

**BUSINESS STRATEGY OF B2B DIGITAL SOLUTION IN
TELECOMMUNICATION COMPANY
CASE STUDY: TELKOMSEL ENTERPRISE DIGITAL
SOLUTION IN INDONESIA MINING INDUSTRY**

FINAL PROJECT

**In partial fulfilment of the requirements
for the master's degree
from Institut Teknologi Bandung**

**By
MUHAMMAD SA'AD
Student ID: 29121434
(Master of Business Administration Program)**



**INSTITUT TEKNOLOGI BANDUNG
July 2025**

ABSTRACT

BUSINESS STRATEGY OF B2B DIGITAL SOLUTION IN TELECOMMUNICATION COMPANY CASE STUDY: TELKOMSEL ENTERPRISE DIGITAL SOLUTION IN INDONESIA MINING INDUSTRY

By
Muhammad Sa'ad
Student ID: 29121434
(Master of Business Administration Program)

Indonesia as one of the largest economies in Southeast Asia, has experienced economic growth and become one of major player in the global market. The country's economic growth contributed by its natural resources such as oil, gas, mining and minerals. The Mining & mineral sector has a significant role. The government programs like "Making Indonesia Digital 4.0" plan to accelerate the digital transformation that placed Indonesia as one of the leaders in the digital economy. The Government efforts like the regulations and guidelines, direct investment, and invite the foreign investment digital infrastructure to accelerate the adoption of Industry 4.0 Technologies to all sectors include mining industry.

In the context of Indonesia digital economy, PT. Telekomunikasi Selular (TSEL) as Indonesia market leader in mobile operator/provider, faces both significant business challenges and opportunities as it strives to expand its business in the B2B digital solutions market, particularly in mining& minerals industry and other industrial sectors. TSEL has seen its core B2C business such as voice, SMS and data services revenue growth stagnate and the Net profit margin decreased, encourage the company to diversify into more digital business.

This research objectives the strategic business development of TSEL B2B/Enterprise Digital Solutions (TEDS) in the Indonesia mining industry, providing an in-depth case study of its digital business strategy efforts. The research utilizes qualitative code of data from key informant interviews with TEDS High level management and Mining digitalization expert as primary data and secondary data from report, journal, paper and internet. The research utilizes several strategic frameworks consist of value Chain Activity, VRIO, General Environment PESTLE, Industry, Competitor & Porter's Five Forces, SWOT, TOWS matrix, Michael Porter's Generic Strategy and Business Model Canvas to analyse TEDS's Internal and External factors (strengths, weaknesses, opportunities, and threats) in the mining sector and the formulate the business strategy with Michale Porter's Generic Strategy and TOWS matrix and develop the suitable new business model with Business Model canvas. The research finds that TEDS's strengths include its vast network coverage, strong government relations, and leadership in providing end-to-end digital solutions (network, IoT, platform, cloud, edge computing, and AI).

However, TEDS have weakness such as Telco centric Brand and reputