourage startup collaboration, including ecosystem development.

Product Development (Prajanti et al., 2021). Strategic components need to be developed to support the development of an inclusive and sustainable creative economy including ease of licensing, efficiency and effectiveness of budgeting and others.

Market Strengthening (EVENDIA, 2022), (Sutrisno & Anitasari, 2019) The strength of the economic industry is identified, a creative economy development model is prepared using the SWOT approach (for each creative economy sub-sector in each stakeholder), as well as the respective roles according to the type of creative economic power in each region. Implementation plans and actions are then prepared based on the 3C (Connect - Collaborate - Commerce / Celebrate) stages, or it can be interpreted as Connectedness, Collaboration and Commercialization / Celebration

VI. CONCLUSION AND RECOMMENDATION

The conclusion from the results of this study is to create a comprehensive program to drive creative industries through education, human resource development, design, quality and market development and to prepare incentives to spur the growth of culture-based creative industries. It takes seriousness and cooperation from all parties, both public, government and private in developing the creative economy so that the products have innovative value and are highly competitive and are useful for increasing more mature economic growth. Carry out what was previously planned and review and evaluate the results of what was previously obtained.

The following are recommendations for optimizing BUMDes through the implementation of a creative economy for the community by utilizing wood waste as a raw material for crafts into a product that has high economic value that can generate income and can improve the community's economy so that a creative economy in BUMDes is able to contribute to the existence of the expected BUMDes able to move and drive the wheels of the community's economy in supporting the development of small businesses.

1. Creative economy development. First, Empowerment of creative human resources. Second, increasing literacy regarding the design mindset. Third, the creation of creative works by utilizing cultural heritage. Fourth, Unity and integrity, as well as the existence of the Indonesian nation in international forums and Fifth, Development and use of media as a distribution channel and presentation of works.
2. Digital ecosystem. First, improve the quality of digital services. Second, improve the quality of human resources. Third, integrating research, design and development with industrial modernization in other productive sectors. Fourth, encourage the development of financial technology. Fifth, strengthening the innovation ecosystem by collaborating between the government, business people, educational institutions, and the community. Sixth, the government is trying to encourage startup collaboration, including ecosystem development.
3. Product Development. Strategic components need to be developed to support the development of an inclusive and sustainable creative economy, including ease of licensing, efficiency and effectiveness of budgeting and others.
4. Market Strengthening. The strengths of the economic industry were identified, a creative economy development model was prepared using the SWOT approach (for each sub-sector of the creative economy in each stakeholder), as well as their respective roles according to the type of creative economic power in each region. Implementation and action plans are then prepared based on the Connectedness, Collaboration and Commercialization/Celebration stages

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Factors Affecting the Effectiveness of Management Information Systems for Business Licensing Services in the South Kalimantan Province

Syahruzi¹ and Alfian¹

¹ Accounting, Faculty of Economic and Business, Lambung Mangkurat University, Banjarmasin, Indonesia

Abstract

Licensing information systems try to be an important aspect in the ease of doing business to improve the investment climate. Many problems were found that occurred in the apparatus, services to the use of information technology. This study aims to analyze the effect of apparatus competence, service quality, and information technology utilization on the effectiveness of business licensing service management information systems in the province of South Kalimantan. In this research, independent variables were used in the form of apparatus competency, service quality, and information technology utilization. While the dependent variable in this study is the effectiveness of business licensing service management information systems in the province of South Kalimantan. The research population used was 68 apparatus implementing management information systems for business licensing services in the province of South Kalimantan. Selection of the sample using purposive sampling method and obtained a sample of 59 apparatus. The type of data in this study is using primary data from distributing questionnaires. The analytical method used was multiple regression analysis using SPSS version 26. The results showed that the service quality variable had a significant effect on the effectiveness of the business licensing service management information system in the province of South Kalimantan. However, the competency of the apparatus and the utilization of information technology has no effect on the effectiveness of the management information system for business licensing services in the province of South Kalimantan. From this research, it can provide knowledge about the factors that influence business licensing service management information systems and information to relevant agencies to pay attention to the competence of apparatus, quality of service and information technology used.

Keywords: *Business Licensing Service Management Information System; Apparatus Competency; Service quality; Utilization of Information Technology*

I. INTRODUCTION

Ease of business licensing is an important aspect for realizing an improvement in the investment climate in Indonesia in an effort to realize the state's goal of improving people's welfare. Licensing system reform is a scale that the Government is also pushing for in facilitating access to business licensing (Manik & Mayarni, 2021). In the digital era, which is developing very rapidly, it will also demand rapid system changes, where services in digital-based licensing must be issued immediately, thereby shortening the licensing process, both time and material (Arnomo, S, 2012). With permits that are still not systemized, it is difficult for the community to obtain the necessary permits. If the old system is still used, people who obtain the necessary permits will go through a very lengthy process that takes quite a long time, thus greatly hampering the rate of business growth. This can make investors or the public withdraw from taking care of the necessary permits, because there are many ineffective things that have to be done (Cahya and Dewi 2021).

Therefore each of the Investment Services and One Stop Integrated Services (DPMPTSP) in the Province of South Kalimantan has a licensing management information system in the form of an integrated information system and consists of several applications in its use. One example is a website-based Licensing SIM which is an internet-based system application where applicants can access information such as types of permits, licensing requirements, download licensing application forms and check the status of the permit administration completion process (Biredoko and Sudarmana 2016).

The actual conditions that occurred in the implementation of this policy still found a number of problems related to the use of management information systems in licensing activities and integrated services such as technical issues and the supporting facilities used need to be improved in terms of supervision and periodic repairs.

Network problems with existing computerized systems often cannot be connected properly, and limited human resources, in this case competent technical staff (Cahya & Dewi, 2021).

In order to create a good system implementation, it is also necessary to have competent apparatus from the licensing service provider (Nurwindiarti, 2016). An apparatus is said to perform well if it can carry out its work correctly and according to the planned targets. For this reason, the apparatus must have qualified and competent human resources in their fields (Sedarmayanti., 2019). In carrying out these public services, local government officials are responsible for providing good service to the community in order to create community welfare (Setiadi 2018). As research conducted by (Puji & Agusman, 2021) shows that in the implementation of business licensing service management information systems there are obstacles caused by human resources not having sufficient competence. This is supported by research (Abu Taber et al., 2014) and (Numberi, 2022) states that the competency of the apparatus affects the effectiveness of information systems. However, another opinion was expressed by (Febrianingsih, 2015) in his research that employee knowledge does not affect the effectiveness of an information system.

Quality service is the key that must be maintained by the local government (Yulianingsih et al., 2019). Providing services in the form of licensing is certainly crucial for each Investment and One-Stop Service Office (DPMPTSP) in the Province of South Kalimantan, both in terms of speed and accuracy of service, certainty of costs, friendliness of staff to the comfort of waiting rooms. The demand for improving the quality of public services is a need that must be met by the government (Afandi & Susilo, 2021). In research conducted by (Cahya and Dewi 2021) it was found that in the application of management information systems for business licensing services, they still experienced obstacles in terms of service quality such as certainty of time and cost, to the services obtained from officers. This is supported by research conducted (Suhendro 2016) and (Negash, Ryan, and Igbaria 2003) states that service quality has a positive effect on the effectiveness of business licensing service management information systems. In line with the research conducted by (Nurwindiarti, 2016) states that the quality of service has improved with the use of this licensing management information system.

Utilizing information technology in the field of management information systems is a way to create good governance in order to be able to provide the best service to the community (Afandi & Susilo, 2021). Information systems supported by information technology can provide added value to organizations if they are designed to be effective information systems (Numberi 2022). The use of information technology can help facilitate expectations for the realization of licensing services that can provide services that are fast, precise, fair and transparent (Numberi 2022). The research conducted (Cahya and Dewi 2021) states that information technology has not been fully utilized, such that network access is difficult to reach so that information on the system is not known by the public. This is in line with research (Abu Taber et al. 2014) and (Puji Astuti & Dharmadiaksa, 2022) which state that the use of information technology affects the effectiveness of information systems. However, research (Febrianingsih 2015) states that the use of technology does not affect the effectiveness of information systems.

Basically every organization, program or activity has determined effectiveness as a key element to achieve the goals or objectives that have been set. Effectiveness is always linked between the expected results and the actual results achieved (Sulaiman, Massyat, and Saleh 2021). Duncan in (Steers 2012) suggests a measure of effectiveness that can be used to measure the effectiveness of implementing a program, both programs implemented by government agencies and private companies consist of 3 aspects, namely goal attainment, integration and adaptation. These three aspects are generally used as a tool to measure the effectiveness of an organization in implementing programs, where researchers use the effectiveness measure that has been put forward by Duncan in Steers to measure the effectiveness of business licensing service management information systems managed by each Investment Service and One-Integrated Services. Pintu (DPMPTSP) in the current province of South Kalimantan.

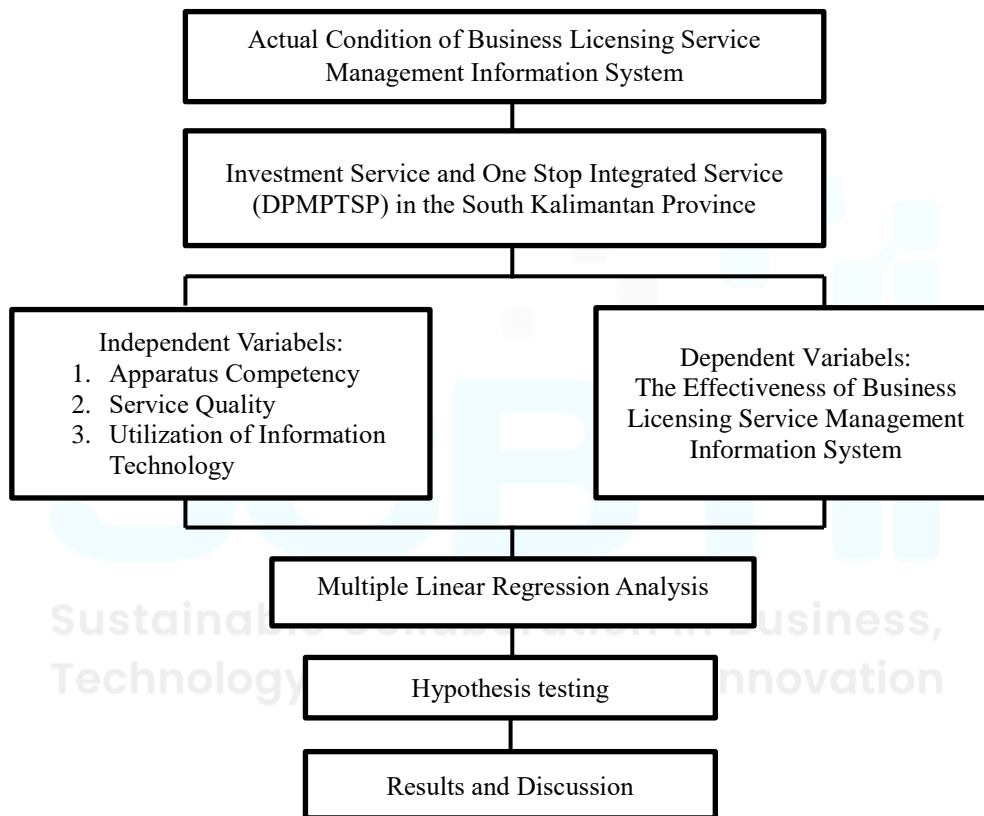
This research is a development of research conducted by (Rafida et al., 2019) with the title "Effectiveness of Online Service Management Information System Applications (Simponie) in Online Business Licensing Services at the Investment Service and One-Stop Integrated Services (DPMPTSP) Serang Regency" Year 2018". Based on the research conducted by (Rafida et al., 2019), the variable used is the effectiveness of the system with a quantitative research approach. From the results of this study it was found that the effectiveness of the Simponie application in online business licensing services at the Investment and One-Stop Services Office (DPMPTSP) of Serang Regency was declared ineffective due to several factors.

The difference between this research and previous research is the object of research conducted at the Investment and One-Stop Service Office (DPMPTSP) in the Province of South Kalimantan. Another difference is

in the variables studied, which in previous studies used the effectiveness variable. While in this study there are three variables, namely apparatus competence, service quality, and the use of information technology. This research was conducted because there were still differences in the results from previous studies, so the researchers included this variable for further testing. So in this study to determine the effect of apparatus competence, service quality, and information technology utilization on the effectiveness of business licensing service management information systems in the province of South Kalimantan.

II. LITERATURE REVIEW

THEORETICAL FRAMEWORK



Picture 1. Theoretical Framework
Source: Data Processed by Researchers, (2022)

The frame of mind of this research begins with the existence of problems in the application of business licensing service management information systems. The large number of people's thoughts about the government bureaucracy which is complicated, convoluted and there are brokers makes it difficult for licensing service agencies to develop to eliminate the old mindset of the people.

The government continues to make various innovations, one of which is by issuing policies related to the provision of licensing services (Henri & Baihaqi, 2020). One of the implementing agencies for providing licensing services is the Investment and One-Stop Services Office. Responding to the government's goal of accelerating business and providing ease of licensing services for the community, the One-Stop Investment and Services Service (DPMPTSP) in the South Kalimantan Province has also implemented a business licensing service management information system to make it easier for the public or service applicants to arrange business licensing in the form of issuance of business documents by utilizing internet access. In its application, of course there are influencing factors such as the competence of the apparatus which is still minimal, the quality of service is not good, and not utilizing information technology.

Based on the literature review and the results of previous research, the researchers indicated the competency of the apparatus, quality of service and utilization of information technology as independent research variables that could affect the effectiveness of business licensing service management information systems as the

dependent variable. The type of data used in this study is primary data. Primary data were obtained through direct field studies by distributing questionnaires to respondents/research subjects who were at the Investment and One-Stop Services Office (DPMPTSP) in the province of South Kalimantan as the object of research. The data will be tested and analyzed using multiple linear regression analysis techniques to determine the effect, so that the final results are in the form of conclusions and suggestions.

Effectiveness Theory

(Dunn, 2008) states that effectiveness is a measurement of an alternative that can achieve the expected result (effect) or achieve the goal of taking action. Duncan in (Steers 2012) suggests a measure of effectiveness in measuring program effectiveness, both programs implemented by government and private agencies consist of 3 aspects which include goal attainment, integration and adaptation.

Management information System

According to Gordon B Davis in (Jogiyanto, 2017) a Management Information System is a system that performs functions to provide all information that affects all organizational operations.

Public service

Public service can be interpreted as a service provider for the needs of the community who have needs for the organization in accordance with the basic rules and procedures that have been determined. According to (1999) in (Kamarni, 2011) Public service can be interpreted as providing services (serving) the needs of people or communities who have an interest in the organization in accordance with the basic rules and procedures that have been determined.

Apparatus Competency

Competence is an ability to carry out or perform a job or task that is based on skills and knowledge (Wibowo., 2017). According to the National Personnel Agency (BKN) competence is the characteristics and ability to work which includes aspects of knowledge, skills and attitudes according to the duties and or function of the position. According to (Havesi 2005), competence is someone who has characteristics in the form of knowledge, abilities, and skills that carry out in a job.

Service Quality

According to Tjiptono in (Hardiyansyah, 2018) suggests that "The concept of service quality can be understood through consumer behavior, which is a behavior played by consumers in searching, buying, using and evaluating a product or service that is expected to satisfy their needs. According to Zeithaml et al (Hardiyansyah, 2018), service quality can be measured from five dimensions, namely: Tangible, Reliability, Responsiveness, Assurance, and Empathy.

Utilization of Information Technology

According to Haag & Keen (1996) in (Murhada & Giap, 2011) explaining information technology is a tool or device that supports work by using information and carrying out tasks or obligations related to or related to information processing. According to Martin (1999) in (Murhada & Giap, 2011), information technology used in storing and processing information is not only limited to computer technology (hardware and software) but also includes communication technology to send/distribute information.

Research Hypothesis

Based on the theoretical framework and empirical studies above, the hypothesis in this study is:

H1: Apparatus competence influences the effectiveness of business licensing service management information systems.

This opinion is in line with research conducted by (Abu Taber et al., 2014) and (Numberi, 2022) which states that apparatus competence influences the effectiveness of information systems.

H2: Quality of service affects the effectiveness of business licensing service management information systems.

This conclusion is supported by research conducted by (Suhendro, 2016) and (Negash et al., 2003) stating that service quality has a positive effect on the effectiveness of business licensing service management information systems. This is also in line with research conducted by (Nurwindiarti, 2016) stating that service quality has improved with the use of this licensing management information system.

H3: Utilization of information technology affects the effectiveness of business licensing service management information systems.

This opinion is in line with research conducted by (Abu Taber et al., 2014) and (Puji Astuti & Dharmadiaksa, 2022) which state that the use of information technology affects the effectiveness of information systems.

III. RESEARCH METHODOLOGY

The scope of research

The scope of this research includes the influence of apparatus competence, service quality, and the use of information technology on the effectiveness of business licensing service management information systems at the Investment Services and One Stop Integrated Services (DPMPTSP) in the Province of South Kalimantan.

Types of research

This type of research uses descriptive correlation analysis using quantitative methods. Quantitative research can be said to be a positivist research that focuses on testing theories by measuring the variables of the research numerically and analyzing data using statistics.

Place/Location of Research

This research was carried out at the Investment and One-Stop Services Office (DPMPTSP) in the Province of South Kalimantan.

Units of Analysis

Apparatuses at the Investment Service and One Stop Integrated Service (DPMPTSP) in the Province of South Kalimantan who were involved in the application of a licensing service management information system tried to be asked to give their perceptions of statements related to the variables studied through the instruments provided.

Population and Sample

The population in this study were apparatus implementing the management information system for business licensing services at the Investment and One-Stop Services Office (DPMPTSP) in the Province of South Kalimantan, totaling 68 people. Determination of the sample in this study is based on nonprobability sampling method using purposive sampling technique. Sample selection was carried out based on predetermined criteria, so that a sample of 59 apparatus was obtained.

Data collection technique

The data used in this research is primary data. The primary data in this study were obtained through a survey of respondents using a questionnaire. This research questionnaire uses a Likert scale. These indicators are measured using a Likert scale with a range of 1-5.

Variables and Operational Definitions of Variables

The variables in this study include 4 variables, including: Business Licensing Service Management Information System Effectiveness (Bound Variable/Y), Apparatus Competence (Independent Variable/X1), Quality of Service (Independent Variable/X2), and Utilization of Information Technology (Independent Variable/X3). The indicators measured from each variable are as follows.

Table 1. Variable Operational Measurement

Variable	Indicator	Measurement Scale
Business Licensing Service Management Information System Effectiveness (Y)	Goal Achievement, Adaptation and Integration	Likert
Apparatus Competence (X ₁)	Knowledge, Ability and Attitude	Likert
Quality of Service (X ₂)	Tangible, Reliability, Responsiveness, Assurance, dan Empathy.	Likert

Utilization of Information Technology (X ₃)	There is supporting software, availability of internet network, utilized according to regulations, computerized processes, and has a website.	Likert
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Source: Data is processed from various references, 2022

Data analysis technique

Research data is processed using Statistical Product and Service Solutions (SPSS) with version 26.0. Then performed descriptive statistical analysis. After that, a data quality test was carried out in the form of (1) validity test and (2) reliability test. In the descriptive statistical analysis several tests were carried out namely (1) normality test; (2) multicolonearity test; (3) heteroscedasticity test as part of the classical assumption test. Furthermore, in the multiple regression analysis and the model suitability test which consists of two tests namely (1) test the coefficient of determination and (2) test f. Finally, the t test was carried out to test the hypothesis.

IV. RESULT / FINDING

Respondents in this study were apparatus implementing the business licensing service management information system at the Investment and One-Stop Services Office (DPMPTSP) in the province of South Kalimantan. Respondent characteristics show 33 male respondents and 33 female respondents. The majority of examiners who worked at the research site were aged 26 to 35 years with the last level of education at Strata 1 and worked between 1 and 5 years.

Results of Descriptive Statistical Analysis

Table 2. Results of Descriptive Statistical Analysis

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Apparatus Competence	56	19	30	27,05	2,77
Quality of Service	56	48	85	76,76	9,26
Utilization of Information Technology	56	15	25	22,48	2,52
Business Licensing Service Management Information System Effectiveness	56	28	50	44,12	4,95
Valid N (listwise)	56				

Source: SPSS Output Data (reprocessed data, 2023)

Of the 56 research samples, the apparatus competence variable (X₁) has a minimum value of 19 and a maximum value of 30. Service quality variable (X₂) has a minimum value of 48 and a maximum value of 85. Information technology utilization variable (X₃) has a minimum value of 15 and a maximum value of 25. The variable effectiveness of the business licensing service management information system (Y) has a minimum value of 28 and a maximum value of 50.

Data Quality Test Results

Validity test

This test uses the Statistical Package for Social Science (SPSS) version 25 by calculating the bivariate correlation between each score of each question item and the total score of the construct variable. The value of r table can be obtained from the degree of freedom (df) = n - 2 with a significance level of 5%. In this study it was known that n = 30 so that df = 30 - 2 = 28 at a significance level of 5% showed r table, namely 0.349. All question items regarding individual morality, arrogance, greed and acts of fraud in the procurement of goods and services are declared valid because r count > r table.

Reliability Test

This test is carried out by calculating the cronbach alpha coefficient of each instrument in a variable. The Cronbach alpha results from the variables of apparatus competency, service quality, utilization of information

technology and effectiveness of licensing service management information systems try to be more than 0.70 which indicates that all variables are reliable.

Classical Assumption Test Results

Normality Test

Table 3. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
	N	56
Normal Parameters ^{a,b}	Mean	,0000000
	Std. Deviation	2,79834892
Most Extreme Differences	Absolute	,115
	Positive	,115
	Negative	-,108
Test Statistic		,115
Asymp. Sig. (2-tailed)		,063 ^c

Source: SPSS Output Data (reprocessed data, 2023)

The data in the table produces an asymp sig of 0.063 more than 0.05. So it can be said that the data is normally distributed.

Multicollinearity Test

Table 4. Multicollinearity Test Results

Coefficients ^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Apparatus Competency	,142	7,054
	Service Quality	,157	6,386
	Utilization of Information	,249	4,017
	Technology		

Source: SPSS Output Data (reprocessed data, 2023)

Each independent variable has a tolerance exceeding 0.10 and the Variance Inflation Factor (VIF) value is less than 10. With this regression model, it can be said that there is no evidence of multicollinearity between independent variables.

Heteroscedasticity Test

Table 5. Heteroscedasticity Test Results

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
		1	(Constant)	1,932	2,287	
	Apparatus Competency	-,261	,218	-,431	-1,198	,236
	Service Quality	,020	,062	,107	,313	,755
	Utilization of Information	,260	,181	,389	1,436	,157
	Technology					

Source: SPSS Output Data (reprocessed data, 2023)

The results in the table above reflect that the significance (sig) of each independent variable is > 0.05. This explains that the regression model does not have signs of heteroscedasticity.

Results of Multiple Linear Regression Analysis

Table 6. Results of Multiple Linear Regression Analysis

Model	Coefficients ^a				t	Sig.
	Unstandardized Coefficients		Standardized Coefficients	Beta		
	B	Std. Error				
1 (Constant)	8,552	3,887			2,200	,032
Apparatus	,110	,371	,062		,296	,768
Competency						
Service Quality	,357	,106	,667		3,375	,001
Utilization of Information Technology	,230	,308	,117		,747	,458

Source: SPSS Output Data (reprocessed data, 2023)

The regression equation obtained from the results of the analysis with the multiple linear regression model is as follows:

$$Y = 8,552 + 0,110X_1 + 0,357X_2 + 0,230X_3 + \epsilon$$

Model Fitment Test Results

Determination Coefficient Test (R²)

Table 7. Determination Coefficient Test (R²)

Model	Model Summary ^b			
	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,826 ^a	,681	,663	2,87794

Source: SPSS Output Data (reprocessed data, 2023)

The R squared value which explains that the independent variable has a level of interaction with the independent variable is worth 0.663 or 66.3%, the remaining 33.7% are various other variables not present in this study.

F Test

Table 8. F Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	921,433	3	307,144	37,083	,000
	Residual	430,692	52	8,283		
	Total	1352,125	55			

Source: SPSS Output Data (reprocessed data, 2023)

The F significance value of the three independent variables in the model from the regression is 0.000. That value indicates the sig. $f < 0.05$. Furthermore, the F-table value of 2.783 is smaller than the calculated F-value of 37.083. So it can be concluded that this model is feasible to be used to predict the population.

Hypothesis Testing Results

Statistical Test t

Table 9. Statistical Test t Results

Model	Coefficients ^a				t	Sig.
	Unstandardized Coefficients		Standardized Coefficients	Beta		
	B	Std. Error				
1 (Constant)	8,552	3,887			2,200	,032
Apparatus	,110	,371	,062		,296	,768
Competency						
Service Quality	,357	,106	,667		3,375	,001

Utilization of Information Technology	,230	,308	,117	,747	,458
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Source: SPSS Output Data (reprocessed data, 2023)

Based on the basis of decision making, which is to reject H_0 when the value of $t_{count} > t_{table}$ or when the value of $Sig. < 0.05$. So, the service quality variable influences the effectiveness of business licensing service management information systems. Meanwhile, the variable competency of the apparatus and utilization of information technology has no effect on the effectiveness of the management information system for business licensing services.

V. DISCUSSION

The Effect of Apparatus Competency on the Effectiveness of Business Licensing Service Management Information Systems

The results of this study indicate that the competency variable of the apparatus has an effect with a significant level of 23.2% on the effectiveness of the management information system for business licensing services. Because this study uses a significant level of 95%, the apparatus competency variable has a low influence on the effectiveness of the business licensing service management information system in the South Kalimantan Province.

The influence of apparatus competence can be explained by the theory of effectiveness, which according to Duncan's theory contains aspects of adaptation which have one indicator in the form of increasing the ability of human resources in this case to increase the knowledge, skills and attitudes possessed by apparatus. The results of this study are in line with the results of research conducted by (Febrianingsih, 2015) which states that apparatus competence has no significant effect on the effectiveness of an information system.

The Effect of Service Quality on the Effectiveness of Business Licensing Service Management Information Systems

The results of this study support the second hypothesis, namely service quality affects the effectiveness of business licensing service management information systems. This is indicated by the variable service quality which has a significant level of 99.9% on the effectiveness of the business licensing service management information system.

The success of the licensing service management information system will be achieved if there is good service quality. Quality service is something that should be maintained by public service organizations to reflect the quality of the organization. Therefore, service quality affects the effectiveness of business licensing service management information systems. If the quality of the service provided is good, then the business licensing service management information system will run effectively, and if the service quality provided is poor, then the business licensing service management information system will not work effectively. This research is in line with the results of research conducted by (Suhendro, 2016) and (Negash et al., 2003) stating that service quality affects the effectiveness of business licensing service management information systems.

The Effect of Utilization of Information Technology on the Effectiveness of Business Licensing Service Management Information Systems

The results of this study indicate that the variable utilization of information technology has an effect with a significant level of 54.2% on the effectiveness of the management information system for business licensing services. Because this study uses a significant level of 95%, the information technology utilization variable has a low influence on the effectiveness of business licensing service management information systems in the province of South Kalimantan.

The influence of the use of information technology can be explained by the theory of effectiveness, which according to Duncan's theory includes aspects of achieving goals which has one of the indicators in the form of achieving goals. In theory, related to realizing the effectiveness of a good business licensing service management information system, of course, the use of information technology can help to facilitate business licensing services that are fast, fair, transparent and appropriate. By utilizing information technology, it can make it easier for apparatus to provide access to the public for the issuance of business licenses. The results of this study are in line with the results of research conducted by (Febrianingsih, 2015) which states that the use of information technology has no significant effect on the effectiveness of an information system.

VI. CONCLUSION AND RECOMMENDATION

This study aims to examine and analyze the influence of apparatus competence, service quality, and information technology utilization on the effectiveness of business licensing service management information systems. The test was carried out on the apparatus implementing the business licensing service management information system at the Investment and One-Stop Services Office (DPMPTSP) in the South Kalimantan Province. Based on the research that has been carried out, it can be concluded that the quality of service affects the effectiveness of business licensing service management information systems, while the competence of personnel and the use of information technology does not affect the effectiveness of business licensing service management information systems. Based on the limitations contained in this study, further research is suggested for future researchers who are expected to be able to add or replace other appropriate variables, add research samples from the side of the community who carry out licensing, ensure the instrument (questionnaire) used matches the conditions object under study and provide face-to-face understanding to respondents directly to ascertain the actual field conditions in order to obtain more accurate information.

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The Impact of Information Technology Innovation Transformation Policy on Service Improvement Intellectual Property Services

Dita Komala Putri¹, Eleonora Sofilda², Dini Hariyanti³,
^{1,2,3} Fakultas Ekonomi dan Bisnis, Universitas Trisakti, Jakarta, Indonesia

Abstract

Introduction/Main Objective: There are still many problems in the implementation of public services by the government such as public ignorance of these services and unresponsive service delivery which has forced the Directorate General of Intellectual Property (DGIP) to transform information technology innovations to face the challenges of the current rapid flow of digitalization, especially for the protection of intellectual property. **Background of the Problem:** Various problems that result in the governance system not running or are not expected to run well require the government bureaucracy to be reformed and adjusted to the dynamics of community demands, one of which is by transforming public services by utilizing technology to make it easier for people to access services quickly. In addition, it is also to increase community participation and create transparency in services. **Research gaps/Novelty:** This research aims to analyze and assess the impact of information technology innovation transformation on improving intellectual property services, becoming the basis for developing an online service system currently run by the Directorate General of Intellectual Property as well as outputs in the form of policy recommendations that can be used for other intellectual property fields. **Research Methods:** This research uses a qualitative approach with in-depth interviews for data collection. The tool used for analyzing is NVivo. **Finding/Result:** The results of this study indicate that the transformation carried out by DGIP in the field of information technology has proven to improve the quality of services provided. **Conclusions and implications:** The technology transformation carried out also has an impact on the increase in IP applications, administrative processes that are more efficient in terms of cost and time, to the creation of public trust/satisfaction with existing services and the increase in IP applications will have an impact on the increase non-tax revenues accepted by the DGIP.

Keyword: innovation transformation, information technology, services, intellectual property

I. INTRODUCTION

The Directorate General of Intellectual Property as one of the units under the Ministry of Law and Human Rights which has the task of organizing the formulation and implementation of policies in the field of intellectual property in accordance with the provisions of laws and regulations has carried out comprehensive and gradual bureaucratic reform 5 (five) years until 2025 referring to Presidential Regulation Number 81 of 2010 concerning Grand Design Bureaucratic Reform 2010-2025 in order to achieve good governance and a clean and accountable bureaucracy. One of them is by enforcing the submission of intellectual property applications online which was previously submitted manually. This information technology innovation in providing intellectual property services to the public aims to make it easier for the public to receive services.

This is necessary to confront the challenges of the current swift flow of digitalization, and one of them is by making changes or transformations so that public services that have been running manually can be adapted to changing times into fast and efficient services. Because in reality, there are still many problems in the implementation of public services such as public ignorance of public services organized by the government and service providers who are less responsive. These various problems / obstacles that result in the governance system not running or expected to not run well must be reorganized or renewed so that bureaucratic reform needs to be implemented in order to realize good governance. Bureaucratic reform is essentially an effort to make fundamental reforms and changes to the system of government administration, especially

regarding institutional aspects (organization), management (business processes) and human resources of the apparatus.

In addition, the rapid progress of science, information and communication technology and changes in the strategic environment require the government bureaucracy to be reformed and adjusted to the dynamics of society's demands. Therefore, fundamental, comprehensive and systematic steps must be taken immediately, so that the goals and objectives that have been set can be achieved effectively and efficiently. In 2004, the government has emphasized the importance of implementing the principles of clean government and good governance, which are universally believed to be the principles needed to provide excellent service to the community. By 2011, all ministries/agencies and local governments are targeted to have a commitment to implement the bureaucratic reform process.

Several studies have been conducted on information technology innovation policies in improving the quality of public services. In 2016, there was a research conducted by Eko Eddy Supriyanto with the title "Information Technology (IT) Innovation Policy through the Electronic Government Program in Improving the Quality of Public Services in Indonesia". The result of this research is that the establishment of e-government can improve public service transactions that are not limited by time and location barriers, and at a cost that is affordable by the community. In addition, in 2022 there was a study entitled "Digital Transformation: The Role of Digital Leadership" by Evans E.W. Tulungen. The results showed that the role of digital leadership is crucial in realizing digital transformation. By utilizing information technology, the work process in the government sector will be further assisted. In addition, with the use of big data, the decision-making process by leaders will be facilitated. Meanwhile, there is also research by Inka Nusamuda Pratama in 2023 entitled "Good Governance Transformation in Improving the Quality of Public Services in Mataram City". The research showed that the transformation of Good Governance in Mataram City was carried out through three stages, planning, implementation, and evaluation. At the planning stage, a strategic plan and human resource development were prepared. In the implementation stage, transformation was carried out in several public service areas, including population administration services, licensing, and health services. In addition, information technology-based service innovations were also carried out, such as the implementation of online public service applications and community complaint systems. In the evaluation stage, monitoring and evaluation of public service performance, as well as collecting feedback from the public.

Based on the research above, no research has been found on the transformation of information technology innovations carried out by the DGIP. Therefore, researchers are interested in analyzing and examining the impact of the transformation policy on improving intellectual property services and increasing copyright applications in particular. The formulation of the problem born from the background above is how the impact of the information technology innovation transformation policy on improving intellectual property services. In addition, other problem formulations are related to the implementation of these policies in other intellectual property fields.

While the purpose of this research is to analyze and examine the information technology innovation transformation policy that has an impact on improving intellectual property services. In addition, this research aims to analyze and examine the information technology innovation transformation policy if it is implemented into other intellectual property fields.

II. LITERATURE REVIEW

GRAND THEORY

Public Policy

In the Big Indonesian Dictionary, policy is defined as a series of concepts and principles that become the outline and basis of plans in carrying out a job, leadership, and how to act (about government, organization, etc.); statement of ideals, goals, principles and guidelines for management in an effort to achieve goals. Solichin Abdul Wahab argues that the term policy itself is still in disagreement and is an arena for debate among experts.

According to Thomas R. Dye (2005) public policy is what the government does or does not do. The definition given by Thomas R. Dye has a very broad scope. In addition, the study is only focused on the state as the subject of study. According to the dictionary of public administration Chanler and Plano in (Harbani Pasolong 2014), says that public policy is the strategic use of existing resources to solve public or government problems.

MIDDLE-RANGE THEORY

Digital Transformation

According to Westermen and Bonnet (2011), digital transformation is a process of organizational change involving people, strategies, structures through the use of digital technology and business models that adjust to improve organizational performance. Then they also define digital transformation as a change that will make a lot of innovations that change the company to be more effective and efficient in doing business.

While the definition of digital transformation according to Fitzgerald (2013) is the use of digital technology that is carried out radically to improve performance or to achieve the goals of the company. He also added that digital transformation brings many new challenges to organizations and requires them to be more careful than the previous era.

Information Technology

According to Bambang Warsita, information technology is a means and infrastructure in the form of (hardware, software, useware) systems and methods for sending, receiving, processing, interpreting, storing, classifying, and using data appropriately. Meanwhile, according to Behan and Holme, information and communication technology is everything that supports recording, storing, processing, sending and receiving information. From the opinions of the experts above, it can be concluded that information technology is a technology used to receive data, send data, process data precisely and quickly in order to obtain quality information. Information technology has very important benefits, as for the benefits of information technology, namely can be used as a tutorial or commonly referred to as an explanation or how to, practice and practice (drill and practice), is to train a person's memory to have excellent abilities in a field, simulation which is used to simulate an event that has occurred or has not yet occurred and is usually related to a risk. Trial or experiment, this activity is more aimed at new activities or new experiments, game which aims to sharpen the brain and can also be made to learn while playing.

From some of the benefits of technology, it can be concluded that the benefits of information technology are not only to find information that will be needed, but can also be used as a tool for information to be received and understood easily, and can be used to develop skills in learning.

Directorate General of Intellectual Property

According to Regulation of the Minister of Law and Human Rights Number 41 of 2021 concerning Organization and Work Procedures of the Ministry of Law and Human Rights, the Directorate General of Intellectual Property is an executive element in the Ministry of Law and Human Rights which has the task of carrying out the formulation and implementation of policies in the field of intellectual property in accordance with the provisions of laws and regulations. In other words, the Directorate General of Intellectual Property is an intellectual property office in Indonesia that organizes the formulation and implementation of intellectual property policies which include Trademarks, Patents, Copyrights, Industrial Designs, Geographical Indications, Integrated Circuit Layout Designs and Trade Secrets.

As an agency that handles intellectual property in Indonesia, the Directorate General of Intellectual Property's motto to become an international-class intellectual property office certainly has a tough challenge considering Indonesia's large population and territory consisting of islands. In carrying out its duties and functions, the Directorate General of Intellectual Property has seven echelon II units, namely Secretariat of the Directorate General of Intellectual Property, Directorate of Copyright and Industrial Design, Directorate of Trademark and Geographical Indication, Directorate of Patent, Integrated Circuit Layout Design and Trade Secret, Directorate of Intellectual Property Cooperation and Empowerment, Directorate of Intellectual Property Information Technology, Directorate of Investigation and Dispute Resolution.

APPLIED THEORY

Publik Service

Law No. 25/2009 on Public Services is a law that regulates public services provided by government agencies. The main objective of this law is to improve the quality of public services and provide satisfaction to the public. Some of the things regulated in this Law include the principles of good public services, public service standards that must be met, public complaint mechanisms, and sanctions for government agencies that do not meet established public service standards.

The principles of good public services include equality, certainty, public interest, community participation, professionalism, accountability, transparency, and sustainability. Government agencies must ensure that every citizen has the same right to obtain public services, without discrimination or unfair treatment. Public service standards that must be met include the service process, service time, service fees, service products or results, and the behavior of public service officers. Government agencies must ensure that established public service standards are met and socialized to the public.

Intellectual Property

Patent

A patent is the exclusive right of an inventor to an invention in the field of technology for a certain period of time to carry out his own invention or to grant approval to other parties to carry out his invention. An invention is an inventor's idea that is poured into a specific problem-solving activity in the field of technology, which can be in the form of a product or process or the improvement and development of a product or process. A simple patent is an invention in the form of a new product or device that has practical use value due to its shape, configuration, construction or components can obtain legal protection in the form of a simple patent.

The difference between Patents and Simple Patents is that Patents are granted for inventions that are new, contain inventive steps, and can be applied in the industry. While a simple patent is granted for any new invention, development of an existing product or process, and can be applied in the industry. A simple patent is granted for an invention in the form of a product that is not merely different in technical characteristics, but must have a function/use that is more practical than the previous invention due to its form, configuration, construction, or components which include tools, goods, machines, compositions, formulas, compounds, or systems.

Trademark

Trademark is a sign that can be displayed graphically in the form of images, logos, names, words, letters, numbers, color arrangements, in the form of 2 (two) dimensions and / or 3 (three) dimensions, sound, holograms, or a combination of 2 (two) or more elements to distinguish goods and / or services produced by persons or legal entities in the trading activities of goods and / or services.

Industrial Design

Industrial Design is a creation about the shape, configuration or composition of lines or colors, or lines and colors, or a combination thereof in the form of three dimensions or two dimensions that give an aesthetic impression and can be realized in three-dimensional or two-dimensional patterns and can be used to produce a product, goods, industrial commodities or handicrafts.

Copyright

Copyright is one part of intellectual property that has the broadest scope of protected objects, because it covers science, art and literature (art and literary) which also includes computer programs. The development of the creative economy which is one of the mainstays of Indonesia and various countries and the rapid development of information and communication technology requires an update of the Copyright Law, considering that Copyright is the most important basis of the national creative economy. With the Copyright Law that meets the elements of protection and development of the creative economy, it is expected that the contribution of the Copyright and Related Rights sector to the country's economy can be optimized.

Geographical Indication

A Geographical Indication is a mark indicating the region of origin of a good and/or product which due to geographical environmental factors including natural factors, human factors or a combination of both factors gives a certain reputation, quality, and characteristics to the goods and/or products produced. The mark used as a Geographical Indication may be in the form of an etiquette or label attached to the goods produced. The mark may be the name of a place, region, or area, words, pictures, letters, or a combination of these elements. Geographical Indications are protected as long as the reputation, quality, and characteristics that are the basis for the protection of Geographical Indications on an item are maintained.

Trade Secret

Trade Secret is information that is not known by the public in the field of technology and/or business, has economic value because it is useful in business activities, and is kept confidential by the owner of the Trade Secret. The scope of protection of Trade Secrets includes production methods, processing methods, sales methods, or other information in the field of technology and/or business that has economic value and is not known by the general public.

Layout Design of Integrated Circuit

An Integrated Circuit Layout Design is a creation in the form of a three-dimensional layout design of various elements, at least one of which is an active element, as well as some or all of the interconnections in an integrated circuit and the three-dimensional layout is intended for the preparation of an integrated circuit. A registered Integrated Circuit Layout Design shall enjoy legal protection for a period of 10 years from the first time the Integrated Circuit Layout Design is commercially exploited or from the date of receipt of the application for registration.

Previous Studies

Several researches have been conducted related to the information technology innovation transformation policy mentioned in the introduction above. It can be seen from these examples, that by utilizing information technology the work process in the government sector will be increasingly assisted and can improve public service transactions that are not limited by time and location barriers, and at a cost that is affordable by the community.

There are also other research related to the information technology innovation transformation, good governance and public services. A research written by Mar Atun Nasikhah in 2019 with the title “Innovation in Information Technology-Based Public Transportation Services” explains that public service innovations presented at the Malang station such as: B2B (Business to Business) or purchases through External Channels, H-90 Train Ticket Reservations, CIC (Check In Center), Customer Care, Complaint Management, and Environmentally Friendly Toilets, is an innovation that suits the needs of the community. These innovations will facilitate and accelerate the community in carrying out the service process so that services become more effective and efficient.

In relation to good governance, in a study entitled “Innovation of Public Services Based on Information and Communication Technology Based on Balinese Local Wisdom Values” by I Wayan Gde Wiryawan in 2018, it shows that the implementation of bureaucratic reform in local governments in Bali by innovating the public service system based on local wisdom has not been optimal, because from the results of the study only the city of Denpasar has built a public service system based on Information and Communication Technology based on local wisdom with the name e-Sewaka Dharmopadesa as an effort to build an innovative public service system in accordance with the expectations and interests of the people in Bali who are heterogeneous due to the development of tourism.

In addition, one of the studies related to public services was conducted by Syamsul Bahri in 2020 with the title “Implementation of Smart City Policy in Realizing the Quality of Public Services in Tangerang City”. The results showed that the implementation of smart city policies in realizing quality public services in Tangerang City could not be carried out effectively in improving the welfare of the community factually from influencing factors including communication influencing related to all existing indicators and still less effective indicators of skills. Resources are related to all existing indicators and are still less effective in the skills of the availability of facilities and infrastructure needed. Disposition related to all existing indicators and less effective level of trust in policies taken by leaders and related bureaucratic structures of all existing indicators and which are still less effective instructive in accordance with Standard Operating Procedure.

III. RESEARCH METHODOLOGY

In general, research methodology is defined as a scientific process or way to obtain data that will be used for research purposes. Methodology contains scientific methods, steps, types to the limits of scientific methods. Meanwhile, research is an effort to gain knowledge through evidence - evidence of facts with certain scientific work procedures that are crisis and controlled (Alfandi, 2001). In general, research methodology is defined as a scientific process or way to obtain data that will be used for research purposes. Methodology contains scientific methods, steps, types to the limits of scientific methods. Meanwhile, research is an effort to gain knowledge through evidence - evidence of facts with certain scientific work procedures that are crisis and controlled (Alfandi, 2001). In addition, research activities must have certain characteristics. The characteristics of research are scientific in nature, meaning that research is carried out in accordance with

procedures and uses convincing evidence in the form of facts obtained objectively. The process is continuous, the results of a study can always be improved from time to time through a process that runs continuously. Besides that, research must contribute, which means that a study must have an element of contribution or added value to pre-existing science. Besides that, it is analytical, that is, a study conducted must be proven and described using scientific methods and there is a causal relationship between the variables.

Based on the data analysis and type of data, this research uses qualitative research methods, which is a method or research method that emphasizes analysis or descriptive. In a qualitative research process, the subject's perspective is emphasized and the theoretical basis is used by the researcher as a guide, so that the research process is in accordance with the facts encountered in the field when conducting research. Qualitative research methods aim to explain a phenomenon in depth and are carried out by collecting data as deeply as possible. Qualitative methods prioritize observation of phenomena and examine the substance of the meaning of these phenomena. The analysis and sharpness of qualitative research is greatly affected by the strength of the words and sentences used.

The data collected in this research was conducted with in-depth interviews involving stakeholders involved in the policy formulation process, policy implementers and beneficiaries of the policy. In-depth interviews in a study can explore a person's views, opinions or input on a problem. In this research, the opinions and views of stakeholders are very important in elaborating the problem and drawing conclusions for problem solving.

Table 3.1 Categorization of Informants

No	Informant	Position	Institution	Category
1.	Anggoro Dasananto	Director of Copyright and Industrial Design	Directorate General of Intellectual Property	Regulator
2.	Khuswardanti Ariwanti Rahayu	Task Executor, Application & Publication Coordinator, Directorate of Copyright and Industrial Design	Directorate General of Intellectual Property	
3.	Arief Ramadhan	Intellectual Property Applicant	Public	Applicant

Source: Researcher (2023)

The data analysis method was carried out with NVivo, an application used for processing and analyzing qualitative data in the form of audio recordings and transcripts from audio recordings. In addition, the results of the interview can be in the form of a written narrative from the source if the source is not willing to be interviewed or limited in place and time.

NVivo can separate data sourced from informants and data sourced from researchers and secondary data (books, research reports, journal articles, websites). NVivo coding results can be displayed on the research results to show a consistent and accurate analysis process. During the coding process, nodes will be generated. Nodes are a set of references to topics or sub-topics related to the research problem (Bandur, 2019).

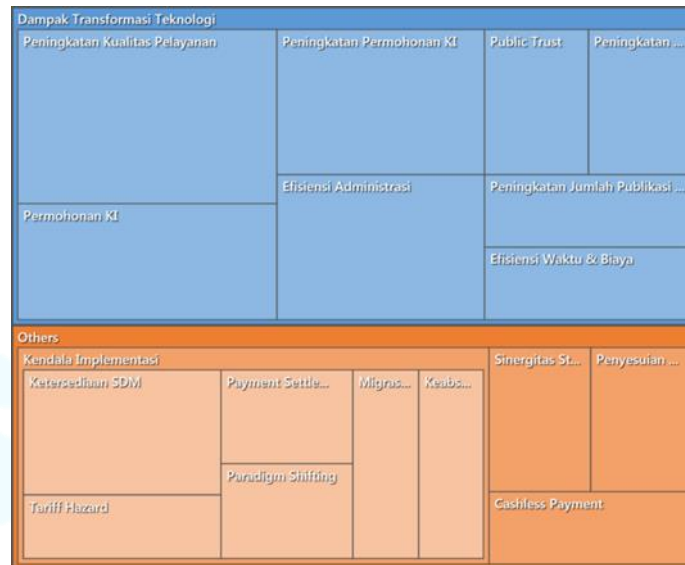
The stages of data analysis carried out are: (i). Describing informants by presenting profiles; (ii). Transcribing the interview results, which are set out in a structured transcript; (iii). Coding and classifying interview transcripts and other document sources through the formation of nodes and sub-nodes; (iv). Determining patterns, namely by looking for patterns or themes for each node through the form of data visualization; and (v). Interpreting emerging patterns or themes or the process of drawing conclusions.

The analysis technique used consists of two stages, namely First Cycle Coding which consists of hierarchical analysis and concept mapping and Second Cycle Coding, namely comparative diagram analysis.

IV. RESULT ANALYSIS AND DISCUSSION

The following is an aggregate coding hierarchy to see which nodes are the most dominant (or have the highest number of coding activities) of all interviewees, as follows:

Figure 4.1 Hierarki Agregat



Source: Data Processed (2023)

From Figure 4.1, it can be seen that there is only one (1) system nodes when referring to the research objectives that have been developed, namely the Impact of Technological Transformation - System Nodes 1. The way of presenting the hierarchy starts from: (i). Identifying in aggregate which nodes have the highest hierarchy; (ii). Identifying the nodes with the highest reference to system nodes 1; and (iii). Identifying the nodes with the highest reference to the system nodes Others.

In aggregate, there are at least a few nodes with the highest hierarchical level, namely (the rest can be seen in Figure 1 and the magnitude can be seen in the coding nodes appendix). The following table illustrates the aggregate number of references (including sub-nodes, if any) of each of these nodes, as follows:

Table 4.1 Reference Nodes of the Aggregate Hierarchy

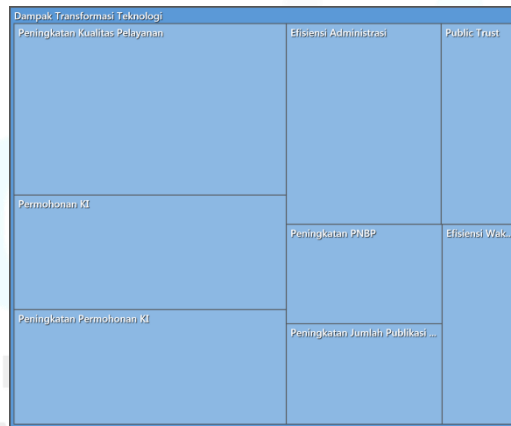
No.	Nodes	Ref.	Files Coded	Max. Value	Share
1	Peningkatan Kualitas Pelayanan	3	1	3	100%
2	Permohonan KI	2	1	3	66%
3	Peningkatan Permohonan KI	2	1	3	66%
4	Efisiensi Administrasi	2	1	3	66%
5	Ketersediaan SDM	2	1	3	66%

Source: Data Processed (2023)

The results show that the 5 nodes above have the largest contribution in the overall hierarchy, both in terms of the number of references and data sources (transcripts). This indicates that, overall (2 categories of sources), both implicitly and explicitly, allude to the impact of technological transformation on improving the quality of services provided. In addition, the "Service Quality Improvement" nodes have the highest source value (3) with a total contribution of 100%. This indicates that all sources and all existing data sources agree that the technological transformation carried out by the Directorate General of Intellectual Property has had an impact on improving the quality of services provided. As for the other nodes, namely "IP Application", "Increased IP Application", "Administrative Efficiency", and "Availability of Human Resources", each has a reference of 66% with a contribution value. As for the other nodes, they have similar interpretations.

Furthermore, the hierarchy of System Nodes1 (Impact of Technology Transformation) will be shown below:

Figure 4.2 System Hierarchy Nodes 1



Source: Data Processed (2023)

From Figure 4.2, it can be seen that in System Node 1, "Improved Quality of Service" is the node with the highest number of references, which is 3. Furthermore, the other nodes ("IP Application", "Increased IP Application", "Administrative Efficiency"), have a number of references, respectively, of 2. These results mean that, in the context of developing the impact of technological transformation carried out, improving the quality of service provided is the most mentioned by all interviewees. Meanwhile, other impacts such as an increase in IP applications and administrative efficiency also dominate. The contribution values can be seen in the table below:

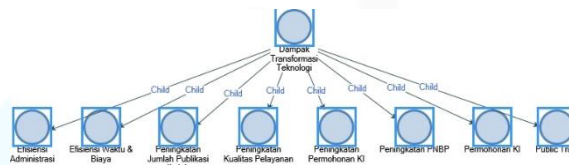
Table 4.2 System Hierarchy Reference Nodes 1

No.	Nodes	Ref.	Files Coded	Max. Value	Share
1	Peningkatan Kualitas Pelayanan	3	1	3	100%
2	Permohonan KI	2	1	3	66%
3	Peningkatan Permohonan KI	2	1	3	66%
4	Efisiensi Administrasi	2	1	3	66%
5	Public Trust	1	1	3	33%
6	Peningkatan PNPB	1	1	3	33%
7	Peningkatan Jumlah Publikasi Ilmiah	1	1	3	33%
8	Efisiensi Waktu & Biaya	1	1	3	33%

Source: Data Processed (2023)

From the table above, it can be seen that the "Improved Quality of Service" nodes contributed 100% of the total sources. Furthermore, the impact of "IP Application", "Increased IP Application" and "Administrative Efficiency" were each mentioned by 88% of the sources involved. The following will show the mapping of System Nodes 1:

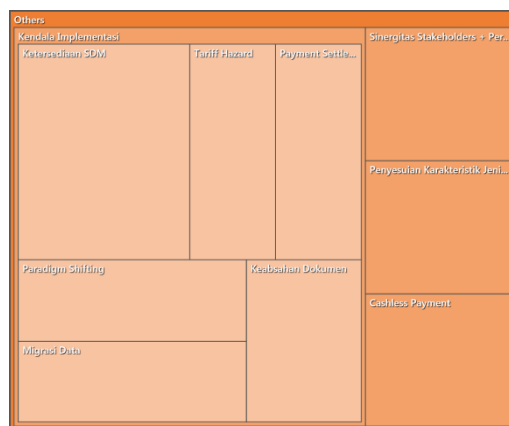
Figure 4.3 System Project Map Nodes 1



Source: Data Processed (2023)

Furthermore, the following will be shown regarding the hierarchy of the Other Nodes System (matters touched upon beyond the purpose of the research), as follows:

Figure 4.4 System Hierarchy Nodes Others



Source: Data Processed (2023)

From Figure 4.4, it can be seen that, in the Others Nodes System, "Availability of Human Resources" is the nodes with the highest number of references, which is 2. The contribution value can be seen in the table below:

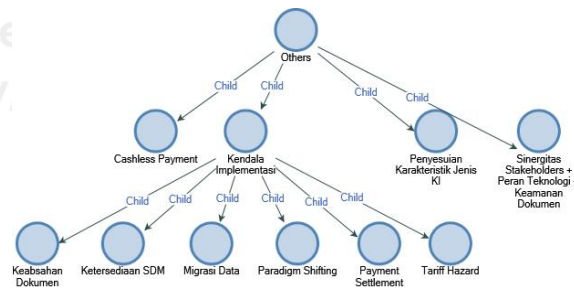
Table 4.3 System Hierarchy Reference Nodes Others

No.	Nodes	Ref.	Files Coded	Max. Value	Share
1	Ketersediaan SDM	2	1	3	88%
2	Sinergitas Stakeholders + Peran Teknologi > Keamanan Dokumen	1	1	3	33%
3	Penyesuaian Karakteristik Jenis KI	1	1	3	33%
4	Cashless Payment	1	1	3	33%
5	Tariff Hazard	1	1	3	33%
6	Payment Settlement	1	1	3	33%
7	Paradigm Shifting	1	1	3	33%
8	Migrasi Data	1	1	3	33%
9	Keabsahan Dokumen	1	1	3	33%

Source: Data Processed (2023)

From Table 4.3, it can be seen that the "Availability" nodes have a contribution of 88% of the total sources. This means that 88% of the sources alluded to the obstacles encountered during implementation, namely regarding the availability of human resources. The following will show the mapping of the Others Nodes System:

Figure 4.5 Project Map Sistem Nodes Others



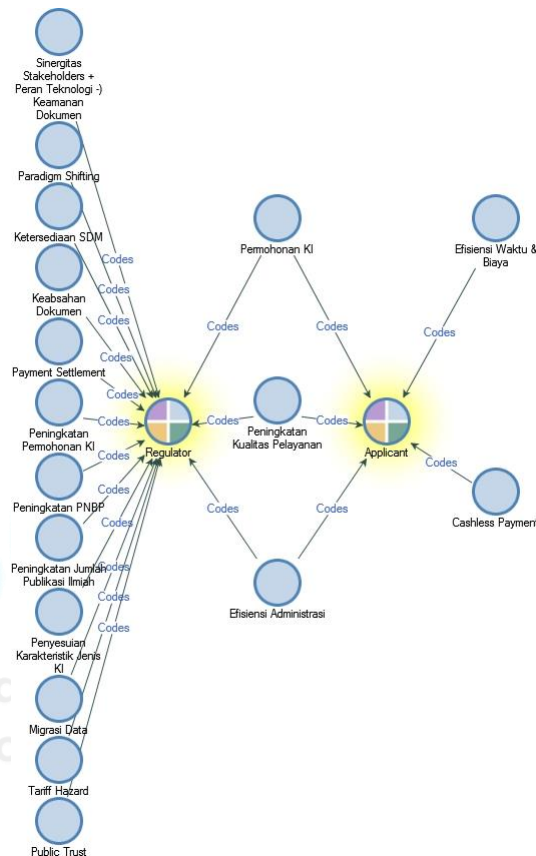
Source: Data Processed (2023)

Based on the figure above, the "Implementation Constraints" nodes have several sub-nodes that are mapped, namely: "Document Validity", "HR Availability", "Data Migration", "Paradigm Shifting", "Payment Settlement", and "Tariff Hazard".

Next, the results of the comparative diagram analysis will be shown. This section is the second stage in coding analysis (Second Cycle Coding). The Second Cycle Coding is based on the nodes or coding that has been made previously (First Cycle Coding). The results illustrate the similarity of things mentioned by each source (category), the similarity is shown in the nodes located in the middle of the source case. Meanwhile, the nodes to the right and left of the sources are nodes mentioned by each source that are not related to each other where it can replace the exploration diagram. Meanwhile, the number of references to each nodes can be seen in the

Coding Nodes folder - select category - statement/image. The following will show the similarity of nodes between regulators and applicants. In this case, the similarity of the nodes indicates that there are similarities between the things mentioned on the regulator and the applicant, either explicitly or implicitly. The following is a comparison diagram that shows this (clear images can be seen in the Nvivo - Output - Comparison Diagram - Regulator vs Applicant - Image folder)

Figure 4.6 Comparison Diagram - Regulator vs Applicant



Source: Data Processed (2023)

In the figure, there are about 3 similar nodes ("IP Application", "Improvement of Service Quality", and "Administrative Efficiency") that are mentioned by both parties, either explicitly or implicitly. These similarities can be considered by researchers so that they can conduct a deeper analysis between these similarities. (To see specifically what statements in the nodes that are mentioned simultaneously by both parties, can be seen through the Nvivo - Output - Comparison Diagram - Regulator vs Applicant - Statement folder).

Furthermore, it will also be shown about the results of the cluster analysis of each coding activity carried out, the following figure shows what is meant:

2. Overall (2 categories of sources), both implicitly and explicitly, mentioned the impact of technological transformation on improving the quality of services provided. In addition, the "Improved Quality of Service" nodes have the highest source value (3) with a total contribution of 100%. This indicates that all sources and all existing data sources agree that the technological transformation carried out by the Directorate General of Intellectual Property has had an impact on improving the quality of services provided. The other nodes, namely "IP Application", "Improvement of IP Application", "Administrative Efficiency", and "Availability of Human Resources", each have a reference of 66% with a contribution value.
3. In the case of the development of the impact of technological transformation, the improvement of the quality of services provided was the most mentioned by all interviewees. Meanwhile, other impacts such as an increase in IP applications and administrative efficiency also dominated the discussion.
4. 88% of the interviewees mentioned obstacles encountered during implementation, namely the availability of human resources and there are similarities between what is mentioned on the regulator side and the applicant side, either explicitly or implicitly.
5. The pair between IP Application and Non-Tax State Revenue Increase has the highest coefficient value of 0.998 on scale 1. This means that the two things are coded in a relatively similar sentence. In addition, it can also be said that the increase in intellectual property applications will have an impact on the increase in non-tax revenue received by the Directorate General of Intellectual Property.

VI. CONCLUSION AND POLICY RECOMMENDATION

A. Conclusion

1. The transformation carried out by the Directorate General of Intellectual Property in the field of information technology has proven to improve the quality of services provided. This can be seen from the "Improved Service Quality" nodes mentioned by all sources. This indicates that both sources categorized as regulators and applicants, both confirm the matter in question. Apart from that, the technological transformation carried out also has an impact on the increase in intellectual property applications, a more cost- and time-efficient administrative process, to the creation of public trust/satisfaction regarding existing services.

2. The information technology transformation policy can be applied to other intellectual property services by looking at the suitability of the characteristics of the type of intellectual property itself. This can be seen from the nodes of adjusting the characteristics of the type of intellectual property. As for the implementation, there are several obstacles that are mapped from the analysis results shown in the nodes: "Availability of Human Resources", "Paradigm Shifting (related to employee paradigms that are still not fully oriented towards changes in administrative processes)", "Data Migration", "Payment Settlement", "Tariff Hazard", and "Document Validity".

3. The results of the analysis show that an increase in the level of quality of intellectual property services will have an impact on public satisfaction. This can be seen in the "Public Trust" nodes. Information technology transformation applied to the administrative process has proven to facilitate the community in terms of cost and time.

B. Policy Recommendation

After the research conducted, the author provides several policy recommendations that can be applied by the Directorate General of Intellectual Property, namely the transformation carried out by the Directorate General of Intellectual Property in the field of information technology has proven to improve the quality of services provided, but it is necessary to evaluate and monitor regularly in order to improve the service system that is cost and time efficient. One way that can be done is by conducting a public satisfaction survey. The results of the survey can be the basis for policy changes so as to continue to create public trust/satisfaction regarding existing services and an increase in intellectual property applications which will also have an impact on increasing non-tax revenues received by the Directorate General of Intellectual Property.

Based on the results of data procession, analysis and discussion carried out; there are several points of conclusion

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The Effect of Commitment Organization and Competence Toward Village Satisfaction Working in Cirebon District

Sandi Nasrudin Wibowo¹, Yodi Rudiantono², Misbak³, Erlan Angga Purnama⁴ and Yulio Purnomo⁵

^{1,2,3}Management Departement, Swadaya Gunung Jati University, Cirebon, Indonesian

^{4,5} Student Management Departement, Swadaya Gunung Jati University, Cirebon, Indonesian

Abstract

Susukan lebak Subdistrict, Cirebon district is one of 40 sub-districts in Cirebon district. Since the enactment of the division of Lemahabang sub-district, Susukanlebak sub-district has 13 villages which have an area of 2,788 Ha. This study aims to examine the Organizational Commitment and Competence of Job Satisfaction of village officials in the Susukanlebak district of Cirebon district. This research is a quantitative research, using associative and descriptive data methods. Data collection techniques used are quantitative data analysis. Quantitative data were analyzed using validity test, reliability test, normality test, multicollinearity test, simple regression test, multiple regression test, determination test, correlation coefficient, partial t test and simultaneous f test. The sample used in this study was 60 respondents, with simple random sampling data collection techniques or random techniques. The results obtained that the Organizational Commitment and Competence of Job Satisfaction of Village Apparatuses in the Susukanlebak District Area are included in the quite good category with an average value of frequency distribution of (X1) 2.58, (X2) 2.58 and (Y) 2, 57. The results of the Kolmogorov-normality test showed 0.092 were greater than the significance value of 0.05. Then it can be concluded that the variable is normally distributed. Based on the results of the study found that: Organizational Commitment has a positive and significant effect on Job Satisfaction with a tcount of 39.941 > ttabel 1.67. Competence has a positive and significant effect on Job Satisfaction with a tcount of 46.602 > ttabel 1.67. Organizational Commitment and Competency simultaneously or jointly affect the Job Satisfaction variable. with a value of Fcount 3.16 > Ftable 1518.927. explain the topic in this research.

Keywords: Organizational Commitment; Competence; Job Satisfaction

I. INTRODUCTION

In this competitive reform era, both government and private agencies will always be faced primarily with human resource problems. Human resources are not unique and valuable, but human resources in the organizational environment play the most important role. It seems logical that agencies will expend a lot of effort to acquire and fully utilize these human resources. This effort is known as human resource management.

The scope of human resource management, in general, discusses matters relating to humans, including organizational commitment and competence. Then the resulting output is employee job satisfaction, which is a very important factor because it can affect the running of the organization as a whole. The satisfaction felt by employees at work is an indication that employees have a good feeling about carrying out their duties and work. Job satisfaction is also a positive attitude of employees towards various situations at work.

The clarity of goals and policies implemented by the organization also affects employee commitment to carrying out their duties. The level of employee commitment to organizational values and goals will ultimately affect job satisfaction. Commitment and competence are two very important things in carrying out daily tasks for an employee. For this reason, the clarity of goals and policies implemented by the agency is a very important factor and needs to be implemented properly and correctly so that organizational commitment and competence are the main things everyone works on. So that the work system can be better and more developed (Paramita, Lumbanraja, and Absah 2020).

Organisational commitment is one of the key factors that determine the success or failure of an organisation to achieve its objectives. Employees who are committed to their organisation tend to be attentive to their work, feel a strong sense of responsibility in the performance of their duties and have a high level of loyalty to the agency or company. Commitment is a conviction, a bonding agent that generates the energy to do the best possible. It is evident that commitment affects the performance of human resources and ultimately has a major impact on performance and satisfaction.

Organizational performance is a function of an organization's performance or operations, which is influenced by internal and external factors. As the main asset, the productivity of human resources (HR) within the company must be increased by creating working conditions and environment that can encourage employees to increase their competencies, abilities and skills optimally, increase commitment to the company and be able to develop their careers so that they are more advanced (Wardana, Putra, and Panjaitan 2022). Organizational commitment is an attempt to define and involve oneself in the organization and there is no desire to leave it. The stronger the organizational commitment that employees have in supporting the implementation of their duties and work, the better the performance that will be generated (Robbins, 2016). The commitment of employees to the organization will make employees have loyalty to the organization and work well for the benefit of the organization. This situation is very good for the achievement of employee performance and organizational goals, because the organization has full support from its members so that it can concentrate fully on the goals to be achieved (Sari, Agung, and Widayani 2022).

A person's commitment to an organization or company is very important in the world of work. So important, in fact, that some organizations dare to list commitment as one of the requirements for a position or vacancy in their job advertisements. Although this is very common, it is not uncommon for employers and employees to still not seriously understand the meaning of engagement. Therefore, the role of human resources, especially senior and junior management, must be able to act as a driving force in achieving the mission and goals of the organization.

Today, the definition of commitment is no longer that an employee is willing to stay with a company or institution for a long time. Rather, it is more about wanting to do the best for the organisation and even willing to go beyond the boundaries required by the institution or company. Of course, this is only possible if employees feel happy and fulfilled in the institution.

An employee will not be interested and unable to do his job if he does not have the skills, abilities, and skills to carry out his work, and this will affect the improvement of work quality. Or vice versa, skills, abilities, and skills without good and sustainable commitment, in this case, commitment is not optimal, it is impossible to produce good quality work and interfere with achieving organizational goals.

Job satisfaction is an individual issue, as everyone's level of satisfaction is different depending on the values that apply to them. The more aspects of the job that meet the individual's expectations, the higher the level of satisfaction. Job satisfaction is a combination of psychological, physiological and environmental factors that make a person feel honest and satisfied with their job.

Job satisfaction for an employee is a very important factor because the satisfaction he gets will determine a positive attitude towards work. Feelings of satisfaction at work can lead to behavior, such as the level of discipline, work enthusiasm and performance results, so that if job satisfaction is higher, it will lead to enthusiasm at work.

From the results of observations and interviews that researchers conducted in some villages in the Susukanlebak sub-district area, the problems that arise in each village are almost the same, namely due to the low appreciation of work results, less representative workspace, and there are still many employee placements that are not by their competence. So an attitude of dissatisfaction at work arises.

Permendagri No. 67 of 2017, concerning the appointment and dismissal of village officials, states that village officials are appointed by the village head from villagers who have met the general and special requirements, namely having a minimum education of general high school or the equivalent. Furthermore, it is stated in Perbup No. 22/2018 concerning village officials, which explains that village officials have at least a general high school education or the equivalent.

In addition to the symptoms of dissatisfaction from a competency background, job dissatisfaction is also described in the table below, which explains the number of new village officials who have less than five years on the job. Therefore, dissatisfaction can be measured by the number of village officials who quit or were replaced.

Tabel 1. Length of Service of Village Apparatus

NO	LENGTH OF SERVICE	TOTAL	PERCENTAGE (%)
1.	<5 YEARS	60 People	45,1%
2.	5-10 YEARS	31 People	23,3%
3.	10-15 YEARS	22 People	16,5%
4.	15-20 YEARS	16 People	12%
5.	>20 YEARS	4 People	3,1%

JUMLAH**133 PEOPLE****100%**

Sumber : Data Primer yang diolah 2020.

Research from (Ega Praja Rimata Faculty of Economics UNY 2017) concluded that organizational commitment affects employee job satisfaction. Meanwhile, research conducted by (Sartito Siantur, Roma Diana, Maria Sihombing, Lenta Marianti Sitinjak, and Rizki Yuspantrisia. Prima Indonesia University, 2019) concluded that competency variables have a positive and significant effect on employee job satisfaction. Differences in research results can result from the dimensions and indicators used by different researchers; besides that, the object of research is the difference in results with similar titles.

Based on the background of the research above, therefore the researcher is interested in research involving job satisfaction, organizational commitment, and competence in the village in the Susukanlebak sub-district area. Finally, the author is interested in conducting research with the title: "THE EFFECT OF ORGANIZATIONAL COMMITMENT AND COMPETENCY ON THE JOB SATISFACTION OF VILLAGE DEVICES IN THE SUSUKANLEBAK DISTRICT area of CIREBON."

II. LITERATURE REVIEW

2. 1 Literature Review

Organizational Commitment

Definition of Organizational Commitment

The performance of an organization is determined by the conditions and behavior of its employees. The phenomenon that often occurs in both private and government agencies, due to the absence of a commitment bond between the government agency and the personal employees. Because human resources are performance and a picture of the quality of human resources themselves both directly and indirectly.

Meyer and Allen (1991) in Umam (2012: 258-259) state that:

"Organizational commitment as a psychological construct that is characteristic of the relationship between organizational members and their organization and has implications for individual decisions to continue their membership in the organization".

Kaswan (2015: 126) provides a statement that:

"Organizational commitment is a work attitude in the form of desire, willingness, dedication, loyalty, and / or strong trust that shows the desire to remain a member of the organization by accepting the values and goals of the organization, and working on behalf of / for the benefit of the organization". Literature studies are not limited to theory, but also empirical evidence.

Factors that Affect Organizational Commitment

Meyer, J. P., Allen. N in Kaswan (2015: 126) states that organizational commitment consists of formulating three dimensions of commitment, namely:

1. Affective commitment
2. Continuance commitment
3. Normative commitment.

According to David (in Sopiiah 2008: 163), there are four factors that influence organizational commitment, as follows:

1. Personal factors, such as age, gender, education level, work experience and personality.
2. Job characteristics, such as the scope of the position, challenges in the job, role conflict, level of difficulty in the job.
3. Structural characteristics, such as the size of the organization, the form of the organization, the presence of labor unions, and the level of control that the organization exercises over its employees.

4. Work experience. An employee's work experience greatly affects the level of employee commitment to the organization. Employees who have only worked for a few years and employees who have worked for decades in the organization certainly have different levels of commitment.

Indicators of Organizational Commitment

Kaswan (2015: 126) states that commitment indicators include:

1. Individual characteristics
2. Significance of the task
3. Feedback from the leader
4. Age
5. Position
6. Various facilities and benefits
7. Merit pay
8. Social respect
9. Culture or religion

From the several expert definitions above, the researcher concludes that organizational commitment is the awareness that exists within an employee in the form of desire, dedication, loyalty, and / or strong trust which is indicated by the desire to remain part of the organization.

Because with a good organizational commitment from an employee, the desire to leave an organization is getting smaller so that the organization does not need to look for new employees.

Competence

Definition of Competency

Each person has a different level of competence. Competence can support an individual in carrying out the assigned tasks so that competence is one of the supporters to determine the value of job satisfaction. Spencer in Moehariono (2014: 5) states that, "Competence is, "The underlying characteristics of a person are related to the effectiveness of individual performance in their work or the basic characteristics of individuals who have a causal or causal relationship with the criteria that are used as a reference, effective, or excellent or superior performance in the workplace".

Competence is a basic characteristic that can be defined as a characteristic that underlies a person related to the effectiveness of individual performance in his work, or basic characteristics of individuals who have a causal relationship or as a cause and effect with the criteria used as a reference, effective or perform excellent or superior at work or in certain situations (Fadhli, Komardi, and Putra 2022).

Factors affecting competence

Competence is influenced by several factors, Michael Zwell (2000) in Wibowo (2012) states that there are several factors that affect competence, namely:

1. Beliefs and Values

A person's beliefs about himself and others will greatly affect his daily behavior. If the person has positive thoughts about himself and others, it will be someone who has the characteristics of a forward-thinking person.

2. Skills

Skills reflect that the employee is diligent and expert in all competencies. Skill development that is specifically related to competencies that can have a good impact.

3. Experience

Experience is a necessary element of competence in the world of work, but to become an expert is not enough with experience.

4. Personality Characteristics

Personality includes many factors including change, but personality is not something that cannot change. A person's personality can change at any time if he interacts with the surrounding forces and environment.

5. Emotional Issues

Emotional barriers can limit mastery of competencies. Fear of making mistakes, being embarrassed, feeling disliked all tend to limit an employee's initiative.

6. Intellectual Ability

Competence depends on cognitive thinking such as conceptual thinking and analytical thinking.

Competency Indicators

According to Spencer in Moehariono (2014: 5)

1. Nature
2. Mind
3. Behavior
4. Individual Characteristics
5. Self Motivation
6. Self-confidence
7. Captivation
8. Drive to learn
9. Intrapersonal
10. Interpersonal
11. Technical
12. Leadership

Job Satisfaction

Definition of Job Satisfaction

Job satisfaction is one of the important factors that affect life satisfaction, because most of human time is spent at work. One of the factors that can make employees decide to stay in an organization is job satisfaction. With good job satisfaction, they will be loyal to stay in the organization, so that the turnover rate will be low and the organization does not need additional costs for the process of recruiting new employees because employees have good satisfaction in the organization.

Job satisfaction as an assessment of the perceived characteristics of the job, the work environment and the emotional experience gained in the job. Job satisfaction is also an assessment, attitude or feeling of an employee towards the work he does, and is related to factors such as type of work, work environment, relationships between co-workers, compensation, and social relations at work (Zerebecki and Oprea 2022)

Factors that affect job satisfaction

Kramer and Kinicki in Keswan (2015: 92-94) state that factors that can affect the onset of job satisfaction, namely:

1. Need fulfillment
This model means that satisfaction is determined by the extent to which job characteristics provide opportunities for individuals to fulfill their needs.
2. Difference
This model states that satisfaction is a result of meeting expectations. Expectation fulfillment reflects the difference between what is expected and what individuals get from work. If expectations are greater than what is received, people will not be satisfied. Conversely, it is expected that individuals will be satisfied if they receive benefits above expectations.
3. Value attainment
The underlying idea of value attainment is that satisfaction results from the perception of a job that provides fulfillment of important individual work values. In general, research consistently supports the prediction that value fulfillment is positively related to job satisfaction. As such, leaders can increase employee job satisfaction by structuring the work environment and associated rewards and recognition to reinforce employee values.
4. Fairness
This model suggests that satisfaction is a function of how fairly individuals are treated at work. Decisions are the result of people's perception that the comparison between work outcomes and inputs is relatively more favorable than the comparison between other work expenditures and inputs.
5. Genetic Component

This model is based on the belief that job satisfaction is partly a function of personal traits and genetic factors. The model implies that individual differences are only as important for explaining job satisfaction as the characteristics of the work environment.

Job Satisfaction Indicators

1. The Salary Given is Perceived as Fair
If the salary is perceived as fair based on job demands, numbers: individual champions, and salary standards that apply to the job group, job satisfaction will arise.
2. Bright and Cool Workspace
A workspace that is not cramped. hot. whose lights do not dazzle the eyes creates comfort for work.
3. Comfortable Work Equipment
Work equipment is comfortable to use, such as tables, chairs that can be adjusted high-low, tilted-straight sitting position.
4. Good Working Relationship with Coworkers
The relationship that occurs between employees is a one-sided dependency relationship, which has a functional character. The job satisfaction that exists in employees arises because they are in a certain number, are in one workspace, so they can talk to each other (social needs are met).
5. Good Working Relationship with Superiors
Leadership that is consistently related to job satisfaction is tolerance. Functional relationships reflect the extent to which supervisors help employees to satisfy work values that are important to them.
6. Good Working Relationships with Subordinates
Bosses who have transformational leadership characteristics can encourage employees to increase their motivation to feel satisfied with their work. From several expert definitions above, coupled with existing dimensions and indicators. Researchers concluded that job satisfaction is a sense of satisfaction within a worker based on an assessment of a comfortable work situation.

The above explanation of the theme of job satisfaction can be concluded that there are 6 dimensions and 12 indicators used as the basis for research in assessing the job satisfaction of village officials in the Susukanlebak District, Cirebon Regency.

Framework and Hypothesis

Framework of Thought

Organizational commitment is a work attitude in the form of desire, willingness, to show a desire to remain dedicated, loyalty, and strong trust to show a desire to remain part of the organization (Farrukh et al. 2020). Kaswan (2015: 126) divides the three dimensions of work competence:

1. Affective Commitment
2. Continuance Commitment
3. Normative Commitment

Competence is, the characteristics that underlie a person are related to the effectiveness of individual performance in their work as a cause and effect with the criteria used as a reference, effective, excellent or superior work results at work (Firmansyah, Brahmasari, and Brahma 2020). Spencer in Mocheriono, divides four dimensions related to work competence:

1. Disposition
2. Self-concept
3. Knowledge
4. Skills

According to Job satisfaction is a set of feelings that employees have about things that are pleasant or not about the work they face (Mugira 2022). And edison divides into 6 dimensions in job satisfaction, namely:

1. Leadership
2. Competence of the work at hand
3. Management policy
4. Compensation
5. Awards
6. Work Environment Atmosphere

From the explanation above, the following framework can be made:

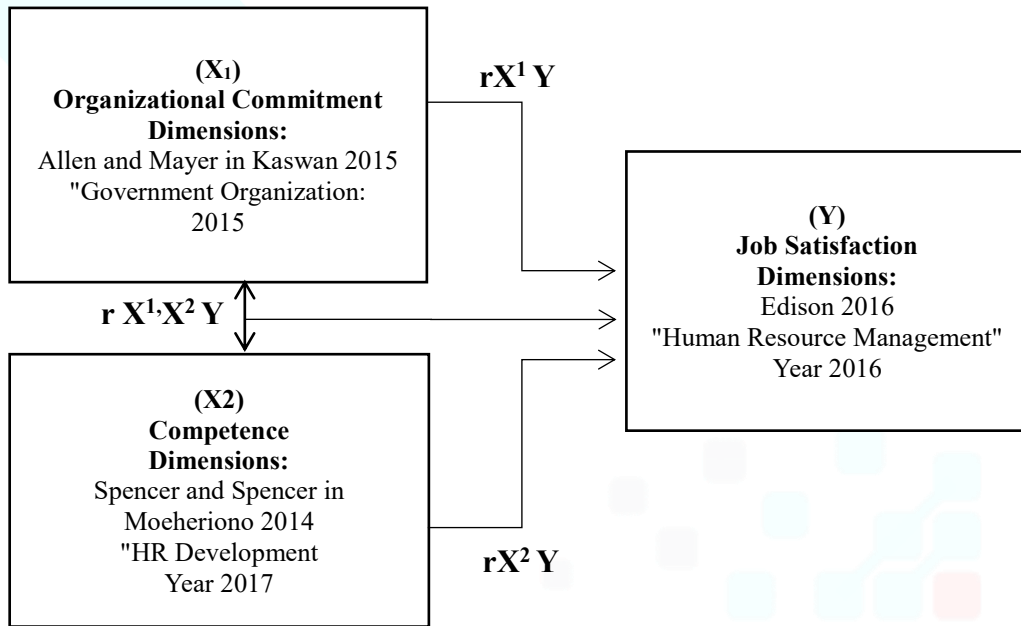


Figure 2. Framework of Thought

Based on the framework in Figure 2.1 and previous research, a research paradigm of related dimensions is made as follows:

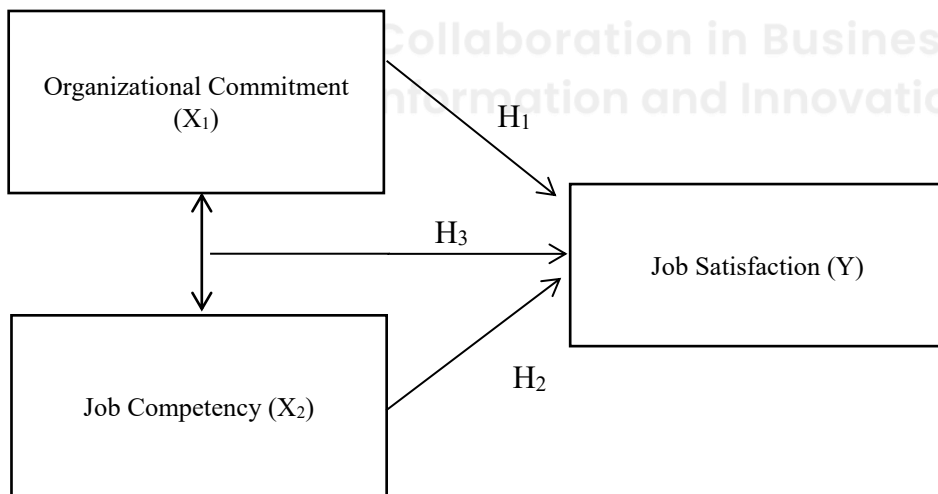


Figure 3. Research Paradigm

Hypothesis

According to Sugiyono (2014: 132) the hypothesis is a temporary answer to the formulation of research problems, it is said to be temporary because the answers given are only based on theory. The hypothesis is formulated on the basis of a framework which is a temporary answer to the formulated problem.

Based on the formulation of the problem, literature review and research paradigm, three alternative hypotheses are proposed in this study (H_1 , H_2 , H_3) as follows:

H1: There is an effect of organizational commitment (X1) on job satisfaction (Y)

H2 :There is an effect of job competence (X2) on job satisfaction (Y)

H3: There is an influence between organizational commitment (X1) and competence (X2) on job satisfaction (Y).

III. RESEARCH METHODOLOGY

This type of research used is quantitative research. The method used is the associative method. This research method uses the associative method because this associative method is a study that aims to determine the relationship between two or more variables and to determine the effect between variables. The research is located in the village government in the Susukanlebak sub-district. The population in this study were all village officials, totaling 133 people. The Probability Sampling uses the Simple Random Sampling technique. The number of sampling are 54 people from all the total. Determination of the number of samples using the slovin formula with a tolerable error rate of 10% with the following formula :

$$n = \frac{N}{1 + Ne^2}$$

When :

n = sample size

N = population

e = error (presentation error that can be tolerated for the inappropriate use of the 10% population replacement system).

Reliability Test

In this study, researchers measured the reliability test using the Cronbach Alpha technique, namely

$$\alpha = \frac{k \cdot r}{1 + (k-1) \cdot r}$$

Ghozali (2016:48)

Where :

α = Cronbach Alpha

r = Average correlation between items

k = Number of items

For the purposes of interpreting the results of reliability calculations, researchers used the provisions according to Nunnally (1994) in Ghozali (2016: 48) If the Cronbach Alpha value ≥ 0.70 means that the questionnaire measurement is reliable. To test reliability using Statistical Product and Service Solution (SPSS) 24.0. for Windows. In this study to determine the effect of Organizational Commitment (X1), Competence (X2), Job Satisfaction (Y). To test simple regression using SPSS 24.0. for Windows.

Regression Analysis

Analisis Regresi Sederhana

In this study to determine the effect of Organizational Commitment (X1), Competence (X2), Job Satisfaction (Y). To test simple regression using SPSS 24.0. for Windows.

The simple regression equation in Sugiyono (2016: 188), namely: $Y = a + bX$

Description:

Y = Predicted value

A = Constant or if the price of X = 0

B = Regression Coefficient

X = Independent Variable Value Uji Hipotesis

Multiple Regression Analysis

In this study, we determine the effect of organizational commitment (X1) and competence (X2) on Job Satisfaction (Y). To test multiple regression using SPSS 24.0. for Windows.

The multiple regression equation in Sugiyono (2016: 192), namely:

$$(Y) = a + b_1 (X_1) + b_2 (X_2)$$

Description:

Y = Bound Variable

X_{1,2} = Free Variable

a = Constant or if the price of X = 0

b = Coefficient of Regression Direction of Variables X₁ and X₂

T-test (partial hypothesis testing)

The test is carried out to test the significance of regression between the independent variable and the dependent variable using the one tailed test tool. The test steps are as follows:

a. Determine the hypothesis

H₀: b₁ = 0, if the independent variable does not affect the dependent variable.

H₁: b₁ ≠ 0, if the independent variable affects the dependent variable.

b. Looking for the t value from the t table, the t table value at 5% precision,

$$df = n - k$$

c. Determining the t value in Sugiyono (2016: 184), namely

$$t = \frac{r \sqrt{n - 2}}{\sqrt{1 - r^2}}$$

d. Comparing t count with t table

H₀ is rejected if tcount ≤ ttable

H₀ is accepted if tcount ≥ ttable

More clearly the hypothesis can be described as follows:

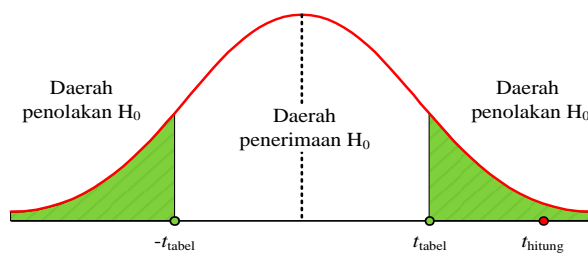


Figure 4. Acceptance and Rejection Areas of the t Test

F-test (total hypothesis testing)

The test is conducted to test the significance of the regression coefficient between two or more independent variables with the dependent variable using the F-test test tool. The test steps are as follows:

a. Determine the hypothesis

$H_0: b_1 = b_2 = 0$, if the independent variable does not affect the dependent variable.

$H_0: b_1 \neq b_2 \neq 0$, if the independent variable affects the dependent variable.

b. Find the value of F ($k - 1, n - k$) from the F table Ftable value at 10% precision

c. Determine the value of F count in Sugiyono (2016: 192), namely:

$$F = \frac{r^2/k}{(1 - r^2) / (n-k-1)}$$

d. Comparing F count with F table

H_0 is rejected if $F_{count} \leq F_{table}$

H_0 is accepted if $F_{count} \geq F_{table}$

More clearly the hypothesis can be described as follows:

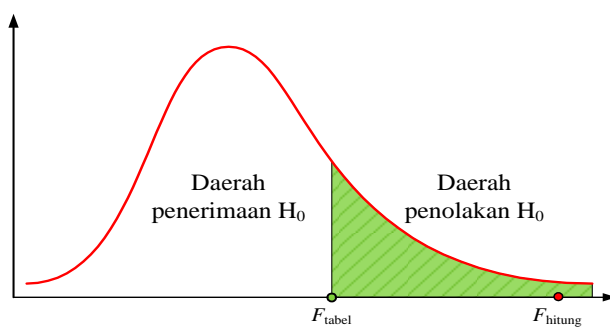


Figure 5. Test Acceptance and Rejection Regions

IV. RESULT / FINDING

Reliability Test

A questionnaire is said to be reliable if the answer to the statement is consistent or stable over time. With the criteria, the variable can be declared reliable if it provides a Cronbach Alpha value > 0.6 .

Reliability Test of Organizational Commitment (X1)

The results of the calculation of the instrument reliability test using the Statistical Package for the Social Science (SPSS) version 23 for windows program.

Table 2. Organizational Commitment Reliability Test Results (X1)

Reliability Statistics	
Cronbach's Alpha	N of Items
.876	18

Based on table 2 above, it appears that the Cronbach Alpha value is $0.876 > 0.70$, which means that all statements for the Organizational Commitment variable (X1) are reliable. So it can be concluded that all statements of the Organizational Commitment variable instrument (X1) can be used in the data analysis process.

Competency Reliability Test (X2)

The results of the calculation of the instrument reliability test using the Statistical Package for the Social Science (SPSS) version 23 for windows program.

Table 3. Competency Reliability Test Results (X2)

Reliability Statistics	
Cronbach's Alpha	N of Items
.914	24

Sumber: Output Data Diolah, Tahun 2019

Based on table 3 above, it appears that the Cronbach Alpha value is $0.914 > 0.70$, which means that all statements for the Competency variable (X2) are reliable. So it can be concluded that all statements of the Competency variable instrument (X2) can be used in the data analysis process.

Job Satisfaction Reliability Test (Y)

The results of the calculation of the instrument reliability test using the Statistical Package for the Social Science (SPSS) version 23 for windows program.

Table 4. Reliability Test Results Job Satisfaction (Y)

Reliability Statistics	
Cronbach's Alpha	N of Items
.906	24

Source: Data Output Processed, 2019

Based on table 4 above, it appears that the Cronbach Alpha value is $0.906 > 0.70$, which means that all statements for the Job Satisfaction (Y) variable are reliable. So it can be concluded that all statements of the Job Satisfaction (Y) variable instrument can be used in the data analysis process.

The Effect of Organizational Commitment (X1) on Job Satisfaction (Y)

The data will be processed through statistical simple regression models through computer assistance with the Statistical Package for the Social Science (SPSS) version 23 for windows, where the results are as shown in tables 5 and 6 below:

Table 5. Coefficientsa

Model		Unstandardized Coefficients		Standardized	T	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	-.459	2.588		-.177	.860
	Komitmen Organisasi	1.334	.033	.982	39.941	.000

a. Dependent Variable: Kepuasan Kerja

Table 6. Coefficient of Determination Organizational Commitment (X1) on Job Satisfaction (Y)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.982 ^a	.965	.964	1.550

a. Predictors: (Constant), Komitmen Organisasi

Source: 2020 Data Output

Interpretation of data from hypothesis test 1 (H1):

1. Based on the results of data processing in table 4.21, an R (B) value of 1.334 is obtained in a positive direction, this gives an indication that the greater the value of organizational commitment (X1), the higher the level of job satisfaction (Y).
2. Based on table 5, a tcount value of 39.941 is obtained $>$ from a ttable value of 1.67 or a significance value of $0.000 < 0.05$. This means that the effect of organizational commitment (X1) on job satisfaction (Y) is significant. Therefore the proposed hypothesis (H1) is accepted, that organizational commitment (X1) has a positive and significant effect on job satisfaction (Y) in village government in the Susukanlebak sub-district (H1) has been tested.
3. To determine whether the hypothesis (H1) is rejected or accepted, the following graph is presented in Figure 6 below:

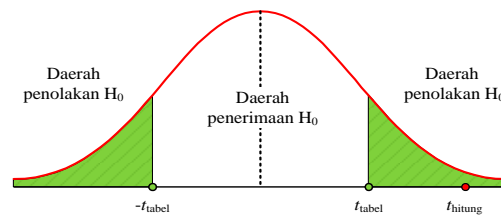


Figure 6. Areas of Rejection and Acceptance of the First Hypothesis

Based on table 5, an R Square value of 0.965 is obtained, this means that Organizational Commitment (X1) contributes 96.5% to interest in Job Satisfaction (Y) in Village officials in the Susukanlebak sub-district. and the remaining 3.5% is influenced by other variables not examined. This 96.5% contribution is included in the very strong category, because it is in the range of 0.80% - 1.00% (Sugiyono 2014:240). Results of Simple Regression Analysis Organizational Commitment (X1) on Job Satisfaction (Y)

The Effect of Competence on Job Satisfaction

The data will be processed through statistical simple regression models through computer assistance with the Statistical Package for the Social Science (SPSS) version 23 for windows, where the results are as shown in tables below:

Tabel 7. Results of Simple Regression Analysis

Competence (X2) on Job Satisfaction (Y)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	5.653	2.088		2.708	.009
	Kompetensi	.941	.020	.987	46.602	.000

a. Dependent Variable: Job satisfaction

Source: 2020 Data Output Processed

Tabel 8. Koefisien Determinasi
Kompetensi (X₂) terhadap Kepuasan Kerja (Y)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.987 ^a	.974	.974	1.335

a. Predictors: (Constant), Competence

Source: 2018 Data Output Processed

Interpretation of data from hypothesis testing 2 (H2):

1. Based on the results of data processing in table 4.23, an R(B) value of 0.941 is obtained in a positive direction, this gives an indication that the greater the Competence (X2), the higher Job Satisfaction (Y).
2. Based on table 4.23, a tcount value of 46.602 is obtained > from a ttable value of 1.67. Means the influence of competence on job satisfaction is significant. Therefore the proposed hypothesis (H2) is accepted, that competency (X2) has a positive and significant effect on job satisfaction (Y) in village officials. This means that the hypothesis proposed (H2) has been tested.
3. To determine whether the hypothesis (H2) is rejected or accepted, the following graph is presented in Figure 4.3.

Result section presents the results of the study. Research results can be supplemented with tables, graphs (pictures), and / or charts.

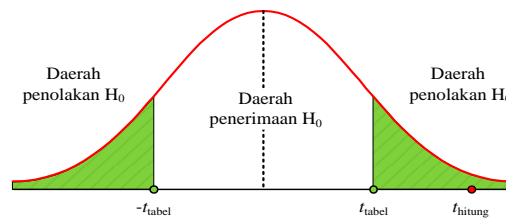


Figure 7. Areas of Rejection and Acceptance of the Second Hypothesis

Based on table 7, an R Square value of 0.974 is obtained, this means that Competence (X2) contributes 97.4% to Job Satisfaction (Y) in village officials and the remaining 2.6% is influenced by other variables not examined. This contribution of 97.4% is included in the very strong category, because it is in the range of 0.80% - 1.00% (Sugiyono 2014:250).

The Effect of Organizational Commitment and Competence on Job Satisfaction

The data will be processed through statistical multiple regression models through computer assistance with the Statistical Package for the Social Science (SPSS) version 23 for windows, where the results are as shown in tables below:

Table 9. Results of Multiple Regression Analysis

Organizational Commitment (X1) Competence (X2) on Job Satisfaction (Y)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3899.025	2	1949.512	1518.927	.000 ^b
	Residual	73.158	57	1.283		
	Total	3972.183	59			

a. Dependent Variable: Job satisfaction

b. Predictors: (Constant), Competence, Organizational Commitment

Source: 2019 Data Output Processed

Tabel 10. Coefficient of Determination of Organizational Commitment (X1) and Competence (X2) on Job Satisfaction (Y)

Model Summary

Model	R	R Square	Adjusted R	
			Square	Std. Error of the Estimate
1	.991 ^a	.982	.981	1.133

a. Predictors: (Constant), Competence, Organizational Commitment
Source: 2019 Data Output Processed

Interpretation of data from hypothesis testing 3 (H3):

1. Based on table above, an f_{count} value of 1518.927 is obtained $>$ from f_{table} with a value of 3.16 so that the influence of Organizational Commitment (X1) and Competence (X2) on Job Satisfaction (Y) has a significant influence, then the hypothesis that proposed (H3) is accepted, that Organizational Commitment (X1) and Competence (X2) have a positive and significant effect on Job Satisfaction (Y) on the Des device, this means that the hypothesis proposed (H3) has been tested.
2. Based on table 4.26 above, a multiple regression coefficient (R) of 0.991 is obtained with a positive direction, meaning that the higher the value of Organizational Commitment (X1) and Competence (X2), the higher the Job Satisfaction (Y) in village officials.
3. To determine whether the hypothesis (H3) is rejected or accepted, the following graph is presented in Figure 8.

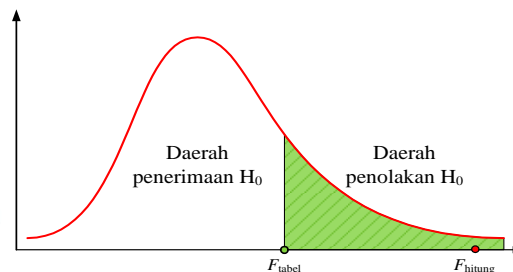


Figure 8. Areas of Rejection and Acceptance of the Third Hypothesis

Based on table 10, the Adjusted R Square value is 0.981, this figure indicates that Organizational Commitment (X1) and Competence (X2) contribute 98.1% to Job Satisfaction (Y) and the remaining 1.9% is influenced by variables- other variables not examined. This 98.1% contribution is included in the very strong category, because it is in the range of 0.80% - 1.00% (Sugiyono 2014:250).

V. DISCUSSION

Effect of Organizational Commitment on Job Satisfaction

Based on testing the first hypothesis (H1) using the simple regression test above, it proves that there is an influence between Organizational Commitment (X1) on Job Satisfaction (Y) on Village officials in the Susukanlebak sub-district area, Cirebon Regency. With the test data from the Statistical Package for the Social Science (SPSS) 23 for windows program, it can be seen from table 4.21 that the R (B) value is 1.334 with a positive direction, and the value of the t_{count} is 39.941 while the t_{table} is 1.67. Thus the t_{count} value $>$ from the t_{table} value, and a significant value of $0.000 < 0.05$ so it can be concluded that the relationship between the Organizational Commitment variable (X1) on Job Satisfaction (Y) has a positive and significant influence, by contributing 96.5% to the interest in Job Satisfaction (Y) and the remaining 3.5% is influenced by other variables not examined.

The Effect of Competence on Job Satisfaction

Based on testing the second hypothesis (H2) using the simple regression test above, it proves that there is an influence between Competence (X2) on Job Satisfaction (Y) on village officials in the Susukanlebak sub-district, Cirebon district. With test data from the Statistical Package for the Social Science (SPSS) 23 for windows program, it can be seen from table 4.23 that the R (B) value is 0.941 with a positive direction, and the value of the t_{count} is 46.602 while the t_{table} is 1.67. Thus the t_{count} value $>$ from the t_{table} value, and a significant value of $0.000 < 0.05$ so it can be concluded that the relationship between the Competency variable (X2) on Job Satisfaction

(Y) has a positive and significant influence, by contributing 97.4% to Job Satisfaction (Y) and the remaining 2.6% is influenced by other variables not examined.

Effect of Organizational Commitment and Competence on Job Satisfaction

Based on testing the third hypothesis (H3) using the multiple regression test above, it proves that there is an influence between the variables of Organizational Commitment (X1) and Competence X2) on Job Satisfaction (Y) on Village officials in the Susukanlebak sub-district area, Cirebon Regency. With test data from the Statistical Package for the Social Science (SPSS) 23 for windows program, it can be seen from table 4.26 that the R value is 0.991 with a positive direction, and the value of fcount in table 4.25 is 1518.927 while the ftabel is 3.16. Thus the tcount value > from the ttabel value, and the significant value of 0.000 < 0.05 so it can be concluded that the variable relationship, namely Organizational Commitment (X1) and Competence (X2) on Job Satisfaction (Y) has a positive and significant influence, by contributing 98.1% to Job Satisfaction (Y) and the remaining 1.9% is influenced by other variables not examined.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

Based on the results of the study "The Effect of Organizational Commitment and Competence on Job Satisfaction of Village Apparatus in Susukanlebak District, Cirebon Regency. Thus the implications of this research are as follows:

1. Organizational commitment (X1) affects job satisfaction (Y). This can be seen in the average value in the frequency distribution of 2.58 and is included in the good enough category. With the smallest average value in the 2nd statement of 2.43 "I Love Being in this Agency". Furthermore, input to the kuwu in the Susukanlebak sub-district area should pay attention to a sense of comfort and security to village officials, in order to create a sense of love for the agency.
2. Competence (X2) affects job satisfaction (Y). This can be seen in the average value in the frequency distribution of 2.58 and is included in the good enough category. With the smallest average value in the 2nd statement of 2.42 "Ability to Complete Tasks Part of a Person's Attitude". Furthermore, input to the kuwu in the Susukanlebak sub-district area to provide training and development related to the ability of their village apparatus, so that in solving tasks and problems can be resolved cheerfully in accordance with the vision and mission.
3. Organizational Commitment and Competence (X2) affect job satisfaction (Y). This can be seen in the average value in the frequency distribution of 2.57 and is included in the good enough category. With the smallest average value in the 2nd statement of 2.42 "Leaders Can Create a Conducive Work Environment". Furthermore, input to the kuwu in the Susukanlebak sub-district area is to create a conducive work atmosphere and environment and a representative workplace, in order to create a cheerful work culture in accordance with their vision and mission.

6.1 Recommendation

Based on the results of the research, conclusions, implications, and limitations, the researcher provides the following suggestions:

1. For related objects
All village governments are expected to be able to improve their organizational commitment and work competence, so that the job satisfaction of village officials in the Susukanlebak sub-district area is getting better and very good. So that the services provided to the community in the area of each village make excellent service, and in accordance with the vision and mission of the sub-district for the village in the Susukanlebak sub-district area.
All villages in the Susukanlebak sub-district area, especially for the kuwu to pay more attention to the factors that influence the dissatisfaction of village officials. Such as work environment factors, training and development factors, and a sense of love for the institution or workplace are getting better in order to avoid resignation of village officials in the Susukanlebak sub-district area.
2. For Further Researchers
The variables used for this study were only two variables, therefore further research can add other variables. So that it can provide a broader picture of what factors affect job satisfaction besides the factors of organizational commitment and work competence.
The questionnaire made by researchers regarding the variables of organizational commitment, competence and job satisfaction is still limited and from each statement it can be optimized with a better

statement and is easier for respondents to understand, therefore in future studies it can add and improve the statements in this study.

The data collection method from the total population used in this study uses simple random sampling techniques or random techniques from the total population. Future research is expected to increase the number of samples to be used, so that it will approach the actual results and conditions.

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Sustainable Collaboration in Business,
Technology, Information and Innovation

The Influence Of Legal And Regulatory Framework On Performance Audit In Oil And Gas Sector In Tanzania

Amani Patrick Mbogella, Semboja Haji Hatib¹, Zuhura Mohammed Abdallah¹

¹Faculty of Business Administration, Zanzibar University, Zanzibar, Tanzania

Abstract

Tanzania's Supreme Audit Institution has experience in performance audit for vast of years. The office of the Controller and Auditor General in Tanzania is known globally. This article assesses the influence of legal and regulatory framework on performance audit in oil and gas sector in Tanzania. Tanzania government have taken initiatives to ensure that the legal and regulatory framework is effective. However, there is still challenges with regard to the legal and regulatory framework in Tanzania context. Hence results to inadequate performance of the audit performance in Tanzania. Results showed that, there is positive relationship of legal and regulatory framework and performance audit, this implies that a unit change in the legal and regulatory framework will increase the efficiency in performance audit by the rate of 0.161 at 5% level of significant. In order to ensure that performance audit is effective, this study thus, recommends ensuring performance audit is prepared according to the approved audit standards and the performance audit unit consist multi disciplinary. The Central Government should establish legal and regulatory framework which emphasizes the need for regular audit of government entities operations and the Treasury should disburse funds for audit activities timely.

Keywords. Legal and Regulatory Framework, Performance Audit; Oil and gas sector; Tanzania

I. INTRODUCTION

In recent years Tanzania undergone various reforms such as financial management reforms. This is due to dissatisfaction with management of public resources (Hoffinan, 2011, and Makoye, 2013). One of the key element of these overall reforms in public sector is the financial control mechanisms particularly on the performance audit unlike to the regularity audit which looks in individual transactions to determine if the transaction conforms to the authority and complies with expenditure rules and related funding institutions (Schillemans, 2013 and Rubecksen, 2009). Public sector audit in Tanzania has gained much recognition from the government of Tanzania and the public in general due to corruption, mismanagement of public funds and accountability phenomena. The government of Tanzania has put much effort on performance audit as this will increase the accountability in the public sector.

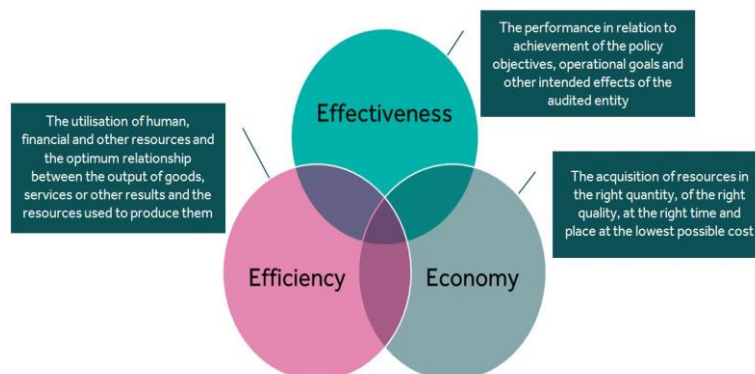


Figure 1. Assertions of Performance Audit

Increasing demand for performance audit in oil and gas sector in Tanzania has created research opportunities as ordinary people have not benefited from oil and natural gas exploration in many African states (Raymond & Leffler, 2006). Billions of dollars in revenue had little positive impact on the lives of most people in countries like Angola and Nigeria (Simbakalia, 2013, CAG report, 2018, Kibendera, 2013). In Tanzania, Uganda, Mozambique and other new oil states in Africa, the recently discoveries of oil and natural gas resources will be beneficial if will consist value for money on its production and operation. Effective legal and regulatory framework should be established by supreme audit institutions so as to maintain a high standard of performance audit activity. Furthermore the performance auditor is expected to address concerns relating to assertions of performance audit while assessing the effectiveness of a program or activity.

Performance audit resources may jeopardize the nation's opportunity to fully capitalize its natural resources if is inadequate. Given the significant discoveries of natural gas in Tanzania, there is apparent demand of Tanzanian citizens participation at all levels of natural gas value chain. Participation of the Tanzanian in oil and natural gas activities is importance for the industry's stability, integration into local economies and poverty reduction. However, according to Kibendera (2013), Tanzania has challenges towards the exploration and implementation of natural resources including oil and natural gas extraction. Moreover, CAG report (2018) demonstrated that there is a skill gap at the professional levels in auditing sector for extractive industry in Tanzania. Despite the fact that, the government of Tanzania has identified gaps in legal and regulatory framework in natural gas value chain still there is a concern on performance audit management which has to be addressed. There is a need for more practical and context based knowledge on performance audit in general. This study will employ a critical interpretive approach to investigate the legal and regulatory framework in order to gain understanding of the practice and the role of public sector audit particularly for performance audit in oil and gas sector in Tanzania.

II. RESEARCH METHODOLOGY

This part provides the research design, population, sampling procedures, validity and reliability of the study instruments and the procedures for data analysis.

2.1 Research Design

This study adopted a cross sectional survey research design, here analysis constitutes data of variables which is collected at one given point of time across a sampled population. Being a survey research design enabled the researcher to administer a questionnaire to a large sampled population to describe the attitudes, opinions, behavior or characteristics of the population. In survey research design, a researcher collect data that explain and quantify social phenomena, particularly issues, conditions and problems that are prevalent in the society at a particular point in time, without repeating the same unit of inquiry (Tan, 2010).

2.2 Study Population

For the purpose of this study, the study population were 1,204 from three entities. The first entity consists all employees (614) of the supreme audit institution in Tanzania (SAI), which is mainly concerned with the performance audit in oil and gas sector in Tanzania, the second entity consists all employees (385) from Total Tanzania LTD which is the oil and gas company in which over 50 years, has remained the leader in downstream sector of Tanzania oil and gas sector with an extensive distribution network and the third entity consist the employees (205) from Tanzania Petroleum Development Corporation (TPDC). TPDC is involved in the upkeep of the petroleum database, the promotion of acreage, the negotiation and award of licenses, and the monitoring of contracted companies under operations.

2.3 Sample Size

The sample has been derived from a sample frame of 1,204 staff from Tanzania supreme audit institution, Total Tanzania LTD and TPDC. The proportional sampling has been used due to the fact that the target population is greater than 1,000 but less than ten thousand items/ respondents from three entities. Thus, from the selected three entities, a sample of 471 staff has been selected from the population of 1,204 basing on the simple random sampling size determination formula shown below. In additional, this formula was applied in line with Mugenda and Mugenda (Mugenda, & Mugenda, 2003) statistical technique for selecting a sample from a population of less than ten thousand.

$$n = \frac{\frac{z_{\alpha/2}^2 P(1-P)}{e^2}}{1 + \frac{z_{\alpha/2}^2 P(1-P)}{Ne^2}} = \frac{\frac{1.96^2 \times 0.5(1-0.5)}{0.05^2}}{1 + \frac{1.96^2 \times 0.5(1-0.5)}{1,204 \times 0.05^2}} = \text{approximately to } 471$$

Thus, the level of confidence which placed 95% provides us a Z Value of 1.96 per the normal Table. Where Z is the critical value that is 1.96 and e is the margin error of 5% which is 0.05, p is the probability proportion which is 0.5, N is the population and n is the sample size. Proportional sampling technique is used when the population is large.

2.4 Data Collection Methods and Tools

Primary and secondary data were employed in this study. Semi structured interview, focused group discussions and surveyed questionnaire methods were used for collection of primary data.

Secondary data also were used in this study, written or printed materials was obtained particularly from the audit reports, financial statements and progress reports of Tanzania supreme audit institution, Total Tanzania LTD and TPDC.

2.5 Data Analysis (Qualitative and Quantitative)

For quantitative data, likert scale, multiple linear regression model were used under the study. Likert scale from questionnaires were used whereby data was analyzed using SPSS V. 26 and STATA software's. Moreover, in case of likert scale of 1-5 stages was used. The scale was divided into I, Strong Dissatisfied, 2 Dissatisfied 3, Neutral, 4 Satisfied and 5 Strong Satisfied.

III. ESTIMATION OF MODEL

3.1 Multiple Linear Regression Model

It is a statistical model which explains the continuous dependent variable with independent variable. The independent variables may be two or more. The independent variables may be continuous or categorical (dummy coded appropriate). As far as this study is concerned, the independent variable is the legal and regulatory framework whereby the dependent variable is the effective performance audit. The aim of the model is to obtain a model which best predicts the chance of an outcome variable (let's say y) as a function of the explanatory variables (let's say x's).

Study Objective: To Determine the Influence of Legal and Regulatory Framework on Performance Audit in oil and gas Sector in Tanzania

Multiple regression and correlation analysis was employed before, the legal and regulatory framework index was obtained by adding each item in the legal and regulatory framework to obtain the total index which is a continuous variable. Similarly, the performance audit index was obtained by adding each item and obtaining a total index. After having obtained these variables of the correlation, multiple linear regression model was employed.

Diagnostics checks such as box plot were employed to determine whether there is an outlier, test of heteroskedasticity by using Breusch pagan test, test multicollinearity by using a variance inflation factor (VIF), test of linear association between the performance audit index and the legal and regulatory framework and finally test of autocorrelation were employed in order to ensure that the estimate obtained from the multiple linear regression model are unbiased, efficient and consistent as follows.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 (X_A + X_B + X_C) + \varepsilon$$

Whereby Y= performance audit score or index X_1 =Modern audit systems, this is categorical variable 1, X_2 =Old audit systems that is a dummy variable 1 and X_3 =Legal and regulatory framework score or index, X_A =Constitutional Mandate, X_B =Audit Act and X_C =Audit regulations.

3.2 Reliability

The issue of reliability was ensured by the researcher through pre-testing of tools, parallel form reliability and using the internal reliability methods such as Cronbach's alpha. The researcher also used semi-structured interview to different categories of the respondents.

3.3 Validity

The validity of this study was ensured by the usage of different methods as triangulation. Researcher has also carefully prepared interview guides based on the research questions. Thereafter, it was presented to the experts for validation and improvement before embarking on data collection.

3.4 Data Analysis, Results and Discussion for the Influence of the Legal and Regulatory Framework on the Performance Audit in Oil and Gas Sector in Tanzania

The influence of the legal and regulatory framework towards auditing is the main variable under the study. Based on this statement, three variables were developed namely; the constitution mandate, the Audit Act and the audit regulations. Based on sub variables raised, questionnaires were developed to investigate the influence of the legal and regulatory framework on the performance audit in oil and gas sector in Tanzania and the results were obtained and analyzed as described below.

3.4.1 Constitutional Mandate

The Constitutional mandate is one of the variable under legal and regulatory framework. The study sought to determine the extent to which constitutional mandate were adhered as far as the performance audit is concerned. Three questionnaires were developed and results from the respondents were analyzed accordingly. The questionnaire developed were related to. The extent to which performance audit is mandated into the constitution; the extent to which scope of performance audit is mandated into the constitution, the roles of performance audit mandated into the constitution and the time frame of performance audit.

3.4.1.1 Performance Audit and Constitution Mandate

The findings on the performance audit mandate in the constitution sought to investigate if performance audit is well mandated into the constitution content, the results indicate that 34.9 % of the respondents strongly disagreed and 43.2 % disagreed that, performance audit is well mandated into the constitution. While 6.5% strongly agreed and 7.9% agreed meanwhile, 7.6% of the respondents were neutral as shown in the Figure 2.

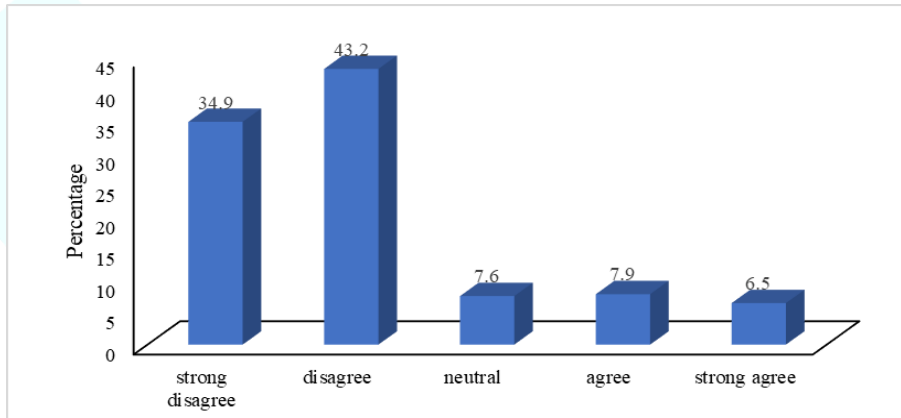


Figure 2. The Relevance of Performance Audit Mandate in the Constitution

Thus, the majority of the respondents do not agree that the performance audit and its mandate is not well addressed into constitution.

3.4.1.2 Scope of Performance Audit

The findings on the scope of performance audit sought to investigate if scope of performance audit is well addressed into the constitution, the results showed that 11.9 % of the respondents strongly disagreed and 39.2 % disagreed that the scope of performance audit is well addressed into the constitution. While 15.8% of the respondents strongly agreed and 15.5% agreed meanwhile 17.6% of the respondents were neutral as shown in the Figure 3.

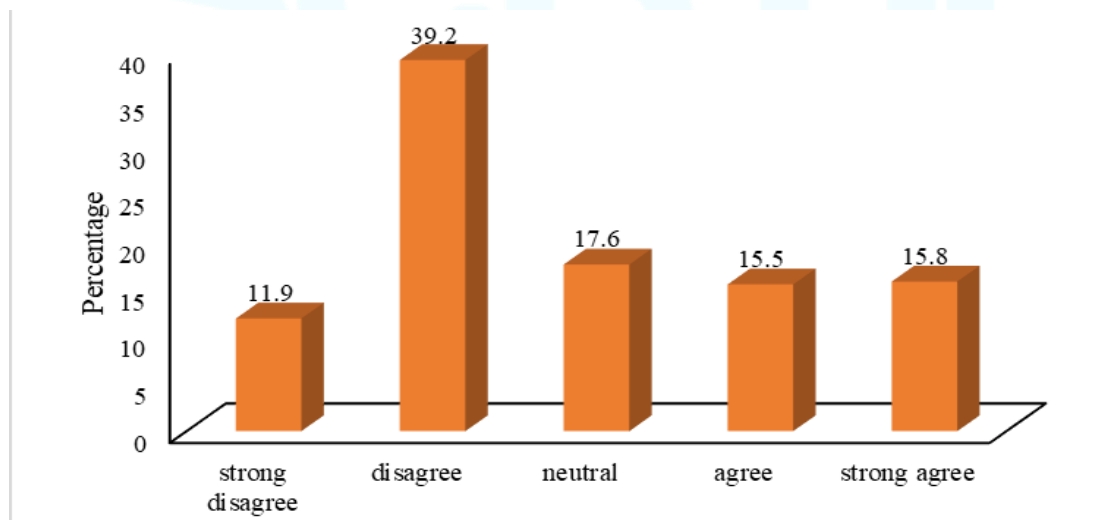


Figure 3. Scope of Performance Audit and the Constitution

Thus, the majority of responded stated that the scope of performance audit is not well stated into the constitution, which hinder the efficiency of the performance audit in Tanzania.

3.4.1.3 The Roles of Performance Audit

The findings on the roles of performance audit which sought to seek if the roles of performance audit is well addressed into the constitution. The results showed that 13.3% of the respondent strongly disagreed and 45% disagreed that the roles of performance audit is well addressed into the constitution. While 12.2% of the

respondents strongly agreed and 15.1% of the respondents agreed meanwhile 14.4% were neutral as shown in the Figure 4.

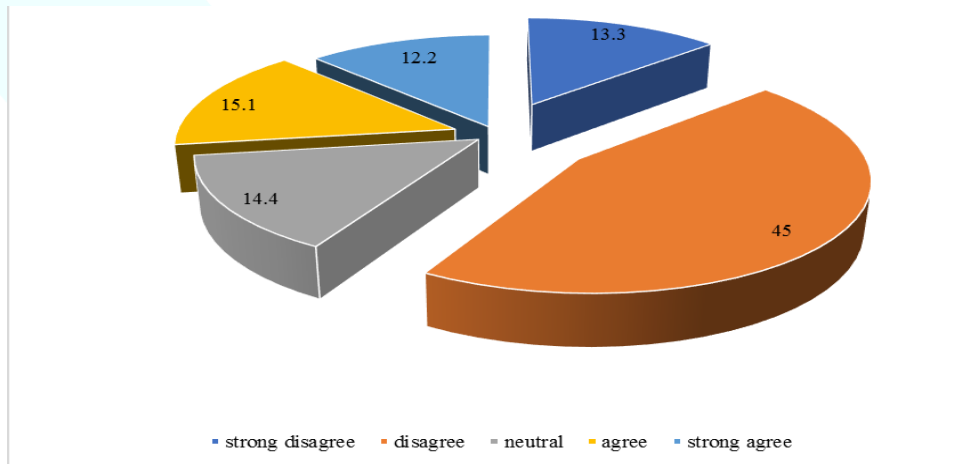


Figure 4. The Role of Performance Audit

Thus, the majority of the responded stated that the roles of performance audit is not well stated into the constitution. Hence pose the challenge on the performance audit.

3.4.1.4 Time Frame of Performance Audit

Time frame of performance audit is one of the variable under the study. The study sought to determine the extent to which the time frame of the performance audit is well expressed under the constitution, the results showed that 7.9% of the respondents strongly disagreed and 37.1% disagreed that time frame for performance audit is well stipulated into constitution. While 15.8% of the respondents strongly agreed and 16.5% agreed meanwhile 22.7% were neutral as shown in the Figure 5.

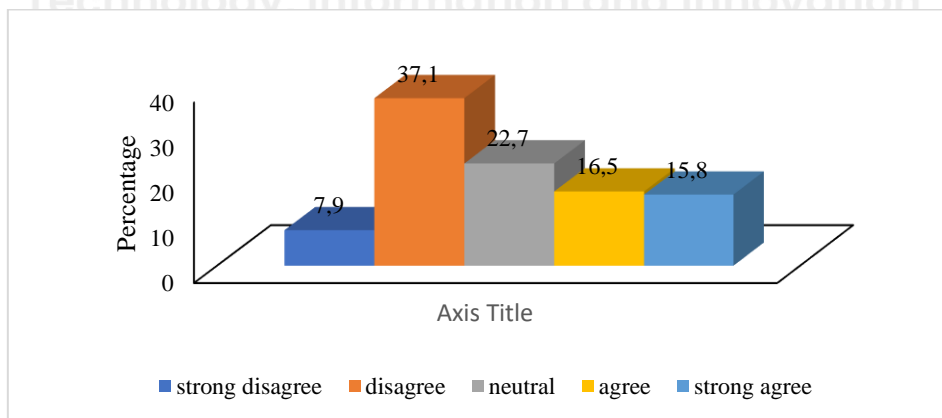


Figure 5. Time Frame of Performance Audit and Constitution

Therefore, the majority of the respondent stated that the time frame of performance audit is not well stated into the constitution, this hinder the effectiveness of the performance audit particularly in oil and gas production in Tanzania.

3.4.2 The Audit Act and the Performance Audit

The audit Act is one of the sub-variable under the legal and regulatory framework as the independent variable of the study. The study sought to determine the extent to which audit Act is well expressed the performance audit. Three questionnaires were developed and results from the respondents were analyzed accordingly. The developed questionnaires were related to; the relevance of scope of performance audit, the relevance of the roles of performance audit and the relevance of the time frame of performance audit as described below.

3.4.2.1 The Relevance of Scope of Performance Audit

The findings on the relevance of scope of performance audit into Audit Act sought to investigate if the scope of performance audit is well stated. The results showed that 17.7% of the respondents strongly disagreed and 37.5% of the respondents disagreed that the scope of performance audit into audit Act is not well stated. While 12.6% of the respondents strongly agreed and 17.7% agreed meanwhile 22.4% were neutral as shown in the Figure 6.

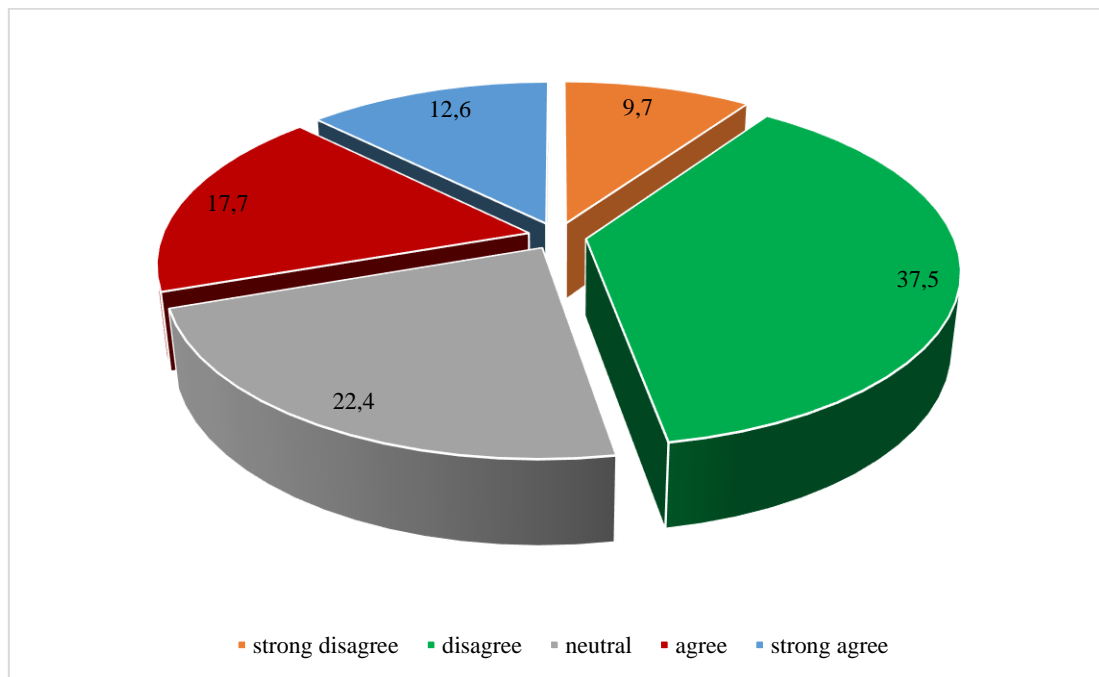


Figure 6. Relevance of Scope of Performance Audit into Audit Act

Hence, the majority of the respondents do not agree that the scope of performance audit is well addressed into the audit Act. Hence hinders the efficiency of the performance audit in Tanzania.

3.4.2.2 The Relevance of the Roles of Performance Audit

The findings on the relevance of the roles of performance audit into audit Act sought to investigate if the roles of performance audit is well stipulated into audit Act, the results showed that 7.3% of the respondents strongly disagreed and 33% disagreed that the roles of performance audit is well addressed into audit Act. While 15.8% of the respondents strongly agreed and 20.1% agreed meanwhile 23.8% were neutral as shown in the Figure 7.

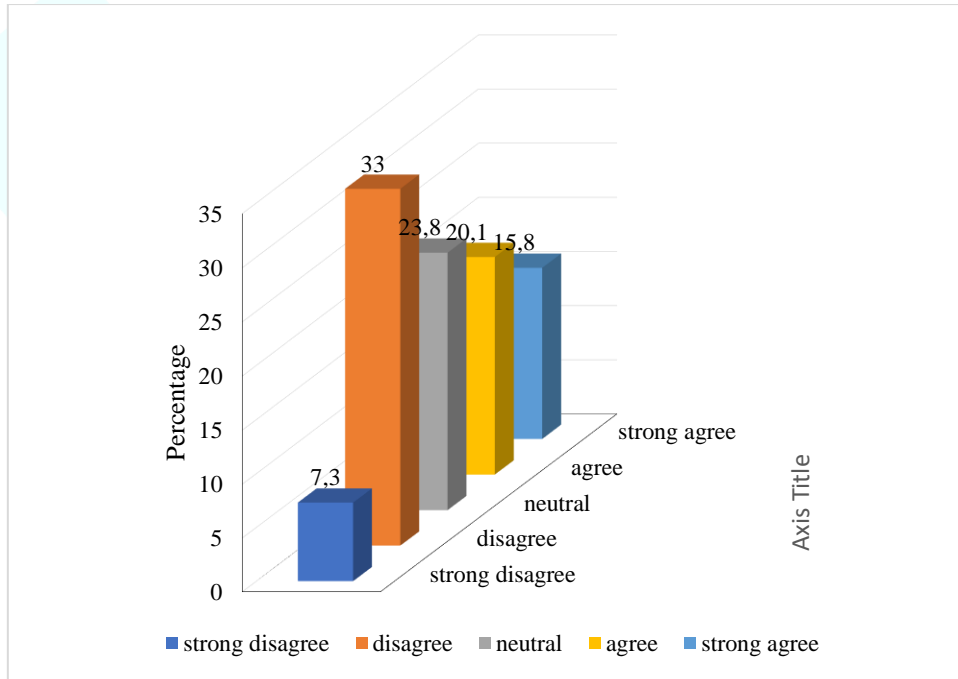


Figure 7.The Relevance of the Roles of Performance Audit

Thus, the majority of respondent stated that the roles of performance audit is not well addressed into audit Act. Hence hinders the efficiency of the performance audit.

3.4.2.3 The Relevance of the Time Frame of Performance Audit

The findings on the relevance of the time frame of performance audit sought to investigate if the time frame to conduct performance audit is well addressed into Audit Act. The results indicated that, 16.9% of the respondents strongly disagreed and 45% disagreed that the time frame to conduct the performance audit is not well addressed into the audit Act. While 7.6% of the respondents strongly agreed and 14.7% agreed meanwhile 15.8% of the respondents were neutral as shown in the Figure 8.

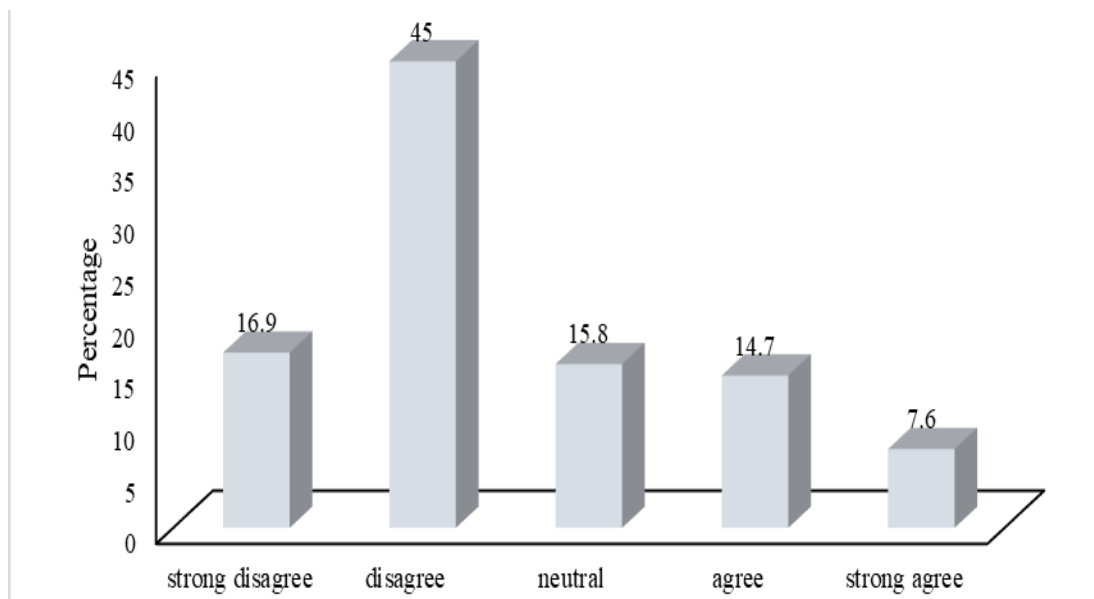


Figure 8. The Relevance of Time Frame of Performance Audit

Therefore, the majority of respondent agreed that the time frame for conducting the performance audit is not well addressed into audit Act.

3.4.3 The Audit Regulations and the Performance Audit

The study sought to determine the extent to which audit regulations is well expressed the performance audit. Three questionnaires were developed and results from the respondents were analyzed accordingly. The developed questionnaires were related to; the relevance of scope of performance audit, the relevance of the roles of performance audit and the relevance of the time frame of performance audit as described below.

3.4.3.1 Scope of Performance Audit

The findings on the scope of performance audit in audit regulations sought to investigate if the scope of performance audit in audit regulations is well addressed, results indicate that 12.2% of the respondents strongly disagreed and 49.6% disagreed that the scope of performance audit in audit regulations is well addressed. While 5.8% of the respondents strongly agreed and 14.7% agreed meanwhile 17.6% of the respondents were neutral as shown in the Figure 9.

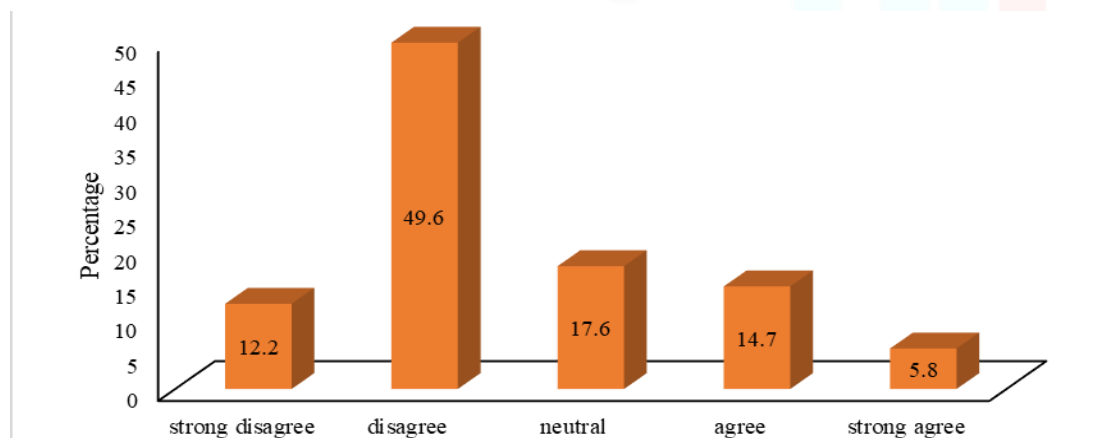


Figure 9. The Scope of Performance Audit

Thus, the majority of respondents do not agree that the scope of performance audit into audit regulations is properly addressed.

3.4.3.2 The Roles of Performance Audit and the Audit Regulations

The findings on the roles of performance audit into audit regulations sought to investigate if the roles of performance audit is well addressed into audit regulations, the results indicate that 25.7% of the respondents strongly disagreed and 21.7% of the respondents disagreed that the roles of performance audit is well addressed into audit regulations. While 5.1% of the respondents strongly agreed and 23.2% of the respondents agreed meanwhile 23.2% were neutral as shown in the Figure 10.

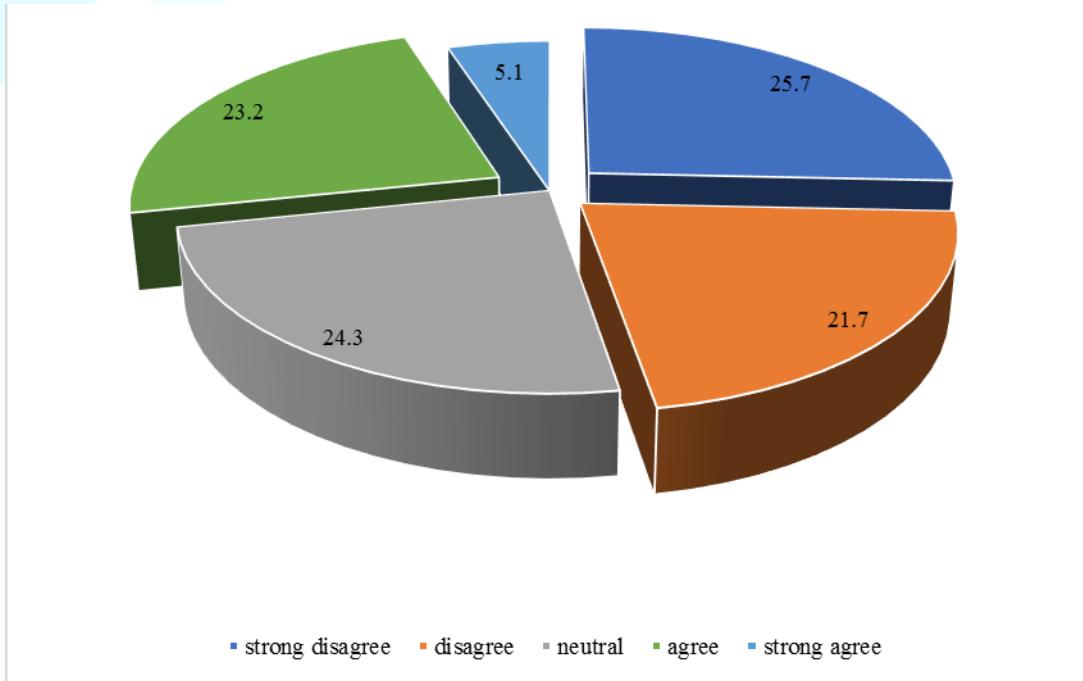


Figure 10. The Roles of Performance audit and the Audit Regulations

Hence the majority of institutional actors showed that they are not independent on the implementation of the projects.

3.4.3.3 The Time Frame of Performance Audit and the Audit Regulations

The findings on the time frame of the performance audit sought to investigate if the time frame of the performance audit is well addressed into the audit regulations. Results indicated that, 24.5% of the respondents strongly disagreed and 39% of the respondents disagreed that, the time frame for the performance audit is well outlined into audit regulations. While 7.6% of the respondents strongly agreed and 14.1% of the respondents agreed meanwhile 14.8% of the respondents were neutral as shown in the Figure 11.

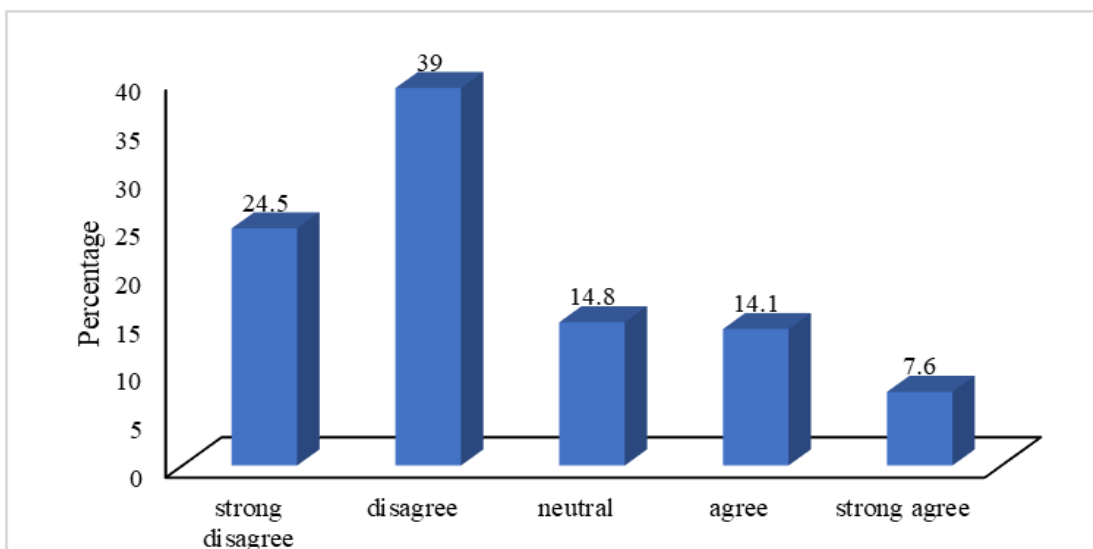


Figure 11. The Time Frame of Performance Audit and Audit Regulations

Therefore, the majority of respondents disagreed that, the time frame of the performance audit is not well addressed into the audit regulations. Hence hinder the efficiency of the performance audit.

3.5 Descriptive Analysis of the Legal and Regulatory Framework on the Performance Audit in Oil and Gas Sector in Tanzania

Respondent's opinion on whether Performance audit and its mandate in the constitution, on average score (2.0791) of respondents disagreed, while the respondents' opinion on whether the scope of performance audit in the constitution, on average score (2.8417) of respondents were neutral. Respondent's opinion on the roles of performance audit in the constitution, on average score (2.6799) of the respondents disagreed. Meanwhile the respondents' opinion on whether the time frame of performance audit in the constitution, on average score (2.9532) of respondents were neutral.

Respondents' opinion on relevance of the scope of performance audit, on average score (2.8592) of respondents were also neutral meanwhile the respondents' opinion on the relevance of the roles of performance audit, on average score (3.0403) of respondents were neutral. Respondents' opinion on whether the relevance of the time frame of the performance audit, on average score (2.5108) of the respondents disagree, while the respondents' opinion on the scope of the performance audit, on average score (2.5216) of the respondents disagree.

In addition, the respondents' opinion on the roles of the performance audit, on average score (2.6014) of the respondents disagree, meanwhile the respondents' opinion on the time frame of the performance audit, on average score (2.4116) of the respondents disagree.

The overall results indicate that on average (2.64988) of the respondents disagree that there is adequate legal and regulatory framework towards the performance audit in oil and gas sector in Tanzania as shown in Table 1.

Table 1. Descriptive Analysis for Legal and Regulatory Framework

Variable	Mean	Rank	Decision
Performance audit and its mandate in the constitution	2.0791	12	D
The scope of performance audit in the constitution	2.8417	4	D
The roles of performance audit in the constitution	2.6799	5	D
The time frame of performance audit in the constitution	2.9532	2	D
The relevance of the scope of performance audit	2.8592	3	D
The relevance of the roles of performance audit	3.0403	1	A
The relevance of the time frame of the performance audit	2.5108	9	D
The scope of the performance audit	2.5216	8	D
The roles of the performance audit	2.6014	6	D
The time frame of the performance audit	2.4116	11	D
Overall mean	2.64988		D

Source. Field Survey, 2022

KEY. Mean scores ranging from 1-1.80=Strongly Disagree, 1.81-2.80= Disagree, 2.81-3.20=Neutral, 3.21-4.20=Agree, 4.21-5.00=Strongly Agree

These findings are also supported by CAG (2018) and NBAA (2014) who showed that, inadequate legal and regulatory framework of the project implementation hinder the performance of projects in extractive industry. In addition, they said that, the labour turn over on the implemented projects is very high due to inadequate working conditions including, lack of motivation, limited working facilities and inadequate of capacity building for the project staff.

3.6 Correlation between the Legal and Regulatory Framework and the Performance Audit

Table 2 shows the relationship between the legal and regulatory framework (as measured by the legal and regulatory framework score) and performance audit (measured by the performance audit score), while controlling of the modern audit systems and the old audit systems. Preliminary analyses were performed to ensure no violation of the assumption of normality, linearity and homoscedasticity. There was a weak, positive, correlation between the legal and regulatory framework and the performance audit, controlling of the modern audit systems and the old audit systems, ($r=0.241$, $n=264$, $p=0.001$). As presented in the Table 2, the coefficient of determination R square is 0.134 and R is 0.366 at 5% level of significance. The coefficient of determination indicated that 13.4 of variation on the performance audit has been explained by the independent variables included in the model.

Table 2. Correlation between the Legal and Regulatory Framework and the Performance Audit

Control Variables			Legal & Regulatory Framework	Performance Audit
Modern & Old audit systems	Legal and Regulatory Framework	Correlation	1	0.241
		Significance (2-tailed)	.	0
		Df	0	264
	Performance audit	Correlation	0.241	1
		Significance (2-tailed)	0	.
		Df	264	0
R	.366			
R Square	0.134			
Adjusted R Square	0.124			
Std. Error of the Estimate	5.47155			

** Significant at 0.01(2-tailed).

3.7 Legal and Regulatory Framework versus the Performance Audit in Oil and Gas Sector in Tanzania

The analysis of variance in Table 3 shows that the model used was statistically significant at ($P < 0.001$, $F=13.645$ and degree of freedom (DF) = 274) account for the joint variation of the independent variables with the dependent variables. This implies that the modern audit systems and the old audit systems and the legal and regulatory framework have a significant combined effect on the performance audit.

Table 3. Analysis of Variance

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1225.529	3	408.51	13.645	.000b
Residual	7903.591	264	29.938		
Total	9129.119	267			

Multiple linear regressions were further used to assess the effect of modern audit systems, old audit systems and the legal and regulatory framework in the performance audit. The result in Table 4 shows that the legal and regulatory framework is statistically significant (p -value <0.01) and it had positive influence on the performance audit. This implies that a unit change in the legal and regulatory framework will increase the efficient in performance audit by the rate of 0.161326. Modern audit systems was statistically significant (p -value <0.01) and it had a positive influence on the performance audit. This implies that the modern audit systems applied in performance audit in oil and gas sector in Tanzania exceed in the efficiency of performance audit using old audit systems by the rate of 2.308836 in the performance audit. Even when modern audit systems, old audit systems and the legal and regulatory framework are non-existent, the performance audit is still positive at 15.98793 indicating that there are other drivers of the performance audit including the audit policies, the institution framework and the institutional capacities.

Table 4. Regression Output of the Legal and Regulatory Framework and the Performance Audit

Variable	Unstandardized Coefficients		T	Sig.
	B	robust standard error		
Constant	15.98793	1.317529	12.13	0
Modern audit systems	1.567117	0.771672	2.03	0.043
Old audit systems	2.308836	0.82035	2.81	0.005
Legal & Regulatory Framework	0.161326	0.041356	3.9	0

Note - -Modern audit systems and old audit systems are controllable variables under the study

IV. CONCLUSION AND RECOMMENDATIONS

Results showed that, there is positive relationship of legal and regulatory framework and the performance audit as audit legal and regulatory framework was statistically significant (p -value <0.01) and had positive influence on the performance audit. This implies that a unit change in legal and regulatory framework will increase the efficient of performance audit by the rate of 0.161 at 5% level of significant. The modern audit systems were statistically significant (p -value <0.01) and it had positive influence on the performance audit. This implies that the performance audit used the modern audit systems exceed the performance audit used old audit systems by the rate of 2.432 in terms of audit performance.

The study recommended that, the Central Government should establish legal and regulatory framework which emphasizes the need for regular audit of government entities operations particularly on the oil and gas sector. Regular auditing (At least each financial year) is an important activity as it enables the Controller and Auditor General to identify the opportunities for the increase of value for money opportunities and identify malpractices and likelihood of fraudulent activities into public institutions including auditing cooperation's which are concerned with oil and gas production in Tanzania. This statement is also supported by the World bank findings (2009).

4.1 Practical Implications of the Study

In practice, value for money for oil and gas sector is achieved through performance audit by involving the appropriate legal and regulatory framework and understanding and addressing challenges which emerge during production, distribution and usage of oil and gas.

Using relevant legal and regulatory framework in performance audit is a significant strategy to be used on performance audit, hence this needs to be undertaken into consideration by SAI when planning, designing and implementing regulatory reforms as suggested by this study. Moreover, audit staff are only seen as passive receivers of the legal and regulatory framework outcome, not as active participants in using audit rules, audit staff are supposed to be active in using appropriate audit regulations. Effective legal and regulatory framework will result to improved performance audit particularly in oil and gas sector in Tanzania. This is also supported by Kearey *et al.*, (2012) and Crocker, (2006), both suggested that audit staff participation on establishment of relevant legal and regulatory framework will add value towards the performance audit.

In addition, the study found that the role of legal and regulatory framework is paramount for performance audit. The current audit legal and regulatory framework applied in performance audit is too limited and does not cover all dimensions of audits particularly value for money for oil and gas sector in terms of control system, audit scope and its mechanism. The auditors practically use manual systems in which auditing is limited and not efficiently done, audit systems used does not adequately add value towards the performance audit such as in oil and gas sector. Hence the study suggests that effective audit legal and regulatory framework should be used on performance audit particularly in oil and gas sector auditing.

4.2 Contribution of the Study to Policy and Decision Makers

Policy makers and decision makers will gain insight on the critical roles of auditors in performing performance audit in oil and gas sector and gain understanding on the important role that performance audit plays in enhancing corporate governance, particularly in fostering government official's accountability and transparency. Policy and decision makers also will get to know the effective legal and regulatory framework in conducting performance audit without ignoring the involvement of auditors who are the backbone for effective audit in oil and gas sector. Hence the study help policy formulas to identify the loopholes in performance audit and their effects in oil and gas sector and hence design and develop policies accordingly.

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Relationship Between Artificial Intelligence Technology, Knowledge Sharing, and Digital Leadership Styles Towards Generation Z Individual Innovativeness During the Internship Period (MBKM Internship Program)

Anjani Uswatun Hasanah Wahyudi¹, Achmad Fajar Hendarman²
^{1,2}Institut Teknologi Bandung, Bandung, Indonesia

Abstract

The 21st century's technological advancements have resulted in a new economic and social setting, requiring innovation for survival in a fast-paced environment, encouraging individuals and businesses to thrive in an unpredictable period. Individuals must become change agents to drive innovation. As a result, a more in-depth study of the present generation poised to enter the labour market is required. Thus, this research aims to investigate the factors that significantly affect each individual employee's Innovativeness in Indonesia's generation Z (Specifically, individuals who participate in the government's internship program, the MBKM Program), which will soon dominate the labor market. A total of 150 respondents were generated who met the predetermined criteria. The data obtained were processed using Multiple Linear Regression to examine the relationship between Knowledge Sharing in the work environment, Digital Leadership Style, and the presence of AI technology towards Generation Z Individual Innovativeness. As a result of this research, Knowledge Sharing that occurs in the work environment, Digital Leadership Style, and the presence of AI technology has a positive and significant relationship with Individual Innovativeness. These results suggest that fostering a knowledge-sharing work culture, along with implementing effective digital leadership practices and embracing AI technology, can enhance individual innovation capabilities in the workforce.

Keywords: Individual Innovativeness, Artificial Intelligence, Knowledge Sharing, Digital Leadership Style, Generation Z

I. INTRODUCTION

The 21st century's technological advancements create a new economic and social setting. Due to the fact that Industry is evolving over time, the development of this Industry is marked by the development from Industry 1.0 to the current Industry 4.0. Industry 4.0 is related to the rapid development of technology. This digital development is also called as digitalization. The term digitalization refers to the phenomena of change brought about by the expansion of digital information and communication technologies, which represent the transition from the industrial to the digital eras (Lengsfeld, 2019). In accordance with what was stated by Priyanto Rudito in the digital mastery book, the transition happens because digital steroids digitalization occurs more rapidly than expected. The term digital steroids exist due to the widespread adoption of the internet, social media, mobile devices, and other digital devices (Rudito & Mardi, 2017).

It is commonly acknowledged that individuals and businesses must be prepared to face an unpredictable and disruptive era. In this unpredictable and disruptive era, creativity has emerged as a critical competence for individuals to process the innovativeness (Hero et al., 2017; Thabrani, 2022; Thornhill-Miller et al., 2023). In the context of professional work, innovation becomes important as it enables companies to achieve success. Because unpredictable circumstances foster a high level of competitiveness due to the emergence of new consumer demands and changes in related industries, so necessitates an effective response to any changes in order to adapt and thrive (Hung et al., 2023). Thus, innovation is needed to survive by adapting to market and business environment changes and by meeting customer demands (Tohidi & Jabbari, 2012).

Innovation has become a critical concern for Indonesia, as it ranks low in the Global Innovation Index (GII) compared to other countries in Southeast Asia, East Asia, and Oceania. Particularly, Indonesia lags behind in the Business Sophistication pillar of the GII, which evaluates a country's business progress in innovation. Therefore, it is important to analyze innovation within companies, where organizational innovativeness is influenced by individual innovation. Understanding individual innovativeness is essential for future competency requirements, as individuals drive innovation and organizational success. However, companies should recognize the generation gap and address it to unlock the full potential of employees and foster a culture of continuous innovation.

Therefore, to support the innovativeness of Generation Z, which the majority of Indonesia's population, factors like technological trends, company approaches/strategies, and leadership styles need to analyze further. Technological trends, such as Artificial Intelligence (AI) has gained attention. According to Accenture's analysis, 78% of businesses believe that AI will be disruptive over the next 10 years (Sinclair et al., 2019). On the other hand, Forbes' analysis indicates that 64% of businesses expect AI to increase (Haan, 2023). Therefore, it is crucial to conduct research on the relationship of AI technology on the innovativeness of the current generation, specifically Generation Z.

In addition to technological trends, the appropriate approach is also needed to support the working environment, which is beneficial in the current era. With rapid technological changes, there is a need for the growth and dissemination of beneficial knowledge for individuals within companies to cope with the current situation. This will optimize the deployment of intelligent systems (Olan et al., 2022) and maintaining business growth (Ali Hassan et al., 2018). In accordance with previous research, it is found that knowledge sharing plays an important role in innovation which will later support business development (Kamaşak & Bulutlar, 2010). On the other hand, in this digital era, the presence of effective leadership capability is necessary to support individuals within the company to thrive (Bender, 2015). Supported by the results of research conducted by Priyantono Rudito in a book entitled Digital Mastery, it is proven that digital capabilities are determined by digital leadership, which means the quality of leadership has a substantial influence on the development of an organization's capability (Rudito & Mardi, 2017). Hence, leadership skills have become a critical issue that companies need to address (Bender, 2015). This was also mentioned by respondents during preliminary interviews, stating that traditional leadership styles can hinder the emergence of innovation within themselves.

In light of the aforementioned issues, it is necessary to examine the correlation between AI technology trends, knowledge sharing approaches, and digital leadership styles with the innovativeness of individuals, particularly the current Generation Z. This research aims to provide valuable insights for companies to bridge the gap between Generation Z and the professional environment, as well as prepare for the entry of Generation Z into the labor market. Furthermore, considering the limited existing research focusing specifically on Generation Z in Indonesia, this investigation aims to address knowledge gaps and provide valuable information regarding factors associated with Individual Innovativeness. By examining the impact of Artificial Intelligence (AI), knowledge sharing approaches, and digital leadership styles on the innovativeness of Generation Z individuals, this research aims to contribute to the enhancement of internal employees within companies and offer valuable insights for the future.

II. LITERATURE REVIEW

2.1 Individual Innovativeness

The innovative concept is defined as an individual's ability to think creatively and generate novel ideas (Orlova, 2022). Individual innovation is crucial to be assessed since it aims to ensure the adaption of an individual to a constantly changing world (Orlova, 2022). Following the concept of innovativeness, which everything happens in context over time, the concept is in line with the idea of novelty in systems, processes, products and services, behavior change, environmental adaptation, and development of learning and knowledge (Gilbert, 2007). Individual innovation is also defined as the effort put forth by individuals in experimenting with the aim of creating new goods, services, procedures, tasks, and technology, as workers' willingness to try new things and generate creative ideas is correlated with innovativeness (Batra & Vohra, 2016; Hendarman & Tjakraatmadja, 2012). Hence, in this research, Individual or employee innovativeness is a form of action from individuals in the form of willingness as well as the ability to comprehend renewable

things to encourage product and service or process innovation in business practices to support the improvement of the business growth (Poduška et al., 2020).

2.2 Digitalization

The current era is known as Industry 4.0. The fourth Industry is intimately tied to the tremendous technological advancements altering the entire value creation chain in the contemporary era (Ignat, 2017). In other words, this technological advancement is referred to as digitalization, which describes adopting digital technology throughout all spheres of business and society. The term digitalization refers to the change brought about by expanding digital information and communication technologies, which represent the transition from the industrial to the digital era (Lengsfeld, 2019). According to a previous study, there are three primary perspectives on the responses to digitalization: internal efficiency (including new working practices and re-planning of internal operations), external opportunity (including new business opportunities), and disruptive transformation (the digital age alters the function of the company as a whole) (Parviainen et al., 2022).

2.3 Generation Z

Individuals born during the technological or digitalization period are considered part of the current social generation. The current Generation is Generation Z, born between 1995-2012 (Barhate and Dirani, 2022; Gabrielova and Buchko, 2021). Most Generation Z is classified as beginning phases or preparing to enter the workforce (Chillakuri, 2020). According to several studies, Gen z is connected to technology (Singh, 2016), which is supported by data indicating that Generation Z is the largest group of internet users for informational purposes (Shtepura, 2022). It is supported by data showing that Gen Z spends much more on media activities, which indirectly had a major impact on the length of media use, which climbed significantly from the prior 10 years (Shtepura, 2022). Compared to the previous generation, Generation Z is less conservative (Dadic et al., 2022). In relation to the research, Gen z is the most educated generation, with the greatest percentage holding a bachelor's degree (Dadic et al., 2022). In terms of Generation Z preferences, Gen Z tends to be achievement-oriented (Balan & Vreja, 2018; Barhate & Dirani, 2022b; Chillakuri, 2020). As a result, Gen Z has become significantly more independent (Sakdiyakorn et al., 2021) and is more concerned with career advancement (Balan & Vreja, 2018; Chillakuri, 2020).

2.4 Artificial Intelligence (AI)

Since 1955, John McCarthy has defined artificial Intelligence (AI) a computer science that enables computers to operate in ways that mirror human capabilities in analyzing, problem solving, learning, and interaction (Guan et al., 2020; Wafa & Muzammil Hussain, 2021). Aims to ensure the adaption of an individual to a constantly changing world (Orlova, 2022). AI, for example, can assist humans in analyzing and comprehending massive amounts of unstructured data or information with fewer resources and at a lower cost (Truong & Papagiannidis, 2022). As a result of their ability to acquire a variety of information or data, AI can assist humans in acquiring new ideas and expanding their knowledge; therefore, AI can indirectly assist individuals in their innovative endeavor (Haefner et al., 2021; Truong & Papagiannidis, 2022).

H1: Artificial Intelligence (AI) has a positive relationship towards Individual Innovativeness

2.5 Knowledge Sharing

The definition of knowledge is a collection of experiences, values, pertinent information, essential elements for creativity, and professional insights that serve as a framework for evaluating and integrating new experiences and data (Munir & Beh, 2019). There are at least two parties participating in the knowledge sharing process, such as individuals and other individuals or individuals and groups (Nguyen et al., 2019). According to previous research, knowledge sharing is divided into two categories throughout the process: knowledge donation and knowledge collection (van den Hooff & de Ridder, 2004). Donating knowledge refers to the act of transferring someone else's intellectual property through communication (Akram et al., 2020; Nguyen et al., 2019; van den Hooff & de Ridder, 2004). Meanwhile, knowledge collecting is an approach of consulting with the intention of obtaining certain individuals or groups of other people's intellectuals (Akram et al., 2020; Nguyen et al., 2019; van den Hooff & de Ridder, 2004).

Knowledge is crucial to the innovation process (Usmanova et al., 2021), and knowledge sharing is becoming the primary method for employees to acquire and generate knowledge in the workplace (Udin et al., 2022), which means employees must interact to acquire and distribute knowledge. Following the previous study, knowledge sharing increases the effectiveness of employees' work activities by exchanging added value and providing a forum for exchanging information about prior experience, skills, and knowledge (ALMULHIM, 2020; Udin et al., 2022). Moreover, innovation is positively influenced by knowledge sharing because it facilitates the exchange of information in both formal and informal contexts, thereby assisting each employee in generating new ideas (Arsawan et al., 2022). Multiple published journals indicate a positive correlation between knowledge sharing and individual innovation. The following hypothesis can therefore be formed and tested further in this study.

H2: Knowledge Sharing has a positive relationship towards Individual Innovativeness

2.6 Digital Leadership

Digital leadership is categorized as change-oriented, adaptable, and forward-looking perspective; these characteristics of digital leadership are crucial for bringing about transformation (Benitez et al., 2022). A leader that possesses an excellent digital mindset, great digital skills, and a constant commitment to adopting a digital transformation framework could be said to be adopting digital leadership, which is the ability to incorporate the most recent social trends into a company model (Bach & Sulřková, 2021). In general, rather than focusing only on digital infrastructure or skills, digital leadership takes into account all aspects of the organization. Previous studies have described digital leadership as using leadership competencies to embrace transformative and innovative leadership through digital attitudes, including digital awareness and experience (Niu et al., 2022). According to the book *Digital Mastery*, digital culture (consisting of digital values and perspectives) and digital attitudes are required for digital leadership (Rudito & Mardi, 2017). Furthermore, some journals have discovered a positive relationship between digital leadership style and company performance in innovation (Kho, 2020; Mihardjo et al., 2019). The positive relationship demonstrates how leaders are essential in enabling employees to innovate and improving firm innovation performance. Based on the explanation above, the hypothesis that can be investigated further is

H3: Digital Leadership has a positive relationship towards Individual Innovativeness

2.7 Research Gap

Table 1. Previous Research (Research Gap)

General Information		Specific Information				
Authors(s)	Methodology	Variable			Scope	
		AI	KS	DL		Innovativeness (Y)
(Nham et al., 2020)	Structural equation modeling (SEM)		✓		✓	Vietnam
(Khanh Pham TRAN, 2021)	Structural equation modeling (SEM)		✓		✓	Vietnam
(Ali Hassan et al., 2018)	OLS regression analysis		✓		✓	Pakistan
(Asurakkody & Kim, 2020)	Cross-sectional descriptive study		✓		✓	Sri Lanka
(Ye et al., 2021)	A questionnaire survey & Partial least squares (PLSs)		✓		✓	China
(Erhan et al., 2022)	A questionnaire survey with SPSS & AMOS			✓	✓	Turkey
(Niu et al., 2022)	A questionnaire based & (PLS-SEM)			✓	✓	China & Korea
(Hadi & Rumangkit, 2022)	A questionnaire based and processed using Smart PLS 3			✓	✓	Indonesia
(Benitez et al., 2022)	The mixed methods approach combines the strengths of both qualitative and quantitative methods			✓	✓	Spain & Bulgaria
(Muniroh et al., 2022)	Quantitative approach with PLS-SEM			✓	✓	Study Case: PT. Telkom Digital
(Olan et al., 2022)	Systemic data sampling method (questionnaire survey)	✓	✓			United Kingdom
(Ramachandran et al., 2022)	A quantitative study based & Secondary data were also employed in this study	✓				India

(Truong & Papagiannidis, 2022)	An in-depth review of the literature on artificial intelligence and innovation management	✓			✓	
(Wijayati et al., 2022)	Quantitative research utilized structural equation modeling (SEM) with AMOS software	✓				Indonesia
Relationship Between Artificial Intelligence Technology, Knowledge Sharing, and Digital Leadership Styles Towards Generation Z Individual Innovativeness During the Internship Period (MBKM Internship Program)		✓	✓	✓	✓	Indonesia

The preceding table elucidates prior research findings that identified a gap in the utilization of variables. However, it is crucial to emphasize that each independent variable consistently exhibited a positive association with innovation, both at the individual and organizational levels. To address this existing gap and further contribute to the field, the present study encompasses all the variables listed in the aforementioned table. Thus, the inclusion of these variables serves a dual purpose: first, it aids in the formulation of hypotheses, and second, it substantiates the novelty and originality of the current research endeavor.

2.7 Conceptual Framework

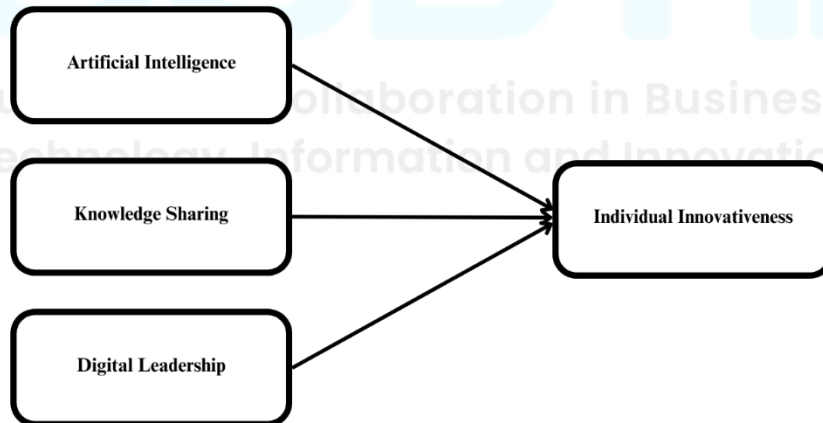


Figure 1. Conceptual Framework

The following research hypothesis is based on the framework:

- **H1:** Artificial Intelligence (AI) has a positive relationship towards Individual Innovativeness
- **H2:** Knowledge Sharing has a positive relationship towards Individual Innovativeness
- **H3:** Digital Leadership has a positive relationship towards Individual Innovativeness

III. RESEARCH METHODOLOGY

This research commenced with a background study, followed by a preliminary interview to validate factors relevant to the perceived situation of the respondents. Subsequently, hypotheses were formulated based on a

literature review and research gaps. The research utilized a quantitative approach employing a questionnaire form as the research method. The questionnaire was generated using questions developed and utilized in previous journals to facilitate the analysis of the variables under study. The target population for this research consisted of individuals classified as Generation Z, aged 17 to 28, who had previously or currently participated in the MBKM Internship program administered by the Ministry of Higher Education of Indonesia. The population was not restricted by geography, university, or Industry. To determine an appropriate sample size for this study, a formula recommended by Hair et al. (2019) was employed, whereby the number of indicators was multiplied by a factor of 5. With 22 indicators identified, the resulting minimum sample size was determined to be 110 respondents (Hair et al., 2019). This sample size, consisting of approximately 110 respondents, was deemed sufficient to facilitate a robust analysis of the relationships under scrutiny and obtain a comprehensive overview by means of regression analysis..

In this study, data will be collected using a Google form, and the findings will be analyzed using Cross Tabulation analysis tools to demonstrate the association between each variable. The analysis process will include a descriptive analysis to provide a summary of the data, a validity test to assess the accuracy and relevance of the measures used, a reliability test to assess the consistency and stability of the data, a classical assumption test to ensure that the underlying assumptions for the statistical tests are met, and finally, a multiple linear regression test to examine the relationships between the variables of interest. By employing these comprehensive analysis methods, this study aims to derive meaningful insights and contribute to the existing body of knowledge.

IV. RESULT/FINDINGS

4.1 Questionnaire Validity & Reliability

Table 2. Questionnaire Validity

No	Variables	Validity Result	N of Items
1	Artificial Intelligence	Valid	4
2	Digital Leadership	Valid	6
3	Knowledge Sharing	Valid	7
4	Individual Innovativeness	Valid	5

To assess the validity, the researcher compared the Pearson correlation of each item with the critical value from the r table. If the calculated correlation (r-value) is greater than the critical value (r-table), the questionnaire's item is considered valid. With sample size (n) of 150, resulting in degrees of freedom (df) of 148 at a significance level (α) of 5%, corresponding to a critical value (r-table) of 0.1603. Based on the validity test results, all question items in each variable demonstrated r_i values greater than the corresponding r-table values. Therefore, it can be concluded that all question items are valid.

Table 3. Questionnaire Reliability

No	Variables	Cronbach's Alpha	N of Items
1	Artificial Intelligence	0.750	4
2	Digital Leadership	0.830	6

3	Knowledge Sharing	0.854	7
4	Individual Innovativeness	0.785	5

The reliability of the AI and II variables in this study is confirmed by their Cronbach's alpha values falling within an acceptable range. Additionally, the KS and DL variables exhibit high levels of reliability with Cronbach's alpha values exceeding 0.80. The results presented in Table 4.10 affirm the robust internal consistency of the measurement tools utilized for the variables in this research.

4.2 Descriptive Statistics

Table 4. Descriptive Statistics

	N	Min	Max	Mean	Std Deviation
AI Availability (Yes)	150	0	1	0.533333333	0.500558972
Internship Duration more than 5 Months	150	0	1	0.606666667	0.490126222
ITB Students	150	0	1	0.173333333	0.379803317
Gender (Female)	150	0	1	0.546666667	0.499485194
ICT Industry	150	0	1	0.286666667	0.453719404
Age	150	19	24	20.98	1.120103063
AI	150	1	5	4.183333333	0.521892101
KS	150	1	5	4.197142857	0.52015138
DL	150	1	5	4.132222222	0.531378081
II	150	1	5	4.205333333	0.532914825

The table above displays the descriptive statistics of the variables used in this study, based on a sample size of 150 respondents. The majority of respondents, accounting for 54.7%, were female, and their ages ranged from 19 to 24 years, meeting the criteria for Generation Z individuals. Most respondents had a work duration of more than 5 months in the MBKM internship program. They represented various universities, with ITB students being the largest group. The respondents came from different companies and industries, with 28.6% from the ICT Industry.

Overall, respondents, both from ICT and non-ICT industries, rated the importance of AI technology at 4.1 out of 5, demonstrating their recognition of its benefits. Preliminary interviews revealed that respondents sought to access and explore AI technology independently, even if not provided by their companies. Around 53% of the respondents experienced the facilitation of AI technology in their internship activities, indicating Generation Z's exposure to the advantages of AI technology in the workplace.

Furthermore, it is evident that Generation Z recognizes the significance of leaders who possess knowledge and competence in digital technology, as indicated by their average rating falling within the range of 4.1. Additionally, Generation Z actively participates in knowledge-sharing activities during their internships, as reflected in the

consistent high ratings for Knowledge Sharing. They also exhibit a strong belief in their own Individual Innovativeness, with an average rating of 4.2.

4.3 Classical Assumption Test

Table 5. Normality Test

One-Sample Kolmogorov-Smirnov Test		
Unstandardized Residual		
N		150
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	1.62749855
Most Extreme Differences	Absolute	.071
	Positive	.071
	Negative	-.043
Test Statistic		.071
Asymp. Sig. (2-tailed)		.061 ^c
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

The normality assumption of the regression model was assessed using the One-Sample Kolmogorov-Smirnov (KS) test on the data from 150 respondents. The analysis revealed that the Asymp value, which determines the significance level, exceeded 0.05. Therefore, the data in this study can be considered to have a normal distribution, successfully addressing the violation of normality assumption in the Regression Model.

Table 6. Heterocedasticity Test

Coefficients ^a		
Model	t	Sig.
(Constant)	2.942	0.004
Knowledge Sharing	1.111	0.268
Digital Leadership	-1.741	0.084
AI Tech	-0.011	0.992

a. Dependent Variable: abs

The purpose of conducting the heteroscedasticity test is to investigate whether the residual data exhibits constant variance. The table presented above provides the results of the Glejser test, indicating the significant scores for all variables examined in this study. Based on these findings, it can be concluded that heteroscedasticity is not present in the data. This conclusion is supported by the significance scores, with Knowledge Sharing yielding a score of 0.268, Digital Leadership Style with a score of 0.084, and AI Tech demonstrating a significance score of 0.992, all of which exceed the threshold value of 0.05.

Table 7. Multicollinearity Test

Coefficients ^a		
	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Knowledge Sharing	0.376	2.66
Digital Leadership	0.273	3.661
AI Tech	0.322	3.106

a. Dependent Variable: Individual Innovativeness

Table 4.6 presents the Multicollinearity test for the variables used in the regression model. To pass this test, it is necessary to assess the tolerance values and Variance Inflation Factor (VIF). A good regression model has tolerance values above 0.10 and VIF values below 10. Based on these criteria, the data in table 4.6 successfully passes the multicollinearity test.

The results in the table indicate the following:

- The variable "Knowledge Sharing" has a VIF value of 2.660 (less than 10) and a tolerance value of 0.376 (greater than 0.10), indicating the absence of multicollinearity.
- The variable "Digital Leadership" has a VIF value of 3.661 (less than 10) and a tolerance value of 0.273 (greater than 0.10), signifying the absence of multicollinearity.
- The variable "AI Tech" has a VIF value of 3.106 (less than 10) and a tolerance value of 0.322 (greater than 0.10), indicating the absence of multicollinearity.

4.4 Multiple Linear Regression

Table 8. Regression Model Test

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.797	1.179		2.372	0.019		
1 Knowledge Sharing	0.274	0.060	0.374	4.538	0.000	0.376	2.660
Digital Leadership	0.240	0.081	0.287	2.968	0.004	0.273	3.661

AI Technologies	0.253	0.114	0.198	2.227	0.027	0.322	3.106
a. Dependent Variable: Individual Innovativeness							
b. Standards errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$							

The regression model derived from the Multiple Linear Regression analysis, as presented in the table above, can be expressed as follows:

$$Y = 2.797 + 0.253X_1 + 0.274X_2 + 0.240X_3$$

In this model, the dependent variable is Individual Innovativeness, while the independent variables include AI Tech, Knowledge Sharing, and Digital Leadership.

The table demonstrates that all independent variables exhibit a positive and significant relationship with the dependent variable. This is indicated by the positive B coefficients, which signify a positive relationship, and the significance levels (sig scores) below 0.05, indicating the correlations are statistically significant. Specifically, the B coefficients for each independent variable are as follows: Knowledge Sharing has a positive B coefficient of 0.274, Digital Leadership has a coefficient of 0.240, and AI Technology has a coefficient of 0.253. All B coefficients are positive, and their associated significance levels are below 0.05. Hence, the independent variables in this study exhibit a positive and significant relationship with the dependent variable, Individual Innovativeness.

Table 9. Model Summary (R Square)

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792 ^a	0.627	0.619	1.644

Dependent Variable: Individual Innovativeness

According to the table, the R square value of the Regression Model employed in this study is 0.627, indicating that the independent variables included in the initial analysis account for about 62.7% of the variation observed in the dependent variable.

Furthermore, as evidenced by the R value of 0.792, the overall fit of the regression model implies a reasonably significant relationship between the independent and dependent variables. The adjusted R square value of 0.619, which takes into account the degrees of freedom and sample size, further supports the model's explanatory power.

4.5 Hypothesis Testing & T test & F test

Table 10. T-Test

Coefficients ^a								
Regression Model	1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.797	1.179		2.372	0.019		

Knowledge Sharing	0.274	0.060	0.374	4.538	0.000	0.376	2.660
Digital Leadership	0.240	0.081	0.287	2.968	0.004	0.273	3.661
AI Tech	0.253	0.114	0.198	2.227	0.027	0.322	3.106

a. Dependent Variable: Individual Innovativeness

The results of hypothesis testing for Regression Model 1, examining the association between three independent variables (knowledge sharing, digital leadership, and artificial intelligence technology), are presented in the table above. The t-table value, considering a sample size of 150, three independent variables, and a significance level of 5%, is $(n-k-1) = 146$, resulting in a value of 1.976.

Based on the findings in the table, the following conclusions can be drawn:

- The variable Knowledge Sharing demonstrates a significance value of 0.000, indicating its influence on Individual Innovativeness is significant. The calculated t-value of 4.538 exceeds the t-table value of 1.976, confirming the significant impact of Knowledge Sharing on Individual Innovativeness. Hence, the first hypothesis (H1), which posits a positive and significant relationship between Knowledge Sharing and Individual Innovativeness, is accepted.
- The variable Digital Leadership exhibits a significance value of 0.004, signifying its significant influence on Individual Innovativeness. With a calculated t-value of 2.968 surpassing the t-table value of 1.976, Digital Leadership is found to have a significant impact on Individual Innovativeness. Therefore, the second hypothesis (H2), proposing a positive and significant relationship between Digital Leadership and Individual Innovativeness, is accepted.
- The variable AI Tech displays a significance value of 0.027, indicating its significant effect on Individual Innovativeness. The calculated t-value of 2.227 exceeds the t-table value of 1.976, confirming the significant influence of AI Tech on Individual Innovativeness. Consequently, the third hypothesis (H3), which suggests a positive and significant relationship between AI Tech and Individual Innovativeness, is accepted.

In summary, the results indicate that all three independent variables, namely Knowledge Sharing, Digital Leadership, and AI Tech, have a significant and positive relationship with Individual Innovativeness.

Table 11.F-Test

ANOVA ^a						
Regression Model 1		Sum of Squares	df	Mean Square	F	Sig.
Regression		663.229	3	221.076	81.784	.000 ^b
1	Residual	394.664	146	2.703		
Total		1057.893	149			

a. Dependent Variable: Individual Innovativeness

b. Predictors: (Constant), AI Tech, Knowledge Sharing, Digital Leadership

The table above shows that the F-test's significance value is 0.000, which is less than 0.05. This implies that the independent variables, namely Knowledge Sharing, Digital Leadership, and AI Tech, collectively have a

significant relationship with the dependent variable, Individual Innovativeness. Thus, it can be concluded that there exists a positive and statistically significant relationship between the independent variables and the dependent variable, Individual Innovativeness.

V. DISCUSSION

Relationship Between Role of Artificial Intelligence and Individual Innovativeness

Based on the regression model calculation, Artificial Intelligence Technology is considered to have a positive and significant relationship. Since, AI Technology has a score of 0.253 for the B score and the significance levels are all less than 0.05. In accordance with the regression model calculation, the Hypothesis testing also showed a positive and significant relationship towards Individual Innovativeness Generation Z. Because the calculation results for the hypothesis obtained a significant value of 0.027, which is smaller than 0.05. The calculated t-value is 2.227, which is greater than the t-table value (1.976), indicating that AI Tech has a significant influence on Individual Innovativeness. The findings in this research are supported by previous journals which clearly acknowledge that Artificial Intelligence Technology is related to Employees' Innovative work behavior or Employees' Individual Innovativeness (Odugbesan et al., 2023). The research subject, on the other hand, has an impact on the results. Generation Z, often known as the iGeneration, is a group of people who grew up during the rapid advancement of digitalization. As a result, Generation Z has a competitive advantage in technological skill and is more aware of technological advancements. Thus, it is undeniable that the presence of AI technology greatly aids Generation Z in innovating within their respective companies.

Furthermore, among respondents from non-ICT industries, 56% reported that their companies have not provided them with AI technology. However, the research reveals a positive relationship with individual innovativeness, which is consistent with the responses of the study participants, who rated the importance of AI technology at an average of 4.1 out of 5. This score indicates that respondents perceive AI technology as a support system for their professional activities, fostering creativity in problem-solving and the generation of novel products and services. These findings align with the preliminary interviews conducted earlier, revealing that even in the absence of company-provided AI technology, respondents actively explore and independently utilize AI technology. The willingness to explore new technologies is inherent in the characteristics of Generation Z. Therefore, the consideration and utilization of AI technology are vital for supporting the sustainability of businesses and corporations in the current generation. Since the previous journal found that AI technology is essential for enabling corporate innovation and enhancing business results (Ayoko, 2021; Li et al., 2023). Although the advancement of artificial technology in the future presents both challenges and opportunities. Therefore, it is plausible to conclude that AI does considerably contribute to encouraging innovation at both the corporate and individual levels.

Relationship Between Knowledge Sharing and Individual Innovativeness

Based on the statistical hypothesis testing, it was found that Knowledge Sharing has a positive and significant relationship towards Individual Innovativeness. It is clear from the results of the T-test variable knowledge sharing, which has a significant value of 0.000, which is less than 0.05. The calculated t-value is 4.538, which is more than the t-table value (1.976). As a result, the first hypothesis, H1: the variable Knowledge Sharing has a positive and significant Relationship on Individual Innovativeness, is "Accepted." This is in accordance with respondents' responses, which average 4.2 out of 5. This number is quite high, and it can be interpreted that Generation Z or respondents consider this knowledge sharing activity necessary to stimulate their creativity, enhance their knowledge in come up with innovative ideas. Several prior journals have also demonstrated the relationship between Knowledge Sharing and Individual Innovation. The findings of numerous previous articles Knowledge Sharing has a positive and significant relationship and influences individual or employee innovativeness, since Knowledge Sharing was defined as a critical aspect in innovation in the previous journal (Akram et al., 2020; Ali Hassan et al., 2018; ALMULHIM, 2020; Ologbo et al., 2015). Therefore, drawing from the data and real-life experiences of interns in the MBKM Program, it can be concluded that knowledge sharing activities play a crucial role in nurturing the Individual Innovativeness of Generation Z in the workplace. This is particularly important in the current era where individuals are expected to keep up with rapid developments. As a

result, adopting knowledge sharing approaches becomes vital to improve knowledge and encourage the growth of individual innovation.

Relationship Between Digital Leadership Style and Individual Innovativeness

According to the results of the Regression model calculation and Hypothesis testing, Digital Leadership has a positive and significant relationship on Individual Innovativeness. This is demonstrated by the B score, which has a positive value of 0.240. Aside from the B score, the T-test results for hypothesis testing reveal a significant value of 0.004, which is less than 0.05. The estimated t-value of 2.968 is higher than the t-table value of 1.976, indicating that Digital Leadership has a strong relationship with Individual Innovativeness. As a result, the second hypothesis, H2: the variable Digital having a positive and significant relationship with individual inventiveness, is "Accepted."

The findings of this study are aligned with prior journals which found a positive and significant association between Digital Leadership and Individual or Employee Innovation (Erhan et al., 2022; Muniroh et al., 2022). These findings indicate that there is a strong belief among the current Generation Z, specifically the sample of respondents in this study, regarding the importance of digital leadership. This is due to the fact that Generation Z lives and grows up in an era characterized by rapid digital advancements. Therefore, it is implicitly expected that Generation Z requires leaders who can guide them in accordance with the current era, rather than relying on traditional or outdated methods. Because based on the preliminary interviews conducted, it was observed that leaders who adhere to outdated leadership styles tend to hinder the growth of innovation within Generation Z. This finding is consistent with the average response provided by the respondents, which scored 4.1 out of 5. Because it is believed that leaders with a Digital Leadership Style can empower Generation Z to utilize technology effectively and foster a flexible and adaptable mindset and values, thereby encouraging employees to innovate (Muniroh et al., 2022)

VI. CONCLUSION AND RECOMMENDATION

1. Conclusion

In this research, a total of 150 respondents were generated who met the predetermined criteria. The data obtained were processed using Multiple Linear Regression to examine the relationship between 3 independent variables and 1 dependent variable. Based on the data and results obtained, several conclusions and recommendations can be drawn for future research and relevant stakeholders.

1. The data analysis demonstrated a positive and significant link between AI Technology and Individual Innovativeness, implying that integrating AI technology in the workplace might assist Generation Z individuals innovate. AI technology facilitates information access, assists in the handling of complex data, and aids decision-making, therefore benefiting both businesses and individuals in terms of innovation.
2. Furthermore, the study found a positive and significant relationship between Knowledge Sharing and Individual Innovativeness. Generation Z actively engages in knowledge sharing activities, both formally through company programs and informally through interactions with colleagues and team leaders. These activities expand their knowledge and expertise, fostering creativity in problem-solving and idea generation, thereby stimulating innovation within themselves and contributing to overall company innovation.
3. Additionally, the study discovered a favorable and significant relationship between Digital Leadership Style and Individual Innovativeness. Generation Z perceives digital leaders as adaptable, open to new ideas, and skilled at utilizing digital technologies to assist professional operations. By connecting leaders' attitudes, mindsets, values, culture, and capabilities with the demands of the current era, adopting a digital leadership style encourages Generation Z to innovate.

2. Recommendations

Recommendation for Company

- Based on the findings, it is recommended for companies, especially non-ICT industries, to improve the availability of AI technology to enhance support for individual innovativeness among Generation Z. A thorough evaluation of the company's current condition and specific departments is crucial to ensure the suitability and effective utilization of the technology. Companies located in sectors with higher AI development are encouraged to consider its influence on corporate innovation efficiency when implementing AI technology.
- Develop engaging knowledge sharing activities, such as mentoring, workshops, and open discussions, to foster innovation among individuals, particularly Generation Z. These activities should be designed to be enjoyable and cater to different working scopes within the organization. By expanding knowledge sharing initiatives, companies can better support individuals in adapting and transforming to meet the demands of unpredictable conditions.
- Provide training to develop digital leadership skills among organizational leaders. This will help align their attitudes, mindsets, values, and abilities with the requirements of the digital age. Considering the rapid technological advancements experienced by Generation Z, companies should consider implementing and promoting a digital leadership style. Despite being unfamiliar with the term "Digital Leadership style," the majority of Generation Z respondents recognized its importance in fostering innovation.

By implementing these recommendations, companies can create a supportive environment that encourages individual innovation, addresses the needs of Generation Z, and embraces digital leadership practices to stay relevant in today's dynamic business landscape.

Recommendation for Gen Z

- Given that Generation Z has been raised in the digital era, it is imperative to enhance their awareness and understanding of digital technologies to foster innovation. By following this recommendation, it is anticipated that Generation Z will be motivated to explore and utilize technologies, particularly Artificial Intelligence, effectively in order to enhance their work performance and drive innovation within their organizations.
- Promoting active communication and participation among Generation Z within the workplace, both through formal channels and informal interactions like casual conversations, is crucial. This active engagement indirectly stimulates the development of new knowledge and information, which plays a pivotal role in driving innovation within their respective industries.
- Generation Z should develop their adaptability and flexibility in relation to different leadership styles. This recommendation aims to encourage Generation Z to be adaptable and flexible, enabling them to fully leverage the benefits provided by various leadership styles. For instance, leaders who exhibit a Digital Leadership Style ensure that Generation Z has access to digital resources, foster a conducive attitude, and promote open knowledge sharing in the current dynamic environment. Such an approach undoubtedly facilitates Generation Z's ability to innovate, provided they can effectively utilize the available resources while remaining adaptable and flexible in response to different leadership styles.

Recommendation for Future Research

Based on the findings of this study, future research is advised to expand the sample size and broaden the scope beyond Generation Z individuals in the MBKM Program. Examining Generation Z in a wider context, such as within Indonesia, would enhance the generalizability of the findings. Additionally, it is recommended to include variables related to the Industry and department of the company for more focused and detailed analysis. Incorporating these variables would contribute to a deeper understanding of the relationships being studied. Furthermore, exploring other relevant variables aligned with future digitalized industries is suggested to gain a comprehensive understanding of the factors influencing individual innovativeness in such contexts. These

suggestions aim to improve the robustness and applicability of future research and contribute to the advancement of knowledge in the field.

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The Effect of Influencer Marketing Source Credibility: Attractiveness, Trustworthiness, Expertise towards Purchase Intention on OMG Beauty TikTok

Nadia Salsabila Zulfa¹, Ira Fachira²

¹ School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

² School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

The rise of social media platforms has revolutionized human life, enabling communication, information sharing, entertainment, and social interaction. Accelerated by the COVID-19 pandemic, people turned to digital platforms, including TikTok, a popular app for creating and sharing short videos. TikTok algorithm-driven "For You" video feed offers personalized content recommendations, making it an engaging platform for entertainment and information. This research explores the rise of TikTok influencers, who have become powerful marketing tools for brands. OMG Beauty as a newcomer in the beauty industry participates in this phenomenon. The research delves into the concept of influencer credibility by Ohanian (1990) and its influence on consumers' online purchase intentions. It is limited for OMG Beauty's with the respondents of Indonesian TikTok users, aware of beauty products and influencer on TikTok, consumers of OMG Beauty to help OMG Beauty in choosing the most appropriate TikTok influencers to level up their purchase intention. This research employs a quantitative approach using a questionnaire with a 5-point Likert scale to measure respondents' behavior and agreement towards various variables. The data collected will be analyzed using SPSS tools, specifically through regression analysis. Multiple Linear Regression analysis will be conducted to test hypotheses and provide marketing strategy recommendations for OMG Beauty, focusing on the influence of influencer marketing on purchase intention. A positive relationship is found between influencer credibility and consumer online purchase intention after conducting the regression analysis. OMG Beauty should collaborate with attractive influencers, consider trustworthiness characteristics to a lesser extent, and prioritize expertise in the beauty and dermatology industries. Ultimately, this research contributes to a better understanding of the evolving dynamics between influencer marketing of TikTok and purchase intention in the digital age.

Keywords : Influencer Marketing, The Source Credibility, Attractiveness, Trustworthiness, Expertise, Purchase Intention

I. INTRODUCTION

With over 1 billion monthly users worldwide, including a significant user base in Indonesia, TikTok's market reach is substantial (Iqbal, 2023). Its unique features, such as vertical videos and continuous looping, provide opportunities for various groups to tap into the TikTok user base. One of the highly developed industries on TikTok is the beauty industry. Since the pandemic, it can especially feel the growing number of small influencers on TikTok. 52% of users are using TikTok to explore beauty products with a viral engine that gives viewers a continual supply of bite-sized tidbits shows from a hashtag of #BeautyTok has 6.9 billion views (Catalyst, 2022). This is an interesting opportunity for beauty brands to promote it through these small influencers, especially brands with low prices because TikTok users are dominated by young people. TikTok allows businesses to reach a demographic that is eager to engage in e-commerce and does not share the skepticism of older generations when it comes to making purchases in this manner (Gandola, 2022). TikTok marketing is now one of the considerations of marketing tools for a brand to market its products.

Currently, Key Opinion Leaders or influencers have become a trend on social media, where some people can be very important on those platforms. Facebook, Instagram, and YouTube are continuously developing and offering a chance for people to share their views, personal experiences, and ideas with a wider audience, enabling them to become content creators or influencers if they have a substantial following that can impact the beliefs and opinions of their followers, leading to the interest of companies who wish to reach their target audience and increase their customer base (Gajanova et al., 2020). People just have to get a lot of followers on social media to become famous, they don't have to be successful or talented in a certain area anymore (Djafarova & Trofimenko, 2018).

Credibility is one of the important factors in TikTok. For example, if the TikTok Influencer were certified, their status as a TikTok Influencer would further increase their credibility (Raymond et al., 2021). The credibility of influencers has significant impacts on consumers' intention to make a purchase (Lin & Nuangjammong, 2022). Moreover, various studies have proved that purchase intention is affected by the Ohanian model credibility of influencers on YouTube and Instagram (AlFarraj et al., 2021; Lou&Yuan, 2019; Martiningsih & Setyawan, 2022). However, no research examines specifics on TikTok yet since it is a new phenomenon to be discovered.

OMG Beauty is one of the local beauty brands that was born to have high value beauty products with a very affordable price that allows all women to access beauty products within their budget. OMG believe that beauty plays an important role in women's life. Not only beauty makes them more beautiful physically, but also feel good, increase their self-esteem, boost their confidence, and lead them to achieve their dream. The purpose of OMG is to ensure all women in any background can still take care of their beauty by riding on the latest beauty trends without sacrificing their budget. Having a beauty that never fades will make them feel always well-prepared to face anything life throws at them, especially when their days are filled with working hard from morning to night.

OMG Beauty has been focusing their market and audiences on TikTok since. They expand their audiences by adding TikTok accounts. In June, they made two new accounts of OMG Beauty, @omgbeauty.id and @omgcosmetics.id with different purposes. They use several marketing strategies to improve their performance in the market such as influencer marketing, social media marketing, web series, affiliate program, website, beauty agency and or community, event marketing, and other brand activations.

Influencer marketing is a common thing for a brand to promote their products or services for many purposes to their customers. Influencer marketing heavily relies on the genuine voice of the influencer, who is frequently compensated to post content about a brand (Keller & Swaminathan, 2020: 280). Tiktok, as a new platform, has surpassed the one billion user mark beating Instagram on by the Covid-19 pandemic (Buchholz & Richter, 2022). With a unique algorithm named "For You Page", TikTok influencers may quickly and easily establish credibility, and their followers will be eager to see the businesses and goods they decide to promote online (Pixlee, 2022). Using influencers to promote the brand may boost the exposure and ultimately expand the customer base but there are constraints to the ideas of influencer reach and engagement because of the wrong target (Wiedmann & von Mettenheim, 2020). Coupled with the large cost of its implementation, it becomes a challenge for a brand to decide what credibility aspect an influencer should have that suits the target audiences and the brand to increase brand awareness and sales.

Ohanian (1990) developed the source credibility model from Hovland and his associates (1953) used to suggest a communicator's favorable traits that influence the receiver's reception of a message. This marketing strategy makes use of the ability to sway the opinions of key figures in order to influence purchase decisions and/or brand awareness (Lou&Yuan, 2019). According to source credibility models, consumers' purchase intentions are influenced by attractiveness, trustworthiness, and expertise (Weismueller et al., 2020). An influencer's ability to influence their audience's intention to buy a thing is proportional to the credibility they've earned through regarding the item they're endorsing credibility (Raymond et al., 2021). OMG beauty as a newcomer in the beauty industry use the same way to increase brand awareness and sales. In this research, it will be focusing on the purchase intention as one of the purchase decision processes. Sutanto & Aprianingsih (2016) said that higher purchase intentions result from higher levels of influencer credibility; vice versa, lower buy intentions result from lower levels of credibility. This research aims to analyze the relationship between influencer's source credibility model and purchase intention to provide more understanding for OMG Beauty. The understanding can be useful for OMG Beauty to utilize their influencer to attract brand awareness as well as sales. Therefore, this research is conducted to analyze the effect of influencers' credibility on the purchase intention specifically on purchase intention of OMG Beauty and the importance of choosing what credibility to be used as in influencer marketing.

II. LITERATURE REVIEW

2.1 Purchase Intention

Purchase intentions refer to a consumer's strategy for trying to buy a certain brand and a kind of choice intent to buy looks at why a customer chooses a certain brand (Wang & Scheinbaum, 2017). Previous studies have shown that a rise in the purchase intentions correlates with a rise in the purchase decision which means when customers

feel strongly about a brand, they are more likely to make a purchase (Martins et al., 2019). Purchase intention in which is a personal inclination related to a brand with the aim of engaging in a buying behavior (Weismueller et al., 2020). Consumers' purchase intent can be observed when they visit the brand's website, social media platform or have a thought to buy products (Kungrapunt & Papat, 2018). The TikTok platform has the potential to impact the purchasing decisions of potential consumers through its media influence (Sumanti et al., 2022).

Since TikTok existed, people have changed their behavior because of the TikTok concept that really guides the consumers. In addition, now TikTok has become an S-commerce, an extension of e-commerce, utilizing social media platforms to facilitate enhanced information sharing and social interaction between sellers and consumers (Hua et al., 2022). TikTok released the TikTok shop in 2021 which is a marketplace by TikTok. TikTok Shop is a feature that allows users to shop straight from the TikTok platform which enables businesses, companies, and artists to advertise and sell their goods directly on TikTok (Christison, 2022). While on Instagram Shopping, consumers are not directly directed to purchase. While on TikTok, users can buy products whenever they see a yellow cart from a video or live streaming of an account. This makes TikTok's users are influenced to shop online impulsively and consume since they use it once or twice (Erizal, 2020). Therefore, the construct of purchase intention is considered as a dependent variable in this research as the degree to which the consumer would like to purchase OMG Beauty in the future.

2.2 Influencer Marketing

Influencer marketing is one of the marketing tools that leverage the power of influencing people or opinion leaders to increase brand awareness and/or purchase decisions among customers (Lou & Yuan, 2019). In social media, there are lots of influencers with their specialization in the field. They gained followers through their content that can make people follow and trust them. Influencers are individuals who are regarded as experts with a devoted following, and their audience is highly engaged (Makrides et al., 2019). Brands need to choose whose influencer they are going to use to promote products or services. Keller and Swaminathan (2020) said that choosing influencer marketing is dependent on finding the appropriate influencers with the appropriate appeal. It is crucial that brand select influencers who adhere to the following key criteria: The company must make an effort to find a credible influencer; the chosen influencer's online activities must be consistent with the brand's values; and the chosen influencer's live values and interest must coincide with those of their followers (Kecek et al., 2022). TikTok influencers are growing in popularity as a form of marketing because of their widespread appeal among young people (van der Bend et al., 2023). TikTok's algorithm makes users go viral easily if they regularly post. More people engage with each other, friends or even strangers, and the content on TikTok (Yang, 2022). Influencers on TikTok are creative and produce fresh, genuine content in these brief video clips to satisfy their followers' need for entertainment (Barta et al., 2023).

2.2.1 The Source Credibility Model

Source credibility is a phrase often used to describe the good traits of a communicator that influence the receiver's reception of a message (Ohanian, 1990). Consumer attitudes, beliefs, behavior and opinions have been demonstrated to be influenced by the influencer's perceived credibility (Erdogan, 1999). Attractiveness, trustworthiness, and expertise are factors affecting influencers as a message resource. The source credibility model in social media is important as people build their image to be credible as they want. The credibility of the source has a favorable impact on the intention to share information on social media (Nathalia & Kristiana, 2019). A trusted source in social media which about information or messages can be spread all around the world. No one has researched influencer marketing source credibility on TikTok, only Song et al. (2021) stated that credibility on TikTok may play a role in whether its users are prepared to commit to the app.

2.2.1.1 Attractiveness

Attractiveness occurs during the identification process where people discover something in the source that they enjoy and find appealing (Shimp & Andrews, 2013). A more attractive source is more likely to influence someone's subjective beliefs and values (Kim & Park, 2023). Ohanian (1990) stated and analyzed attractiveness based on attractive, classy, handsome/beautiful, elegant, and sexy. Those dimensions can be reasons why audiences like, follow and trust influencers. Previous research has linked endorser attractiveness to endorsement success, especially for beauty-related products and brands (Yang, 2022). The perceived attractiveness of the influencers can also affect purchase intention (Weismueller et al., 2020).

2.2.1.2 Trustworthiness

Trustworthiness relates to honesty, integrity, and credibility based on the opinions of the target audience, implying that a brand is likely to perform as promised (Osei-Frimpong et al., 2019). There is a favorable association between influencer trustworthiness and followers' behavior toward the brand, according to research (Balaban et al., 2022). Trustworthiness refers to the communicator's level of confidence to communicate information they believe is most valid (Li & Yin, 2018). A person's credibility increases if they are seen to be truthful (Masuda et al., 2022). Trustworthiness can be defined and classified by honesty, dependable, sincere, reliable and trustworthy (Ohanian, 1990). It points to honesty that people can rely on, which in turn increases the purchase intention or then purchase decision (Wilopo, 2021).

2.2.1.3 Expertise

Expertise is the amount to which a communicator is seen to be a source of validity and refers to a knowledge, expertise, or talents of the influencer (Erdogan, 1999). The receiver's behavior is determined by the source's degree of competency knowledge, which determines the influencer's output (Baig & Shahzad, 2022). Expertise has five factors analysis such as expert, knowledgeable, skilled, qualified and experienced (Ohanian, 1990). The knowledge of the influencer is the credibility of the source, which directly affects the amount of confidence needed to get people to buy what is being recommended (Wang & Scheinbaum, 2017).). The influencers show that they are an "expert" in their social media through their content and profile so people will know they have the knowledge will likely increase purchase intention (Weismueller et al., 2020). It leads that expertise positively affects consumer perception of the brand and purchase intention (Masuda et al., 2022).

2.3 Conceptual Framework

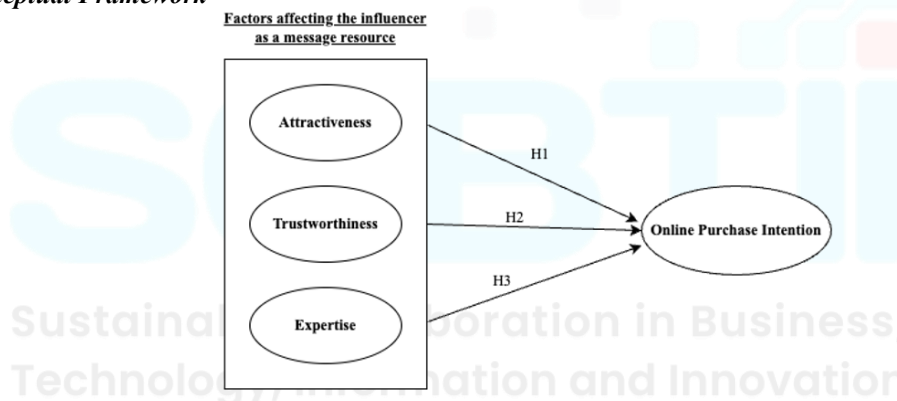


Figure 2.1 Conceptual Framework (AlFarraj et al., 2022)

This research used the conceptual framework from AlFarraj et al. that has similar research. With the same dependent and independent variables, they developed research "Examining the impact of influencers' credibility dimensions: attractiveness, trustworthiness and expertise on the purchase intention in the aesthetic dermatology industry." They examined some aesthetic dermatology industry's Instagram influencer that affected their purchase intention. The reason they chose influencer credibility is the same as because influencer credibility marketing is important and on the rise in the beauty industry. However, the difference is they add a mediating variable of online engagement (cognitive and affective).

2.4 Research Hypotheses

- H1: The attractiveness of the influencer has a positive relationship effect on the purchase intention.
- H2: The trustworthiness of the influencer has a positive relationship effect on the purchase intention.
- H3: The influencer's expertise in the field has a positive relationship effect on the purchase intention.

III. RESEARCH METHODOLOGY

This research is using quantitative methods to answer the research questions. The quantitative method is part of processes in this research by collecting data from the target audiences. The quantitative research method provides reassurance in the form of numbers, which makes it more reliable in supplying statistical proof for

surveys (Hart & Baker, 2008). This research uses dependent and independent variables to analyze and answer the research questions. The independent variables include attractiveness, trustworthiness and expertise which are part of the source credibility theory by Ohanian. While purchase intention will be the dependent variable which can be influenced and affected from those three independent variables. All populations should be using TikTok since the research is limited to TikTok influencers, so it needs to be people who know about TikTok. The population is only constrained by geography, which is Indonesia. In this research, the quantitative method using questionnaires is conducted which consists of questions from each variable to discover. To obtain the most precise outcomes, it is recommended to administer a survey using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (Diamantidis & Chatzoglou, 2019).

The population is only constrained by geography which is Indonesia since mostly OMG Beauty's consumers are in Indonesia. However, the population cannot be calculated, the researcher uses an unknown sampling method. The standard rule of thumb for an ideal sample size is to have at least five times as many observations as the number of variables to be evaluated (Hair et al., 2019). Therefore, the sample size of this research will be no less than 125 respondents to measure the analysis. It will be gathered on an online form and will be distributed on an online platform. Regression analysis is used for this research to know and test the relationship between variables; both dependent and independent. Regression refers to techniques that can be utilized to infer the connection relationship between a group of variables in the field of marketing (Hart & Baker, 2008). Multiple Linear Regression analysis performed in this research to determine and prove hypotheses that will lead to recommendation marketing strategy for OMG Beauty in using influencer marketing towards purchase intention. The data analysis will consist of a pilot test before doing the real test with a minimum of 30 samples, validity test, reliability test, classical assumption test and multiple linear regression analysis.

IV. RESULT / FINDING

4.1 Questionnaire Validity & Reliability Test

Table 4. 1 Questionnaire Validity

Dimension	N	Result
AT	5	Valid
TW	5	Valid
EP	6	Valid
PI	6	Valid

Source : SPSS Output (2023)

To determine the validity, the researcher conducted a comparison between the Pearson correlation of each item and the critical value obtained from the r-table. If the calculated correlation (r-value) exceeded the critical value (r-table), the questionnaire item was considered valid. The study included a sample size of 217, resulting in 148 degrees of freedom (df) at a significance level (α) of 5%. The corresponding critical value (r-table) was determined to be 0.1332. The results of the validity test indicated that all question items within each variable displayed r values surpassing their respective r-table values. Consequently, it can be inferred that all question items are deemed valid.

Table 4. 1 Questionnaire Reliability

Variable	Cronbach's Alpha	Result
Attractiveness	0.745	Reliable
Trustworthiness	0.746	Reliable
Expertise	0.859	Reliable
Purchase Intention	0.838	Reliable

Source : SPSS Output (2023)

All the Cronbach's alpha of the variables are accepted as reliable since 0.745 for attractiveness is acceptable, 0.746 for trustworthiness is acceptable, 0.859 for expertise is good and 0.838 for purchase intention is also good. Therefore, all the instruments for each variable are reliable in this research.

4.2 Descriptive Statistics

Table 4. 3 Descriptive Statistics

Variable	N	Min	Max	Mean	St. Dev
Attractiveness	217	1	5	19.7	2.487
Trustworthiness	217	1	5	18.11	3.118
Expertise	217	1	5	22.96	3.15
Purchase Intention	217	1	5	24.27	3.341

Source : SPSS Output (2023)

Table 4.3 displays the descriptive statistics for the variables in the study. The majority of the variables have mean values above 4 points, indicating a positive assessment since the Likert scale ranges from 1 to 5, where 1 represents "Strongly Disagree" and 5 represents "Strongly Agree." Among the variables, trustworthiness has the smallest mean, which will have an impact on subsequent calculations. On the other hand, the highest mean belongs to the dependent variable, purchase intention, with a score of 24.27. The standard deviation for purchase intention is the highest at 3.341, indicating heterogeneity and a wider spread of data from the mean value. Conversely, attractiveness has the lowest standard deviation with a score of 2.487, suggesting similarity among the data points.

4.3 Classical Assumption Test

4.3.1 Normality Test

Table 4. 4 Normality Test

One-Sample Kolmogorov-Smirnov Test		
N		217
Normal Parameters	Mean	0
	Std Dev.	1.19095279
Most Extreme Differences	Absolute	0.059
	Positive	0.059
	Negative	-0.048
Test Statistic		0.071
Asymp. Sig (2-tailed)		0.61

Source : SPSS Output (2023)

The normality test using the One Kolmogorov-Smirnov method indicates that the Asymp.Sig. (2-tailed) value of 0.064 is greater than 0.05. Therefore, it can be concluded that all the data in this study follow a normal distribution. This effectively addresses the deviation from normality that may occur within the Regression Model.

4.3.2 Heteroscedasticity Test

Table 4.5 Heteroscedasticity Test

Model	t	Sig
(Constant)	8.393	0.000
Attractiveness	-0.883	0.378

Trustworthiness	0.046	0.963
Expertise	-1.370	0.172

Source : SPSS Output (2023)

The purpose of conducting a heteroscedasticity test is to examine whether the residual data demonstrates consistent variance. The Glejser test is utilized, and if the significance value exceeds 0.05, it indicates the absence of heteroscedasticity in the research. The table above displays the significance scores for each variable: Attractiveness with a score of 0.378, Trustworthiness with 0.963, and Expertise with 0.172. As a result, all variables have passed the heteroscedasticity test, suggesting the absence of heteroscedasticity in the data.

4.3.3 Multicollinearity Test

Table 4.6 Multicollinearity Test

Model	Tolerance	VIF
Attractiveness	0.146	6.868
Trustworthiness	0.180	5.548
Expertise	0.106	9.477

Source : SPSS Output (2023)

The purpose of this test is to determine if there is any correlation among the independent variables that would cause the regression model to fail the multicollinearity test. The results indicate that the independent variables in this study have VIF values below 10 and tolerances above 0.1, indicating the absence of multicollinearity. This suggests that there is no strong correlation between the variables. Here is a breakdown of the results:

- The attractiveness variable has a VIF value of 6.868 (<10) and a tolerance of 0.146 (>0.1), indicating that it passes the multicollinearity test.
- The trustworthiness variable has a VIF value of 5.548 (<10) and a tolerance of 0.180 (>0.1), indicating that it passes the multicollinearity test.
- The expertise variable has a VIF value of 9.477 (<10) and a tolerance of 0.106 (>0.1), indicating that it passes the multicollinearity test.

Overall, these results demonstrate that there is no multicollinearity issue among the independent variables in the regression model.

4.4 Multiple Linear Regression

4.4.1 Regression Model

Table 4.7 Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Std. Error	Beta		
(Constant)	1.446	0.680		2.127	0.035
Attractiveness	0.409	0.086	0.304	4.756	0.000
Trustworthiness	0.297	0.062	0.277	4.819	0.000
Expertise	0.409	0.080	0.386	5.128	0.000

Source : SPSS Output (2023)

$$Y = 1.446 + 0.409X_1 + 0.297X_2 + 0.409X_3$$

Description:

Y : Dependent Variable (Purchase Intention)

X₁ : Independent Variable (Attractiveness)

X₂ : Independent Variable (Trustworthiness)

X₃ : Independent Variable (Expertise)

The regression model's table above shows the independent variable has a positive and significant relationship with the dependent variable. By seeing the positive B value which is 1.446 indicating a positive relationship and the significance level (sig score) below 0.05 suggesting that the correlations are statistically significant. Moreover, all the independent variables had a positive B score of 0.409 for attractiveness, 0.297 for trustworthiness and 0.409 for expertise. Additionally, all the significance levels of the variables are below 0.05. Consequently, the independent variables in this research have a positive and significant relationship with the dependent variable.

Table 4.8 Model Summary (R Square)

Model Summary	R	R-Squared	Adj. R-Squared	Std. Error of Estimate
1	0.934	0.873	0.871	1.199

Source : SPSS Output (2023)

The model summary for this research is shown above. According to the table, the R Square is 0.873 which means the independent variables show a relationship of 87.3% with the dependent variable and the remaining 12.7% is affected by external factors beyond the independent variables.

4.5 Hypothesis Testing, T Test & F Test

4.5.1 Hypotheses Testing & T Test

Table 4.9 Hypothesis Testing and T Test (Regression Model)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig
	B	Std. Error	Beta		
(Constant)	1.446	0.680		2.127	0.035
Attractiveness	0.409	0.086	0.304	4.756	0.000
Trustworthiness	0.297	0.062	0.277	4.819	0.000
Expertise	0.409	0.080	0.386	5.128	0.000

Source : SPSS Output (2023)

The results of hypothesis testing and T-tests for this research are as follows:

1. Attractiveness: The hypothesis that attractiveness of the influencer has a positive effect on purchase intention is accepted, with a significance value of 0.000 and a calculated t-value of 4.756.
2. Trustworthiness: The hypothesis that trustworthiness of the influencer has a positive effect on purchase intention is accepted, with a significance value of 0.000 and a calculated t-value of 4.819.
3. Expertise: The hypothesis that the influencer's expertise in the field has a positive effect on purchase intention is accepted, with a significance value of 0.000 and a calculated t-value of 5.128.

In summary, all three hypotheses are accepted, demonstrating the positive relationships between Attractiveness, Trustworthiness, Expertise, and purchase intention.

4.5.2 F Test

Table 4. 10 F Test

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	2104.591	3	701.53	487.734	0
Residual	306.368	213	1.438		
Total	2410.959	216			

Source : SPSS Output (2023)

Based on the F test, all the independent variables have a relationship with the dependent variable. It can be seen from the conclusion that the significance level is 0.000 and the F count of 487.734 which is bigger than the F table of 2.647.

V. DISCUSSION

5.1 Relationship between Attractiveness and Purchase Intention

After conducting calculations, it can be concluded there is a positive and significant relationship between attractiveness of influencers and purchase intention. It can be considered from the significance level is below 0.05 which is 0.000 with the 4.756 for the t table. The B score in regression model 0.409 also presents that every increase in attractiveness of OMG Beauty's influencers can increase the purchase intention. This result is aligned with previous study that proves that when customers perceive social media influencers as attractive their motivation to develop a favorable intention to make a purchase is increased (AlFarraj et al., 2021). Influencers who possess attractiveness are more effective in influencing belief change, thereby capturing consumers' attention towards the product and ultimately motivating them to make a purchase of the promoted product (Nugroho et al., 2022).

5.2 Relationship between Trustworthiness and Purchase Intention

According to the result, trustworthiness of OMG Beauty's influencer has a positive significant relationship with the purchase intention. It can be proven from the significance level of 0.000 and t table of 4.819. Previous research also explained that there is a positive relationship between trustworthiness and purchase intention (Virkkunen & Norhio, 2019; Wiedmann & von Mettenheim, 2020; Li & Yin, 2018). It is aligned with Nugroho et al., (2022) that the greater the level of trustworthiness an influencer possesses, the more impact it has on the intention to purchase. However, there are several studies that conclude that trustworthiness doesn't affect the purchase intention (AlFarraj et al., 2022; Martiningsih & Setyawan, 2022). In this research, trustworthiness' B score on a regression model has the lowest score that makes trustworthiness have the least influence in this research. This statement is aligned by the previous research (Wilopo, 2021).

5.3 Relationship between Expertise and Purchase Intention

The findings of this variable shows that expertise of influencer characteristic has a positive significant relationship with the purchase intention. The B score on the regression model with 0.409 shows expertise has the positive effect on purchase intention. The influencers who have expertise in some field especially in the beauty industry, in this case, have the most influence on how consumers intend to buy OMG Beauty products. Utilizing an influencer whose expertise aligns with the endorsed product will exert a stronger positive influence on purchase intention compared to employing an endorser whose expertise does not align with the endorsed product (Till & Busler, 2000). It is the same as attractiveness, AlFarraj et al. (2021) research's result explained that expertise of influencers they used can impact the consumers desire to make a purchase.

VI. CONCLUSION AND RECOMMENDATION

In brief, this study involved 217 samples meeting specific criteria. Multiple Linear Regression was used to analyze the data and examine the relationships between three independent variables and one dependent variable. It is limited for OMG Beauty's with the respondents of Indonesian TikTok users, aware of beauty products and influencer on TikTok, consumers of OMG Beauty to help OMG Beauty in choosing the most appropriate TikTok influencers to level up their purchase intention. The results indicated positive relationships between the attractiveness, trustworthiness, and expertise of influencer characteristics and OMG Beauty Purchase Intention. The study recommends OMG Beauty to collaborate with attractive influencers, consider trustworthiness characteristics to a lesser extent, and prioritize expertise in the beauty and dermatology industries. These findings suggest that such collaborations can enhance purchase intention and contribute to the success of OMG Beauty's products. It will help OMG Beauty in choosing the most appropriate TikTok influencers to level up their purchase intention.

In short, the recommendations for OMG Beauty are to collaborate with attractive influencers while adhering to the brand's code of conduct, incorporate trustworthy influencers, striking a balance between attractiveness, expertise, and trustworthiness and prioritize collaborating with influencers who possess expertise in the beauty and dermatology fields. Collaborating with influencers who possess attractive characteristics can trigger a cognitive bias, where the positive traits associated with the influencers extend to the perception of OMG Beauty's

products, creating content that emphasizes trust and reliability can leverage peripheral cues to drive purchase intent and using influencer with expertise as a social proof can leverage because when influencers share their expertise through tutorials, demonstrations, and authoritative content, consumers may perceive them as credible sources of information. This, in turn, can lead to an increased purchase intention as consumers are influenced by the perceived authority of the influencers.

Moreover, further research can compare influencer types (macro vs. micro, celebrity endorsements vs. influencer collaborations) to determine their impact on OMG Beauty Purchase Intention, investigate mediating and moderating factors (consumer involvement, brand loyalty, product types) in the relationship between influencer characteristics and OMG Beauty Purchase Intention and validate the research findings by studying other local beauty brands in Indonesia.

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Developing Luxury Branding Digital Strategy for Body Care Brand: A Case Study of Brand “W”

Amanda Lyra Kalista Sahab¹, Fitri Aprilianty¹

¹School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

This study aims to develop a competitive branding strategy that effectively conveys the luxurious persona of a local body care brand, "W." This brand has emerged in response to the high demand for body care products in Indonesia. In order to differentiate itself in a saturated market, Brand "W" strives to establish a perception of luxury. However, the brand faces challenges in implementing this strategy, as its target market perceives inconsistent luxury images from Brand "W" on social media. To address these challenges, a comprehensive business environment analysis was conducted, encompassing both external and internal factors. This analysis involved interviews, PESTLE analysis, and competitor analysis. Additionally, a research method combining qualitative and quantitative approaches was employed, utilizing in-depth interviews, online questionnaires, and social media analytics. The findings indicate that Brand "W" cannot be classified as a luxury brand according to the luxury value framework. Therefore, the next step for the brand is to undertake a rebranding project, aiming to position itself in the premium segment. In summary, it is crucial for Brand "W" to develop an effective branding strategy to compete successfully as a new brand in a saturated market. This strategy should involve revamping the brand's visual identity, creating a content pillar specifically tailored for the digital platform, launching digital campaigns, and establishing stronger associations with key opinion leaders (KOLs). This research is expected to have a positive impact on the further growth of body care sector in Indonesia and put contribution to the academic field of management science.

Keywords : Body Care; Digital Platforms; Luxury Branding; Personal Care

I. INTRODUCTION

The body skin care market in Indonesia is keep arising. It is reflected to the projected revenue of body skin care market in Indonesia that will reach USD\$864,2 million in 2025 (Statista, 2021). In addition, reflected on the current online trend, according to the Indonesia E-commerce Report 2022, in the 2nd quarter of 2022, the market share of beauty products purchased from e-commerce reached more than Rp210 billion, with the personal care category contributing the most, 29.6% (Rp62.2 billion), and specifically lotions being the most popular products (Kompas, 2022). The increasing number of body care revenues is affected by the shifting behaviour phenomenon on the market. As quoted from Kilala Tilaar, CEO of Martha Tilaar Group, due to the pandemic restrictions, people are obligated to stay at home leading to them to have more time to maintaining their wellness and seek more personal care products rather than decorative products (Yuliasuti, 2022). Moreover, the future of the beauty industry is moving into at-home treatments as a form of behavior adaptation since the pandemic. Consumers seek professional results that they can achieve independently. (Intel, 2022) In addition, Inventure-Alvara's latest research on consumer preferences for personal care products found that the future trend is encompassing products with glowing, whitening, anti-acne, and anti-aging effect. (Yuliasuti, 2022)

Looking at these conditions, PT. PTI, a local beauty fast moving consumer goods company, sees this as an opportunity to tap into the market. Therefore, in August 2022, Brand “W” finally launched and delivering products that answer market needs. Brand “W” is building a luxurious brand image on digital platforms, such as social media. Their target audience comprises Indonesian women aged 19 to 35 years. Specifically, Brand “W” seeks to appeal to outgoing and socially oriented young adults who aspire to be admired for their ability to stay up to date with the latest trends and seek pleasure in luxurious goods.

However, Brand “W” faces a challenge in building their luxury brand image as its not delivered well. The image that they aim to build is not stand-out enough among competitors. It is validated through a preliminary survey that is conducted to their targeted market which divided into those who have and have not tried, it is found that they perceived the luxury image from their social media tend to be inconsistent.

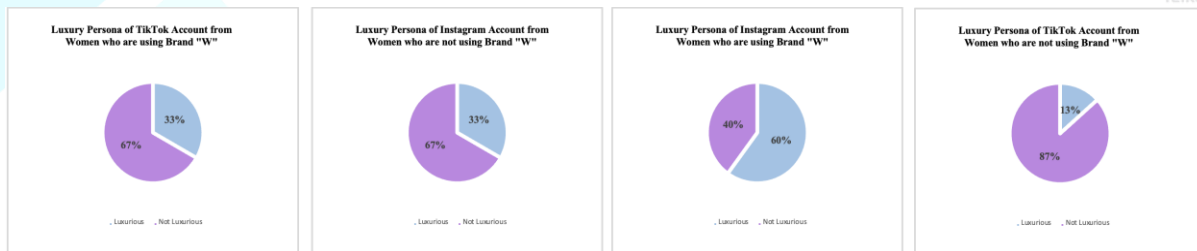


Figure 12 Preliminary Survey Result

Based on the preliminary results, it is evident that there is still an inconsistency in the luxury brand persona that Brand "W" intends to deliver compared to the market perception. This finding suggests that women who have used Brand "W" products tend to believe that the brand's persona on Instagram is luxurious. However, most respondents still perceive Brand "W" digital presence on Instagram and TikTok as not luxurious. Therefore, this study aims to develop a digital branding strategy for Brand "W" to establish a more assertive luxury persona.

II. LITERATURE REVIEW

PT.PTI is a national market leader in beauty fast-moving consumer goods (FMCG), established in 1985. After successfully standing for about 37 years, PT.PTI has more than 1600 SKUs launched under namely 11 brands, including Brand "W". Brand "W" is PT.PTI latest released brand and a new player in the body care competitive market. This brand softly launched their products on August 8, 2022, through TikTok. Brand "W" has its vision to manifest women's desire in fulfilling their dreams to look presentable and be admired by having a brighter skin, they have always wondered. Brand "W" has launched five lotion variants and two face serums and generally priced at Rp80,000.

More on to in depth analysis of the business environment, this analysis is conducted to assess the internal and external factors that might affecting the business process of Brand "W". Frameworks used in this type of analysis are PESTLE analysis, competitor analysis, and customer insight, which later will be generating the opportunities and threats of Brand "W". Meanwhile for the internal analysis, this study will be gathering insights through in-depth interview with the internal team, which later will be generating the strengths and weaknesses of Brand "W".

External Analysis

PESTEL Analysis

PESTEL Analysis is a tool to form an external force that influences a business. This framework incorporated political, economic, sociological, technological, environmental, and legal aspects to help identify risk factors for SWOT analysis. (Oxford College of Marketing, n.d.).

Table 83 PESTEL Analysis Result

Political Legal	Economical
<p>O - Passed BPOM's selection process for each SKU</p> <p>T - Restrictions imposed on product claims by Article 24 (1) of Undang-Undang No. 8 of 1999, coupled with Peraturan BPOM No. 3 of 2022</p> <p>T - TikTok's product listing and content guidelines prohibit certain marketing copywriting techniques and product claims</p> <p>O - The commerce policies of the Meta group on Instagram</p>	<p>O - The government has effectively maintained domestic spending with high purchasing power.</p> <p>O - The beauty and personal care market in Indonesia, particularly in the personal care segment is thriving.</p> <p>O - The projected growth of Indonesia's digital economy, a significant portion attributed to e-commerce and market share of beauty products</p>
Sociological	Technological
<p>O - The COVID-19 pandemic and related restrictions have shifted consumer behavior towards increased online shopping, particularly in the beauty and care industry.</p>	<p>O - Indonesia's substantial number of e-commerce users, which accounts for roughly half of the population.</p>

O - The popularity of at-home treatments has surged due to COVID-19 quarantines, with consumers seeking professional results that can be achieved independently.

T - A significantly large e-commerce market poses a possible saturated market which intensifies price competition.

O - Indonesia has an outstanding growing number of social media users, particularly on Instagram and TikTok.

Environmental

O - Given the high UV index levels in Indonesia, there is a growing concern about the harmful effects of sun exposure on the skin.

Competitor Analysis

Competitor analysis is the process of identifying competitors in the business's industry to generate differentiations to offer and ways to approach the market. In addition, this comparison method can be used to analyze the business's strengths and weaknesses in the existing market (Mailchimp, n.d.).

To analyze the opportunities and threats of Brand "W", the competitors that could be used as benchmarks are Scarlett Whitening, Bonavie, and Satellite of Glow (SOG). These brands are self-care beauty brands whose first releases are body lotions, which is a similarity they share with Brand "W". Aspects that will be on the comparisons regarding the digital presence of each brand, includes brand profile, products, and their social media presence.

Table 84 Competitor Analysis Result

Opportunities/Threat	Key Takeaways
Threat	Competitors offer a wide product variation, encompassing different product types and their respective variants, and comparatively on lower prices. This allows customers to choose from numerous options and enjoy a convenient one-stop shopping experience.
Threat	Competitors renowned for its collaborations with a diverse range of KOLs, ranging from nano influencers to mega influencers and even international brand ambassadors.
Threat	Competitors have successfully established distinctive brand personalities that differentiate them from each other. This is reflected in the visual style they have cultivated on their digital platforms. Meanwhile, Brand "W" has not yet.
Opportunity	Competitors have embraced an agile content creation approach on TikTok and can be seen the success story.
Opportunity	Competitors often conduct extended live streaming sessions to convert the audience into customers in a long duration with an engaging set up, which attracts customers to stay longer.

Customer Insight

Customer insights is extensive research that provides insights on consumer behavior, brand perception, and innovation opportunities for a company to increase its revenue. By providing a 360-degree view of customers, this method can help companies gain a deep understanding of market demand for their brand. In addition, customer insights enable companies to analyze their brand's impact within the competitive landscape and understand how it influences customers' purchasing decisions. Based on the output of this research, companies can make informed decisions that can enhance their overall performance, such as optimizing product features, pricing models, and distribution channels. (McKinsey, n.d.)

Internal Analysis

Table 85 Internal Analysis Result

Strength/Weakness	Key Takeaways
Strength	Presence of Product Innovation Development (PID), which operates independently from the brand team. The PID team receives full support from PT.PTI in terms of innovative tools and laboratories.

Strength	PT.PTI possesses its own in-house manufacturing facility which is compliant with the Good Practices in Cosmetic Manufacturing (CPKB).
Strength	A streamlined distribution channel facilitated by PT.PGI, a subsidiary of PT.PTI specializes in the distribution of the company's brands.
Weakness	Centralized distribution creates a limitation in live streaming activation for Brand "W".
Strength	Strong brand team management in executing marketing activations. The brand-building team at Brand "W" receives support from various divisions within the brand squad.
Weakness	Employees are handling multiple brands and not being fully dedicated to Brand "W" which resulting an overwhelmed resources if brands running their campaign at the same time.
Strength	Brand "W" has dedicated designers assigned to each division within the organization.
Weakness	The high turnover rate of designers since the contract is normally for only three months.
Weakness	Lacking design supervision since designers are not integrated into one another in one division.

III. RESEARCH METHODOLOGY

Problem Analysis

Problem tree analysis plays a central role in various project planning processes and is extensively utilized by development agencies. This approach aids in identifying solutions by visually representing the cause-and-effect relationships surrounding a particular issue, resembling a mind map but with a more organized structure. (Overseas Development Institute, 2014) Furthermore, through conducting an external analysis encompassing PESTLE analysis, competitor analysis, and customer insights, as well as an internal analysis involving company analysis and digital channel analysis, various weaknesses and threats impacting Brand "W" can be identified.

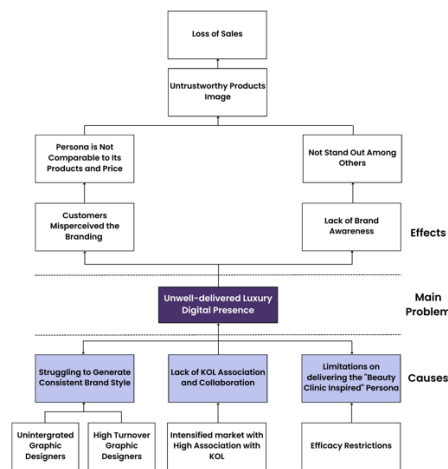


Figure 13 Problem Tree

According to the problem tree, main problem that is faced by Brand "W" is unwell-delivered luxury digital presence to the customers, which includes three primary causes:

1. Brand "W" is struggling to generate consistent brand style.
2. Brand "W" is lacking in KOL association and collaboration.
3. Brand "W" faced limitations on delivering the "Beauty Clinic Inspired".

As a result of these problems, the following outcomes that could happen are:

1. Customers might misperceived the branding that delivers by Brand "W".
2. Customers might feel that the price of Brand "W" products are too expensive to compare with the personification.

3. Brand “W” might be lacking of brand awareness.
4. Brand “W” might not stand out among competitors
5. Brand “W” might frame with untrustworthy products image
6. Brand “W” might face loss of sales

Data Collection and Analysis

In Diaz-Bustamante, Carcelen, and Puelles' (2016) paper, the authors emphasized the importance of employing a mixed-method approach, combining qualitative and quantitative methods, when conducting research on brand image, particularly when measuring the quality of a brand image. It consists of several steps, beginning with the identification of elements that individuals associate with a brand through in-depth interviews. Subsequently, the gathered information is used to develop a measurement or scale that can be validated among a larger population. This method often involves the use of a questionnaire utilizing a Likert scale format. (Díaz-Bustamante et al., 2016) In this paper, researcher also employed the mix method of qualitative and quantitative, which consist of those steps. The flow of this research can be shown on the Figure 3 located below.

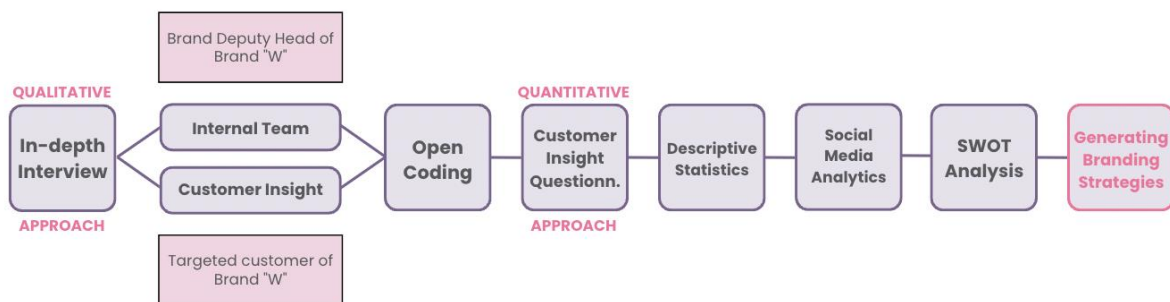


Figure 14 Flow of Research

Qualitative

The qualitative methodology involves the collection and analysis of non-numerical data, focusing on subjective judgments expressed through words. In this particular study, qualitative research is utilized to gain a more profound understanding of the subject under investigation. (Khan, 2022) By employing qualitative methods, the researcher can explore the internal team's perceptions of Brand “W” as a brand, validate previously identified challenges, and identify potential solutions through an in-depth interview.

1. In-depth Interview

The interview is a significant method of data collection that involves verbal communication between the subject and the researcher. There are various interview approaches, ranging from completely unstructured to highly structured. (Fox, 2009) In this study, a semi-structured interview approach was employed, wherein the researcher prepares a set of predetermined questions prior to the interview and incorporates additional topic-related questions during the session. (Doyle, 2022) The primary recipients of these semi-structured interviews are internal representatives and part of the customer insight.

Questions list for Internal Team

1. What is your role? And what are your day-to-day responsibilities?
2. How did the brand “W” come into existence? What phenomenon or struggle triggered the emergence of Brand “W”?
3. What kind of brand persona that Brand “W” wants to deliver?
4. What competitive advantages does Brand “W” offer compared to its competitors?
5. Who is Brand “W” target market and what are their characteristics?
6. What are the characteristics that customers like about Brand “W” products?
7. What are the characteristics that customers dislike about Brand “W” products?
8. What marketing efforts have been made by Brand “W”, especially on digital platforms?
9. So far, what marketing efforts have been most influential for Brand “W”, especially on digital platforms?
10. What are the marketing goals for Brand “W” in 2023?

11. What has been done to increase awareness of Brand “W”, especially on digital platforms?
12. How does Brand “W” maintain relationships with existing customers, especially on digital platforms?
13. Are there any challenges that Brand “W” faces in implementing social media marketing strategies?

Questions list for Customer Insight

1. What kind of body care that you use?
2. What brand you normally bought your body care products?
3. What is your consideration in buying one or tried a new product?
4. What competitive advantage that normally attract you to buy body care products?
5. Do you think that body care brands that you use define your position or social status?
6. What kind of brand personification that you think attract you to buy?
7. When it comes to the word “luxury”, what are things that comes to your mind?
8. What kind of brand personification that defines as “Luxury Brand” in body care sector for you?
9. What brands you define that giving luxury personification in body care sector?

Quantitative

The quantitative method is characterized by the utilization of objective measurements that involve statistical, mathematical, and numerical analysis. (Labaree, n.d.) In the customer insight journey, this quantitative approach is employed to validate the findings obtained from the interviews within a broader market context. Furthermore, this method is utilized to assess the effectiveness of Brand “W” luxury digital branding strategies based on the luxury value framework developed by J. Brock Smith and Mark Colgate in 2007. (Tynan et al., 2010) To gather quantitative data, researchers typically employ instruments such as questionnaires. (Labaree, n.d.) In this study, an online-based questionnaire will be utilized to collect data from customers.

1. Customer Insight Questionnaire

In this study, a likert-scale type of questionnaire will be employed to allowing respondents quantify their opinions or feelings regarding Brand “W” luxury digital brand persona. (Nemoto & Beglar, n.d.) The participants in this research will be a sample of women in Indonesia within Brand “W” defined target market, with a particular focus on the 21-26 age group in the socio-economic status of A/B. To ensure accurate measurements, the judgment sampling approach will be utilized to select the sample, with a minimum 200 sample size determined according to the guidelines provided by Malhotra. (Saunders et al., 2019) (Malhotra, 2010)

Open Coding

Open coding is an interpretative procedure for data collected from the in-depth interview session. (Corbin & Strauss, 1990). In this study, the process of open coding involved identifying valuable data based on keywords mentioned by the participants during interview session.

1. Marketing Insight

Marketing insights, derived from research and data analysis, provide invaluable information in this context. These insights can be obtained from authoritative sources or directly from customers themselves. By promptly translating these insights into actionable strategies, businesses can develop effective marketing plans that benefit both customers and the company. (Veracity, 2020)

2. Digital Presence

Digital presence is characterized as the manner in which an individual, group, organization, or business projects itself across various digital platforms. These platforms encompass numerous elements, including websites, social media, email marketing, content creation, e-commerce, customer reviews, among others. (Tortorice, 2022) The digital presence is not limited to only online visual representative a business or a brand, but it also an entity that represents them and interact with the audiences. (Paun, 2020)

3. Motivation

Motivation arises when an individuals are triggered into demanding something which creates a disequilibrium. (Bayton, 1958) In terms of customer’s motivation, it is encompasses as a stimulus that converts actions of customers to more than a brand awareness, whether it is converted as an interactions or purchases. In a long term, knowing what motivates customers engaging with brand will help the business to increase the customer satisfactions and loyalty. (Taylor, 2022)

4. Luxury Image

Luxury can be understood as any product that is likely to satiate the desires of consumers, providing more than just basic necessities (Díaz-Bustamante et al., 2016) In addition, a luxury image pertains to how a brand or product is perceived - typically as high-end, exclusive, and linked with wealth and status. The interpretation of a luxury

image is subjective and can fluctuate based on elements such as cultural context, economic standing, and the unique characteristics of individual consumers. (Klaus & Aus Berlin, 2012)

Descriptive Statistics

In order to analyze the results obtained from the customer insight questionnaire, this study will employ descriptive statistics, which aims to examine the relationships within the data. Moreover, this research will utilize a graphical method to display the data, enabling a comprehensive interpretation of the questionnaire results. (Cooksey, 2020)

Social Media Analytics

According to OOSGA, Instagram and TikTok are included in the top 5 most used social media in Indonesia at the year of 2023. (OOSGA, 2023) These two channel are also being used by Brand “W” to be their main marketing channel and building connections with customers. In analyzing the social media, this research will use the Hypeauditor, Inflact, and Phlanx online calculator to determine several metrics. In addition, this research will also do an online observation on the social media platforms.

IV. RESULT / FINDING

Qualitative Result

Table 86 In-depth Interview with Brand Deputy Head Result

Coding	Key Takeaways
Marketing Insight	<ul style="list-style-type: none"> S – Brand “W” establishment is based on real data and a prevalent phenomenon. S – Brand “W” understatement in specifying target market and their characteristic. S – Building a brand in two of most used social media platforms in Indonesia.
Digital Presence	<ul style="list-style-type: none"> W – Brand “W” is still struggling in building their brand presence on Instagram. S – Brand “W” shows alignment between online and offline activation. S – Brand “W” acknowledge the importance of KOL collaboration in raising awareness.
Luxury Image	<ul style="list-style-type: none"> S – Brand “W” acknowledge the importance of KOL collaboration in building a strong luxury image. S – Brand “W” recognize the importance of community and found its way to maintain the bond. S – Brand “W” utilizing not only online activation, but also offline activation in building brand awareness, that specify on luxury image.

Table 87 In-depth Interview with Customer

Coding	Key Takeaways
Marketing Insight	<ul style="list-style-type: none"> O – Brand “W” still have an untapped market of Brand “W”. O – Brand “W” has a brand’s credibility and highlight the professional manner to build a distinct personality.
Motivation	<ul style="list-style-type: none"> O – Brand “W” has a credible ingredients and benefit which are the motive in trying out new products.
Luxury Image	<ul style="list-style-type: none"> T – Customers are associated with a high price or something expensive regarding products with luxury image O – Strong brand elements can be an additional score in building a brand with luxury image. O – Customers perceived a strong luxury image by a strong story telling and philosophy. O – Customers perceived a luxury brand through a key opinion leader (KOLs) that embody a luxury persona O – A strong relationship of community can pose as a strong support system and loyalist.

Table 88 Customer Value Framework (Choo et al., 2012)

Values	Actions	Brand's Perspective	Customer's Perspective
Functional	Highlighting effectiveness of ingredients, as well as the infused fragrances inspired by high-end luxury brands	✓	✓
Hedonic	Associated with KOLs that are suitable with brand's personification.	✓	✓
Symbolic	Build a distinctive brand image by incorporating the experience of visiting a beauty clinic into the products.	✓	
	Distinctive elements to prove authenticity	✓	
	Establish a clean aesthetic and emphasize the visual elements of a beauty clinic in their key visuals. Strong brands' background story or philosophy.	✓	✓
Financial	Products are sold on a relatively expensive price.		✓
Relational	Build a community to build a relationship with customer and build support system.	✓	✓

Quantitative Result

Table 89 Question Lists of Customer Insight's Online Questionnaire

Question List	Answer Choice
Name/Initial	
Age	a. 18-20 b. 21-26 c. 27-35
Monthly Expenses The expenses referred to cover individual expenditures on basic household needs.	a. Less than Rp700,000 b. Rp700,000-Rp1,000,000 c. Rp1,000,000-Rp1,500,000 d. Rp1,500,000-Rp2,000,000 e. Rp2,000,000-Rp3,000,000 f. More than Rp3,000,000
Basic needs: Food, Monthly Rent (if applicable), Electricity, and Water. These expenses are only for ONE PERSON. If there are additional dependents, please divide the expenses accordingly.	
I feel that a brand has a luxury image when it sets a relatively high price or expensive.	a. Strongly disagree (1) b. Disagree (2) c. Neutral (3) d. Agree (4) e. Strongly Agree (5)
What is the price of a body care product, specifically a body lotion, that you consider expensive?	a. Rp50,000-Rp100,000(per 300ml) b. Rp100,000-Rp300,000(per 300ml) c. Rp300,000-Rp500,000 per 300ml) d. More than Rp500,000(per 300ml)
I feel that a brand has a luxury image when it has a simple, clean, and professional appearance on social media.	a. Strongly disagree (1) b. Disagree (2) c. Neutral (3) d. Agree (4) e. Strongly Agree (5)
I feel that a brand has a luxury image when it offers products with results equivalent to visiting a beauty clinic.	
I feel that a brand has a luxury image when it offers products with effective ingredients accompanied by expensive perfume fragrances.	

I feel that a brand has a luxury image when it endorses or collaborates with famous artist or influencers.

I feel that a brand has a luxury image when it has a special story behind its products and brand.

I feel that a brand has a luxury image when it builds a strong relationship with customers through a community

I feel that a brand has a luxury image when it has unique distinctive brand elements and authenticating

Questionnaire Result

The questionnaire gathered responses from 230 Indonesian women between the ages of 21 and 26 who use body care products. These respondents were categorized into SES A and B. According to Nielsen's 2010 research, the Socioeconomic Status (SES) in Indonesia is determined based on the monthly household expenditure, which includes expenses such as daily meals, electricity and water, and monthly rent. The results of the questionnaire, indicate that most respondents (119) have monthly expenses exceeding Rp3,000,000, placing them in the SES A category. The remaining respondents (111) have monthly expenses ranging from Rp2,000,000 to Rp3,000,000, classifying them in the SES B category.

1. I feel that a brand has a luxury image when it sets a relatively high price or expensive.

Majority of the respondents (120) strongly agreed with this statement. Additionally, 101 respondents expressed their agreement. In summary, the average agreement rating from the respondents indicates that they associate a brand with a luxury image when the products are priced relatively high or considered expensive, with a quantified value of 4.42. The perception of expensive prices varies among individuals. In the context of body care products, "expensive" refers to a price that they perceive as luxurious but are still willing to purchase. In other words, this price range represents their upper limit for buying body care products. According to the questionnaire results, most respondents (116) consider body care products relatively expensive when they are priced between Rp300,000 and Rp500,000 for a 300 ml packaging.

Considering Brand "W" products specifically, they are marketed within the price range of Rp60,000 to Rp80,000. In the questionnaire results, only three respondents considered body care products within the range of Rp50,000 to Rp100,000 as expensive. This is relevant to the previous question where most respondents associated a brand with a luxury image when it had a relatively high or expensive price. Consequently, this poses a **threat** to Brand "W" because customers are less likely to perceive it as a brand with a luxury image based on its price. Furthermore, the analysis reveals that Brand "W" fails to meet the criteria of a luxury brand as it does not encompass all aspects of the luxury customer value framework. From the customers' perspective, luxury products are typically associated with high prices. However, Brand "W" mindset revolves around offering luxurious products at an affordable price point. Consequently, this poses a **threat** to Brand "W" ability to position itself as a brand within the luxury segment.

2. I feel that a brand has a luxury image when it has a simple, clean, and professional appearance on social media.

Most of respondents (119) agreed with this statement, also followed by 104 respondents strongly agreed with the statement. In conclusion, the customers' perspective on perceiving a luxury image indicates that a key visual portraying a simple, clean, and professional pose presents an **opportunity** for Brand "W". The brand team has already recognized this and is striving for better execution to establish a luxury image on their social media platforms.

3. I feel that a brand has a luxury image when it offers products with results equivalent to visiting a beauty clinic.

Most of respondents (120) agree with the statement then followed the other 102 respondents also agree with this statement. This presents an **opportunity** for Brand "W" to emphasize the luxury beauty clinic experience to customers in order to shape their perception of the brand as luxurious.

5. I feel that a brand has a luxury image when it offers products with effective ingredients accompanied by expensive perfume fragrances.

Most of respondents (116) strongly agreed with the statement with the additional 107 respondents agreed with this statement. This presents an **opportunity** for Brand “W” to emphasize their use of credible ingredients with proven efficacy, as well as the inclusion of luxurious fragrances, to enhance their luxury image.

6. *I feel that a brand has a luxury image when it endorses or collaborates with famous artist or influencers.*

Most of respondents (126) strongly agreed with the statement with also 90 respondents agreed with the statement. This situation presents an **opportunity** for Brand “W” to engage in more collaborations with KOLs who can effectively embody the brand's identity, thereby strengthening its luxury image and increasing awareness among the target audience.

7. *I feel that a brand has a luxury image when it has a special story behind its products and brand.*

Most of respondents (110) agree with the statement while the other 104 respondents strongly agree with this statement. This presents a **threat** for Brand “W” because as a brand does not have a strong or special story that can adding value to the eye of customers. Consequently, considering this factor, Brand “W” cannot be perceived in the luxury segment.

8. *I feel that a brand has a luxury image when it builds a strong relationship with customers through a community*

Most of respondents (116) strongly agreed with the statement which also followed by 100 respondents' agreement with this statement. This presents an **opportunity** for Brand “W” to maintain a strong connection with its community, as it contributes to enhancing the luxury image of the brand. By fostering a sense of belonging and actively engaging with the community, Brand “W” can further establish itself as a brand associated with luxury.

9. *I feel that a brand has a luxury image when it has unique distinctive brand elements and authenticating*

Most of respondents (130) strongly agree with the statement then followed by 88 respondents agreed with this statement. This presents an **opportunity** for Brand “W” to focus on developing and incorporating unique and distinctive brand elements, which will significantly contribute to strengthening its luxury image.

Social Media Analytics Result

Table 90 Social Media Analytics Result

Strength/Weakness	Key Takeaways
Weakness	Low engagement rate on Instagram
Strength	High followers' growth rate on Instagram
Strength	Post schedule on a specific time with the highest engagement time
Strength	High performance post on KOL association contents
Strength	High content variation on Instagram
Weakness	Failing in maximize the use of Instagram Ads which resulting a stagnant growth for the brand
Strength	High engagement rate on TikTok
Weakness	Low content variation on TikTok
Strength	High utilization of TikTok advertising to reach a wider market

SWOT Analysis

The SWOT Analysis serves as an effective means of constructing organizational and competitive strategies. Consequently, an organization operates within two environments: one internal and the other external. The SWOT Analysis method aids in assessing the "strengths," "weaknesses," based on the internal conditions of a company, and "opportunities," and "threats" based on the external analysis. (GÜREL, 2017)

Table 91 SWOT Analysis Result

Strength	Weakness
S1 – Brand “W” efficacy has undergone laboratory testing and received accreditation.	W1 – High turnover rate of designers since the contract normally for only three months

S2- Comprehensive brand squad responsible for executing 360-degree marketing activations.
S3 – Brand “W” has dedicated designers assigned to each division within the organization.
S4 – Market availability since Brand “W” establishment is based on real data and prevalent phenomenon of shifting behavior
S5 – Market understatement from the brand team to create contents that resonates
S6 – Building a brand in two of most used social media platforms in Indonesia
S8 – Brand “W” shows alignment between online and offline activation
S9 – Brand “W” acknowledge the importance of KOL collaboration in raising awareness and building a strong luxury brand image
S10 – Brand “W” recognize the importance of community and found its way to maintain the bond.
S11 – Brand “W” has a good number of followers growth rate
S12 – Brand “W” realizes the prime time of posting on Instagram, which is every Wednesday at 4PM
S13 – Best performing contents are coming from KOL collaboration post on Instagram
S14 – Wide range of contents type on Instagram
S15 – Good engagement rate on TikTok
S16 – Brand “W” has actively utilized the TikTok advertisement feature to boost awareness

W2 – Lacking design supervisions since designers are not integrated to one and another in one division
W3 – Brand teams have no authorities in holding stock or pack on customers’ orders
W4 – Centralized distribution create a limitation in live streaming activation for Brand “W”
W5 – Have no substantial strong key visual elements that is stand out
W6 – Brand “W” is still on their trial-and-error phase which they are struggling in growing brand, especially on Instagram
W7 – Low engagement rate in Instagram which indicates low interactions between brand and customers
W8 – Lack of advertising activity on Instagram that caused low effort in building awareness
W9 – Lack of content variation on TikTok

Opportunity

O1 – Despite a strict process of BPOM registration, Brand “W” has passed the process
O2 – The projected growth of Indonesia’s digital economy, with a significant portion attributed to e-commerce and a specific market share of beauty products
O3 – The COVID-19 pandemic and related restrictions have shifted consumer behavior towards increased online shopping
O4 – The popularity of at-home treatments
O5 – Agile content types reach more audiences than a generic and well-orchestrated contents
O6 – Competitors’ successful in in-live activations
O7 – Align perception between brand and customer regarding key visual aspect to be simple, straightforward, clean, and sleek.
O8 – Customers’ motivation in trying out new products based on brand’s credibility in providing products with a good ingredients and benefits.
O9 – Strong brand’s image can be supported with memorable experience
O10 – Customers’ perception on brands that are strongly associated with KOL is premium
O11 – A persuasive brand communication style can attract customer to try products
O12– Strong bond with community will elevate the support for brand
O13 – Unique distinctive elements can build a strong brand personification and differentiate the brand.

Threat

T1 – Customers’ perception on Brand “W” luxury digital presence still inconsistent
T2 – Marketing and advertising limitations based on UU No 8 Year of 1999 and BPOM regulations which also correlated with TikTok and Instagram Guidelines
T3 – Saturated market of body care
T4 – Competitors’ growth in expanding their product varieties is intense
T5 – Competitors offer more relatively lower price than Brand “W”
T6 – Competitors has established distinctive brand personality
T7 – Lag behind competitors that associates more with KOL
T8 – Customers are less likely to perceive Brand “W” with a luxury image due to its low price and will be appears cheap
T9 – Perception of customers regarding brand with luxury image normally has a strong background story and philosophy as an added value
T10– Brand “W” cannot be classified on a luxury segment

V. DISCUSSION

According to the previous chapters, it is known that Brand “W” luxury digital presence is still perceived inconsistently (**T1**). To address these issues, the researcher proposes a solution for Brand “W”, which entails rebranding itself to cultivate a premium image. The following steps are recommended to support this process:

1. Revamp the visual guidance of Brand “W”
2. Build a content pillar for Instagram and TikTok
3. Activate digital campaign
4. Associates more with KOLs

The main reason that researcher is suggesting doing rebranding and cultivate premium image instead is because Brand “W” cannot be classified as a luxury segment (**T10**). It is implied on the result from customers’ insight interview and questionnaire that customers are less likely to perceive Brand “W” with a luxury image due to its low price and indicates to appears cheap (**T8**). Moreover, the perception of customers regarding brand with luxury image normally associates with a strong background story and philosophy of its brand (**T9**), which Brand “W” cannot fulfill it.

According to Mark Vaesan, as cited in Tomango, luxury and premium brands often exhibit similar aesthetics but differ in their approaches and pricing strategies due to market dynamics. However, premium brands provide products at a price point that customer perceive as worthwhile based on the product's value. Furthermore, premium brands are more likely to be responsive to market competitors and their actions. (Vaesen, 2021) From the description stated above, Brand “W” is more likely to be suitable in the premium segment of body care market instead of luxury. Thus, to build the premium branding and support the marketing goals of Brand “W” in 2023, below are the detailed strategy to support the rebranding process.

Revamp the Visual Guidance of Brand “W”

This solution aimed to address a weakness, namely the absence of strong and distinctive visual elements that make the brand stand out (**W5**) in the saturated market of body care (**T3**). By implementing a new visual guidance, Brand “W” can differentiate itself in the market and enhance its premium brand image (**O13**). Furthermore, by adopting a more simplistic, direct, clean, and sleek visual approach, Brand “W” can take on an opportunity to be perceived as a premium brand by customers, aligning with both the brand's perspective and customers' expectations regarding such key visual aspects (**O7**).

Build a Content Pillar for Instagram and TikTok

Content pillar referred as a core information that needs to be delivered to the followers or customers through contents that will be posted on the business’ social media. (Winters, 2022) Brand “W” is still lacking content variation on TikTok (**W9**), compared to Instagram (**S14**). In addition, this brand is still lacking of content consistency because they are still on their trial and error phase (**W6**). Regardless, those produced contents will still considering the limitations of regulations.

CONTENT PILLAR BREAKDOWN INSTAGRAM		CONTENT PILLAR BREAKDOWN TIKTOK	
Category	Details	Category	Details
Product Knowledge	Product showcases, Product with muse, Product efficacy.	Product Knowledge	Product showcases, Product with muse, Product efficacy.
KOL Collaboration	Contents that are associates with KOL.	Promotional Campaign	Seasonal campaign. Ex: double-date, payday, support for offline events, event activation.
Promotional Campaign	Seasonal campaign. Ex: double-date, payday, support for offline events, event activation.	Tips and Trick	Tips and trick for followers regarding skin tips, skin maintenance, skin conditions, skin concerns, and others.
Tips and Trick	Tips and trick for followers regarding skin tips, skin maintenance, skin conditions, skin concerns, and others.	KOL Collaboration	Contents that is associates with KOL.
Engaging Content	Mini games, content with CTA (polling, comment, tag), giveaway	GlowMin Content	Behind the scene, GlowMin adventure

Figure 15 Content Pillar Breakdown for Instagram and TikTok

Activate Digital Campaign

Digital Advertising

Brand “W” main goals in 2023 is to reach a wider awareness. Digital advertising is a valuable tool that brands can utilize to reach more awareness and impressions. (Durante, 2021) Brand “W” has successfully leveraged the potential of digital advertising on TikTok (**S16**). However, on Instagram, Brand “W” appears to be less active in utilizing the advertising features (**W8**). To enhance its reach and engagement, especially on Instagram, it is crucial for Brand “W” to maximize the use of digital advertising. Various types of content can be employed for these advertisements, such as products’ efficacy and KOL association.

Digital Campaign: 14 Days Glow Challenge

It is a marketing campaign that aims to increase brand awareness through user-generated content. So other than increasing brand awareness, it also also building stronger relationships with the community (**S10**). The main objective of this campaign is to emphasize the claim of Brand “W” to achieve brighter and healthier-looking skin within 14 days (**S1**). It also can counter partly of the marketing limitations because it is utilizing a user-generated content. In result, this campaign can also attract customer to try the products.

Associates more with KOL

In concept, influencers are doing a word-of-mouth marketing but the customers put a lot of trust to them because of their exceptional credibility. Moreover, study shows that 74% customers are agreed that word-of-mouth marketing approach is majorly influencing their purchase decision. (Agarwal, 2022).

Align with that, customers also have their perspective that brand that is strongly associated with KOL is perceived premium (**O10**). In contrast, Brand “W” is lagging behind competitors in terms of Build number of KOL association contents (**T7**) although the best performing contents on Instagram are coming from KOL association contents (**S13**). Through a collaborations involving product reviews, endorsements, and sponsored content, Brand “W” can significantly amplify its brand visibility and foster trust among potential customers.

List of KOL that can be used by Brand “W” for endorsement are:

1. Nanda Arsyinta: Fashion and beauty influencer known for her feminine persona portrayed across her platforms. Her content primarily consists of videos featuring beauty reviews, beauty transitions, and more.
2. Tasya Farasya: Beauty influencer who initially gained recognition on YouTube through her makeup tutorials, has established herself as a trusted source in the beauty industry. Her loyal following relies on her authentic reviews and expertise.
3. Titan Tyra: Lifestyle influencer with a focus on beauty, fashion, and travel, is highly regarded for her candid approach, particularly in her beauty content. She values honesty and believes it is crucial in maintaining trust and fostering strong relationships with her audience.
4. Joleene Marie: A former Puteri Indonesia 2019 contestant and now an actress, embodies a strong feminine and independent persona. With her association with premium brands and endorsements, Joleene reflects a premium image herself. Stephanie Rose
5. Stephanie Rose: Beauty influencer who initially gained recognition on YouTube through her makeup tutorials, specializes in providing guidance for individuals with dry skin. Her personal experience and relatability to dry skin concerns establish a strong connection with her audience.
6. dr. Yessica Tania: A doctor specializing in skincare and aesthetics, she has successfully established herself as an authoritative figure in the field through her social media platform. Dr. Zie utilizes her platform to share valuable medical information pertaining to various skin concerns and offers practical tips to address them.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

The final output of this research is a branding strategy for Brand “W” to overcome their unwell-delivered luxury digital presence. Thus, researcher suggest for Brand “W” doing rebranding and cultivate a premium brand personification. Here are following steps to support the rebranding process:

1. Revamp the visual guidance of Brand “W”
2. Build a content pillar for Instagram and TikTok
3. Activate digital campaign
4. Associates more with KOLs

The following suggestions above have their own reasoning and detailed strategy that can be seen in the previous section.

Business Implication

Key findings of this research have significant implications for Brand “W” branding strategy to overcome the problem of their un-well delivered luxury digital presence that possible leads to loss of profit in a long term. Moreover, this research is expected to have a positive impact on the further growth of body care sector in Indonesia. The research put contribution to the academic field of management science, offering a comprehensive

problem-solving approach, encompassing problem identification and analysis, root causes founding, and finished by set of alternative strategies as an optimal development.

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Factors Influencing Consumer Purchase Decision in Buying Local Shoes Pilot Case : MKS' Shoes

Fauriza Aishafahana¹, Nurrani Kusumawati²

¹ School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

² School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

Purchase decisions are made by choosing between two or more options and deciding whether to buy or not to buy. The purchase decision is influenced by many factors. Local brand is an important topic in the analysis of the relationship between these variables due to COVID-19. MKS' Shoes, which is one of the well-known local shoes in Indonesia, has a strong character so that it is much loved by local residents. Therefore, this study aims to provide which factors influence customer purchase decisions in buying MKS' Shoes and make the customers repurchase the product. The researcher then made a hypothesis about the variables that influence the customers purchase decision in buying MKS' Shoes. In the literature review, all the variables selected positively affect the customer purchase decision. This research will be conducted using a quantitative method with an online survey. The online survey obtained 219 respondents consisting of women and men in Bandung and Jabodetabek areas, especially the younger generation who have purchased MKS' Shoes and repurchased once. Those data were analyzed by the PLS-SEM method using the SmartPLS application. This study indicates that Marketing Mix, Brand Image, and Consumers Nationalism positively influence customers' purchase decision and repurchase intention because of the customer satisfaction. While the other factors ; Social Media Marketing, KOL (Key Opinion Leader), Word of Mouth (WOM) and Brand Trust negatively affect customers' purchase decisions and repurchase intention.

Keywords: Marketing Mix, Social Media Marketing, KOL (Key Opinion Leader), Word of Mouth (WOM), Brand Image, Brand Trust, Consumers Nationalism, PLS-SEM, Survey, Quantitative, Purchase Decision

I. INTRODUCTION

1.1 Research Background

Every individual must have a different point of view, this perspective influences consumers in making decisions. Salem (2018) defined it as the process that begins when a consumer recognizes a need, searches for options, evaluates alternatives, and then chooses a specific product and service. Many factors influence customer purchasing decisions in buying local brands. Important factors that can be used as variables that influence customer purchasing decisions are the marketing mix of the brand (product, price, place, promotion, quality, convenience, uniqueness, etc.), the influence of social media marketing, the influence of KOL (Key Opinion Leader), Word of Mouth (WOM), brand image & trust, or a person's high sense of nationalism so that they always want to use and buy the local products. These important factors will lead the customers to finally buy a product. The output after they buy a product is their satisfaction. This satisfaction from the customers' act in buying a product will lead them to repurchase the product. This is the reason why purchase decisions are important to analyze. It is a consideration of the marketing strategy that will be carried out by the company/brand for the customers from decision making process stage until repurchase intention stage. The success of companies/brands in influencing consumers in purchasing decisions is strongly supported by efforts to build communication with consumers through marketing and

innovation strategies to create new variants of a product. From the several important factors that have been mentioned before, several local shoe brands used these variables to influence customer purchase decisions in buying the products sold. So, why local shoes?

The covid 19 pandemic has opened up opportunities for some people to develop their business. This is very influential in increasing the desire of the Indonesian people to buy local products. This is reflected in the results of the Katadata Insight Center (KIC), 2020 survey regarding the spending behavior of Indonesian consumers during the pandemic. The survey results showed that 87.2% of respondents said they preferred to buy domestic (local) brands, only 12.8% preferred branded products from abroad. Local products that are currently booming are products that are involved in the fashion industry, local shoes is one of them. From the research results, it can be concluded that most of the respondents chose one of the local shoes that are currently often being purchased in Indonesia, MKS' Shoes. The main research gap in understanding why most respondents prefer MKS above other local companies is its unique selling points. MKS dominates the market despite various local brands. Quality, design, customer service, and even a fascinating brand story could be these distinctive selling qualities. Understanding respondents' preference for MKS will illuminate the exact features that engage with customers and contribute to its success, filling the research vacuum and giving significant insights for local brands.

1.2 Problem Statement

There are several problems experienced by customers with the products they already have and are looking for local brands as an answer to these problems. Most of them (60%) just want to add to their shoe/clothing collection, but the other most important problem is that customers need these products for certain occasions. Therefore, it is important for local brands to create branding that shows the purpose of selling these products. In the end, 40% of the population chose MKS' Shoes as their preferred local brand and the remainder chose 4 or more other local brands. This proves that most of the population is familiar with the product and like the brand (MKS' Shoes).

1.3 Research Question

1. What is the most influential factor that made the customer finally decide to buy the local shoes?
2. What are the problems in the company that prevent the customers from finally reaching the purchase decision stage? How does the brand handle it?
3. Does customer satisfaction influence consumers to repurchase the product?

1.4 Research Objective

1. To find out what variables are most influential in attracting the attention of potential customers and making potential customers ultimately decide to buy
2. To analyze what the problems in the company that prevent customers from finally reaching the purchase decision stage
3. To determine whether or not customer satisfaction influences consumers to repurchase a product

1.5 Scope and Limitation

The sample of this research is women and men in Indonesia, especially the younger generation who have purchased local brands in Indonesia and repurchased once in a geographic area in the Bandung and Jabodetabek areas. This research will be conducted from September 2022 to July 2023.

II. LITERATURE REVIEW

2.1 MKS' Shoes

MKS' Shoes is a footwear brand that is headquartered in Bandung. MKS' strives to bring a new take on everyday footwear. Bringing fashion, comfort, edgy, chic and durability together, MKS' Shoes not only stand out but it is also functional without going out of style.

2.2 Marketing mix (Product,Price,Place,Promotion)

Borden (1957) is credited with being the first person to compile a list of 12 controllable marketing elements. These were distilled by McCarthy (1960) into a shorter schema namely "4Ps". These included product, price, place, and promotion (4PS). One of the elements that has a role in the consumer's purchase decision is the marketing mix.

2.3 Word of Mouth

Word of mouth (WOM) is a noncommercial form of informal communication about a product, brand, or service. Consumers may promote products and brands by giving away the product, participating in volunteer activities related to the brand, and spreading positive word of mouth (Arnett, German & Hunt, 2003). Wang and Yu (2015) stated that there are both good and negative reviews of a service or product, and that both sorts of reviews influence a consumer's buying decision.

2.4 Key Opinion Leader (KOL) and Influencers

According to McCracken's (1989) study, a celebrity endorser is an individual who enjoys public recognition and uses this recognition to promote a consumer product by appearing in an advertisement. Celebrity endorsement influences the emotions of consumers and can also influence their attitudes toward advertisements and brands, which can increase purchase intentions and, as a result, sales.

2.5 Brand image & brand trust

Brand image is a crucial component of a brand that enables clients to differentiate it from its competitors (Aaker, 1996). The study that was carried out by Watson et al. (2015) looked into the impact that a company's brand image can influence consumers' choices about purchases of branded clothing products in Germany. Brand trust was defined as consumers' willingness to rely on a brand to fulfill its stated or implied promise (Chaudhuri & Holbrook, 2001). Pop et al., Dabija and Alt (2022) confirmed that brand trust influences purchase decisions positively.

2.6 Social media marketing

According to Erdogmus and Cicek (2012) and Mangold and Faulst (2009), social media has made it possible for customers to quickly communicate with their peers significant information regarding the products or services offered by specific firms. Further, prior literature revealed that a number of scholars (Khatib, 2016; Yogesh and Yesha, 2014) reported that social media marketing plays an important role in forming consumers' purchase decisions.

2.7 Consumer perception under the construct of Nationalism

According to Cateora and Graham (2007), nationalism can be defined as a deep feeling of one's own self-worth in relation to their country. Taniredja (2009) noted that a deep feeling of a tight tie with one's homeland and a growing sense of nationalism is getting stronger and stronger. In contrast to this, the sensation of a deep connection with one's motherland is increasingly stronger.

2.8 Purchase Decision

Purchase decision was defined as an individual's selection of a company-introduced product or service above those of its competitors (Kim & Sung, 2009). When consumers' awareness about a brand and its offering increases, they usually seek for more information about it online and then assess the benefits of selecting it over those of competitors prior to making a buying decision (Sharma et al., 2021).

2.9 Customer Satisfaction

Customer satisfaction, according to Philip Kotler (1995), is "a person's feeling of pleasure or disappointment when he/she compares the perceived outcome of a product or service against his/her expectations". According to Kotler and Andreasen (1995: 50), customer satisfaction is the degree of one's feelings after comparing the performance of the products that he felt with his expectations. If a consumer has purchased and expectations are met, it will result in customer satisfaction.

2.10 Repurchase Intention

The act of purchasing a thing can lead to additional purchases of that product in the future. The intention to repurchase a product twice or more, either for the same product or for a new product, is referred to as repurchase intention (Zhilin et al, 2009). The term "repurchase intention" refers to a customer's desire and likelihood to use the same product or service in the near or distant future (Kotler P.,2012).

2.11 Conceptual Framework

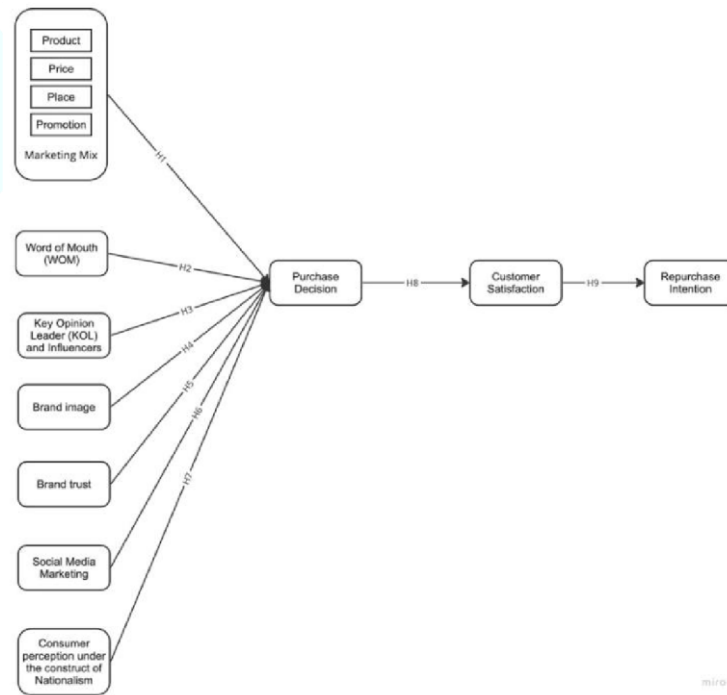


Figure 2.1 Theoretical Framework

Source : Kasirye, F. (2022), Inaolaji, A.T. and Narci, M. T. (2022), Shubhangam K, et.al. (2020), Hossain, M.M, et.al. (2017), Sudha, M. and Sheena, K. (2017), Kim, K.H. and Kim, E.Y. (2020), Wijyaningtyas, M. et al. (2022), Hanaysha, J.R. (2022), Hanaysha, J.R. (2018), Dibias L.M., Ratih H., Heny H. (2021), Siallagan, E. and Vallentine, F. (2021), Diawan, N.S., et.al. (2016), Lin, B., et.al. (2022), Ngoc Duy Phuong, N. and Thi Dai g, T. (2018)

H1 : Marketing mix has an effect on the consumers purchasing decisions

H2 : Positive word of mouth has an effect on the consumers purchasing decisions

H3 : KOL & Influencers has an effect on the consumers purchasing decisions

H4 : Brand image has an effect on the consumers purchasing decisions

H5 : Brand trust has an effect on the consumers purchasing decisions

H6 : Social media marketing has an effect on the consumers purchasing decisions

H7 : Consumer nationalism has an effect on the consumers purchasing decisions

H8 : Purchase decision has an effect on customer satisfaction

H9 : Customer satisfaction has an effect on the repurchase intention

The theoretical framework presented above draws upon a synthesis of various hypotheses proposed in several academic papers. This comprehensive framework amalgamates the collective findings to assert that each of the variables considered plays a crucial role in influencing consumers to make a purchase decision. By integrating insights from multiple studies, the framework concludes that factors such as marketing mix, word of mouth, key opinion leader, brand image, brand trust, social media marketing, and consumer nationalism influence on consumers, ultimately leading them to the final purchase of a product.

III. RESEARCH METHODOLOGY

3.1 Research Approach

This quantitative study collected data via survey. The quantitative method helps the researcher understand consumers' reasons for buying the goods and their correlations. Before doing the full study, the researcher conducts a pilot test. Pilot tests detect and fix any issues before the main study, determining whether a project or program can be completed (Mertens, D. M., 2015).

3.2 Survey Method

The researcher has opted to use a survey approach for this study's methodology. The reason to use the survey method is because the researcher wants to know the perspective of the customer regarding the factors that affect them to buy the products. A questionnaire will be used for the survey procedure. A questionnaire is an effective data collection technique when studying a big population and needing to collect data in a standardized way (Dillman, D. A., Smyth, J. D., & Christian, L. M., 2014).

The researcher will use Google Forms for multiple-choice and open-ended questions. Google form will be shared across other platforms, including Instagram, Line, and WhatsApp. The researcher will also collect quantitative data using a Likert scale questionnaire. A five- or seven-point Likert scale lets people rate their agreement or disagreement with a statement. Attitude is measured using Likert scales, which range from strongly agree to strongly disagree (Jamieson, S., 2004).

3.2.1.1 Data Collection

Since MKS is a Bandung-based shoe firm, respondents are from Bandung and Jabodetabek. The respondents' ages will be 19-25, 26-30, and over 30. The minimum number of sample sizes used is 100 samples according to the study conducted by Roberta Heale and colleagues in 2013. The researcher chooses judgment sampling because the population being investigated is small, inaccessible, and the researcher needs a specific set of traits in the sample (Creswell, J. W., & Creswell, J. D. 2017).

3.2.1.2 Data Analysis

When the quantitative research has been completed, the data that has been obtained will be processed in the following chapter. Descriptive statistics, PLS-SEM, Validity Test, Reliability Test, Collinearity Test, Coefficient of Determination and Stone-Giesser Test, and F Square Effect Size will be used to analyze the data that was gathered from the respondents in this study.

IV. RESULT / FINDING

This study lasted two weeks. A researcher-administered Google form questionnaire obtained quantitative data. The researcher received 219 answers, with 123 being processed. This section discusses quantitative analysis findings.

4.1 Quantitative Approach Analysis

4.1.1 Descriptive Analysis For Framework

Table 4.1 Descriptive Analysis for Framework 1

Variable	Indicator	Mean	Min	Max	Standard Deviation	
Marketing Mix (Product, Price, Place, Promotion)	MM Product 2	The reliability and quality of the product is very high	4.114	1	5	0.665
	MM Product 3	The product design is very attractive	4.439	1	5	0.788
		The product has very appealing features				
	MM Price 2	The point of purchase has provided me with more than one option of payment mode	4.52	1	5	0.616
	MM Place 1	MKS' sells its products through various channels	4.276	1	5	0.819
	MM Promotion 1	MKS' advertises the product frequently	4.244	1	5	0.82
	MM Promotion 3	The website of MKS' provides sufficient information	4.244	2	5	0.691
Word of Mouth (WOM)	WOM 1	The favorable aspects of the product are frequently discussed by the people	4.163	1	5	0.703
	WOM 2	I got recommendations from others	4.073	1	5	0.93
	WOM 3	People gave me completely highly relevant information about MKS' for my decision making	4.325	1	5	0.704
		The information about MKS that people gave me was helpful enough				
Key Opinion Leader (KOL)	KOL 1	I use this instagram account as a source of information about MKS'	3.943	2	5	0.877
	KOL 2	This instagram account influence me to buy MKS'	4.203	3	5	0.555
	KOL 3	This instagram account persuades me to dress like the account picture suggest	3.878	2	5	0.717
	KOL 4	This instagram account's review greatly influenced my buying decision	4.252	3	5	0.619
Brand Image	BI 1	MKS' has a good reputation	4.504	1	5	0.63

	BI 2	Compare to other brands, MKS' is a unique brand	4.455	1	5	0.666
	BI 3	I feel MKS' suits my needs	4.057	1	5	0.725
Brand Trust	BT 1	MKS' is always at my consumption expectations level	4.163	1	5	0.703
	BT 2	MKS' gives me confidence and certainty in the consumption of a product	4.13	1	5	0.754
	BT 3	MKS' never disappoints me I could rely on MKS'	4.203	1	5	0.743
Social media marketing	SMM 1	MKS' content is relevant to me (Instagram)	4.154	1	5	0.599
	SMM 2	MKS' content is popular among other users or friends (Instagram)	4.358	1	5	0.626
	SMM 3	There are advantageous campaigns in social media (Instagram)	4.081	1	5	0.645
	SMM 4	MKS' content is relevant to me (Tiktok)	4.089	1	5	0.638
	SMM 5	MKS' content is popular among other users or friends (Tiktok)	4.146	1	5	0.706
	SMM 6	There are advantageous campaigns in social media (Tiktok)	4.049	1	5	0.661
Consumer perception under the construct of Nationalism	CPN 1	Indonesian people should always buy Indonesianmade products instead of imports	3.626	1	5	1.107
	CPN 2	It may cost me in the long-run but i prefer to support Indonesian products	3.22	1	5	1.213
	CPN 3	We should buy from foreign countries only those products that we cannot obtain within our own country	3.073	1	5	1.257
	CPN 4	It is always best to purchase Indonesian products	3.976	1	5	0.869
Purchase Decision	PD 2	Details concerning the level of quality affect purchase decision	4.301	1	5	0.785

	PD 3	Making a purchase decision for MKS' requires a lot of thought	3.951	1	5	1.019
Customer Satisfaction	CS 1	I have trust in MKS' products and services	4.301	1	5	0.624
	CS 2	I can feel secure accommodating MKS'	4.341	1	5	0.774
	CS 3	Value-added services are something the MKS' management is constantly working on developing for their customer	4.407	1	5	0.635
Repurchase Intention	RI 1	I will make purchase again on MKS'	4.187	1	5	0.758
	RI 2	I will visit the MKS' store again in the future	4.154	1	5	0.807
	RI 3	I intend to recommend MKS' to people around me	4.325	1	5	0.681

4.1.2 Statistical Analysis for Framework

Based on the previous conversation, the researcher proposes to use the PLS-SEM technique to examine quantitative data. As a result, the researcher will now give the results of the framework 1 analysis utilizing the PLS-SEM approach.

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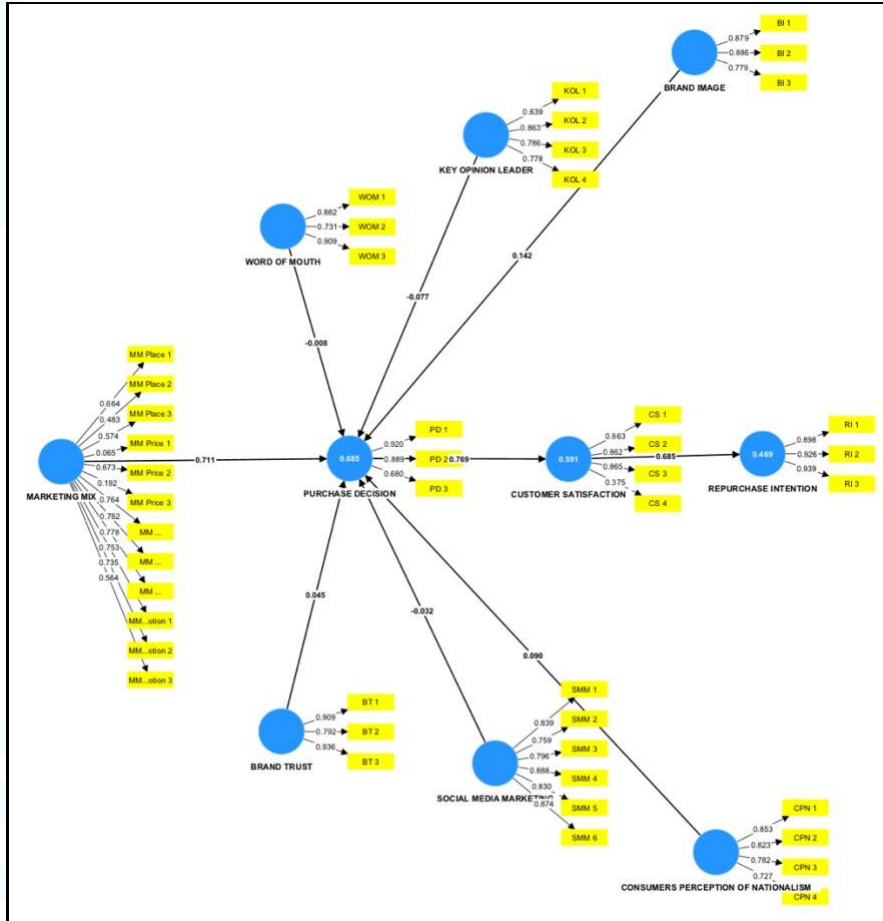


Figure 4.1 PLS-SEM Analysis Result

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4.1.2.1 Content Validity Test

Table 4.2 Content Validity Test

Variables	Indicator	Outloading	Validity
Marketing Mix (Product, Price, Place, Promotion)	MM Product 2	0.775	Valid
	MM Product 3	0.8	Valid
	MM Price 2	0.672	Valid
	MM Place 1	0.689	Valid
	MM Promotion 1	0.801	Valid
	MM Promotion 3	0.576	Valid

Word of Mouth (WOM)	WOM 1	0.885	Valid
	WOM 2	0.746	Valid
	WOM 3	0.9	Valid
Key Opinion Leader (KOL)	KOL 1	0.641	Valid
	KOL 2	0.865	Valid
	KOL 3	0.813	Valid
	KOL 4	0.761	Valid
Brand Image	BI 1	0.883	Valid
	BI 2	0.883	Valid
	BI 3	0.777	Valid
Brand Trust	BT 1	0.907	Valid
	BT 2	0.803	Valid
	BT 3	0.932	Valid
Social media marketing	SMM 1	0.842	Valid
	SMM 2	0.756	Valid
	SMM 3	0.797	Valid
	SMM 4	0.887	Valid
	SMM 5	0.828	Valid
	SMM 6	0.876	Valid
Consumer perception under the construct of Nationalism	CPN 1	0.856	Valid
	CPN 2	0.839	Valid
	CPN 3	0.787	Valid

	CPN 4	0.707	Valid
Purchase Decision	PD 2	0.909	Valid
	PD 3	0.756	Valid
Customer Satisfaction	CS 1	0.872	Valid
	CS 2	0.876	Valid
	CS 3	0.876	Valid
Repurchase Intention	RI 1	0.897	Valid
	RI 2	0.925	Valid
	RI 3	0.941	Valid

4.1.2.2 Internal Consistency

Table 4.3 Internal Consistency Reliability

Indicator	Composite Reliability	Reliability
Brand Image	0.885	Reliable
Brand Trust	0.913	Reliable
Consumer Nationalism	0.875	Reliable
Customer Satisfaction	0.907	Reliable
Key Opinion Leader	0.856	Reliable
Marketing Mix	0.867	Reliable
Purchase Decision	0.822	Reliable
Repurchase Intention	0.944	Reliable
Social Media Marketing	0.931	Reliable
Word of Mouth	0.883	Reliable

4.1.2.3 Convergent Validity Test

Table 4.4 First Attempt Convergent Validity Test

Indicator	Average Variance Extracted
Brand Image	0.721
Brand Trust	0.778
Consumer Nationalism	0.639
Customer Satisfaction	0.765
Key Opinion Leader	0.6
Marketing Mix	0.523
Purchase Decision	0.699
Repurchase Intention	0.848
Social Media Marketing	0.693
Word of Mouth	0.716

4.1.2.4 Discriminant Validity Test

Table 4.5 Discriminant Validity Test First Attempt

	Brand Image	Brand Trust	Consumer Nationalism	Customer Satisfaction	Key Opinion Leader (KOL)	Marketing Mix	Purchase Decision	Repurchase Intention	Social media marketing	Word of Mouth (WOM)
Brand Image	0.849									
Brand Trust	0.57	0.882								
Consumer Nationalism	0.415	0.36	0.799							
Customer Satisfaction	0.693	0.757	0.416	0.875						
Key Opinion Leader (KOL)	0.408	0.444	0.479	0.351	0.774					
Marketing Mix	0.688	0.659	0.45	0.744	0.474	0.724				
Purchase Decision	0.569	0.466	0.455	0.68	0.32	0.705	0.836			

Repurchase Intention	0.588	0.524	0.463	0.668	0.332	0.65	0.446	0.921		
Social media marketing	0.675	0.638	0.444	0.691	0.524	0.739	0.548	0.643	0.832	
Word of Mouth (WOM)	0.487	0.458	0.27	0.473	0.34	0.504	0.361	0.547	0.553	0.846

4.1.2.5 Collinearity Test

Table 4.6 Collinearity Test

Indicator's Code	VIF
BI 1	1.91
BI 2	1.94
BI 3	1.57
BT 1	2.393
BT 2	1.932
BT 3	3.168
CPN 1	1.913
CPN 2	2.121
CPN 3	1.945
CPN 4	1.323
CS 1	2.064
CS 2	2.009
CS 3	2.052
KOL 1	1.577
KOL 2	1.668
KOL 3	2.224
KOL 4	1.456
MM Place 1	1.744
MM Price 2	1.635
MM Product 2	1.908
MM Product 3	1.946
MM Promotion 1	2.008
MM Promotion 3	1.498
PD 2	1.208
PD 3	1.208

Meanwhile, the T-Statistic for the following five structural paths is less than 1.96: Brand Image to Purchase Decision, Brand Trust to Purchase Decision, Key Opinion Leader to Purchase Decision, Social Media Marketing to Purchase Decision, and Word of Mouth to Purchase Decision.

Table 4.7 Structural Path Significance

Structural Path	Path Coefficient	T-Statistics (O-STDEV)	Coefficients of Determination (R ²)	Cross-Validated Redundancy (Q ²)
Brand Image -> Purchase Decision	0.144	1.441	0.536	0.49
Brand Trust -> Purchase Decision	-0.025	0.279	0.536	0.49
Consumer Nationalism -> Purchase Decision	0.186	2.731	0.536	0.49
Customer Satisfaction -> Repurchase Intention	0.668	7.163	0.447	0.341
Key Opinion Leader -> Purchase Decision	-0.093	1.209	0.536	0.49
Marketing Mix -> Purchase Decision	0.583	5.542	0.536	0.49
Purchase Decision -> Customer Satisfaction	0.68	8.986	0.462	0.499
Social Media Marketing -> Purchase Decision	0.01	0.091	0.536	0.49
Word of Mouth -> Purchase Decision	-0.015	0.195	0.536	0.49

The study will do the Goodness of Fit (GoF) as the next step. GoF measures impact size and convergent validity, which gives it a score between 0 and 1.

Table 4.8 Goodness of Fit Result

Variable	R ²	Q ²
Purchase Decision	0.536	0.49
Customer Satisfaction	0.462	0.538
Repurchase Intention	0.447	0.499
Average	0.4816	0.509

GoF	0.495
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The study's GoF result is 0.495, as shown in Table 4.16. GoF values in excess of 0.1 suggest that the model satisfactorily describes the data.

4.1.2.7 Hypothesis Testing

PLS analysis is applied to provide an explanation for the outcomes of hypothesis testing. The significance of the inner model's T-values and path coefficients is emphasized.

Table 4.9 Hypothesis Testing

Hypothesis	Structural Path	Path Coefficient	T Values	P Values	Result
H1	Marketing mix > Purchase Decision	0.583	5.542	0	Accepted
H2	Word of Mouth > Purchase Decision	-0.015	0.195	0.845	Rejected
H3	Key Opinion Leader > to Purchase Decision	-0.093	1.209	0.227	Rejected
H4	Brand Image > Purchase Decision	0.144	1.441	0.15	Rejected
H5	Brand Trust > Purchase Decision	-0.025	0.279	0.78	Rejected
H6	Social Media Marketing > Purchase Decision	0.01	0.091	0.927	Rejected
H7	Consumer Nationalism > Purchase Decision	0.186	2.731	0.006	Accepted
H8	Purchase decision > Customer Satisfaction	0.68	8.986	0	Accepted
H9	Customer Satisfaction > Repurchase Intention	0.668	7.163	0	Accepted

4.1.2.8 f² Square Effect Size

The f² effect size is a measure of the magnitude of an effect based on its own sample size. If f² is more than 0.35, then the effect size is relatively large. A medium effect size is represented by a f² value between 0.35 and 0.15. A small effect size, as measured by f², is indicated by a value of 0.15 to 0.02. Table 4.18 displays the f² result from this analysis.

Table 4.10 f² Square Effect Size

	Brand Image	Brand Trust	Consumer Nationalism	Customer Satisfaction	Key Opinion Leader (KOL)	Marketing Mix	Purchase Decision	Repurchase Intention	Social media marketing	Word of Mouth (WOM)
Brand Image							0.02			
Brand Trust							0.001			
Consumer Nationalism							0.052			
Customer Satisfaction								0.807		

Key Opinion Leader (KOL)							0.012			
Marketing Mix							0.252			
Purchase Decision				0.858						
Repurchase Intention										
Social media marketing							0			
Word of Mouth (WOM)							0			

V. DISCUSSION

In comparing the results of this research with other relevant previous studies, a notable difference becomes evident. In the prior research, all of the hypotheses were accepted, indicating that all variables had a significant influence on consumer purchase decisions. However, in this current study, a stark contrast emerges as most of the hypotheses are rejected, suggesting that the majority of the variables analyzed do not have a significant impact on consumer purchase decisions. This disparity in findings warrants additional critical analysis to understand the factors contributing to the varying outcomes. Possible explanations could include differences in the research methodologies, sample demographics, or contextual factors. By delving deeper into these nuances, researchers can gain valuable insights into the complexities of consumer behavior and refine future investigations. Such comparative analysis serves to enrich the existing body of knowledge and encourages a more comprehensive understanding of the factors that influence consumers' choices in the marketplace.

- a. H1 : Marketing Mix (Product, Price, Place, Promotion) positively influence Consumers Purchasing Decisions

The first hypothesis makes the assumption that there is a significant effect that the Marketing Mix (Product, Price, Place, and Promotion) has on the Consumer Purchase Decision. The analysis of the data conducted for this study supported the validity of this hypothesis. This was demonstrated by the fact that the T-value for this hypothesis is 5.542, which is more than the value of 1.96 when compared at a significance level of 0.05 (5%). Therefore, the hypothesis is accepted.

- b. H2 : Word of Mouth (WOM) positively influence Consumers Purchasing Decisions

According to the second hypothesis, there is an insignificant effect between Word of Mouth (WOM) and Consumer Purchase Decision. This hypothesis was rejected by the data analysis in this study, since the T-value for it is 0.195, which is less than the value of 1.96 at the 5% level of significance

- c. H3 : Key Opinion Leader (KOL) positively influence Consumers Purchasing Decisions

Hypothesis 3 assumes that Key Opinion Leader (KOL) has an insignificant effect on Consumer Purchase

Decision. Data analysis done in this research rejected this hypothesis, proven by the T-value of this hypothesis is 1.209, which is smaller than the value of 1.96 at a significance point of 0.05 (5%). Therefore, the hypothesis is rejected.

d. H4 : Brand Image positively influence Consumers Purchasing Decisions

It is assumed in Hypothesis 4 that Brand Image has an insignificant effect on Consumer Purchase Decision. This hypothesis was disproved by the data analysis that was carried out as part of this study. This was demonstrated by the fact that the T-value for this hypothesis is 1.441, which is lower than the value of 1.96 when compared at a significance level of 0.05 (5%). Therefore, the hypothesis is rejected.

e. H5 : Brand Trust positively influence Consumers Purchasing Decisions

Hypothesis 5 assumes that Brand Trust has an insignificant effect on Consumer Purchase Decision. Data analysis done in this research rejected this hypothesis, proven by the T-value of this hypothesis is 0.279 which is smaller than the value of 1.96 at a significance point of 0.05 (5%).

f. H6 : Social Media Marketing positively influence Consumers Purchasing Decisions

Hypothesis 6 assumes that Social Media Marketing has an insignificant effect on Consumer Purchase Decision. Data analysis done in this research rejected this hypothesis, proven by the T-value of this hypothesis is 0.091 which is smaller than the value of 1.96 at a significance point of 0.05 (5%).

g. H7 : Consumer perception of Nationalism positively influence Consumers Purchasing Decisions

Hypothesis 7 assumes that Consumer perception of Nationalism has a positive influence and significant effect on Consumer Purchase Decision. Data analysis done in this research accepted this hypothesis, proven by the T-value of this hypothesis is 2.731, which is larger than the value of 1.96 at a significance point of 0.05 (5%). Therefore, the hypothesis is accepted.

h. H8 : Consumer Purchase Decision has a significant effect on Customer Satisfaction

Hypothesis 8 assumes that Consumer Purchase Decision has a positive influence and significant effect on Customer Satisfaction. Data analysis done in this research accepted this hypothesis, proven by the T-value of this hypothesis is 8.986, which is larger than the value of 1.96 at a significance point of 0.05 (5%).

H9 : Customer Satisfaction has a significant effect on Repurchase Intention

Customers are more likely to make a repeat purchase if they are satisfied, according to Hypothesis 9, it has a significant effect on purchase decisions. The T-value of 7.163, which is greater than the value of 1.96 at the 5% significance level.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

RQ 1 : What is the most influential factor that makes the customer finally decide to buy the local shoes?

Based on the literature review, all of the variables positively influence the consumers' purchase decisions. While in this study, based on PLS-SEM analysis results, there are only two variables including Marketing Mix and Consumers' Nationalism that influence the customers to buy MKS' product and have a significant effect in the purchasing decisions. This is proven by all of the results of T-values are higher than 1.96 and the p-values are below 5% of significance level. According to this, the most influential factor that influences consumers' purchase decision is the marketing mix with its T-value is 5.542 and the p-value is 0, which has a large effect size and significance. Supported by the findings by Inaolaji, A. T. (2022), marketing mix have been discovered to influence customers' propensity to purchase products. This could happen because of the uniqueness of the product with the fair price that can lead the customers to finally buy the product, supported by the statement in the questionnaire that the majority of respondents (92.3%) said that the reason of buying the MKS' product is the good motifs and uniqueness of its model. Most of the respondents also agree that MKS' has a high quality product. The second factor that is the most influential factor that influences consumers' purchase decision is the consumers' perception of nationalism with its T-value is 2.731 and the p-value is 0.006, which has a large effect size and significance. Siallagan, E. and Vallentine, F. (2021) find that nationalism has a positive and significant influence on purchasing decisions. This finding is also supported by the questionnaire that most of the respondents agree to prefer buying local brands because they think it is the best decision when people buy a product that they produce in their country. From the explanation above, the most influential factors that made the customer finally decide to buy the product from MKS' are the marketing mix and consumer nationalism.

RQ 2 : What are the problems in the company that prevent the customers from finally reaching the purchase decision stage? How does the brand handle it?

The problems in the company that experienced by customers with MKS' product can be seen from the results in hypothesis testing. Brand trust, KOL, and word of mouth, has a negative original sample and has a P-Value higher than 0.05 and the T-value lower than 1.96. This means those factors do not influence customers to purchase the product and the problems experienced by customers are aligned with the factors that do not meet the requirements of T statistics. It can be seen that the problems are mainly from the marketing strategy. For example, KOL does not influence customers to buy a product because the brand or the company uses the wrong influencers/KOL for the brand. Brand trust also does not influence customers to buy a product because people do not trust the brand that people negatively talk about which of course is connected with the negative word of mouth. MKS' can handle this problem by making a marketing plan or marketing strategy carefully by looking at their target market. This can adjust what kind of KOL/influencers they will use to increase sales. Look for people who have a genuine interest in a brand and can help spread the word. Work with people who have a genuine interest in and use of the products, and get them to write reviews and give recommendations based on their own experiences. People's trust in the brand will also increase due to the strong influence of KOL and good recommendations from people. Inspire the happy customers to spread the word by posting reviews and testimonials online.

RQ 3 : Does customer satisfaction influence consumers to repurchase the product?

Based on the analysis data above, the customer's satisfaction influences the repurchase intention. It can be seen from Table 4.17 (Hypothesis Testing) that customer satisfaction to repurchase intention has a P-Value lower than 0.05 and the T statistics greater than 1.96. This has been proven by the findings of the study by Lin, et.al. (2022) that customers are more likely to repurchase after having their needs met. This is also supported by Ngoc, et.al. (2018) study that there is a substantial positive relationship between perceived service quality and customer satisfaction to repurchase intention. Based on the questionnaire, most of the

respondents agree that they will do the repurchase and will always visit the MKS' store in the future. They also agree that they will recommend this brand to their family and friends. This output from the customers' act regarding that statement is that they feel satisfied with the products they bought that leads them to do the repurchase. In conclusion, By providing a positive experience and meeting customer expectations, companies can build long-term relationships with their customers, increasing the likelihood of repeat purchases.

6.2 Recommendation

6.2.1 Further Research

In this research, the researcher found that Word of mouth, Key opinion Leader, Brand Image, Brand Trust, and Social Media Marketing have a small effect size and are not significant to Purchase Decision. Therefore, the researcher suggests in the further research, that variables are changed with other variables which might have a bigger effect towards a Purchase Decision.

6.2.2 Brand (MKS' Shoes)

From the results of data processing in chapter 4, it can be concluded that the factors that can influence customers in buying a product are marketing mix and consumers' nationalism. It can be seen that MKS' Shoes must be based on product consistency and price as well as the place for the company to sell products.

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The Impact Of Product Review Videos (Communication Style) On Youtube Towards Generation Z Perceived Transparency And Credibility In Electronic Product Purchase Intention

Daniel Tansil¹, and Ira Fachira¹

¹School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

In 2022, Indonesia's Generation Z, comprising two-thirds of the population, faced financial challenges. A recent survey by Populix with 2,535 respondents revealed that 32% of Generation Z, with an allowance below four million rupiahs, relied on YouTube for smartphone decision-making. This study investigates the impact of product review videos, specifically communication style, on purchase intention among Generation Z. Using a quantitative approach, data was collected from 322 respondents through non-probability sampling, and statistical analysis was conducted using PLS-SEM. The results indicate that the communication style of product review videos positively influences perceived transparency, credibility, attitudes toward tech YouTubers, and purchase intention among Generation Z. This research contributes to understanding Generation Z consumer behavior in the electronics industry, particularly regarding product review videos and their impact on perceived transparency, credibility, attitudes toward tech YouTubers, and purchase intention. The findings provide valuable insights for tech company marketers targeting the Indonesian Generation Z market. By leveraging the impact of product review videos and the influence of tech YouTubers, marketers can enhance perceived transparency, credibility, attitudes toward tech YouTubers, and purchase intention among customers.

Keywords: Communication Style, Perceived Transparency, Perceived Credibility, Attitudes Towards Tech YouTubers, Purchase Intention, Generation Z.

I. INTRODUCTION

Internet innovation has significantly impacted our lives, transforming various aspects of society. In the past, people relied on physical means to gather product information, but now, with the widespread availability of internet access, particularly through smartphones, it has become an essential part of our daily routines, work, and education. Indonesia alone has seen a growth of internet users, reaching 212.9 million in January 2023, with social media platforms playing a significant role in the daily lives of Indonesians (Kepios, 2023)

YouTube, founded by Steve Chen, has become a leading platform for sharing videos globally. In Indonesia, it is the second most-visited website, amassing 833 million visits. YouTube's user-friendly interface, vast content library, and interactive features have fostered a thriving online community. Notably, YouTube has become a major platform for product review videos, where YouTubers share their first-hand experiences with various products. For Generation Z, YouTube plays a vital role in influencing their purchasing decisions, with 32% of Gen Z consumers in Indonesia relying on it for information before buying a smartphone (Populix, 2022)

Generation Z, born between 1997 and 2012, forms a significant part of the Indonesian population, accounting for 27.94% (BPS, 2020). Despite being tech-savvy and relying on social media, they often seek guidance when making purchases, especially for expensive products. This demographic engages in thorough research before making decisions, with product reviews holding significant influence. Among Generation Z, a notable figure in the Indonesian YouTube scene is David Brendi, known as Gadget In. With approximately 10.5 million subscribers, his insights and guidance help consumers navigate the complex electronic vendor market (Chenda, 2011)

Research on the impact of product review videos on consumer behavior has focused on factors such as credibility, usefulness, and behavioral intentions. However, there remains a knowledge gap in understanding the purchasing behaviors of Generation Z consumers in the Indonesian electronics market. To address this gap, researchers can use the Stimulus-Organism-Response (SOR) framework to explore how communication styles, such as social-oriented and task-oriented approaches, impact Generation Z's purchase intentions. This research approach aims to uncover the influence of product review videos on the purchasing decisions of Generation Z consumers, providing valuable insights into their behavior (Chubbiansyah, 2018; Fitriani et al., 2020)

In conclusion, the internet and social media have revolutionized how we gather information and make purchasing decisions. As a leading video-sharing platform, YouTube has emerged as a primary source of product reviews for Generation Z consumers in Indonesia. YouTubers like David Brendi hold significant sway, providing valuable insights that help consumers navigate the electronic vendor market. To better understand the specific impact of product review videos on the purchasing intentions of Generation Z, further research is essential. By employing the SOR framework, researchers can delve into how communication styles shape Generation Z's purchase intentions, shedding light on the consumer behavior of this influential demographic.

Here are the research questions formulated more cohesively:

1. How does the influence of Product Review Videos (Communication Style) impact Perceived Transparency, Perceived Credibility, and Attitudes Toward Tech YouTubers in Generation Z?
2. How do Perceived Transparency, Perceived Credibility, and Attitudes Toward Tech YouTubers Influence Purchase Intention in Generation Z?

II. LITERATURE REVIEW

2.1 Stimulus-Organism-Response Model

The stimulus-organism-response (SOR) model proposed by (Winston, 2012) and expanded upon by (Shang et al., 2023) provides a comprehensive framework for understanding the interplay between external stimuli, internal

psychological processes, and subsequent behavioral responses. The communication style of product review videos serves as a significant stimulus (Fitriani et al., 2020) influencing viewers' cognitive and affective responses. Tech YouTubers' perceived transparency and credibility shape the organism's attitudes toward them, which, in turn, affect behavioral responses (Park et al., 2007) The response component reflects observable outcomes, such as purchase intention, resulting from the interaction between the stimulus and the organism (Donovan & Rossiter, 1982) The SOR model has been widely applied in consumer behavior research, contributing to a better understanding of human behavior in response to stimuli (Devedi et al., 2017; Fitriani et al., 2020; Shang et al., 2023).

2.2 YouTube

YouTube, a prominent video-sharing platform, provides a wide array of current online video content (Bhuiyan et al., 2017) As a leading social media site, users actively engage with videos through uploading, sharing, commenting, and expressing preferences via likes and views. YouTube has emerged as a significant player in the participatory media landscape, gaining acclaim among autonomous creators known as YouTubers (Burgess & Green, 2009) These creators utilize various mediums, including videos, photos, ratings, articles, and blogs, to share opinions and offer reviews. Particularly, product reviews, especially for electronics, serve as valuable resources for manufacturers to gather customer feedback and assist consumers in making informed purchasing decisions (Filho & Tan, 2009)

2.3 Communication Style

Communication styles in online settings play a crucial role in influencing audience engagement and perception of product review videos. Previous research has identified social-oriented and task-oriented communication styles as significant factors impacting transparency, credibility, and consumer engagement (Fitriani et al., 2020; Yao et al., 2022). The social-oriented style prioritizes cooperation and enjoyable interactions, fostering trust and positive audience perception. On the other hand, the task-oriented style emphasizes achieving specific objectives and maintaining quality and honesty. Both styles have been found to positively influence perceived transparency and credibility. Based on these findings, hypotheses were developed to further explore the relationship between communication styles and perceived transparency and credibility in product review videos on YouTube.

After the researcher did some previous research hypotheses were developed, like below;

- H1 :Social-oriented Communication Style (SOCS) have a positive influence on Perceived Transparency (PT) of product review on YouTube
- H2 :Social-oriented Communication Style (SOCS) have a positive influence on Perceived Credibility (PC) of product review video on YouTube

- H3 :Task-oriented Communication Style (TOCS) have a positive influence on Perceived Transparency (PT) of product review on YouTube
- H4 :Task-oriented Communication Style (TOCS) have a positive influence on Perceived Credibility (PC) of product review video on YouTube

2.4 Perceived Transparency of Video Information (PT)

Transparency is a fundamental principle in modern society, encompassing clear communication and understanding of social and natural phenomena (Vattimo, 1992) In the business context, perceived transparency plays a crucial role in influencing consumer purchase decisions (Harrington, 2007) It refers to how easily others can comprehend the communication or actions of individuals, impacting consumer trust and decision-making (Schnackenberg & Tomlinson, 2016) Research suggests that perceived transparency reduces the need for generating alternative motives and fosters a sense of comfort and certainty among users (Li & Mao, 2015) In the context of Tech YouTubers, emphasizing transparency can establish trust and credibility with the audience, influencing attitudes toward the YouTubers and ultimately impacting consumer behavior and purchase decisions.

After the researcher did some previous research hypotheses were developed, like below;

- H5 :Perceived Transparency (PT) have a positive influence on Perceived Credibility (PC) of video information
- H6 :Perceived Transparency (PT) have a positive influence on Attitudes Toward Tech YouTubers (ATTYTB)

2.5 Perceived Credibility of Video Information (PC)

Credibility plays a crucial role in shaping users' perceptions and decision-making processes. It refers to the trustworthiness and reliability of the information, typically associated with professionals like editors, reviewers, and news reporters (Fitriani et al., 2020) In electronic application services, perceived credibility relates to users' certainty and positive outcomes when using such services (Jacoby & Kaplan, 1972). User-generated content on social media platforms, particularly from YouTubers, is often viewed as more credible and unbiased than traditional advertisements based on individual product experiences. The perceived credibility of the source significantly impacts message evaluation, attitudes, and purchase intentions (Mir & Rehman, 2013) how credibility influences consumer attitudes toward Tech YouTubers (ATTYTB) and subsequently affects purchase intentions can help build trust and enhance the influence of ATTYTBs on consumer behaviour (Mir & Rehman, 2013)

After the researcher did some previous studies hypotheses were developed, like below;

- H7** :Perceived Credibility (PC) have a positive influence on Attitudes Toward Tech YouTubers (ATTYTB)

2.6 Attitudes Toward Tech YouTubers (ATTYTB)

To support the hypothesis robustly, this study will thoroughly investigate the relationship between consumer attitudes towards Tech YouTubers and their subsequent purchase intentions. Drawing on existing literature, we will examine how favourable or unfavourable attitudes towards these influential figures impact consumers' intentions to purchase products. This research aims to contribute empirical evidence that reinforces the proposed hypothesis, supported by previous studies (Fishbein & Ajzen, 1975; Mosavi, 2012). By employing rigorous data collection methods and conducting meticulous analysis, we seek to provide compelling insights into the significant role of Tech YouTubers in shaping consumer behaviour and decision-making processes, thus further strengthening the hypothesis (Fishbein & Ajzen, 1975; Mosavi, 2012).

After the researcher did some previous studies hypotheses were developed, like below;

H8 :Attitudes Toward Tech YouTubers (ATTYTB) have an positive influence effect on Purchase Intention (PI)

2.7 Purchase Intention (PI)

The buyer decision process consists of five stages: need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase evaluation (Kotler & Keller, 2006). Purchase intention, situated between evaluating alternatives and making a purchase decision, reflects a consumer's desire to acquire a product based on their preferences, experiences, and needs (Kotler & Keller, 2006). In the context of product reviews as a communication style, providing valuable information positively influences purchase intention. Research on QPVLCR (Quantity of posts, post views, likes, comments, and reviews) suggests that these factors also have a positive impact on purchase intention (Fitriani et al., 2020). Additionally, incorporating sensory marketing and information influences parasocial interaction, cognitive and affective trust, and perceived usefulness, leading to increased stickiness and adoption, ultimately enhancing purchase intentions (Huang et al., 2022). Understanding these variables enables marketers to shape consumers' purchase intentions through targeted communication strategies and valuable information dissemination.

2.8 Conceptual Framework

After conducting an extensive literature review, our research team has gathered substantial information that will serve as a foundation for our study's hypotheses. The diagram below provides a concise summary of the key findings we have discovered through our review process:

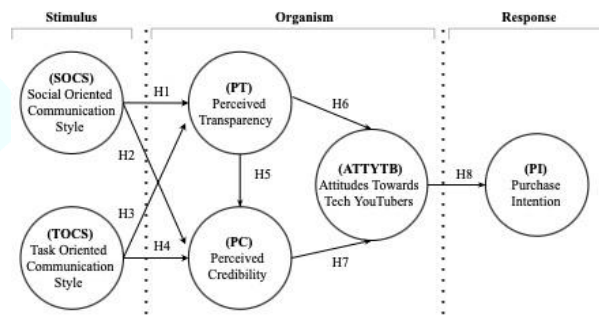


Figure 2.1 Conceptual Framework

III. RESEARCH METHODOLOGY

3.1 Research Design

This research investigates the impact of communication style in product review videos on purchase intention among Generation Z for electronic products. The study involved a comprehensive literature review to develop hypotheses, followed by a quantitative approach using surveys for data collection. The subsequent subsection provides details on the data collection process. Finally, the collected survey data were analyzed to draw conclusions and suggest areas for further exploration.

3.2 Research Approach

3.2.1 Quantitative Research Approach

This research employed quantitative methods, specifically a survey design, to gather, analyze, and report findings. The study followed the guidelines for a survey or experimental study, including identifying the sample and population, defining the inquiry strategy, collecting, and analyzing data, and interpreting findings (Creswell, 2003). By utilizing statistical techniques, the research aimed to investigate the impact of Communication Style as Product Review Videos on the purchase intention of Generation Z. The survey method allowed for the identification of patterns, relationships, and associations between variables within the population. The data collection process involved administering a quantitative survey questionnaire to obtain a quantitative description of trends, attitudes, or opinions within the sample, enabling generalizations about the population (Creswell, 2003).

3.3 Data Collection

3.3.1 Population and Sample

This research explicitly targets Generation Z as the primary population of interest. Generation Z, born between 1997 and 2012, is widely recognized as digital natives, having grown up in an era of pervasive internet, social networks, and mobile systems. To highlight the significance of this demographic, a recent survey conducted by Populix with a sample of 2,535 respondents revealed that 32% of Gen Z consumers in Indonesia rely on YouTube as their preferred source of information when making smartphone purchase decisions (Populix, 2022). As a result, the research population for this study consists of Generation Z individuals aged between 11 and 26 residing in Indonesia.

3.3.2 Sampling Techniques

This research will use purposive sampling, a non-probability sampling method, to select participants who are relevant to the research questions. The study focuses on Generation Z individuals in Indonesia, aged 11 to 26. Statistical methods will be used to determine the minimum sample size required. Initially, a pilot sample of 30 individuals will be used to estimate the proportion of Generation Z considering purchasing electronic products after watching product review videos by Tech YouTubers. Assuming 21 out of 30 participants express such consideration, the minimum sample size will be approximately 323 respondents. It's important to note that this estimation is approximate and further statistical considerations may be needed based on the research design and analysis plan. This study aims to have a sufficient sample size to draw meaningful conclusions about the impact of Communication Style in Product Review Videos on the purchase intention of Generation Z in Indonesia.

3.2.3 Questionnaire Design

The survey questionnaire was meticulously developed to explore the impact of Tech YouTubers and other factors on Generation Z's purchase intention for electronic goods. It encompassed essential aspects such as SOCS, TOCS, PT, PC, ATTYTB, and PI. Great attention was given to ensuring clarity, conciseness, and relevance of the questionnaire statements to effectively capture the required information in each subsection. Organized into seven sections, the questionnaire began by gathering socio-demographic and behavioral information from respondents. The following sections focused on specific variables, including SOCS, TOCS, PT, PC, ATTYTB, and PI. Participants were asked to rate their agreement on a 5-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5), to assess their responses.

Several modifications were made to adapt the original indicators to the Tech YouTubers-related variables in the questionnaire. Initial indicators provided by (Fitriani et al., 2020) for SOCS and TOCS were adjusted to evaluate Tech YouTubers' impact. The PT indicators were also revised based on (Fitriani et al., 2020) for research. Likewise, the PC variable indicators were modified to align with Tech YouTubers. The ATTYTB indicators were derived from studies by (Belanche et al., 2021; Sánchez-Fernández & Jiménez-Castillo, 2021) Lastly, the PI indicators were adapted from (Huang et al., 2022) research. These modifications aimed to capture the specific characteristics of Tech YouTubers and their influence on viewers' attitudes and purchase intentions.

3.4 Data Analysis

3.4.1 Descriptive Statistic

Descriptive statistics will be employed in this research. Descriptive statistics are crucial in organizing and summarizing data, providing insights into the relationship between variables within a sample or population. It is essential to calculate descriptive statistics as a fundamental step before making inferential statistical comparisons. Descriptive statistics encompass various aspects, including the type of variables (nominal, ordinal, interval, and ratio), frequency distributions, central tendency measures, dispersion or variation, and position measures (Kaur et al., 2018). This study will analyze the data using measures such as the mean, standard deviation, and response frequencies, considering the Likert scale ranging from 1 to 5.

3.4.2 Utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM)

This study will employ Partial Least Squares Structural Equation Modeling (PLS-SEM), a powerful multivariate analysis technique commonly used to estimate cause-effect relationship models (Zeng et al., 2021). PLS-SEM is a sequential approach that enhances the explained variance of endogenous variables and falls within the broader framework of structural equation modelling (SEM), allowing for examining relationships among multiple independent and dependent variables. Considering this research's theoretical and data-driven nature, PLS-SEM is the appropriate method for achieving the research objectives. The evaluation of the PLS-SEM model will be based on the following criteria:

3.4.2.1 Reliability Test

The primary objective of this research is to assess the reliability of statistical data, with a specific focus on examining the consistency of variables over time. Two key measures are utilized to achieve this: internal consistency and composite measurement reliability. The software tool SmartPLS is employed to evaluate the reliability of indicators by squaring each outer loading, with a minimum threshold of 0.4 sets as the desired score. In addition, the precision of internal consistency reliability is assessed using a composite reliability value of 0.4 or higher, following the guidelines outlined by (Wong, 2013). These measures and criteria will enable the evaluation and determination of the reliability of statistical data in the research study.

3.4.2.2 Validity Test

Validating the methodology is of utmost importance in ensuring the accuracy of measuring statistical data across different variables. This validation process involves examining the extent to which the chosen method accurately captures the intended constructs and generates consistent results that align with the characteristics and variations of the surrounding environment. Malhotra (2010) states that a minimum Average Variance Extracted (AVE) value of 0.5 is necessary to establish convergent and discriminant validity. Discriminant validity can be further assessed by ensuring that the correlation between latent variables surpasses the square root of the AVE for each variable. Another approach to evaluating discriminant validity is through Fornell and Larcker's (1981) criterion, which verifies that a construct shares more variance with its indicators than with other constructs. By employing these validity measures and criteria, the research can ascertain the robustness and accuracy of the statistical data measurement method.

3.4.2.3 Structural Path of Significance in Bootstrapping

In this study, the Bootstrapping procedure in SmartPLS is employed to generate T-statistics values for the outer and inner models, facilitating the evaluation of their significance. This approach enables hypothesis testing and the determination of significance levels between variables. The SmartPLS bootstrapping method calculates T-

statistics to test the significance of path coefficients in both the inner and outer models. A path coefficient is considered significant if its T-statistics value surpasses 1.96 in a two-tailed t-test with a significance level of 5%. (F. Hair Jr et al., 2014)

3.4.2.4 Collinearity Test

The collinearity test analyses variables within a dataset to identify those that should be excluded or combined. In this test, the Variance Inflation Factor (VIF) is evaluated. Software programs like SPSS can be used to calculate the VIF value for collinearity testing. To mitigate potential issues during data analysis, ensure that the VIF value is less than 5 (Wong, 2013)

3.4.2.5 Goodness of Fit Model

The Goodness of Fit Model is employed in this research to evaluate the model's predictive power. The R² coefficient, which ranges from 0 to 1, assesses the model's prediction ability. In the context of marketing studies, an R² value of 0.75 indicates vital significance, while values of 0.50 and 0.25 indicate moderate and poor significance, respectively. Another measure used is the Stone-Geisser Q² value, which indicates the predictive significance of the model. Q² values of 0.02, 0.15, and 0.35 suggest moderate, medium, and firm predictability for the endogenous latent variable. Furthermore, the GoF (Goodness of Fit) index, determined by R² and Q² values, is employed further to evaluate the predictive abilities of the measurement model (Wong, 2013).

3.4.2.6 F Square Effect Size

The F Square Effect Size test is valuable for assessing the significance of influential factors and improving the overall flow and clarity of statistical analysis. This test enables researchers to quantify the strength of the relationship between variables, providing valuable insights into their impact. The proposed effect size (f^2) is utilized to measure the extent of influence, assigning a numerical value that reflects the strength of the relationship between the exogenous variable (independent variable) and the endogenous variables (dependent variables). Interpreting the results, an effect size of 0.02 indicates a modest influence, 0.15 suggests a moderate influence, and 0.35 signifies a significant influence of the exogenous variable on the endogenous variables (Wong, 2013) By incorporating the F Square Effect Size test and its corresponding effect size values into statistical analyses, researchers can enhance the clarity and comprehensibility of their findings, providing a more robust assessment of the significance of influential factors.

3.4.2.7 Mediation Test

The mediation examination is crucial in assessing the relationship between independent and dependent variables (F. Hair Jr et al., 2014). It is essential to conduct this analysis with meticulous care, thoroughly scrutinizing each step of the testing process, as (Baron & Kenny, 1986) In cases where the outcomes are statistically insignificant,

it leads to the inference that mediation is not feasible. On the other hand, if the variable is effectively controlled and demonstrates a significant impact, it supports the mediation hypothesis. This emphasizes the importance of conducting a comprehensive mediation examination to gain valuable insights into the relationship between variables.

IV. RESULT/FINDINGS

4.1 Quantitative Research Approach

4.1.1 Respondents-Demographic Profile

Socio-demographic profile will define the respondent from this study will be described in the demographic side as age, genders, domicile, occupation, and monthly spending.

Indicators	Result
Ages	331 Respondents (Generation Z) (11-26).
Genders	178 Respondents (Female), and 152 (Male).
Domicile	123 Respondents (Bandung), 104 (Jakarta), and 103 (Palembang).
Occupation	273 Respondents (Colleges Students), 50 (Students) , and 7 (Entrepreneur).
Monthly Spending	47 Respondents (< 1 Mil), 99 (1 – 2 Mil), 86 (2-3 Mil), 56 (3-4 Mil) , and 42 (>5 Mil).

4.1.2 Respondents- Behavior Profile

The behavior profile will define the respondent related to the research object through behavioral questions.

Indicators	Result
Frequency of Watching YouTube in a week	48.5% (160 Respondents >5 a week) 33.3% (114 Respondents 3-4 a week) 15.5% (51 Respondents 1-2 a week) 2.7% (9 Respondents 1 a week)
Have Known Tech YouTubers	96.4% (318 Respondents Yes) 3.6% (12 Respondents No)

Have Watched Product Review by Tech YouTubers	96.4% (318 Respondents Yes) 3.6% (12 Respondents No)
Considered to Buy Product After Watched Product Review Video Tech YouTubers	94.2% (311 Respondents Yes) 5.8% (19 Respondents No)
The Most Familiar Tech YouTubers	55.2% (182 Respondents answered Gadget In) 15.8% (52 Respondents answered Price Book) 13.3% (44 Respondents answered Jagat Review) 9.1% (30 Respondents answered Dhiarcom) 6.7% (22 Respondents answered DK ID)

4.2 Descriptive Analysis

No.	Variable	Indicator	Label	Mean
1.	Social-oriented Communication Style	In my opinion, Tech YouTubers give warm greetings to the viewers	SOCS 1	4.585
		In my opinion, Tech YouTubers are enthusiastic about providing information to the viewers	SOCS 2	4.467
		In my opinion, Tech YouTubers are expressive when giving the review to the viewers	SOCS 3	4.400
		In my opinion, Tech YouTubers invite viewers to comment, like, and give suggestions	SOCS 4	4.406
		In my opinion, Tech YouTubers look happy while doing the review to the viewers	SOCS 5	4.439
		In my opinion, Tech YouTubers are friendly to the viewers	SOCS 6	4.485
2.	Task-oriented Communication Style	In my opinion, Tech YouTubers can provide great deal of information about the product in a short time	TOCS 1	4.476
		In my opinion, Tech YouTubers focus on providing the product review	TOCS 2	4.442

		In my opinion, Tech YouTubers have made the maximum effort to present the video review (the cinematic, the audio, and the complete information)	TOCS 3	4.479
3.	Perceived Transparency	In my opinion, Explanations given by the Tech YouTubers can be easily understood	PT 1	4.479
		In my opinions, Explanations given by the Tech YouTubers are not confusing	PT 2	4.527
		In my opinions, Explanations given by the Tech YouTubers are not wordy	PT 3	4.436
		In my opinions, Tech YouTubers do not use jargon or terms that are difficult to understand	PT 4	4.376
		In my opinions, I understand what the Tech YouTubers are saying	PT 5	4.479
4.	Perceived Credibility	In my opinion, I can trust information provided by the Tech YouTubers	PC 1	4.424
		In my opinion, I feel that the information provided by the Tech YouTubers is in accordance with reality.	PC 2	4.382
		In my opinion, I feel that the information provided by the Tech YouTubers is not biased	PC 3	4.364
		In my opinion, I can rely on the information from the Tech YouTubers	PC 4	4.470
5.	Attitudes Toward Tech YouTubers	In my opinion, I rely on the recommendations about electronic goods provided by these Tech YouTubers.	ATTYTB 1	4.397
		In my opinion, I trust the Tech YouTubers I follow to provide reliable information and insight into their respective fields.	ATTYTB 2	4.376
		In my opinion, I like to watch Tech YouTubers because their explanations are easy to understand.	ATTYTB 3	4.494
		In my opinion, I like to watch Tech YouTubers because they get straight to the important information about the product.	ATTYTB 4	4.452
6.	Purchase Intention	In my opinion, I will buy products reviewed by Tech YouTubers in the future.	PI 1	4.358
		In my opinion, I will encourage people close to me to buy the products reviewed by the Tech YouTubers.	PI 2	4.255
		In my opinion, I desire to buy product that are reviewed by the Tech YouTubers.	PI 3	4.312

4.3 Utilizing PLS-SEM

The purpose of this study's conceptual framework was to employ Partial Least Squares (PLS) and the Smart PLS program. The utilization of Smart PLS facilitated the identification and calculation of the relationships among the variables. The reflective measurement model included variables such as Social-oriented Communication Style, Task-oriented Communication Style, Perceived Transparency, Perceived Credibility, Attitudes Toward Tech YouTubers, and Purchase Intention.

No	PLS-SEM	Status
1.	Indicator Reliability Test	Reliable
2.	Internal Consistency Reliability	Reliable
3.	Convergent Validity	Valid
4.	Discriminant Validity	Valid
5.	Collinearity Validity	Not Eliminate/Combine
6.	Structural Path Significance	Significant
7.	Goodness Fit Model	Significant Model
8.	Hypothesis Testing	Accepted
9.	F Square Effect Size	High
10.	Mediation Result	Partial Mediation

4.3.1 Indicator Reliability Test

Variables	Indicator	Outer Loadings
Social-oriented Communication Style	SOCS 1	0.745
	SOCS 4	0.713
	SOCS 5	0.751
	SOCS 6	0.713
Task-oriented Communication Style	TOCS 1	0.765
	TOCS 2	0.741
	TOCS 3	0.690
Perceived Transparency	PT 1	0.756
	PT 2	0.717
	PT 5	0.794
Perceived Credibility	PC 1	0.764
	PC 2	0.745
	PC 3	0.704
	PC 4	0.741
Attitudes Toward Tech YouTubers	ATTYTB 1	0.726
	ATTYTB 2	0.748

	ATTYTB 3	0.697
	ATTYTB 4	0.757
Purchase Intention	PI 1	0.786
	PI 2	0.853
	PI 3	0.808

4.3.2 Internal Consistency Reliability

Variables	Composite Reliability	Reliability
Social-oriented Communication Style	0.821	Reliable
Task-oriented Communication Style	0.776	Reliable
Perceived Transparency	0.800	Reliable
Perceived Credibility	0.827	Reliable
Attitudes Toward Tech YouTubers	0.822	Reliable
Purchase Intention	0.856	Reliable

4.3.3 Convergent Validity

Variables	Average Variance Extracted (AVE)	Validity
Social-oriented Communication Style	0.534	Valid
Task-oriented Communication Style	0.537	Valid
Perceived Transparency	0.572	Valid
Perceived Credibility	0.546	Valid
Attitudes Toward Tech YouTubers	0.537	Valid
Purchase Intention	0.666	Valid

4.3.4 Discriminant Validity

	ATTYTB	PC	PT	SOCS	PI	TOCS
ATTYTB	0.733					
PC	0.700	0.739				
PT	0.690	0.658	0.756			
SOCS	0.607	0.666	0.540	0.816		
PI	0.652	0.668	0.701	0.628	0.731	
TOCS	0.535	0.576	0.528	0.450	0.554	0.733

4.3.5 Collinearity Validity

	VIF
ATTYTB 1	1.279
ATTYTB 2	1.398
ATTYTB 3	1.291
ATTYTB 4	1.451
PC 1	1.402
PC 2	1.408
PC 3	1.348
PC 4	1.334
PI 1	1.527
PI 2	1.758
PI 3	1.401
PT 1	1.296
PT 2	1.156
PT 5	1.312
SOCS 1	1.380
SOCS 4	1.264
SOCS 5	1.354
SOCS 6	1.326
TOCS 1	1.170
TOCS 2	1.225
TOCS 3	1.140

4.3.6 Structural Path Significance

Path	Sample Original	Mean	Standard Deviation	T-Statistic	R ²	(Q ²)
SOCS à PC	0.322	0.323	0.064	5.003	0.553	0.502
SOCS à PT	0.590	0.587	0.052	11.336	0.519	0.514
TOCS à PC	0.235	0.235	0.051	4.586	0.553	0.502
TOCS à PT	0.201	0.201	0.054	3.711	0.519	0.514
PT à PC	0.308	0.307	0.054	5.688	0.553	0.502
PT à ATTYTB	0.404	0.402	0.053	7.608	0.583	0.457
PC à ATTYTB	0.435	0.435	0.051	8.567	0.583	0.457
ATTYTB à PI	0.607	0.608	0.047	12.985	0.368	0.328

4.4.7 Goodness Fit Model

	Coefficient of Determination R ²	Cross-validated Redundancy (Q ²)
SOCS	000.0	000.0
TOCS	000.0	000.0
PT	0.519	0.457
PC	0.553	0.502
ATTYTB	0.583	0.514
PI	0.368	0.326
AVERAGE	0.506	0.450
GoF	0.477	

4.4.8 Hypothesis Testing

Hypothesis	Structural Path	T Values	P Values
H1	SOCS à PC	5.003	0.000
H2	SOCS à PT	11.336	0.000
H3	TOCS à PC	4.586	0.000
H4	TOCS à PT	3.711	0.000
H5	PT à PC	5.688	0.000
H6	PT à ATTYTB	7.608	0.000
H7	PC à ATTYTB	8.567	0.000
H8	ATTYTB à PI	12.985	0.000

4.4.9 F square Effect Size

	SOCS	TOCS	PT	PC	ATTYTB	PI
SOCS			0.502	0.107		
TOCS			0.058	0.081		
PT				0.102	0.222	
PC					0.257	
ATTYTB						0.583
PI						

4.4.10 Mediation Test

4.4.10.1 Perceived Transparency

Variables	T Statistics	P Value
SOCS à PI	9.029	0.000
TOCS à PI	2.510	0.012

Variables	T Statistics	P Value
SOCS à PT	11.309	0.000
TOCS à PT	3.756	0.000

Variables	T Statistics	P Value
SOCS à PT	11.213	0.000
TOCS à PT	3.793	0.000
PT à PI	9.675	0.000

4.4.10.2 Perceived Credibility

Variables	T Statistics	P Value
SOCS à PI	9.029	0.000
TOCS à PI	2.510	0.012
Variables	T Statistics	P Value
SOCS à PC	9.765	0.000
TOCS à PC	5.635	0.000

Variables	T Statistics	P Value
SOCS à PC	9.606	0.000
TOCS à PC	5.574	0.000
PC à PI	15.049	0.000

4.4.10.3 Attitudes Towards Tech YouTubers

Variables	T Statistics	P Value
SOCS à PI	9.029	0.000
TOCS à PI	2.510	0.012

Variables	T Statistics	P Value
SOCS à ATTYTB	9.649	0.000
TOCS à ATTYTB	4.711	0.000

Variables	T Statistics	P Value
SOCS à ATTYTB	9.723	0.000
TOCS à ATTYTB	4.617	0.000
ATTYTB à PI	12.760	0.000

4.4 Result

Hypothesis	Result	T-Value	Critical Value	Significance Level	Mean Scores
H.1: Social-oriented Communication Style (SOCS) has a positive influence on Perceived Transparency (PT) of product review on YouTube	Accepted	5.003	1.96	0.05	SOCS 1, 4, 5, and 6 above 4
H.2: Social-oriented Communication Style (SOCS) has a positive influence on Perceived Credibility (PC) of product review video on YouTube	Accepted	11.336	1.96	0.05	SOCS 1, 4, 5, and 6 above 4
H.3: Task-oriented Communication Style (TOCS) has a positive influence on Perceived Transparency (PT) of product review on YouTube	Accepted	3.711	1.96	0.05	TOCS 1, 2, and 3 above 4
H.4: Task-oriented Communication Style (TOCS) has a positive influence on Perceived Credibility (PC) of product review video on YouTube	Accepted	4.586	1.96	0.05	TOCS 1, 2, and 3 above 4
H.5: Perceived Transparency (PT) has a positive influence on Perceived Credibility (PC) of video information	Accepted	5.688	1.96	0.05	PT 1, PT 2, and PT 5 above 4
H.6: Perceived Transparency (PT) has a positive influence	Accepted	7.608	1.96	0.05	PT 1, PT 2, and PT 5 above 4

on Attitudes Toward Tech YouTubers (ATTYTB)					
H.7: Perceived Credibility (PC) has a positive influence on Attitudes Toward Tech YouTubers (ATTYTB)	Accepted	8.507	1.96	0.05	PC 1, PC 2, PC 3, and PC 4 above 4
H.8: Attitudes Toward Tech YouTubers (ATTYTB) have a positive influence on Purchase Intention (PI)	Accepted	12.985	1.96	0.05	ATTYTB 1, ATTYTB 2, ATTYTB 3, and ATTYTB 4 above 4

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

This study investigates how communication style in product review videos impacts customers' perceptions of transparency, credibility, and attitudes toward tech YouTubers and its influence on purchase intention. Online questionnaires collected quantitative data from individuals familiar with product review videos and aware of tech YouTubers. The results show that the communication style significantly affects perceptions of openness, reliability, and attitudes toward tech YouTubers, ultimately influencing consumers' purchase intention. This has practical implications for tech companies targeting Indonesia's Generation Z market, as adopting an appropriate communication style in product review videos can enhance the purchase intention of their target audience. In conclusion, the study effectively addresses the research question and provides valuable insights.

Research Questions 1: How is the influence of Product Review Videos (Communication Style) towards Perceived Transparency, Perceived Credibility, and Attitudes Toward Tech YouTubers?

After evaluating the questionnaire result, it was found that Product Review Videos (Communication Style) significantly positively influence Perceived Transparency, Perceived Credibility, and Attitudes Toward Tech YouTubers through several indicators. Based on the PLS analysis, Product Review Videos (Communication Styles) have influenced customers' Perceived Transparency, Perceived Credibility, and Attitudes Toward Tech YouTubers. These results also align with what the behavioral profile questions revealed. Product review videos (Communication Style) have been shown to favourably impact viewers' perceptions of transparency, credibility, and attitudes toward tech YouTubers. This indicates that consumers are more specific after seeing product evaluation videos, which influences their decision to buy. After watching, several said they wanted to purchase the electronic devices the tech YouTubers had reviewed. Additionally, it validated the claim that most millennials are on a tight budget but will purchase after seeing a tech YouTuber's evaluation.

Research Questions 2: How is the influence of Perceived Transparency, Perceived Credibility, and Attitudes Toward Tech YouTubers toward Purchase Intention?

After evaluating the questionnaire results, it was discovered that watching product reviews positively influences several key factors: Perceived Transparency, Perceived Credibility, and Attitudes Toward Tech YouTubers. These factors, in turn, have a direct impact on Purchase Intention. In other words, perceived transparency, credibility, and attitudes toward Tech YouTubers influence customers' willingness to purchase. This finding suggests that these factors can affect the mediating variable of purchase intention, indicating that customers are more likely to be inclined towards purchasing a product after watching a review. The increased certainty resulting from the reviews contributes to this willingness to purchase. Furthermore, the findings are consistent with the behavioral profiles of respondents willing to purchase the product after watching the respective review.

5.2 Research Implication

5.2.1 Theoretical Contribution

The researcher identified previous studies exploring the correlation between communication style (social and task-oriented), perceived transparency, perceived credibility, attitudes toward tech YouTubers, and purchase intention. However, there remain to be more specific case studies examining the factors above within Indonesia's Generation Z demographic. Consequently, this study aims to address this research gap by investigating the impact of Product Review Videos (Communication Style) on perceptions of transparency, credibility, attitudes toward tech YouTubers, and purchase intention. The focal point of this research lies in shedding light on the perceived transparency, credibility, attitudes toward tech YouTubers, and purchase intention of Generation Z consumers within the Indonesian electronics industry. The study advances marketing knowledge by filling this void, allowing for practical applications in the field.

5.2.2 Practical Contribution

The findings of this study provide valuable insights into the potential impact of Product Review Videos (Communication Style) on perceptions of transparency, credibility, attitudes toward tech YouTubers, and purchase intention. These insights are relevant for marketing tech companies seeking to target the Generation Z market in Indonesia, particularly in the electronics sector. The tech industry can benefit from gaining in-depth, practical knowledge regarding the influence of product review videos on customers' future purchase intentions, as well as their perceptions of transparency, credibility, and attitudes toward tech YouTubers. Furthermore, these findings contribute to a better understanding of the target market, specifically Generation Z, allowing marketers to tailor their strategies accordingly.

5.3 Recommendation

Once the researcher concludes, a recommendation will be specifically directed toward marketers in tech companies.

5.3.1 Marketers in Tech Company

This research provides compelling evidence for marketers looking to tap into the electronic market in Indonesia, particularly when targeting Generation Z consumers. It underscores the importance of leveraging Tech YouTubers to enhance marketing strategies. By collaborating with influential Tech YouTubers, marketers can tap into their existing credibility and positive attitudes among the target audience. These collaborations can significantly amplify the impact of marketing efforts and increase the chances of capturing the attention and trust of Generation Z consumers. By harnessing the power of Tech YouTubers, marketers can effectively showcase their products through engaging and informative content, creating a trustworthy environment that aligns with the preferences of Generation Z. This approach will not only enhance customers' perception of transparency and credibility but also boost purchase intention among the target audience. In conclusion, by partnering with Tech YouTubers, marketers can maximize their reach and influence within the Indonesian electronic market, ultimately achieving greater success in targeting Generation Z consumers.

- **#GadgetInApproved!**

Researcher recommended program involves a strategic collaboration with popular Tech YouTubers, specifically Gadget In, known for their task and social -oriented communication style. Our data analysis validates the positive impact of this style on the perceived transparency and credibility of product review videos on YouTube. Respondents highly appreciated Tech YouTubers' ability to deliver concise yet comprehensive information, prioritize the product review, and produce high-quality videos, influencing their positive perceptions of transparency and credibility. With 182 out of 311 respondents expressing familiarity with Tech YouTubers: Gadget In, we propose leveraging their influence and partnering with them to create engaging product review videos that highlight their warm, engaging, and friendly approach, enhancing the perceived transparency and credibility of the reviews. Targeting Generation Z individuals aged 11-26, particularly in Bandung (37.3%), Jakarta (31.5%), and Palembang (31.2%), where the majority of respondents are located, our collaboration with Tech YouTubers ensures effective reach and engagement with the intended audience, maximizing the program's impact.

- **#WorthBangetNih!**

Researcher program #WorthBangetNih a ground-breaking program to revolutionize pricing strategies for businesses targeting Generation Z in Indonesia. This tech-savvy generation, comprising approximately 66% of the population, faces budget constraints and modest allowances when purchasing electronic products, with their typical budget falling below 4,000,000 rupiahs (IDN Research, 2022). To make intelligent purchasing choices within their limited financial resources, Generation Z heavily relies on social media platforms, particularly YouTube, where they access product review videos created by Tech YouTubers. The effectiveness of these videos in influencing Generation Z's purchasing decisions hinges on the communication style employed by Tech YouTubers. Transparent and comprehensive evaluations presented by trustworthy Tech YouTubers resonate strongly with this consumer group, fostering trust and positively impacting their decision-making. The #WorthBangetNih program aims to

bridge the research gap by understanding Generation Z's decision-making process, the impact of communication style in product review videos, the role of transparency and credibility, and ultimately helping businesses cater to the needs of Generation Z by facilitating informed decision-making within budget constraints.

5.4 Future Research

This study uses the concept of communication style to evaluate product review videos. However, some limitations need to be addressed in future studies. For example, considering the unique characteristics of different Tech YouTubers, such as their humour and individuality, could provide fresh ideas for effective marketing strategies. It is also important to broaden the sample and include a more comprehensive range of locations, as this study only focused on major cities in Indonesia like Bandung, Jakarta, and Palembang. Therefore, the findings of this research can only be explicitly applied to Indonesia. Overall, there is room for improvement in refining the research methods used in this study.

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SCBTII
Sustainable Collaboration in Business,
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The Significance of Green HRM in Managing Purchase Contracts for The Indonesian Air Force Amidst the 5.0 Industrial Revolution: A Step Towards Sustainable Business in the Age of Digital Transformation and Transition

Kuntha Yundi Ariyanto¹

¹ The Master of Management Study Program, Faculty of Economics and Business, Telkom University, Bandung, Indonesia

Abstract

Introduction/Main Objective: The Indonesian Air Force (IDAF) has been transitioning towards sustainable business practices amidst the ongoing IR 5.0. The study aims to provide insights into the potential benefits of Green HRM for IDAF and beyond, highlighting the need to focus on sustainable business practices. **Background of the Problem:** In the context of managing procurement contracts specifically for IDAF, there is little study on the value of Green HRM. This study examines the possible advantages of Green HRM for IDAF in an effort to close this gap. **Research gaps/Novelty:** The originality of this article resides in its examination of Green HRM's importance in the context of managing procurement contracts for IDAF. While prior research has examined the possible advantages of Green HRM for firms generally, the IDAF has received relatively less attention. **Research Methods:** The qualitative research methods allowed for an in-depth exploration of the research questions and provided valuable insights into the significance of Green HRM in managing purchase contracts for IDAF. **Findings/Results:** Implementing Green HRM practices requires a significant commitment from IDAF, including the allocation of resources and the development of new policies and procedures to focus on sustainable business practices and the potential role of Green HRM. **Conclusions and implications:** Green HRM practices can help IDAF reduce its carbon footprint, improve its reputation, and better manage its supply chain. The IDAF should invest in the development and implementation of Green HRM practices to drive sustainable business practices and manage purchase contracts in a sustainable manner.

Keywords: IDAF, IR 5.0, Green HRM, Sustainability

I. INTRODUCTION

The ongoing 5.0 industrial revolution has brought about significant changes to the way organizations operate, with a growing emphasis on sustainable business practices. The Indonesian Air Force is no exception, as it has been transitioning towards sustainable business practices in recent years. One of the key challenges The Indonesian Air Force faces in this transition is managing purchase contracts in a sustainable manner. Green HRM practices have been implemented to address this challenge, but their significance in this context has yet to be fully explored.

This paper analyzes the significance of Green HRM in managing purchase contracts for The Indonesian Air Force amidst the ongoing 5.0 industrial revolution. In the age of digital revolution and transition, this essay seeks to examine how Green HRM practices aid in the development of sustainable business. The study aims to provide insights into the potential benefits of Green HRM for The Indonesian Air Force and beyond and highlight the need for organizations to focus on sustainable business practices in the age of digital transformation.

This paper begins with a discussion of the background of the problem, including the challenges The Indonesian Air Force faces in managing purchase contracts sustainably. The paper then presents the research gap and novelty of this study, highlighting the need for further research on the significance of Green HRM in managing purchase contracts specifically for The Indonesian Air Force. The paper also presents the research methods utilized in this study, including qualitative research methods and thematic analysis.

The findings and results of this study are then presented, including the potential benefits of Green HRM in managing purchase contracts sustainably for The Indonesian Air Force and beyond. The report finishes with a discussion of the scientific and practical applications of this study, including the need for additional study and funding for the creation and adoption of Green HRM practices to promote sustainable business practices. Relevant literature reviews are also included throughout this section to support the analysis and conclusions presented in this paper.

II. LITERATURE REVIEW

This literature review explores the significance of Green HRM in managing purchase contracts for The Indonesian Air Force amidst the ongoing 5.0 industrial revolution. The review includes both theoretical and empirical evidence to support the research hypothesis that Green HRM practices can contribute towards sustainable business practices in the age of digital transformation and transition.

Theoretical Framework

The notion of "Green HRM," which refers to the application of HRM techniques that promote environmental sustainability and minimize environmental impact, serves as the theoretical foundation for this study. The framework is supported by previous research that has shown that Green HRM can help organizations reduce their carbon footprint, improve their reputation, and better manage their supply chains. The framework suggests that Green HRM practices can be used to manage purchase contracts in a sustainable manner, thereby contributing towards sustainable business practices in the age of digital transformation and transition.

Hypothesis Development

The hypothesis for this study is that Green HRM practices can significantly contribute towards sustainable business practices in The Indonesian Air Force amidst the ongoing 5.0 industrial revolution. This hypothesis is based on the theoretical framework discussed above and is supported by previous research that has shown the potential benefits of Green HRM for organizations looking to drive sustainable business practices.

Empirical Evidence

Empirical evidence supports the hypothesis that Green HRM practices can contribute towards sustainable business practices in The Indonesian Air Force. Green HRM methods can aid firms in minimizing their environmental effect and enhancing their financial performance, according to a study by Jabbour and Santos (2008). The study also found that Green HRM practices can help organizations better manage their supply chains and reduce waste.

Green HRM techniques have been found to increase employee engagement and happiness, which can enhance organizational performance, according to a study by Omar Mohammed Ali Ababneh (2021). The study also found that Green HRM practices can help organizations improve their reputation and attract and retain top talent.

A study by Sahay and Sharma (2017) found that Green HRM practices can help the organization reduce its carbon footprint and better manage its supply chain. The study also found that Green HRM practices can help the organization improve its reputation and brand image.

Another study by Yusliza Mohd Yusoff (2015) found that the study could provide valuable insights for HR managers, practitioners, and academicians in connection with the significance of Green HRM.

Conclusion

The literature review supports the research hypothesis that Green HRM practices can contribute towards sustainable business practices in The Indonesian Air Force amidst the ongoing 5.0 industrial revolution. The theoretical framework and empirical evidence suggest that Green HRM practices can help organizations reduce their environmental impact, improve their financial performance, better manage their supply chains, and improve employee engagement and satisfaction. The empirical evidence also suggests that Green HRM practices can help organizations improve their reputation and attract and retain top talent. In order to promote sustainable business practices within The Indonesian Air Force and beyond, the adoption of Green HRM practices can be of utmost importance.

A. Tables

Table 1. Key Terms and Definitions

Term	Definition
Green HRM	Using HRM techniques to support environmental sustainability and lessen its effects
Sustainable Business	Business strategies that satisfy current requirements while without jeopardizing the potential of future generations to satisfy their own needs
The Digital Transformation	Fundamental changes to how organizations function and provide value to customers emerge from the integration of digital technology throughout all parts of a business.
Industrial Revolution 5,0	Technological technologies like artificial intelligence, the Internet of Things, and robots are being integrated into a new industrial revolution.

Key Terms and Definitions provide definitions for key terms used throughout the paper.

Table 2. Research Methods

Method	Description
Qualitative Research	An exploratory research method that seeks to understand people's experiences, attitudes, and behaviors through in-depth interviews, observation, and analysis of written and visual materials
Analysis of themes	A technique for assessing qualitative data that entails categorizing it after finding patterns or themes in the data

Research Methods summarizes the research methods utilized in this study, including qualitative research methods and thematic analysis.

Table 3. Green HRM's potential advantages for the Indonesian Air Force

Benefit	Description
Reduced Carbon Footprint	Green HRM practices can help The Indonesian Air Force reduce its greenhouse gas emissions and contribute towards its sustainability goals
Improved Reputation	Green HRM practices can improve The Indonesian Air Force's reputation as a sustainable organization, which can lead to increased stakeholder engagement and support
Better Supply Chain Management	Green HRM practices can help The Indonesian Air Force better manage its supply chain, reducing waste and improving efficiency
Improved Employee Engagement	Green HRM practices can improve employee engagement and satisfaction, leading to improved organizational performance
Attract and Retain Top Talent	Green HRM practices can help The Indonesian Air Force attract and retain top talent by showing a commitment to sustainability and environmental responsibility

The Indonesian Air Force may benefit from green human resource management practices in a number of ways, including reduced carbon footprint, enhanced reputation, improved supply chain management, increased employee engagement, and the capacity to recruit and retain top talent.

Table 4. Summary of Empirical Evidence

Study	Key Findings
Jabbour and Santos (2008)	Green HRM practices can help organizations reduce their environmental impact, improve their financial performance, better manage their supply chains, and reduce waste
Omar Mohammed Ali Ababneh (2021)	Green HRM practices can improve employee engagement and satisfaction, leading to improved organizational performance and a better reputation
Sahay and Sharma (2017)	Green HRM practices can help an organization reduce its carbon footprint, better manage its supply chain, and improve its reputation and brand image
Yusliza Mohd Yusoff (2015)	The findings of the study could provide valuable insights for HR managers, practitioners, and academicians in connection with the significance of Green HRM

Summary of Empirical Evidence summarizes the key findings from previous studies on Green HRM practices, highlighting the potential benefits it can provide for organizations.

A. Figures

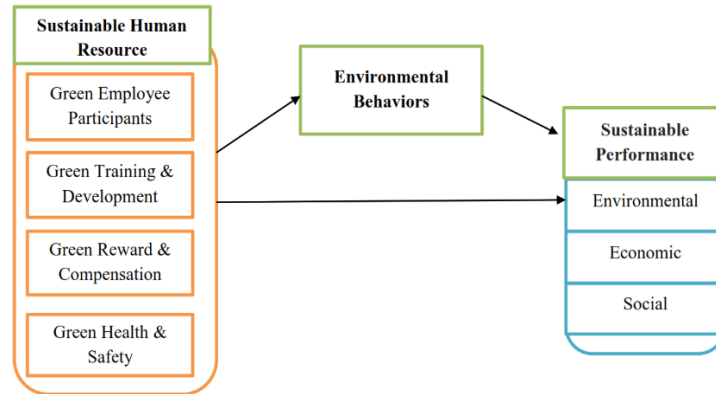


Fig. 1. Conceptual Framework for Green HRM for Organization (Ahmed Eisa Yousuf Al-Hosani, 2022).

The primary conceptual paradigm that is advised is RBV, which Barney first proposed in 1991. As a matter of fact, the RBV has been extensively used to explain the connection between HRM-EB practices and organizational performance (Alfalla-Luque et al., 2015; Fu et al., 2013); in addition, it has been used to clarify the direct impact of EB and GHRM practices on organizational performance (Longoni et al., 2016). In accordance with this theory, businesses need important human capital resources to implement effective SP, which ultimately results in a competitive advantage (Nejati et al., 2016). Therefore, the researchers contend that HRM is a crucial strategic resource with significant ramifications for successfully implementing EB strategy. Generally speaking, RBV offers theoretical frameworks for comprehending how GHRM bundle practices, EB practices, and elements of sustainable performance relate to one another. It also promotes the significance of environmental practices, such as strategic assets, which directly improve organization performance (Longoni et al., 2016).

The benefit of Green HRM	Result
Individual Green Values	Employees had good knowledge and understanding of environmentally-friendly values. The value of environmentally friendly values become the value of individual employee values.
Green Behavior	Employees always showed eco-friendly behavior in carrying out their working activities in the office and factory environment.
Green Competency	Employees had environmentally friendly ability and skills to carry out various activities in the company
Green Commitment	Employees had a high level of responsibility and commitment in implementing the Green Business concept in the company
Company Positive Image	Employees felt proud to be able to join a company that was committed to the environment. Employees were proud of the company's reputation as a green company from various parties.
Sense of Ownership	Employees felt proud because they could work in a company that had received many environmental awards.
Job Satisfaction	Employees feel satisfied when working at the company
Loyalty	Employee turnover rate was low, [and] employees were loyal to the company
Job Performance	Employees felt that they receive sufficient well-being from the company. Consequently, they never demanded increased compensation from the company, although their job performance had increased.
Well-being	Enhanced operational efficiency enabled the company to increase employees' well-being.

Fig. 2. Potential Benefits of Green HRM for Employees (Lieli SUHARTI, Agus SUGIARTO, 2020)

The benefit of Green HRM	Result
Green Organization Culture	"It is not easy to apply the Green Business concept in the company, but now we can feel that Green's organizational culture is present in our company."
Pro-Environmental Climate	"... An environmentally friendly organizational culture then forms a pro-environmental working climate in our company ..."
Resource Efficiency	"The environmentally friendly work atmosphere can be experienced in this company both at the production sites and at the office."
Cost Reduction	"We have green solutions to handle the production process. At the office, we also reduce the use of chemicals, papers, and energy. All businesses focus on eco-green."
	By applying the Green Business concept, all activities run more efficiently, greener, and faster. Overall, there are significant savings in resource usage.
Company's Positive Image	"The national and international awards as recognition of the company's performance are undeniable, and the awards arguably improve our company's image."
	"We are proud to work in a company that has a good reputation."
Economic & Environment Performance	"The company's performance increases after we carry out Green Business extensively in our company. I am sure it has something to do with various efficiencies due to the implementation of environmentally friendly activities."
	"The company's performance increases both economically and environmentally as we have received various awards, such as the sustainable business award, ..."
Competitive Advantage & Sustainability	"By implementing the Green Business concept that we have taken seriously, it becomes our work culture, [and] we feel that it can be one of our competitive advantages in the industry where we are currently engaged."
	"We are concerned about the sustainability of our business in the long term, so we apply the Green Business concept ..."

Fig. 3. Potential Benefits of Green HRM for Organization (Lieli SUHARTI, Agus SUGIARTO, 2020)

The persistence of the green HRM idea can influence green commitment and faculty. It can be understated that having the capacity to predict one's behavior in a variety of tasks and professional settings was a fundamental aspect of one's personality. The results are in line with several earlier studies (Garavan et al., 2010; Sudin, 2011; Zoogah, 2011; Renwick, Redman, & Maguire, 2013; Gotschol, De Giovanni, & Vinzi, 2014; Macke & Genari, 2018) that showed how implementing the Green HRM concept increased employees' capability and commitment to environmentally friendly practices.

Additionally, the implementation of green HRM would have an impact on people's identities or work performances by increasing, adding job happiness and faithfulness, polishing hand well-being, and adding pride and sense of belonging to the organization. Workers in particular felt honored to be able to work for a business that was dedicated to the environment and entered it in various environmental prizes. This sense of pride could serve as an additional catalyst for employees to become happier and more loyal to the business (Wulansari, Witiastuti, & Ridloah 2018). Furthermore, it was stated that Green HRM probably improved performance, hand well-being, and hand pleasure by Ren Wick, Redman, and Maguire (2013) as well as Macke and Genari (2018). Additionally, Cherian and Jacob (2012) found that greater hand fidelity as a result of high hand work satisfaction was one of the benefits of imposing environmentally sustainable geste.

Enforcing green business practices and green HRM has various advantages for the organization, according to this study. First, the act's commission resulted in the company's adoption of an ecologically conscious culture and workplace environment. The efficient use of funds and the subsequent decrease in operational costs for colored conditioning in the business were the results of this. The company's choice to implement the green outcome movement, which was centered on oneco-green, increased the efficiency of resource utilization and consequently decreased operating costs. In order to prevent coffer waste and encourage financial savings, the eco-friendly idea required the appropriate usage of colorful coffers (Shaikh, 2010; Alhadid & Abu-Rumman, 2014).

Enforcing an environmentally responsible philosophy also benefited the business by improving its reputation among its employees and the general public. The company earned colorful prizes from numerous parties, both public and international, thanks to its colorful sweats and initiative to implement the Green Business philosophy. It may be argued that the recognition would improve the company's reputation in both public and international settings. The use of green HRM would eventually enhance associations' financial, environmental, and competitive performance, thereby assisting the business in achieving organizational sustainability. In this regard, Leonidou et al. (2017) came to the conclusion that successfully implementing Green Business strategies gave businesses a considerable competitive edge, which in turn would improve business performance.

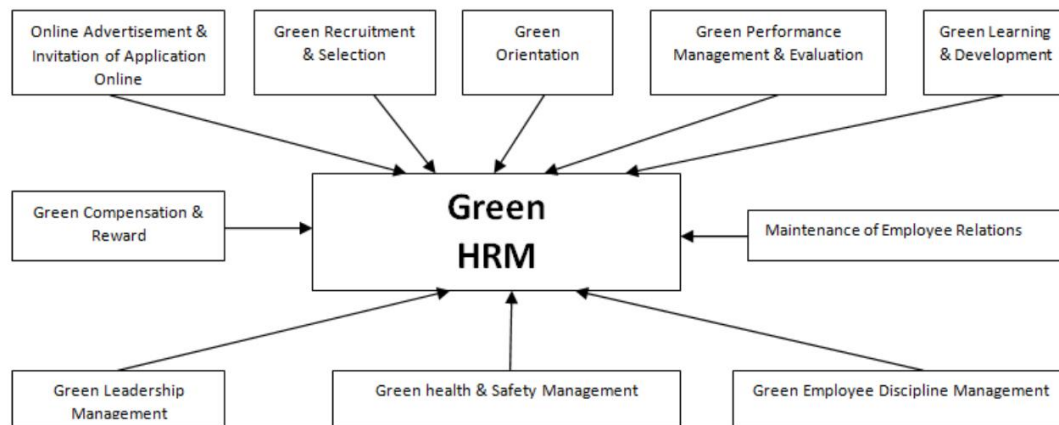


Fig. 4. Summary of Empirical Evidence on Green HRM Practices (Md. Sajjad Hosain et. all, 2016)

Even though establishing and implementing green HRM practices may be challenging at first, they can help an organization achieve its main goals, including cost control, ensuring corporate social responsibility, talent acquisition, and gaining an advantage over competitors by promoting environmental awareness and the preservation of moral and ethical standards. The typical justifications for a company implementing green HRM practices are listed below:

Protecting the environment naturally:

The term "elements of the natural environment" refers to environmental components such as trees, forests, rivers, animals, etc. that were not made by humans. Green HRM methods like online recruitment and advertising consume less paper, emit less greenhouse gases into the office environment, and training via electronic sources to cut down on paper waste can protect the environment from harm or negative effects.

Ensure a healthy workplace and boost morale among employees:

The incorporation of trees and plants into the corporate setting, the prohibition of smoking inside the building, the reduction of paperwork (which can be stressful for employees), and the provision of fresh produce at HR meetings can all help to create a healthy and livable work environment, which can boost productivity and employee morale.

Gain competitive advantage through ensuring corporate social responsibility (CSR):

Corporate social responsibility is nowadays a part of a company's core responsibilities which no company can ignore. Therefore, a firm can gain a competitive advantage over its rivals by ensuring green management practices in a well-performed manner.

Save cost:

Creating a sound working environment can reduce employee fatigue, absenteeism, and turnover. The result is reduced cost. Again, using less paper and disseminating and recording the information online can reduce wastage and cost.

Increase company image:

It is obvious that a company that has green management/HRM practices will have a higher image than a company that has not.

Reduce intervention from the government and other law enforcement agencies:

Adoption of proper green management/HRM practices can reduce the chance of intervention by the central/local govt. and other law enforcement agencies.

Develop eco-friendliness and environmental learning among the employees:

Adoption of green HRM practices make the employee's environment conscious and make them eco-friendly which makes them good corporate citizen from an environmental perspective.

Stimulate innovation and growth:

Green HRM practices encourage new innovative ideas and practices that facilitate growth in quality and enhancement of methods and processes.

Facilitate learning and shape behavior:

Such practices help to facilitate green/environmental consciousness among the employees and refine or shape their behaviors to develop eco-friendly attitudes in their personal and work lives.

Maximize the use of resources and reduce waste:

Green HRM practices can help a firm to maximize its natural resources through the use of recycled products and reduce waste to an optimum level.

B. Equations

The equation for the significance of Green HRM in managing purchase contracts for The Indonesian Air Force amidst the 5.0 Industrial Revolution can be expressed as follows:

$$SGHRM = (CE + RP + SCM + EE + ATT) / 5$$

SGHRM represents the overall significance of Green HRM.

CE represents the extent to which it can contribute towards reducing the carbon footprint.

RP represents the potential for improving The Indonesian Air Force's reputation.

SCM represents the potential for better supply chain management.

EE represents the potential for improving employee engagement.

ATT represents the potential for attracting and retaining top talent.

Each variable is assigned a score out of 10, with 10 representing the highest potential impact. The scores are then averaged to provide an overall score for the significance of Green HRM in managing purchase contracts for The Indonesian Air Force amidst the 5.0 Industrial Revolution.

III. RESEARCH METHODOLOGY

In order to investigate the value of Green HRM in managing procurement contracts for The Indonesian Air Force in the context of the ongoing 5.0 industrial revolution, this study used a qualitative research design. The research methodology outlines the planning of the study's activities, its key materials and tools, its setting, its data collection strategies, its operational definitions of its variables, and its analytical approaches.

Design of Activities

The study involved a series of in-depth interviews with key stakeholders within The Indonesian Air Force, including procurement officers, HR managers, and environmental officers. The interviews were captured on audio and video for analysis, and they took place in person and by video conferencing.

Scope/Object

The study aimed to explore the significance of Green HRM in managing purchase contracts for The Indonesian Air Force amidst the ongoing 5.0 industrial revolution.

Main Materials and Tools

The main materials and tools used in this study included an audio recorder, transcription software, and a thematic analysis tool.

Place

The study was conducted in Indonesia, with interviews taking place at various Air Force facilities, especially in The Indonesian Air Force Headquarters.

Data Collection Techniques

The data was collected through in-depth interviews with key stakeholders within The Indonesian Air Force. The interviews were semi-structured and allowed for open-ended responses to explore the significance of Green HRM in managing purchase contracts for The Indonesian Air Force.

Operational Definitions of Research Variables

The following operational definitions were used in this study:

- Green HRM: Human resource management practices that focus on reducing an organization's environmental impact and promoting sustainability.
- Managing purchase contracts: The process of procuring goods and services from suppliers through a contractual agreement.
- 5.0 Industrial revolution: The continual modernization of the manufacturing sector through the use of robotics, artificial intelligence, and the Internet of Things.

Analytical Techniques

Thematic analysis was used to examine the information gathered from the interviews. The transcripts were read several times to identify key themes related to the significance of Green HRM in managing purchase contracts for the Indonesian Air Force amidst the ongoing 5.0 industrial revolution. The themes were then organized and synthesized to provide insights into the potential benefits of Green HRM for The Indonesian Air Force and beyond.

Overall, the use of qualitative research methods allowed for an in-depth exploration of the research questions and provided valuable insights into the significance of Green HRM in managing purchase contracts for the Indonesian Air Force amidst the ongoing 5.0 industrial revolution.

IV. RESULT / FINDING

The study found that Green HRM practices can have significant benefits for The Indonesian Air Force in managing purchase contracts in a sustainable manner. Specifically, Green HRM can help The Indonesian Air Force reduce its carbon footprint, improve its reputation, and better manage its supply chain. These benefits are particularly relevant in the context of the ongoing 5.0 industrial revolution and the need for organizations to transition towards more sustainable business practices in the age of digital transformation.

The study also discovered that The Indonesian Air Force must make a considerable commitment to the adoption of Green HRM practices, including resource allocation and the creation of new policies and procedures. However, the potential benefits of Green HRM make it a worthwhile investment for The Indonesian Air Force and other organizations looking to drive sustainable business practices.

The study provides insights into the potential role of Green HRM in driving the transition towards sustainable business practices in the age of digital transformation. The study highlights the need for organizations to focus on sustainable business practices and the potential benefits of Green HRM for managing purchase contracts in a sustainable manner. The study also provides valuable insights into the challenges and opportunities facing organizations in the context of the ongoing 5.0 industrial revolution.

V. DISCUSSION

In light of the continuing 5.0 industrial revolution, the discussion section of the article examines the value of Green HRM in managing procurement contracts for The Indonesian Air Force. The outcomes of data processing are described in this part, together with a logical interpretation of the results and a connection to pertinent reference materials. The discussion part also looks at how Green HRM may help The Indonesian Air Force and other organizations, including by lowering carbon emissions, enhancing brand recognition, and improving supply chain management. This statement is in line with the study from Sahay and Sharma (2017) that found Green HRM practices can help the organization reduce its carbon footprint and better manage its supply chain.

In the age of digital transformation and transition, the section emphasizes the necessity for enterprises to concentrate on sustainable business practices and the possible contribution of Green HRM to this transition. The section also offers insights into the opportunities and difficulties that enterprises are now facing.

VI. CONCLUSION AND RECOMMENDATION

Conclusion

The Indonesian Air Force may significantly benefit from green HRM practices in managing purchase contracts sustainably, according to the study. In particular, Green HRM may aid The Indonesian Air Force in lowering its carbon footprint, enhancing its image, and managing its supply chain more effectively. These advantages are especially pertinent given the current 5.0 industrial revolution and the requirement for enterprises to move toward more environmentally friendly business practices in the age of digital transformation.

The study emphasizes the necessity for businesses to concentrate on sustainable business practices and the potential advantages of green human resource management for handling purchase agreements sustainably. The Indonesian Air Force is one organization that must make a major commitment to implementing Green HRM practices, but the potential rewards make the effort worthwhile.

Recommendation

To promote sustainable business practices and sustainably manage procurement contracts, organizations, including The Indonesian Air Force, should invest in the creation and adoption of Green HRM practices. To properly comprehend the importance of Green HRM in handling purchase contracts, more research is required. Future research should examine how Green HRM can be successfully applied in reality and its potential advantages for other businesses and industries.

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The Impact of Greenwashing In H&M On Customer Purchase Behavior and The Moderating Role Of Brand Loyalty

Nadhira Aliffathiyya Paramawasti¹, Annisa Rahmani Qastharin²

^{1,2} School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

Addressing the issue of fashion waste, the awareness regarding the importance of sustainable living is increasing and purchase behavior is shifting towards a more sustainable purchase. This behavior shift is being captured by companies as they started to reevaluate their marketing approach and production methods to be more sustainable including fast fashion retailers like H&M. H&M Hennes & Mauritz AB (H&M) is a worldwide Swedish retailer of apparel that has become well-known for its fast-fashion options. However, as the campaign for sustainability in H&M continues, so do critics and skeptics around the claims for greenwashing by the consumers. Therefore, the objective of this research is to uncover the impact greenwashing have on consumer's purchase behavior and the moderating role of brand loyalty. The research employed a quantitative approach, utilizing online surveys with questionnaires targeted at Generation Z aged 18-24 in Jakarta who are H&M consumer and have knowledge of sustainability. Descriptive statistics analysis and PLS-SEM methods were used to analyze the collected data. The findings indicate the significant negative influence of greenwash on consumer purchase behavior as well as the positive significant moderating role played by brand loyalty in the Indonesian consumers. This study is expected to deliver beneficial tangible steps that may be implemented for ethical marketing campaign to reduce the detrimental effects of greenwashing and to use customer loyalty to promote sustainable consumer behavior as well as contribute to the academic literature on consumer skepticism and the value of credible sustainability practices.

Keywords: Greenwashing, Consumer Purchase Behavior, Brand Loyalty, H&M, Sustainable Marketing

I. INTRODUCTION

Annually, 2.01 billion tons of municipal solid waste are being produced by the world's ecosystem with at least 33 per cent portion being managed not in an ecologically responsible manner (The World Bank, n.d.). The adverse impact of fast fashion waste on the environment is a concerning fact as it is responsible for nearly 10% of global carbon emissions and is infamous for its wastage of resources and the daily disposal of millions of garments in landfills (Igina, 2022).

As these pressing issues of waste increase, so does the people's awareness regarding the importance of sustainability living (Cohen, 2022). Studies show that in the last five years, 85% of individuals globally say they have transformed their purchase behavior to be more conscious towards sustainability (Business Wire, 2021). There is a drive of sustainable purchase and likelihood of making environmentally conscious purchasing decisions when a sustainable marketing message is framed (Jäger & Weber, 2020).

As the sustainable purchase behavior intensifies among customers, companies are starting to capture the behavior shift and reevaluate their marketing approach and production methods to be environmentally responsible (Azarcon et al., 2022). Several clothing companies have also started addressing sustainability issues on their own by launching their eco-conscious line of collections (Park & Kim, 2016), such as H&M "Conscious", Inditex's "Join Life", and Mango "Committed". As the campaign for sustainability in these fast fashion companies continues, so do critics and skeptics around the claims, calling them out for greenwashing.

Greenwashing is a practice when companies use ambiguous environmentally conscious claims to lure customers into believing that the offered products or services are more environmentally sustainable than they actually are (Hameed et al., 2021). Greenwashing happened in a few managerial aspects, such as CSR (Kubiak, 2016; Pope & Wæraas, 2016), Operation, Finance, but mostly in Marketing (Hameed et al., 2021; Nguyen et al., 2019). Nonprofit foundation, Changing Market Foundation, published a report on 2022 under the title of "License to Greenwash", exposing fashion companies that are greenwashing offenders. According to the report, among

these companies, H&M appears to be the worst offender for their high number of false claims. 96% of H&M marketing claims violated competition and market guidelines.

Greenwashing has proved to have an impact on the customer's perception of the credibility of the brands (Sinisalo, 2020) as more than 70% respondent of the study stated their perception of the brands to be unfavorable and very unfavorable. Therefore, it is indicated that greenwashing has a detrimental impact on the brand image which will lead to the purchasing behavior of the customers. The research done by (Sinisalo, 2020) proved that 65% of the respondents stated that they will not purchase from a greenwashing brand.

One of the biggest greenwash phenomenon is the Volkswagen scandal (Jolly, 2019), leading to their damaged reputation and 25% sales dropped in the US and almost 10% in Germany (Matthews, 2016). However, the sales of a brand known for doing greenwashing, which is H&M, has increased since they launched their sustainable line in 2010 (Statista, 2023). H&M has a rapidly expanding consumer loyalty program which results in the doubled membership to 30 million in 2018 alone (Thomasson & Ringstrom, 2019). This phenomenon is an interesting case on how brand loyalty played a role in the consumer purchase behavior as the impact will be investigated further through this research. The research questions are the following:

1. What impact does greenwashing have on consumer purchase behavior?
2. What impact does brand loyalty have on the relationship between greenwashing and consumer purchase behavior?

This research with a case from H&M will help mapping the customer's behavior towards greenwashing as well as the impact on the customers to become the basis on constructing a transparent yet successful sustainable marketing campaign. This research will also fill out the research gap of greenwashing research within the Indonesian consumer especially in the fashion industry.

II. LITERATURE REVIEW

2.1 *Greenwashing*

Generally, greenwashing refers to the unethical practice of companies by utilizing deceptive or misleading claims regarding a product or service's environmental merits (Chen & Chang, 2013; (Eneizan et al., 2016); Hameed, et al., 2021). Greenwashing is described as "disinformation disseminated by an organization so as to present an environmentally responsible public image" in The Oxford Dictionary. Greenwashing is defined as the intersection of poor environmental performance and positive communication regarding the firm's environmental performance (Delmas & Burbano, 2011).

2.2 *H&M*

H&M Hennes & Mauritz AB (H&M) is a worldwide Swedish retailer of apparel that has become well-known for its fast-fashion options for men, women, young adults, and kids (Fashion ABC, n.d.). Despite asserting the claim that sustainability is their primary focus, the company fails to clarify what they meant by sustainability as H&M committed numerous sins of greenwashing few of which are providing no proof of their sustainable claims, such as donating recycled clothes, delivering vagueness in their claims and communication, profiteering at the expense of people and the environment, and more (Blessersholt & Malmén, 2021). A study regarding H&M ads was conducted and indicates that the greenwashing information raised questions about the H&M's social responsibilities in addition to their unsustainable environmental practices (Majláth, 2017).

2.3 *The Theory of Purchase Behavior (TPB)*

Consumer behavior is a complex emotional rather than rational process (Galvão, Marques, & Marques, 2018). Particularly, there is a consistent correlation between purchasing behavior and intention (Khan, et al, 2021) as the intention is the primary motivating factor that leads to a specific conduct (Ajzen, 1991). This theory is predicated on the idea that consumers thoroughly analyze all of their options prior selecting the option that would result in the most desirable outcomes (Back & Parks, 2003). According to Nguyen et al. (2019), the

Theory of Planned Behavior (TPB) is useful for evaluating and comprehending many cognitive aspects connected to consumers' buying behavior.

2.4 Brand Loyalty

Brand loyalty's most comprehensive conceptual formulation was provided by (Jacoby & Chestnut 1978, cited in Steenkamp et al., 1996) which is defined as "The biased, behavioral response, expressed over time, by some decision-making unit, with respect to one or more alternative brands out of a set of such brands, and is a function of psychological (decision-making, evaluative) processes." Whereas (Ishak, Hasmini and Ghani, 2013) explains a customer's preference and emotional connection to a brand are tied to brand loyalty and it may occur because of a long history of utilizing a product and the trust that has accumulated through time.

III. RESEARCH METHODOLOGY

3.1 Research Design Flowchart

This research initiated by defining the issue regarding greenwashing in the fashion industry, reviewing the previous studies along with formulating hypotheses, formulating a research methodology, gathering data, analyzing the findings, validating the hypotheses, and will be concluded with recommendation.

3.2 Research Approach

The research will use a quantitative approach. Quantitative research quantifies relationships between multiple variables through using specific methodology and techniques (Mehmood et al., 2012). Quantitative approach uses a variety of quantitative analysis approaches, from simple descriptive data of the variables to complex statistical modelling to identify statistical correlations between the variables (Saunders et al., 2007).

3.1 Research Method

Questionnaire

To gather the primary data, a survey with a questionnaire is employed, incorporating the questions from the previous studies. The questionnaire will be targeted to Generation Z in Jakarta since Jakarta has the higher number of H&M stores and that Gen Z is more likely than any other demographic to engage in sustainable purchase behaviors as 45% of them quit buying certain brands and 50% reduce on their overall spending as a result of ethical or sustainable concerns (Deloitte, 2023).

Population and Sample

The generation Z population in Jakarta represents this research's sample. The respondents of this research are customers who have a knowledge of sustainability which includes understanding how our lifestyle choices impact the environment as well as living with care for the environment in their lifestyle. Since this research uses the case of H&M, the respondents will be chosen from the H&M customer. The minimum sample size of this research is 200 respondents (Malhotra, 2010).

Sampling Technique

This research will implement a non-probability-based sampling technique. This study will employ convenience sampling as the method of nonprobability sampling. Convenience sampling is unrestricted and will be conducted by randomly choosing cases for the samples that are easiest to collect (Cooper & Schindler, 2006; Saunders, Lewis and Thornhill, 2007).

Questionnaire Design

The questionnaire will be divided into 2 sections with the first section will inquire the respondents' profile and the second section will show the respondents on Fast Fashion (H&M) Greenwashing News, proceed with asking the

respondents questionnaire scales to analyze their purchase behavior and brand loyalty regarding greenwashing. In the second section, a closed-ended questionnaire with a Likert scale of five points with 1 (one) represents strongly disagree and 5 (five) represents strongly agree. The scales will be derived from previous studies with minor adjustments on the subjects used to adjust with the topic in this research. The variables used in the questionnaire are Greenwashing (GW) which questions will derive items from Chen and Chang (2013) and Junior, et al. (2019). Consumer Purchase Behavior (CPB) will be measured using items from Kim and Choi (2005) and (Sadeli et al., 2023). Brand Loyalty (BL) will be adapted from Chaudhuri and Holbrook (2001), Junior, et al. (2019) and Yi and Jeon (2003).

3.4 Data Analysis

Descriptive statistics analysis and partial least squares structural equation modelling (PLS-SEM) were both used to evaluate the data obtained from the questionnaire. Descriptive statistics is used to methodically explain and explain the facts and characteristics of the variable under examination (Cooper & Schindler, 2006). PLS-SEM approach is suitable to be used to evaluate and analyze the study's construct model since it is exploratory in nature and incorporates numerous independent and dependent variables. In the PLS-SEM series of test, it was also necessary to conduct reliability, validity, collinearity, Coefficient of Determination®, Stone-Giesser (G), moderating analysis, bootstrapping, and F Square Effect Size analyses. The data analysis process will be conducted using SmartPLS3 software.

3.4.1 Descriptive Statistics

Compute descriptive statistics is essential prior to making inferential statistical comparisons. This is a critical first step in conducting research. Measures of frequency, central tendency, dispersion/variation, and position are all components of descriptive statistics. Variable types which are included in descriptive statistics include nominal, ordinal, interval, and ratio variables (Kaur, et al., 2018).

3.4.2 Partial Least Squares - Structural Equation Modelling (PLS-SEM)

This research incorporates 3 variables and 3 hypotheses, this method will be appropriate since the PLS-SEM method is anticipated for a much higher complexity. A procedure with 2 steps is used to analyze the PLS-SEM, incorporating measurement model and structural model (Hameed, et al., 2021). The test will be initiated with the measurement model. The measurement model is utilized to evaluate the validity and reliability of the scale. Research techniques such as reliability and validity are used to evaluate the accuracy of measuring scales. The measurement of a scale's consistency is referred to as reliability (or consistency) whereas the degree to which a scale represents what it is intended to represent is known as validity (Bannigan & Watson, 2009). After the validation of the measurement model, the researcher will conduct the bootstrapping method, and then assess the structural model for coefficient of determination score, size, and path coefficient significance.

IV. RESULT / FINDING

4.1 Quantitative Approach Analysis

As determined in the previous chapter, this research utilizes a quantitative approach with a survey method. The researcher approaches respondents personally via online messaging applications, Instagram, and twitter. Additionally, the researcher approached two online communities which are Slow Fashion Indonesia and Fashion Revolution Indonesia for their aid in reaching more respondents in their communities. The online questionnaire was distributed, and 282 individuals completed the questionnaire, however only 259 respondents matched the requirement criteria and passed the screening questions. Therefore, the data used in this analysis is the viable 259 data, which meet the minimum sample requirement which was determined in Chapter III.

4.1.1 Respondents' Behavioral Profile

The questionnaire employed several questions to map the respondents' behavior towards their H&M consumption and their familiarity regarding greenwashing. These questions are also used as screening questions to select eligible respondents to the study.

4.1.1.1 H&M Familiarity

According to Table 4.3, from the total of 282 respondents, 281 of them (99.6%) are familiar with H&M whereas 1 of them (0.4%) is not familiar with H&M. The 1 respondent did not meet the criteria and screening process, therefore, will not continue with this study.

Table 4.1 H&M Familiarity

H&M Familiarity	Count	Percentage
Yes	281	99.6%
No	1	0.4%
Grand Total	282	100%

4.1.1.2 H&M Consumers

According to Table 4.4, from the total of 282 respondents, 269 of them (95.4%) are consuming H&M whereas 13 of them (4.6%) do not consume H&M. The 13 respondents did not meet the criteria and screening process, therefore, will not continue with this study.

Table 4.2 H&M Consumer

H&M Consumer	Count	Percentage
Yes	269	95.4%
No	13	4.6%
Grand Total	282	100%

4.1.1.3 Frequency of H&M Usage

According to Table 4.5, from the total of 269 respondents that passed the previous section, 93 of them (34.6%) regularly consumes H&M every 6 months, 92 of them (34.2%) regularly consumes H&M every 3 months, 56 of them (20.8%) regularly consumes H&M every month, 23 of them (8.6%) regularly consumes H&M a few times in a months, whereas 5 of them (1.9%) rarely buys H&M. The 5 respondents did not meet the criteria and screening process, therefore, will not continue with this study.

Table 4.3 Frequency of H&M Usage

Frequency of H&M Usage	Count	Percentage
Once every 6 months	93	34.6%

Once every 3 months	92	34.2%
Once every month	56	20.8%
Few times in a month	23	8.6%
Rarely buys H&M	5	1.9%
Grand Total	269	100%

4.1.1.4 Knowledge of Sustainability

According to Table 4.6, from the total of 269 respondents that passed the previous section, 259 of them (96.3%) understand the concept of sustainability, whereas 10 of them (3.7%) do not have the knowledge of sustainability. The 10 respondents did not meet the criteria and screening process, therefore, will not continue with this study.

Table 4.4 Knowledge of Sustainability

Knowledge of Sustainability	Count	Percentage
Yes	259	96.3%
No	10	3.7%
Grand Total	269	100%

4.1.1.5 Greenwashing Familiarity

According to Table 4.7, from the total of 269 respondents that passed the previous section, 179 of them (66.5%) are aware of greenwashing, whereas 90 of them (33.5%) are not familiar with greenwashing. This indicates that the majority of Indonesian customers have an awareness regarding greenwashing.

Table 4.5 Greenwashing Familiarity

Greenwashing Familiarity	Count	Percentage
Yes	179	66.5%
No	90	33.5%
Grand Total	269	100%

4.1.2 Respondents' Socio-Demographic Profile

The socio-demographic profile in this analysis is the gender and age of the eligible respondents.

4.1.2.1 Gender

According to Table 4.1, out of 259 respondents, 154 of them (59.46%) are female whereas 105 respondents are male (40.54%). This result infers that the sample size in this study is more representative towards female customers. This might also indicate that H&M has more female customers rather than male customers, although the gap between the numbers is not huge.

Table 4.6 Gender

Gender	Count	Percentage
Male	105	59.46%
Female	154	40.54%
Grand Total	259	100%

4.1.2.2 Age

According to Table 4.2, the three largest ages of the respondents are 20, 21, and 22 with 81, 75, and 38 respondents respectively. This might indicate that these ages are the biggest customers of H&M. The other ages are 18 with 10 respondents (3.86%), 19 with 18 respondents (6.95%), 23 with 21 respondents (8.11%), and 24 with 16 respondents (6.18%).

Table 4.6 Age

Age	Count	Percentage
18	10	3.86%
19	18	6.95%
20	81	31.27%
21	75	28.96%
22	38	14.67%
23	21	8.11%
24	16	6.18%
Grand Total	259	100%

4.1.3 Descriptive

The Mean, Median, Standard Deviation, Min value and Max value are calculated for each indicator from each variable. It is shown that the indicator of “H&M overstates or exaggerates how its green functionality actually is” (GW3) from Greenwashing variable has the highest mean score of 4.243. This indicates that the average respondents agree that they perceive H&M claims regarding its environmental practices or sustainability initiatives are inaccurate or misleading. In contrast, the variable Brand Loyalty has the lowest mean count with the indicator of “I would be willing to pay a higher price for H&M over other brands” (BL4) with the mean count of 2.293. This low mean count suggest that the respondents are not willing to pay more for H&M over other alternatives.

The Greenwashing variable has a relatively lower standard deviation compared to other variables. The indicator of “I’m sure that H&M’s sustainable products exist only in advertisements” (GW5) has the lowest standard deviation with 0.71. Standard deviation shows how the average data values disperse from one another (Cooper & Schindler, 2006). A low standard deviation means the data are clustered to the mean value (Zach, 2021). This

Analysis

means that most respondents believe that H&M products are only sustainable in their advertisements. Conversely, Brand Loyalty variable has the higher standard deviation with the indicator of “I like H&M more than other shops” (BL8). This indicated the data values are highly dispersed and the respondents have different opinion regarding their H&M preference.

4.1.4 Partial Least Square (PLS-SEM) Analysis

Partial Least Square (PLS-SEM) method is utilized to evaluate the data obtained in this research. This process is conducted using SmartPLS 3 software to map and analyze the correlation between the variables. The variables used in the reflective measurement model are Greenwashing (GW), Consumer Purchase Behavior (CPB), and Brand Loyalty (BL). The analysis was conducted in a series of fundamental steps, including construct validity, construct reliability, and indicator reliability, discriminant validity, multicollinearity test, and bootstrapping. The output model of the analysis is shown on Figure 4.1

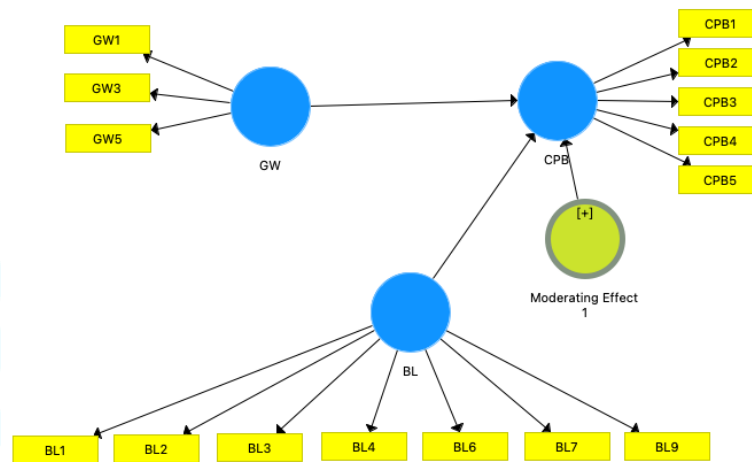


Figure 4.1 PLS-SEM Model Construct after adjustment

Ultimately, researchers need to evaluate the significance and relevance of each formative indicator by using bootstrapping method to evaluate each indicator weight's level of significance (Hair et al., 2014). It is suggested to conduct the significance testing using bias-corrected and accelerated bootstrap interval (the BCa interval) confidence intervals (Hair et al., 2017). To determine the t-values and p-values of the path coefficients, the strength and significance of the path coefficients are measured in reference to the relationships (structural path) hypothesized between the constructs, which will determine the hypothesis acceptance or rejection (Sarstedt et al., 2021).

Table 4.7 Bootstrapping Result

Structural Path	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	Coefficients of Determination (R ²)	Crossvalidated Redundancy (Q ²)
BL → CPB	0.828	0.023	36.386	0.767	0.605
GW → CPB	-0.088	0.034	2.557		
Moderating Effect 1 → CPB	0.093	0.039	2.415		

Coefficient of Determination (R^2) is a strength-of-fit tests and metrics that are employed for measuring the explanatory power (Shmueli & Koppius, 2011). The R^2 spans a range of 0 to 1, with higher values representing a stronger explanatory power (Hair et al., 2014). R^2 values of 0.75, 0.50, and 0.25 are generally classified as substantial, moderate, and weak, respectively (Hair et al., 2011). According to Table 4.13, the R^2 value of the dependent variable, which is Consumer Purchase Behavior, is 0.767. This high number shows a strong power. The Greenwashing and Brand Loyalty variables along with the moderating effect explain 76.7% of the variance in the Consumer Purchase Behavior.

The next step is to conduct Blindfolding to get cross-validated redundancy measures for each construct (Hair et al., 2011). To indicate the prediction efficacy of the structural model for a given endogenous construct, Q^2 values should be greater than zero with Q^2 values above 0, 0.25, and 0.50 imply the PLS-path model's small, medium, and substantial predictive importance (Hair et al., 2019). According to Table 4.13, the Q^2 value of the dependent variable, which is Consumer Purchase Behavior, is 0.605. This high number shows a substantial predictive accuracy.

4.1.3.4 Hypotheses Testing

The result of the structural model and bootstrapping method will become the determination of the acceptance and rejection of the hypotheses as well as their significance. In this section, path coefficient, T-values, and P-values are used in the decision. Standardized path coefficient values range between +1 and -1, with coefficients closer to +1 indicating strong positive relationship and coefficients closer to -1 indicating strong negative relationships (Hair et al., 2014). The result of the hypotheses testing is displayed in Table 4.15.

Table 4.8 Hypotheses Testing

Hypotheses	Structural Path	Path Coefficient	T Values	P Values	Result
H1	Greenwashing → Consumer Purchase Behavior	-0.088	2.557	0.005	Accepted
H2	Moderating Effect 1 → Consumer Purchase Behavior	0.093	2.415	0.008	Accepted
H3	Brand Loyalty → Consumer Purchase Behavior	0.828	36.386	0	Accepted

4.1.3.4.1 H1: Greenwashing negatively affects consumer purchase behavior

Hypothesis 1 suggests that greenwashing have a negative impact on consumer purchase behavior. By using a significance level of 5%, the T-value of this structural path is 2.557 which indicates a significant negative relationship indicated by a negative path coefficient which is at -0.088. At P-value of 0.0005, the hypothesis is accepted. Therefore, it can be inferred that when greenwashing is detected, it results in the downward in the consumer purchase behavior.

4.1.3.4.2 H2: Brand loyalty plays the moderating role towards greenwashing and consumer purchase behavior

Hypothesis 2 suggests that brand loyalty plays the moderating role towards greenwashing and consumer purchase behavior. By using a significance level of 5%, the T-value of this structural path is 2.415 which indicates a significant positive relationship indicated by a positive path coefficient which is at 0.093. At P-value of 0.0008, the hypothesis is accepted. Therefore, it can be inferred that even when

greenwashing is detected, if the consumer has a brand loyalty towards H&M, it does not result in the downward in the consumer purchase behavior. Brand loyalty significantly changes the existing (negative) relationship between greenwashing and consumer purchase behavior.

4.1.3.4.3 H3: Brand loyalty positively affects consumer purchase behavior

Hypothesis 3 suggests that brand loyalty positively affects consumer purchase behavior. By using a significance level of 5%, the T-value of this structural path is 36.3865 which indicates a significant positive relationship indicated by a positive path coefficient which is at 0.828. At P-value of 0, the hypothesis is accepted. Therefore, it can be inferred that brand loyalty has a positive influence on consumer purchase behavior.

4.1.3.5 Moderation Analysis

As the moderation effect of brand loyalty towards consumer purchase behavior is proved to be significant and the hypothesis being accepted by the path coefficient, T-values, and P-values, this moderation analysis will use simple slope analysis from PLS Algorithm to further interpret the moderating effect. The slope graph is presented in Figure 4.4 below.

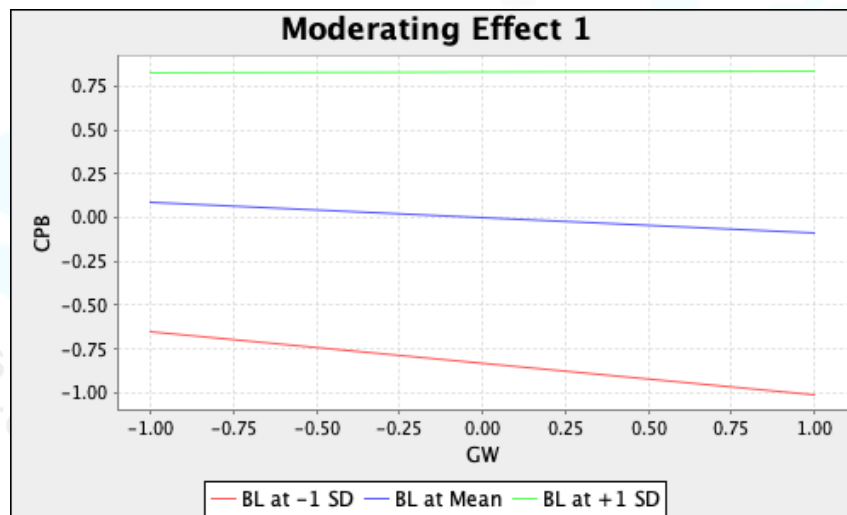


Figure 4.2 Simple Slope Analysis

The red slope represents a condition if the brand loyalty is reduced, the blue slope represents a condition if the brand loyalty is at mean, and the green slope represents a condition where the brand loyalty is increased. It is evident that the red slope where brand loyalty is reduced, the slope is steeper than the blue and green slope, indicating the more greenwashing done, the more detrimental it impacts the declining consumer purchase behavior. Conversely, it is also evident in the green slope, when brand loyalty is present and increased, the line maintained the stable level for the consumer purchase behavior despite the increasing greenwashing value. Whereas when brand loyalty is at a mean level, the slope is declining with the increasing greenwashing value, however, it is not as steep as when brand loyalty is reduced.

The result can be concluded that Brand Loyalty indeed plays a moderating role in the relationship between Greenwashing and Consumer Purchase Behavior by strengthening their relationship positively. The path coefficient, T-value, and P-value all indicating the same result which is how greenwashing significantly influence consumer purchase behavior in a negative manner. However, when brand loyalty in the customer is present, the detriment towards consumer purchase behavior can be alleviated. This proved the significant moderating role of brand loyalty in this research.

V. DISCUSSION

5.1 Greenwashing negatively affects consumer purchase behavior

The first hypothesis, which asserts that greenwashing negatively influences consumer purchase behavior, is supported by the data, in accordance with the analysis carried out in this research. The collective findings gathered show that, as shown by the negative path coefficient of -0.088, T-value of 2.557 which exceeds the threshold of 1.96 at a significance level of 0.05, greenwashing indeed has a negative impact on the purchase behavior of the consumers. This finding is consistent with prior research by Khan, et al. (2021), Hameed, et al. (2021), and Sinisalo (2020) which also emphasized the negative relationship between greenwashing and consumer purchase behavior. Therefore, the significant negative influence of greenwash on consumer purchase behavior among Indonesian consumers can be explained further.

H&M and the fashion industry should put a strong emphasis and priority on transparency in their sustainable practices and present accurate, substantiated information on their environmental initiatives and merits. It is highly important to avoid false and misleading claims. H&M must be careful in appropriately portraying its sustainability practices in its marketing materials. They need to refrain from making exaggerated or false claims that are likely to be interpreted as greenwashing. In promoting and communicating their environmental activities, they should utilize precise language supported up by credible proof. Companies may increase consumer trust and lower skepticism about their green claims by being transparent and honest about their efforts. It is also important to consider the longevity of the business and how the companies can sustain their consumers into maintaining their consumption. By not being transparent and providing vagueness, it will ignite skepticism in the consumers which will impact their purchasing behavior. Therefore, to maintain the sustainability and stable customers, companies should not promote greenwashing and provide clarity and transparency in their marketing practices.

H&M and fashion companies have to constantly evaluate and monitor the success of its sustainability initiatives. They may discover areas for improvement and make the required changes to their practices by seeking consumer feedback and carrying out independent audits. This demonstrates their dedication to continuous growth and strengthens customer loyalty. H&M and fashion companies should also use their annual sustainability report in communicating their factual sustainability initiatives in a comprehensive manner.

In conclusion, based on both the statistical and descriptive analysis, it is indicated and evident that greenwash has a significant negative influence on consumer purchase behavior among Indonesian consumers of this research. H&M uses a global marketing strategy by providing a consistent international presence with a single, universal image worldwide (Don Aguas Consulting, 2018), which does not differ the marketing approach according to the geographical location, which makes H&M Indonesia follow the same marketing course. Subsequently, the greenwashing scheme is also being applied worldwide, including H&M Indonesia. The findings of this research give insights on the negative impact of greenwashing towards the consumer purchase behavior, specifically in the Indonesian customers.

5.2 Brand loyalty plays the moderating role towards greenwashing and consumer purchase behavior

The second hypothesis of this research asserts the moderating role played by brand loyalty towards the relationship between greenwashing and consumer purchase behavior. It is supported by the data, in accordance with the analysis carried out in this research. The collective findings gathered show that, as shown by the positive path coefficient of 0.093, T-value of 2.415 which exceeds the threshold of 1.96 at a significance level of 0.05, brand loyalty indeed plays a moderating role impacting the influence of greenwashing on the purchase behavior of the consumers.

H&M and fashion companies might serve as a key player in educating customers about sustainable fashion selections. They can enable consumers to make well-informed choices and promote more sustainable purchase behaviors by educating them on the detrimental impacts of the fashion industry and providing advice on responsible consumption and fashion recycling in their marketing campaigns. This campaign should make use of a variety of communication platforms, including social media, their website, and in-store displays. Engaging with customers and directly resolving their concerns helps strengthen brand loyalty and reduce the consequences of greenwashing. This initiative could repair the tarnished reputation of H&M for being a greenwashing offender and slowly shift the brand image as the greenwashing advocate for the customers.

This finding is consistent with prior research by Khan, et al. (2021), Hameed, et al. (2021), and Guo et al. (2017) which previously proved the moderating role of brand loyalty towards the negative relationship between greenwashing and consumer purchase behavior. Therefore, the significant influence of brand loyalty on greenwashing and consumer purchase behavior among Indonesian consumers can be comprehensively explained. It can be inferred that among the Indonesian H&M consumers, as greenwashing indeed hinders the customers to purchase H&M, this detriment risk is able to be alleviated by having a loyalty towards H&M. Since the finding shows a positive influence from brand loyalty, therefore, the Indonesian consumers who have a loyalty to H&M are still maintaining their consumption of H&M products despite their acknowledgement of the greenwashing done by H&M. The findings of this research give insights on the positive impact of brand loyalty towards the negative influence of greenwashing towards the consumer purchase behavior, specifically in the Indonesian customers.

5.3 Brand loyalty positively affects consumer purchase behavior

The third hypothesis of this research suggests that greenwashing negatively influences consumer purchase behavior, supported by the data, in accordance with the analysis carried out in this research. The collective findings gathered show that, as shown by the positive path coefficient of 0.828, T-value of 36.386 which exceeds the threshold of 1.96 at a significance level of 0.05, brand loyalty indeed has a significant positive impact on the purchase behavior of the consumers. This finding is aligned with previous research by Khan, et al. (2021) and Hameed, et al. (2021) which proved that brand loyalty positively influences consumer purchase behavior.

For the purpose of fostering brand loyalty, H&M and fashion companies should concentrate on developing solid connections with their customers. Personalized interactions, first-rate customer support, and engaging loyalty programs are a few ways to ignite brand loyalty. By offering extra exclusive rewards and benefits to loyal customers, H&M and fashion companies may encourage repurchase intentions and boost brand loyalty. Through several metrics, such as repeat purchases, customer referrals, and engagement levels, H&M and fashion companies should monitor and measure customer loyalty. Subsequently, companies may acknowledge loyal customers with special offers, early access to new collections, or special occasions. Recognizing and valuing loyal customers allows them to feel deeper connection to the brands.

H&M is responsible for making sure that their products and services correspond to or beyond the expectations of their customers. One of the indicators used in this study to measure brand loyalty is “I believe that H&M products are reliable” which means the consumers trust H & M in delivering the products as they need. It includes delivering durable, high-quality apparel that is produced in a responsible manner. Fulfilling their commitments by offering value for money will help H&M increase customer satisfaction, which will in turn promote and foster brand loyalty among the customers.

In conclusion, based on both the statistical and descriptive analysis, it is indicated and evident that brand loyalty has a significant positive influence on consumer purchase behavior among Indonesian consumers of this research. The findings of this research give insights on the positive impact of brand loyalty towards the consumer purchase behavior, specifically in the Indonesian customers.

VI. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The objective of this study is to uncover the impact greenwashing have on consumer purchase behavior as well as to determine what impact brand loyalty have on the relationship between greenwashing and consumer purchase behavior. An online questionnaire which was distributed to H&M consumers in Jakarta who have a knowledge of sustainability and regularly use H&M products were utilized for gathering the data for this study. Both descriptive statistics analysis and PLS-SEM analysis are used to analyze the quantitative data in this study. The results of this study examine the impacts of greenwashing and brand loyalty on consumer purchase behavior. The findings are evident that greenwashing have a significant negative impact towards the consumer purchase behavior, brand loyalty has a significant positive impact on consumer purchase behavior, brand loyalty plays a moderating role in the negative influence of greenwashing towards consumer purchase behavior.

6.2 Recommendations

6.2.1 H&M and Fashion Industry

The findings of this research can be fundamental in deriving into recommendations towards H&M and fashion industry in their marketing aspects in order to generate purchase behavior and brand loyalty of their customers. By implementing the recommendations H&M and fashion companies are able to capitalize on the positive impact of brand loyalty, reduce the detrimental impacts of greenwashing, and foster a loyal customer base that supports their sustainability initiatives. H&M and the fashion industry should place a strong emphasis and priority on transparency in their sustainable practices and present accurate, substantiated information on their environmental initiatives and merits as well as educating their customers on fashion sustainability. It is highly important to avoid false and misleading claims. H&M and fashion companies should concentrate on developing solid connections with their customers by making sure their demands are met and fostering brand loyalty even further by implementing loyalty programs and rewards.

6.2.2 Further Research

This research only evaluates H&M as a case study of greenwashing and brand loyalty towards consumer purchase behavior. Therefore, the result may differ in other brand cases, which should be examined as an opportunity to learn more regarding the impact of greenwashing towards consumer purchase behavior. There were also several research limitations that should be studied in subsequent studies, such as the fact this study did not include other factors that may significantly influence the purchase behavior such as pricing, brand trust, brand image, and others that if included may have different study findings. Finding and studying another local brand that commits greenwashing is advised since this could affect the outcomes and have a different impact on the purchase behavior than in H&M's case as an international brand.

Another suggestion is to broaden the scope of the population and sample, as this study only considers Indonesians in Jakarta as the population and sample and the data collection period is during June 2023. Additionally, Generation Z respondents were the focus of this study because they are an important target for H&M and the fast fashion industry. However, it was highlighted that there are also millennials in Indonesia who bought from H&M. Therefore, further study into the impact of greenwashing on the purchase behavior of the older generations may be possible in the future. This study utilizes a quantitative method as well as the descriptive statistics analysis and PLS-SEM as the data analysis method. Further research may utilize other research methodology as it may add to the findings while providing a more thorough understanding of the phenomenon.

6.3 Research Implications

6.3.1 Theoretical Contributions

Theoretical contributions by clarifying how greenwashing, brand loyalty, and consumer purchasing behavior interconnect. It contributes to the academic literature by offering empirical evidence. By proving the significant negative impact of greenwashing on consumer purchase behavior, this study contributes to the academic literature on consumer skepticism and the value of credible sustainability practices. This study also established how brand loyalty has a significant positive impact on customer purchase behavior, which contributes to the academic literature on how brand loyalty might promote sustainable consumption by acting as a buffer against consumer skepticism.

6.3.2 Practical Contributions

This study has significant practical knowledge and contributions for marketers, the fashion industry in general as well as for H&M specifically. The recommendations made regarding the findings provide companies with tangible steps that may be implemented to reduce the detrimental effects of greenwashing and to use customer loyalty to promote sustainable consumer behavior. These implications contribute to the development of ethical marketing strategies and sustainable company practices.

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SCBTii

Sustainable Collaboration in Business,
Technology, Information and Innovation

The Effect Of Cooperation Policy Between Directorate General Of Intellectual Property And Japan International Cooperation Agency (Jica) On Performance Improvement Of Directorate General Of Intellectual Property

Galang Aprilian¹, Eleonora Sofilda², Dini Hariyanti³,
^{1,2,3} Fakultas Ekonomi dan Bisnis, Universitas Trisakti, Jakarta, Indonesia

Abstract

Introduction/Main Objective: Directorate General of Intellectual Property (DGIP) and Japan International Cooperation Agency (JICA) has established cooperation since 1995. Nowadays, DGIP has become an advanced and good institution in the development of intellectual property system in Indonesia. **Background of the Problem:** As a result JICA has expanded the scope of cooperation not only focusing on the field of intellectual property. **Research gaps/Novelty:** this research is aimed to analyze and study the effect of cooperation between DGIP and JICA on performance of DGIP, sustainability of cooperation between DGIP and JICA as well as fields of cooperation needed by DGIP in the future with the output recommendation policies of cooperation in DGIP. **Research Methods:** This research uses a qualitative approach with in-depth interviews for data collection. The tool used for analyzing is NVivo. **Finding/Result:** From the data processing, there are some matters as an effect of cooperation. They are Human Resource Skill Improvement, Foreign Direct Investment, Training/Novelty of Examination, Technical Assistance and On the Job Training. **Conclusions and implications:** This research resulted that the cooperation between DGIP and JICA has an impact on DGIP performance, especially in increasing the capacity of human resources. In the future the cooperation needs to be continued to keep increasing the capacity of human resources. This will improve performance of DGIP which will have an impact on increasing Non-Tax State Revenue (PNBP) of DGIP. In addition, the collaboration with other counterparts and the improvement of cooperation area in the field of audit quality management is needed.

Keyword: cooperation, DGIP, JICA, performance

I. INTRODUCTION

Directorate General of Intellectual Property (DGIP) has a policy to establish cooperation with JICA since 1995¹ and still in force until now with several cooperation schemes provided by JICA through National Development Agency. During this period, many JICA experts have been dispatched to Indonesia to assist the improvement of intellectual property (IP) system, such as increasing the capacity of employees, disseminating IP information, and drafting various regulations on IP. The assistances are beneficial for DGIP taking that into account that Indonesia is a developing country that needs an assistance to improve the IP system especially the employee capacity enhancement. This kind of public policy, cooperation with JICA brought many benefits for Indonesia, especially DGIP in many areas.

On 2015, during the discussion of cooperation extension between DGIP and JICA, both sides are agreed in expanding the scope of cooperation, not only for intellectual property, but also regarding legislation and settlement of IP case by court. By such agreement, the project of cooperation involved Directorate General of Legislation (DGL) and Supreme Court (SC).² As a result of this policy, DJKI's portion of getting JICA assistance is reduced and it is not focused because it is divided into three agencies within it. Several activities that were previously carried out routinely, such as training, study visits and roving seminars, have become less frequent.

Such matters, affecting to the implementation of activities planned. The policy taken by both sides is postponing the implementation to next year. The possible consequences for DGIP are the 2020-2024 strategic plans which are "Becoming an Intellectual Property institution that guarantees legal certainty, and becomes a driver of innovation, creativity and national economic growth" and DGIP's mission of "Creating Quality Intellectual Property Services and Enforcement"

¹ Silitonga, Daulat P. (2020). *Point of Cooperation between the Directorate General of Intellectual Property, Ministry of Law and Human Rights of the Republic of Indonesia and the Government of Japan through Japan International Cooperation Agency (JICA)*. [Speech]. Directorate General of Intellectual Property

² *Record of Discussion (RoD) on The Project on Intellectual Property Rights Protection and Legal Consistency for Improving Business Environment*

can also be hampered. Meanwhile, to achieve this vision, various collaborations with foreign parties are needed, one of which is related to increasing the capacity of DGIP employees.

After the completion of cooperation project between DGIP and JICA 2015-2020, the cooperation is continue using Individual Expert scheme by experts dispatchment from JICA according to requests from the Indonesian. Unlike the technical cooperation scheme, this cooperation scheme further reduces the activity intensity due to the minimum budget allocated by JICA.

As a government organization, a policy always depends on the instruction of high-level officials. In this case, DGIP is depending on the instruction of Director General. Regarding the continuity of cooperation, it is also depended on the instruction. The Director instructed to continue the cooperation without considering the effect of such cooperation to DGIP. Although according to the Public Satisfaction Index survey the DGIP performance was satisfactory, it is still necessary to review whether this good performance is one of the impacts of the cooperation with JICA.

To solve this and become input for organization, it is necessary to conduct research related to the effect of the cooperation established with JICA on DGIP performance. This research can determine future cooperation policies and determine what areas of cooperation are needed to achieve DGIP's vision and mission.

Several studies have been conducted regarding cooperation policy between Indonesia and JICA. On 2018 there was research conducted by Wahyurudhanto entitled "Effectivity of Cooperation Program Implementation between Polri and JICA in the field of Polmas". This research is studying how is the effectivity of cooperation conducted by Polri and JICA in the field of Polmas (Community Policing). Besides, on 2020 there was research entitled "The role of Japan International Cooperation Agency (JICA) in the implementation of Capacity Building for Restoration of Ecosystem in Conservation Area (RECA) Project in Bromo Tengger Semeru East Java National Park" by Jivandra Vega. The research is aimed to find out the role of JICA in a project called RECA in the Semeru area, East Java. Meanwhile, there is also research by Sulfitri Husain in 2022 entitled "The Role of the Japan International Cooperation Agency (JICA) After the 2018 Natural Disaster in Central Sulawesi". The aim of this research was to find out the procedures for JICA assistance in the implementation of assistance in disaster locations.

From the above studies, there has not been any research on JICA cooperation policy in the field of intellectual property. Because of the limitation, researcher did not find any research regarding the impact between a cooperation and performance. However, there is previous research with a similar concept, the impact of training as one of the implementation of cooperation policy on the employee performance carried out by Anriza Julianry, Rizal Syarif, and M. Joko Affandi entitled "The Effect of Training and Motivation on Employee Performance and Organizational Performance of the Ministry of Communication and Informatics". It was concluded that training had a significant effect on employee performance.

In addition, the study entitled "Effects of Foreign Direct Investment on Intellectual Property, Patents and R&D" conducted by K. Arun in 2014. Such research resulted that between Foreign Direct Investment (FDI) with intellectual property is interconnected. The increase of FDI will be followed by the increase of intellectual property application. Japan as a country which has many investments in Indonesia affecting the high number of patent application in DGIP coming from Japanese companies.³

Based on some previous studies, the researcher is interested to analyze and study on the effect of cooperation policy between DGIP and JICA in the field of intellectual property, especially the effect of such cooperation to the enhancement of DGIP performance. The formulation of the problem are (1) how the effect of the cooperation policy established between DJKI and JICA has an impact on increasing the performance of DJKI and (2) how the collaboration will continue in the future. Besides, another formulation of the problem is (3) what areas of cooperation are needed by DGIP in the future.

Meanwhile, the objectives of this research are (1) to study and analyze the impact and (2) continuity of cooperation policies between DGIP and JICA on improving the performance of DGIP. In addition, this research is aimed (3) to examine and analyze the fields of cooperation needed by DGIP in the future.

II. LITERATURE REVIEW

Grand Theory

Public Policy

According to Parsons (2011) Public Policy is an action carried out by the government, political parties and policy makers for the benefit of the wider community. In this definition, Parsons sees public policy as any action taken by policy makers, especially the government, for the wider interest, in this case society. In this research, the public policy in question is DGIP's policy in cooperation with foreign partners, namely JICA

³ World Intellectual Property Organization (WIPO) data center 2023

where this cooperation will have an impact on the intellectual property system in Indonesia. This policy will also have an impact on society as users of intellectual property services in Indonesia.

Laswell and Kaplan (1970) define public policy as a projected program of goal, value, and practice or a program to achieve objectives, values in directed practices. This means that the policy must have a certain objective to be achieved in which the policy maker must conduct a research or calculation towards the direction of such policy. Robert Eyestone as quoted by Agustino (2008: 6) defines public policy as "the relationship between government units and their environment". The relationship between the government and its environment can be in any form. So it can be concluded that whatever the government issues both regulations, appeals, laws and so on is a policy because it is related to its environment. The environment here can mean people in a particular area or country.

Whereas from the views of taxonomy, public policy is divided into sectoral and teritorial policy (Nugroho: 2008). Sectoral policy includes political sector, social sector, economic sector, and infrastructure sector. Meanwhile, teritorial policy includes central level policies and regional level policy. In this search, the policy carried out by the DGIP are included in three sectors, namely foreign, social and economic politics considering that JICA is an international organization from Japan. While the substance of cooperation carried out between DGIP and JICA includes social and economic problems.

In the social field, JICA helps the community in increasing public understanding of the intellectual property. Whereas in economic matters, JICA helps related to the field of intellectual property which is closely related to the economy. From the aspect of territorial, this policy is included in the central policy because DJKI is a central agency under the Ministry of Law and Human Rights.

MIDDLE-RANGE THEORY

Cooperation

According to Clitrap (2008), cooperation is an activity in groups to do or complete a task together. This definition explains on the action or activity in groups. On this definition, the cooperation within the group has an objective to finish task which is carried out together. The term together shall be consisting of two or more people.

Meanwhile, according to Pamudji (1985) cooperation is defined as work carried out by two or more people by interacting between individuals who do cooperation so that dynamic goals are achieved. According to Pamudji, there are three elements contained in cooperation. They are people who cooperate, interaction and there is the same objective.

Individuals who conduct cooperation in this definition may be define as parties involved in the cooperation. In this research the parties involved are Indonesia and Japan which are represented by DGIP and JICA respectively. Meanwhile, interaction may be in the form of communication and discussion through official letter or electronic mail.

The cooperation itself from the perspective of international aspects is divided into three categories. They are (1) Bilateral cooperation which consists of two countries such as between Indonesia and Japan, (2) Regional Cooperation which consist of several countries in the same region or region, such as the Association of South East Asia Nation (ASEAN) and (3) Multilateral Cooperation which consist of more than two countries but is not limited by certain regions such as the United Nations, WTO, OKI, etc.

Directorate General of Intellectual Property

According to Ministry of Law and Human Rights Regulation No. 41 of 2021 on the Organization and Work Procedures of the Ministry of Law and Human Rights, Directorate General of Intellectual Property is a unit under the Ministry of Law and Human Rights which has the task of carrying out the formulation and implementation of policies in the field of intellectual property in accordance with prevailing laws and regulations. In other words, DGIP is an intellectual property office in Indonesia that organizes the formulation

and implementation of intellectual property policies including trademarks, patents, copyright, industrial design, geographical indications, layout design of integrated circuit and trade secrets.

As an organization handling intellectual property in Indonesia, the Motto of Directorate General of Intellectual Property to become an International -class Intellectual Property Office certainly has many challenges for Indonesia has high population and the area which is consisting of islands. In carrying out its duties and functions DJKI has seven echelon II units, namely: (1) Secretariat of Directorate General of Intellectual Property, (2) Directorate of Copyrights and Industrial Designs, (3) Directorate of Trademark and Geographical Indications, (4) Directorate of Patent, Layout Design of Integrated Circuit and Trade Secrets, (5) Directorate of Cooperation and Empowerment of Intellectual Property, (6) Directorate of Information Technology of Intellectual Property and (7) Directorate of Investigation and Disputes Settlement.

In carrying out the process business of IP registration, there are position namely Examiner of Intellectual Property which has tasks and duties in examining intellectual property application consisting of Patent, Trademark, and Industrial Design.

Patent Examiner is Functional Position of Patent Examiners is a position that has the scope, duties, responsibilities, authority, and the right to examine patent applications.⁴ The Trademark Examiner is Functional Position of Trademark Examiners is a position that has the scope, duties, responsibilities, authority, and the right to examine trademark applications.⁵ Meanwhile, Industrial Design Examiner is Functional Position of Industrial Design Examiners is a position that has the scope, duties, responsibilities, authority, and the right to examine industrial design applications.⁶

Japan International Cooperation Agency (JICA)

The Japan International Cooperation Agency (JICA) is an organization established by the Japanese government to give assistance to the development of developing countries. This is a form of implementation of the tasks carried out by JICA because JICA is an independent organization appointed by the Japanese government to implement the Official Development Assistance (ODA) program.

In 1954, Japan joined the Colombo Plan which is considered as the beginning of Japan to distribute Japan's foreign aid to a number of countries in the world. Colombo Plan is a cooperation organization formed in 1950 aimed to support the economic and social development of countries in South Asia, Southeast Asia and the Pacific region. Furthermore, through the ODA program, the Japanese government began to fulfill its commitment to help developing countries, especially the countries that had been colonized.

The implementation of assistance in Indonesia was carried out through National Development Agency as the Indonesian government agency that handled national development planning. Referring to the JICA cooperation scheme, there are four schemes can be used in implementing the ODA program.

The first is called *ODA Loan*. It is kind of funds with light requirements, namely long -term and low flowering, which is needed by developing countries, in order to organize the socio-economic foundation which will be the basis of development. Second, Grant Aid as funding assistance provided by the Japanese government without obligation to pay back. This is Technical Cooperation which means the cooperation given to assist the development of human resources in developing countries. So that every country can develop, absolutely necessary "human development efforts" that will play a role in socioeconomic development. The last is Individual Experts in the form of sending experts from JICA sent to the donor recipient countries and with certain themes. The technical cooperation basically also has experts dispatched, but the difference is that experts sent in this individual expert scheme can change every two years depending on the request of the donor recipient country.

⁴ Regulation of the Minister of Civil Servant Aparatus and Bureucratic Reform of the Republik of Indonesia No. 26 of 2013 on the Functional Position of Patent Examiners and its Credit Points.

⁵ Regulation of the Minister of Civil Servant Aparatus and Bureucratic Reform of the Republik of Indonesia No 34 of 2013 on the Functional Position of Trademark Examiners and its Credit Points.

⁶ Regulation of the Minister of Civil Servant Aparatus and Bureucratic Reform of the Republik of Indonesia No 36 of 2013 on Functional Position of Industrial Design Examiners and its Credit Points.

APPLIED THEORY

Performance

According to Prawirocentono (1999) performance is the work that can be achieved by a person or group of people in an organization, in accordance with their respective authority and responsibilities, in the context of efforts to achieve the organization's goals legally, do not violate the law and in accordance with morals or ethics. The explanation focuses on the results achieved from a person or group of people. So, in this definition, performance benchmarks are a predetermined result.

According to Miner (1990), performance is how a person is expected to function and behave in accordance with the tasks that have been charged to him. In this case it is explained that performance is not always measured by the success of the targets achieved but in how a person's process can carry out in accordance with the mandatory tasks.

In this research performance is a measure of how the quality or action of DGIP employees in carrying out their duties to achieve the determined targets.

Performance of DGIP

Intellectual Property Application to DGIP

The Annual Report of DGIP shows that there is an increase for intellectual property application for registration. The statistics shows that DGIP is success in increasing public awareness on the importance of IP registration.

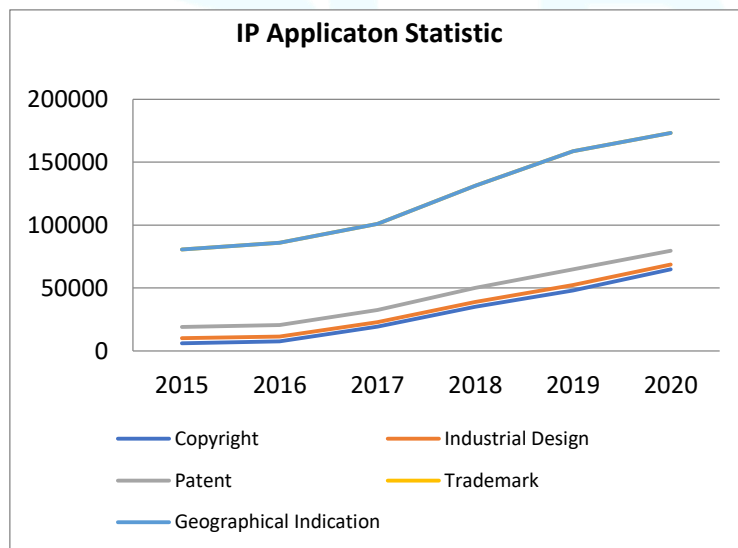


Figure 1. IP Application Statistic (Annual Report of DGIP 2021)

From the data all IP regimes namely copyright, trademark, industrial design, geographical indications and trade secrets have increased. In addition to registration, there is also data that shows the statistics of intellectual property protection in Indonesia. The following is a statistic for data on intellectual property rights (IPR) protection in Indonesia.

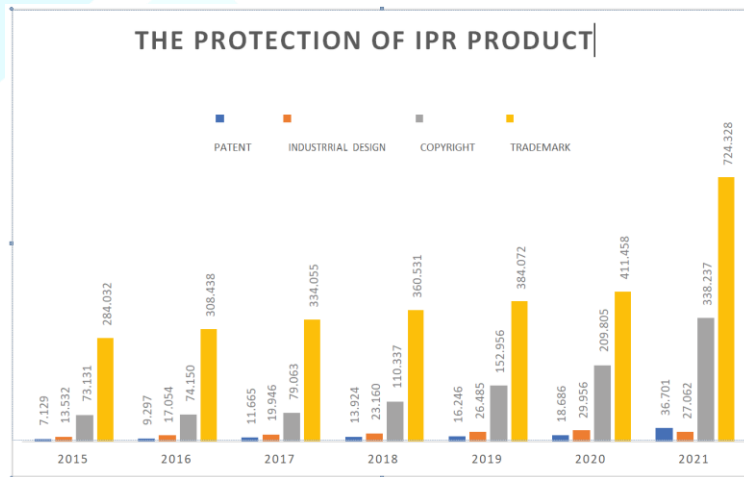


Figure 2. IPR Protection (Annual Report of DGIP 2021)

Public Satisfaction Index

In order to measure organization performance, DGIP conducted survey of Public Satisfaction Index (*indeks kepuasan masyarakat, IKM*) carried out by third party outside of the Ministry of Law and Human Rights that is national independent consultant, MarkPlus Inc. The survey is consisting of 9 components plus 1 element of assessment.⁷

The result of survey shows that the public is satisfied with DGIP with the results of the IKM survey at 3.26 in 2019, 3.29 in 2020 and 3.39 in 2021. It can be seen in the last three years there is an increase in public satisfaction which means the DGIP performance is increasing.

The following is an IKM table conducted by DJKI from 2019 to 2021.

Table 1. Table of DGIP IKM Survey

No	Aspect of Services	IKM	IKM	IKM
		Score	Score	Score
		2019	2020	2021
1	Requirements,	3,38	3,36	3,50
2	System, mechanism, and procedures	3,24	3,17	3,48
3	Time of completion,	3,00	3,02	3,31
4	Cost / tariff,	3,16	3,31	3,51
5	Specification product of service type,	3,16	3,21	3,53
6	Competence of servant,	3,38	3,23	3,50
7	Behavior of servant,	3,51	3,38	3,48
8	Infrastructure	3,28	3,27	3,11
9	Handling of complaints, suggestions and feedback,	3,09	3,18	3,39
10	Element of Utilization of Information technology	3,40	3,37	3,46
11	Legal Assistance After Granting	-	3,64	3,05

⁷ Regulation of the Minister of Administrative Reform Number 14 of 2017 on Guidelines for the Preparation of Community Satisfaction Survey

Source: Annual Report of DGIP 2021

Performance Accountability System of Government Institution

Apart from the IKM, the measurement of DGIP performance also be conducted through Performance Accountability System of Government Institution (*Sistem Akuntabilitas Kinerja Instansi Pemerintah*, SAKIP) which is a systematic series of various activities, tools, and procedures designed for the purposes of determining and measurement, data collection, classification, summarizing, and reporting performance in government agencies in the context of accountability and improvement of government agencies performance.⁸

The implementation of SAKIP includes 6 elements of assessment, namely performance planning, performance measurement, performance reporting, performance evaluation, and performance achievements. The following is a table of DGIP SAKIP assessment results from 2019 to 2021:

Table 2. Assessment of SAKIP for DGIP

Elements of Assessment	Score Percentage	2019	2020	2021
Performance Planning	30%	22,26	22,54	22,79
Performance Measure	25%	22,40	22,40	22,40
Performance Reporting	15%	13,00	13,27	13,00
Performance Evaluation	10%	8,31	8,00	8,31
Performance Achievement	20%	12,10	14,92	15,33
Total	100%	78,07	81,12	81,83
Predicate		BB Very Good	A Satisfactory	A Satisfactory

Source: Annual Report of DGIP 2021

In this it can be seen that the performance of DGIP is increased from year to year, starting from 2019 with a value of 78.07 with a very good “BB” predicate, 2020 with a value of 81.12 and 2021 with a value of 81.83 with a satisfactory “A” predicate. The good performance of this DJKI certainly has many factors that influence. One of the factors that can influence is the capacity building of DGIP employees. Training conducted by DGIP including training conducted by DGIP in collaboration with foreign partners, one of which is JICA

Previous Studies

Several studies have been conducted regarding cooperation policy between Indonesia and JICA as mentioned on the introduction above. It can be seen from the example, cooperation between Indonesia and JICA not only includes certain fields, but there are various fields. Moreover, the cooperation with JICA can be further developed to other areas. One example is the cooperation between the Ministry of Law and Human Rights and JICA in which the previous cooperation only the field of intellectual property, currently includes the field of legislation and judicial.

There are also other research related to cooperation, JICA, performance and intellectual property. An article written

⁸ Peraturan Presiden Nomor 29 Tahun 2014 tentang Sistem Akuntabilitas Kinerja Instansi Pemerintah (sebelumnya diatur dalam Instruksi Presiden Nomor 7 Tahun 1999, pada 21 April 2014 dicabut dan dinyatakan tidak berlaku).

by Mirzokhid Rakhimov, published at the Journal of Eurasian Studies on January 1, 2014 entitled “Central Asia and Japan: Bilateral and Multilateral Relations” explained on the cooperation relations of Japan and Central Asian countries. The study explained how Japan established cooperation relationships through the ODA program, what their advantages and obstacles, as well as what policies should be conducted by Japan in the future. In the article, researchers explain every bilateral cooperation between Japan with countries in Central Asia. In the conclusion of the article, it was revealed that Japan needs to form a new concept of foreign policy that can benefit both parties, both the Japanese, as well as the country given by donors.

In addition to research on cooperation with JICA, there is a previous research on the performance regarding factors that influence the performance of the employees conducted by Korkeew Jankingthong and Suthinee Rurkkhum entitled “Factors Affecting Job Performance: A Review of Literature in 2012” issued by Silpakorn University Journal of Social Sciences, Humanities, and Arts. The research is in the form of literature studies on factors that can affect performance. The results of his research showed that transformational leadership, organizational justice, work engagement, and public service motivation (PSM) had a direct influence on performance.

The author found that there was no research on the impact between a cooperation and performance. However, there is previous research with a similar concept, the impact of training as one of the implementation of cooperation on employee performance carried out by Anriza Julianry, Rizal Syarief, and M. Joko Affandi entitled “The Effect of Training and Motivation on Employee Performance and Organizational Performance of the Ministry of Communication and Informatics” published by the Journal of Business and Management Applications, Vol. 3 No. 2 in May 2017. It was concluded that training had a significant effect on employee performance. Besides training also has a significant effect on motivation. It can be concluded that the training has an impact on performance.

In relation to intellectual property, there are several studies conducted, especially the relationship between intellectual property and investment from abroad entering Indonesia. Research entitled “Intellectual Property Rights and Foreign Direct Investment: A Welfare Analysis” by H. Tanaka in 2014, which was published by the European Economic Journal, revealed that intellectual property had an impact on foreign investment. With the certainty of intellectual property protection, investment will also increase.

In addition, the study entitled “Effects of Foreign Direct Investment on Intellectual Property, Patents and R&D” conducted by K. Arun in 2014 and published by Queen Mary Journal of Intellectual Property resulted that the presence of Foreign Direct Investment (FDI) with intellectual property is interconnected. If someone invests in a country, of course that person wants his intellectual property products to be protected. In addition, with the certainty of intellectual property protection in a country, FDI will increase because people will calmly invest.

III. RESEARCH METHODOLOGY

This research using qualitative approach with the type of explanatory research and is a case study. The data collected in this research was conducted with in-depth interviews involving stakeholders involved in cooperation between DGIP and JICA in accordance with the formulation of the problem. In -depth interviews in a study can explore one's views, opinions, or input on a problem. The informants consisting of the regulator, operator, and academics categories.

Table 3. Categorization of Informants

No.	Informant	Position	Institution	Category
1	Sri Lastami	Director of Cooperation and Empowerment of IP	DGIP, Ministry of Law and Human Rights	Regulator
2	Dede Mia Yusanti	Director of Information Technology of IP	DGIP, Ministry of Law and Human Rights	
3	Tomohiro Nishiyama	<i>JICA Expert</i>	JICA	Operator

No.	Informant	Position	Institution	Category
4	Marchienda Werdany	Coordinator for International Cooperation	DGIP, Ministry of Law and Human Rights	
5	Prof. Aidir Amin Daud	Professor of International Law	Universitas Hassanudin	Academics

Source: Researcher (2023)

While data analysis is carried out using NVIVO which is an application used for processing and analysis of qualitative data in the form of audio recordings and transcripts from audio recordings. In addition, the results of the interview can be in the form of written narratives from the resource person if the resource person is not pleasing to an interview or limited place and time.

NVIVO can separate data sourced from informants and data sourced from researchers and secondary data (books, research reports, journal articles, and websites). Nvivo coding results can be displayed on the results of research to show a consistent and accurate analysis process. When the coding process, nodes will be produced. Nodes are a set of references to topics or sub-topics related to research problems (Bandur, 2019).

Data analysis conducted through stages (i). Describe the informant by presenting a profile; (ii). Transcribes the results of the interview, as outlined in a structured transcript; (iii). Conduct coding and classification of interview transcripts and other sources of documents through the formation of nodes and sub-nodes; (iv). Determine the pattern by finding a pattern or theme and; and (v). Interpreting pattern or themes raised or process of conclusion.

Meanwhile technique of data analysis consists of two steps; they are (i) *First Cycle Coding* which consists of hierarchy analysis and concept map, and (ii) *Second Cycle Coding* that is comparison diagram analysis.

IV. RESULT/FINDINGS

From the results of data processing, the following is an aggregate coding hierarchy to see which nodes are the most dominant (or have the highest number of coding activities) of the whole informant.

Dampak Kerja Sama DJKI & JICA Terhadap Kinerja DJKI				Others	
Peningkatan Skill SDM	Technology Underst...	Intellectual Pro...	Train...	Peran Universitas	
	Public Awareness	Peni...	Inova...	IP Pro...	Kesiapan Teknolo...
	Training -) Novelty Pemeriksa...	OJT -) Peningkatan S...	FDI -) Peningkatan Permo...	Studi V...	Pener...
Urgensi Kerjasama Bagi DJKI				Kendal...	Individ...
FDI	Technical Assistance	Ketersediaan ...	Kete...	IP System Refor...	
	Multinational Collaboration -) ...	External Interest			

Figure 3 : Aggregate Hierarchy (Data Processed, 2023)

From the results of data processing, it can be seen that the nodes system is divided into 3 (three) which refers to the formulation or purpose of research that has been developed previously, namely: (i). Effect of DGIP and JICA Cooperation on DGIP Performance - Nodes System 1; and (ii). The urgency of cooperation for DJKI - Nodes System 2. (iii). others- Nodes Others The way the hierarchy presentation starts from: (i). Identifying aggregate nodes which has the highest hierarchy; (ii). Identifying nodes with the highest reference to the nodes 1 system; (iii). Identifying nodes with the highest reference to the Nodes 2 systems; and (iii). Identifying nodes with the highest reference to the Nodes Others system.

In the aggregate there are 12 nodes having the largest contribution in the whole hierarchy, both in terms of the number of references and data sources (transcripts) shown in the following table

Table 4: Reference of Nodes Aggregate Hierarchy

No.	Nodes	Ref.	Files Coded	Max. Value	Share
1	Peningkatan Skill SDM	5	2	5	100%
2	FDI	4	1	5	80%
3	Training > Novelty Pemeriksaan	3	1	5	60%
4	Technical Assistance	3	1	5	60%
5	OJT > Peningkatan Skill SDM	2	2	5	40%
6	Intellectual Protection > Permohonan KI	2	2	5	40%
7	Technology Understanding	2	2	5	40%
8	Public Awareness	2	2	5	40%
9	Multinational Collaboration > Training	2	1	5	40%
10	Ketersediaan Personil	2	1	5	40%
11	Kesiapan Teknologi Pendukung	2	2	5	40%
12	Peran Universitas	2	1	5	40%

Source: Data Processed (2023)

This shows, overall (3 categories of informants), both implicitly and explicitly, agreed that cooperation between DGIP and JICA aimed to improve the competence of DGIP human resource. In addition, Nodes "Increased SDM Skill" has the highest source value (5) with a total contribution of 100%. This indicates that, all informants and all existing data sources (3 transcripts) alluded to the impact on increasing human resource competencies. Other nodes namely "FDI" and "Training> Novelty Examination" has a reference of 4 and 3 with a contribution value of 80% and 60%. This indicates that there are around 80% of informants who mentioned foreign investment and 60% that alluded to the benefits of programs related to the renewal of the intellectual property examination process. As for other nodes have a similar interpretation.

Furthermore, the following will be shown the hierarchy of the Nodes 1 system (the effect of DGIP & JICA cooperation on DGIP performance), as follows:

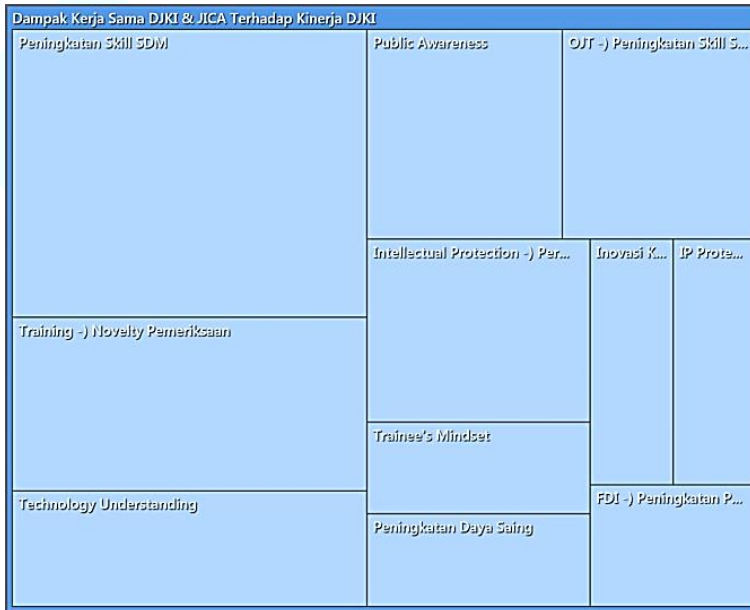


Figure 4: System Nodes 1 Hierarchy (Data Processed, 2023)

Table 5: Reference of System Nodes 1 Hierarchy

No.	Nodes	Ref.	Files Coded	Max. Value	Share
1	Peningkatan Skill SDM	5	2	5	100%
2	Training > Novelty Pemeriksaan	3	1	5	60%
3	OJT > Peningkatan Skill SDM	2	2	5	40%
4	Intellectual Protection > Permohonan KI	2	2	5	40%
5	Technology Understanding	2	2	5	40%
6	Public Awareness	2	2	5	40%

Source: Data Processed (2023)

From the table above, it can be seen that, in the system node 1, nodes "Increasing Human Resources (*Sumber Daya Manusia*, SDM) Skill" has a contribution of 100% of the total existing sources. This means that, it is proven that the impact of the program will increase the competence of DGIP Human Resource Furthermore, the impact of "OJT> Improvement of SDM Skill", "Intellectual Protection> IP Application", "Technology Understanding", and "Public Awareness" each is alluded to by 40% of the informants involved.

Meanwhile, the following figure will show the hierarchy of the Nodes 2 system (the urgency of cooperation between DGIP and JICA):



Figure 5: System Nodes 2 Hierarchy (Data Processed, 2023)

Table 6: Reference of System Nodes 2 Hierarchy

No.	Nodes	Ref.	Files Coded	Max. Value	Share
1	FDI	4	1	5	80%
2	Technical Assistance	3	1	5	60%
3	Multinational Collaboration > Training	2	1	5	40%

Source: Data Processed (2023)

It can be seen that, Nodes "FDI" or Foreign Direct Investment has a contribution of 80% of the total existing sources. This means that, it is proven that foreign investment (Japan) in Indonesia is a factor in the establishment of DGIP's cooperation with JICA. Furthermore, the impact of "technical assistance" and "multinational collaboration > training", each of which is alluded to by 60% and 40% of informants involved.

In the Nodes Other system, it can be seen that, Nodes "The Role of the University" and "Supporting Technology Readiness" has a contribution of 40% of the total existing sources. This means that in the role of the university it is needed in helping DGIP for the completion of the increasing intellectual property application. The following is the hierarchy of other nodes systems and hierarchical references in the Nodes Others system.



Figure 6: Hierarchy of System Nodes Others (Data Processed 2023)

Table 7: Reference of System Nodes Others Hierarchy

No.	Nodes	Ref.	Files Coded	Max. Value	Share
1	Peran Universitas	2	1	5	40%
2	Kesiapan Teknologi Pendukung	2	1	5	40%

Source: Data Processed (2023)

Furthermore, the second stage is carried out in Coding Analysis (Second Cycle Coding). The second cycle coding is based on nodes or coding that has been previously created (first cycle coding). The results illustrate the similarity of things that are alluded to by each informant (category), the similarity is displayed in Nodes located in the middle of the informant case.

Comparison – Regulator vs. Operator

The following will display the similarity of nodes between Regulator and Operator. In this case, the similarity of the Nodes indicates that, there is a similarity between the things that are alluded to the regulator and the operator, both explicitly and implicitly.

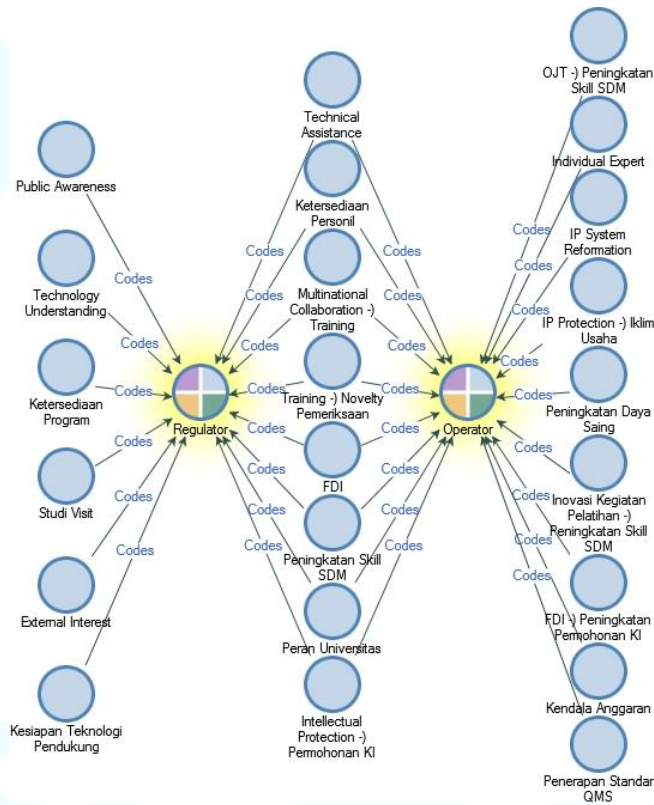


Figure 7: Comparison Diagram between Regulator and Operator (Data Processed, 2023)

There are 8 similarities in Nodes ("Technical Assistance", "Availability of Personnel", "Multinational Collaboration> Training", "Training> Novelty Examination", "FDI", "Improvement of SDM Skill", "University Role", and "Intellectual Protection).

Comparison – Regulator vs. Academics

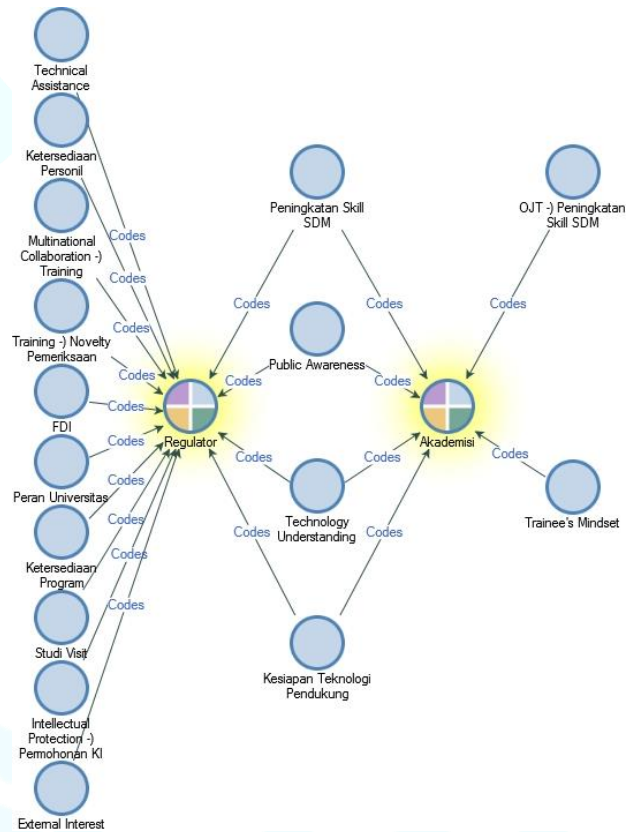


Figure 8: Comparison Diagram between Regulator and Academics (Data Processed, 2023)

Between Regulator and Academics there are similarities in nodes which indicates that there is a similarity between things that are alluded to the Regulator and the Operator, both explicitly and implicitly.

There are about 4 similarities in Nodes ("Improvement of SDM Skill", "Public Awareness", "Technological Understanding", and "Supporting Technology Readiness")

Comparison – Operator vs. Academics

There are about 2 similarities in nodes ("OJT> Improvement of HR Skill", and "Improved SDM Skill") mentioned by both parties, both explicitly and implicitly as seen in the comparison diagram as follows.

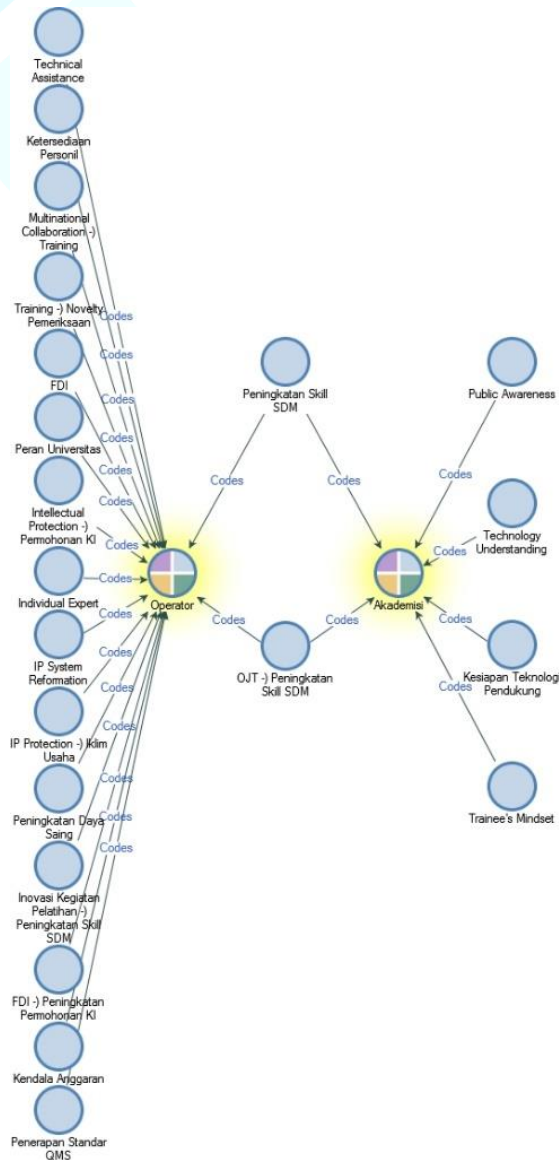


Figure 9: Comparison Diagram between Operator and Academics (Data Processed, 2023)

Furthermore, it is still in the Second Cycle Coding stage, several Causal Coding will be grouped that have been built in the previous stage. The following is a tabulation that contains nodes and its interpretation.

Table 8: Causal Coding Tabulation

No.	Nodes	Body Nodes Samples	Interpretation
1	FDI > Peningkatan Permohonan KI	Terlalu bukan hanya masuk penyelesaian apa penerimaan permohonan yang meningkat tapi	Related to foreign investment to Indonesia that needs protection for each product of company

	<p>penyelesaian permohonan kekayaan intelektual juga meningkat dari beberapa merk ya. Inovasi sendiri, tapi kalau itu peran JICA, aku sih merasa tidak ya karena di dalamnya mungkin kalau di paten itu ada sumbangsih dalam tanda kutip ya (pelatihan pelatihan) gitu. Tapi kalau kita lihat di merk kekayaan intelektual keseluruhan gitu apakah mereka memberikan vending yang sama? tentu tidak. Jadi aku lihat itu memang keberhasilan dari DJKInya itu sendiri dari penerapan manajemen SDM dan operasional yang bagus gitu. Di tahun 2022-2023 aja kan apakah udah ada pelatihan pemeriksaan selain paten? kan ga ada. Padahal terlihat penyelesaian permohonan itu kan merk yang terlihat menonjol</p>	
2 Inovasi Kegiatan Pelatihan > Peningkatan Skill SDM	<p>kalau aku ya selalu punya, Lebih baik kita yang belajar ke sana daripada mereka yang datang karena kalau kita ke sana kita langsung ada file-nya gitu loh bukannya duduk mendengar workshop itu aja tapi kita ya enggak tahu ya kalau di dalam tapi kalau di pemerintah ikut beberapa kegiatan JICA ya diundang ke sana lebih banyak kelas room ya oh ya dan agak kadang-kadang Memang agak sedikit boring gitu kan kalau sendiri kan kalau Jepang kalau mengajarkan kita kan boring gitu kan jadi mereka dan mereka kayaknya setiap tahun sama aja gitu konsepnya enggak ada apa ya apa sih merubah gitu jadi konsepnya seperti OJT atau mau dibuat lebih menarik konsepnya tuh terkadang malah modul yang diajarin tuh sama terus gitu contoh-contoh itu itu aja. Aku pernah pelatihan di Madrid tahun 2015, Diulang lagi jadi ga ada inovasi apa apa gitu gitu terus. Karena kalo praktik kan lebih enak yaa feelnya lebih</p>	<p>Related to the study Visit which must be innovative for type of activity so the training is interesting</p>
3 IP Protection > Iklim Usaha	<p>kalau peningkatan ini dipacu dari kita sudah merasa berubah lah yaa orientasinya, nah itu sebagai acuannya. Memang itu juga kerja sama itu juga ada andilnya juga, jadi</p>	<p>Related to the role of intellectual property protection to the conducive business environment for FDI</p>

		memang dengan bantuan mereka juga kita terpacu juga lah.	
4	<i>Intellectual Protection</i> -) Permohonan KI	kalau peningkatan ini dipacu dari kita sudah merasa berubah lah yaa orientasinya, nah itu sebagai acuannya. Memang itu juga kerja sama itu juga ada andilnya juga, jadi memang dengan bantuan mereka juga kita terpacu juga lah.	Intellectual property protection increase the number of intellectual property applications
5	<i>Training > Novelty</i> Pemeriksaan	JICA lebih intens membantu kita. Jadi JICA aktif menempatkan expertnya di sini untuk memberikan <i>novelty</i> pada proses pemeriksaan.	Training given will create novelty to the process of examination
6	<i>OJT > Peningkatan Skill SDM</i>	Tapi tentu tetap keputusannya manual, subjektif, sikap pribadi. Untuk jenis kegiatan yang palik efektif menurut saya ada kelebihan dan kekurangannya masing-masing. Seminar atau training dengan mengundang banyak orang akan memberikan pengetahuan yang lebih luas, namun kurang mendalam. Sebaliknya, kegiatan seperti OJT akan memberikan pengetahuan yang lebih mendalam namun dengan skala yang lebih sempit.	Related to the OJT program that have most effect to the improvement of skill for human resource
7	Multinational Collaboration > Training	kalo aku sih penasaran banget sama UKIPO, karena selama ini ga pernah langsung kan. Dulu sempat beberapa kali expert sana mengundang kita untuk beberapa kali training. Tapi gatau apa itu memang cara mereka sendiri. Tapi kalau negara itu mungkin Australia ya untuk QMSnya.	Related to the synergy of stakeholder (foreign) in creating the training for human resources

Source: Data Processed (2023)

V. DISCUSSION

Based on the results of data procession, analysis and discussion carried out; there are several points of conclusion

1. There are at least five nodes having high contribution. They are, "Peningkatan Skill SDM"/ "SDM Skill Improvement", "Foreign Direct Investment", "Training> Novelty Examination", "Technical Assistance" and "OJT". "Peningkatan Skill SDM"/ "SDM Skill Improvement" which has the greatest contribution value is the impact felt by DGIP for this cooperation. From the aggregate nodes it shows that this is the most impacted matters for DGIP. All the categories of informants revealed that this cooperation can increase the ability of DGIP's human resources.
2. The Foreign Direct Investment or FDI shows that there are connections between the intellectual property protections with investment. The informant from the category of Operator stated that the number of Japanese companies doing business in Indonesia is the reason of why JICA established cooperation with DGIP. Therefore, there will be some benefit for Japanese side if the companies are registering their IP in Indonesia.

- JICA which dispatching expert in DGIP will be the connector between Japanese companies and DGIP. If there are problems regarding IP applications, JICA Expert can easily make coordination with DGIP.
3. Nodes Training> Novelty Examination is a necessity for examiners related to the latest techniques and issues in the field of technology. It is known that technology develops rapidly, thus examiners, especially patent examiners must be able to adapt to the latest developments. Recently, there are request from the Patent Directorate to have training on the examination for nanotechnology, biotechnology, and artificial intelligence. Such developments need to be updated to patent examiners to conduct patent examination. In addition, related to trademark, there are kind non-traditional trademark consisting of sound, color, three-dimensional and hologram that are new in Indonesia. Japan Patent Office already implements the examination for non-traditional trademark. It is beneficial for Indonesia since the legal instrument is exist but not for its practical implementation. The technique in examining such new thing in Indonesia become the novelty for trademark and patent examiners and must be known by all examiners.
 4. Technical Assistance is assistance for an existing problem related to the examination. It is known that the examination process is through several stages, one of which is the searching stage. This Technical Assistance is important for patent examiners in searching the previous patent (prior art) from the various sources. It is hoped that Japan through JICA can facilitate the assistance such as access to a patent database website in other countries. Besides there are also some scheme of application for IP. In Patent, there is Patent Prosecution Highway Scheme which enable applicant from Japan to register referring to their application in Japan Patent Office (JPO); and Patent Cooperation Treaty (PCT) scheme which enable applicants file their patent in several countries. Regarding Trademark, there is an international scheme namely Madrid Protocol which also enable applicant to register their trademark in several countries.
 5. Whereas OJT or On the Job Training shows the implementation of cooperation activities between DGIP and JICA. From the two informants, the operator and regulator category said that the OJT is the implementation activity which has the most impact on the performance of DGIP employees. It is more focused in certain field of examination and more practical,

VI. CONCLUSION AND RECOMMENDATION

A. Conclusion

- a. The effect of the cooperation between DJKI and JICA that is most obvious seen is an increase in the competence of Human Resources of DGIP. The other benefits that are the presence of novelty in the examination, increasing IP application, understanding of technological developments, and increasing public awareness related to intellectual property.
- b. The continuation of cooperation between DGIP and JICA in the future according to the informants involved is still needed. It is because the cooperation will assist DGIP employees in understanding the development of technology and issues in the field of intellectual property. In addition, cooperation must be continued considering to the many investments by Japanese companies in Indonesia which resulted in the many applications for intellectual property protection. The protection of intellectual property itself will also increase of foreign investments to Indonesia.
- c. Related to the field of cooperation needed by DGIP, among others is about understanding the latest technological developments. In addition, not only with Japan, cooperation with other countries is also needed in the future. In other words, cooperation or collaboration with other partners besides JICA is also a necessity for DGIP. One field needed is the Quality Management System related to intellectual property examination.

B. Recommendation

1. The cooperation carried out by DGIP and JICA must be continued and established closely in the future. This cooperation both directly and indirectly has a positive effect on the intellectual property system in Indonesia. The most important is the increase of performance for DGIP employees in line with the increase of intellectual property application for registration. With an increase in intellectual property application for registration, it will also increase state revenue through Non -Tax State Revenue (*Penerimaan Negara Bukan Pajak*, PNBP).
2. The cooperation carried out by DGIP must be continued by exploring the area or other fields of cooperation and collaborating with other counterparts. The fields needed by DGIP now including technological

developments in terms of intellectual property examination as well as its Quality Management System. Therefore, DGIP motto to be the world class intellectual property office can be achieved.

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Analysis of Inventory Management for Pharmaceutical Medical Disposables in XYZ Hospital

Johanna Maranatha¹, Mursyid Hasan Basri²

^{1,2} School of Business and Management, Institut Teknologi Bandung, Bandung, Indonesia

Abstract

The Indonesian society's growing health consciousness has prompted the government's active involvement in promoting public health. Budget allocation has been increased to enhance the quality of healthcare services. Pharmacies play a crucial role in supporting hospitals by meeting their equipment needs. The budget allotted for medical disposables constitutes a significant portion of the hospital budget, accounting for 35%. Medical disposables directly impact healthcare quality and patient recovery, making high-quality materials essential. However, managing warehouse inventory in hospitals is challenging due to unpredictable events like warfare, viruses, and natural disasters. These uncontrollable circumstances make effective supply chain management crucial to prevent losses. This research focuses on examining the understock or overstock issue of medical disposables in a hospital in Bandung, since the pharmacy does not apply specific inventory management system. This research method is quantitative approach with source data from August 2022 to April 2023. The research uses the continuous review policy to compare actual and ideal stock levels, and ABC analysis prioritizes products for improved effectiveness through cycle counting in the pharmacy. The findings indicate that Hospital XYZ currently faces an overstock situation with medical disposables, presenting an opportunity for cost savings of IDR 306.827.266,28.

Keywords: Continues Review Policy, Inventory Management, Medical Disposables, Pharmaceutical

I. INTRODUCTION

Hospitals in Indonesia must fulfil the requirements of the Ministry of Health Indonesia, which are location, building, infrastructure, human resources, pharmacy, and equipment stated in Regulation number 3 (Menteri Kesehatan Republik Indonesia, 2020). Regulation already stated by Regulation number 72 (Menteri Kesehatan Republik Indonesia, 2016) concerning pharmaceutical service standards must ensure the availability of safe, quality, beneficial, and affordable pharmaceuticals, medical devices, and disposable medical supplies.

Medical disposables (*Bahan Medis Habis Pakai/BMHP*) are equipment in the health industry for single use and the product list is regulated by the legislation according to Minister of Health Regulation Number 74 (Menteri Kesehatan Republik Indonesia, 2016). Medical disposables are used to support the treatment process in the hospital for every patient (Novita et al., 2016) several examples of medical disposables are drug test disposables, exam gowns, face masks, gloves, bandages & wraps, suction, surgical sponges, syringes, and others.

The management of medical disposables is crucial and important and impacts the quality of healthcare service (Adhelita, 2019). High-value medical consumables are commonly utilized by doctors to give high-quality treatment to patients and get the best care (Sun and Luan, 2023). The objective to manage medical disposables is to make sure the supply of medical disposables is available for use and ensure the total of the medical disposable can support giving good service to the patient (Adhelita, 2019). The same resources also stated medical disposables are one of the elements to help the process of recovery and operation of hospitals. Since medical disposables are important for the hospital, improvement management for medical disposables will give a big impact on the ability of the hospital to provide maximal services for the patient (Iswanto, 2021). As it is crucial, the management of the pharmaceutical must concern with the stock of medical disposables because these components are used in the daily operation of the hospitals (Dewi et al., 2020). The forecasting of the demand or sales is really needed for every hospital and this step has been always crucial and difficult to measure (Liu et al., 2020)

Effective and efficient pharmaceutical management is very important to the quality management of the hospital because poor management impact the stagnant and shortage of supply. Moreover, good inventory management effecting to the hospital's revenue while providing good services (Rochman, 2019). How the management controls the supply will lead to two impacts on the hospital opportunity costs or opportunity loss for the hospital (Dewi et

al., 2020). Every patient in the hospital has a different condition with this result the medical disposables or the treatment for each patient will be different. The problem of medical inventory calculation continues to recur, and the hospital take concerned with this problem (Iswanto, 2021).

The EOQ method is highly advised for the management of pharmaceutical supplies in the hospital stated in the journal (Octaviany, 2018). Another study stated the concept of EOQ is effective and efficient to control supplies because can achieve a balance between the costs of holding inventory and the costs of ordering incrementally (Dewi et al., 2020). The expectation of this method can help the hospital to minimize the inventory with low costs and good quality (Adhelita, 2019). An effective inventory management system is crucial in the pharmaceutical industry. Therefore, the objective of this research is to identify and analyze the optimal inventory management system that can be implemented in the pharmaceutical sector. The study aims to explore the potential benefits and opportunities that such a system can offer to pharmaceutical companies.

II. LITERATURE REVIEW

2.1 Introduction to Pharmaceutical

The pharmaceutical industry can be categorized as a complex process (He et al., 2017). The standard of pharmaceuticals in Indonesia is divided into two areas. Standard of pharmacy management and clinical pharmacy services (Wiryanto et al., 2019). The pharmaceutical in hospitals is responsible not only for supplying drugs but also, medical disposables for hospital use (Robiyanto et al., 2019).

2.2 Introduction to Pharmaceutical Supply Shain

The Pharmaceutical Supply Chain (PSC) can be described as the coordination of all the tasks of the pharmacy inventory from raw materials to the end users. In the PSC there are three roles which are producers, purchasers, and pharmaceutical providers. The PSC system is complicated and has a big responsibility since the pharmaceutical must make sure to deliver the right drug to the patient because this drug hope can combat the disease and influence the health of the patient (Uthayakumar & Priyan, 2013). The supply chain in the hospital takes up a large portion of operating expenses when the supply chain optimization can help the hospital to reduce the health care cost (Gebicki et al., 2014). The PSC has several problems with strategic issues on PSC, one of them is the process of inventory management (Singh et al., 2016).

2.3 Inventory Management

The inventory management is part of PSC process. Inventory management can describe as activities related to the acquisition, storage, and usage of an organization's inventory and include warehousing (Zwaida et al., 2021). The inventory of the hospital is divided into three categories; perishables (blood, plasma, and drug), non-disposable (equipment, instruments, etc), and disposables items (gloves, masks, medical textiles, etc). Approximately one-third of the total budget of the hospital is allocated to healthcare facilities for the procurement of medical materials, supplies, and pharmaceuticals (Deressa et al., 2022). Inventory management has a concept of balancing the costs of ordering between holding inventory and with the level of service provided. The expenses of ordering involve the time and effort to create an order, the delivery of the order, and other cost that depend on the number of orders. The holding cost refers to the expenses which are issued to keep the inventory in stock, including the opportunity cost, space rental costs, and other expenses related to the number of stock on hand (Gebicki et al., 2014).

2.4 Inventory Control

Inventory control means ensuring the availability of stock by keeping appropriate total numbers with a variety of types, so can be used whenever and wherever needed (Ogbo et al., 2014). Inventory control models are typically created to minimize cost and ensure optimal inventory levels that meet customer demands, thereby enhancing customer satisfaction (Antic et al., 2022).

2.4.1 Continuous Review System

The Q-system or continuous review system defined as fixed order size and a variable order period, and operates by automatically placing an order for a predetermined quantity, whenever the on-hand stock level falls below a certain minimum threshold.

2.4.2 Periodic Review System

Periodic review system or P-system is the inventory system orders place based on the current inventory level checkout at regular intervals or periodically, for example the inventory checked 3-day or 4-day or weekly (Ma et al., 2013).

2.4.3 Economic Order Quantity (EOQ)

The main objective from this techniques is to make sure the right amount of stock is ordered and solves the problem about blockage of funds and extra storing cost, decreasing the inventory cost for example purchasing cost, holding cost, order cost, and shortage cost (Poswal et al., 2022). The formula of the EOQ is

$$Q^* = \sqrt{\frac{2DS}{H}} \quad (1)$$

Where

D : Annual demand
S : Cost per order (IDR)
H : Holding cost

2.4.4 Safety Stock

Safety stock refers to inventory that is kept on hand to avoid stockout and backorder scenarios (Rădăşanu, 2016).

$$SS = Z\alpha\sigma L \quad (2)$$

$Z\alpha$: Safety factor with service level α
 σL : Standard deviation of demand during lead time

2.4.5 Reorder Point

Reorder point define as strategy of minimum amount of inventory required for a product that signals to placing an order (Amirrudin et al., 2023).

$$\text{ROP} = (\text{LT} \times d) + \text{Safety Stock} \quad (3)$$

LT = lead time (unit is in days)
D = daily demand

4.6 ABC Analysis

ABC analysis is one of the inventory control systems, and this method is particularly suitable for medical store, including pharmaceuticals (Col Gupta et al., 2007). The method to increase the revenue by focusing on the products deemed significant (Rădăşanu, 2016). This method helps to calculate the worth of inventory items by considering cost and the total amount of the stock (Jobira et al., 2022). (Jobira et al., 2022). The calculation classification as follows showed on the table 2.2 according to textbook (Chopra et al., 2013).

Table 2.1 - ABC Classification

Item	Item (%)	Money value (%)
A	15%	70% – 80%
B	30%	15% - 25%
C	55%	5%

Source : Heizer Textbook (2017)

2.4.6.1 Cycle Counting

Cycle counting use inventory classification developed through ABC analysis because in healthcare industry only ABC considered on the monetary value and rate consumption of times not enough (Fathoni et al., 2019). The method of cycle counting is periodically and based on the capacities. Cycle counting can do every time depending to the pharmacy operation condition (Shen, 2017). The regulation of the items must be different in every year depending to the condition on every year (Fathoni et al., 2019). The number of items to be checked each day is determined using the following equation:

$$\text{Daily Checked Item} = \frac{\text{Quantity for Each Class}}{\text{Scheduling Policy for Each Class}} \quad (4)$$

2.4.7 Average Inventory Level

Average inventory level (AIL) can be defined as a metric used to assess the typical quantity of inventory held (Chopra et al., 2013).

2.5 BPMN

Business modelling is used to give a clear explanation of variety process to the audience, to make it easier. There are five basic categories elements are (OMG, 2010):

1. Flow objects
2. Data
3. Connecting objects
4. Swimlanes
5. Artifacts

III. RESEARCH METHODOLOGY

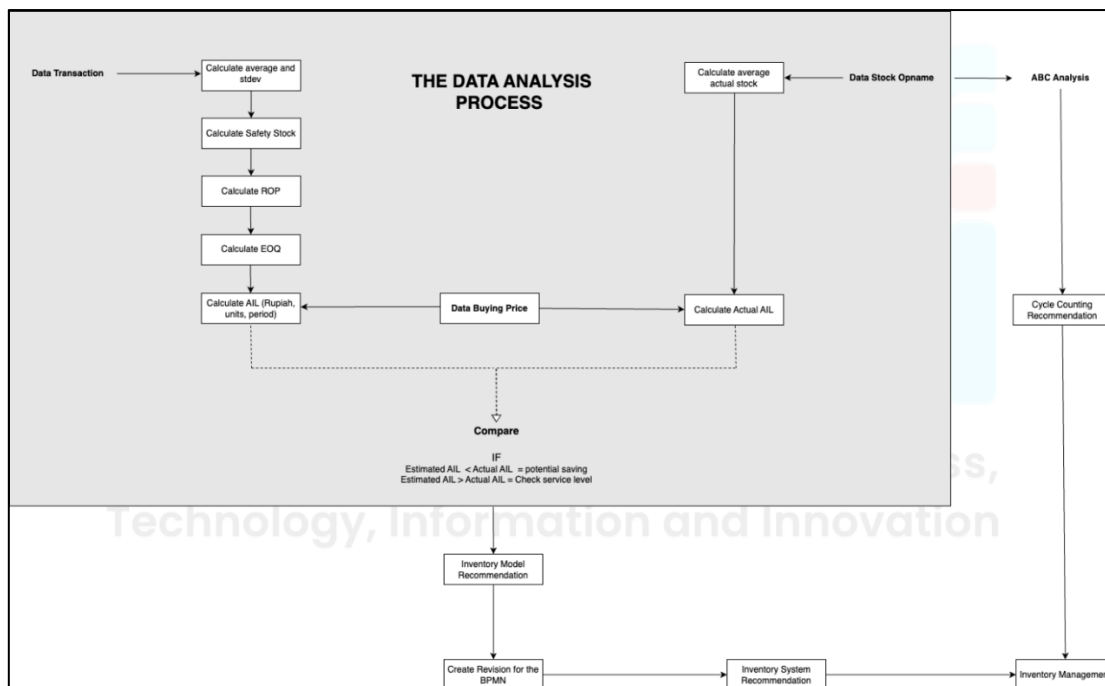


Figure 2.1 - Flow of Research
Source : Author's interpretation

This research at one private hospital in Indonesia. The research will use quantitative approach to find out the main problems in the pharmaceutical management especially medical disposables inventory management. The research also use discussion between the management staff. The process of find out the problems as show on the figure 2.1.

IV. RESULT / FINDING

4.1 Analyzing the Actual Condition and Proposed Calculation

In this section, the calculation will be divided into two parts: the actual condition and the proposed calculation. The actual condition involves analyzing the current state of inventory management, while the proposed calculation utilizes the continuous review policy. By examining both aspects, we can gain a comprehensive understanding of the inventory management system and evaluate its effectiveness.

4.1.1 Analyzing the Actual Condition

The subsequent calculation involves analyzing the inventory stock of the items. This calculation is based on the actual data of the stock. It is important to calculate the actual stock data to assess whether the current inventory control is well-managed or not. This calculation will be used to compare with the estimated stock data. The inventory stock data covers the period from August 2022 to April 2023, and includes all the medical disposable items. The calculation as show on the table 4.1 on the column AIL actual in unit and rupiah.

4.1.2 Calculation for Continuous Review Policy

The proposed calculation for the continuous review policy utilizes data sales from August 2022 to April 2023 in the pharmaceutical department. This data is essential for estimating the optimal inventory levels required under the continuous review policy. The calculation process involves several steps, including determining the average demand per week, calculating the standard deviation, determining the safety stock (SS), calculating the reorder point (ROP), and determining the economic order quantity (EOQ). Table 4.1 provides several examples of these calculations using a total of 1,147 items. Additionally, the calculation also estimates the average inventory level (AIL) in both unit and monetary value to provide a comprehensive understanding of inventory management.

4.1.3 Compare the Actual Condition and Proposed Calculation

compare the current inventory management system with the proposed inventory management system in XYZ Hospital Pharmaceutical. The comparison will be made by analyzing the percentage difference in the Average Inventory Level (AIL) between the two systems. The percentage difference will determine whether the items are overstocked, understocked, deadstock, in normal stock, or discontinued. These categories are based on the gap between the proposed AIL and the actual stock.

1. understocked when its actual inventory level is lower than the proposed condition.
2. overstocked when its actual inventory level exceeds the proposed condition
3. Normal stock is an acceptable range of 1%-10% for the AIL gap
4. Deadstock refers to items that are on hand but have had no sales in the last twelve weeks or the last three months
5. Discontinued when they have stock on hand but no sales in certain period

The result already show on the table 4.1 from column status. This analysis will provide insights into the improvements that can be made to enhance the hospital's overall performance. The GAP is obtained by subtracting the Actual AIL from the Estimated AIL in terms of price. Based on the analysis can help the management of the pharmaceutical to create a new strategy for the inventory management system.

Table 4.1 - Example Calculation from Actual Condition and Proposed Calculation

TYPE OF BMHP	AVG	STDEV	SS	ROP	EOQ	AIL ESTIMATED (UNIT)	AIL ESTIMATED (PRICE)	AIL ACTUAL (UNIT)	AIL ACTUAL (PRICE)	GAP	GAP %	FREQ	STATUS
HEMODIALYSIS CATHETER KIT DOUBLE LUMEN STRAIGHT													
BABE	0,06	0,24	0,21	0,01	0,16	0,30	IDR 255.603,42	0,40	IDR 360.000,00	IDR 94.396,58	36%	3	OVERSTOCKED
SUTURE VICRYL RAPIDE 2/0													
W9962 90 CM ETHICON	0,61	0,65	0,57	0,09	1,51	1,33	IDR 140.310,30	10,41	IDR 1.102.057,63	IDR 961.747,33	685%	7	OVERSTOCKED
SUTURE VICRYL PLUS 4/0													
KCF0048175 CM ETHICON	0,67	1,15	1,02	0,10	1,25	1,64	IDR 281.714,37	1,33	IDR 229.333,33	IDR 52.381,04	-19%	1	UNDERSTOCK
EUROPLAST 7,5 CM X 4,5 M	0,50	0,58	0,51	0,07	1,69	1,35	IDR 94.760,53	-	IDR 94.760,53	-100%	2	UNDERSTOCK	
AMINARIA LK M	0,09	0,30	0,27	0,01	0,69	0,61	IDR 46.827,44	0,67	IDR 51.266,67	IDR 4.439,23	9%	1	NORMAL
DISPOSABLE NEEDLE 27G X 1/2 IN													
DCP RECONSTRUCTION	1,39	2,37	2,08	0,20	25,48	14,82	IDR 12.688,20	78,38	IDR 67.092,69	IDR 54.404,49	429%	5	OVERSTOCKED
LOCKING PLATES 3.5 7H	-	-	-	-	-	-	IDR -	-	IDR -	IDR -			DISCONTINUED
IMA SUPREME SIZE 2.5	0	0	0	0	0	-	IDR -	1,50	IDR 787.500,00	IDR 787.500,00		0	DEADSTOCK
RUCTION CATHETER NO.14FR REMEDI													
CP PROXIMAL LATERAL TIBIA 5.5 SH	0,60	0,62	0,55	0,09	6,94	4,02	IDR 19.883,89	25,77	IDR 127.577,80	IDR 107.693,90	542%	5	OVERSTOCKED
CP PROXIMAL LATERAL TIBIA 5.5 SH	0,06	0,21	0,18	0,01	0,05	0,21	IDR 1.623.587,91	-	IDR -	IDR -		0	DEADSTOCK

Source : Author's interpretation

4.1.4 Result Analyzing the Inventory Condition

Based on the previous steps, out of the total 1,147 medical disposable items, the researcher has categorized each item. The analysis reveals that the hospital's condition is mainly characterized by deadstock and overstocked items. The figure 4.1 presents the overall condition of XYZ Hospital Pharmaceutical by the total value of volume: 526 items are categorized as deadstock, accounting for 45.86% of the total items; 474 items are categorized as overstocked, accounting for 41.33% of the total items; 97 items are discontinued, accounting for 8.46%; 47 items are understocked, accounting for 4.18%; and the total items for normal stock is 2, accounting for 0.17%.

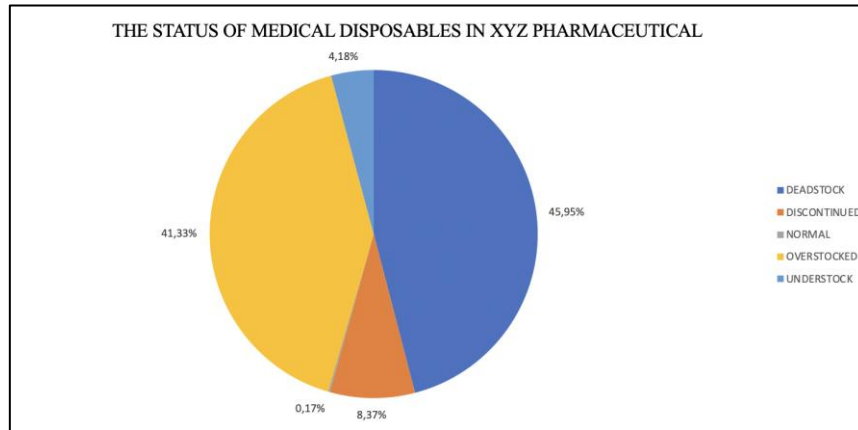


Figure 4.1 - Status of Medical Disposables in XYZ Pharmaceutical

Source : Author's interpretation

4.2 ABC Analysis

The management need to develop a future to do improvement to the inventory management system. The objective of this recommendation is to reduce the holding cost of the inventory stock, to fulfil the value of understock, and the management create an optimal schedule to check the inventory stock. The ABC classification help the pharmaceutical to controlling the stock of the medical disposables, especially the pharmaceutical have many stock of the medical disposables. The researcher tries to adapt the ABC classification to make the management of the pharmaceutical have a regulation for the inventory stock. This technique categorized the item into three different class A, B, or C based on the volume and value of the stock.

The ABC analysis encompasses two key factors: value and volume. In terms of volume-based ABC classification, Class A should encompass 15% of the total items, Class B should account for 30% of the total items, and Class C should make up 55% of the total items. For the purpose of these calculations, we will focus on 524 items as the ABC classification only applies to items categorized as overstocked, understocked, or normal. The table 4.2 show the result of the ABC classification based on inventory volume.

Table 4.2 - the Results of the ABC Classification Based on Inventory Volume

CLASS	NUMBER OF ITEMS	% NUMBER OF ITEMS	INVENTORY VALUE	% INVENTORY VALUE
A	78	15%	IDR 152.283.870,48	84,87%
B	155	30%	IDR 21.042.760,66	11,73%
C	291	55%	IDR 6.113.778,16	3,41%
TOTAL	524		IDR 179.440.409,29	

Source : Author's interpretation

1. Class A consists of a total of 78 items, which accounts for 15% of the total items. These items have a total value of IDR 152,283,870.48, representing 84.87% of the total monetary value.
2. Class B consists of a total of 155 items, which accounts 30% of the total items. These items have a total value of IDR 21.042.760,66, representing 11.73% of the total monetary value
3. Class C consists of total 291 items, which accounts 55% of the total items. These item have a total value of IDR 6.113.778,16, representing 3.41% of the total monetary value

The table 4.3 show the ABC classification based on the annual dollar usage. And the result is :

1. Class A consists of a total of 54 items, which accounts for 10% of the total items. These items have a total value of IDR 143,592,015.34, representing 80% of the total monetary value.
2. Class B consists of a total of 138 items, which accounts 26% of the total items. These items have a total value of IDR 26.823.471,66, representing 15% of the total monetary value
3. Class C consists of total 332 items, which accounts 63% of the total items. These item have a total value of IDR 9.024.922,79, representing 5% of the total monetary value

Table 4. 3 - the Results of the ABC Classification Based on Annual Dollar Usage

CLASS	NUMBER OF ITEMS	% NUMBER OF ITEMS	INVENTORY VALUE	% INVENTORY VALUE
A	54	10%	IDR 143.592.015,34	80,00%
B	138	26%	IDR 26.823.471,17	15,00%
C	332	63%	IDR 9.024.922,79	5,00%
TOTAL	524		IDR 179.440.409,29	

Source : Author's interpretation

4.3 Cycle Counting

The management needs to develop control measures for each class to ensure that the ABC classification effectively assists in inventory management. The control of inventory should consider both the quantity and quality of products to ensure efficient management tailored to the specific needs of each item. Effective inventory management is crucial in a hospital setting, as it directly impacts customer service and cost reduction.

Cycle counting is the preferred technique for the company due to its higher accuracy compared to other methods. This technique incorporates the ABC classification system to categorize items and schedule periodic checks.

1. Class A consists of critical inventory items that require increased management attention. Although the number of items in this class may be relatively low, the value of these items is significant, necessitating careful regulation and control.
2. Class B comprises medical disposables that are considered less critical compared to Class A. The level of control and monitoring for Class B is not as frequent as for Class A.
3. Class C consists of items that are considered less important than those in Class B. This class contains a larger number of items compared to the other classes, but the overall value of the inventory is relatively low. The level of regulation and monitoring for this class is conducted less frequently compared to Class B

Since has proposed two types of ABC classification, namely inventory volume and inventory annual dollar usage, it is necessary to propose two corresponding types of cycle counting. The total number of items in each class will vary, and the equation mentioned earlier will be used to determine the specific number of items to be counted in each cycle.

Table 4.4 - Cycle Counting Based on Inventory Volume

CLASS	NUMBER OF ITEMS	Scheduling Policy	Daily Checked Item
A	78	30	3
B	155	90	2
C	291	120	2

Source : Author's interpretation

Based on the cycle counting using the ABC classification based on inventory volume (Table 4.4) at HYZ Hospital Pharmaceutical, the management is required to check 7 different medical disposable items each day.

Table 4.5 - Cycle Counting Based on Inventory Annual Dollar Usage

CLASS	NUMBER OF ITEMS	Scheduling Policy	Daily Checked Item
A	54	30	2
B	138	90	2
C	332	120	3

Source : Author's interpretation

Based on the cycle counting using the ABC classification based on inventory annual dollar usage table 4.5) at HYZ Hospital Pharmaceutical, the management is required to check 7 different medical disposable items each day.

4.4 BPMN

The current process of the process of procuring pharmaceutical products in XYZ Hospital Pharmaceutical. To identify the potential reasons for overstocked items in the BPMN, researcher will conduct an analysis of the current process.

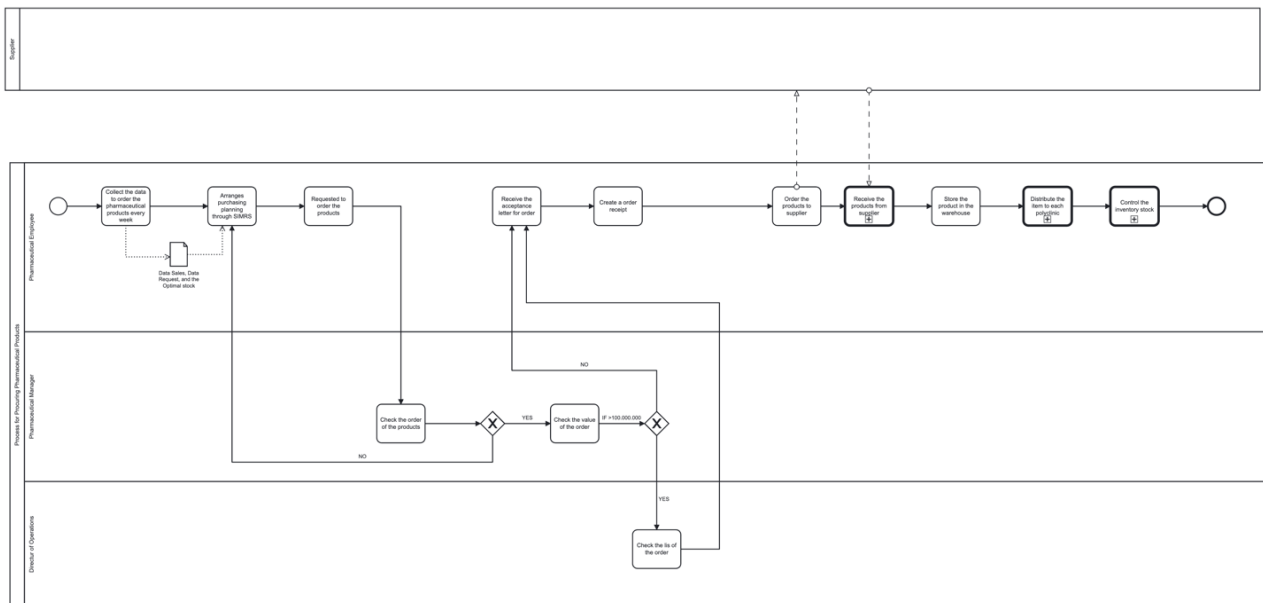


Figure 4. 2 - BPMN of Procuring Pharmaceutical Products

Source : Author's interpretation

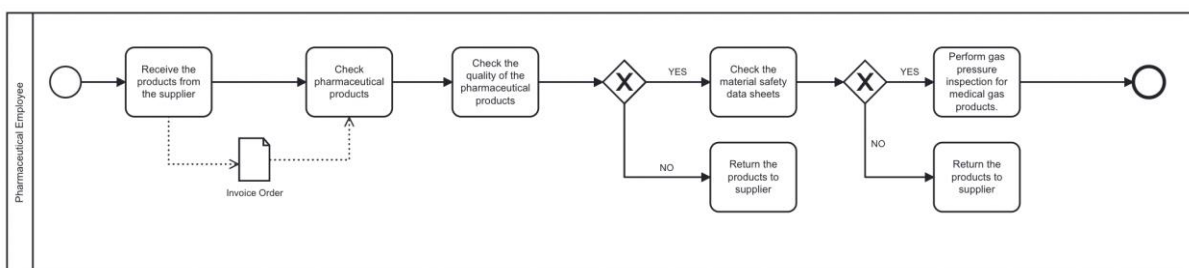


Figure 4.3 -BPMN of Receive the Products from Supplier

Source : Author's interpretation

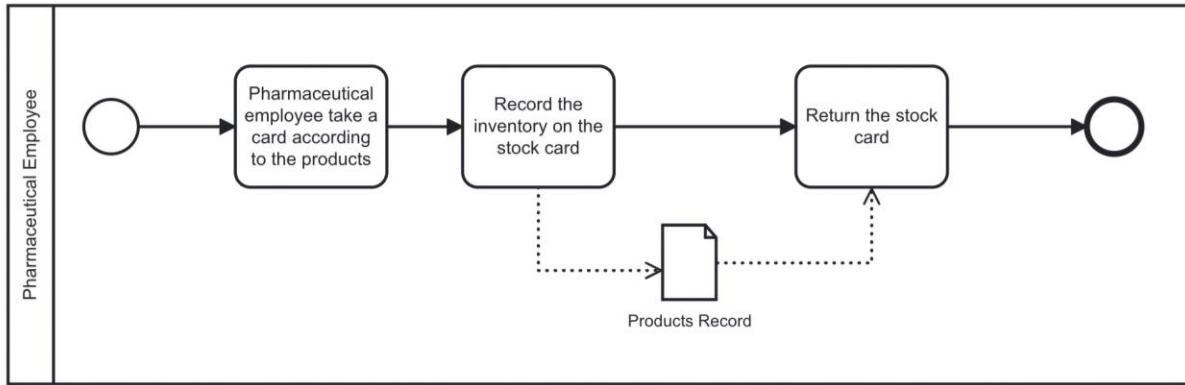


Figure 4. 4 - BPMN of Distribution of Products
Source : Author's interpretation

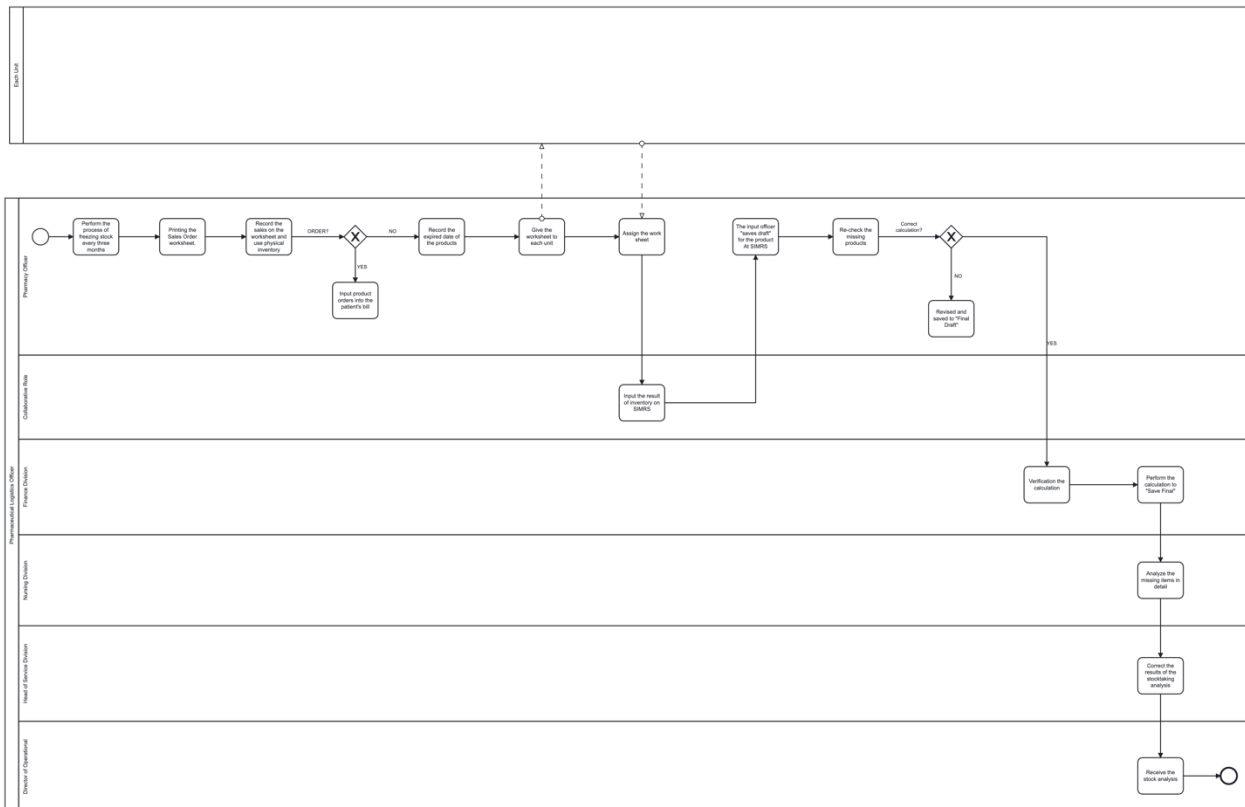


Figure 4. 5 - BPMN of Inventory Control
Source: Author's interpretation

The stakeholder on this process divided into external and internal. The internal is from the XYZ Hospital pharmaceutical also divided into three different stakeholders. The current process of procuring the pharmaceutical products is:

1. The pharmaceutical employee collect data to determine the items needed for ordering for one week ahead, including,
 - Sales data from the previous period
 - Request data from each polyclinic
 - Calculation of maximum and minimum inventory levels for each product
2. Pharmaceutical employees create a purchasing list of items to be ordered through the SIMRS system.

3. Pharmaceutical employees submit the list of items to the pharmaceutical manager, with a deadline of 08:00 from Monday to Saturday, through the SIMRS system.
4. The manager checks the list of items gathered by the employee and makes considerations. If any items do not fit the requirements, the employee needs to revise the order planning.
5. If the total value of the requested order exceeds IDR 100,000,000, approval is required from the director of operations in the pharmaceutical department.
6. Once approved, the employee receives authorization to proceed with the order from the pharmaceutical management.
7. The pharmaceutical employee creates a order receipt
8. The employee places the order with the supplier.
9. Upon receiving the items from the supplier, the pharmaceutical employee follows a specific process as show on figure 4.3:
 - The pharmaceutical logistics team receives the products from the supplier based on the invoice order.
 - The employee inspects the pharmaceutical products for quality. If the quality already good the employee will go to next step and if the quality is bad, the employee needs to return the products.
 - The employee need to checks the material safety data sheets. If the product already fulfil the standard the employee will go to next step and if the products do not fulfil the standard the employee need to return the products.
 - A gas pressure inspection is conducted for incoming medical gas products.
10. The pharmaceutical employees store the products in the warehouse.
11. Distribute the products to each polyclinic, when the employee distributes the products to each polyclinic, there will be a process that the employee needs to do as show on figure 4.4:
 - Employees must take a card according to item that already distribute to each polyclinic.
 - The employee recording the items that already out from the warehouse.
 - Put again the card.
12. Inventory stock of the products is controlled every three months, involving several processes described in the figure 4.5, including:
 - Freezing stock in the warehouse through the SIMRS system in every three months
 - Printing sales order worksheets from each depot
 - Recording sales on the worksheets and conducting physical inventory checks
 - In case of medical disposable orders, directly including the item in the patient's bill
 - Writing the expiration dates of each product
 - Providing the worksheet calculation to each depot
 - Assigning the worksheet to each depot
 - Inputting the physical inventory calculation into the SIMRS system by pharmaceutical and finance staff
 - Saving the input as a "Save Draft" in the SIMRS system by the pharmaceutical officer.
 - Rechecking the calculation for any missing products by the pharmaceutical officer
 - If revisions are needed, the officer will make them and save the final version as "Save Final" in the SIMRS system.
 - The finance staff verifies the input of the stock opname
 - The pharmaceutical manager conducts a detailed analysis of the items to ensure the validity of the calculation.
 - The head of operations receives the analysis report and presents it to the head of XYZ Hospital

The current process of procuring pharmaceutical products is already in place. The researcher's objective is to identify potential factors contributing to inventory overstocking in the hospital. This investigation aims to assist the hospital in analyzing the existing process and finding ways to mitigate overstocking issues in the inventory. Several possibilities have been identified as potential causes for overstocking in the current process:

- Consideration of depot or polyclinic requests for ordering: The pharmaceutical employees consider individual requests from each depot or polyclinic, leading to double calculations and excessive ordering. It is unnecessary to consider these individual requests, as the

calculation of maximum and minimum inventory levels and previous sales data would suffice.

- Reliance on physical inventory system: The use of a physical inventory system introduces the possibility of calculation errors and contributes to overstocking. To improve accuracy, the pharmaceutical management should consider implementing a cycle counting technique instead.
- Weekly ordering schedule: The current practice of ordering items on a weekly basis or periodic review system increases the potential for inventory overstocking in the pharmacy. To address this, the pharmaceutical department should adopt a reorder point (ROP) system for more timely and efficient ordering.
- Quarterly inventory stock checks: Conducting inventory stock checks every three months also poses a risk of overstocking. To address this issue, the pharmaceutical department should implement cycle counting, which involves daily stock checks based on calculated item quantities.

By addressing these potential issues and implementing appropriate measures such as relying on calculated inventory levels, utilizing cycle counting, and adopting an efficient ordering schedule, the hospital can effectively reduce the occurrence of overstocked items in the pharmacy inventory. Therefore the researcher create revision for process on the BPMN, which are

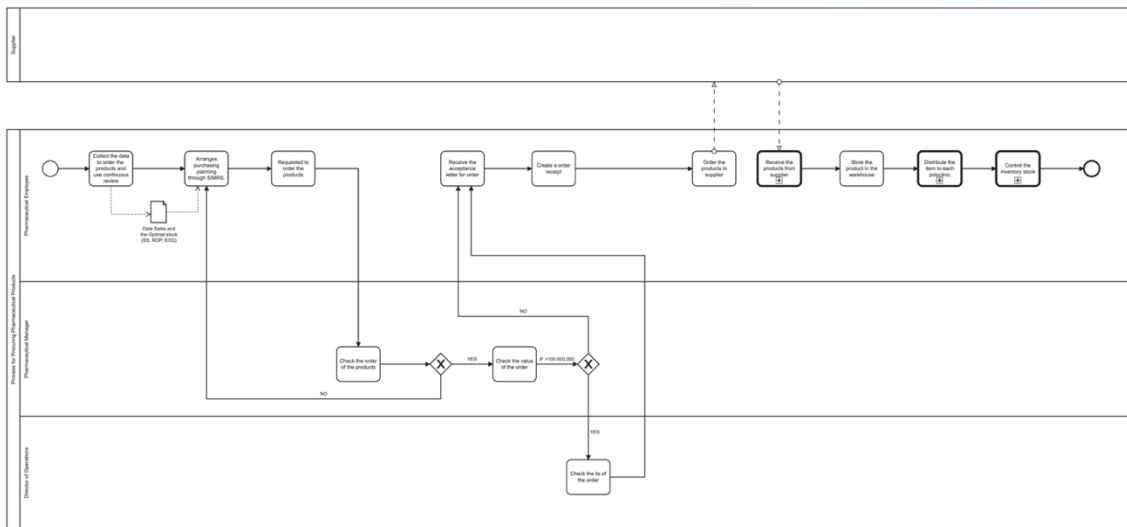


Figure 4. 6 - New BPMN of Procuring Pharmaceutical Products

Source : Author's interpretation

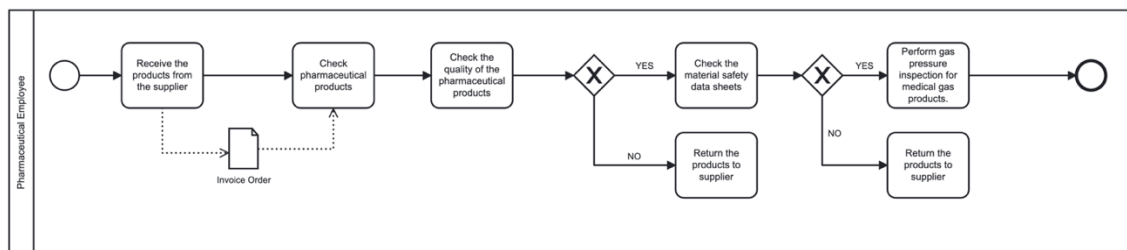


Figure 4.7 - New BPMN of Receive the Products

Source : Author's interpretation

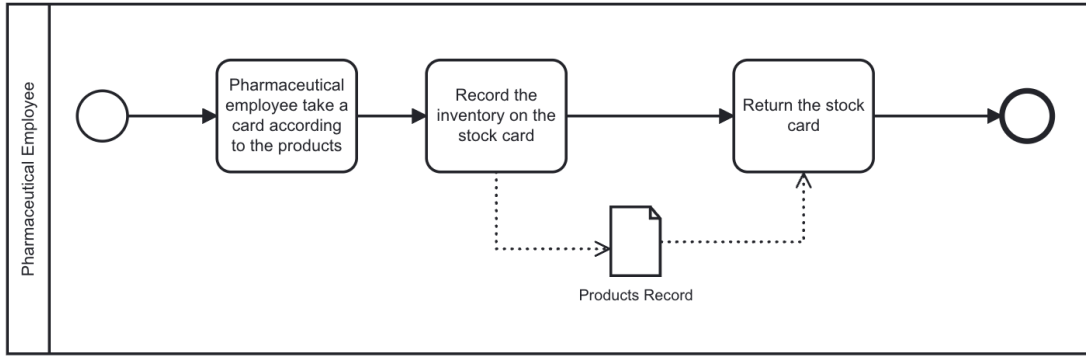


Figure 4.8 - New BPMN of Distribution Items
Source : Author's interpretation

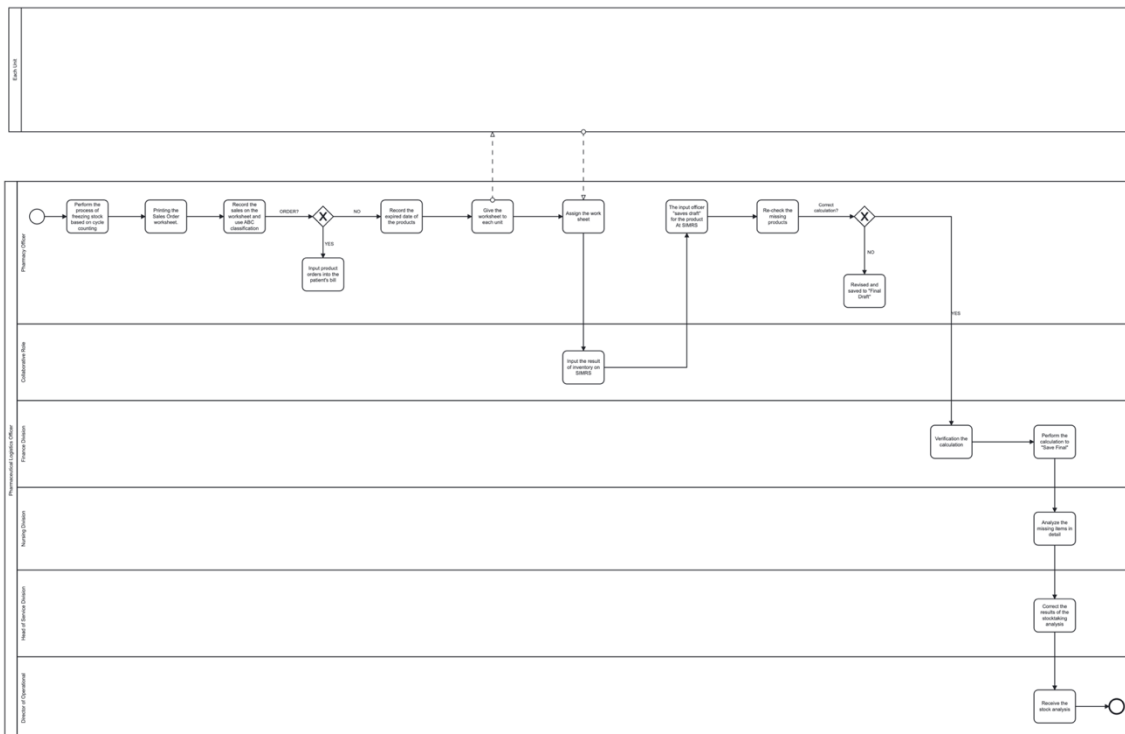


Figure 4.9 - New BPMN of Inventory Control
Source : Author's interpretation

Based on the analysis, the figure above illustrates the revised business process of the XYZ Pharmaceutical . The analysis has identified several necessary changes in the business process to enhance and align it with the inventory management system that has been thoroughly analyzed. These changes aim to improve the overall efficiency and effectiveness of inventory management within the pharmaceutical sector. The change on the business process are :

1. Figure 4.6 depicts the revised process of procuring pharmaceutical products. The notable difference in the revision is that the pharmaceutical management now only needs to consider the continuous review system, which includes safety stock, reorder point, and economic order quantity. The need for polyclinic requests has been eliminated to mitigate the bullwhip effect. This new revision has been implemented to optimize the ordering process.
2. Figure 4.6 illustrates the revised planning arrangement on the SIMRS based on calculations. The hospital no longer needs to place weekly orders to prevent overstocking of items.
3. Figure 4.9 illustrates the revised inventory control process of XYZ Pharmaceutical. The notable difference is that prior to the revision, the pharmaceutical department conducted item checks once every

three months. However, after the revision, the management has implemented cycle counting and ABC classification as part of the inventory recording process to prevent any instances of missing items. This enhancement aims to improve the accuracy and efficiency of inventory management within the pharmaceutical department

V. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

In conclusion, the research conducted for this study provides valuable insights into the inventory management practices of XYZ Hospital Pharmaceutical. The study has yielded several important findings, which are as follows:

Firstly, the analysis of the average inventory level reveals significant aspects of XYZ Hospital Pharmaceutical's inventory management. Notably, a considerable portion of their inventory, comprising 45.95% or 527 products out of 1,147 medical disposables, falls under the deadstock category. Additionally, 41.33% or 474 products are identified as overstocked, 8.73% or 96 products have been discontinued, 4.18% or 48 products are classified as understocked, and only 0.17% or 2 items are considered to have normal stock levels.

Secondly, the proposed continuous review policy for inventory shows great promise in terms of cost savings for XYZ Hospital Pharmaceutical. The study estimates potential savings of IDR 306.827.266,28, which represents 43% of the average inventory level, by addressing deadstock products.

Lastly, the researcher recommends the adoption of cycle counting as a superior inventory control approach when compared to traditional physical inventory management. The choice should be based on the value of dollar usage to enhance the efficiency of hospital inventory management.

In summary, this research sheds light on crucial aspects of XYZ Hospital Pharmaceutical's inventory practices and provides practical recommendations to optimize inventory management and achieve cost savings.

5.2 Recommendation

5.2.1 Recommendation for XYZ Hospital Pharmaceutical

There are several key recommendations that XYZ Hospital Pharmaceutical can implement to enhance the performance of its inventory system. These recommendations are as follows:

Firstly, the hospital should establish a distinct set of rules by implementing an inventory management system that follows a continuous review policy. This will enable better monitoring and control of inventory levels, ensuring timely replenishment and reducing the risk of stockouts and overstocking.

Secondly, in anticipation of future regulatory changes, particularly those related to minimum order requirements, XYZ Hospital Pharmaceutical should leverage its inventory data to adjust the economic order quantity. Data-driven calculations will help optimize order quantities, leading to more efficient inventory management.

Thirdly, adopting the ABC classification based on inventory value is highly recommended. This classification system more effectively identifies critical items, ensuring that the hospital prioritizes the management of high-value items appropriately. Similarly, when conducting cycle counting, giving priority to high-value items (Class A items) will streamline the counting process and reduce unnecessary checks.

Lastly, the hospital should consider writing off deadstock items to prevent them from becoming obsolete in the future. Properly accounting for the costs of deadstock items in the inventory will provide a more accurate financial picture and allow for better decision-making regarding inventory management.

5.2.1 Recommendation for Future Research

The researcher also suggests several areas for future research within the current topic

Firstly, it is recommended to reassess the holding cost incurred by the hospital. The current study assumed of 26% based on a previous study, but conducting a more detailed analysis will provide a more accurate understanding of the holding cost's impact on inventory management.

Secondly, future research should focus on conducting a comprehensive study on the application of VEN (Volume-Effectiveness-Normalization) analysis for inventory management of medical disposables. This analysis can offer valuable insights into optimizing inventory levels and improving overall efficiency.

Thirdly, it is essential to investigate the concept of minimum order quantity (MOQ) and its current assumption as a lot-for-lot (L4L) strategy in inventory management. A deeper exploration of alternative strategies and their effects on inventory control will be beneficial for enhancing the hospital's inventory practices.

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The Influence of Customer Satisfaction and Brand Trust on Brand Switching of Global Fashion Brands towards Local Fashion Brands

Sarah Alifah Fridayanti.¹, Fitri Aprilianty²

^{1,2} School of Business and Management, ITB, Indonesia

Abstrac

Currently, the local fashion brand in Indonesia is rising. The number of local fashion brands is increasing because their existence allows them to compete with global fashion brands, allowing customers to easily switch from global to local fashion brands. Lately, customers have tended to buy fashion products from local fashion brands, as it raises customers' local pride. Therefore, the purpose of this study is to know the factors influencing Indonesian customers to do brand switching and to understand the influence of customer satisfaction, brand trust, and moderating effects on brand switching from global fashion brands to local fashion brands. This study used a quantitative approach by utilizing online survey methods which targeted Indonesian Gen Z customers who switched from global to local fashion brands. PLS-SEM is used to analyze the data. The findings show that the factors influencing customers' brand switching intentions are local identity, brand credibility, brand attitude, customer satisfaction, and brand trust. The moderating effect of variety seeking also influences the brand switching of global fashion brands towards local fashion brands. This study contributes to filling a gap in the studies of the fashion industry focusing on customers' brand switching intentions by discovering other factors and scope of study. Furthermore, this study may help the fashion industry, especially global fashion brands operating in Indonesia that compete with Indonesian local fashion brands to gain knowledge of Brand Switching and also assist them by providing marketing strategies.

Keywords: Brand Switching, Brand Trust, Customer Satisfaction,, Global Fashion Brand, Local Fashion Brand

I. INTRODUCTION

Global fashion brands have been a success in Indonesia throughout the years, fostering trust, trends, and prestige in their customers. Local fashion companies have been dragged down by the splendor of global fashion brands in recent years. Fortunately, the number of local fashion brands rose a few years ago. The textile and apparel industry's GDP at constant prices increased to 13.74% in the second quarter of 2022 (Rizaty, 2022). The Indonesian fashion industry is expected to increase at a rate of 4.21% each year, caused by technological advances such as social media and e-commerce (Aurell, 2022). The pandemic has benefited local fashion brands by allowing them better access to the market, and the "Local Pride" movement has enhanced the Indonesian market's desire to buy local products (Ananda, 2021). The shifting condition of local and global fashion brands is also a result of Gen Z behavior. Gen Z is prone to trying different brands. Only 37% of Gen Z is a loyal customer (Forbes, 2022). Furthermore, fashion products are the most commonly purchased by Gen Z in Indonesia, with a rate of 56% (Rizaty, 2022). This means that Gen Z has substantial influence in determining the fashion industry market because they are the generation with the greatest population and have a greater desire to purchase fashion products rather than other products.

In contrast to the rise of local fashion brands, GAP exited the Indonesian market in 2018 and closed a number of outlets around the world (Antara News, 2020). Furthermore, Bershka, Stradivarius, and Top Shop all closed stores in Indonesian shopping malls. The number of local fashion brands will not increase if the quality cannot compete with the global. In other words, because local brands exist in the same way as global brands, customers can easily switch from global to local fashion brands. Customers nowadays regard the products of local brands as an expression of pride.

Customer switch from global to local fashion brands refers to a lack of client brand loyalty. Brand loyalty refers to a customer's strong desire and commitment to continue purchasing or using a product despite external variables that encourage switching behavior (Oliver, 1999). Brand loyalty is linked to brand switching because it reduces diversity seeking. Customers that lack brand loyalty are more willing to try new products to broaden their experience. Customer dissatisfaction leads to variety seeking behavior. Variety seeking has a negative impact on the link between brand trust and brand loyalty. As a result, according to a prior study, customer satisfaction influences brand trust as the consumer's willingness to believe in the brand to accomplish its intended purpose. Furthermore, brand trust diminishes the intention of shifting brands (Wang & Xiao, 2022). Brand switching can negatively impact sales and market share, potentially leading to bankruptcy (Gilbert, 2022).

Previous study by (Wang & Xiao, 2022) has studied customer brand switching intention in sharing apparel which shows that customer satisfaction and brand trust influence brand switching with the existence of moderating effect variety seeking. Therefore, will customer satisfaction and brand trust also influence brand switching in the context of brand switching of global fashion brands towards Indonesian local fashion brands. Moreover, to get an in-depth understanding, this study also investigates other factors that may influence brand switching. By discovering another factor influencing brand switching it will fill the gap of previous study. This study aims to understand factors influencing Gen Z Indonesian customers' brand switching from global to local fashion brands, considering individual intentions. The findings can help global fashion brands maintain their position in the Indonesian market.

II. LITERATURE REVIEW

2.1 Perceived Brand Globalness and Brand Credibility

Perceived Brand Globalness (PBG) is defined as customers' perception of a brand being internationally marketed and recognized as such in places where the brand exists in standardized goods and communications (Steenkamp et al, 2003). Customers' belief in product information is explained by brand credibility, which requires customers to believe that the brand has the competence and trustworthiness to consistently deliver on what has been promised (Erdem & Swait, 2004). A brand with strong trust can be seen in the image of its customers, who want greater quality and more significant goods (including pricing and location) as compared to other competing companies. As a result, brand credibility is critical in consumer decision making and perceptions of choice (Othman et al, 2017).

When a brand is regarded to be worldwide, it gains credibility. The relevance of brand trust is also discovered in this study (Vuong & Giao, 2019). If a brand is seen as a worldwide brand but lacks brand credibility, it will be unable to capture the attention of buyers. Furthermore, a study by (Özsomer & Altaras, 2008) demonstrates a link between Perceived Brand Globalness (PBG) and Brand Credibility. PBG has a positive relationship with Brand Credibility in the context of Global Brand Purchase Likelihood. PBG influences Brand Credibility based on its market, according to (Mandler et al, 2020). PBG is more significant in a country with a globalizing market, such as South Korea, than in a country with a globalized market, such as Germany. Therefore, the researcher argues that Perceived Brand Globalness (PBG) has positive association with Brand Credibility. The hypothesis proposed is:

Hypothesis 1: Perceived Brand Globalness positively influences brand credibility

2.2 Perceived Brand Localness and Brand Credibility

Perceived Brand Localness (PBL) is defined as a customer view that a brand provides value, preference, and needs of the local country, where the brand is recognized as a local player as well as an emblem or symbol of local

culture (Özsomer et al., 2012; Swoboda et al., 2012). A local brand increases its value by acquiring a local identity, culture, and adapting to local demands and desires (Halkias et al., 2016). Furthermore, local brands are typically seen as pride and representatives by the local community rather than merely as enterprises with limited geographical availability (Dimofte et al., 2008).

Perceived Brand Localness (PBL) impacts Brand Credibility, according to (Mandler et al., 2020). According to the findings, PBL has a significant impact on brand confidence in both globalized markets (e.g., Germany) and globalizing market countries (e.g., South Korea). PBL only helps domestic brands' brand credibility. Brand Credibility is positively related to perceived brand localness (PBL). Therefore, this study will test whether PBL positively influences brand credibility on brand switching of Global towards Local fashion brands. The hypothesis proposed is:

Hypothesis 2: Perceived Brand Localness positively influences brand credibility

2.3 Perceived Brand Globalness and Global Identity

Global identity refers to consumers' sense of belonging to a worldwide community and belief in the positive impacts of a global lifestyle. It is reflected in the following psychological aspects: they engage in global activities, believe that globalization is beneficial, and believe that people all over the world share similar characteristics (Dong & Yu, 2020).

According to a study from (Dong & Yu, 2020), Perceived Brand Globalness (PBG) influenced customers' Global Identity and Local Identity. PBG has the potential to improve consumer trust in brands while also creating a worldwide identity. Globalization should be interwoven to awaken a customer's global identity. The perceived globalness of a brand influences both global and local identity. Therefore, this study will determine whether Perceived Brand Globalness has a positive impact on consumers' Global Identity and Local Identity on brand switching of Global towards Local fashion brands. The hypothesis proposed:

Hypothesis 3: Perceived Brand Globalness has a positive impact on customers' global identity

2.4 Perceived Brand Localness and Local Identity

Customers who believe in and cherish local traditions and customs, are interested in local events, and recognize the specific traits of local communities form a local identity. Being local in general refers to identifying as a member of one's local community. Customers having a greater sense of global identity favored global brands over local brands, and vice versa (Zhang & Khare, 2009).

Perceived Brand Localness (PBL) has influenced customers' local identification (Dong & Yu, 2020). When marketing operations include a local cultural factor, consumers' sense of identification and belonging are enhanced. People see a brand's use of specific marketing strategies that integrate local qualities as an acknowledgement of their own culture (Perceived Brand Localness). Using culture and consumer preferences as a brand signal feature facilitates customer resonance and the development of local identity. Therefore, the researcher argues that Perceived Brand Localness positively influenced Local Identity. The hypothesis proposed is:

Hypothesis 4: Perceived Brand Localness has a positive impact on customers' local identity.

2.5 Brand Credibility and Brand Attitude

Brand attitude is defined as a consumer's judgment of a brand's expected ability, customer's positive or negative attitudes on brands, and customer interaction with the brand (Keller, 1993; Hashem E et al, 2023). Customers' perceptions of the same brand could shift based on their purchasing motivation (Rossiter, 2014). Customers can express their opinions on a brand based on the features and performance of the product or the service provided (Nayem et al., 2019). As a result, brand sentiments among present and potential customers are a key predictor of possible purchasing behavior. As a result, brand attitude is an important idea for both customers and brands.

According to the findings of the (Chin et al, 2019) study of Brand Credibility and Brand Attitude, Brand Attitude positively influences Brand Credibility. When a brand demonstrates great trust, a buyer is more likely to favor it. Credibility enhances consumer willingness to buy, which boosts a company's sales performance. Furthermore, the findings of (Kemp & Bui, 2011) show that a more credible brand fosters a more positive brand attitude. Brand reputation is essential since it promotes client buying intent. It is also advantageous to the corporation because brands can charge greater prices to clients. As a result, the researcher contends that brand credibility effects brand attitude positively.

Hypothesis 5: Brand credibility positively influences consumers' Brand Attitude.

2.6 Global Identity, Local Identity and Brand Attitude

There is only a few study researched on the influence of global identity and local identity towards brand attitude. According to the findings of (Dong & Yu, 2020), global identity and local identity have an impact on brand attitude. Through the psychological impact of a brand's social value, consumers' local and global identities, built by multinational brands, may affect Brand Attitude and purchase intentions. Therefore, the researcher argues that Global identity and Local identity has an impact on Brand Attitude. The hypothesis proposed is:

Hypothesis 6: Consumers' global identity positively influences Brand Attitude

Hypothesis 7: Consumers' local identity positively influences Brand Attitude

2.7 Brand Attitude and Customer Satisfaction

Customer satisfaction is defined as a person's feelings of fulfillment or discontent as a result of comparing a product's or service's actual performance to the expected results (Kotler, 1994). Customer satisfaction is a psychological reaction of the consumer to a favorable evaluation of the consuming outcome in accordance with the consumer's expectation. As a result, exceeding client expectations with a product will result in satisfaction (Shukla, 2004). When customers are satisfied with the services they receive they are more willing to pay for them and are more likely to tolerate price increases. Customers who are pleased with the company's products and services are more likely to buy more frequently and in larger amounts, as well as additional things and services (Anderson et al, 1994). By providing the maximum level of customer satisfaction, it promotes satisfied customers

to remain loyal (Prasilowati et al., 2020). As a result, customer satisfaction is critical since dissatisfied customers would most likely seek out other products or services to meet their requirements and wishes.

According to (Ko & Chiu, 2008), brand attitude has a beneficial impact on consumer satisfaction. Furthermore, brand attitude is directly tied to consumer satisfaction. Consumer happiness is an important aspect in determining consumer propensity to return. Only satisfaction influences prospective revisiting of a brand. As a result, enticing students requires an efficient marketing plan. Furthermore, according to (Taylor, 2003), brand attitude has a direct effect on consumer satisfaction since it acts as a mediator between customer contentment and loyalty. Therefore, the researcher argues that brand attitude has a positive impact towards customer satisfaction. The hypothesis proposed:

Hypothesis 8: Customers' Brand Attitude positively influences Customer Satisfaction

2.8 Customer Satisfaction and Brand Trust

According to (Chaudhuri & Holbrook, 2001), brand trust is the consumer's readiness to rely on the brand's capacity to execute its stated objective. Customer-brand interactions foster the growth of brand trust, which eventually leads to an emotional relationship. It has been proven to be beneficial for maintaining loyal customers, lowering marketing costs, and increasing earnings, all of which are necessary for brands to flourish (Wang & Xiao, 2022).

The level of brand trust influences consumers' purchasing intentions, which leads to positive brand referrals. Consumer happiness and repurchase intention are influenced by brand trust (Becerra & Badrinarayanan (2013); Chen-Yu et al., 2016). Consumer trust in the brand is crucial because they act as legitimate actors, gaining access to and establishing marketing legitimacy (Lillqvist et al., 2018). Because trust fosters highly valued trade relationships between the consumer and the brand, it fosters brand loyalty or commitment (Morgan & Hunt 1994). Furthermore, brand trust is affected by any negative information about the brand. Any controversy involving unethical, illegal, or criminal activity or product wrongdoing has the potential to significantly destroy consumer faith in the brand (Custance et al., 2012).

According to (Wang & Xiao, 2022), customer satisfaction increases brand trust favorably. The study supplemented a prior study on consumer satisfaction, which showed that customer contentment increases brand trust in the context of sharing clothes. In (Othman et al, 2017), the relationship between customer satisfaction and brand trust is also satiated; as customer contentment rises, so will customer trust in the brand, and vice versa. Furthermore, a study from (Loureiro and González, 2008) found a favorable association between satisfaction and trust. The investigations discovered that enjoyment is linked to loyalty via trust. As a result, trust has a bigger impact on satisfaction than loyalty. Therefore, the researcher argues that customer satisfaction is positively associated with brand trust. The hypothesis proposed:

Hypothesis 9: Customer satisfaction positively influences Brand Trust

2.9 Brand Trust and Brand Switching

Brand switching is the process of transitioning from constant consumption of one brand for a similar product to consistent consumption of a different brand (Charlas et al, 2012), with the possibility of migrating to a brand

competitor (Wang & Xiao, 2022). Consumers often desire to explore a variety of things and services in order to vary and enrich their consumption experiences, with behavior differing based on their level of pleasure with the product or services (Appiah et al., 2019). Customers that do not require as much variety will be more loyal, until the brand proves untrustworthy. Product diversity desire promotes brand switching positively (Wang & Xiao, 2022).

According to (Wang & Xiao, 2022), brand trust diminishes brand switching intention. Brand trust promotes loyalty through the consumer-brand relationship exchange (Morgan & Hunt, 1994). As a result, brand flipping occurs when brand loyalty deteriorates. In other words, when a customer is devoted to a brand, brand switching will not occur. Therefore, the researcher argues that brand trust reduces brand switching intention. The hypothesis proposed:

Hypothesis 10: Brand Trust negatively influences Brand switching of global fashion brands towards local fashion brands.

2.10 Moderating Effect of Variety Seeking

Customers who seek variety in their purchasing behavior vary between items, categories, or brands to prevent decreasing utility caused by repeated purchases or consumption of the same products (Ratner et al., 1999). Intrapersonal motives were used to define direct variety-seeking behavior. Variety-seeking is motivated by a desire for change and/or novelty, or by product attribute satiation. External environmental changes may also inspire customers to seek variety. Marketers and merchants must provide variation in product and service assortments to keep loyal customers due to this satiation and uncertainty-based desire for variety. Customers frequently abandon their preferred brand in favor of trying something new (Kahn, 1995). Variety seeking is naturally driven by behavioral choice patterns such as switching between familiar alternatives, customers in search of new things usually leads to unfamiliar brands or brands that have never been tried, and the need to shelter from uncertainty, according to a study by (Berné et al., 2001).

Prior research discovered that variety seeking moderates the interactions of brand trust and loyalty in the common purchase context. The level of variety seeking influences brand switching (Menidjel et al., 2017). According to (Wang & Xiao, 2022), the interplay between variety seeking and brand trust is not significantly related to brand switching. Only when all of the brand kinds are considered does variation seeking have a moderating effect on brand trust and brand switching intention. However, brand flipping remains a basic requirement for customers with a high level of variety seeking.

Furthermore, context diversity seeking influenced brand switching propensity in clothes purchases. According to the data, persons who desire novelty and change are more likely to switch clothing brands due to perceived risk, brand loyalty, and enjoyment. As a result, there is a significant level of brand switching in their clothes purchases (Michaelidou & Dibb, 2009). Patients that receive bad WOM, discontent, and variety seeking behavior are individuals who may move clinics in the beauty clinic market. However, these three criteria do not have a direct impact on consumer loyalty (Astuti & Santoso, 2020). One of the studies also discovered that the extent of variety seeking influenced brand switching. Therefore, the researcher argues that Variety seeking moderates the relationship between brand trust and brand switching negatively, making the negative relationship weaker at higher levels of variety seeking. The hypothesis proposed:

Hypothesis 11: Variety seeking negatively moderates the relationship between brand trust and brand switching of global fashion brands towards local fashion brands.

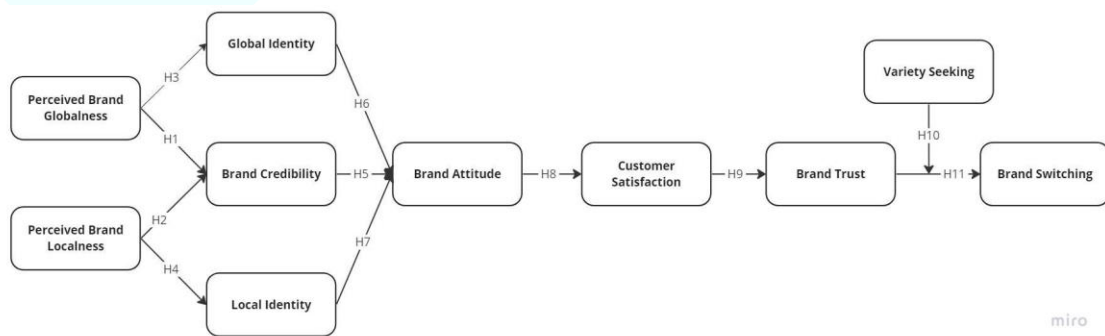


Figure 1. Conceptual Framework

The constructed framework in figure 1. are obtained from prior study by Vuong and Giao, 2019; Özsomer and Altaras, 2008; Mandler et al, 2020; Chin et al, 2019; Kemp and Bui, 2011; Ko and Chiu, 2008; Taylor, 2003; Wang & Xiao, 2022; Loureiro and González, 2008; Michaelidou & Dibb, 2009; Astuti and Santoso, 2020. All of these studies were congruent and may support the study's research purpose, which is to investigate the influence of customer satisfaction and brand trust on brand switching from global fashion brands to local fashion businesses.

III. RESEARCH METHOD

3.1 Research Process

The procedure begins with recognizing the problem that has recently appeared or has become a trend. Following that, those issues were gathered through secondary data from news and social media on how local fashion brands are growing and how customer preferences are shifting from global fashion brands to local fashion brands. Then comes a review of past research that is relevant to the research problem. The next stage is to conduct research utilizing quantitative data collection methods, such as an online poll of customers who have switched brands, as shown by customers who used to shop global fashion brands but are now buying local fashion brands. The preceding stage's data is reviewed to generate a conclusion and recommendation.

3.2 Data Collection

The survey's target respondents are Indonesian Gen Z customers from Bandung and Jakarta who have switched from a Global Fashion Brand to a Local Fashion Brand. According to (Malhotra, 2010), the minimal number of sample sizes in marketing research is 200 respondents. The sample technique used in this investigation will be judgemental with non-probability sampling. In which specific persons or circumstances are purposefully chosen to provide knowledge that cannot be obtained through other methods (Taherdoost, 2016). This study's brand samples include H&M (global fashion brands) and This is April (local fashion companies). As a result, respondents must be customers of both brands.

3.3 Measurement

Obtained and adapted from previous studies there are several indicators to measure the operational variables in this study. Given that the research was conducted in Indonesia, the indicators were translated into Indonesian to

ensure equivalence between the translation and the original indicators. To evaluate questions on all factors, the Likert scale will be utilized. Number 1 represents "Strongly Disagree" and number 5 represents "Strongly Agree".

Table 1. Research Indicator

Variables	Label	Indicator	Source
Perceived Brand Globalness	PBG1	I considered H&M as global fashion brand	Steenkamp et al, 2003; Dong & Yu, 2020
	PBG2	I can find/purchase H&M globally (in many countries)	
	PBG3	H&M are most likely purchased by Indonesian	
Perceived Brand Localness	PBL1	This is April is available for purchase throughout the country.	Steenkamp et al, 2003; Xie et al., 2015; Dong & Yu, 2020
	PBL2	The marketing activities of This is April are aligned to local cultures and customer preferences.	
	PBL3	In my opinion, This is April is a good symbol of Indonesia	
Global Identity	GI1	Purchasing H&M makes me feel like I have become a part of the global culture	Dong & Yu, 2020; Tu et al., 2012
	GI2	Purchasing H&M makes me feel like I have become a global citizen.	
	GI3	Purchasing H&M makes me feel like I am linked to the world.	
Local Identity	LI1	Marketing activities of This is April raise the local pride in myself	Dong & Yu, 2020; Tu et al., 2012; Xie et al., 2015
	LI2	Wearing/using This is April raise the local pride in myself	
	LI4	Purchasing This is April would help me express my local pride	
	LI4	Purchasing This is April product arouse a sense of belonging to my home country	
Brand Credibility	BC1	This is April has the ability to delivers what it promises more than H&M	Erdem & Swait, 2004;
	BC2	This is April delivers what it promises more than H&M	

	BC3	This is April has made me expect to keep its promises rather than H&M	
Brand Attitude	BA1	I have more positive thoughts about This is April rather than H&M	Chin et al, 2019; Dong & Yu, 2020
	BA2	I think This is April product is worth purchasing rather than H&M	
	BA3	I think I am willing to buy This is April product rather than H&M	
Customer Satisfaction	CS1	This is April product that I purchased meets my expectations rather than H&M product	Wang & Xiao, 2022; Loureiro & González, 2008
	CS2	I feel satisfied with This is April product rather than H&M product	
	CS3	Overall, my experience is positive with This is April rather than with H&M	
	CS4	I have done the right thing by purchasing This is April product rather than H&M product	
Brand Trust	BT1	I trust This is April more than H&M	Wang & Xiao, 2022; Xie et al., 2015
	BT2	This is April is more reliable than H&M	
	BT3	I feel safe when wearing This is April product rather than H&M product	
	BT4	This is April is more honest than H&M	
Variety Seeking	VS1	I frequently look for fashion brands I never tried before	Wang & Xiao, 2022; Van Trijp et al., 1996
	VS2	I look for situations/places where I might be exposed to new and different sources of brand information/product.	
	VS3	When I want to buy fashion products, I feel it is safer to buy from familiar brands	
	VS4	I enjoy taking chances on buying unfamiliar brands in order to diversify my purchasing.	
	VS5	Although I like the previous brand, I still switch from it just to try something different	

Brand Switching	BS1	I do not plan to stay with a brand that I purchased for so long	Wang & Xiao, 2022; Wong et al., 2019
	BS2	I am thinking of buying another brand than what I usually buy	
	BS3	I likely to switch brands, if This is April offer better value than H&M	
	BS4	I consider myself as one of those customers who have switched from H&M (global fashion brands) to This is April (Indonesian local fashion brands)	

3.4 Data Analysis

In order to analyze the data gathered for the main survey, descriptive analysis and Partial Least Square-Structural Equation Modeling (PLS-SEM) is performed. According to (Saunders et al., 2014), PLS-SEM is utilized as an iterative equation modeling method that maximizes the explained variance of endogenous constructs where it is designed for studies that are both theory-skeletal and data-rich. SEM (Structural Equation Modeling) allows the researchers to address a set of interconnected research questions by modeling the relationship of multiple independent variables and dependent variables at the same time (Kante et al., 2018). Several independent and dependent variables will be contained in this research. Therefore, PLS-SEM will be used for this exploratory study.

IV. RESULTS/FINDINGS

The online survey is utilizing a quantitative approach with questionnaire-based surveys. The survey gained a total of 280 respondents in which the researcher has already surpassed the minimum requirement number of sample size. There are 14 respondents who did not pass the screening question. Therefore, the respondents that are passed the criteria are 266 respondents.

4.1 Respondents Profile

Age

The respondents age of this study are dominated with the aged 20-24 years old with 201 respondents (75.6%), there are 52 respondents (19.5%) who are aged 25-28 years old, there are 8 respondents (3%) who are aged 16-19 years old and 5 respondents (1.9%) aged 12-15 years old.

Domicile

There are 157 respondents (59%) are domiciled in Bandung area and the rest 109 respondents (41%) are domiciled in Jakarta.

Occupation

The majority of respondents are college students with 204 respondents (76.7%), 32 respondents (12%) are entrepreneurs, 20 respondents (7.5%) are employees, and the rest 10 respondents (3.8%) are students.

4.2 Measurement Validation

A reliability test is performed by the researcher to assess the consistency of the data for the variable (Bruton et al., 2000). In table 1, by using composite reliability (CR) the results show that all of the variables are reliable with the requirement of CR greater than 0.7 (Wong, 2013).

Table 2. Composite Reliability Test

Variable	Composite Reliability	Reliability
Perceived Brand Globalness	0,868	Reliable
Perceived Brand Localness	0,840	Reliable
Global Identity	0,868	Reliable
Local Identity	0,909	Reliable
Brand Credibility	0,859	Reliable
Brand Attitude	0,860	Reliable
Customer Satisfaction	0,903	Reliable
Brand Trust	0,896	Reliable
Variety Seeking	0,915	Reliable
Brand Switching	0,890	Reliable

The construct validity test using Average Variance Extracted (AVE) in the table 2 with requirement of minimum value of 0.5 resulted that the data is valid. The discriminant validity test in table 3, also shows that all the data is valid since the square root of AVE latent of each variable should be greater than the value between the correlated latent variables to be identified as valid (Wong, 2013).

Table 3. Average Variance Extracted Test

Variables	AVE	Validity
Perceived Brand Globalness	0.788	Valid
Perceived Brand Localness	0.757	Valid
Global Identity	0.782	Valid

Local Identity	0.786	Valid
Brand Credibility	0.775	Valid
Brand Attitude	0.781	Valid
Customer Satisfaction	0.774	Valid
Brand Trust	0.761	Valid
Variety Seeking	0.717	Valid
Brand Switching	0.751	Valid

Table 4. Discriminant Validity Test

	BA	BC	BS	BT	CS	GI	LI	PBG	PBL	VS
BA	0.884									
BC	0.849	0.911								
BS	0.819	0.837	0.891							
BT	0.852	0.832	0.84	0.891						
CS	0.878	0.866	0.836	0.864	0.880					
GI	0.516	0.543	0.502	0.515	0.506	0.884				
LI	0.863	0.86	0.789	0.838	0.874	0.528	0.886			
PBG	0.858	0.852	0.791	0.795	0.863	0.552	0.884	0.888		
PBL	0.835	0.858	0.81	0.838	0.847	0.525	0.878	0.853	0.870	
VS	0.881	0.862	0.837	0.829	0.859	0.596	0.88	0.872	0.876	0.846

4.3 HYPOTHESIS TESTING

The hypothesis testing from PLS-SEM (4th version) calculation by performing bootstrapping. Bootstrapping provides T values and P values which help the researchers determine whether the hypothesis is accepted or rejected. The requirement of T value greater than 1.96 and P value under 0.05 the hypothesis is considered as

accepted. However, hypothesis 6 is shown to not meet the requirement of the T value and P value, in which the hypothesis is considered as rejected or not supported in this study. In conclusion, the rejected hypothesis is only one and the other shows to be accepted.

Table 5. Hypothesis Testing Result

Hypothesis	Structural Path	T Values	P Values	Result
H1	Perceived Brand Globalness → Brand Credibility	5.858	0.000	Accepted
H2	Perceived Brand Localness → Brand Credibility	6.491	0.000	Accepted
H3	Perceived Brand Globalness → Global Identity	15.409	0.000	Accepted
H4	Perceived Brand Localness → Local Identity	5.652	0.000	Accepted
H5	Brand Credibility → Brand Attitude	4.774	0.000	Accepted
H6	Global Identity → Brand Attitude	1.111	0.267	Rejected
H7	Local Identity → Brand Attitude	5.959	0.000	Accepted
H8	Brand Attitude → Customer Satisfaction	55.145	0.000	Accepted
H9	Customer Satisfaction → Brand Trust	55.784	0.000	Accepted
H10	Brand Trust → Brand Switching	5.406	0.000	Accepted
H11	Variety Seeking X Brand Trust → Brand Switching	2.525	0.012	Accepted

V. DISCUSSION

This study is intended to analyze the factors that make customers committed to brand switching and also analyze the influence of customer satisfaction and brand trust on brand switching of global fashion brands towards local fashion brands. There are ten hypotheses proposed and nine of them are supported. Hypothesis 1 and 2 is supported, it means that both PBG and PBL positively influence brand credibility. According to (Vuong & Giao, 2019), when a brand is perceived as a global brand, it will receive credibility from the customer. However, the influence of PBG on brand credibility is different based on whether the country is a globalized market or not. PBL can also influence credibility, study from (Mandler et al., 2020) stated that PBL strongly influences brand credibility since PBL is seen as more important in the country with emerging markets. Hypothesis 3 is accepted, which the result is in congruence with the previous study by Dong and Yu (2020) that found PBG has significant impact on global identity. When a brand is perceived as a global brand, it will arouse the sense of global identity of the customer. In this study, it means that H&M as the global brand is able to arouse the global identity of the

customer since the PBG positively influences global identity. Hypothesis 4 is accepted, PBL positively influences local identity. The local fashion brand that is perceived as a local brand is seen as a symbol of the country and considered as a brand that can express customer local pride. This is April as the representative of the local fashion brand is also able to arouse the local identity of the customer.

Hypothesis 5 is accepted, a more credible brand will create trust in the customer's mind. The findings are consistent with recent research by Kemp and Bui (2011) and Chin et al (2019), which discovered that brand credibility positively increases brand attitude. Brand credibility refers to a company's ability to deliver on its promises to customers. As a result, a more reputable brand will instill trust in the customer's thinking. Considering that the hypothesis is accepted, respondents agreed that the local fashion brand represented by This is April is more credible. However, hypothesis 6 is not supported. The global identity does not influence the customer to have a positive attitude to the brand. The findings contradict a previous study by Dong and Yu (2020), which indicated that global identity positively affects brand attitude. Despite the fact that hypothesis 3 is accepted which is a brand perceived to be global by the customer has influenced the customer's global identity. However, the global identity has little bearing on the customer's good evaluation towards the company because brand attitude is how the customer evaluates the brand. It suggests that respondents do not believe that the global identity provided by global fashion brands leads to a more positive view of the global fashion brand. This situation could arise because global fashion brands provide no other superior value other than their globality.

Hypothesis 7 is accepted, the findings correspond with a previous study by Dong and Yu (2020), which discovered that local identity influences brand attitude depending on the social value offered by a business. In other words, if the brand provides a positive value to the consumer through their business process, including marketing activities that might inspire customer pride in the local brand, the customer may develop a favorable attitude toward the brand. The accepted hypothesis leads to the conclusion that the local fashion brand represented by This is April is capable of fostering customer pride in the local brand, resulting in a more positive attitude toward the local fashion brand rather than the global fashion brand. In comparison to hypothesis 6, it can be determined that the local fashion brand that arouses the consumer's local identity receives a more favorable attitude from the customer than the global fashion brand.

Hypothesis 8 is accepted, the findings are consistent with prior research by Ko and Chiu (2008) and Taylor (2003), which discovered that brand attitudes have a beneficial impact on customer satisfaction. This study also shows that when customers have a positive attitude towards a brand there will be a high possibility that the customer will also be satisfied with the brand. Hypothesis 9 is accepted, customer satisfaction has a positive influence with brand trust. The findings are consistent with recent research by Loureiro and González (2008) and Wang and Xiao (2022), which discovered that satisfaction had a favorable influence on brand trust. Customer trust on a brand will increase along with the increase of satisfied customers (Othman et al, 2017). Hypothesis 10 is also accepted, the findings are consistent with a previous study by Wang and Xiao (2022), which discovered that brand trust can lessen brand switching intentions. The hypothesis is supported, which indicates the majority of respondents trust local fashion brands more than global fashion brands, leading them to switch from global to local fashion brands. Lastly, hypothesis 11, variety seeking negatively moderates the relationship between brand trust and brand switching is also accepted. The findings are consistent with a recent study by Menidjel et al., (2017), which discovered that the degree of variety seeking in customers influences their brand switching intention. Brand switching is required for customers with a high variety seeking level to diversify their purchasing experience (Wang & Xiao, 2022). The higher variety seeking level will strengthen the negative relationship between brand trust and brand switching. The majority of the respondents show that they seek for a situation to be exposed to a new brand. Therefore, based on the survey response the respondents have quite high variety seeking. This situation where they seek a new brand, increases the brand switching intention. Once the customer got information of a

new brand that was similar with the previous brand they purchased or met their expectation, the intention to switch to another brand will increase.

VI. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

In conclusion, this study shows that brand switching from global fashion brands to local fashion brands in Indonesia is driven by local identity, brand credibility, brand attitude, customer satisfaction, brand trust, and variety seeking. In addition, the higher the level of variety seeking makes the customer's intention to switch to other brands increased. Although they found satisfaction and trustworthiness in a product or brand they tend to be less committed to it because they are more keen to try new products, services, and brands while also diversifying their buying experience.

5.2 Recommendation

Provide Added Value

The hypothesis of global identity impacting brand attitude is rejected as a result of the findings. The term "brand attitude" refers to how customers evaluate the brand. As a result, the rejected hypothesis implies that the customer does not hold a significant positive evaluation of the global fashion brand. A brand should have a value that the competition does not have or lacks in order to have an excellent evaluation and compete with it. Providing high-value products or services is one approach to keep customers loyal. When a corporation offers a similar desirable product as a competitor, it must maintain price competitiveness, for example, by offering bargains or sales to entice customers. Furthermore, fashion brands cannot be isolated from the service provided to customers. Improving customer experience through brand service can increase consumer value because they are satisfied with the brand's previous experience.

Customers may get brand fatigue and move to a different brand. Increasing the value of the product is also required to overcome the customer's need for variety. Before adding value to a product, the corporation should first learn about the customer's existing fashion preferences. To find out, the organization can conduct surveys or do trend research based on the target market. After learning about the customer's preferences, the corporation can create a new product line or a new fashion trend. Furthermore, by conducting appropriate research and development (R&D) and implementing successful marketing efforts, the corporation is able to not only innovate but also establish a new fashion trend (Indeed Editorial Team, 2022).

The brand's value is reflected not only in the product but also in the service offered. The organization can also adopt before and after sales service to enhance the client experience while boosting engagement with the consumer. For pre-sales service, the company can give an application or website through which the customer can make a purchase. With the addition of virtual product try-ons for customers to imagine the product even when they are not in the store. This innovation adds value to their service, especially if the competitor does not offer such an experience. For after-sales service, a firm can develop a product recycling program in which customers' unused products from the brand can be exchanged for a specific product or anything else that the company can provide. As a result, the customer is directly involved in the construction of a good evaluation of the brand, which can increase their faith in the company.

Loyalty Program

Customers who did brand switching are individuals who switched to another brand and usually purchased another similar brand, indicating that they are not a loyal customer. As a result, the corporation should develop a program to keep people loyal to a brand. Before developing a loyalty program, a company needs to understand how to maintain contact with customers through an effective communication channel to the target market. As a result, the corporation can learn about the customer's behavior, interests, and desires. Following that, the company should build effective marketing channels in order to engage with customers on a deeper level and keep them aware of the brand's presence. With excellent marketing channels, the company may easily inform customers of product upgrades (new release or innovation). Furthermore, the organization can transmit their values and the previously described brand attitude program through marketing channels (Fashinza, n.d.).

Although loyalty programs can be developed to preserve client loyalty, many businesses have already used traditional loyalty programs such as membership. The company can provide customized loyalty programs to add value to the program. For example, the corporation may develop a program in which the consumer receives a tailored incentive for purchasing a certain amount of items/price, encouraging them to purchase additional products. An experience-based loyalty program can also be created because, according to (Kekes-Szabo, 2022), Gen Z values experience over financial reward. As a result, for Gen Z customers, the company can provide in-store experiences such as personal stylists to assist them in product selection or priority check out for membership. This type of encounter can provide consumers with an amazing purchasing experience, causing them to return to purchase the goods again. However, before adopting this type of promotion, marketers should perform research to see whether the program is appealing to Gen Z customers.

5.3 Limitation And Future Discussion

This study also has limitations. First, despite the fact that the hypothesis of this study was developed using comprehensive theoretical analysis, the cross-sectional design limits the data's causality. The cross-sectional design is also vulnerable to common method bias. Despite the fact that numerous steps have been made to alleviate the problem. As a result, for future study, a longitudinal or experimental approach will be chosen. In this study, just one hypothesis is rejected. As a result, the researcher proposed that future research be conducted to learn about additional factors that may influence brand switching intention, as well as using mix-method methodology to discover other variables that might not be discovered by prior studies. Furthermore, as noted in Chapter 1, brand switching may differ amongst persons, which means that a new product variety, different brand sample, or a different research focus may yield different results.

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Exploring Potential Factors On The Purchase Intention Of Battery Electric Vehicles (BEVS) Among Millennials To Expand Market Share In Automotive Industry

Fitria Nur Indriani¹, Mustika Sufiati Purwanegara²

^{1,2}Bandung Institute of Technology, School of Business and Management, Bandung, Indonesia

Abstract

Multiple countries are transitioning to electric vehicles to reduce pollution, but Indonesia's market share in electric car sales is less than 2%. This study focuses on Generation Y or millennials and aims to identify factors that influence their purchase intention and attitude towards electric vehicles, in order to boost market sales. Previous research highlights the significance of attitude from theory of planned behaviour in purchase intention, forming the study's theoretical foundation. Additional variables also added combining from previous research from Asia countries such as China, India, and Malaysia with considered include price value, perceived risk, perceived benefit, government policy, infrastructure barriers, instrumental attributes, perceived technology, and environmental concern. Both qualitative and quantitative methods were used to collect data. Qualitative data involved netnography analysis of social media discussions to validate consumer perceptions. A questionnaire was distributed online to 230 respondents, targeting millennials born between 1981 and 1996. Data analysis employed multiple linear regression using SPSS. The results reveal that price value, perceived benefit, government policy, infrastructure barriers, instrumental attributes, and attitude significantly influence purchase intention for electric vehicles. Furthermore, price value, perceived risk, perceived benefit, infrastructure barriers, instrumental attributes, and environmental concern impact consumer attitudes. The findings of this research have the potential to serve as a marketing strategy for the automotive industry to increase the market share of battery electric vehicles.

Keyword: Purchase Intention; Battery Electric Vehicles; Consumer Attitudes

I. INTRODUCTION

Indonesia, with a population of 275 million in 2022, holds the largest population in Southeast Asia (BPS, 2022). The country's extensive road network spans over 532,837.9 km. Despite the challenges of the COVID-19 pandemic, vehicle sales in Indonesia experienced significant growth, with 22,945,516 registered automobiles in 2022 (CEIC Data, 2022). The passenger car market in Indonesia has been expanding steadily, as evidenced by the increasing number of passenger cars in use each year. Car manufacturing in Indonesia reached 1,470,146 units in 2022, a 31% increase compared to the previous year. This growth reflects the rising demand for personal vehicles, driven by population growth and improved economic conditions. The ability of individuals to purchase cars is influenced by the growing population and income levels, allowing more people to afford private transportation. Figure 1.1 illustrates the continuous increase in car ownership in Indonesia.

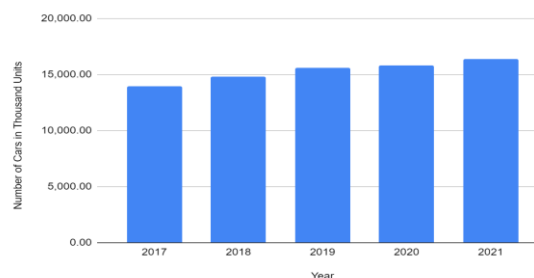


Fig. 1 The number of cars in use in Indonesia from 2017 to 2021

The increase in conventional car ownership has led to a rise in gasoline consumption and subsequent greenhouse gas emissions, primarily caused by Internal Combustion Engine (ICE) vehicles that rely on fossil fuels (Pandyaswargo et al., 2021). Data from Bank Indonesia shows that the government's average financial responsibility for fuel subsidies was 9.67% from 2008 to 2019. Vehicles contribute to more than 50% of air

pollution in major urban centers like Medan, Surabaya, and Jakarta. To address these concerns, researchers are focusing on investing in technological advancements for transportation, particularly in developing new energy sources that are environmentally friendly and emit zero harmful emissions which are electric vehicles (Narasipuram et al, 2021). Electric vehicles (EVs) utilize a battery and motor to operate, eliminating the reliance on gasoline as a fuel source (Sung and Min, 2022). This technological advancement in the automotive industry has positioned EVs as a promising alternative that effectively reduces emissions from fossil fuels. Currently, the automotive market offers several types of electric vehicles, including Hybrid Electric Vehicles (HEVs), Plug-in Hybrid Electric Vehicles (PHEVs), Battery Electric Vehicles (BEVs), and Fuel Cell Electric Vehicles (FCEVs). Among these, BEVs stand out as the most eco-friendly option due to their minimal noise and zero emissions. Unlike vehicles with internal combustion engines (ICEs), BEVs solely rely on electric motors for power, resulting in a complete absence of emissions.

The Indonesian government has demonstrated its commitment to promoting the development of the electric vehicle business ecosystem through the implementation of government regulation No. 55/2019 (Febryansah, 2021). Various initiatives have been introduced by the government to encourage the adoption and usage of electric vehicles, aiming to incentivize vehicle users to switch and purchase electric vehicles. However, despite the significant overall vehicle sales in 2022, as reported by the Association of Indonesian Automotive Industries (Gaikindo) with a total of 1,013,582 units sold, the sales volume for electric cars remained relatively low, reaching only 15,437 units during the same period.

Understanding consumer preferences for electric vehicles is important in Indonesia due to their novelty (Gunawan et al., 2022). The Theory of Planned Behavior (TPB) is commonly used to explore consumer preferences for new technology. TPB emphasizes intention, defined as willingness to engage in an activity, as the primary factor influencing behavior (Zhang et al., 2018). By analyzing logical judgments and information, TPB helps individuals make informed decisions to mitigate unfavorable outcomes (Ajzen et al., 2011). TPB factors influencing purchase intention include attitude, subjective norm, and perceived behavioral control (Ajzen et al., 2011). Previous studies have shown that attitude significantly influences consumer perception of electric vehicles in Indonesia (Gunawan et al., 2022). This study incorporates additional variables from previous research and real opinions from the Indonesian population. The study identifies price value, perceived risk, perceived benefit, government policy, infrastructure barriers, instrumental attributes, perceived technology, and attitude as influential factors in the purchase of Battery Electric Vehicles (Choi & Ji, 2015; Mohd Suki, 2019; She et al., 2017; Zhang et al., 2020).

With an estimated population of around 69.38 million individuals, Generation Y represents approximately 25.87% of the total population in Indonesia (Databoks, 2021). The choice of Generation Y as the target group is driven by their renowned technological savvy and their current stage in their prime spending years. (Singh, 2020). Due to the early stage of Battery Electric Vehicle (BEVs) adoption in Indonesia, potential consumers have limited knowledge and experience with BEVs (Febryansah, 2021). This research is crucial as it aims to identify the factors influencing consumers' attitude and purchase intention among Generation Y. The study seeks to gain a deeper understanding of the challenges associated with BEVs adoption and propose suitable strategies for the future.

II. LITERATURE REVIEW

A. *Electric Vehicles*

Electric vehicles (EVs) are automobiles propelled by an electric motor that generates electricity from either fossil fuels or alternative energy sources (Sung and Min, 2022). Within the category of EVs, Battery Electric Vehicles (BEVs) or All-Electric Vehicles (AEVs) are regarded as the most eco-friendly choice since they exclusively rely on a battery and produce no emissions. BEVs are designed with smaller and more compact engine components compared to traditional vehicles, resulting in more cost-effective maintenance and a smoother, more comfortable ride due to reduced vibrations (C. Sudjoko et al., 2021).

B. *Purchase Intention*

The intentions of consumers regarding electric vehicle purchases are influenced by a combination of demographic, situational, contextual, and psychological factors. (Gunawan et al., 2022). Understanding the factors that impact consumers' decisions to purchase Battery Electric Vehicles (BEVs) is crucial for promoting widespread adoption and developing effective government policies (Dong & Liu, 2020; Yang et al., 2019). Consumer acceptance and adoption of BEVs play a significant role in determining the success of the BEV market (Han et al., 2017; Lieven et al., 2011).

C. Price Value

The price value is recognized as a significant factor that influences users' intention to adopt a technology. As a result, previous studies (Bower, DeWitt, & Lai, 2020; Kaur & Arora, 2021) have emphasized the importance of considering price value as a key determinant impacting users' intention. When the advantages of a product outweigh the costs, consumers perceive it as having good value (A. Vafaei-Zadeh et al., 2022). In the context of electric vehicles, when consumers realize that using an electric car can lead to cost savings, they perceive the vehicle to have high value. Financial considerations are often a top priority for consumers when deciding to purchase an electric vehicle (Lebeau et al., 2013).

D. Perceived Risk

According to Farivaret et al. (2018), perceived risk refers to users' beliefs regarding the possibility of negative consequences or uncertainties related to outcomes or consequences. The perceived risk model includes dimensions such as physical, performance/functional, financial, social, and time risks, influencing acceptance of new technologies (Al-Majali, 2020). Research conducted by Indiani et al. (2015) and Zulfikar & Mayvita (2018) indicated that perceived risk has a more significant influence on an actual purchase than trust.

E. Perceived Benefit

In the context of electric car purchases, perceived benefits can be categorized into financial and non-financial aspects (Yang et al., 2020). Financial benefits include subsidies for purchasing electric vehicles, cost savings from zero fuel consumption, and good after-sales service (Yang et al., 2020). Non-financial benefits encompass environmental friendliness, noise reduction, advanced technology, and smooth acceleration (Morganti and Browne, 2018). In a study conducted by Yang et al. in 2020, it was found that there is a strong and positive relationship between the perceived benefits of electric vehicles and consumers' attitudes towards them.

F. Government Policy

Government incentive programs provide additional advantages to customers (Wang et al., 2017). Previous research has investigated various forms of incentives, including monetary subsidies, tax exemptions, free parking, and access to special lanes for buses or high-occupancy vehicles, in relation to consumer preferences for electric vehicles (EVs) (Lieven, 2015). These policies, such as subsidies aimed at promoting EV sales, have proven effective in encouraging EV adoption in different countries, as exemplified by China (China Passenger Car Association, 2020). In the Chinese market, government policies play a critical role in facilitating widespread EV adoption, as buyers are often motivated by subsidies or the need to comply with car licensing requirements in specific cities (Xing et al., 2016).

G. Infrastructure Barrier

Infrastructure barriers, particularly the availability of charging stations, play a crucial role in the decision to purchase electric vehicles. Insufficient charging infrastructure is considered the primary barrier to the widespread adoption of electric vehicles in urban areas (She et al., 2017). Studies conducted in Denmark have shown that the number of public charging stations and the availability of workplace charging stations significantly influence the demand for electric vehicles (She et al., 2017).

H. Instrumental Attributes

Instrumental attributes refer to the functionality and utility derived from the features and capabilities of new technologies (Voss et al., 2003). Numerous studies indicate that the potential adoption of electric vehicles (EVs) depends on their instrumental attributes, including purchase price, running costs, reliability, performance, driving range, and recharging time (Graham Rowe et al., 2012; Skippon & Garwood, 2011). These attributes have a significant impact on consumers' decision-making processes when considering the adoption of EVs.

I. Perceived Technology

The concept of perceived technology, derived from the Technology Acceptance Model (TAM), emphasizes perceived usefulness and perceived ease of use as key factors (Chen and Barnes, 2007). Perceived usefulness (PU) relates to how consumers perceive environmentally friendly products as enhancing their quality of life, influencing their intention to adopt such products (Chen, 2016). Perceived ease of use (PEU) refers to the assessment of how easily items can be understood and utilized. People are generally more inclined to use products that are simpler and require less effort (Sharma, 2019). In the context of electric vehicles, users tend to believe that they are user-friendly and require minimal effort to learn and operate, thus influencing their perceived ease of use.

J. Environmental Concerns

Consumer environmental concerns can predict the acceptance of hybrid electric vehicles, and this is mediated by factors like attitude (Wang et al., 2016). In the case of China, studies have revealed a paradox between the government's belief in EVs as the future trend for energy-saving and emission reduction, and the relatively low consumer response to this trend (Wang et al., 2021).

K. Attitude

The Theory of Planned Behavior (TPB) framework helps individuals make rational decisions by analyzing information and mitigating negative consequences (Ajzen et al., 2011). Within TPB, purchase intention is influenced by attitude, subjective norm, and perceived behavioral control (Ajzen et al., 2011). In consumer behavior, attitudes reflect favorable or unfavorable feelings towards a specific product or service. Regarding electric vehicles (EVs), attitudes encompass cognitive beliefs about their environmental impact and other factors influencing adoption decisions (Wang et al., 2017; Khurana et al., 2020). Previous studies have consistently shown significant relationships between attitudes and intentions, supporting the importance of attitude in predicting adoption behavior.

L. Conceptual Framework

The primary aim of the initial conceptual framework is to comprehend the factors that influence millennials' purchase intention of Battery Electric Vehicles (BEVs) in the Indonesian market. These factors were selected based on previous studies conducted in various Asian countries, including India, China, and Malaysia. Specifically, the framework includes three variables: price value, perceived risk, and infrastructure barriers, which were adapted from a study in Malaysia (Vafei-Zadeh et al., 2022). Additionally, two variables, namely government policy and environmental concern, were sourced from earlier research conducted in China (Wang et al., 2017). Two more variables, instrumental attribute and perceived technology, were adopted from a study conducted in India (Pradeep et al., 2021). Lastly, the variable of attitude was derived from the Theory of Planned Behaviour (Ajzen, 2011).

Aside from comprehending millennials' purchase intention of Battery Electric Vehicles (BEVs), this research also seeks to examine the factors that influence millennials' attitude towards BEVs. In this context, attitude pertains to a prepared state that influences how individuals react to various objects and situations concerning BEVs (Tan and Lau, 2010). Below are the conceptual frameworks of this research:

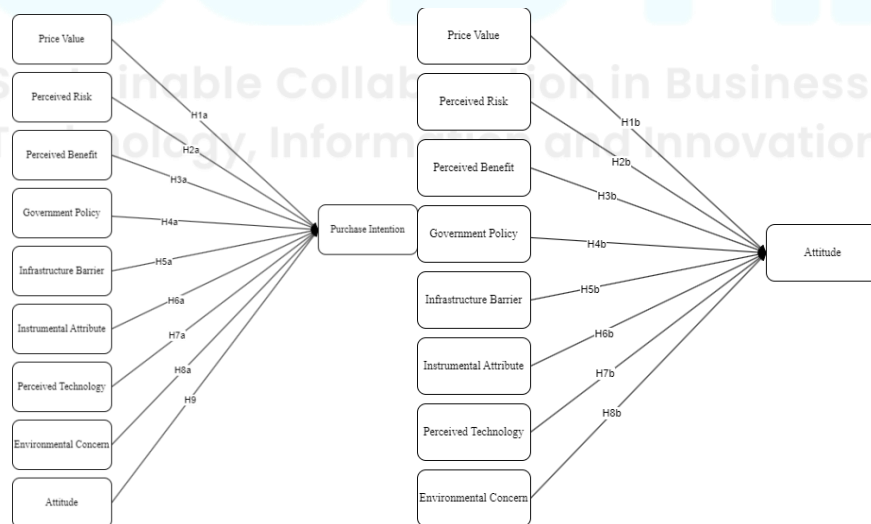


Fig. 2 Conceptual Framework

In order to achieve the objective of this research, a set of hypotheses was developed and examined in Fig. 2, which included specific details and tests.

H1a: Price Value positively influences consumers' purchase intentions

H1b: Price Value positively influences consumers' attitudes

H2a: Perceived Risk negatively influences consumers' purchase intentions

H2b: Perceived Risk negatively influences consumers' attitudes

- H3a: Perceived Benefit positively influences consumers' purchase intentions
- H3b: Perceived Benefit positively influences consumers' attitudes
- H4a: Government Policy positively influences consumers' purchase intentions
- H4b: Government Policy positively influences consumers' attitudes
- H5a: Infrastructure Barrier negatively influences consumers' purchase intentions
- H5b: Infrastructure Barrier negatively influences consumers' attitudes
- H6a: Instrumental Attribute positively influences consumers' purchase intentions
- H6b: Instrumental Attribute positively influences consumers' attitudes
- H7a: Perceived Technology positively influences consumers' purchase intentions
- H7b: Perceived Technology positively influences consumers' attitudes
- H8a: Environmental Concern positively influences consumers' purchase intentions
- H8b: Environmental Concern positively influences consumers' attitudes
- H9: Attitude positively influences BEV and purchase intentions

III. RESEARCH METHODOLOGY

This research utilizes a mixed-method analysis approach, combining qualitative and quantitative techniques to obtain specific research findings.

A. Qualitative Approach

Qualitative research is an open-ended and exploratory approach that prioritizes smaller sample sizes to gain comprehensive insights and capture diverse perspectives on the research subject (Malhotra, 2010). To achieve a genuine understanding of interactions within online communities, the researcher will employ netnography, an online ethnography method. This method allows for a deeper exploration of phenomena in the online environment, supported by the widespread use of the internet in society. The aim is to investigate online communities that host relevant and insightful user-generated content about electric vehicles. Through these communities, valuable insights into participants' experiences and perceptions can be gathered. Data will be collected from posts and comments associated with electric vehicles, focusing on Indonesian automotive accounts. For each post that generated over 100 comments, the researcher will filter and analyze a maximum of 100 comments to extract meaningful information.

B. Quantitative Approach

The survey method was chosen to investigate the adoption rate of new technology vehicles, consumers' intentions to purchase electric vehicles, and the underlying motivations behind electric car purchases. The survey was conducted using Google Forms in Bahasa Indonesia, enabling respondents to comfortably provide their answers in their native language. The target population for this quantitative research comprises millennials aged 27-42 years old. To gather data, the study will use purposive sampling, a non-probability sampling method, to include participants who meet specific criteria relevant to the research objectives. The study aims to obtain a minimum of 200 respondents, following Malhotra's recommendation (2010). The questionnaire consists of two sections. The first section includes socio-demographic variables, such as age, gender, occupation, monthly income, and behavior. The second section contains variables to measure constructs such as price value, perceived benefit, perceived risk, government policy, infrastructure barrier, instrumental attribute, perceived technology, environmental concern, attitude, and purchase intention. Respondents rate the statements using a Likert scale ranging from 1 to 5 (1 = Strongly disagree, 3 = Neutral, 5 = Strongly agree).

After collecting the data through the online survey, the researcher analyzes it using SPSS software. Various techniques, such as Descriptive Analysis, Classical Assumption Test, and Multiple Linear Regression Analysis, are employed to examine and evaluate the questionnaire results.

IV. RESULT / FINDING

M. Qualitative Result

The qualitative aspect of this study involved utilizing the netnography method to collect data from social media comments and online communities. The data collected was then analyzed using NVivo software. The study

focused on four social media platforms: Facebook, Twitter, Youtube, and Instagram. However, only comments from Youtube, Twitter, and Instagram were included for analysis, as Facebook primarily consisted of content related to the socialization program of the KOLEKSI community. After applying filtering criteria, 42 comments were selected from the initial collection of 138 comments for further analysis. The findings revealed that there was a prevailing negative sentiment towards electric vehicles, surpassing the positive sentiment. These comments were sourced from Instagram (25 comments), Youtube (12 comments), and Twitter (5 comments). To ensure the credibility of the social media findings, the researchers conducted data triangulation. This involved comparing the results with existing literature to validate the findings. As a result, all variables were found to pass the validity test, confirming their suitability for further investigation in the research.

N. Quantitative Result

A survey using a questionnaire was utilized as the quantitative approach in this study. The questionnaire was completed by a total of 230 participants, which met the minimum sample size requirement.

Table 1. Respondent socio-demographic characteristics.

	Category	Frequency	Percentage
Gender	Female	59	74.3%
	Male	171	25.7%
Age	27 – 35 years old	159	69.1%
	36 – 42 years old	71	30.9%
Occupation	Employee	130	56.5%
	Entrepreneur	79	17.3%
	Freelancer	17	0.9%
	Other	2	0.4%
	Not occupied Yet	2	0.4%
Monthly Income	<Rp3.000.000	4	1.7%
	Rp3.000.000 - Rp6.999.999	39	17%
	Rp7.000.000 – Rp10.999.999	79	34.4%
	Rp11.000.000 – Rp14.999.999	63	27.4%
	Rp15.000.000 – 19.999.000	22	9.6%
	>Rp20.000.000	23	10%
Behaviour	Aware about Battery Electric Vehicles	208	90.4%
	Not Aware about Battery Electric Vehicles	22	9.6%
	Planning on purchase Battery Electric Vehicles in the next 5 years	208	90.4%
	Not Planning on purchase Battery Electric Vehicles in the next 5 years	22	9.6%

Based on the socio-demographic result, the dominant respondent is Male with percentage 74.3%, Age range between 27 – 35 years old with 69.1%, occupation as employee with 56.5%, and has monthly income Rp7.000.00-Rp10.999.999 with 34.4%. The behavioural question is used to filter the total respondent. Out of 230 respondents, 208 planning to purchase Battery Electric Vehicles in the future and qualified to answer the second section of questionnaire.

Table 2. Descriptive Analysis

Indicator	Mean	Std. Dev
Price Value		
With the current quality of Battery Electric Vehicles, it is quite understandable that they are relatively expensive.	3.92	1.193
The current price of Battery Electric Vehicles is the price with the best offer	3.59	1.397
Perceived Risk		
I'm hesitant to buy an electric vehicle, because maybe the selling price will drop drastically in the future	3.70	1.215
I'm hesitant to purchase Battery Electric vehicles, as I might have to buy a spare battery	3.19	1.401
Currently, electric vehicle technology may be difficult for the Indonesian market to accept	3.84	1.231
Battery Electric Vehicle batteries have the potential to explode while charging	3.90	1.184
Battery Electric vehicles may experience a power failure	3.81	1.247

The current repair shop of EV is typically limited	3.78	1.215
Perceived Benefit		
The maintenance cost for Battery Electric Vehicles will be less.	4.30	1.215
Battery warranty influence my purchase intention towards Battery Electric Vehicle	4.34	0.691
I will save on fuel expenses, as running cost should be lower in case of a Battery Electric Vehicles expenses/costs	4.22	0.679
Using electric vehicle will benefit me because of the smooth driving experience	4.33	0.630
Government Policy		
For purchasing BEVs, a government direct subsidy policy is attractive to me	4.27	0.679
For purchasing BEVs, a government direct subsidy policy is attractive to	3.26	1.359
Infrastructure Barrier		
There are enough charging stations for electric vehicles in public	2.09	1.080
There are enough charging stations for electric vehicles in highway	2.28	1.244
There are enough charging stations for electric vehicles in workplace	2.22	1.202
Instrumental Attribute		
In my opinion, utilizing a battery electric vehicle (BEV) for long distances can be challenging	3.51	1.369
Charging a BEV requires a significant amount of time	3.68	1.342
I find it challenging to charge a BEV at home.		
Perceived Technology		
I believe in the future the technology of electric vehicles may be develop	4.39	0.563
I believe in the future the price of electric vehicles may be cheaper.	4.43	0.648
Environmental Concern		
Battery Electric Vehicles can contribute to the environment for saving the future generation.	4.39	0.613
	4.33	0.636
I want to purchase a Battery Electric Vehicles because of increased air pollution	4.39	0.665
I think that everyone has a responsibility to protect the environment	3.80	1.203
I think that environmental problems have become increasingly serious in recent years.		
Attitude		
Purchasing Battery Electric Vehicles is beneficial	3.92	1.221
In general, I think buying Battery Electric Vehicles is very good	3.83	1.154
In general, I think buying Battery Electric Vehicles is very good.	3.95	1.215
Purchase Intention		
I look forward to more Battery Electric Vehicles brands and models being introduced on the market	4.30	0.702
When I have/need to buy a new car, I'm planning to buy a Battery Electric Vehicles	4.38	0.663
When I have/need to buy a new car, I'm planning to buy a Battery Electric Vehicles	4.38	1.401

The descriptive analysis in Table 2 reveals important insights into the quantitative data, specifically the mean and standard deviation. The results show that the perceived technology variable has the highest mean score of 4.43, indicating a strong belief in future price reductions for electric vehicles. This belief is positively related to individuals' purchase intentions. On the other hand, the infrastructure barrier variable has the lowest mean score of 2.09, suggesting that there is a lack of charging stations in public, which needs improvement.

Table 3 Validity and Reliability Test

Factor	R value	Cronbach's Alpha
Price Value		
With the current quality of Battery Electric Vehicles, it is quite understandable that they are relatively expensive.	0.856	0.696
The current price of Battery Electric Vehicles is the price with the best offer	0.897	
Perceived Risk		
I'm hesitant to buy an electric vehicle, because maybe the selling price will drop drastically in the future	0.814	0.889
I'm hesitant to purchase Battery Electric vehicles, as I might have to buy a spare battery	0.545	
Currently, electric vehicle technology may be difficult for the Indonesian market to accept	0.831	
Battery Electric Vehicle batteries have the potential to explode while charging	0.876	
Battery Electric vehicles may experience a power failure	0.868	

The current repair shop of EV is typically limited	0.849	
Perceived Benefit		0.671
The maintenance cost for Battery Electric Vehicles will be less.	0.584	
Battery warranty influence my purchase intention towards Battery Electric Vehicle	0.562	
I will save on fuel expenses, as running cost should be lower in case of a Battery Electric Vehicles expenses/costs	0.628	
Using electric vehicle will benefit me because of the smooth driving experience	0.498	
Government Policy		0.762
For purchasing BEVs, a government direct subsidy policy is attractive to me	0.365	
For purchasing BEVs, a government direct subsidy policy is attractive to	0.885	
Infrastructure Barrier		0.795
There are enough charging stations for electric vehicles in public	0.283	
There are enough charging stations for electric vehicles in highway	0.818	
There are enough charging stations for electric vehicles in workplace	0.793	
Instrumental Attribute	0.912	0.855
In my opinion, utilizing a battery electric vehicle (BEV) for long distances can be challenging	0.921	
Charging a BEV requires a significant amount of time	0.931	
I find it challenging to charge a BEV at home.		
Perceived Technology	0.695	0.614
I believe in the future the technology of electric vehicles may be develop	0.721	
I believe in the future the price of electric vehicles may be cheaper.		
Environmental Concern	0.481	0.762
Battery Electric Vehicles can contribute to the environment for saving the future generation.	0.784	
I want to purchase a Battery Electric Vehicles because of increased air pollution	0.187	
I think that everyone has a responsibility to protect the environment	0.427	
I think that environmental problems have become increasingly serious in recent years.		
Attitude	0.911	0.872
Purchasing Battery Electric Vehicles is beneficial	0.866	
In general, I think buying Battery Electric Vehicles is very good	0.901	
In general, I think buying Battery Electric Vehicles is very good.		
Purchase Intention		
I look forward to more Battery Electric Vehicles brands and models being introduced on the market	0.686	0.654
When I have/need to buy a new car, I'm planning to buy a Battery Electric Vehicles	0.517	
When I have/need to buy a new car, I'm planning to buy a Battery Electric Vehicles	0.586	

The results obtained from Pearson Correlation analysis, based on data collected from 208 respondents through questionnaires, validate the findings. The distributed questionnaires are confirmed to be valid, supported by the R-Value surpassing the critical R-Table value of 0.135, considering the adjusted number of respondents.

To assess the reliability of the data, Cronbach's Alpha coefficient was used, which is a commonly used measure to evaluate the internal consistency or reliability of a scale or questionnaire (Field, 2018). Typically, a threshold value of 0.6 or higher is considered acceptable for Cronbach's Alpha (Hair et al., 2017). In this study, all the variables utilized demonstrated a reliable level of internal consistency, as all of the Cronbach's Alpha coefficients associated with the variables exceeded the threshold value of 0.6. By calculating Cronbach's Alpha coefficient, the researchers were able to determine the extent to which the items within the scale consistently measure the same underlying construct or concept.

Gujarati (2017) emphasizes the significance of evaluating classical assumptions and satisfying the BLUE criteria (Best, Linear, Unbiased Estimator) before proceeding with regression analysis. In this study, various assumption tests were carried out, encompassing normality, autocorrelation, heteroscedasticity, and multicollinearity. The purpose of these tests was to verify if the data adhered to these assumptions, thereby ensuring the reliability and validity of the regression analysis outcomes.

The Kolmogorov-Smirnov analysis was employed to test for normality, and the results revealed that the attitude dependent variables displayed normal distribution with scores exceeding the significance level of 0.05. However, the purchase intention variable showed a significance level below 0.05, indicating a departure from normality. Nonetheless, this deviation is not a major concern since the total data includes over 100 observations out of 230, as noted by Ifham (2019). The multicollinearity test indicated that the independent variables had tolerance values above 0.10, indicating the absence of multicollinearity issues. The VIF scores for each variable were below 10, further confirming the absence of multicollinearity. Additionally, the heteroscedasticity test demonstrated that all independent variables had scores above the significance level of 0.05, indicating no heteroscedasticity problems. The autocorrelation test showed Durbin-Watson scores of 1.780 and 1.978 for the attitude and purchase intention variables, respectively, suggesting the absence of autocorrelation. In conclusion, this study successfully fulfilled the classical assumption tests for normality, multicollinearity, heteroscedasticity, and autocorrelation, enabling the application of multiple linear regression analysis.

Table 4 Multiple Regression Analysis

Dependent Variable	Independent Variable	ANOVA		Coefficient		R ²
		F	Sig.	B	Sig.	
Purchase Intention	Price Value	3.616	<0.001	0.339	0.035	0.810
	Perceived Risk		<0.001	0.046	0.793	
	Perceived Benefit		<0.001	0.199	0.006	
	Government Policy		<0.001	0.84	0.012	
	Infrastructure Barrier		<0.001	-0.151	0.007	
	Instrumental Attribute		<0.001	0.205	0.044	
	Perceived Technology		<0.001	0.015	0.836	
	Environmental Concern		<0.001	-0.026	0.781	
Attitude	Attitude		<0.001	0.116	0.014	0.141
	Price Value	105.898	<0.001	0.502	<0.001	
	Perceived Risk		<0.001	-0.110	0.015	
	Perceived Benefit		<0.001	0.011	0.009	
	Government Policy		<0.001	0.059	0.096	
	Infrastructure Barrier		<0.001	-0.062	0.017	
	Instrumental Attribute		<0.001	0.280	<0.001	
	Perceived Technology		<0.001	0.033	0.187	
Environmental Concern		<0.001	0.110	0.012		

The table provided presents the findings of a multiple linear regression analysis conducted on the proposed conceptual framework. In relation to the dependent variable, purchase intention, price value, infrastructure barrier, government policy, and attitude exhibit a positive and significant influence. Perceived benefit and perceived technology demonstrate a positive influence but lack statistical significance. Conversely, perceived risk, instrumental attribute, and environmental concern have a negative influence and are not statistically significant. Regarding the dependent variable, attitude, price value, perceived risk, government policy, infrastructure barrier, and instrumental attribute have a positive and statistically significant influence. However, perceived benefit, government policy, perceived technology, and environmental concern show a positive influence but do not reach statistical significance ($p > 0.05$). The R² value of 80.3% indicates that the independent variables account for approximately 80.3% of the variance in the dependent variable, attitude. The remaining 19.7% of the variance is attributed to other variables not included in this model. These outcomes offer valuable insights into the relationships between the different factors and the dependent variables as per the proposed conceptual framework.

V. DISCUSSION

H1a: Price Value positively influences consumers' purchase intentions

The positive and significant influence of price value on purchase intention (H1a) is evident. The price value of battery electric vehicles plays a crucial role in influencing individuals' decisions to buy these vehicles. This finding is consistent with previous research that also highlights the positive significance of price value towards purchase intention (Zhang et al., 2020; A. Vafaei-Zadeh et al., 2022). Consequently, automotive companies must prioritize setting an acceptable price range that aligns with market expectations and the product's quality.

H1b: Price Value positively influences consumers' attitudes

The price value variable shows a positive and significant influence on attitude (H1b), consistent with prior research conducted by Gunawan et al. (2022) and Yuen et al. (2020). These studies indicate that a positive perception of the value offered by electric vehicles leads to a more favorable evaluation of their usability. Furthermore, individuals who believe that the price of electric vehicles aligns with the quality of the product are more likely to support the acceleration of electric vehicle programs and express interest in future purchases.

H2a: Perceived Risk negatively influences consumers' purchase intentions

Perceived risk has a negative and insignificant influence on purchase decision (H2a). This means that the level of perceived risk does not significantly impact individuals' intentions to purchase battery electric vehicles (BEVs). This finding is consistent with research conducted by Simsekoglu (2020), indicating that perceived risk may not be a decisive factor in the intention to buy a BEV.

H2b: Perceived Risk negatively influences consumers' attitudes

The perceived risk variable shows a negative and significant influence on attitude (H2b), in line with previous studies (Choi & Ji, 2015; Majali, 2020; Gunawan et al., 2022). According to the findings, it is evident that as the likelihood of risks associated with electric vehicles increases, individuals tend to have a less positive perception of electric vehicles. This indicates that individuals who perceive potential issues with battery performance, maintenance, and other constraints are more likely to develop a negative attitude towards electric vehicles and show reluctance in adopting their usage (Gunawan et al., 2022).

H3a: Perceived Benefit positively influences consumers' purchase intentions

Perceived benefit has a positive and significant influence on purchase intention (H3a). This aligns with previous studies that have shown perceived benefits to be a significant factor affecting purchase intention. Consumers perceive electric vehicles as superior to conventional combustion engine vehicles because of factors like zero petroleum consumption, minimal pollution, and seamless movement (Yuan et al., 2020). This indicates that millennials are well aware of the benefits associated with electric vehicles, and these benefits significantly shape their intentions to purchase. However, it's essential to note that individuals' decisions may also be influenced by a combination of financial and non-financial factors beyond the perceived benefits.

H3b: Perceived Benefit positively influences consumers' attitudes

Perceived benefit has a positive and significant influence on attitude. This aligns with previous studies that have shown perceived benefits to have a significant impact on both attitude and purchase intention (Yuan et al., 2020). Consumers perceive electric vehicles to outperform traditional combustion engine automobiles in various aspects, such as zero petroleum consumption, minimal pollution, and providing smooth movement (Caulfield et al., 2010).

H4a: Government Policy positively influences consumers' purchase intentions

The government policy variable shows a positive and significant influence on purchase intention (H4a), indicating that government policies can directly influence consumers' intentions to buy electric vehicles. This aligns with prior research that highlights the impact of monetary policies on consumer behavior, as evidenced in studies by Sierzechula et al. (2014) and Wang et al. (2021). It suggests that individuals are more likely to purchase electric vehicles when there are government incentives in place, such as subsidies and tax reductions.

H4b: Government Policy positively influences consumers' attitudes

Unlike its effect on purchase intention, government policy does not show a significant influence on attitudes (H4b). This finding raises questions about the effectiveness of current monetary policies in shaping individuals' attitudes towards electric vehicles. It is possible that the existing financial incentive policies may not fully meet consumers' expectations, as suggested by Li et al. (2016). This difference between the effects of government policy on purchase intention and attitudes underscores the complexity of consumer decision-making processes in the context of electric vehicle adoption.

H5a: Infrastructure Barrier negatively influences consumers' purchase intentions

The infrastructure barrier variable shows a negative and significant influence on purchase intention (H5a). This finding differs from studies conducted in Malaysia that focused on the factors influencing Generation Y, as mentioned in Vafaei-Zadeh et al. (2022). The results indicate that, in the Indonesian context, Generation Y individuals are significantly affected by infrastructure barriers when forming their attitudes towards electric

vehicles and establishing a meaningful connection with the intention to purchase. These findings highlight the significance of addressing infrastructure barriers, especially the availability of charging stations, to foster the growth of the electric vehicle market.

H5b: Infrastructure Barrier negatively influences consumers' attitudes

The infrastructure barrier variable has a negative and significant influence on attitude. This result differs from studies conducted in Malaysia that examined the factors influencing Generation Y, as shown by Vafaei-Zadeh et al. (2022). Improving the charging infrastructure and ensuring its accessibility can effectively address barriers that hinder the adoption of electric vehicles. This, in turn, can enhance the appeal and feasibility of electric vehicle ownership for Generation Y individuals in Indonesia.

H6a: Instrumental Attribute positively influences consumers' purchase intentions

Instrumental attributes also exhibit a positive and significant influence on purchase intention (H6a). This result is in line with previous studies conducted by Pradeep et al. (2021), which reported different findings. Instrumental attributes of electric vehicles refer to the practical and functional aspects that impact consumers' decision-making process, such as the vehicle's range, availability of charging infrastructure, and ease of use.

H6b: Instrumental Attribute positively influences consumers' attitudes

Instrumental attributes exhibit a positive and significant influence on purchase intention (H6b), which is consistent with previous studies conducted by Pradeep et al. (2021). These instrumental attributes pertain to the practical and functional aspects of electric vehicles, including factors such as range, availability of charging infrastructure, and convenience of use. The findings support the notion that consumers consider these instrumental attributes when making decisions about purchasing electric vehicles.

H7a: Perceived Technology positively influences consumers' purchase intentions

Perceived technology has a positive but insignificant influence on purchase intention (H7a). This finding is in contrast to previous studies conducted by Pradeep et al. (2021), which suggested that uncertainty about the technology of battery electric vehicles (BEVs) could lead to lower willingness to adopt them. To address these concerns, the study examined individuals' perceptions regarding future technology. The results revealed that respondents expressed confidence in the improvement and benefits of future technology.

H7b: Perceived Technology positively influences consumers' attitudes

Perceived technology shows a positive but insignificant influence on attitude. Previous research Pradeep et al. (2021) has highlighted the potential impact of uncertainty surrounding the technology of battery electric vehicles (BEVs) on individuals' willingness to adopt them. However, the findings also suggest that instilling confidence in future technological advancements can positively influence purchase intentions. While perceived technology may not directly and significantly affect attitudes and purchase intentions, the perception of future technological improvements can play a significant role in shaping individuals' decision-making processes.

H8a: Environmental Concern positively influences consumers' purchase intentions

Environmental concern has a negative and insignificant influence on purchase intention. Interestingly, these results seem to differ from previous studies that emphasized the strong and significant impact of environmental concern on consumers' decisions to buy electric vehicles (Khurana, 2019). This discrepancy could possibly be attributed to a lack of knowledge or awareness regarding the environmental benefits associated with BEVs. To promote adoption, manufacturing firms, government bodies, dealers, and salespersons should proactively highlight the advantages of electric vehicles in reducing harmful emissions generated by internal combustion engines in conventional vehicles. Educating and informing consumers about the positive environmental impact of BEVs may help overcome the observed lack of influence of environmental concern on their purchase intentions.

H8b: Environmental Concern positively influences consumers' attitudes

The influence of environmental concern on attitudes towards battery electric vehicles (BEVs) is positively and significantly observed (H8b). This implies that individuals not only acknowledge information regarding the environmental implications associated with BEVs but also allow it to significantly shape their overall attitudes towards these vehicles. This finding is in line with earlier studies that have highlighted the role of environmental concerns in promoting green consumption behavior (Mondejar-Jimenez et al., 2011; Wang et al., 2021). In other words, individuals who have a stronger environmental awareness and recognize the potential positive impact of BEVs on the environment are more likely to develop favorable attitudes towards these vehicles.

H9: Attitude positively influences BEV and purchase intentions

Attitude exerts a positive and significant influence on purchase intention (H9), which is in line with prior research conducted by Simsekoglu et al. (2019), Wang et al. (2021), Gunawan et al. (2022), and Vafaei-Zadeh (2022). These findings suggest that electric vehicles offer various positive benefits, including a reduction in air pollution levels. As a result, when the general public becomes more aware of the positive advantages associated with electric vehicle usage, their inclination to adopt electric vehicles in the future increases. This underscores the importance of promoting and raising awareness about the environmental and societal benefits of electric vehicles to further encourage their acceptance and adoption.

VI. CONCLUSION AND RECOMMENDATION

O. Conclusion

Based on the result of this study, Factor that's affecting consumers' purchase intention towards Battery Electric Vehicles among Indonesia's millennial are price value, perceived benefit, government policy, instrumental attribute, infrastructure barrier, and attitude. Additionally, Factor that's affecting consumers' attitude towards Battery Electric Vehicles among Indonesia's millennial are price value, perceived risk, perceived benefit, instrumental attribute, infrastructure barrier, and environmental concern.

P. Recommendation

The study's findings have practical implications for the growth of the electric vehicle market in Indonesia. Both the automotive industry and the government can use these results to develop targeted marketing programs and campaigns to increase electric vehicle adoption among consumers, especially millennials. Key factors that significantly influence consumers' purchase intention and attitude are price value, perceived benefit, infrastructure barrier, and instrumental attribute. Therefore, the automotive industry should focus on understanding and highlighting these factors. For the automotive industry to boost market sales, setting the right price value for electric vehicles is crucial. Implementing programs like local manufacturing and assembly can help reduce costs and make the price more acceptable to consumers. Enhancing the perceived benefits of buying electric vehicles is essential. Offering affordable maintenance fees can make electric vehicles more appealing compared to traditional combustion engine vehicles.

To expand the market share of electric vehicles in Indonesia, collaboration between the government and automotive companies is essential. Investing in charging infrastructure and strategically placing charging stations in key locations can facilitate the adoption of electric vehicles. Understanding customer preferences and needs is vital for automakers and stakeholders. Market research and analyzing consumer feedback can identify instrumental attributes that are important to potential buyers. This knowledge can guide product development and marketing strategies to emphasize key attributes that align with customer needs and boost purchase intention.

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Stock Valuation In The Automotive And Component Sub-Sector Companies Listed On-Idx After The Covid-19 Pandemic

Aneu Nafisatul Munawaroh¹, Dwi Fitrizal Salim¹

¹ Faculty of Economic and Business, Telkom University, Bandung, Indonesia.

Abstract

The results of previous studies showing that stock prices do not accurately reflect their intrinsic value, as well as variations in the movement and growth of stock prices of companies listed on the Indonesia Stock Exchange (IDX), are driving this research. Based on financial data for 2017–2021, this study seeks to determine the intrinsic value of shares in the Automotive and components sub-sector for the next five years. PT Astra Otoparts Tbk (AUTO), PT Garuda Metalindo Tbk (BOLT), and PT Multi Prima Sejahtera Tbk (LPIN) are the objects of research. Three scenarios were chosen, namely pessimistic, moderate, and optimistic scenarios. The methods used to calculate the intrinsic value of the shares are the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF) approach and the Relative Valuation (RV) method with the Price to Earning Ratio (PER) and Price to Book Value (PBV) approaches. This research reveals how this approach applies to valuing companies after the COVID-19 pandemic. Based on the results of calculations using the DCF method, the results show that the intrinsic values of AUTO and LPIN are undervalued in all scenarios, while BOLT is overvalued in all scenarios. The DCF method is validated by the RV method with the PER and PBV approaches. The calculation results stated that AUTO, BOLT, and LPIN shares were declared valid because they were in the industrial range. The investment recommendation is to sell BOLT shares and buy AUTO and LPIN shares.

Keyword: Relative Valuation; Discounted Cash Flow; Free Cash Flow to Firm; Price to Earning Ratio

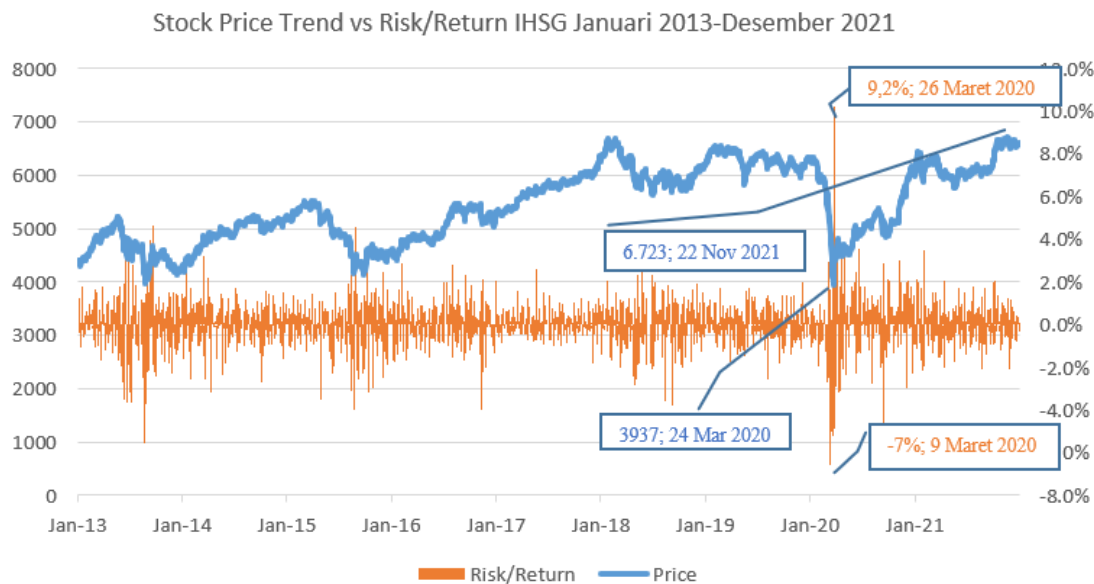
I. INTRODUCTION

Stock valuation is a topic that has gained a lot of interest among investors in today's age of rapid information dissemination and fluctuations in market prices. Changes in market costs provide fluctuating returns for financial backers. The Composite Stock Price Index (IHSG) is a measure that describes how stock returns fluctuate globally on the Indonesia Stock Exchange (IDX). The movement of the Composite Stock Price Index (IHSG) throughout 2021 is much better than the pressures that occurred in 2020. Even though the pandemic is not over, the index continues to improve and touch record highs. This research is important because the automotive industry is one of the mainstays that makes a significant contribution to the national economy. The transportation equipment industry contributed around 1.35% to national GDP in 2020, or around 7.57% of the non-oil and gas processing industry's GDP (Ministry of Industry, 2021), and in 2021, the automotive and component sub-sectors will also experience stock fluctuations. This industry is one of the five that have been the focus of the "Making Indonesia 4.0" initiative since 2018. The large contribution of the automotive industry to national GDP makes it an attractive option for investors, so it is necessary to evaluate companies in the automotive industry.

Based on Figure 1.1, it can be seen that the IHSG risk/return fluctuated and was at its lowest point of -1.7% on March 9, 2020. This was due to the wide spread of COVID-19, which has become a negative sentiment and affected global financial markets so much that the IDX implemented a policy of trading halts. Meanwhile, returns touched the highest level of 9.2% on March 26, 2020. This was due to capital market conditions, which had started to improve, although they had not fully recovered from the pandemic. Meanwhile, the share price has the highest value on November 22, 2021, with a value of 6.723, and the lowest share price was on March 24, 2020, with a value of 3,937. Likewise, risk and return shares in automotive sub-sector companies experienced the same fluctuation phenomenon as the IHSG.

Stock prices are determined by supply and demand, so stock prices go up and down every day. If the demand is high, the stock price will rise; otherwise, if the supply is high, the stock price will fall. One of the factors that influences the rise and fall of a company's stock price is the condition of the company's macroeconomic fundamentals. Fundamental analysis is more suitable for stock market trading because it combines variables such as accounting policies, risk profiles, and potential increases (Fibrianto & Hendrawan, 2018). These variables include the characteristics and financial condition of the company. The intrinsic value (fair value) of a share can be defined as the present value of cash inflows that will be obtained over the life of the company (Learn et al.).

Discounted Cash Flow is a reliable method of fundamental analysis for calculating a company's long-term value (Ivanovska et al., 2014). Based on the phenomenon above, the purpose of this study was to determine the intrinsic value of shares of companies engaged in the automotive and component sub-sectors that have an average operating income and positive revenue growth in the last (three) years, in this case represented by AUTO, BOLT, and LPIN on the IDX, using the Discounted Cash Flow (DCF) method through the Free Cash Flow to Firm (FCFF) approach and the Relative Valuation method with the Price to Earning Ratio (PER) and Price to Book Value (PBV) approaches, on optimistic, moderate, and pessimistic scenarios for 2022.



Gambar 1.1 Tren Harga Saham Vs Risk/Return IHSJ Januari 2013-Desember 2021
Sumber: yahoo finance (data diolah)

II. LITERATURE REVIEW

Previous research on valuation has been conducted by Soelistyo and Hendrawan (2022), who conducted research on the automotive sub-sector based on financial data from 2016–2020. The applied method is divided into three scenarios: pessimistic, moderate, and optimistic. The results of the study show that by using the Discounted Cash Flow (DCF) method through the Free Cash Flow to Firm (FCFF) approach, the shares of PT Astra International Tbk (ASII) and PT. Indospring Tbk (INDS) is overvalued in all scenarios; PT Gajah Tunggal Tbk (GJTL) is undervalued in all scenarios; and PT. Selamat Sempurna Tbk (SMSM) is overvalued in the pessimistic scenario and moderately undervalued in the optimistic scenario. Correction of the SMSM and ASII intrinsic values is necessary because the results of the relative valuation (RV) analysis show that the DCF results of the two companies are not fully valid, which shows that the pandemic crisis has significantly affected the value of both companies. The investment recommendation for ASII and INDS is to sell their shares, while for SMSM and GJTL, it is to buy their shares.

Wanda et al. (2022) conducted research on the effect of market-to-book value ratio and earnings per share on the volatility of stock prices listed on the Nairobi Securities Exchange (NSE) in Kenya. This study uses a special longitudinal design, a random effects model, and substantive evidence. The results showed that the market-to-book value ratio and earnings per share negatively affect stock price volatility. Stock price volatility varies from company to company. This deviation may be the result of internal and external factors. Both have an impact on stock price fluctuations. These internal factors include company revenue, annual asset growth, liquidity, total net worth, and sales. The external factors include government policies and their impact, interest rate movements.

Silalahi et al.'s (2022) research on stock price valuation analysis in estimating stock prices during the COVID-19 period, and investment decisions. The research was conducted at 11 companies registered in the Telecommunications, pharmaceutical, and financial subsectors, which are members of ISSI. The results showed that with the PER and PBV approaches, the results of the independent sample t-test were $0.032 < 0.05$, so H_0 was rejected and H_1 was accepted, meaning that there is a significant difference between the average PER and PBV stock valuation results. RMSE PER (1786) and PBV (1935) mean that PER has a better error rate than PBV. TLKM, KAEF, KLBF, PYFA, and SIDO, and 5 companies with undervalued conditions using the PER method, and 6 companies with overvalued conditions, namely ISAT, DVLA, MERK, TSPC, BRIS, and BTPS. DVLA, KAEF, KLBF, MERK, and SIDO are awarded based on the use of the PBV method. And six companies have overvalued their shares: ISAT, TLKM, PYFA, BRIS, BTPS, and TSPC. In addition, there are six businesses that use PER and PBV in the same way: KAEF, KLBF, SIDO, TSPC, BRIS, and BTPS.

Sitorus et al. (2019) conducted research on stock price valuations in Property and Real Estate sector companies during the 2013–2017 period. This method is applied in three scenarios: pessimistic, moderate, and optimistic. The results show that with the DCF-FCFF method, CTRA is undervalued in all scenarios, and LPKR and BSDE are overvalued in all scenarios. PER and PBV analysis give the result that the assessment is still in the industry range, meaning that the assessment is correct. Based on the results of this study, the recommended investment decision is to sell LPKR and BSDE shares and also buy CTRA shares.

Rikumahu et al. (2018) conducted research on the valuation of stock prices in the banking sector listed on the LQ 45 Index during the 2011–2016 period. The value of banking shares that have remained at the LQ 45 index for 5 years using the PER method is calculated by comparing the intrinsic value with the market price of the stock, showing the same results, namely overvalued (7) and undervalued (7). Meanwhile, the value of banking stocks that have remained in the LQ 45 index for 5 years is calculated using the book value price method, all of which are stated to be overvalued. The comparison of these two methods is that because PBV cannot represent the current stock price, valuation using PER is better for investors to use as a reference in terms of making investment decisions.

The similarities between previous research and this research are as follows:

1. The objects under study are both companies in the automotive and component sub-sectors.
2. The types and methods of research approaches used both use quantitative descriptive methods.

The differences between previous research and this research are as follows:

1. The object in the previous research was PT. Astra International Tbk, PT. Congratulations Perfect Tbk, PT. Gajah Tunggul Tbk, and PT. Indospring Tbk, while in this research the object is PT. Astra Otoparts Tbk, PT. Garuda Metalindo Tbk, and PT. Multiprima Sejahtera Tbk.
2. The theory used in previous studies was Damodaran's theory, while the theory used in this study was Damodaran's theory and was supplemented by David T. Larrabe and Jason A. Voss.
3. In previous studies, the focus was on the fair value valuation of shares for the 2021 projection, while in this study, the fair value valuation of shares for the 2022 projection (After COVID-19).

III. RESEARCH METHODOLOGY

This type of research uses a quantitative descriptive method using historical data. The descriptive approach helps researchers understand clearly the descriptions of the variables used in the research. A quantitative approach is used in this research because the data collected is quantitative in nature and can be analyzed by utilizing statistical theories. The intrinsic (fair) value of shares is obtained by means of the valuation used in this study. This study used purposive sampling, which is a sampling technique that uses certain considerations according to the desired criteria to determine the number of samples to be studied (Sugiyono, 2018). Data collection techniques used in this study are documentation techniques, namely data collection techniques by studying, classifying, and using secondary data. Secondary data is research data obtained that is not directly related to providing data to data collectors (Sugiyono, 2018). The secondary data was taken from several sites, including <https://www.idx.co.id/> dan <https://emiten.kontan.co.id/>, <https://finance.yahoo.com/>, <https://www.bi.go.id/>,

In valuing the company's shares in this research object, the Discounted Cash Flow (DCF) method is used with the Free Cash Flow to Firm (FCFF) approach to analyze the valuation from the company's fundamentals, and the Relative Valuation (RV) method with the Price to Earning Ratio (PER) approach. and Price to Book Value (PBV) to analyze from the market side.

3.1 DCF-FCFF

This method is used to determine the series of cash flows in the future by determining the present value. This value will then become the basis for calculating firm value and equity value. By knowing the equity value and the number of shares outstanding, the intrinsic value of the company can be obtained. The stages in estimating the intrinsic value of shares using the DCF approach to the FCFF approach are to analyze historical data from 2017–2021 to determine projected revenue, operating expenses, depreciation and amortization costs, capital expenditures, and working capital. Then make a projection for the next five years by making a growth revenue value projection first. The next step is to determine the discount (WACC). As for the formula for calculating the weighted average cost of Capital (WACC), Larrabee and Voss (2013) state as follows:

$$\text{WACC} = \{D \times r_d (1 - \text{tax})\} + (E \times r_e)$$

Projections are calculated using the WACC value, then enterprise value (EV) is calculated by adding up the present value of FCFF in each projection year and the terminal value at the end of the projection year. Furthermore, to generate equity value by subtracting the Enterprise value from the total long-term debt and adding it to the total cash owned by the company, the following is the formula used to calculate Free Cash Flow to Firm (Larrabee and Voss, 2013):

$$\begin{aligned} \text{FCFF} = & \text{EBIT} \times (1 - \text{Tax rate}) \\ & + \text{Depreciation and amortization} \\ & - \text{Capital expenditures} \\ & - \text{Addition to working capital} \end{aligned}$$

3.2 Relative Valuation – PER and PBV

The means used to perform relative valuation are multiples, so this method is also called a multiplier because investors will calculate how many times (multiplier) the value of earnings is reflected in the stock price. The approach used in assessing the fair price of shares in this method is to use the Price to Earnings Ratio (PER) and Price to Book Value (PBV) approaches. The PER approach uses the value of earnings. Price to Earnings Ratio (PER) and Earnings per Share (EPS) values include published values. The company's PER calculation foundation will then be built based on PER trends formed from its historical data. While the PBV approach compares the stock price (P_0) with the book value per share (Book Value), Under ideal conditions, the market value of a stock should reflect its book value. The following is the formula for calculating the intrinsic value of shares using the PER and PBV approaches:

$$\text{PER} = \text{Value of Equity} / \text{Earning After Tax}$$

$$\text{PBV} = \text{Value of Equity} / \text{Book Value Of equity}$$

Calculation results from Relative Valuation using the Price Earning Ratio (PER) and Price to Book Value (PBV) approaches will validate the results of calculating the DCF intrinsic value using the Free Cash Flow to Firm (FCFF) approach where the validation is if the results of the Relative Valuation calculation are still within the industry PER and PBV ranges.

IV. RESULT / FINDING

4.1 Historical Performance

PT Astra Otoparts, Tbk has been registered as a public company since June 15, 1998 on the IDX. The closing price for AUTO shares as of December 30, 2021 is IDR 1,155 per share, with a total of 4,819,733,000 outstanding shares. The following is the financial behavior and average growth of AUTO based on historical data from the company's financial statements which will be used as an assumption model for FCFF projections.

Based on Table 4.1 it can be seen that the average annual growth of AUTO revenue is 4.6%, for the opex portion of revenue is 94.4%, the portion of AUTO depreciation and amortization of revenue is 3.5%, AUTO's Capital expenditure (CAPEX) of revenue is 3.4% and working capital to revenue AUTO average -1.7%.

Table 4.1 AUTO historical performance for the 2017-2021 period (in millions of rupiah)

	2017	2018	2019	2020	2021	Average
<i>Revenue</i>	13,549,857	15,356,381	15,444,775	11,869,221	15,151,663	<i>Revenue Growth</i>
<i>Growth</i>		13%	1%	-23%	28%	4.6%
						<i>% of revenue</i>
<i>Total Operating expenses</i>	(12,727,322)	(14,518,327)	(14,425,296)	(11,226,556)	(14,480,514)	94.4%
<i>Depreciation & Amortitation</i>	(476,084)	(474,031)	(473,686)	(508,941)	(521,988)	3.5%
EBIT	346,451	364,023	545,793	133,724	149,161	
Total Capex	412,501	571,191	890,816	320,871	294,408	3.4%
<i>% capex thd revenue</i>	3%	4%	6%	3%	2%	
<i>Total Current asset</i>	5,228,541	6,013,683	5,544,549	5,153,633	6,621,704	
<i>Cash and Equivalent</i>	(679,916)	(889,615)	(788,153)	(1,503,144)	(1,837,380)	
<i>Net current Liabilities</i>	(2,664,143)	(3,232,167)	(2,931,139)	(2,335,867)	(3,805,370)	
<i>Working Capital</i>	1,884,482	1,891,901	1,825,257	1,314,622	978,954	11.06%
▲ WC		7,419	(66,644)	(510,635)	(335,668)	-1.7%

Source: Financial Report of PT. Astra Otoparts, Tbk. (Data processed)

PT Garuda Metalindo has been registered as a public company since July 7 2015 with the ticker code BOLT. The closing price for BOLT shares as of December 30, 2021 is IDR 825 per share, with a total of 2,343,750,000 outstanding shares. The following is the financial behavior and average growth of BOLT based on historical data from the company's financial statements for the 2017-2021 period as the basic assumption model that will be used for FCFE projections:

Table 4.2
BOLT historical performance for the 2017-2021 period (in millions of rupiah)

	2017	2018	2019	2020	2021	Average
<i>Revenue</i>	1,047,701	1,187,195	1,206,818	788,873	1,181,849	<i>Revenue Growth</i>
<i>Growth</i>		13%	2%	-35%	50%	7.5%
						<i>% of revenue</i>
<i>Total Operating expenses</i>	(928,334)	(1,086,554)	(1,155,699)	(849,079)	(1,123,908)	95.0%
<i>Depreciation & Amortitation</i>	(35,765)	(41,891)	(40,509)	(39,780)	(44,420)	3.8%
EBIT	83,603	58,750	10,611	(99,986)	13,521	
Total Capex	22,190	44,963	22,678	16,546	35,161	2.6%
<i>% capex thd revenue</i>	2%	4%	2%	2%	3%	
<i>Total Current asset</i>	540,253	629,372	588,364	476,252	643,891	
<i>Cash and Equivalent</i>	(37,655)	(13,848)	(9,061)	(6,386)	(7,858)	
<i>Net current Liabilities</i>	(75,055)	(171,101)	(108,332)	(74,953)	(169,106)	
<i>Working Capital</i>	427,543	444,424	470,971	394,913	466,927	
▲ WC		16,881	26,547	(76,058)	72,014	0.02%

Source: Financial Report of PT. Garuda Metalindo, Tbk. (Data processed)

Based on Table 4.2 it can be seen that the average annual BOLT revenue growth is 7.5%, while the portion of Operating Expenses (OPEX) to revenue is 94.4%, BOLT's depreciation and amortization portion to revenue is 3.8%, Capital expenditure (capex) BOLT to revenue is 2.6% and the average difference between working capital and BOLT revenue for the 2017-2021 period is 0.02%.

PT Multi Prima Sejahtera has been registered as a public company since February 5, 1990, with the stock code LPIN. The closing price for LPIN shares as of December 30, 2021 is IDR 390 per share, with a total of 425,000,000 outstanding shares. The following is the financial behavior and average growth of LPIN based on

historical data from the company's financial reports for the 2017-2021 period as the basic assumption model that will be used for FCFF projections:

Table 4.3
LPIN historical performance for the 2017-2021 period (in millions of rupiah)

	2017	2018	2019	2020	2021	Average
<i>Revenue</i>	102,949	95,213	88,358	103,066	120,475	<i>Revenue Growth</i>
<i>Growth</i>		-8%	-7%	17%	17%	4.7%
						<i>% of revenue</i>
<i>Total Operating expenses</i>	(95,979)	(91,109)	(89,541)	(99,798)	(113,726)	96.1%
<i>Depreciation & Amortizat</i>	(1,029)	(1,141)	(1,126)	(948)	(1,080)	1.1%
EBIT	5,941	2,963	(2,309)	2,320	5,669	
Total Capex	1,597	338	819	599	4,089	1.4%
<i>% capex thd revenue</i>	2%	0%	1%	1%	3%	
<i>Total Current asset</i>	133,471	137,579	140,615	151,757	111,057	
<i>Cash and Equivalent</i>	(31,174)	(60,458)	(79,638)	(97,780)	(45,785)	
<i>Net current Liabilities</i>	(25,509)	(17,222)	(10,782)	(16,764)	(15,160)	
<i>Working Capital</i>	76,788	59,899	50,195	37,213	50,112	
▲ WC		(16,890)	(9,703)	(12,983)	12,899	-7.65%

Source: Financial Report of PT. Multi Prima Sejahtera, Tbk. (Data processed)

Based on Table 4.3 it can be seen that the average annual growth of LPIN revenue is 4.7%, the portion of OPEX to revenue is 96.3%, the portion of depreciation and amortization to revenue is 1.1%, Capital expenditure (CAPEX) LPIN to revenue is 1.4% and the working capital index for the 2017-2021 period has a negative value of -7.65%

4.2 Projection Method

The projection uses the DCF method with the FCFF approach in three scenarios, namely pessimistic, moderate, and optimistic scenarios, based on the model assumptions that have been obtained and calculated using the WACC as the FCFF discount rate, which will be used to calculate the present value. The following are the FCFF AUTO projection results that have been obtained for each scenario in the 2022-2026 period, along with the terminal value, enterprise value, and equity value in Table 4.4 using a WACC value of 10.7%:

Table 4.4
Projection of FCFF AUTO for the period 2022-2026 (in millions of rupiah)

Scenario	2022	2023	2024	2025	2026	TV	Ent. Value	Equity Value
Pessimist (g : 4,6%)	541,869	566,812	592,904	620,196	634,470	7,557,710	6,835,522	8,156,611
Moderate (g : 5,1%)	544,184	571,666	600,535	630,862	646,791	7,915,138	7,092,343	8,413,432
Optimist (g : 5,5%)	546,499	576,540	608,231	641,665	659,300	8,295,031	10,134,962	11,456,051

Source: Financial Report of PT. Astra Otoparts, Tbk. (Data processed)

Based on table 4.4 in carrying out FCFF projections, AUTO's revenue growth is with a pessimistic scenario of 4.6%, moderate 5.1%, and optimistic 5.5%. The AUTO Terminal value in the pessimistic scenario is 7,557,710; the moderate value is 7,915,138; and the optimistic value is 8,295,031. Meanwhile, the enterprise value AUTO in the pessimistic scenario is 6,835,522, in the moderate scenario it is 7,092,343, and in the optimistic scenario it is

10,134,962. The equity value for AUTO in the pessimistic scenario is 8,156,611, in the moderate scenario it is 8,413,432 and in the optimistic scenario it is 11,456,051.

The following are the FCFF BOLT projection results that have been obtained for each scenario in the 2022–2026 period, along with the terminal value, enterprise value, and equity value in Table 4.5 using a WACC value of 6.9%:

Table 4.5
Projection of FCFF BOLT for the period 2022-2026 (in millions of rupiah)

Scenario	2022	2023	2024	2025	2026	TV	Ent. Value	Equity Value
Pessimist (g : 5,1%)	19,683	20,677	21,721	22,818	23,394	534,791	481,288	197,554
Moderate (g : 7,5%)	20,149	21,668	23,301	25,058	26,002	830,536	712,071	428,337
Optimist (g : 10%)	20,615	22,682	24,956	27,458	28,834	1,528,055	1,608,643	1,324,909

Source: Financial Report of PT. Garuda Metalindo, Tbk. (Data processed)

Based on table 4.5 in carrying out FCFF projections, BOLT revenue growth is with a pessimistic scenario of 5.1%, moderate 7.5%, and 10% optimistic. The Terminal value of the BOLT value in the pessimistic scenario is 536,980; the moderate value is 835,292; and the optimistic value is 1,542,628. Meanwhile, the enterprise value BOLT in the pessimistic scenario is 483,286, in the moderate scenario it is 716,172, and in the optimistic scenario it is 1,623,251. The BOLT equity value for the pessimistic scenario is 199,534; the moderate scenario is 432,438; and the optimistic scenario is 1,339,517.

The following are the results of the FCFF LPIN projections that have been obtained for each scenario in the 2022-2026 period, along with the terminal value, enterprise value, and equity value in Table 4.5 using a WACC value of 8.8%:

Table 4.6
Projection of FCFF LPIN for the period 2022-2026 (in millions of rupiah)

Scenario	2022	2023	2024	2025	2026	TV	Ent. Value	Equity Value
Pessimist (g : 4,7%)	11,872	12,431	13,016	13,629	13,949	216,202	195,506	241,145
Moderate (g : 5,1%)	11,912	12,513	13,145	13,809	14,157	225,442	202,433	248,071
Optimist (g : 5,4%)	11,951	12,595	13,275	13,991	14,368	235,243	277,154	322,792

Source: Financial Report of PT. Multi Prima Sejahtera, Tbk. (Data processed)

Based on Table 4.5 in carrying out FCFF projections, it is known that LPIN's revenue growth will be with a pessimistic scenario of 4.7%, moderately 5.1%, and optimistic 5.4%. The Terminal value of LPIN in the pessimistic scenario is 216,430, moderate 225,686, and optimistic 235,505. Meanwhile, the enterprise value of LPIN in the pessimistic scenario is 195,714, in the moderate scenario it is 202,654, and in the optimistic scenario it is 277,422. For the equity value of LPIN in the pessimistic scenario, it is 241,352, in the moderate scenario, it is 248,292, and in the optimistic scenario, it is 323,061.

4.2 Analysis Results

The valuation results from AUTO with data for 2021 for WACC = 10.7%, industry growth = 5.1%, company growth = 4.6%, number of shares = 4,819,733,000, EAT = 634 billion, and Book value of equity = 11.8 trillion are presented in Table 4.7:

Tabel 4.7 AUTO Valuation Results

DCF - FCFF						
Scenario	Intrinsic Value (Rp)	Market price on 30 December 2021 (IDR)			Analysis	Deviation
Pessimist	1692	1,155			<i>Undervalued</i>	46.5%
Moderate	1746				<i>Undervalued</i>	51.1%
Optimist	2377				<i>Undervalued</i>	105.8%
RV - PER						
Scenario	PER Company	PER Industry Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	12.85	-29	23	34	<i>Undervalued</i>	<i>Valid</i>
Moderate	13.25				<i>Undervalued</i>	<i>Valid</i>
Optimist	18.04				<i>Undervalued</i>	<i>Valid</i>
RV - PBV						
Scenario	PBV Company	PBV Industry Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	0.69	0.29	2.33	5.18	<i>Undervalued</i>	<i>Valid</i>
Moderate	0.71				<i>Undervalued</i>	<i>Valid</i>
Optimist	0.97				<i>Undervalued</i>	<i>Valid</i>

Source: www.idx.com dan finance.yahoo.com ((Data processed))

Based on the data in Table 4.7, using the DCF method, AUTO shares are considered undervalued because the intrinsic value of AUTO in all scenarios is above the market price on December 30, 2021 of IDR 1,155. The intrinsic value of AUTO in the pessimistic scenario is Rp. 1,692.3, with a deviation from the market price of 46.5%, while Rp. 1,745.6 in the moderate scenario, with a deviation from the market price of 51.1% and Rp. 2,376.9 in the optimistic scenario, with a deviation of 105.8% from the market price. By using the RV PBV approach, AUTO shares are considered undervalued because the intrinsic value of AUTO's PBV in all scenarios is below the industry average of 2.33.

The intrinsic value of PBV AUTO is 0.69 in the pessimistic scenario, 0.71 in the moderate scenario, and 1 in the optimistic scenario. The intrinsic value of PBV AUTO in all scenarios is within the industry range. In the RV method of the PER approach, AUTO shares are considered undervalued because the intrinsic value of PER AUTO in all scenarios is below the industry average of 23. The intrinsic value of PER AUTO is 12.8 times higher in the pessimistic scenario, 13.3 times higher in the moderate scenario, and 18 times higher in the optimistic scenario. The intrinsic value of PER AUTO in all scenarios is within the industry range.

The valuation results from BOLT with data in 2021 for WACC = 6.9%, industry growth = 5.1%, company growth = 7.5%, number of shares = 2,343,750,000, EAT = 82.7 billion, and Book value of equity = 817.6 billion are presented in Table 4.8

Tabel 4.8 BOLT Valuation Results

DCF - FCFF						
Scenario	Intrinsic Value (Rp)	Market price on 30 December 2021 (IDR)			Analysis	Deviation
Pessimist	84.3	825			<i>Overvalued</i>	-89.8%
Moderate	182.8				<i>Overvalued</i>	-77.8%
Optimist	565.3				<i>Overvalued</i>	-31.5%
RV - PER						
Scenario	PER Company	PER Industry Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	2.4	-29	23	34	<i>Undervalued</i>	<i>Valid</i>
Moderate	5.2				<i>Undervalued</i>	<i>Valid</i>
Optimist	16.0				<i>Undervalued</i>	<i>Valid</i>
RV - PBV						
Scenario	PBV Company	PBV Industry Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	0.2	0.29	2.33	5.18	<i>Undervalued</i>	<i>Valid</i>
Moderate	0.5				<i>Undervalued</i>	<i>Valid</i>
Optimist	1.6				<i>Undervalued</i>	<i>Valid</i>

Source: www.idx.com dan finance.yahoo.com ((Data processed))

Based on the data in Table 4.8, using the DCF method, BOLT shares are considered overvalued because the intrinsic value of BOLT in all scenarios is below the market price on December 2021 of Rp. 825. The intrinsic value of BOLT in the pessimistic scenario is Rp. 85.1, with a deviation from the market price of -89.7%, while Rp. 184.5 in the moderate scenario, with a deviation from the market price of -77.6% and Rp. 571.5 in the optimistic scenario, with a deviation of -30.7% from the market price.

By using the RV-PBV approach, BOLT shares are considered undervalued because the intrinsic value of BOLT's PBV in all scenarios is below the industry average of 2.33. BOLT PBV intrinsic value is 0.24 times in the pessimistic scenario, 0.53 times in the moderate scenario, and 1.64 times in the optimistic scenario. BOLT's PBV intrinsic value in all scenarios is within the industry range. In the RV method of the PER approach, BOLT shares are considered undervalued because the intrinsic value of a PER BOLT in all scenarios is below the industry average of 23. The intrinsic value of PER BOLT is 2.4 times higher in the pessimistic scenario, 5.2 times higher in the moderate scenario, and 16.2 times higher in the optimistic scenario. The per-bolt intrinsic value in all scenarios is below the industry range.

Valuation results from LPIN with data for 2021 for WACC = 8.8%, industry growth = 5.1%, company growth = 4.7%, number of shares = 425,000,000, EAT = 25.4 billion, and Book value of equity = 309.9 billion, presented in Table 4.9. Based on the data in Table 4.9, using the DCF method, LPIN's shares are considered undervalued because the intrinsic value of LPIN in all scenarios is above the market price on December 2021 of Rp. 390. The intrinsic value of LPIN in the pessimistic scenario is Rp. 557.6, with a deviation from the market price of 43%, while Rp. 573.6 in the moderate scenario, with a deviation from the market price of 47.1% and Rp. 745.6 in the optimistic scenario, with a deviation from the market price of 91.2%.

By using the RV-PBV approach, LPIN's shares are considered undervalued because the intrinsic value of LPIN's PBV in all scenarios is below the industry average of 2.33. LPIN's PBV intrinsic value is 0.76 times in the pessimistic scenario, 0.79 times in the moderate scenario, and 1.02 times in the optimistic scenario. The intrinsic value of LPIN's PBV in all scenarios is within the industry range. In the RV method of the PER approach, LPIN shares are considered undervalued because the intrinsic value of PER LPIN in all scenarios is below the industry average of 23. The intrinsic value of PER LPIN is 9.3 times in the pessimistic scenario, 9.57 times in the moderate scenario, and 12.43 times in the optimistic scenario. The intrinsic value of PER LPIN in all scenarios is below the industry range.

Tabel 4.9 Hasil Valuasi LPIN

Scenario	Intrinsic Value (Rp)	Market price on 30 December 2021 (IDR)			Analysis	Deviation
Pessimist	567.4	390			<i>Undervalued</i>	45.5%
Moderate	583.7				<i>Undervalued</i>	49.7%
Optimist	759.5				<i>Undervalued</i>	94.7%
RV - PER						
Scenario	PER Company	PER Industry Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	9.5	-29	23	34	<i>Undervalued</i>	<i>Valid</i>
Moderate	9.7				<i>Undervalued</i>	<i>Valid</i>
Optimist	12.7				<i>Undervalued</i>	<i>Valid</i>
RV - PBV						
Scenario	PBV Company	PBV Industry Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	0.8	0.29	2.33	5.18	<i>Undervalued</i>	<i>Valid</i>
Moderate	0.8				<i>Undervalued</i>	<i>Valid</i>
Optimist	1.0				<i>Undervalued</i>	<i>Valid</i>

Source: www.idx.com dan finance.yahoo.com ((Data processed))

V. DISCUSSION

The following is the result of calculating the intrinsic value of shares using the DCF and RV methods:

Company	Scenario	Intrinsic Value	Stock Price on 1 January 2022	Result	PER	PER Industry - IDX Q4 2021	PBV	PBV Industry - IDX Q4 2021
AUTO	Pesimis	1692.3	1,155	<i>Undervalued</i>	12.8	Min: -29	0.69	Min: 0.29
	Moderat	1745.6		<i>Undervalued</i>	13.3	Avg: 23	0.71	Avg: 2.33
	Optimis	2376.9		<i>Undervalued</i>	18.0	Max: 34	0.97	Max: 5.18
BOLT	Pesimis	84.3	825	<i>Overvalued</i>	2.4	Min: -29	0.24	Min: 0.29
	Moderat	182.8		<i>Overvalued</i>	5.2	Avg: 23	0.53	Avg: 2.33
	Optimis	565.3		<i>Overvalued</i>	16.2	Max: 34	1.64	Max: 5.18
LPIN	Pesimis	567.9	390	<i>Undervalued</i>	9.5	Min: -29	0.78	Min: 0.29
	Moderat	584.2		<i>Undervalued</i>	9.7	Avg: 23	0.80	Avg: 2.33
	Optimis	760.1		<i>Undervalued</i>	12.7	Max: 34	1.04	Max: 5.18

Source: data processed

Based on Table 4.10, it can be seen that in the pessimistic scenario, the intrinsic value of AUTO and LPIN shares using the Discounted Cash Flow (DCF) method and the Free Cash Flow to Firm (FCFF) approach is undervalued because the stock price on January 1, 2022, is lower than the calculation results. Meanwhile, the intrinsic value of the BOLT shares was overvalued because the stock price on January 1, 2022, was higher than the calculation results.

The calculation results of the intrinsic value of AUTO's using the DCF method in a pessimistic scenario of IDR 1,692, while the price on January 1, 2021 is IDR 1,155. The difference between the intrinsic value in the pessimistic scenario and the stock price on the market is due to the company's performance in the next five years in accordance with market expectations. Whereas BOLT has an intrinsic value of IDR 85.1, on January 1, 2021,

the BOLT share price is IDR 825, which is quite a big difference between the intrinsic value in the pessimistic scenario and the stock price on the market due to the estimated average BOLT revenue growth in the projections for the next five years of only 4.5%, which means it is lower than the average BOLT revenue growth for the 2017–2021 period of 7.5%. And the result of calculating the intrinsic value of LPIN's shares is IDR 567,9, On January 1, 2021, LPIN's share price was IDR 390. The difference between the intrinsic value in the pessimistic scenario and the share price in the market was caused by the company's performance in the next five years in line with market expectations.

Based on the results of calculating the intrinsic value in the pessimistic scenario where the results for AUTO and LPIN are undervalued, investors are recommended to buy AUTO and LPIN shares. Meanwhile, BOLT shares are in an overvalued condition, so investors can sell or not buy BOLT shares.

The PER calculation results in the pessimistic scenario for AUTO being 12.8 times, BOLT being 2.4 times, and LPIN being 9.5 times. Meanwhile, IDX Q4 data for 2021 shows that the average PER value for the automotive subsector is 23 times, with the lowest PER value at -29 times and the highest at 34 times. This shows that the results of calculating the intrinsic value of PER AUTO, BOLT, and LPIN are declared valid because they are within the industrial range. Furthermore, the PBV calculation results with a pessimistic scenario show that the AUTO PBV value is 0.69 times, BOLT is 0.24 times, and LPIN is 0.78 times. Meanwhile, IDX Q4 data for 2021 shows that the average PBV value for the automotive subsector is 2.33 times, with the lowest PBV value at 0.29 times and the highest at 5.18 times. This shows that the results of calculating the intrinsic value of PBV AUTO, BOLT, and LPIN are declared valid because they are within the industrial range

Based on the results of valuation calculations in pessimistic scenarios using the PER approach Relative Valuation method, show that BOLT stock prices are cheaper when compared to AUTO and LPIN, where the PER BOLT value is smaller when compared to the PER value of AUTO and LPIN, which is 2.4 times, which means that if we invest in BOLT shares, the return on investment (BEP) is 2 years and 4 months, which is faster than AUTO and LPIN shares. So, investors should choose BOLT shares when compared to AUTO and LPIN shares. This is in line with research conducted by Alhazami (2020), which states that the smaller the PER value of a company, the better it is because it is included in the cheap stock category (Darmadji Tjiptono and Hendy M. Fakhruddin, 2011). But this research is not in line with the research conducted by Anwar and Rahmalia (2019), which states that PER has no effect on stock prices. While there are suggestions for companies if they want a low PER value, companies need to increase earnings per share of their shares.

Meanwhile, using the PBV approach, BOLT's share price is cheaper when compared to AUTO and LPIN, where the PBV value of BOLT is smaller than that of AUTO and LPIN, which is 0.24 times compared to its intrinsic value. So, investors prefer BOLT shares when compared to AUTO and LPIN shares. Meanwhile, companies are advised to increase the book value of the company by increasing the amount of equity, so that the PBV value will decrease.

Based on Table 4.10, it can be seen that in a moderate scenario, the intrinsic value of AUTO and LPIN shares using the Discounted Cash Flow (DCF) method and the Free Cash Flow to Firm (FCFF) approach is undervalued because the stock price on January 1, 2022, is lower than the calculation results. Meanwhile, the intrinsic value of the BOLT shares is overvalued because the stock price on January 1, 2022, is higher than the calculation results. Overall, the intrinsic value of AUTO and LPIN shares is considered undervalued, with a deviation of 51.1% and 49.8%, respectively. The results of calculating the intrinsic value of AUTO in a moderate scenario are IDR 1,746; the price on January 1, 2021 is IDR 1.155, The difference between the intrinsic value in the moderate scenario and the stock price in the market is caused by the company's performance in the next five years as projected in line with market expectations.

Whereas BOLT has an intrinsic value of IDR 184.5, on January 1, 2021, the BOLT share price is IDR 825, which is quite a big difference between the intrinsic value in the moderate scenario and the market share price due to the estimated average BOLT revenue growth in the projections for the next five years of only 6.8%, which is lower than the average BOLT revenue growth for the 2017–2021 period of 7.5%. And the result of calculating the intrinsic value of LPIN's shares is Rp. 584.2, where on January 1, 2021, the LPIN's share price is Rp. 390, the difference between the intrinsic value in the moderate scenario and the share price in the market is caused by the company's performance in the projections for the next five years according to market expectations.

Based on the results of calculating intrinsic value in a moderate scenario where the results of AUTO and LPIN are undervalued, investors are recommended to buy AUTO and LPIN shares. Meanwhile, BOLT shares are in an overvalued condition, so investors can sell or not buy BOLT shares.

PER calculation results in a moderate scenario for AUTO at 13.3 times, BOLT at 5.2 times, and LPIN at 9.7 times. Meanwhile, IDX Q4 data for 2021 shows that the average PER value for the automotive subsector is 23 times, with the lowest PER value at -29 times and the highest at 34 times. This shows that the results of calculating the intrinsic value of PER AUTO, BOLT, and LPIN are declared valid because they are within the industrial range.

Furthermore, the PBV calculation results with a moderate scenario show that the PBV value for AUTO is 0.71 times, BOLT is 0.53 times, and LPIN is 0.80 times. Meanwhile, IDX Q4 data for 2021 shows that the average PBV value for the automotive subsector is 2.33 times, with the lowest PBV value at 0.29 times and the highest at 5.18 times. This shows that the results of the calculation of the intrinsic value of PBV AUTO, BOLT, and LPIN are declared valid because they are within the industrial range.

Based on the results of valuation calculations in a moderate scenario using the PER approach Relative Valuation method, BOLT stock prices are cheaper when compared to AUTO and LPIN, where the PER BOLT value is smaller when compared to the value of AUTO and LPIN shares with a PER value of 5.2 times, which means that if we invest in BOLT shares, the payback period (BEP) is 5 years and 2 months, which is faster than AUTO and LPIN shares. So, investors should choose BOLT shares when compared to AUTO and LPIN shares. While there are suggestions for companies if they want a low PER value, companies need to increase earnings per share of their shares. This is in line with research from Danieswara Halim & Hafni (2019) and Wilandari (2019), which states that earnings per share have a significant and positive effect on stock prices.

Whereas using the PBV approach, BOLT's share price is cheaper when compared to AUTO and LPIN, where the PBV value of BOLT is smaller than that of AUTO and LPIN, which is 0.53 times compared to its intrinsic value. So, investors prefer BOLT shares when compared to AUTO and LPIN shares. Meanwhile, companies are advised to increase the book value of the company by increasing the amount of equity, so that the PBV value decreases.

Based on Table 4.10, it can be seen that in the optimistic scenario, the intrinsic value of AUTO and LPIN shares using the Discounted Cash Flow (DCF) method and the Free Cash Flow to Firm (FCFF) approach is undervalued because the stock price on January 1, 2022, is lower than the calculation results. Meanwhile, the intrinsic value of the BOLT shares is overvalued because the stock price on January 1, 2022, is higher than the calculation results.

Overall, the intrinsic value of AUTO and LPIN shares is undervalued, with a deviation of 105.8% and 94.9%, respectively. The calculation results of AUTO's intrinsic value in the optimistic scenario are IDR 2,377, while the price on January 1, 2021 is IDR 1,155. The difference between the intrinsic value in the optimistic scenario and the stock price on the market is caused by the company's performance in the next five years in line with market expectations.

Whereas BOLT has an intrinsic value of IDR 571.5 and, on January 1, 2021, the BOLT share price is IDR 825, the difference between the intrinsic value in a moderate scenario and the market price of shares is due to the estimated average BOLT revenue growth in the projections for the next five years, which is only 7.3%. meaning that it is lower than the average BOLT revenue growth for the 2017–2021 period of 7.5%. And the result of calculating the intrinsic value of LPIN's shares is Rp. 760.1, where on January 1, 2021, the LPIN's share price is Rp. 390, the difference between the intrinsic value in the optimistic scenario and the share price in the market is due to the company's performance in the next five years according to market expectations.

Based on the results of calculating intrinsic value in an optimistic scenario where the results of AUTO and LPIN are undervalued, investors are recommended to buy AUTO and LPIN shares. Meanwhile, BOLT shares are in an overvalued condition, so investors can sell or not buy BOLT shares. In the optimistic scenario, the PER calculation results for AUTO are 18 times, BOLT is 16.2 times, and LPIN is 12.7 times. Meanwhile, IDX Q4 data for 2021 shows that the average PER value for the automotive subsector is 23 times, with the lowest PER value at -29 times and the highest at 34 times. This shows that the results of calculating the intrinsic value of PER AUTO, BOLT, and LPIN are declared valid because they are within the industrial range. Furthermore, the PBV calculation results with an optimistic scenario show that the PBV value for AUTO is 0.97 times, BOLT is 1.64 times, and LPIN is 1.04 times. Meanwhile, IDX Q4 data for 2021 shows that the average PBV value for the automotive subsector is 2.33 times, with the lowest PBV value at 0.29 times and the highest at 5.18 times. This shows that the results of calculating the intrinsic value of PBV AUTO, BOLT, and LPIN are declared valid because they are within the industrial range.

Based on the results of valuation calculations in the optimistic scenario using the relative valuation method with the PER approach, show that LPIN's share price is cheaper when compared to AUTO and BOLT, where the PER value of LPIN is smaller when compared to the value of AUTO and LPIN shares with a PER value of 12.7 times, which means that if we invest in LPIN shares, the return on investment (BEP) is 12 years and 7 months, which is faster than AUTO and BOLT shares. So, investors should choose LPIN shares when compared to AUTO and BOLT shares.

Stocks with relatively low PER values will be more attractive to investors when compared to stocks with relatively high PER values. This is because a small PER value indicates a high earning per share value when compared to the stock price, so the rate of return is better. This result is in line with the results of research conducted by Rahmawantari and Puspitaningtyas (2019). While suggestions for companies if they want a low PER value are that they need to increase earnings per share of their shares, the results of this study are in line with research from Rijikan and Hendrawan (2019), but this study is not in line with research from Fajri et al. (2021), which states that a low PER means that the company has poor performance for investment.

Meanwhile, using the PBV approach, AUTO's share price is cheaper when compared to BOLT and LPIN, where the PBV value of AUTO is smaller than that of BOLT and LPIN, which is 0.97 times compared to its intrinsic value. So, for investors to prefer AUTO shares when compared to BOLT and LPIN shares, Meanwhile, companies are advised to increase the book value of the company by increasing the amount of equity, so that the PBV value decreases.

Many studies have been conducted on the fair value valuation of shares using the Discounted Cash Flow (DCF) method, the Free Cash Flow to Firm (FCFF) approach, and Relative valuation, such as those by Soelistyo, A., and Hendrawan, R. (2022), Gilbran and Hendrawan (2022), Sitorus et al. (2019), Neaxie, LV, and Hendrawan, R. (2018) and Liu (2019). Even Suryanto (2016) used the Price Earning Ratio (PER) method on LQ45 index stocks. Alhazami (2020) conducted research on company stocks that are included in the LQ45 index and are still suitable for collection during the COVID-19 pandemic, one of which is a company from the automotive sector. Investors who want to buy shares should do fundamental analysis because it has a significant effect on the effectiveness of investment decisions (Elbially, 2019).

VI. CONCLUSION AND RECOMMENDATION

This study aims to calculate the intrinsic value of shares in companies belonging to the automotive sub-sector listed on the Indonesia Stock Exchange, including PT. Astra Otoparts Tbk, PT Garuda Metalindo Tbk, and PT Multi Prima Sejahtera Tbk. The valuation methods used in this study are the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF) approach and the Relative Valuation (RV) method with the Price Earning Ratio (PER) and Price to Book Value (PBV) approaches. So, based on the formulation of the problem that has been described and the results of the calculation of the stock valuation described in the previous chapter, the conclusions are as follows:

1. In the pessimistic scenario, the results of calculating the fair value of shares using the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF) approach show that the fair value of AUTO and LPIN shares is undervalued, while the fair value of BOLT shares is overvalued. So, with these results, investors should sell BOLT shares and buy AUTO and LPIN shares.
2. In the pessimistic scenario, the results of the calculation of the DCF method are validated using the Relative Valuation (RV) method of the Price Earning Ratio (PER) and Price to Book Value (PBV) approaches, where the results of the calculation of AUTO, BOLT, and LPIN stocks are declared valid because they are still in the range industry according to data available in IDX Q4 2021.
3. In a moderate scenario, the results of calculating the intrinsic value of the shares using the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF), AUTO, and LPIN approaches are undervalued, while the intrinsic value of BOLT shares is overvalued. With this result, investors should sell BOLT shares and buy AUTO and LPIN shares.
4. In a moderate scenario, the results of the calculation of the DCF method are validated using the Relative Valuation (RV) method of the Price Earning Ratio (PER) and Price to Book Value (PBV) approaches, where the results of the calculation of AUTO, BOLT, and LPIN stocks are declared valid because they are still in the range industry according to data available in IDX Q4 2021.

5. In the optimistic scenario, the results of calculating the intrinsic value of the shares using the Discounted Cash Flow (DCF) method with the Free Cash Flow to Firm (FCFF), AUTO, and LPIN approaches are undervalued, while the intrinsic value of BOLT shares is overvalued. With this result, investors should sell BOLT shares and buy AUTO and LPIN shares.
6. In the optimistic scenario, the calculation results of the DCF method are validated using the Relative Valuation (RV) method, the Price Earning Ratio (PER), and the Price to Book Value (PBV) approaches, where the results of the AUTO, BOLT, and LPIN stock calculations are declared valid because they are still in the range industry according to data available in IDX Q4 2021.

Suggestion Based on the existing conclusions, the authors recommend suggestions that can be used as input for further writing, namely:

1. For future researchers, this study has several limitations, including the fact that the results of this study are only valid in 2022. This takes into account the many factors that affect industry and market conditions, so it is necessary to re-do the research in the following year. Also, this study only uses financial report data from the last five years, so the projections are also limited to the next five years. It is hoped that further research can be carried out with historical data over a longer range to produce better projections in different industries.
2. For investors, besides paying attention to the target share price, it is also recommended to pay attention to historical and recent conditions regarding fundamentals and company performance as comparative information in making decisions. The political situation of the state and the social community can also be factors that affect economic conditions.
3. For companies to maintain and increase the value of shares in the market, in addition to increasing company performance with output revenue and EAT, they must also run their business by ensuring the cost efficiency and effectiveness of company programs, both OPEX and CAPEX.

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Is the tobacco stock still relevant for future investment? Research on Indonesian Stock Exchange sub sector tobacco 2017-2021

Arlinton Hutapea¹, Dwi Fitrizal Salim²

¹ Graduate Study Program of Management, Faculty of Economics and Business, Telkom University, Bandung, Indonesia

² A Lecturer of Schools of Economics and Business, Telkom University, Bandung, Indonesia

Abstract

Investment is an activity carried out to obtain profits for shareholder. Investment decisions-making is based on investors' behaviour that is influenced by rational and irrational behaviour. The volatility of stock prices in the market has not shown their true fair value. This thesis aims to provide investors or shareholder with a rational picture of the fair prices of companies in Indonesia listed on the Indonesia stock exchange such as PT HM SAMPOERNA (HMSP), PT GUDANG GARAM (GGRM), and PT INDONESIA TOBACCO (ITIC) using the discounted cash flow method of Free Cash Flow to Firm (FCFF) and Relative Valuation approaches (RV). DCF is a valuation technique based on fundamental analysis, while relative valuation is based on comparisons with similar industries. The calculation of fair prices is carried out with 3 scenarios such as pessimistic, moderate, and optimistic to get stock prices, Price to Booked Value (PBV), Price to earnings ratio (PER). The Fair Price analysis is based on financial statements 2017-2021 and projection for 2022 to 2026. The results showed that HMSP equities were overvalue in all scenarios with a ROI of -0.28. on the other hand, GGRM equities are overvalued in the pessimistic and moderate scenarios with $0.11 < ROI < 0.22$ and undervalued in the optimistic scenario with a ROI of 0.08. Next, ITIC equities are under-valued in the moderate and optimistic scenario with $-0.79 < ROI < -0.50$, and overvalued in the pessimistic scenario with ROI of -0.50.

Keywords: Free Cash Flow to Firm; Relative Valuation; Tobacco industry; intrinsic value; valuation; return on investment

I. INTRODUCTION

The cigarette industry has an essential role in moving the wheels of the national economy. Data from the Central Statistics Agency (BPS) show excise revenue in 2022 reached IDR 203.92 trillion, or 13.9% of total domestic tax revenue. However, the existence of the cigarette industry also presents a dilemma for the Indonesian government. On the one hand, it increases state revenue, but on the other hand, it impacts the state's health burden. In the last five years, the government has issued several policies that regulate the cigarette industry.

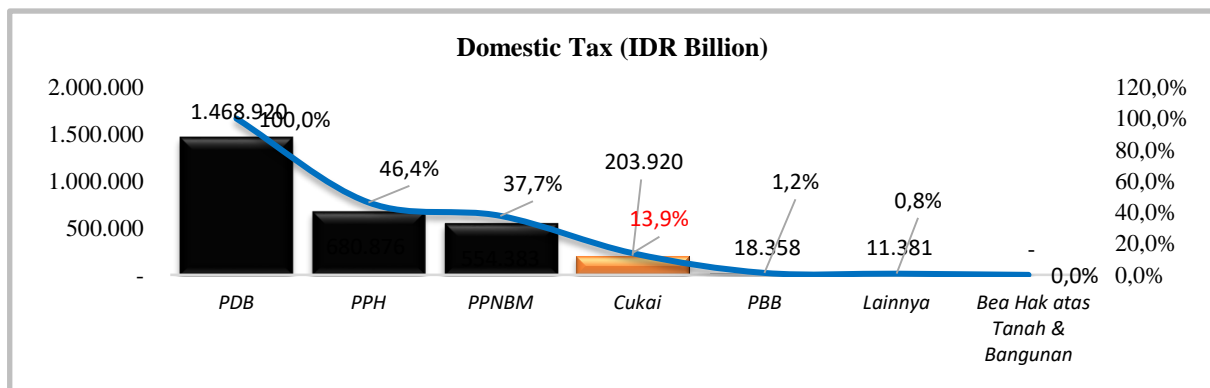


Figure 1.1 Indonesia Domestic Tax (2022)

The implementation of government policies has an impact on the cigarette industry and is also a challenge for tobacco players to maintain financial performance in the future. The composite stock price index (IHSG) data for 2012–2022 showed volatility price in the market. It is influenced by many factors, such as market response to the company's financial performance, social and political factors, and government policies that can affect company profits in the future. Fluctuations in the market cannot be used as a reference for companies or investors because they do not yet show the fair price of the Tobacco shares. Finding a fair price for a company is an essential role for investors and shareholders before carrying out investment activities (Damodaran, 2012).

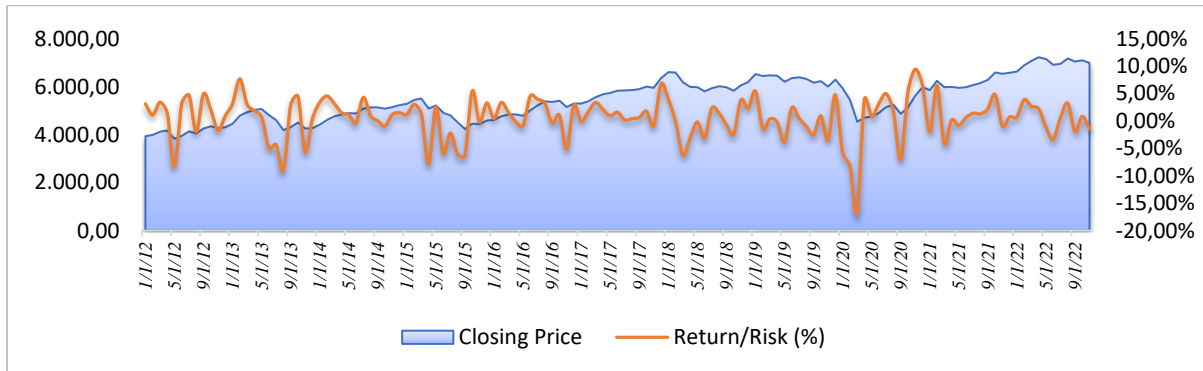


Figure 1.2 Closing market in IHSG

There are two methods often used in conducting valuations: FCFF and Relative Valuation (Gibran & Hendrawan, 2021, Yangting Dong, 2018). Free Cash Flow to Firm is a method used cash flow approach available to all investors (debt and equity), after including common stockholders, bondholders, and preferred stockholders. (Pinto et al, 2015). While Relative Valuation (RV) is a method used for doing comparison of assets or other standard variables to industry averages of a similar type of cash flow approach available to all investors (debt and equity), after including common stockholders, bondholders, and preferred stockholders.

The phenomenon of price volatility and the Government's ESG policy have an impact on the fair price of cigarettes in Indonesia and Return on Investment (ROI). The relationship between valuation and ROI is an issue worth discussing to see whether the cigarette industry is still relevant for future investment. This Study aims to find the intrinsic value of shares and ROI in the Tobacco Sector in 2022-2026 based on the 2017-2021 audited financial reports. The results can be used as strategic input for investors in making investment decision and for corporation in determining strategic action.

II. LITERATURE REVIEW

Valuation is the process of estimating the value of assets based on variables that consider their return in the future, comparisons with similar or similar assets, and estimates of liquidity results. Intrinsic value is the value of an asset based on understanding the characteristics of the investment (Pinto, Henry et al, 2015:28). Three criteria can be used in making decisions (Pinto, Henry et al, 2015: 61), such as:

1. Undervalued means the company's intrinsic value is below current market conditions.
2. Fair Valued means the intrinsic value of a company is the same as the current market conditions.
3. Overvalued means that the company's intrinsic value is above the current market conditions.

Assessing the valuation of tobacco stocks, two approaches are commonly used: discounted cash flow (free cash flow to the firm) and Relative valuation. In conducting a valuation analysis, it is necessary to consider the business conditions, operations, political situation, and economic situation where the company is located.

Discounted Cash Flow

The Discounted Cash Flow method is a valuation based on the present value and the cash flow in the future. Cash flow is the movement of cash over N+1 periods. where the present value is greater than the future value. Understanding that asset values will change from time to time helps investors or shareholders make more optimal financial decisions. The Increasing price of goods or services is generally known as inflation. Later, inflation is expressed as R, while the period is T. The discounted cash is shown in the formulation 1.1 Below

$$\text{Value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t} \quad (1.1)$$

Free Cash Flow to Firm.

Cash flow approach available to all investors (debt and equity), after including common stockholders, bondholders, and preferred stockholders (Damodaran, 2012:380) . FCFF is simply stated based on fundamental analysis based on financial statements. FCFF is shown in the formulation 1.2 below

$$FCFF = EBITDA - D\&A - Interest - Tax D\&A + Interest \times (1 - Tax) + CWC - \text{Capital Expenditure} \quad (1.2)$$

The first step of FCFF is extracting data from financial statements for 2017–2021 related to income statements, balance sheets, and cash flow statement. From the financial statement, several important key parameters were obtained, such as growth, cost of good sales, depreciation amortization, and delta working capital (Ahn, L. 2017). These parameters are compared with revenue to get a common size for each company. All data is gathered and analysed as the basis for revenue projections and characteristic behaviour for the next five years. The company's growth is a guarantee for investors or shareholders against possible risks to the investments made.

The Next step of FCFF is to define projection growth based on criteria defined such as pessimistic, moderate, and optimistic. Industry growth analysis is usually obtained from several reports issued by several business analysts, such as Bloomberg, the World Bank, Etc. Expected returns or Growth are BIAS for investors and shareholders (Abarbanell & Lehavy, 2003; Heidle & Li, 1998; Damodaran, 2012). The weighted cost of Capital (WACC) is used to measure investment feasibility based on capital structure, debt ratio, and equity. The value of WACC is taken from the latest financial statements. Positive growth will have an impact on increasing enterprise value (EV). But negative growth will have an impact on declining EV. In this calculation, we will get several key parameters, such as stock price, PBV, and PER, for each scenario.

Relative Valuation

Comparison of assets or other standards against the average of the industry. Relative Valuation is widely used in best practice because it is easy to use and refers to several standard parameters such as Price to Book Value and Price to Earnings Ratio (Agudze et al. 2020). Stock analysts say that 85% of them tend to use PBV as the main parameter in conducting multiple valuations (Markunson, 2012). Stocks with a low intrinsic PER value will provide the possibility of a better rate of return than those with a higher PER value (Thalman, 2016; Dayag et al, 2019). Relative valuation does not use fundamentals as a reference but is based on market prices. Relative valuation is commonly used in the short term. Since there aren't two assets that remain the same, the use of RV requires an effort to find parameters of similarity between the assets being compared.

Return on Investment (ROI)

Financial ratios are used to measure the success of investments. (Damodaran, 2012; 59). A good ROI means that the benefits received are greater than the capital spent (Krisna & Andayani et al, 2021). ROI helps investors understand and measure investment performance objectively. ROI < 0 (Negative Value) is an indication of a bad investment, while ROI > 1 (Positive Value) is an indication of a good investment. The return on investment has a direct relationship with the risk received. In General, return on investment measured by Net Income divided by

the total capital issued. ROI has several weaknesses because it does not consider periods of time and market dynamics, so investors or shareholders need to evaluate it regularly.

III. RESEARCH METHODOLOGY

This research was conducted using secondary data on audited financial reports for a period of 5 years (2017–2021). Where in the financial reports was data obtained regarding revenue growth trends, cost behaviour, capital expenditures, and changes in working capital. Financial behaviour becomes the basis for valuation activity.

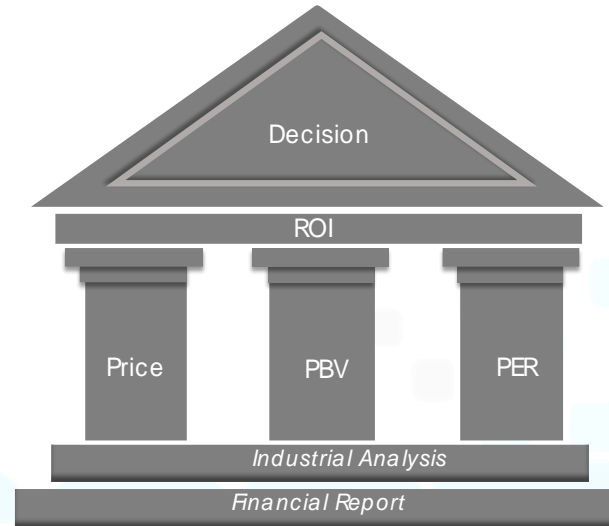


Figure 1.3 Research methodology

The next step is to determine growth projections based on market predictions (Lenoardo et al, 2022; Cambria et al., 2017; Minsky, 2014; Tan et al., 2019). Growth projections are an important basis for assessing FCFF. This study used projections based on Bloomberg analysis for August 2022, where industry growth will be 2.5%. Industry growth is compared with the average company growth to determine the pessimistic, moderate, and optimistic rating mechanisms for each stock. The FCFF results obtained the values of fair price, PBV, and PER. PBV and PER are compared with the industry average to see if the stock value is undervalued, fair value, or overvalued (Basri & Maya, 2020; Anggreani & Rikumahu, 2016). It becomes the initial reference for investors when buying or selling stocks. In addition to assessing the fair price of investment decisions, investors or shareholders need to consider the return on investments. If the stock is overvalued and the ROI is negative, the investor can decide to sell the stock. However, if the shares are undervalued and provide a positive ROI ($ROI > 1$), investors or shareholders may consider holding these share

IV. RESULTS/FINDINGS

FCFF Calculation based on the growth scenario shown in Table 1.1 Projection Growth

Stock	Average	Pessimistic	Moderate	Optimistic
HMSP	1,00%	1,00%	5,63%	7,19%
GGRM	10,45%	2,50%	10,45%	14,43%
ITIC	24,30%	2,50%	24,30%	35,20%

INDUSTRY	2,5%		5,6%	
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In Table 1.1 show the average growth for HSMP is 1.0%, GGRM is 10,45%, and ITIC is 24,30%. While Industrial Growth is 5,6% on average for 2017-2021, A Bloomberg analyst predicts that cigarette growth in 2022 will be at a CAGR of 2.5%. Growth perception is reflected in the recommendations provided by analysts and the bias for each investor and shareholder (Biglari, 2013; Selling & Nordlund, 2015). This Projection will be the basis of reference for the FCFF. If the company's growth is above the industry's growth, then the company's growth will become the basis for projections, or vice versa. Because HSMP growth is lower than industry growth, HSMP growth will range from 1% to 7.19%. Meanwhile, GGRM growth is higher than industry growth. then GGRM is expected to be 2.5% to 14.43%, while ITIC growth is predicted to be 2.5% to 35.20%. The highest growth becomes the optimistic, and the lowest growth becomes the pessimistic scenario.

Pessimistic Scenario

The valuation is calculated based on the lowest growth projection (Hendrawan & Siagian et al, 2018). It showed investment risk to investors or shareholders. In this scenario, the stock price will become a lower price for shareholders and a target price for investors.

Scenario Pessimistic	HSMP	GGRM	ITIC
Revenue (2021)	98.874.784	124.881.266	238.399
Growth Projection	1,0%	2,5%	2,5%
Enterprise Value	70.509.211	64.160.708	255.153
Equity Value	70.509.211	53.903.038	96.203
Cash 2021	17.843.656	4.169.740	3.212
EV+Cash	88.352.867	58.072.778	99.415
Book Value (Total)	29.191.406	59.288.274	324.680
PBV	3,03	0,98	0,31
PER	8,73	5,10	12,25
Value per Share	759,58	30.182	105,68
EPS	109	7.222	10,54
ROI	(0,28)	0,20	(0,50)

Table 1.2 Pessimistic Scenario

In pessimistic scenario, HSMP growth is 1.0%, while GGRM and ITIC are 2.5% same as the projection for 2022. The Calculation shows Enterprise value for HSMP at 70,509,211, GGRM at 64,160,708, and ITIC at 255,13. The intrinsic value for HSMP is IDR 759, GGRM is IDR 30,182, and ITIC is IDR 105. While PBV HSMP 3,03x, GGRM 0,98x, and ITIC 0,31x. PER Value: HSMP 8,73x, GGRM 5,10x, and ITIC 12,25x. ROI will be -0,28 for HSMP, 0,20 for GGRM, and -0,50 for ITIC.

Moderate Scenario

Valuation with an average growth rate where investors or shareholders have medium-term goals with an acceptable risk profile. Acceptable risk is a loss tolerated within certain limits by investors or shareholders. This Scenario is commonly used by investors or shareholders.

Scenario Moderate	HMSP	GGRM	ITIC
Revenue (2021)	98.874.784	124.881.266	238.399
Growth Projection	5,63%	10,45%	24,30%
Entreprise Value	82.426.361	83.451.567	507.704
Equity Value	82.426.361	73.193.897	348.754
Cash 2021	17.843.656	4.169.740	3.212
EV+Cash	100.270.017	77.363.637	351.966
Book Value (Total)	29.191.406	59.288.274	324.680
PBV	3,43	0,95	1,08
PER	8,28	5,04	20,03
Value per Share	862,03	40.208	374,15
EPS	124	8.961	18,68
ROI	(0,28)	0,11	(0,50)

Table 1.3 Moderate Scenario

In Table 1.3, it is shown that HSMP Growth is 5,63%, GGRM is 10,45%, and ITIC is 24,30%. The enterprise value of HMSP is 82,426,361, GGRM is 83,451,567, and ITIC is 507,704. The Intrinsic value for HMSP is IDR 862, GGRM IDR 40208, and ITIC IDR 374. While PBV HMSP 3,43x, GGRM 0,95x, and ITIC 1,08x. PER Value HSMP will be 8,28x, GGRM 5,04x, and ITIC 20,03x. ROI HSMP will be -0,28, GGRM 0,11, and ITIC -0,50.

Optimistic Scenario

Valuation calculation shows the highest level of confidence. The projection used shows the largest growth. The optimistic scenario has a greater risk than the previous scenarios because it ignores market uncertainty. Geopolitics and domestic stability are mandatory supports for market optimism.

Scenario Optimistic	HMSP	GGRM	ITIC
Revenue (2021)	98.874.784	124.881.266	238.399
Growth Projection	7,19%	14,43%	35,20%
Entreprise Value	86.781.448	94.683.240	691.271
Equity Value	86.781.448	84.425.570	532.321
Cash 2021	17.843.656	4.169.740	3.212
EV+Cash	104.625.104	88.595.310	535.532
Book Value (Total)	29.191.406	59.288.274	324.680
PBV	3,58	1,49	1,65
PER	8,15	5,01	21,76
Value per Share	899,47	46.045	569,28
EPS	130	9.951	24,31
ROI	(0,28)	0,08	(0,79)

Table 1.4 Optimistic Scenario

In Table 1.4 Shown shown that optimistic value for HSMP Growth will be 7,19%, GGRM is 14,43%, and ITIC is 35,20%. The enterprise value of HMSP is 86,781,448, GGRM is 94,683,240, and ITIC is 691,271. The Intrinsic value for HMSP is IDR 899, GGRM IDR 46045, and ITIC IDR 569. While PBV HMSP 3,58x, GGRM 1,49x, and ITIC 1,65x. PER Value HSMP will be 8,15x, GGRM 5,01x, and ITIC 21,76x. ROI HSMP will be -0,28, GGRM 0,08, and ITIC -0,79.

Price to Book Value (PBV). A general parameter that is commonly used in comparing a company's valuation. Data from IDX 2022 shows PBV and PER Values of 1.02 and 9.6, respectively. The industry value will be compared with the PBV and PER results from the DCF FCFE Calculation. A comparison of PER and PBV will show whether the intrinsic value is undervalued, fair value, or overvalued. Table 1.5 shows a comparison of them.

Skenario	Pesimis	Moderat	Optimis
▪ Price to Book Value	1,02	1,02	1,02
1. HMSP	▲ 3,03	▲ 3,43	▲ 3,58
2. GGRM	▼ 0,99	▼ 0,95	▲ 1,49
3. ITIC	▼ 0,31	▲ 1,08	▲ 1,65
▪ Relative Valuation			
1. HMSP	Overvalued	Overvalued	Overvalued
2. GGRM	Undervalued	Undervalued	Overvalued
3. ITIC	Undervalued	Overvalued	Overvalued

Table 1.5 Book Value Result

By looking at Table 1.5 above, The PBV value for HSMP is 3.03 to 3.58. While GGRM is 0.99 to 1.49 and ITIC is 0.31 to 1.65. It can be concluded that the HSMP PBV value is in an overvalued position in all scenarios, GGRM is in an undervalued position in pessimistic and moderate scenarios, and ITIC is overvalued in moderate and optimistic scenarios. The Initial market On January 2, 2022, HSMP shares traded at IDR 965, GGRM at IDR 30,600, and ITIC at IDR 282. Fair value using the PBV Parameter indicates that HSMP Share is IDR 2,867, GGRM IDR 29,400, and ITIC IDR 86.

Price to earnings ratios (PER). The Second parameter is Price to earnings ratio (PER). PER is a parameter of company's ability to generate income. PER Calculation result is shown in the Table 1.6

Skenario	Pesimis	Moderat	Optimis
▪ Price to earnings ratio	9,6	9,6	9,6
1. HMSP	▼ 8,73	▼ 8,28	▼ 8,15
2. GGRM	▼ 5,10	▼ 5,04	▼ 5,01
3. ITIC	▲ 12,25	▲ 20,03	▲ 21,76
▪ Relative Valuation			
1. HMSP	Undervalued	Undervalued	Undervalued
2. GGRM	Undervalued	Undervalued	Undervalued
3. ITIC	Overvalued	Overvalued	Overvalued

Table 1.6 PER Result

By looking at PER above, The PBV value for HSMP is 8,15 to 8,73. While GGRM is 5,01 to 5,10 and ITIC is 12,25 to 21,76. it can be concluded that HSMP and GGRM are in an undervalued position in all scenarios, while ITIC is in an overvalued position in all scenarios. The Initial market On January 3, 2022, HSMP shares traded at IDR 965, GGRM at IDR 30,600, and ITIC at IDR 282. Fair value using the PBV Parameter indicates that HSMP IDR 878, GGRM IRDR 16,256, and ITIC IDR 360.

Return on Investment (ROI). an important parameter in determining whether an investment provides long-term profits or losses. ROI is the ratio of earnings per share (EPS) to the total investment made. ROI Calculation result is shown in the Table 1.7.

Stock	Scenario	ROI
HSMP	Pessimistic	(0,28)
	Moderat	(0,28)
	Optimistic	(0,28)
GGRM	Pessimistic	0,20
	Moderat	0,11
	Optimistic	0,08
ITIC	Pessimistic	(0,50)
	Moderat	(0,50)
	Optimistic	(0,79)

Table 1.7 ROI Result

Table 1.2 shows that in the pessimistic scenario, the HSMP EPS value is IDR 109, the GGMR is IDR 7,222, and the ITIC is IDR 10,54. In the pessimistic scenario, HSMP ROI is -0.28, GGRM is 0.20, and ITIC is -0.50. Looking back at Table 1.3 in the moderate scenario, the EPS value for HSMP is IDR 124, GGRM is IDR 8,961, and ITIC is IDR 18.68. ROI in moderate conditions shows that HSMP is -0.28, GGRM is 0.11, and ITIC is -0.50. Optimistic conditions are shown in Table 1.4, where the EPS value of HSMP is 130, GGRM is 9,951, and ITIC is 24.31. From this condition, the ROI results for HSMP are -0.28, GGRM 0.08, and ITIC -0.79. Table 1.7 Show the results of ROI calculations at three cigarette companies show HSMP ROI will be -0.28, GGRM will be 0.08 < ROI < 0.20, and ITIC will be 0.79 < ROI = 0.50. ROI is measured over 5 years (2022–2026) compared to the total investment made.

V. DISCUSSION

The DCF and RV methods are common references and tools for conducting stock analysis and making investment decisions. PBV and PER should not be used separately but combined to provide a comprehensive assessment of asset valuation. The PBV parameter has several weaknesses, such as the comparison of company assets that are not the same. Companies with larger assets commonly have a higher PBV than their industry peers. While a company with a smaller size has the convenience of getting greater growth compared to the industry.

The impact of the cigarette tax cannot be demonstrated in this study because the cost behavior in 2017–2021 has not shown a significant increase. The additional excise burden is shown from the analysis of projected growth in 2022 of 2.5%, where the projected growth is -55% lower than the previous average growth. This decline indicates the market's low regard for the sustainability of the cigarette industry in the long run. The market risk level (Beta) used in this study is a constant obtained from the IHSB. So that market risk trends, and potential risks cannot be shown comprehensively. The potential risk can be shown through the daily stock price risk/return probability test.

Previous research by Kristina et al. (2021) revealed that the government's ESG policy succeeded in reducing the prevalence rate of smokers in Indonesia. However, the decrease in the prevalence rate has not affected the value of the return on investment in cigarettes. Previous studies have shown that tax increases contributed to a 55% cost-to-return ratio. Even though there was an increase in costs, the industry was able to provide a Positive ROI (1.82) over the 5-year time horizon. In this study, ROI is calculated using EBIT and EPS in each scenario over a 5-year time period. Through these calculations in Table 1.7, showing the average ROI for Tobacco is negative (-0,25). This result is different from previous research by Kristina.

Intrinsic value should be the first reference before making an investment decision. The use of ROI as an additional tool in assessing long-term investment is important, but it is also necessary to add other parameters such as margin of safety (MOS) to anticipate market uncertainty and increasing return on investment. MOS is required as a threshold limit for buying or selling shares. It will become an acceptable risk for investors or shareholder

VI. CONCLUSION

HSMP, as the market leader in the industry, shows the smallest trend of revenue growth compared to other competitors. Declining performance in 2020 and 2021 has a direct impact on intrinsic value and ROI results. From the calculation of FCFE and Relative Valuation, the HSMP Intrinsic Value is stated to be overvalued in all

scenarios, and HSMP has a negative ROI (-0.28). HSMP needs to increase the company's revenue in 2022 to gain market trust in the future. Based on the valuation parameters and ROI, it is advisable to sell HSMP so that investors or shareholders can receive a capital gain.

GGRM, as number two in the tobacco industry, performed better than the market leader. Over 5 years, the company recorded an average growth rate of 10.45% above the market growth value. Based on FCFE and Relative Valuation calculations, GGRM is declared overvalued and has a positive ROI in the range of $0.08 < ROI < 0.20$. GGRM's share price is 46 times higher than its market leader. By looking at these two parameters, investors should sell the stock to get the capital gain from it. While for the shareholders, selling shares can increase company capital and maintain market price conditions.

ITIC has the smallest market share compared to the previous two companies. However, ITIC recorded the largest growth compared to the others. Based on FCFE and Relative Valuation analysis, it was found that ITIC shares were overvalued with negative investment returns ($-0.79 < ROI < -0.50$), so it is advisable to SELL ITIC shares to get a short-term gain, and for the shareholder, selling stock can increase company capital and maintain the market.

This research has several weaknesses and is valid until 2022. This research does not analyze market perceptions (Beta) and projections of cost behavior as well as the impact of periodic increases in excise duty. The ROI calculation method in this study is different from previous research by Kristina (2021). Therefore, it is highly recommended that this research be continued and enriched in the future.

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How do we approach validating the intrinsic value? Approaching to validate the intrinsic value of Sub Sector Energy Oil, Gas, and Coal as a backbone Indonesian export during a pandemic and global crisis

Deddy Firdaus¹, Dwi Firizal Salim²

¹ Magister Management, Faculty of Economics and Business, Telkom University, Bandung, Indonesia

² A Lecturer of Schools of Economics and Business, Telkom University, Bandung, Indonesia

Abstract:

This study employs the Discounted Cash Flow (DCF) and Relative Valuation (RV) methods to determine the objective value of companies operating in the Oil, Gas, and Coal industry sub-sector listed on the Indonesia Stock Exchange (IDX) in 2022. The research utilizes audited financial statements from three companies over the period 2017-2021 to project their financial behavior for the next five years under three scenarios: pessimistic, moderate, and optimistic. The analysis includes the consideration of industry average values, Beta (β) as a factor for accurate discounted value determination, and Margin of Safety (MoS) as an approach for enhanced validity. The study concludes that PGAS shares are undervalued across all scenarios, with the lowest deviation in the pessimistic scenario. Additionally, the intrinsic value of PER and PGAS PBV suggests a position at the maximum end of the industry value range, making them favorable for investment. Conversely, PTBA shares are overvalued in the pessimistic and moderate scenarios, while the intrinsic value of PBV indicates undervalued status in the moderate and pessimistic scenarios and overvalued status in the optimistic scenario. As a result, the recommendation is to sell PTBA shares. The initial calculation indicates that ADRO shares are undervalued across all scenarios, but further analysis reveals that the intrinsic value of PBV is invalid, likely influenced by external factors such as the COVID-19 pandemic and global crises. To rectify this, the Margin of Safety (MoS) initiative is introduced to apply the correct risk aversion calculation and adjust the valuation accordingly. The study emphasizes the importance of valuations for both investors and corporations, enabling informed investment decisions and improved company performance in line with the business roadmap and continuity.

Keywords: Beta, DCF, Intrinsic value, Invested Capital, Margin of Safety (MoS), Relative Valuation, Risk Aversion.

I. INTRODUCTION

Based on the data from the Central Statistics Agency (BPS), non-tax state revenue (PNBP) from the natural resources sector remains a significant source of financing for sustainable development. In 2022, PNBP reached Rp. 335.55 trillion, with approximately 35% (Rp. 121.95 trillion) of this revenue originating from natural resource revenues. State revenues from other non-tax sources, commonly referred to as non-oil and gas, account for around 29.1% of the total.

Exports of natural resources also play a vital role in controlling inflation. However, the weak competitiveness of non-oil and gas exports and increased imports in various industries have led to the depreciation of the IDR (rupiah) exchange rate against international currencies

The daily stock price movements on the Indonesia Stock Exchange (IDX) for the energy sectors, particularly the companies State Gas Company (PGAS), PT Adaro Energy (ADRO), and the Bukit Asam Mining Company

(PTBA), show significant volatility over the years. The trends and dynamics of stock prices do not accurately represent the fair price or intrinsic value of the company's shares. This discrepancy in stock prices could lead to incorrect investment decisions by investors and may also influence corporate actions in the company's strategic roadmap going forward. Corporate decisions such as capital increases, acquisitions, spin-offs, and other actions may be affected by distorted stock prices.

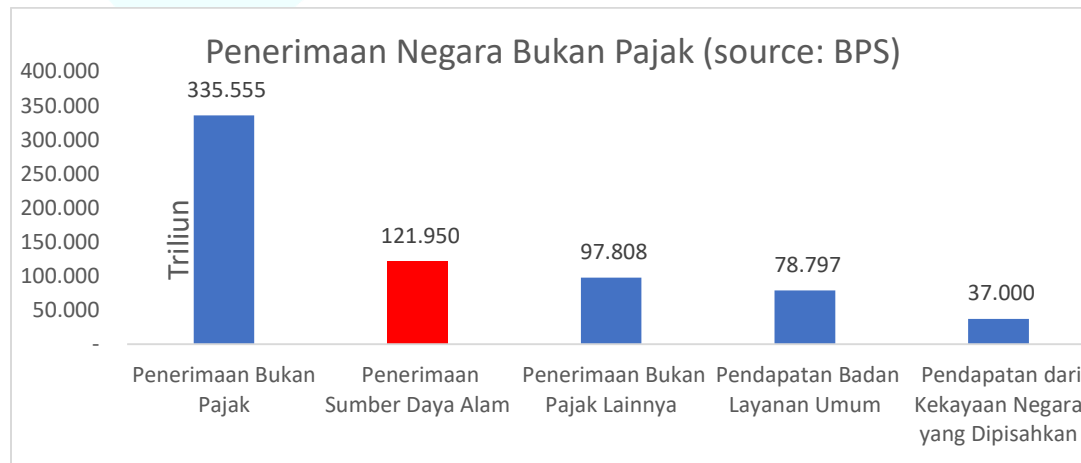


Figure 1. Illustrates the state revenue from the non-tax category in Q3 2022.

The findings suggest that there is a significant potential for misaligned stock prices in the market, indicating that the intrinsic value of these companies may not be adequately reflected. This calls for further analysis and considerations to make well-informed investment and corporate decisions.

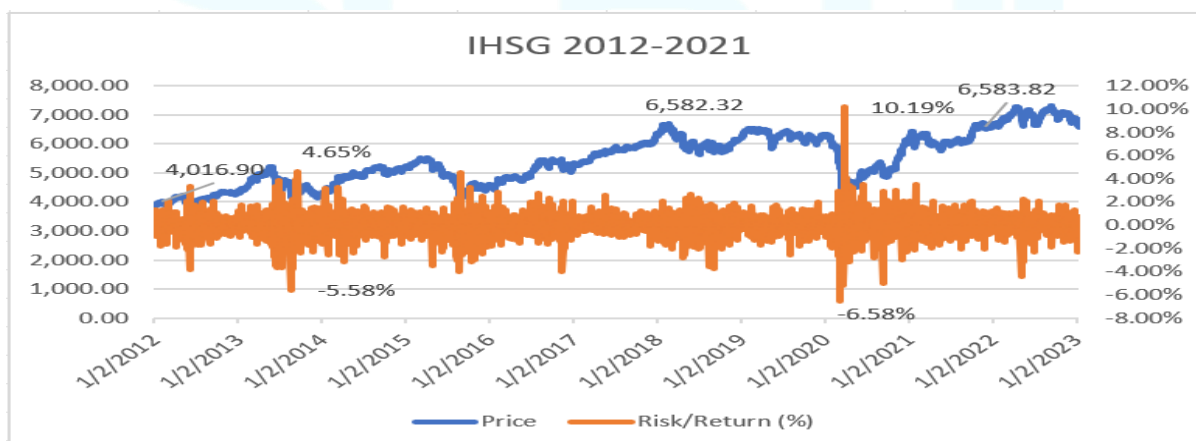


Figure 2 displays the closing market IHSG (Indonesia Stock Exchange Composite Index) from January 2012 to November 2022, highlight the fluctuations and volatility in the energy sector stock prices

In conclusion, non-tax state revenue from the natural resources sector remains essential for financing sustainable development. However, the significant volatility in daily stock price movements in the energy sector companies poses challenges in accurately determining the fair price or intrinsic value of their shares, affecting investment decisions and corporate strategic planning. Further analysis and consideration are necessary to ensure appropriate decision-making by both investors and corporations.

The Discounted Cash Flow (DCF) and Free Cash Flow to Firm (FCFF) methodologies were employed as the valuation methodology in this study. Using DCF, Damodaran (2012) shows how present asset prices and anticipated future cash flows are connected. For long-term estimates, DCF is regarded as a trustworthy technique for estimating firm value, Ivanovski et al. (2014) According to Luna (2018), the FCFF method is utilized to display the Operating

Income component that is used to pay investors and obligations. Relative valuation (RV), meantime, is used to determine whether the calculation was done using the Price to Earnings (PER) and Price to Book Value (PBV) techniques.

Furthermore, research by Hendrawan and Gibran (2020) examining the intrinsic value of stocks in the oil and gas sector demonstrates that MEDC and ELSE values are undervalued in all scenarios, while ESSA values are overvalued in all scenarios, including pessimistic, moderate, and optimistic scenarios. Therefore, in every case, the RV values for MEDC, ESSA, and ELSA are undervalued. Research In their study, Hendrawan and Zemba (2018) found that, among a sample of four healthcare firms (SAME, SRAJ, MIKA, and SILO), three of them had excessive valuations in 2018. The analysis's findings indicated that MIKA and SAME's PER and PBV are overloaded in every circumstance. The analysis's findings indicated that MIKA and SAME's PER and PBV are overloaded in every circumstance. DCF SILO analysis results are undervalued in optimistic and moderate situations, but overvalued in gloomy circumstances, in contrast to SILO, PER analysis results, which are overvalued in all scenarios. For SRAJ, DCF analysis reveals overpriced values in every scenario, and PER analysis yields negative findings.

The dynamics of stock price changes and risk/return that will occur in 2022 could also have an impact on the financial performance of companies in the oil, gas, and coal sub-sector in the future, according to the findings of prior study and the information provided. Likewise with investors, who have higher volatility when compared to the risk/return of the JCI in general. So that it has the potential of the stock price not yet representing its intrinsic value. The valuation method chosen and used in this study is to use the DCF and Free Cash Flow to Firm (FCFF) approaches. DCF is used to link current asset values with projected cash flows in the future, Damodaran (2012). DCF is also considered a reliable tool for valuing company value for long-term projections, Ivanovski et al., (2014) For the FCFF approach used to show the Operating Income component used to pay debts/investors, Luna (2018). Meanwhile, Relative Valuation (RV) is used to confirm whether the calculation has been carried out in accordance with the Price to Earnings (PER) and Price to Book Value (PBV) approaches.

II. LITERATURE REVIEW

The process of valuation is used to establish the worth of the relevant system. Investors are anticipated to be able to ascertain an item's fair value when doing company valuations in order to make investment-related decisions. According to McKinsey, businesses that perform well and have high returns and growth (returns over the cost of capital) will have a positive (high) value on the stock market (Koller 2005). However, it is noted in the publication Behavior Finance (Koller 2005) that market flaws, which can lead to investors acting irrationally, necessitate corrections and that the market is not always correct.

The Discounted Cash Flow (DCF) method utilizing the Free Cash Flow to Firm (FCFF) methodology is the method employed in scientific research for the assessment of stock values in businesses in the energy sector, oil, gas, & coal subsectors. Then use the Price to Earn (PER) and Price to Book Value (PBV) techniques to determine the value of assets utilizing the Relative Valuation (RV) method.

Discounted Cash Flow (DCF)

DCF is a valuation technique that uses a valuation approach to determine an asset's intrinsic value. This intrinsic value is defined as the present value of the future cash flows (expected cash flow), which is achieved by discounting the future cash flows at a specific rate that reflects the risk associated with those future cash flows (Damodaran, 2012:12). The DCF method is ideal for determining the fair value of a business with consistent earnings or cash flow since it makes the future growth and income more predictable (Damodaran, 2012: 19).

Free Cash Flow to Firm (FCFF)

FCFF considers all investors, including debt and equity holders, and calculates the cash flow available to them. The FCFF calculation involves adjusting EBIT for taxes, adding back depreciation and amortization, and reducing it by changes in working capital and capital expenditures (Damodaran 2012:380). The value of the company is obtained by discounting FCFF using the Weighted Average Cost of Capital (WACC), (Damodaran 2012:383).

Relative Valuation

Investors frequently utilize relative valuation because it has various benefits, including a calculating approach based on the comparative factors of several comparison companies. Investors will find the RV method to be simpler and easier to comprehend than the DCF method. Last but not least, the RV technique is applied relativistically rather than intrinsically, allowing it to display market circumstances. Compared to the DCF technique, the value produced by the RV method is also more in line with current market price conditions (Damodaran, 2012: 453-454).

The RV technique aggregates groups of comparable organizations, therefore the findings may be inconsistent since differing essential variables between companies, such as risk, growth, or projected cash flow, may be ignored. On the other hand, the RV method also has a number of drawbacks. Due to excessively pessimistic or optimistic market psychology, the RV technique occasionally causes asset values to swing too high or low. The RV approach is particularly sensitive to data processing in some circumstances because it only has a few findings on the assumptions used in the evaluation (Damodaran, 2012:454). In order for investors to execute multiplier calculations on the earning value, which is represented in the stock price, the multiplier, also known as multiples, is utilized in the RV technique. The RV method allows for the usage of PBV and PER, two of the multiplier's multiple ways.

Price Earnings Ratio (PER)

PER is the ratio between the market price of shares per share to the income per share price (Damodaran, 2012: 468). PER is also connected to the Value of equity and also Earning after tax, where PER is the comparison between the Value of Equity to Earnings after Tax. If the intrinsic value can be obtained, the next step is to compare the intrinsic value of the stock price to the market price. Damodaran also states other calculation formulas in calculating PER, namely by using the Dividend Payout Ratio (DPR), the Cost of Equity, and the expected dividend growth rate (Damodaran, 2012: 471): The company's shares are said to be undervalued if the PER value is relatively lower when compared to the average PER value in similar industrial sectors, provided that all companies are in the same sub-sector and have similarities. The higher the PER value, the smaller the profit for each share obtained, because the price of shares in the market is getting more expensive. On the other hand, if the PER value is lower, the profit for each share will be greater, because the market value of the company's share price is considered to be cheaper (Damodaran, 2012: 21). Stocks with a low intrinsic PER value will provide the possibility of a better rate of return compared to a higher PER value, (Thalman, 2016, Dayag et al, 2019)

Price to Book Value (PBV)

PBV is calculated by dividing the market price per share by the book value (book value) of equity per share (Damodaran, 2012: 512). PBV and the value of equity are related, and the PBV value is a comparison between the value of equity and the book value of equity. When doing investment research, investors frequently employ PBV, where the book value of an asset is the initial asset purchase price plus any development expenses since then, less the asset's depreciation cost (Damodaran, 2012: 29). Conversely, if the PBV value of the stock is lower than that of companies in similar industries, then the stock is likely to be undervalued. It is important to decide to buy undervalued stocks in order to obtain a greater rate of return and at a more measurable level of risk. Stock analysts, 85% of whom tend to use PBV as the main parameter in conducting multiple valuations, (Markunson, 2012)

Invested Capital

When calculating the company's stock value is stated to be too high, the company can use current market expectations to revise new equity or debt, (Luo et al, 2022), also known as invested capital, where Invested Capital is the sum of Debt and Equity Value, (Kumar, R., 2016; Badertscher, 2006).

III. RESEARCH METHODOLOGY

This research was carried out by validating the company based on the company's Fundamental Financial Statements that were audited for the period 2017-2021 in the energy sub-sector, by carrying out calculations for looking at cost behavior, and Forecast Industry based on market references to get projection growth in 2022. From this projection

growth percentage, we calculate how much the FCFF value is generated based on future revenue targets including costs, capex, debt, depreciation and amortization, net income after tax, and the value of working capital. After that, by calculating the WACC and Present Value produce enterprise value and finally get the equity value by taking into account the amount of cash and debt. From there we will calculate the intrinsic value of the company's stock price, PER value, and also PBV using the DCF and RV methods, based on an approach to 3 scenarios namely Pessimistic, Moderate, and Optimistic. Then compare the stock value, PER value, and PBV value to the industry average. Ending with the position of the share price value in the Undervalued, Fair Valued, or Overvalued position.

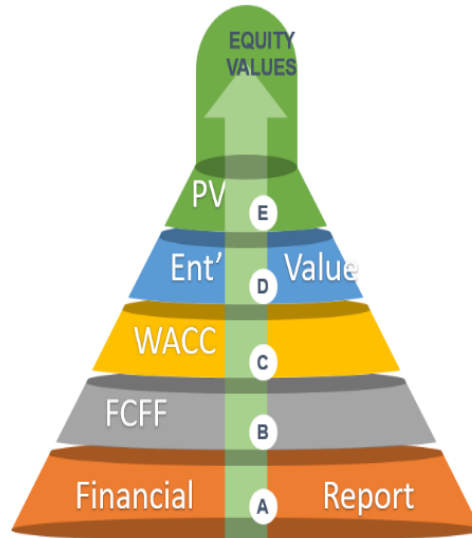


Figure 1.3. Research & Methodology

IV. RESULT

In Table 1. it can be seen that the share value of PGAS issuers as a whole is in an undervalued position, where the lowest deviation is in the pessimistic scenario at -4.32%. While in the moderate and optimistic scenario, the deviation is very high at the level of 170% and 212%. This is because one of the reasons is that the average PGAS revenue is 29.6% above the industry average in the oil, gas, and coal sub-sector, which is around 20.51% (Table 4.5), thus greatly influencing revenue projections and other calculations. for the period 2022-2026. Where the growth projection itself is analytically biased both from the point of view of shareholders and investors (ahn, Jaehan et al, 2019; Sattar et al, 2020; Norlund et al., 2021).

DCF FCFF							
Scenario	Intrinsic Value (USD)	Market Price			Average	Analysis	Deviation
		Low	Medium	High			
Pessimist	1,903.95	1590	1775	1990	1785	UNDERVALUED	-4.32%
Moderate	5,392.28					UNDERVALUED	170.97%
Optimist	6,226.64					UNDERVALUED	212.90%

RV - PER							
Scenario	PER Intrinsic	PER Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			
Pessimist	14.05	7.72	9.72	13	10.15	UNDERVALUED	Valid
Moderate	24.54					UNDERVALUED	Valid
Optimist	28.34					UNDERVALUED	Valid

RV - PBV							
Scenario	PBV Intrinsic	PBV Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			
Pessimist	1.49	1.15	1.31	1.4	1.29	UNDERVALUED	Valid
Moderate	2.61					UNDERVALUED	Valid
Optimist	3.01					UNDERVALUED	Valid

Source: www.idx.com dan finance.yahoo.com (processed data)

Table 1. PGAS Valuation

From Table 1. the PGAS valuation, the calculation results use pessimistic, moderate, and optimistic scenarios, where the pessimistic scenario shows the lowest growth rate, the optimistic scenario shows the highest growth rate, while the median/middle growth rate is shown by the moderate scenario (Goodwin et al, 2019). For the intrinsic value of PGAS's stock price in the pessimistic scenario, the deviation is quite low, but in contrast to the moderate and optimistic scenarios, the deviation is very high. This is heavily influenced by industry growth on the one hand and corporate growth on the other. Stock prices in the market are strongly influenced by the company's growth projections, while the company's growth value is made to look positive in the eyes of investors (Das et al, 2008). For the PER PGAS intrinsic value, for both pessimistic, moderate, and optimistic scenarios, all intrinsic values are above the industry average, where the industry average is at a PER value of 10.15. The PER value has a tendency to move in the opposite direction to the inflation trend (Clarke, 2014). That means that the PER value also depends on influencing macroeconomic factors, including inflation (Dayag, Trinidad, 2019; Farooq et al, 2017). With such conditions there are several price variables that are quite large due to the inflation factor, by itself, it is not easy to determine a fair price in the market (Hsu, Kudo, Yamada, 2013).

Stocks with a low PER intrinsic value will provide the possibility of a higher rate of return when compared to a higher PER value (Thalman, 2016; Dayag et al, 2019). Then the PBV intrinsic value in all scenarios, both pessimistic, moderate, and optimistic, is at the maximum position and is not far above the industry value range. From the results of research and calculations on the shares of PGAS issuers using the calculation of the DCF and RV methods, based on Table 4.7. it can be concluded that the price of PGAS shares is undervalued in all scenarios, in other words, the market value price is below the company's intrinsic value, (Basri, Maya, 2020; Hendrawan, Soelistyo, 2022; Kennedy et al, 2022), for this reason, it is recommended for decisions The investment taken is to buy PGAS shares.

Table 2. below states that ADRO shares are undervalued in all pessimistic, moderate, and optimistic scenarios. For the pessimistic scenario with an intrinsic value of 4,278.13 and a value above the industry range of 4,190 with a deviation of 8.03% in Q3 2022. ADRO's intrinsic value in the moderate scenario is 7991.49 with a much greater deviation of 101.81% to market price. Likewise the optimistic scenario with a value of 9,431.54 with a higher deviation of 138.17% from the market price. Furthermore, ADRO's PER intrinsic value is in the industry's average value of 13 times. ADRO's PER intrinsic value in the pessimistic scenario is 10.38 while in the moderate and optimistic

intrinsic values are 11.56 and 13.11 respectively. For the RV PBV method, the intrinsic value of ADRO is undervalued in all scenarios. The intrinsic value of ADRO's PBV in the pessimistic scenario is 1.97, in the moderate scenario, it is 3.68 followed by a value of 4.34 in the optimistic scenario. The resulting PBV intrinsic value is far above the Q3 2022 energy industry range, so the PBV intrinsic value is declared invalid. There is a significant deviation from the intrinsic value of PBV, which is around -50% on average, due to an increase in cash flows and cash equivalents with a significant value of 54.31% from 1.17 billion dollars to 1.81 billion dollars year on year in 2021. By carrying out a simple simulation to make a change by replacing this cash and cash equivalent value with a proportional value, it will show that the PBV intrinsic value of ADRO will be within the industry range with an overvalued value in all scenarios.

DCF FCFF							
Scenario	Intrinsic Value (USD)	Market Price			Average	Analysis	Deviation
		Low	Medium	High			
Pessimist	4,278.13	2110	3960	4190	3420	UNDERVALUED	8.03%
Moderate	7,991.49					UNDERVALUED	101.81%
Optimist	9,431.54					UNDERVALUED	138.17%
RV - PER							
Scenario	PER Intrinsic	PER Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			
Pessimist	10.38	7.72	9.72	13	10.15	OVERVALUED	Valid
Moderate	11.56					OVERVALUED	Valid
Optimist	13.11					UNDERVALUED	Valid
RV - PBV							
Scenario	PBV Intrinsic	PBV Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			
Pessimist	1.97	1.15	1.31	1.4	1.29	UNDERVALUED	Invalid
Moderate	3.68					UNDERVALUED	Invalid
Optimist	4.34					UNDERVALUED	Invalid

Source : www.idx.com dan finance.yahoo.com (processed data)

Table 2. ADRO Valuation

These changes and corrections are only made locally, where corrections are only made at high enough deviations due to the potential for errors due to inaccurate analysis assumptions and high enough deviations. It is important to avoid making changes in the company's assumptions and growth projections because it could impact the overall valuation even though other calculations are already in valid status. Making corrections locally is implemented

using the Margin of Safety (MoS) initiative. MOS is a parameter used in determining the percentage of the level of risk in investing (Damodaran, 2012). This MoS is usually applied by investors to anticipate and rectify the results of dubious DCF calculations, in other words, the MOS calculation is used as protection for investors against losses in the event of a decrease in net income in the future (Graham, 215-216, 2006). MoS can only be obtained if the investment made is obtained at a price that is below the value that allows human error, unlucky, or extreme price volatility with global implications (Klarman, 2004).

The MoS value is obtained from the diversity that occurs from all pessimistic, moderate, and optimistic scenarios for the industry range. The average of this diversity will produce a risk aversion value from the investment decisions of investors. Empirically the level of risk aversion is always consistent from time to time, within the scope of the current economic situation, (Arago, V. et al, 2022; Schildberg-Horisch, 2018), which can be done by self-report or survey methods (Guiso et al, 2018; Weber et al, 2013), you can also use the asset pricing model method (Cochrane, 2017) and also the experimental initiative method (Cohn et al, 2015; Konig-Kersting & Trautmann, 2018). Of course, the higher the perceived risk aversion value, the higher the MoS percentage selected. In this study, using the asset pricing risk aversion method, local corrections were made in the equity presentation and BV calculations to determine the validation of the next new PBV value (Cochrane, 2017). If the stock value of a company is too high, then the company can take advantage of market expectations to revise new equity or debt, (Luo et al, 2022), in other words, it is commonly called invested capital, (Invested Capital = Debt + Equity) (Kumar, R., 2016; Badertscher, 2006). On the other hand, investments that promote long-term growth are an innovation in valuing stocks with higher expectations (Dong et al, 2020). The selected ADRO PBV intrinsic value validation is a deviation of -28.84% as a correction to the previous intrinsic value in order to produce a valid PBV value in all scenarios. The ADRO intrinsic value that has been corrected with MoS is presented in Table 3. below.

DCF FCFF							
Scenario	Intrinsic Value (USD)	Market Price			Average	Analysis	Deviation
		Low	Medium	High			
Pessimist	3,198.48	2110	3960	4190	3420	OVERVALUED	-19.23%
Moderate	6,993.30					UNDERVALUED	76.60%
Optimist	9,351.37					UNDERVALUED	136.15%
RV - PER							
Scenario	PER Intrinsic	PER Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			
Pessimist	10.38	7.72	9.72	13	10.15	OVERVALUED	Valid
Moderate	11.56					OVERVALUED	Valid
Optimist	13.11					UNDERVALUED	Valid
RV - PBV							
Scenario	PBV Intrinsic	PBV Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			

Pessimist	1.11	1.15	1.31	1.4	1.29	OVERVALUED	Valid
Moderate	1.25					OVERVALUED	Valid
Optimist	1.27					OVERVALUED	Valid

Source : www.idx.com dan finance.yahoo.com (processed data)

Table 3. ADRO Valuation (corrected)

Table 3. states that ADRO shares turn out to be overvalued in pessimistic scenarios and undervalued in moderate and optimistic scenarios. For the pessimistic scenario with an intrinsic value of 3,198.48 and a value within the industry range of 4,190 with a deviation of -19.23% in Q3 2022. ADRO's intrinsic value in the moderate scenario is 6,993.30 with a deviation of 76.6% of the price market. Then the intrinsic value in the optimistic scenario is 9,351.37 with a 136.15% deviation from the market price. Using the RV PER method, Table 4.8 also states that ADRO shares are overvalued in pessimistic and moderate scenarios but undervalued in optimistic scenarios. ADRO's PER intrinsic value is within the average industry value of 13 times. ADRO's PER intrinsic value in the pessimistic scenario is 10.38 while in the moderate and optimistic intrinsic values are 11.56 and 13.11 respectively. For the RV PBV method, ADRO's intrinsic value changes from undervalued to overvalued in pessimistic and moderate scenarios. The intrinsic value of PBV turns into a multiple of accuracy that is much better and valid than the previous one, the results of this study are consistent with the results of previous studies (Suteja, B. et al, 2014; Ceng, Namara, 2000; Minjina 2009) The intrinsic value of PBV ADRO in the pessimistic scenario it is 1.11, in the moderate scenario it is 1.25 followed by a value of 1.27 in the optimistic scenario. The resulting PBV intrinsic value is within the Q3 2022 energy industry range. From the research results, investors are advised to choose the intrinsic value with the lowest market price and within the industry range with also low deviation. DCF analysis is a valuation technique by placing a price of intrinsic value that is closest to the market price, (Ivanovski et al, 2014).

The results of the research and calculation of ADRO issuer shares using the DCF and RV calculation methods are in Table 3. ADRO's DCF calculations are overvalued in the pessimistic scenario, as well as in the RV calculation, overvalued in PER for pessimistic and moderate scenarios, and for PBV calculations, overload for all scenarios. It can be concluded that the price of ADRO's shares is overvalued in most scenarios, in other words, the market value price is above the company's intrinsic value (Hendrawan, Dalilah, 2020; Rikumahu, Anggreani, 2016; Novitasari, Rahardi, 2020), thus recommending it for investment decisions The decision taken is to sell ADRO shares, because from the results of calculations in the pessimistic scenario, all intrinsic values, both the share price and PER and PBV values, are all overvalued.

Next, the PTBA issuer's share value is in an overvalued position in the pessimistic scenario with an intrinsic value of 2,256.98 and moderate at 3,901.62, but the lowest deviation is found in the moderate scenario with a deviation range of -6.44%, while the pessimistic scenario has a much higher deviation high by -45.88%. Thus the overvalued status is considered valid because the intrinsic value in the optimistic scenario has a very high deviation of 64.08%. Meanwhile, the intrinsic value of PER PTBA for pessimistic and moderate scenarios is also overvalued and is in a position below the industry value range. The next consideration is that the PBV intrinsic value of a moderate scenario of 1.70 is above the industry range, the status is undervalued, as well as the pessimistic scenario, the PBV value of 0.98 is below the industry range. Thus it is also necessary to make local corrections to the projected intrinsic PBV value of PTBA shares associated with a fairly high deviation for PBV values in moderate and optimistic scenarios, local corrections are made in equity presentations and BV calculations to determine the validation of the next new PBV value, (Cochrane, 2017). Correction of the MOS calculation needs to be done to determine the risk level parameters in investing, (Damodaran, 2012). In DCF calculations that doubt investors need to protect against losses and potential losses to anticipate a decrease in net income in the future (Graham, 2006). The MOS value obtained from the diversity calculation that occurs in all scenarios, the following is the PTBA PBV value which has been corrected by the MOS calculation.

DCF FCFF							
Scenario	Intrinsic Value (USD)	Market Price			Average	Analysis	Deviation
		Low	Medium	High			
Pessimist	2,076.66	2600	4170	4630	3800	OVERVALUED	-50.20%
Moderate	3,104.84					OVERVALUED	-25.54%
Optimist	4,998.15					UNDERVALUED	19.86%
RV - PER							
Scenario	PER Intrinsic	PER Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			
Pessimist	3.35	7.72	9.72	13	10.15	OVERVALUED	Valid
Moderate	5.29					OVERVALUED	Valid
Optimist	10.15					UNDERVALUED	Valid
RV - PBV							
Scenario	PBV Intrinsic	PBV Industry Q3 2022			Average	Analysis	Status
		Low	Average	High			
Pessimist	0.72	1.15	1.31	1.40	1.29	OVERVALUED	Valid
Moderate	1.17					OVERVALUED	Valid
Optimist	1.99					UNDERVALUED	Valid

Source : www.idx.com dan finance.yahoo.com (processed data)

Table 4. PTBA Valuation (corrected)

The MoS value is obtained from the diversity that occurs from all pessimistic, moderate, and optimistic scenarios for the industry range. The average of this diversity will produce a risk aversion value from the investment decisions of investors. Of course, the higher the perceived risk aversion value, the higher the MoS percentage selected. By using the asset pricing risk aversion method, as previously stated that the value of shares in a company has the potential to be too high, it is necessary to analyze market expectations in revising the new equity, debt, or operating income after tax, (Luo et al, 2022), in other words, it is commonly referred to as invested capital, (Badertscher, 2006). By looking at Table 4, the selected PTBA intrinsic value validation is a deviation of -25.54% as a correction to the previous intrinsic value in order to produce a valid PBV value in all scenarios. Stock analysts, 85% of them tend to use PBV as the main parameter in conducting multiple valuations (Markunson, 2012). The results of research and calculations on PTBA issuer shares using the DCF and RV method calculations in Table 4.11 on PTBA's DCF calculations are overvalued in pessimistic and moderate scenarios, as well as in RV calculations, overvalued in PER for pessimistic and moderate scenarios and for PBV calculations, also overloaded for all scenarios. It can be concluded that the price of PTBA shares is overvalued in most scenarios, for this reason, the recommendation for investment decisions taken is to sell PTBA shares.

Overall DCF and RV Calculation Results

Table 5. DCF-RV PGAS, ADRO, PTBA

Symbol	Method	Scenario	Market Price	Intrinsic Value	Result	Recommendation
PGAS	DCF FCFF	Pessimist	1775	1,904	UNDERVALUED	BUY
		Moderate		5,392	UNDERVALUED	
		Optimist		6,227	UNDERVALUED	
PGAS	RV-PER	Pessimist	1775	1,918	UNDERVALUED	
		Moderate		3,351	UNDERVALUED	
		Optimist		3,870	UNDERVALUED	
PGAS	RV-PBV	Pessimist	1775	1,889	UNDERVALUED	
		Moderate		3,309	UNDERVALUED	
		Optimist		3,816	UNDERVALUED	
ADRO	DCF FCFF	Pessimist	3960	3,198	OVERVALUED	SELL
		Moderate		6,993	UNDERVALUED	
		Optimist		9,351	UNDERVALUED	
ADRO	RV-PER	Pessimist	3960	3,162	OVERVALUED	
		Moderate		3,521	OVERVALUED	
		Optimist		3,994	UNDERVALUED	
ADRO	RV-PBV	Pessimist	3960	3,140	OVERVALUED	
		Moderate		3,536	OVERVALUED	
		Optimist		3,592	OVERVALUED	
PTBA	DCF FCFF	Pessimist	4170	2,077	OVERVALUED	SELL
		Moderate		3,105	OVERVALUED	
		Optimist		4,998	UNDERVALUED	
PTBA	RV-PER	Pessimist	4170	1,075	OVERVALUED	
		Moderate		1,697	OVERVALUED	
		Optimist		5,341	UNDERVALUED	
PTBA	RV-PBV	Pessimist	4170	2,145	OVERVALUED	
		Moderate		3,485	OVERVALUED	
		Optimist		5,927	UNDERVALUED	

For PGAS stock issuers in Table 5. In the DCF FCFF method, we can see that the market price of the stock price in all scenarios is lower than the intrinsic value of the PGAS stock price. Then in the RV-PER method the same thing happens, where the market price of the stock price in all scenarios is lower than the intrinsic value of the PGAS stock price. Furthermore, in the RV-PBV method, the same thing also happens where the market price of the stock price in all scenarios is lower than the intrinsic value of the PGAS stock price. Thus all calculation results show the position of the market price of the stock price in the position of under value to the intrinsic value of the stock price, thus the recommendation given is to buy.

For issuers of ADRO shares in Table 5. In the DCF FCFF method, we can see that the market price of the stock price in the optimistic and moderate scenarios is lower than the intrinsic value of ADRO's stock price, while for the pessimistic scenario, the market price is higher than the intrinsic value of the stock price. ADRO shares. Then in the RV-PER method, the same thing happens, where the market price of the stock price in the pessimistic and moderate scenarios is higher than the intrinsic value of ADRO's stock price, while in the optimistic scenario, the market price of the stock price is lower than the intrinsic value of the stock price. Furthermore, in the RV-PBV method, the same thing also happens where the market price of the stock price in all scenarios is higher than the intrinsic value of ADRO's stock price. Thus the results of the DCF calculation show that the market price is in an overvalued position relative to the intrinsic value of the pessimistic stock price. We make sure that the DCF method as a whole is also overvalued. From the research results, investors are advised to choose an intrinsic value with the lowest market price and are in the industry range with also low deviation (Ivanovski et al, 2014). For the RV-PER and RV-PBV calculation methods, the stock market price is also overvalued against the intrinsic value of the stock price, thus the recommendation given is to sell.

It is the same with ADRO, PTBA share issuers in table 5. on the DCF and RV PER and PBV methods. The position value of the market price shares shows an overvalued position relative to the intrinsic value of the stock price in the pessimistic and moderate scenarios, even though it is undervalued in the optimistic scenario. Thus it can be concluded that the recommendations given are to sell.

V. DISCUSSION

Using the DCF FCFF and RV methods in analyzing the value of issuer shares can help and be used as a reference in making better investment decisions in the future. Of the three companies that were used as research objects, PGAS and PTBA produced a good analysis of DCF and the validity was quite accurate in analyzing the intrinsic value of PER and PBV. For ADRO the results of the analysis do not fully provide good enough validity, especially on PBV values and are far above the industry upper limit range in the energy sector. This is common considering that the industry average value is very influential on the research conducted on the DCF method. Meanwhile, the historical data and financial behavior of each company certainly have different variations and interests. In the course of the situation and conditions in the last few years which have led to quite complex dynamics such as the Covid-19 pandemic, the global political, economic and security situation, the Russia and Ukraine crises and of course national political and security conditions have also influenced the national stock market, especially the energy sector. .

For this reason, in some situations and conditions, it is necessary to make corrections that are local in nature and only carried out on values with a high enough deviation and significantly affect investment decisions and projections used in previous calculations. The initiative used to calculate this risk is the margin of safety (MOS), which is a parameter used to determine the percentage level of risk in investing. The next step that is no less important as a continuation of MOS is to determine risk aversion for several influencing criteria such as operating income, debt, capex, equity and several other criteria that have the potential to influence. In the development of research, it was also found that calculations using the DCF and RV methods could not only be used by investors to decide on their investment strategy but could also be used from the point of view of shareholders and company management in building long-term plans for future corporate action activities by taking into account projected value of invested capital. With the occurrence of dynamics in the calculation of equity in the context of corporate actions, of course, on the other hand, it will have the potential to affect a decrease in the value of PER and will show a negative indication of investor decisions.

VI. CONCLUSION

This study, which uses historical financial report data for the last 5 years, of course, it has some limitations in examining the dynamics that occur and affect markets and industries. With so many variables affecting the DCF and RV calculations carried out in this valuation research, in the course of the research it will be very interesting to develop a risk management calculation method which is also called the Margin of Safety (MOS) and in the future, the MOS calculation is carried out with a Risk Aversion calculation approach to get more valid results. Then it is also suggested to be able to conduct more thorough research related to the effect of invested capital on valuation research. Where valuation research does not only conduct research and recommendations to investors but furthermore can also provide positive recommendations to market players both shareholders and corporate management in planning corporate actions in the future.

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Stock Valuation using the Discounted Cash Flow (DCF) Method with Free Cash Flow to Firm (FCFF) Approach and Relative Valuation Approaches on State-Owned Construction Companies Listed on IDX for 2022 to 2026 Projection

Azlia Sovni¹, Dwi Fitrizal Salim²

¹ Magister Management, Faculty of Economics and Business, Telkom University, Bandung, Indonesia

² A Lecturer of Schools of Economics and Business, Telkom University, Bandung, Indonesia

Abstract

Introduction/Main Objective: The purpose of this research is to assess the impact of the pandemic on the financial performance of state-owned construction enterprises and to provide strategies to improve their performance.

Background of the Problem: The information regarding government policies in infrastructure is crucial for market participants, as it affects the stock values, especially in the construction sector. Fluctuating stock prices pose concerns for shareholders, as they seek to make informed investment decisions. **Research gaps/Novelty:** This paper fills a research gap by focusing on the valuation of state-owned construction enterprises using the Discounted Cash Flow (DCF) method, specifically the Free Cash Flow to Firm (FCFF) approach. The study also looks into the impact of the pandemic on these companies' financial performance. **Research Methods:** The study employs the DCF-FCFF method to estimate the intrinsic value of the selected state-owned construction companies. Then, the Relative Valuation method, which employs the Price Book Value (PBV) and Price to Earnings Ratio (PER) methodologies, will be used for additional validation. **Findings/Results:** DCF analysis shows that ADHI is undervalued in all scenarios, WIKA is overvalued in positive scenarios but undervalued in moderate and optimistic scenarios, and PTPP is overvalued in all scenarios. Since RV shows that PTPP's DCF analysis is partially invalid, intrinsic value results must be corrected. The investing recommendation for ADHI is to buy these shares, while WIKA and PTPP are to sell them. **Conclusions and implications:** This study's findings have implications for policymakers, market participants, and investors by providing insights into the valuation of state-owned construction companies and the impact of the pandemic on their financial performance.

Keywords: Valuation, State-Owned Construction Companies, Discounted Cash Flow, Free Cash Flow to Firm, Relative Valuation

I. INTRODUCTION

Infrastructure development is an essential focus in ensuring equitable economic growth in Indonesia during President Jokowi's second term. This effort was preceded by Presidential Decree No. 3 of 2016, which governs the implementation of 245 infrastructure projects and was later modified by Government Regulation No. 109 of 2020, the third change from the previous regulation regarding National Strategic Projects (PSN). Furthermore, the release of Government Regulation No. 18 of 2020 regarding the 2020-2024 National Medium-Term Development Plan highlights the infrastructure sector as one of the primary focuses. To address impediments in the program's implementation, the government formed an institution as coordinator and liaison between numerous players from both the public and private sectors, named the Committee for the Acceleration of Priority Infrastructure Provision (KPPIP). Infrastructure project delays are frequently caused by a lack of good cooperation among various stakeholders.

WIKA, ADHI, PTPP, and Waskita are the four SOEs in the construction sector that are publicly traded on the Indonesian stock exchange. These SOEs are also present in Indonesia's development, both directly through participation in national strategic projects and indirectly through contributions to state revenues such as dividend payments, tax payments, and other non-tax revenues, the amount of which increases year after year. These firms run the *Projek Strategis Nasional*, or PSN. When we look at these facts, we can see that these organisations have a lot of room to grow, which is why I chose them for investigation. Another argument is that because these companies are publicly traded, they could be a good option for consumers wishing to invest in a construction company.

Joko Widodo, President of the Republic of Indonesia, emphasized that the administration is continuously developing infrastructure despite the fact that the pandemic is still raging in Indonesia. The goal of infrastructure development is to quickly recover the country's economy. The function of BUMN in infrastructure development is critical as a controller and government policy. Information on the direction of government policy is critical for capital market participants since it affects the value of shares, particularly in the SOE development sector.

In the face of fluctuating information and market prices, the value of shares is particularly appealing to investors. Continuous changes in information are reflected in each company's stock price. Shareholders frequently compare the value of their shares to similar stocks as well as the Jakarta Composite Index (IHSG). The JCI is an index that displays fluctuations in the value of stock exchange shares and serves as a reference for capital market activity swings. JCI's prices frequently fluctuate significantly from year to year. Stock prices fluctuate due to a variety of causes and data spread on the Indonesia Stock Exchange (IDX). Unpredictable stock price movements are a key source of concern for investors. Supply and demand, as well as an estimate of a share's inherent value, all influence share value. This is necessary so that investors may make profitable investment selections (Bodie et al., 2018; Damodaran, 2012).

Share prices of BUMN in the construction sector, such as PT PP (Persero) Tbk, PT WIKA (Persero) Tbk, and PT Adhi Karya (Persero) Tbk, also fluctuate. Significant stock price changes occurred between 2012 and 2022, particularly in 2020, when the COVID-19 pandemic began. On specific days, the highest and lowest share prices occur. Before investing, investors must comprehend the growth of the company's linked shares (Utamaningsih, 2020; Neaxie & Hendrawan, 2017).

However, the COVID-19 pandemic has affected both government and private sector enterprises, particularly those in the development industry. The financial performance of BUMNs in the construction services sector has declined due to economic conditions impacted by the pandemic, but they continue to assist the national development program as development agents.

This study draws on earlier research in the field of company valuation that shares topic factors and selected objects of observation. Several earlier studies on the intrinsic value of shares have been conducted, such as research by Rikumahu and Marendra (2018), who projected the value of bank shares using PBV and PER analysis. This study suggests that PER be used in banking investment policy.

Liu's (2019) research examines well-known automobile industries such as Ferrari, Tesla, and Ford. According to the findings of this research, which use financial analysis and the DCF approach to assess stock value, Ford is found to be undervalued, whilst Ferrari and Tesla are found to be overvalued. Kurnia and Sitorus (2020) did study on NASDAQ-listed IT businesses. They found, through the use of the DCF method and the FCFF method, that all companies are overpriced in the pessimistic scenario, and in the optimistic scenario, they are undervalued. This was revealed by comparing the two. Under addition, the findings of the PER and PBV analyses offer recommendations for the acquisition of particular stocks under particular circumstances.

The study that was conducted by Julia and Hendrawan (2021) analyzed the intrinsic value of shares held by the trading, service, and investment companies that had the greatest market capitalizations on the IDX. They employed the DCF, RV-PER, and PBV methodologies and discovered that ACES shares were overpriced on the DCF approach, MAPI was undervalued on the RV-PER method, and AMRT was undervalued in all scenarios. Sulisty and Hendrawan (2022) used the DCF and RV methods to come to the conclusion that shares of ASII and INDS are overvalued in all possible scenarios. On the other hand, shares of GJTL are undervalued in all possible scenarios, and shares of SSM are overvalued in pessimistic, moderate, and optimistic scenarios, but undervalued in optimistic scenarios. The financial reports for the years 2016-2020 were used.

According to past research findings, stock prices on the Indonesia Stock Exchange (BEI) do not yet reflect their genuine intrinsic worth. This intrinsic value is what investors require as a foundation for investment decisions, since it represents the fairness score of equities that aligns with expectations about the basic conditions of the connected institutions. To support the stages of suitable investment decision-making, investors must do fundamental analysis by employing financial information from institutions or by performing stock value valuation. Based on the ratio outcomes between the intrinsic score and the market stock value produced from the study, the results of this analysis can then be used to decide whether the connected stocks should be held, sold, or purchased.

Because the value of shares does not always correspond to their true worth, the authors of a study entitled "Stock Valuation Using The Discounted Cash Flow (DCF) Method with Free Cash Flow to Firm (FCFF) Approach and Relative Valuation Approaches on State-Owned Construction Companies Listed on IDX for 2022 to 2026 Projection" decided to investigate the topic. They titled their research "Share Fair Value Valuation uses the Discounted Cash Flow (DCF) Method." Within the scope of this study, researchers will evaluate the influence of pandemic-related consequences on the financial performance of BUMNs operating within the construction industry, in addition to measures for enhancing such performance. The following three large state-owned construction businesses in Indonesia—PT Waskita Karya (Persero) Tbk, PT Adhi Karya (Persero) Tbk, and PT Pembangunan Perumahan (Persero) Tbk—will be investigated as part of this project. As a result, this study aims to investigate the factors that contribute to the equity fairness of state-owned construction companies that are expected to be listed on the Indonesia Stock Exchange (Jakarta Stock Exchange) in the year 2022.

II. LITERATURE REVIEW

Value of the Firm

The "present value" of the company or organization's predicted free cash flow can be used to determine its value. This value is obtained by discounting the projected cash flow at a rate equal to the weighted average cost of capital (Damodaran, 2012). boosting operating cash flow, lowering the tax burden, lowering net capital expenditure expenses, lowering non-cash working capital, boosting projected growth and high growth periods, and lowering the composite cost of finance can all raise the firm's value (Damodaran, 2012: 843).

The firm's value can be calculated using a formula that is defined as (Damodaran, 2012:304):

$$\text{Value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1+k_c)^t} + \frac{\text{Terminal value}_n}{(1+k_c)^n} \quad (1)$$

Where:

kc = discount rate

n = asset age

CF_t = cash flow in period t

Theory of Valuation

Generally, investors seek profits by purchasing items at a discount from their fair value. To choose an investment portfolio and to select one that is appropriate, it is necessary to have a solid understanding of valuation, often known as asset valuation. The value of an asset can be determined, as well as the factors that contribute to that value, through the valuation process. This value will serve as the foundation for strategic business decisions such as portfolio selection, proper pricing, financing, and dividend distribution (Damodaran, 2012a).

According to Damodaran (2012a), three primary asset evaluation approaches exist. This approach determines the present value of an asset by basing it on the cash flows that asset is expected to generate in the future. These cash flows are then discounted at a rate corresponding to the risk level associated with the cash flows to get at the asset's present value. Free cash flow to the firm (FCFF), which determines the overall value of the business while accounting for investment and asset growth, and free cash flow to equity (FCFE), which focuses on the valuation of company shares or equity, are the two parts that make up this method when it comes to the valuation of companies (Damodaran, 2012:11-12).

The second topic is the concept of relative value. One way to determine the worth of an asset is to examine its current price to the pricing of other comparable assets currently available on the market. Prior to comparing asset prices, relative valuation necessitates standardizing asset prices. Generally, standardization is accomplished by transforming it into a ratio of various factors such as cash flow, profit, book value, or income. Comparisons of assets need to be made using assets that are quite similar to one another, which can be challenging to achieve because of variances in risk, growth, and cash flow (Damodaran, 2012:453).

Last, calculate the value of a contingent claim. This approach assesses the value of assets that include option characteristics by employing a model to price options. Options, or contingent claims, are assets that only pay out if certain conditions are met. For example, in a buy option mechanism, payment is made when the underlying asset's value is higher than the agreed value. In contrast, in a put option mechanism, payment is made when the value is lower than the agreed (Damodaran, 2012:23).

In this particular investigation, the Discounted Cash Flow (DCF) method was combined with the Free Cash Flow to Firm (FCFF) methodology in order to evaluate BUMN shares in the heavy construction and civil engineering sub-sectors (ADHI, PTPP, and WIKA). In order to further validate the Relative Valuation method, we will be using the Price Book Value (PBV) and Price to Earnings Ratio (PER) methodologies.

Discounted Cash Flow (DCF)

The intrinsic value of an asset can be calculated using a technique known as discounted cash flow, or DCF for short. The intrinsic score is an asset's value based on the present score of all the cash flows it anticipates creating in the upcoming period. This value is computed by discounting the cash flows at a rate that reflects the risk level associated with these cash flows. DCF calculates an asset's intrinsic value using fundamental principles (Damodaran, 2012:12). The DCF valuation approach is ideal for computing the fairness score of a company with consistent profit or cash flow income, allowing income stability and growth to be properly estimated (Damodaran, 2012:19).

The following is the basic formula for estimating the cash flows that can be generated using this method:

$$\text{Value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1 + k_c)^t} \quad (2)$$

Where:

CF_t = expected cash flow in period t

k_c = discount rate

n = asset age

According to Damodaran (2012:12-13), the Discounted Cash Flow (DCF) method can be broken down into three different models: the Dividend Discounted Model (DDM), the Free Cash Flow to Equity (FCFE), and the Free Cash Flow to Firm (FCFF).

1. DDM (Dividend Discounted Model)

The DDM is based on the idea that investors who purchase shares in public businesses anticipate dividend income and a share price increase at the end of the term in which they hold those shares. According to Damodaran (2012:323), the value of a share can be seen as the present value of everlasting dividends if one considers the future payouts to be the primary factor in determining the stock price projection. However, this approach has limitations in that it provides overly cautious valuation estimations and does not account for cash returns such as stock buybacks (Damodaran, 2012:344-345).

The general formula for valuation using the DDM technique is as follows (Damodaran, 2012: 329):

$$P_0 = \sum_{t=1}^{t=n} \frac{DPS_t}{(1 + k_{e,hg})^t} + \frac{P_n}{(1 + k_{e,hg})^n} \quad (3)$$

with

$$P_n = \frac{DPS_{n+1}}{k_{e,st} - g_n}$$

Where:

DPS_t = Expected dividend in year t

k_e = cost of equity (hg: high-growth period; st: stable-growth period)

P_n = Price (terminal value) at the end of the year

g_n = stable growth rate after the n th year

2. Free Cash Flow to Equity (FCFE)

The FCFE denotes the cash flow available to non-equity investors. This cash flow is calculated by deducting liabilities such as debt payment, capital expenditures, and working capital. There are numerous phases in evaluating the FCFE that a company can deliver to its shareholders (Damodaran, 2012: 351). The first step is to subtract the investment from the company's net profits. The second step takes into account the impact of working capital on available cash flows. The last cycle entails repaying the debt, which reduces available cash flow, but providing new loans increases available cash flow.

The formula for determining the FCFE score is as follows (Damodaran, 2012: 352):

$$\begin{aligned} FCFE = & \text{Net profit} \\ & - (\text{Capital expenditure} - \text{Depreciation} - \text{Amortization}) \\ & - (\text{Changes in Non-Cash Working Capital}) \\ & + (\text{New debt} - \text{Payment of debt}) \end{aligned} \quad (4)$$

3. Free Cash Flow to Firm (FCFF)

FCFF is the amount of cash flow after liabilities such as debt service, capital expenditures, and working capital have been subtracted. There are numerous phases in evaluating the FCFE that a company can deliver to its shareholders (Damodaran, 2012: 351). The first step is to subtract the investment from the company's net profits. The second step takes into account the impact of working capital on available cash flows. The last cycle entails repaying the debt, which reduces available cash flow, but providing new loans increases available cash flow.

The formula for determining the FCFE score is as follows (Damodaran, 2012: 352):

$$FCFF = EBIT*(1 - \text{tax rate}) \quad (5)$$

$$- (\text{Capital expenditure} - \text{Depreciation} - \text{Amortization})$$

$$- (\text{Changes in Non-Cash Working Capital})$$

Then, the company's value is figured out by discounting the FCFF number by the weighted average cost of capital (WACC) component. The following is the formula that can be used by this method to calculate a company's value (Damodaran, 2006:383-385):

$$\text{Value of a firm} = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1 + WACC)^t} \quad (6)$$

Where:

FCFF = Free Cash Flow to Firms

WACC = Weighted Average Cost of Capital

t = period in years

If a company achieves a stable status after n years and begins to see consistent growth worth g_n , the agency's score can be calculated as follows (Damodaran, 2006:386):

$$\text{Value of a firm} = \sum_{t=1}^{t=\infty} \frac{FCFF_t}{(1 + WACC)^t} + \frac{FCFF_{n+1}/(WACC_{st} - g_n)}{(1 + WACC_{hg})^n} \quad (7)$$

Where:

g_n = growth after the n-th year

WACC = Weighted Average Cost of Capital

(hg: high-growth period; st: stable-growth period)

Relative Valuation

In most situations, relative value is applied since it offers great utility. Comparing numerous construction ratios from comparison agencies is the first step in performing the test. This method is much quicker and less complicated than the discounted cash flow (DCF) method, which is typically used. Second, in comparison to DCF valuation, relative valuation is easier to understand and report. Thirdly, because the evaluation is relative as opposed to intrinsic, relative value is more suitable for characterizing market conditions. Furthermore, the results of relative valuation tests tend to more accurately represent market values than the results of DCF model tests (Damodaran, 2012:453-454).

However, relative valuation has significant disadvantages. First, the relative valuation incorporates several categories of similar institutions, resulting in a variable estimated score where key elements such as projected cash flow, growth, and risk can be neglected. In addition, if the market is unduly enthusiastic about the performance of similar industries, using relative value to evaluate an asset might result in a score that is too high; alternatively, if the market is pessimistic about the performance of a particular industry, using relative valuation can result in a score that is too low. Both of these outcomes are possible. Third, relative valuation is more transparent in terms of the assumptions utilized, making it susceptible to manipulation (Damodaran, 2012: 454).

This method is also known as the multiplier method because the instruments used in relative valuation are multiples. Another name for this technique is the ratio method. The evaluation is calculated by multiplying the earnings score by the share price. The following are numerous multiples approaches that can be utilized in making relative valuations.

1. Earning Multiples: Price-Earning Ratio

Price-earning ratio (PER) is a comparison between the market price of each share on income per share, or it can be formulated as follows (Damodaran, 2012: 468):

$$PER = \frac{\text{Market Price per share}}{\text{Earning Per Share}} \quad (8)$$

PER can also be determined using the following formula: multiply the market price per share by the number of shares,

then divide the result by the earnings per share.

$$PER = \frac{\text{Market Price per share} \times \text{shares}}{\text{Earning Per Share} \times \text{shares}} = \frac{\text{Value of Equity}}{\text{Earning after Tax}} \quad (9)$$

If the intrinsic score of the shares has been computed using the preceding procedure, the following step is to compare the fair value of the shares to the price at which they are now trading on the market.

Damodaran (2012: 471) gives the following method for calculating the price-to-earnings ratio (PER): In addition to the dividend payout ratio (DPR), cost of equity, and desired dividend growth rate, the formula for calculating the PER includes:

$$\frac{P_0}{EPS_0} = PE = \frac{\text{Payout ratio} \times (1 + g_n)}{k_e - g_n} \quad (10)$$

Where:

P_0 = market price per share

EPS_0 = earnings per share

k_e = cost of equity

g_n = expected dividend growth rate

A company is considered undervalued or inexpensive if its PER score is lower than the sector average, assuming that all of the companies being compared are similar. Because the market price is deemed more expensive, the high PER score suggests a modest profit generated on each share. A lower PER score, on the other hand, indicates the amount of profit that may be made on each share because the value is judged to be lower (Damodaran, 2012:21).

2. Book value multiples: Price to Book Value (PBV)

Price to Book Value (PBV) is a ratio that compares the current market price of a share of stock to its book value, also known as its book score of equity (Damodaran, 2012: 512):

$$PBV = \frac{\text{Market price per share}}{\text{Book value of equity per share}} \quad (11)$$

It is also possible to calculate PBV using the following formula: multiply the price per share by the number of shares, then multiply the earnings per share by the number of shares.

$$\begin{aligned} PBV &= \frac{\text{Market Price per share} \times \text{shares}}{\text{Book value of equity per share} \times \text{shares}} & (12) \\ &= \frac{\text{Value of Equity}}{\text{Book Value of Equity}} \end{aligned}$$

The book value of an asset is the initial purchase price plus development expenditures since the initial acquisition less the asset's depreciation cost (Damodaran, 2012:29). Investors utilize PBV in their investing analysis for a variety of reasons. For starters, PBV delivers a number that is consistent and easy to compare to market worth. Second, because of the availability of general accounting standardization, PBV can be utilized directly in industry comparisons to evaluate overvalued or undervalued assets. Third, because agencies with negative book scores are uncommon, PBV can be used to evaluate them (Damodaran, 2012: 511).

However, PBV has some disadvantages. First, accounting decisions regarding depreciation and other variables have a significant impact on PBV. Second, in technology and service institutions that lack major tangible assets, book value is meaningless. Third, if agencies frequently report negative income, book scores can be negative (Damodaran, 2012:511-512).

Empirical Evidence

Gibran and Hendrawan (2022) conducted research on the intrinsic value of shares in the oil and gas sector in 2020. Their findings were derived from financial data spanning the years 2015 through 2019. The results of the DCF

approach demonstrated that MEDC and ELSA were undervalued in all instances, and ESSA was overvalued in all circumstances, including the optimistic, moderate, and pessimistic outcomes.

In addition, it was determined that the RV values for MEDC, ESSA, and ELSA were all on the low end of the spectrum. Dewi and Hendrawan (2021) conducted an analysis of the intrinsic value of stocks in the cosmetics and home goods sector in 2021 by using financial reports that were published between 2016 and 2020. According to the findings of the study, the companies UNVR (PT. Unilever), KINO (PT. Kino), and TCID (PT. Mandom) were overvalued in every scenario. On the other hand, the companies MBTO (PT Martina Berto) and MRAT (PT Mustika Ratu) were overvalued in pessimistic, moderate, and optimistic scenarios, but undervalued in optimistic scenarios.

Jumran and Hendrawan (2021) conducted an investigation into the intrinsic value of stocks of state-owned banks that were listed on the Indonesia Stock Exchange (BEI) in 2021. Their research was based on financial data from 2016 to 2020. According to the findings, the stock prices of state-owned banks (BBNI, BBRI) that utilized the FCFE approach were undervalued in all three scenarios (pessimistic, moderate, and optimistic). This was the case regardless of how hopeful the scenario was. In the optimistic scenario, the RV-PBV analysis found that BBNI was priced too low, whereas in the moderate and pessimistic scenarios, BBRI was priced too high.

Siagian and Hendrawan (2020), using data from the years 2013-2017, concluded that within the property and real estate sector, considering three sample companies - CTRA, BSDE, and LPKR - found that through the employment of the FCFE method, subsequently evaluated using PER and PBV in pessimistic, moderate, and optimistic scenarios, two of the sampled companies, BSDE and LPKR, were positioned as overvalued, while CTRA was positioned as undervalued.

Afriani and Asma (2019) used the PER, FCFE, and FCFE models to examine intrinsic score and stock conditions in the manufacturing business from 2012 to 2016. The PER model research results for 12 tested companies revealed that four were overpriced and should be sold, one was fair valued and should be held, and seven were undervalued and should be purchased. With the FCFE model, four companies were overvalued and should be sold, while eight were undervalued and should be purchased. According to the FCFE model, one firm was overvalued and should be sold, while eleven companies were undervalued and should be purchased.

III. RESEARCH METHODOLOGY

The quantitative descriptive method is used in this study to provide a current summary of the fair stock values of the sampled companies. Because the acquired data is quantitative, the quantitative technique is regarded more appropriate for this investigation. The study uses the intrinsic stock price, calculated using the applied valuation methodologies, as the reference point for determining what constitutes fair prices. This study aims to quantify the results of previous research by carrying out a valuation of the research object to determine the value inherent to a stock.

PT Adhi Karya, PT PP, and PT Wijaya Karya are the three Indonesian construction companies that are the focus of this study. All three companies are owned by the Indonesian government and are traded openly on the Indonesia Stock Exchange. The DCF method and the FCFE methodology, as well as the price book value (PBV) and price earning ratio (PER) approaches for relative valuation, are merged in this investigation. Additionally, the price earning ratio (PER) approach is utilized. For this investigation, the shares of 24 public institutions involved in the heavy construction and civil engineering subsector and listed on the Indonesia Stock Exchange (IDX) will be scrutinized in their entirety.

Purposive sampling is the sampling approach used by the researcher. Purposive sampling is a way of picking samples based on the author's purposeful and precise selection, with the idea that the chosen sample may represent and give data to solve the study's difficulties. The following requirements must be met by samples chosen using this technique:

1. Companies listed on the Indonesia Stock Exchange (BEI) in the heavy construction & civil engineering sub-sector.
2. State-Owned Businesses (BUMN).
3. BUMN firms that have released publicly available financial information in the last 5 (five) years.
4. Companies that have had a steady positive net income in the current year or have had no losses in the previous 5 (five) years. Because the Discounted Cash Flow (DCF) method is difficult to apply to enterprises with negative income, this criterion is used.
5. Companies that have shown positive average growth over the last 5 (five) years. This criterion is considered because investors naturally expect returns on assets maintained for an extended period of time.

Based on these criteria, the researcher determined that three (three) entities, namely ADHI, PTPP, and WIKA, fit the requirements and would be used as samples in this study.

The intrinsic value of a company's shares, as determined by the company's core competencies, will serve as the observation variable for this study (also referred to as firm value). In addition to determining the following variable using Relative Valuation with the use of the Price Earnings Ratio (PER) and Price Book Value (PBV) methods, the Discounted Cash Flow (DCF) mode and the Free Cash Flow to The Firm (FCFF) method will be utilized in order to calculate the Free Cash Flow to The Firm. The variables are described in the table below.

Table 1. Variable Operationalization

Method	Variable	Description	Formula	Scale
Discounted Cash Flow – Free Cash Flow to Firm	FCFF (Free Cash Flow to Firm)	The amount of capital flow available to all investors (debt and equity) in a company (Damodaran, 2012b)	$FCFF = EBIT \cdot (1 - \text{Tax}) + DA - CAPEX - \Delta WC$	Ratio
	WACC (Weighted Average Cost of Capital)	The rate of discount that corresponds to the total cost of capital, taking into account all possible sources (Damodaran, 2012b)	$WACC = \frac{\text{Equity}}{\text{Debt} + \text{Equity}} \times \text{Cost of Equity} + \frac{\text{Debt}}{\text{Debt} + \text{Equity}} \times \text{Cost of Debt}$	Ratio
	TV (Terminal Value)	The present value of all prospective cash flows generated after the scenario analysis time period (Damodaran, 2012b)	$\text{Terminal value}_t = \frac{\text{Cash flow}_{t+1}}{(r - \text{Stable growth})}$	Ratio
	FV (Firm Value)	The present value is calculated by taking the expected future free cash flows and discounting them using the weighted average cost of capital (Damodaran, 2012b)	$\text{Value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1 + k_c)^t} + \frac{\text{Terminal value}_n}{(1 + k_c)^n}$	Ratio
Relative Valuation	Intrinsic Value	The value of an asset is predicated on the present value of all future cash flows, which is determined by discounting the cash flows at a risk-adjusted rate (Damodaran, 2012b)	$\text{Value of a firm} = \sum_{t=1}^{t=n} \frac{CF_t}{(1 + k_c)^t}$	Ratio
	Intrinsic value validity analysis	Comparing DCF's PER and PBV to the industry's PER and PBV	PER min < PER DCF < PER max → valid PBV min < PBV DCF < PBV max → valid	Ratio
	PER (Price to Earnings Ratio)	Ratio between market share price and earnings per share (Damodaran, 2012:468)	$PER = \frac{\text{Equity Value}}{\text{Earning Afer Tax}}$	Ratio
	PBV (Price to Book Value)	Comparison of the market price per share to the book value per share of equity (Damodaran, 2012:512)	$PBV = \frac{\text{Equity Value}}{\text{Book value of equity}}$	Ratio

Furthermore, this study uses data from:

1. Publicly available and certified financial reports from the sampled organizations for the last five years, from January 2017 to December 2021. This five-year period's financial report data is derived from the website www.idx.co.id.
2. Daily stock price data from January 2017 to December 2021, as well as the most recent beta, PER, and PBV ratios for the equities, were obtained from www.yahoofinance.com.
3. www.yahoofinance.com provides data on the Composite Stock Price Index (IHSG).
4. www.bps.go.id provides data on macroeconomic factors in Indonesia, such as Bank Indonesia interest rates, industrial growth rates, and gross domestic product (GDP) growth rates.
5. Data on industry PER and PBV are collected from the Indonesia Stock Exchange's 2021 statistical report, which is available on the website www.idx.co.id.

The purpose of this research is to determine how much the shares of each company are worth on their own. The author does not use the Dividend Discount Model (DDM) approach to compute the stock's intrinsic value because the companies intend to wait to start paying dividends within the next five years. The author uses the Discounted Cash Flow (DCF) approach to study the valuation of the companies in this research from the perspective of the basic aspects of the companies. At the same time, the Relative Valuation method is utilized to analyze from the market's perspective. As a consequence of this, the author will make use of the Discounted Cash Flow (DCF) method, more specifically, the Free Cash Flow to Firm (FCFF) approach, in addition to the Relative Valuation method, which will apply the Price Earnings Ratio (PER) and Price to Book Value (PBV) approaches. Both of these methodologies will be utilized to arrive at a conclusion regarding the company's fair market value.

IV. RESULT/FINDING

PT Adhi Karya Tbk (ADHI)

For the years 2017-2021, the following describes ADHI's financial behavior and average growth based on historical data from the company's financial statements. This model will serve as the fundamental assumption model for FCFF predictions.

	2017	2018	2019	2020	2021	Average
<i>Revenues</i>	15,156	15,655	15,308	10,828	11,530	<i>Revenue Growth</i>
<i>Growth</i>	37%	3%	-2%	-29%	6%	3.1%
						<i>% of Revenues</i>
<i>Total Operating Expenses</i>	13,561	13,680	13,689	9,610	10,204	88.7%
<i>EBITDA</i>	1,596	1,976	1,619	1,218	1,327	11.3%
<i>Depreciation</i>	119	177	177	210	206	1.3%
<i>EBIT</i>	1,477	1,799	1,442	1,008	1,121	10.0%
<i>Total Capex</i>	166	459	1,288	460	357	4.0%
<i>Total Current Assets</i>	24,818	25,387	30,315	30,091	31,601	
<i>Cash and Cash Equivalents</i>	4,131	3,263	3,255	2,364	3,152	
<i>Net Current Liabilities</i>	13,971	15,021	18,935	22,939	25,183	
Working Capital	6,715	7,103	8,125	4,788	3,266	
<i>DWC</i>	3,556	388	1,022	(3,337)	(1,522)	-2.3%

Fig. 1. History of Financial Report of ADHI

ADHI's valuation results with data for 2021 for WACC = 10.4%, industry growth = 3.64%, company growth = 3.1%, number of shares = 3,560,849,376 shares, EAT = IDR 86 billion, and book value of equity = IDR 3,186 trillion, presented in following figures.

DCF - FCFE						
Scenario	Intrinsic Value (IDR)	Market Price on 3 January 2022 (IDR)			Analysis	Deviation
Pessimist	1,860.13	895.00			undervalued	108%
Moderate	1,893.29				undervalued	112%
Optimist	2,459.72				undervalued	175%
RV - PER						
Scenario	PER Company	PER Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	76.57	-184.00	39.30	528.00	overvalued	valid
Moderate	77.94				overvalued	valid
Optimist	101.26				overvalued	valid
RV - PBV						
Scenario	PBV Company	PBV Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	2.08	0.43	2.46	31.30	undervalued	valid
Moderate	2.12				undervalued	valid
Optimist	2.75				overvalued	valid

Fig. 2. Valuation of ADHI

The RV PER approach deems ADHI's shares overvalued since the PER for ADHI's intrinsic value is higher in all possible scenarios than the industry average of 39.30. This causes the RV PER technique to conclude that ADHI's shares are overvalued. The PER intrinsic value of ADHI is calculated to be 76.57 times under the most pessimistic scenario, 77.94 times under the moderate scenario, and 101.26 times under the most optimistic scenario. PER In every scenario, the intrinsic value of ADHI falls within the range that is typical for the industry. The RV PBV method determines that SMSM's share price is attractive in both the pessimistic and moderate scenarios. This is because the intrinsic value of ADHI's PBV in both scenarios is lower than the 2.46 figure representing the industry's average. The optimistic scenario is a situation in which ADHI's PBV is considered overvalued because the company's intrinsic value is higher than the average value of the industry. In the most pessimistic scenario, ADHI's PBV has an intrinsic value of 2.08 times, while in the intermediate situation, it has a value of 2.12 times. In the most optimistic scenario, it has a value of 2.75 times. In every possible outcome, the intrinsic value of ADHI's PBV is within the sector's typical range.

The overall price of ADHI shares is low, and the worst-case scenario shows the lowest variation for them (108%). Because the intrinsic value of ADHI's PER and PBV is, in all possible outcomes, within the range for the industry, purchasing these shares is the recommended investment decision. This conclusion has been determined to be correct due to this fact.

PT Wijaya Karya Tbk (WIKA)

Based on historical data from the company's financial reports, WIKA's financial behavior and average growth for 2017-2021 are as follows. This data will be utilized as the fundamental assumption model for FCFE forecasts.

	2017	2018	2019	2020	2021	Average
<i>Revenues</i>	26,176	31,158	27,213	16,536	17,810	<i>Revenue Growth</i>
<i>Growth</i>	67%	19%	-13%	-39%	8%	8.4%
						<i>% of Revenues</i>
<i>Total Operating Expenses</i>	23,430	28,048	24,143	15,348	16,470	90.4%
<i>EBITDA</i>	2,746	3,111	3,070	1,189	1,339	9.6%
<i>Depreciation</i>	547	292	520	559	433	2.0%
<i>EBIT</i>	2,200	2,819	2,550	630	906	7.7%
<i>Total Capex</i>	997	1,248	1,058	652	597	3.8%
<i>Total Current Assets</i>	34,910	43,555	42,335	47,981	37,187	
<i>Cash and Cash Equivalents</i>	11,254	13,974	10,347	14,952	6,984	
<i>Net Current Liabilities</i>	25,493	27,955	29,271	38,519	35,060	
<i>Working Capital</i>	(1,837)	1,626	2,718	(5,490)	(4,858)	
<i>DWC</i>	(1,691)	3,463	1,092	(8,208)	632	-3.96%

Fig. 3. History of Financial Report of WIKA

The valuation results from WIKA with data in 2021 for WACC = 8.6%, industry growth = 3.64%, company growth = 8.4%, number of shares = 8,969,951,372 shares, EAT = IDR 214 billion, and book value of equity = IDR 9,956 trillion, as in figure 4.

WIKA's stock is considered to be overvalued according to the RV PER technique because, regardless of the circumstances, PER WIKA's intrinsic value is higher than the sector average of 39.30. The intrinsic value of PER WIKA is determined to be 40.96 times in the most pessimistic scenario, 66.68 times under the intermediate scenario, and 90.38 times under the most optimistic scenario. Under all conditions, the intrinsic value of PER WIKA falls within the range typical for the industry. The RV PBV approach determines that shares of WIKA are undervalued compared to the industry average of 2.46 because the intrinsic value of WIKA's PBV is lower in all possible outcomes. WIKA's intrinsic worth, as measured by PBV, is 0.88 times in the most pessimistic scenario, 1.44 times under the moderate scenario, and 1.95 times under the most optimistic scenario. In every scenario, the PBV intrinsic value of WIKA falls within the typical range for the industry.

The findings of an investigation of WIKA's shares' intrinsic worth are always unique, regardless of the circumstances. The intrinsic value is undervalued by 43.6% in the moderate scenario and 94.6% in the optimistic scenario, respectively. However, it is overvalued by -11.8% in the pessimistic scenario because of an overvaluation of the intrinsic value by -11.8%. When circumstances are like these, investors should choose the yield with the least difference between its inherent value and its current market price. The DCF analysis is a method of valuation that yields judgments about the asset's intrinsic worth that are the most comparable to market price. The chosen analytical results are the outcomes of the pessimistic scenario because it has the lowest variance and is considered overvalued. This viewpoint was presented in the previous section. Because the intrinsic value of WIKA's PER and PBV is, in all cases, within the range that is typical for the industry, this conclusion is validated as correct. As a result, it is recommended that the shares be sold as an investment decision.

DCF - FCFE						
Scenario	Intrinsic Value (IDR)	Market Price on 3 January 2022 (IDR)			Analysis	Deviation
Pessimist	979.15	1,110.00			overvalued	-11.8%
Moderate	1,594.02				undervalued	43.6%
Optimist	2,160.49				undervalued	94.6%
RV - PER						
Scenario	PER Company	PER Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	40.96	-184.00	39.30	528.00	overvalued	valid
Moderate	66.68				overvalued	valid
Optimist	90.38				overvalued	valid
RV - PBV						
Scenario	PBV Company	PBV Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	0.88	0.43	2.46	31.30	undervalued	valid
Moderate	1.44				undervalued	valid
Optimist	1.95				undervalued	valid

Fig. 4. Valuation of WIKA

PT PP Tbk (PTPP)

The following description of PTPP's financial behavior and average growth for 2017-2021 is derived from the historical data in the company's financial reports. This description will serve as the fundamental assumption model that will be used for FCFE forecasts.

	2017	2018	2019	2020	2021	Average
<i>Revenues</i>	21,502	25,120	24,660	15,831	16,764	<i>Revenue Growth</i>
<i>Growth</i>	31%	17%	-2%	-36%	6%	3.1%
						<i>% of Revenues</i>
<i>Total Operating Expenses</i>	18,682	21,993	21,459	13,613	14,661	87.0%
<i>EBITDA</i>	2,820	3,126	3,201	2,219	2,103	13.0%
<i>Depreciation</i>	295	498	544	565	554	2.4%
<i>EBIT</i>	2,525	2,628	2,657	1,653	1,549	10.6%
<i>Total Capex</i>	2,284	1,351	1,006	465	430	5.3%
<i>Total Current Assets</i>	29,908	37,534	36,944	30,952	33,732	
<i>Cash and Cash Equivalents</i>	9,383	8,647	8,953	7,376	6,603	
<i>Net Current Liabilities</i>	17,297	22,661	22,504	18,601	19,027	
<i>Working Capital</i>	3,228	6,226	5,488	4,976	8,101	
<i>DWC</i>	537	2,998	(738)	(512)	3,126	5.2%

Fig. 5. History of Financial Report of PTPP

Valuation results from PTPP with data in 2021 for WACC = 11.1%, industry growth = 3.64%, company growth = 3.1%, number of shares = 6,199,897,354 shares, EAT = IDR 361 billion, and book value of equity = IDR 6,169 trillion, as in following figures.

DCF - FCFE						
Scenario	Intrinsic Value (IDR)	Market Price on 3 January 2022 (IDR)			Analysis	Deviation
Pessimist	-2,057	995			overvalued	-307%
Moderate	-2,039				overvalued	-305%
Optimist	-1,944				overvalued	-295%
RV - PER						
Scenario	PER Company	PER Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	-35.29	-184.00	39.30	528.00	undervalued	valid
Moderate	-34.97				undervalued	valid
Optimist	-33.36				undervalued	valid
RV - PBV						
Scenario	PBV Company	PBV Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	-2.07	0.43	2.46	31.30	undervalued	invalid
Moderate	-2.05				undervalued	invalid
Optimist	-1.95				undervalued	invalid

Fig. 6. Valuation of PTPP

Because the intrinsic value of PER PTPP is lower than the industry average of 39.30, the RV PER approach believes PTPP shares to be undervalued. This is because the value of PER PTPP is lower in all possible scenarios. The intrinsic value of PTPP is calculated to be -35.29 times worse in the most pessimistic scenario, -34.97 times worse in the intermediate scenario, and -33.36 times worse in the most optimistic scenario. The RV PBV technique finds PTPP's shares to be undervalued since, regardless of the circumstances, the company's intrinsic value, as measured by its PBV, is lower than the average for the industry, which is 2.46. In the most pessimistic scenario, the PBV intrinsic value of PTPP is -2.07, while in the most intermediate scenario, it is -2.05, and in the most optimistic scenario, it is -1.95. Under all scenarios, the PTPP PBV intrinsic value is lower than the minimal limit that the industry sets.

The PTPP share price is considered overvalued despite having the lowest deviation in the optimistic scenario, which was -295 percent, and having a valid PER intrinsic value but an incorrect PBV intrinsic value. In aggregate, the PBV intrinsic value of PTPP deviates from the industry's lower limit by a margin of 121.3%. The results of the company's fundamental condition analysis, which are presented in Table 4.3, indicate that this deviation was most likely caused by a 38% year-on-year decrease in 2020 EBIT from IDR 2.6 trillion in 2019 and that this decline will continue in 2021, implying a decrease in revenue in both 2020 and 2021. This deviation was most likely caused by a 38% year-on-year decrease in 2020 EBIT from IDR 2.6 trillion in 2019. Simulations in which PTPP's revenue in 2020 and 2021 is replaced with its average revenue over the previous four years demonstrate that PTPP's PBV intrinsic value is within the range of the industry; nonetheless, consistent analysis results indicate that it is undervalued regardless of the scenario. Modifying assumptions, particularly the growth assumption of the company, should be avoided because it would change the findings of the global valuation, where legitimate valuation results are generally more prevalent. Although erroneous analytical assumptions can yield deviations in general, this should not be done since it would change the results of the global valuation.

Before decisions regarding the company's future can be taken, these erroneous outcomes must be corrected locally (and only in the errant organizations). The term "margin of safety" (MOS) refers to the ability to make adjustments. (Damodaran, 2012) suggests that investors should turn to MoS if the DCF analysis generates findings that need clarification or correction. Because no universally accepted laws govern the appropriate amount of MoS, the MoS value for this study will be derived from the outcomes of the previous DCF analysis. The following figure illustrates the intrinsic PBV deviation from each possible situation.

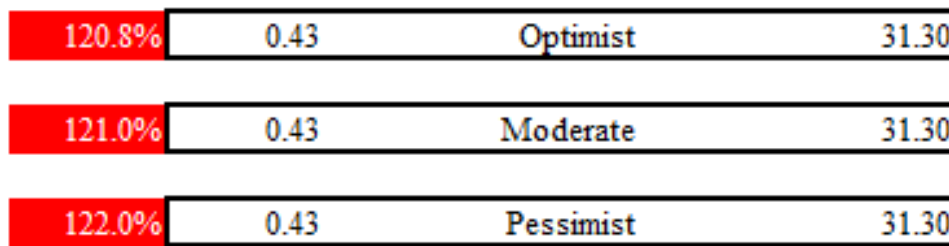


Fig. 7. PTPP's intrinsic PBV deviation over the industry range

MoS will be calculated based on these deviations, with the investors' level of risk aversion having a significant impact on the deviations that are chosen to be used. When there is a larger level of risk aversion, the specified MoS value increases. Because the researcher's goal is to correct the prior intrinsic value to provide a legitimate PBV result in all circumstances, the researcher will choose the highest deviation in this particular instance, which is 122.0 percent. Following the application of the MoS adjustment, the following figure illustrates the PTPP's intrinsic value:

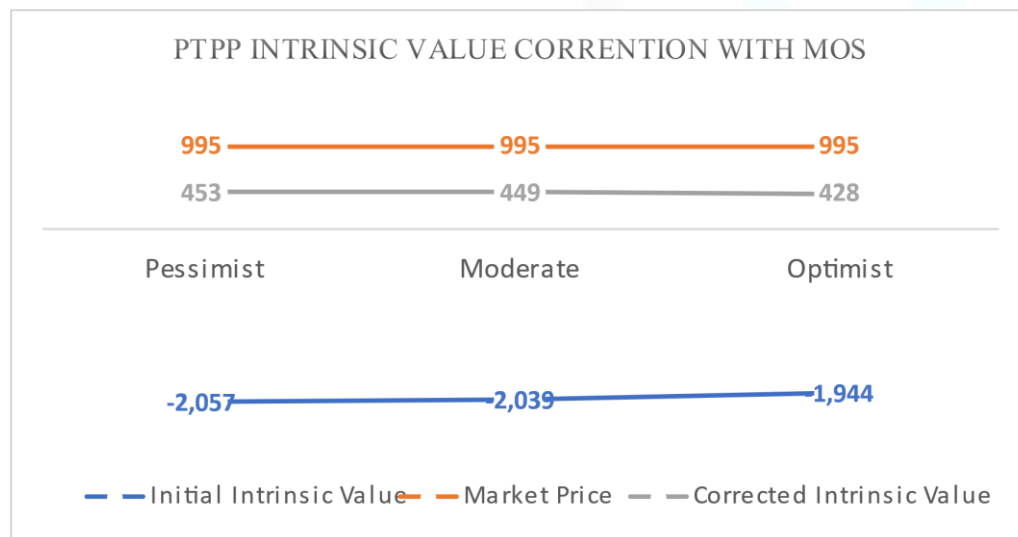


Fig. 8. PTPP intrinsic value correction with MoS = 122.0%

The figure demonstrates that the new intrinsic value is approaching the market price, although it is still below, confirming the previous analysis's conclusion that the asset was overvalued. The aggregate valuation results following corrections are displayed in the following figure.

DCF - FCFF						
Scenario	Intrinsic Value (IDR)	Market Price on 3 January 2022 (IDR)			Analysis	Deviation
Pessimist	452.60	995.00			overvalued	-54.5%
Moderate	448.58				overvalued	-54.9%
Optimist	427.85				overvalued	-57.0%
RV - PER						
Scenario	PER Company	PER Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	7.76	-184.00	39.30	528.00	undervalued	valid
Moderate	7.70				undervalued	valid
Optimist	7.34				undervalued	valid
RV - PBV						
Scenario	PBV Company	PBV Industri Q4-2021			Analysis	Condition
		The Lowest	Average	The Highest		
Pessimist	0.45	0.43	2.46	31.30	undervalued	valid
Moderate	0.45				undervalued	valid
Optimist	0.43				undervalued	valid

Fig. 9. PTPP valuation results after correction

After the market's general decline, PTPP shares are regarded as overvalued, with a deviation of 54.5 percent being the lowest possible value under the most optimistic scenario. Because the intrinsic value of PTPP's PER and PBV is, in all possible outcomes, within the range of values seen in the industry, this conclusion has been validated as correct; hence, it is recommended that the shares be sold as an investment decision.

V. DISCUSSION

Using the Discounted Cash Flow method, the Free Cash Flow to Firm (FCFF) approach, and the Relative Valuation method, the Price to Earnings Ratio (PER) and Price Book Value (PBV) approaches, which use three different scenarios, the intrinsic value of each company is determined.

Discounted Cash Flow (DCF) – Free Cash Flow to Firm (FCFF)

The Discounted Cash Flow (DCF) technique is a method that is applied globally and is approved by both academics and practitioners (Panigrahi et al., 2021). This approach is known as the capital asset pricing model (CAPM). The formula for determining the intrinsic value is to divide each scenario's equity value and divide it by the total number of currently outstanding shares. The results of computing, processing, and analyzing data on overall stock valuation using the Discounted Cash Flow technique are depicted in Figure 10. These results can be seen below.

The DCF methodology asserts that the value of the company will rise as a result of increases in cash flow in the future. In this instance, cash refers to the flow of unrestricted cash. According to Hayder and Alshahmani (2022), free cash flow has a bearing on the value of a company that can be considered statistically significant. If solid assumptions and estimates are used, the FCFF technique will be correct. The FCFF is most widely employed in corporate practice because it permits analysis to be conducted from the perspective of all the company's stakeholders.

Company	Scenario	DCF - FCFF		
		Intrinsic Value (IDR)	Market Price on 3 January 2022 (IDR)	Condition
ADHI	Pessimist	1,860.13	895.00	undervalued
	Moderate	1,893.29		undervalued
	Optimist	2,459.72		undervalued
WIKA	Pessimist	979.15	1,110.00	overvalued
	Moderate	1,594.02		undervalued
	Optimist	2,160.49		undervalued
PTPP	Pessimist	452.60	995.00	overvalued
	Moderate	448.58		overvalued
	Optimist	427.85		overvalued

Fig. 10. Intrinsic value of shares

Although DCF is one of the most widely used methodologies, it has some shortcomings that need to be addressed to reduce the impact of those shortcomings. This method has the advantage of taking into account all of the factors that are essential to the operation of the business, such as the growth rate, the cost of equity, and the weighted average cost of capital, among other factors. While the anticipated downside is that this model is subject to analyst assumptions regarding cash flow growth rates and discount rates (Daly et al., 2021).

Relative Valuation – PER and PBV

Using multiples to estimate stock values is a popular approach in valuation. Analysts employ multiples in addition to DCF to analyze companies and make recommendations to investors (Schueler, 2020). Because of this, the relative valuation approach is also used to evaluate the intrinsic value of shares, in particular by comparing the findings of the computation of PER and PBV with the PER and PBV values that are currently available on the market for businesses that operate in comparable industries. The following graph depicts the results of calculating RV using PER and PBV.

Company	Scenario	PER Company	Average of PER Industri Q4-2021	Condition
ADHI	Pessimist	76.57	39.30	overvalued
	Moderate	77.94		overvalued
	Optimist	101.26		overvalued
WIKA	Pessimist	40.96		overvalued
	Moderate	66.68		overvalued
	Optimist	90.38		overvalued
PTPP	Pessimist	7.76		undervalued
	Moderate	7.70		undervalued
	Optimist	7.34		undervalued

Fig. 11. Relative valuation – PER

As a consideration, investors will choose stocks with a low PER or are in an undervalued position. Because a low PER indicates that a company is capable of generating high earnings per share or EPS, investors have the potential to earn greater profits.

Company	Scenario	PBV Company	Average of PBV Industri Q4-2021	Condition
ADHI	Pessimist	2.08	2.46	undervalued
	Moderate	2.12		undervalued
	Optimist	2.75		overvalued
WIKA	Pessimist	0.88		undervalued
	Moderate	1.44		undervalued
	Optimist	1.95		undervalued
PTPP	Pessimist	0.45		undervalued
	Moderate	0.45		undervalued
	Optimist	0.43		undervalued

Fig. 12. Relative valuation – PBV

PBV is calculated by dividing the share price by the book value or book value per share. This method is widely accepted. Where PBV, when compared to the average PBV of the industry, indicates costly or inexpensive companies and guides investors' investment decisions. The PBV calculation results indicate that WIKA and PTPP shares are undervalued in all circumstances. In all scenarios, WIKA and PTPP's PBV is less than the industry average PBV of 2.46. In the pessimistic and moderate scenarios, shares of ADHI are undervalued, whereas in the optimistic scenario, ADHI's PBV is overvalued because it is greater than the industry average.

According to this RV's PER analysis, PTPP shares are more affordable than ADHI and WIKA shares prices. Using the PBV method, PTPP shares are regarded to be more affordable than ADHI and WIKA. The industry has a significant impact on whether PER and PBV are overvalued or undervalued. When doing a relative valuation, the worth of a company is measured by the value of other businesses operating in the same industry (Agudze & Ibhagui, 2020).

Recommendation of Investment

There are disparities in the valuation results of the research object, namely equities in the construction business, based on the analysis performed using DCF and RV. It should be noted that various factors can cause a company's PER and PBV to be higher or lower than the industry average. (Syed & Bansal, 2018) proposes that investors focus on previous performance and investment possibilities while making judgments. Investors will select lucrative investments; thus, they must concentrate on assets that have an intrinsic value that is equivalent to or greater than the market price (Okpoti Mensah et al., 2022).

As a result of their research, the authors make investment advice, as seen in the figure below.

Stock	Scenario	Condition			Recommendation
		FCFF	RV		
			PER	PBV	
ADHI	Pessimist	undervalued	overvalued	undervalued	Buy
	Moderate	undervalued	overvalued	undervalued	
	Optimist	undervalued	overvalued	overvalued	
WIKA	Pessimist	overvalued	overvalued	undervalued	Sell
	Moderate	undervalued	overvalued	undervalued	
	Optimist	undervalued	overvalued	undervalued	
PTPP	Pessimist	overvalued	undervalued	undervalued	Sell
	Moderate	overvalued	undervalued	undervalued	
	Optimist	overvalued	undervalued	undervalued	

Fig. 13. Recommendation for Investment

VI. CONCLUSION AND RECOMMENDATION

The DCF (Discounted Cash Flow) method and relative value are two complementary approaches that can be utilized in selecting profitable investments. This particular research looked at ADHI, WIKA, and PTPP, all different kinds of businesses. The DCF analysis findings demonstrate that ADHI and WIKA possess real intrinsic values, as measured by PER and PBV, respectively. As a result of the fact that the intrinsic value of PTPP's PBV is lower than

the market range, the reliability of the study's findings has been called into question. Because the PTPP analysis results are inaccurate, aberrant market conditions and behavior would likely predominate between 2020 and 2021. There is little doubt that this is a direct result of the Covid-19 pandemic, which has been going strong since March 2020. Meanwhile, in light of the investigation findings, the investing advice is to purchase ADHI stock while selling WIKA and PTPP stock. This is the current advice.

This study has limitations, including the fact that its conclusions are only valid until 2021. Numerous variables can influence industry and market conditions; therefore, the study must be repeated annually. Furthermore, because this study only analyzes financial report data from the last five years, estimates are confined to the future five years. It is recommended that future study employ historical data over a longer period of time or involve diverse businesses.

The valuation is performed for investors to provide an overview and suggestions regarding the intrinsic worth of the company's shares. It is critical for investors to seek out stocks that are both inexpensive and of high quality. As a result, the valuation must be performed using multiple in-depth methodologies rather than simply one. Investors should additionally apply a margin of safety (MoS) to the intrinsic value derived from DCF analysis, especially if the analysis results are erroneous. MoS can be estimated based on the divergence of invalid PER and/or PBV from the industry range, taking into account the investor's desired degree of risk.

This research is expected to have a positive impact on businesses and provide valuable input to aid in their performance enhancement. Companies can increase sales and profits by enhancing performance and decreasing expenses, costs, and capital expenditure. In addition, companies must keep their price earnings ratio (PER) and price book value (PBV) lower than the average for their industry. When a firm's price-to-earnings ratio (PER) is higher than the average for its industry, it is generally accepted that the company's profits are low, and the stock price is likely to be high. In a similar vein, if the PBV of a firm is higher than the average for its industry, the company's book value equity is considered low, yet the stock price is considered high.

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Sustainability Reporting Disclosure: Evidence from Energy Sector Companies Listed on the Indonesia Stock Exchange

Sri Rahayu¹, Fadhila Regita Ardyanti²

¹ Telkom University: Accounting Departement, School of Economics and Business, Bandung, Indonesia

² Telkom University: Accounting Departement, School of Economics and Business, Bandung, Indonesia

Abstract

This study aims to analyze the effect of good corporate governance with managerial stock ownership proxies, independent commissioners, boards of directors, and audit committees, as well as gender diversity, and financial performance on sustainability report disclosure. The existing Sustainability Report is part of the form of corporate responsibility to internal and external stakeholders and contains information about organizational performance in realizing sustainable development goals (Sustainable Development Goals/SDGs). However, there are still companies that have not disclosed sustainability reports. The population in this study are energy companies listed on the Indonesia Stock Exchange for the 2018-2021 period. This research method uses quantitative methods. The sampling technique used is purposive sampling with data analysis using e-views 12. The results of this study indicate that the audit committee and financial performance have a positive effect on the disclosure of sustainability reports partially, while the variables of managerial share ownership, independent board of commissioners, board of directors, and gender diversity have no effect. This research is expected to be a source of information in making decisions for investors and companies. For companies to be consistent in disclosing sustainability reports based on the applicable GRI.

Keywords: Audit committee; financial performance; gender diversity; good corporate governance; sustainability report

I. INTRODUCTION

Currently, companies are required to report what is called a sustainability report (SR). This is done because the aim is for sustainable development (Sustainable Development Goals/SDGs). The operational impact of energy companies on the environment encourages the need for disclosure of sustainability reports as a form of corporate responsibility for sustainable development. The triple-p bottom line concept applied by the company to achieve sustainable development through operating activities that are carried out responsibly by considering profit, protecting the environment where the company operates (planet), and community welfare (people) makes this in line with the need for disclosure sustainability report (Ardiani et al., 2022) which can have a positive impact on companies in improving company risk management, building company effectiveness, and measuring performance so that companies can face market competition with other companies (National Center for Sustainability Reporting, 2021). The importance of transparency and accountability in sustainability reports allows companies to improve the performance of a company's management and is better at processing the impacts arising from company activities, can reflect the company's long-term stakeholder desires, attract investors, and improve corporate image through an overview of how a company manages its risks (Yudhanti & Listianto, 2021). In stakeholder theory, companies need to pay attention to two main things, namely company goals and corporate responsibility to stakeholders. These two things need to be considered and fulfilled to get satisfaction from the stakeholders (Bangun & Ridaryanto, 2021). The implementation of the sustainability report has been regulated in OJK Regulation No. 51/POJK. 03/2017 of 2017 concerning the Implementation of Sustainable Finance for Financial Services Institutions, Issuers and Public Companies with guidelines based on the Global Reporting Initiative (GRI) (Financial Services Authority, 2017a). The GRI Standards were implemented starting in 2008 as a framework for making sustainability reports, which is the best global method for reporting economic, social, and environmental impacts to society. Indonesia is a country that has many energy companies, so the government has to focus more on seeing the form of corporate responsibility through its sustainability reports. This is because the energy sector companies receive a lot of attention. After all, the majority of their operational activities are in the exploration of natural resources. The following is the data of companies that publish sustainability reports:

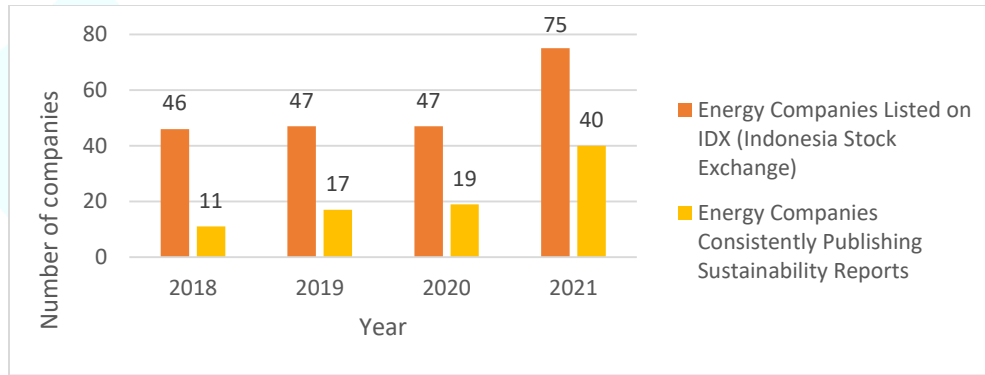


Fig. 1. Disclosure of the 2018-2021 Energy Company Sustainability Report

According to Figure 1, the number of energy companies that produce sustainability reports has been steadily increasing throughout the years. The increase has not kept pace with the number of companies listed on the Indonesia Stock Exchange. This finding suggests that the company is still not fully aware of and committed to its role in developing and publicizing sustainability reports, which serve as a means of holding the company accountable for the implications of its operational operations. Many energies company that have been on time with their sustainability reporting have also shown inconsistencies in disclosing certain details. The following is the average disclosure of energy sector companies' sustainability report items:

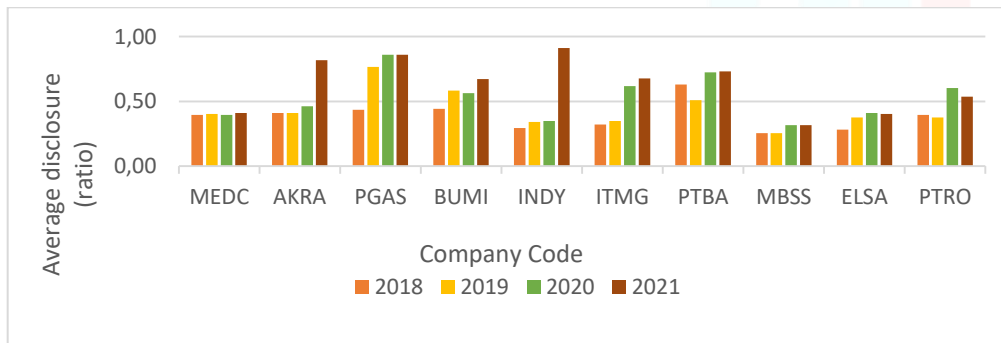


Fig. 2. Average Disclosure of Energy Sector Company Sustainability Report Items for 2018-2021

According to Figure 2, One instance of disclosure reduction was seen in PT Petrosea Tbk, with a decline of 37% in 2019, followed by a further fall of 53% in 2021. According to (Yuliandhari et al., 2022), there is little evidence to suggest that the duration of a company's existence or the extent of rules it has implemented directly correlates with an increase in its sustainability report disclosure. Moreover, there exist companies that provide comprehensive sustainability reports, yet engage in activities that adversely impact the environment. According to news articles sourced from the news page authored by (Ibnu Gozali, 2023), an incident occurred involving PT Medco E&P, a subsidiary of PT Medco Energi Internasional Tbk. The environmental management methods of PT Medco E&P were deemed irresponsible, leading to the poisoning of well water and air through trash disposal. The presence of this phenomenon has resulted in adverse effects on the well-being of those residing in close proximity. The present situation has been ongoing since 2019 and persists as a result of the parties failure to achieve a mutually advantageous conclusion. The correlation between the increasing number of regulations over time and the potential reduction of sustainability-related incidents, such as environmental and social damage in Indonesia, cannot be guaranteed. Merely disclosing a sustainability report does not imply that a company is exempt from violating sustainability aspects, including environmental harm and societal losses. The implications of losses incurred as a result of the company's operational operations will influence stakeholders' decision-making processes.

Previous research has shown that a number of criteria, such as good corporate governance, gender diversity, and financial performance, affect the enhancement of sustainability report disclosure. Good corporate governance systems are supposed to lead to open, honest, and informative financial reporting, as stated by (Ardiani et al., 2022). The end goal is for this to boost confidence in the company on the part of its constituents. Multiple indicators of good corporate

governance have been identified by researchers (Latifah et al., 2019) are management ownership, the independent board commissioner, board directors, and an audit committee. Empirical data demonstrates a strong association between good corporate governance and sustainability report disclosure, according to a study done by (Kholmi & Susadi, 2021). However, the research conducted produced inconsistent results (Yudhanti & Listianto, 2021).

Additional elements that may exert influence must also be considered, such as the need for a variety of viewpoints and opinions, which aid in the creation of more robust conclusions. The director's participation is crucial since they have the power to influence the company's decision-making process and play a part in the report's public dissemination (Yuliandhari et al., 2022). Although there have been some strides made toward equal representation of women, there is still a glaring imbalance between the numbers of men and women. The occurrence can be explained by the fact that men and women are fundamentally different, especially in the realm of decision-making. Women's natural inclination towards caution may help organizations make more prudent decisions and increase the efficacy of their board of director's in decision-making. Men's proclivity for competitiveness may cause them to disregard potentially adverse situations. (Suwasono & Anggraini, 2021) and (Eugenia & Triwacananingrum, 2022) find that gender diversity affects the disclosure of sustainability reports. Recent research conducted by (Juwita & Honggowati, 2021) and (Yuliandhari et al., 2022) have shown contradictory findings to the aforementioned claim.

In addition, (Tobing et al., 2019) argue that financial performance is another significant determinant for the disclosure of sustainability reports. The triple bottom line framework includes profit gain as one of its goals, and a firm's significant level of profitability is a sign of robust financial success. The high financial performance serves as a catalyst for promoting comprehensive transparency, particularly in the context of sustainability reporting. The investigations conducted by (Tobing et al., 2019) and (Latifah et al., 2019) both reference research findings that indicate an influence between financial performance and the level of transparency observed in sustainability reports. The studies carried out by (Triwacananingrum et al., 2020) and (Wardoyo et al., 2022) reported opposing findings.

Based on the explanation above, it is still relevant to research to analyze the effect of Good Corporate Governance, gender diversity, and financial performance on the disclosure of sustainability reports in Energy Companies Listed on the Indonesia Stock Exchange. This research is expected to contribute to the development of literature related to good corporate governance, gender diversity, financial performance, and disclosure of sustainability reports. And it is hoped that it can be used as a source of information for consideration in making investment decisions, as an illustration for company decision-making in the obligation to disclose sustainability reports comprehensively and consistently, thus showing the company's concern for sustainability issues in Indonesia.

II. LITERATURE REVIEW

Good Corporate Governance

Good Corporate Governance is a set of rules governing the relationship between shareholders, managers, creditors, government, employees and other internal and external stakeholders (Nasrum, 2018). This can create reports that are more informative, accountable, and transparent and reveal more information that can provide certainty to stakeholders through a sustainability report (Ardiani et al., 2022). Thus, when a company implements good corporate governance properly, the disclosure of its sustainability report will be greater (Kholmi & Susadi, 2021). Good corporate governance in research uses proxies, namely the board of directors, independent board of commissioners, managerial share ownership, and audit committees (Ardiani et al., 2022), (Kholmi & Susadi, 2021), (Latifah et al., 2019), (Wardoyo et al., 2022), (Yudhanti & Listianto, 2021).

a. Manajerial Share Ownership

Managerial share ownership is the number of shares owned by company management that actively participates in company decision making (Effendi, 2016:59). Companies will compete in providing accountable, informative and transparent disclosure reports, especially sustainability reports (Yudhanti & Listianto, 2021). The large proportion of managerial ownership makes it possible for management to manage the company better because management feels they own the company. The greater the managerial share ownership, the greater the company's responsibility to stakeholders for disclosing sustainability reports as a form of responsibility and gaining greater legitimacy, especially to attract investors. Managerial ownership has a positive impact on sustainability report disclosure. This is supported by research (Yudhanti & Listianto, 2021) and (Ardiani et al., 2022) that managerial ownership has a positive effect on sustainability report disclosure. From the explanation that has been described, the hypotheses that can be taken are:

H1: Managerial share ownership partially has a positive effect on sustainability report disclosure.

Independent Board of Commissioners

According to the Financial Services Authority Regulation Number 33/PJOK.04/2014 concerning the Board of Directors and Board of Commissioners of Issuers or Public Companies, the Board of independent commissioners is a member of the board of Commissioners who comes from outside the issuer or public company, do not own shares, either directly or indirectly, has no affiliation with the issuer or public company, commissioners, directors or major shareholder of the issuer or public company and has no business relationship, either directly or indirectly related to the business activities of the issuer or public company (Financial Services Authority, 2014). Disclosure of sustainability reports requires the independence of the board of commissioners so that it runs according to applicable regulations to create a balance between the interests of the company and stakeholders (Tobing et al., 2019). The board of independent commissioners in the company also as part of the implementation of good corporate governance oversees management performance so that report disclosures such as sustainability reports are disclosed according to the wishes of stakeholders.

The existence of an independent board of commissioners will also increase company transparency to the public in its economic, social, and environmental activities through sustainability reports (Ardiani et al., 2022). The more independent the members of the board of commissioners, the greater the incentive for management to disclose quality sustainability reports. Thus, the disclosure of a sustainability report can provide a positive image in the eyes of stakeholders. Based on this, the board of independent commissioners has a positive effect on the disclosure of sustainability reports. This is supported by the results of research conducted by (Ardiani et al., 2022) and (Yudhanti & Listianto, 2021) that the independent board of commissioners has a positive effect on sustainability report disclosure. From the explanation that has been described, the hypotheses that can be taken are:

H2: The independent board of commissioners partially has a positive effect on the disclosure of the sustainability report.

Board of Directors

The board of directors in a company will determine the policies to be taken or the company's strategy in the short and long term (Nasrum, 2018). The main duties of the board of directors besides managing the company as a whole are to make reports for shareholders and the government, ensuring the company's compliance with applicable laws and regulations (Brooks & Dunn, 2012:18). The board of directors also must prepare company guidelines for implementing good corporate governance (Effendi, 2016:26). Companies in disclosing sustainability reports require the role of the board of directors as the person in control of the company. Lots of communication through meetings can assist companies in expressing clear reports and in accordance with company rules and objectives (Yudhanti & Listianto, 2021). The meeting is held at least 1 time every 2 months (Financial Services Authority, 2017b). So that the higher the frequency of meetings between members of the board of directors, the more often communication and coordination between members will make it easier to realize an accountable, informative, and transparent disclosure of sustainability reports. This is supported by the results of research conducted by (Yudhanti & Listianto, 2021) and (Ardiani et al., 2022) that the board of directors has a positive effect on sustainability report disclosure. From the explanation that has been described, the hypotheses that can be taken are:

H3: The board of directors partially has a positive effect on the disclosure of the sustainability report

Audit Committee

According to the Indonesian Audit Committee Association (IKAI) in (Effendi, 2016) the audit committee is a committee that works professionally and independently formed by the board of directors and helps and strengthens the function of the board of commissioners or supervisory board in carrying out the oversight function of the financial reporting process, risk management, auditing, and implementation of corporate governance in companies. The purpose of forming an audit committee is to supervise the company (Ardiani et al., 2022). Good supervision from the audit committee can ensure that disclosure and internal control can run well (Yudhanti & Listianto, 2021).

The audit committee in a company consists of at least 3 members from independent commissioners and parties from outside the company or public company (Financial Services Authority, 2015). Through the role of the audit committee, performance implementation becomes more effective and can support disclosure of reports that are more integrated in accordance with existing regulations, not only economic performance but also environmental and social performance through sustainability reports, so that the audit committee has a positive effect on sustainability report disclosure. This is supported by the results of research conducted by (Yudhanti & Listianto, 2021), (Ardiani et al., 2022), and (Tobing et al., 2019) that the audit committee has a positive effect on the disclosure of sustainability reports. From the explanation that has been described, the hypotheses that can be taken are:

H4: The audit committee partially has a positive effect on the disclosure of sustainability reports.

Gender Diversity

The term gender diversity in (American Psychological Association, 2018) refers to the extent to which a person's gender identity, role, or expression differs from the cultural norms defined for people of a particular gender. Gender diversity is a characteristic difference between men and women in a company (Suwasono & Anggraini, 2021). This diversity focuses on the existence of a female board of directors in a company. Gender diversity on boards of directors plays an important role in the choice of a company's sustainability involvement (Cicchello et al., 2021). The existence of female directors will increase new views and perspectives thereby improving the decision-making process (Robinson & Dechant, 1997).

Various views on gender differences will have an impact on decision-making regarding the sustainability report disclosure (Bangun & Ridaryanto, 2021), (Euginia & Triwacananingrum, 2022), (Yuliandhari et al., 2022). Gender equality has been implemented in many companies to provide equal opportunities for women to reach high positions in the company even though they are still a minority in the company. Unger in (Bangun & Ridaryanto, 2021) argues that men have the characteristics of being independent, full consideration, rational and competitive, while women have the characteristics of nurturing, caring, sensitive, and relying on intuition. The presence of female directors will increase the diversity of perspectives of board members. More women on the board will improve the decision-making process and increase board effectiveness (Suwasono & Anggraini, 2021). Based on this, gender diversity has a positive effect on the disclosure of sustainability reports. This is supported by the results of research conducted by (Suwasono & Anggraini, 2021), (Ardiani et al., 2022), and (Euginia & Triwacananingrum, 2022) that gender diversity has a positive effect on sustainability report disclosure. From the explanation that has been described, the hypotheses that can be taken are:

H5: Gender diversity partially has a positive effect on the disclosure of the sustainability report.

Financial Performance

According to (Fahmi, 2018:142) Financial performance is an analysis in looking at the extent to which a company implements and uses financial rules properly and correctly. Financial performance is often used as a benchmark for building a better company through how much a company's economic resources are capable of and whether or not a company's financial condition is good (Yudhanti & Listianto, 2021). Ratio analysis to measure financial performance includes liquidity ratios, solvency ratios, activity ratios, profitability ratios, and Market Value Ratios (Hanafi & Halim, 2018). In this study, the authors measure financial performance through the level of profitability by using Return on Assets (ROA).

Financial performance as measured through profitability is one of the points of the triple-p bottom line so companies with high profitability tend to disclose more information in the sustainability report (Latifah et al., 2019). The profitability ratio is an indicator of good corporate management which tends to disclose more information when there is an increase in company profitability, including disclosure in the sustainability report (Tobing et al., 2019). The better the company's profitability, it can be said that the better the company's performance so companies will tend to disclose more extensive information when there is an increase in profitability (Latifah et al., 2019). Disclosure of extensive information, especially on the sustainability report will have a good effect on the company and will also attract investors. The better the company's financial performance, the more trust it will have in informing the sustainability report, thus creating a good view of investors or creditors because the company can show what they expect (Majidah & Muslih, 2018). Based on this, the financial performance has a positive effect on the disclosure of the sustainability report. This is supported by the results of research conducted by (Yudhanti & Listianto, 2021), (Wardoyo et al., 2022), and (Latifah et al., 2019) that financial performance has a positive effect on sustainability report disclosure.

H6: Financial performance partially has a positive effect on the disclosure of the sustainability report.

III. RESEARCH METHODOLOGY

In this study, the independent variables used are good corporate governance (by using proxies including managerial ownership, independent board of commissioners, board of directors, and audit committee), gender diversity, and financial performance. As a population are energy companies listed on the Indonesia Stock Exchange during the 2018-2021 period sourced from the website www.idx.co.id. The technique used by researchers is a purposive sampling technique, with the following considerations:

1. Energy sector companies listed on the Indonesia Stock Exchange in 2018-2021.
2. Energy companies that have consistently published annual reports and financial reports for four consecutive years for the 2018-2021 period.

3. Energy companies that have consistently published sustainability reports for four consecutive years for the 2018-2021 period.

Based on the provisions of the sample selection criteria applied, there were a total of 40 samples consisting of 10 companies during the study period. The following is a list of companies included in this research sample:

Table 1. Company Sample.

Company	Code
Medco Energi Internasional Tbk	MEDC
AKR Corporindo Tbk.	AKRA
Perusahaan Gas Negara Tbk.	PGAS
Bumi Resources Tbk	BUMI
Indika Energy Tbk.	INDY
Indo Tambangraya Megah Tbk.	ITMG
Bukit Asam Tbk	PTBA
Mitrabaha Segara Sejati Tbk	MBSS
Elnusa Tbk	ELSA
Petrosea Tbk	PTRO

Source: Data that has been processed by the author (2023)

The data sources used to support this research are annual reports, financial reports, and sustainability reports of energy companies listed on the Indonesia Stock Exchange (IDX) during 2018-2021. The data analysis technique uses the E-Views 12 application program. The main focus of this research is the disclosure of the company's sustainability report which is the dependent variable. Disclosure of sustainability reports with "GRI Standards" was first issued in 2016 and came into force on 1 July 2018 (Ardiani et al., 2022). The GRI Standards consist of universal standards (100 series), economic topics (200 series), environmental topics (300 series), and social topics (400 series) with a total of 149 indicators (Global Reporting Initiative, 2016). In this research, disclosure of sustainability reports is measured using the sustainability report disclosure index (SRDI). From the SRDI calculation, it can be further grouped by giving a value of 1 to companies that disclose and a value of 0 to companies that do not disclose (Hasanuddin & Suryani, 2019). The following is the formula for calculating the disclosure of a company's sustainability report:

$$SDRI = \frac{\sum Xi}{n} \quad (1)$$

where: SRDI : *Sustainability report* Disclosure Index
 $\sum Xi$: Number of items disclosed
 N : The ideal number of items disclosed (149 items)

In this study the independent variables are managerial share ownership, independent board of commissioners, board of directors, audit committee, gender diversity, financial performance. Managerial share ownership can be measured by the number of shares owned by the company's management of managers and affiliated commissioners (excluding independent commissioners) by giving a score of 1 for companies that have managerial ownership and a score of 0 for companies that do not have managerial share ownership (Latifah et al., 2019).

The independent of commissioners is the second independent variable. It can be calculated using the formula used in research conducted by (Latifah et al., 2019), as follows:

$$\text{Independent Board of Commissioners} = \frac{\text{Total Members of the Board of Commis}}{\text{Total Members of The Board of Commi}} \quad (2)$$

Board of directors is the third independent variable. This variable measured by counting the number of meetings over a 1-year period (Latifah et al., 2019). Audit committee is the fourth independent variable. This variable is

determined by counting the number of audit committee members in a company (Latifah et al., 2019). Gender diversity is the fifth independent variable. In this study calculates the number of women on the board of directors by using the ratio between the number of women on the board of directors in a company and the number of directors in a company. The formula used in research by (Suwasono & Angraini, 2021):

$$GND_DIR = \frac{W_DIR}{SUM_DIR} \quad (3)$$

where: GND_DIR = Gender diversification on the board of directors in the company
 W_DIR = Number of women on the board of directors in the company
 SUM_DIR = Number of board of directors in the company

Gender diversity is the last independent variable. In this study the authors measured the level of profitability using the Return on Assets (ROA) ratio with calculation formulation:

$$ROA = \frac{\text{Earning After Tax}}{\text{Total Assets}} \quad (4)$$

IV. RESULT AND DISCUSSION

The following is a table of the results of descriptive statistical test data on ratio scale variables analyzed based on the mean value, maximum value, minimum value, and standard deviation value.

Table 2. Descriptive Statistics.

Description	Sustainability Report Disclosure	Independent Board of Commissioners	Board of Directors	Audit Committee	Gender Diversity	Financial Performance
Mean	0,4968	0,4084	36,2000	3,8000	0,1319	0,0469
Maximum	0,9128	0,5000	119,0000	7,0000	0,5000	0,2853
Minimum	0,2550	0,3333	6,0000	3,0000	0,0000	-0,0984
Std. Dev.	0,1842	0,0579	24,2922	1,0178	0,1588	0,0778
N	40	40	40	40	40	40

Source: output test result

The dependent variable for sustainability reports disclosure from 40 companies in 2018-2021 in Table 2 shows a mean value of 0.4968. The energy company discloses approximately 75 indicators out of a total of 149 disclosure items referring to the GRI standard. The maximum value is 0.9128 or around 136 indicators disclosed, while the minimum value is 0.2550 or around 38 indicators disclosed.

For the independent variable good corporate governance as measured by the number of independent commissioners, out of 40 companies in 2018-2021 it shows that the value of the independent commissioners has a mean of 0.4084. The maximum value of the independent board of commissioner's variable is 0.5000, which means that some of these companies have a proportion of independent commissioners as much as half of the number of commissioners. While the minimum value of 0.3333 means that the company has at least 1 independent commissioner on the total board of commissioners. Another measure of good corporate governance that is used is the Board of Directors with a measure of the number of board meetings. Table 2 shows that the mean value is 36.2. The maximum value for the board of Directors' variable is 119, meaning that the Board of Directors holds 119 meetings a year. Meanwhile, the minimum value for the board of directors' variable is 6. These companies only hold 6 meetings a year. The number of audit committees of 40 companies in 2018-2021 shows that the mean value is 3.8000. The maximum value of the audit committee variable is 7.0000, meaning that the company has 7 audit committees. Meanwhile, the minimum value for the audit committee variable is 3, which means that some of these companies only have 3 audit committees.

The gender diversity of 40 companies in 2018-2021 shows that the mean value is 0.1319. The maximum value of 0.5000 means that half of the directors in this company are women. Meanwhile, the minimum value for the gender diversity variable is 0, which means that this company does not have a female board of directors.

The financial performance variable, as measured by the Return on Assets ratio, shows that out of 40 companies, it has a mean value of 0.0469. The company can manage its assets properly to generate a profit of 28.5%. Meanwhile,

the minimum value for the financial performance variable is -0.0984, which means that the company has not been able to manage its assets properly, resulting in a loss of 9.8%.

Table 3. Statistical Result.

Dependent Variable: PSR
 Method: Panel Least Squares
 Date: 03/20/23 Time: 23:24
 Sample: 2018 2021
 Periods included: 4
 Cross-sections included: 10
 Total panel (balanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.162167	0.267511	-0.606204	0.5485
KM	0.071541	0.065083	1.099227	0.2796
DKI	0.538031	0.534790	1.006062	0.3217
DD	0.001317	0.001243	1.059543	0.2970
KA	0.076981	0.028039	2.745488	0.0097
GD	0.047044	0.192421	0.244486	0.8084
KK	0.836240	0.372990	2.241987	0.0318
R-squared	0.327426	Mean dependent var		0.496812
Adjusted R-squared	0.205140	S.D. dependent var		0.184154
S.E. of regression	0.164182	Akaike info criterion		-0.618048
Sum squared resid	0.889544	Schwarz criterion		-0.322494
Log likelihood	19.36097	Hannan-Quinn criter.		-0.511185
F-statistic	2.677539	Durbin-Watson stat		1.164896
Prob(F-statistic)	0.031461			

Source: output test result

The results of the test for the coefficient of determination (R²) presented in Table 3 explain the adjusted r-squared value that the variable managerial ownership, independent board of commissioners, board of directors, audit committee, gender diversity, and financial performance can explain the disclosure of a sustainability report of 0.205140 and the remainder of 0.794860 or 79.48% explained by other variables outside the research. The model can be expressed in the panel data regression equation obtained as follows:

$$PSR = -0.162167 + 0.071541KM + 0.538031DKI + 0.001317DD + 0.076981KA + 0.047044GD + 0.836240KK + e \quad (5)$$

Based on the simultaneous test results (table 3), it shows that the prob value (F-statistic) is 0.031461 < 0.05, meaning that all independent variables consist of good corporate governance as measured by managerial ownership, independent board of commissioners, board of directors, audit committee, gender diversity, and financial performance simultaneously have a significant positive effect on sustainability report disclosure.

A. The Effect of Managerial Share Ownership on Sustainability Report Disclosure

The results of panel data regression testing give the result that the probability value on the variable managerial share ownership (KM) is 0.2796 which is greater than 0.05, this means that managerial share ownership does not affect the disclosure of sustainability reports in the energy sector companies listed on the IDX in 2018-2021.

Table 4. Managerial Share Ownership and Disclosure of Sustainability Report

Managerial Share Ownership	Disclosure of Sustainability Report				Total
	Above Average (>0,4968)		Below Average (<0,4968)		
	Total	%	Total	%	
Criteria for having managerial share ownership = 1	13	43%	17	57%	30
Criteria for not having managerial share ownership = 0	3	30%	7	70%	10
Total	16	40%	24	60%	40

Source: Data that has been processed by the author (2023)

The statistical data in Table 4 indicate companies that have managerial share ownership with sustainability report disclosures above the average are 43% or 13 samples, the remaining 57% or 17 samples have managerial share ownership with sustainability report disclosures below the average. Meanwhile, companies that do not have managerial share ownership with sustainability report disclosures above the average 30%, or 3 samples, and the remaining 70%, or 7 samples do not have managerial share ownership with below-average sustainability report disclosures. It can be concluded that companies that have managerial share ownership with sustainability report disclosure values below the average are dominant compared to sustainability report disclosure values above the average. Whereas several companies that do not have managerial share ownership also have sustainability report disclosure values above the average.

In conclusion, the presence of managerial share ownership has no effect on the extent of sustainability report disclosure. the number of managerial shareholdings makes the role of managers more numerous. Even though managerial share ownership in energy companies is high, in fact, management has not been able to maximize its productivity in encouraging activities or activities aimed at long-term performance through sustainability reports. Management is still focused on high rates of return so that it dominates in efforts to get the company to maximize profits and is not too focused on disclosing sustainability reports. The results of this study are in line with research that has been conducted (Yudhanti & Listianto, 2021), (Ardiani et al., 2022), and (Latifah et al., 2019) that managerial share ownership has no effect on sustainability report disclosure.

B. Influence of the Independent Board of Commissioners on Sustainability Report Disclosure

The probability value on the Independent Board of Commissioners variable is 0.3217 which is greater than 0.05 explaining that the board of independent commissioners has no effect on the disclosure of the sustainability report in energy sector companies listed on the IDX in 2018-2021.

Table 5. Independent Board of Commissioners and Disclosure of Sustainability Report

Independent Board of Commissioners	Disclosure of Sustainability Report				Total
	Above Average		Below Average		
	Total	%	Total	%	
Independent Board of Commissioners above the mean (>0,41)	7	58%	5	42%	12
Independent Board of Commissioners below the mean (<0,41)	9	32%	19	68%	28
Total	16	40,0%	24	60,0%	40

Source: Data that has been processed by the author (2023)

According to the statistical data in table 5, from a total of 40 samples of observational data, the independent board of commissioners has a value above the average with sustainability report disclosure above the average of 58% or 7 samples, the remaining 42% or 5 samples of an independent board of commissioners have a value above the average with sustainability report disclosure below average. Whereas those with an independent board of commissioners' value below the average with sustainability report disclosure above the average were 32% or 9 samples, the remaining 68% or 19 sample companies had an independent board of commissioners' value below the average with sustainability report disclosures below the average. However, it can be concluded that companies with an independent board of commissioners' values above average usually have sustainability report disclosures values above average, and those with an independent board of commissioners' values below average typically have values below average.

A good proportion of the number of commissioners does not necessarily result in a good sustainability report disclosure either. The need for supervision (monitoring) of management is the main factor to give encouragement to management in disclosing sustainability reports. Skills, knowledge, and competence are also other factors in improving decision-making at the board of commissioners level (Tobing et al., 2019). The results of this study are in line with research that has been conducted (Yudhanti & Listianto, 2021), (Tobing et al., 2019), and (Latifah et al., 2019) that the board of independent commissioners has no effect on sustainability report disclosure.

C. Influence of the Board of Directors on Sustainability Report Disclosure

The Board of Directors variable shows a probability value of 0.2970 greater than 0.05 thus, this result indicates that the board of directors has no effect on the disclosure of the sustainability report in energy sector companies listed on the IDX in 2018-2021.

Table 6. Board of Directors and Disclosure of Sustainability Report

Board of Directors	Disclosure of Sustainability Report				Total
	Above Average (>0,4968)		Below Average (<0,4968)		
	Total	%	Total	%	
Board of Directors above mean (>36,2)	8	44%	10	56%	18
Board of Directors below mean (<36,2)	8	36%	14	64%	22
Total	16	40%	24	60%	40

Source: Data that has been processed by the author (2023)

According to the statistical data in Table 6, from a total of 40 samples of observational data, the board of directors has a value above the average with sustainability report disclosure above the average of 44% or 8 samples, the remaining 56% or 10 samples of the board of director have a value above the average with sustainability report disclosure below average. Whereas those with a board of director value below the average with sustainability report disclosure above the average were 36% or 8 samples, the remaining 64% or 14 sample companies had a board of director value below the average with sustainability report disclosures below the average. It can be said that companies with a board of directors score above the average tend to have a sustainability report disclosure value below the average, while companies with a board of directors score below the average tend to have a sustainability report disclosure value above the average.

In conclusion, a large percentage of the board of director will not affect the extent of sustainability report disclosure. A good relationship does not mean that to create a transparent, accountable, and informative disclosure of a sustainability report, and in accordance with the needs of stakeholders, it is necessary to hold meetings that are too frequent. But good relations and communication between the board of directors can be able to create good corporate governance. So that this can affect company disclosure, including disclosure of sustainability reports. The results of this study are in line with research that has been conducted by (Yudhanti & Listianto, 2021) that the board of directors has no effect on the disclosure of sustainability reports.

D. Influence of the Audit Committee on Sustainability Report Disclosure

Based on the research results, the significance value of the Audit Committee variable is 0.0097 indicating that the audit committee has a significant positive effect on the disclosure of sustainability reports in energy sector companies listed on the IDX in 2018-2021.

Table 7. Audit Committee and Disclosure of Sustainability Report

Audit Committee	Disclosure of Sustainability Report				Total
	Above average (>0,4968)		Below Average (<0,4968)		
	Total	%	Total	%	
Audit Committee above mean (>3,8)	13	68%	6	32%	19
Audit Committee below mean (<3,8)	3	14%	18	86%	21
Total	16	40%	24	60%	40

Source: Data that has been processed by the author (2023)

According to the statistical data in Table 7, the audit committee has a value above the average with sustainability report disclosure above the average of 68% or 11 samples, the remaining 32% or 6 samples of financial performance have a value above the average with sustainability report disclosure below average. Whereas those with an audit

committee value below the average with sustainability report disclosure above the average were 14% or 3 samples, the remaining 86% or 18 sample companies had an audit committee value below the average with sustainability report disclosures below the average. However, it can be concluded that companies with audit committee values above average usually have sustainability report disclosures values above average, and those with audit committee values below normal typically have values below average.

In conclusion, the large number of audit committees makes for better coordination and can carry out tasks more effectively. Through the role of the audit committee, effective performance implementation can provide encouragement to management to be able to carry out good corporate governance properly and sustainably and can support disclosure of reports that are more integrated in accordance with existing regulations. The results of this study are in line with research conducted by (Yudhanti & Listianto, 2021), (Ardiani et al., 2022), and (Tobing et al., 2019) that the audit committee has a positive effect on the disclosure of sustainability reports.

E. Influence of Gender Diversity on Sustainability Report Disclosure

The Gender Diversity variable shows a value of 0.8084 more than 0.05, this indicates that gender diversity has no effect on the disclosure of sustainability reports in energy sector companies listed on the IDX in 2018-2021.

Table 8. Gender Diversity and Disclosure of Sustainability Report

Gender Diversity	Disclosure of Sustainability Report				Total
	Above Average (>0,4968)		Below Average (<0,4968)		
	Total	%	Total	%	
Gender Diversity above mean (>0,1319)	7	39%	11	61%	18
Gender Diversity below mean (<0,1319)	9	41%	13	59%	22
Total	16	40%	24	60%	40

Source: Data that has been processed by the author (2023)

According to the statistical data in Table 8, gender diversity has a value above the average with sustainability report disclosure above the average of 39% or 7 samples, the remaining 61% or 11 samples of gender diversity have a value above the average with sustainability report disclosure below average. Whereas those with a gender diversity value below the average with sustainability report disclosure above the average were 41% or 9 samples, the remaining 59% or 13 sample companies had a gender diversity value below the average with sustainability report disclosures below the average. It can be said that companies with gender diversity values above the average tend to have sustainability report disclosure values below the average, while companies with gender diversity values below the average tend to have sustainability report disclosure values above the average.

In conclusion, gender diversity in members of the board of directors have different views and new perspectives can improve decision-making that is more accurate and precise. However, the presence of female directors in companies is still something new. Women who are more careful in their actions and tend to avoid risks in making decisions make them lose equal opportunities to participate. So that the number of female directors is not related to the extent of disclosure of the sustainability report. The results of this study are in line with research that has been conducted (Juwita & Honggowati, 2021) and (Yuliandhari et al., 2022) that gender diversity has no effect on sustainability report disclosure.

F. Influence of Financial Performance on Sustainability Report Disclosure

Financial Performance is worth 0.0318 which means that financial performance has a significant positive effect on disclosure of the sustainability report in energy sector companies listed on the IDX in 2018-2021.

Table 9. Financial Performance and Disclosure of Sustainability Report

Financial Performance	Disclosure of Sustainability Report				Total
	Above Average (>0,4968)		Below Average (<0,4968)		
	Total	%	Total	%	
Financial Performance Above mean (>0,0469)	10	56%	8	44%	18

Financial Performance Below mean (<0,0469)	6	27%	16	73%	22
Total	16	40%	24	60%	40

Source: Data that has been processed by the author (2023)

According to the statistical data in Table 9 from a total of 40 samples of observational data, financial performance has a value above the average with sustainability report disclosure above the average of 56% or 10 samples, the remaining 44% or 8 samples of financial performance have a value above the average with sustainability report disclosure below average. Whereas those with a financial performance value below the average with sustainability report disclosure above the average were 27% or 6 samples, the remaining 73% or 16 sample companies had a financial performance value below the average with sustainability report disclosures below the average. However, it can be concluded that companies with financial performance values above average usually have sustainability report disclosures values above average, and those with financial performance values below normal typically have values below average.

In conclusion, high financial performance tends to make management strive to keep it looking good and have the trust of stakeholders. Management will try to provide transparent information about how profits are generated by the company through the disclosure of the sustainability report (Latifah et al., 2019). This will result in the relationship between the company and stakeholders not only based on stakeholder support for the company but the company providing benefits to stakeholders by making disclosures in the sustainability report, according to stakeholder theory. The results of this study are in line with research conducted by (Yudhanti & Listianto, 2021), (Wardoyo et al., 2022), and (Latifah et al., 2019) that financial performance has a positive effect on sustainability report disclosure.

V. CONCLUSION AND RECOMMENDATION

There is evidence that the audit committee and financial performance partially influence the disclosure of the sustainability report. However, good corporate governance represented by proxies of managerial share ownership, independent commissioners, boards of directors, and gender diversity does not affect sustainability report disclosure. However, there are still some limitations such as the research sample which was only 4 years with an energy company so that the number of samples received was not large enough to affect the results. so that it is hoped that future researchers can use research objects with other sectors with longer years of research as well as other variables that are not related which are expected to influence the disclosure of sustainability reports.

The existence of an audit committee in a company will increase the number of sustainability report disclosures which has a positive impact on the company, the role of the audit committee so that performance becomes effective and can encourage management to be able to carry out good corporate governance properly and sustainably so that consistency in carrying out disclosure of sustainability reports can be increased and by applicable GRI standards. Furthermore, companies also must pay attention to good performance so that they will be able to be more transparent in making disclosures to the public. High financial performance will produce adequate information and assist investors in investing in companies that are not only concerned with financial aspects but also social and environmental aspects.

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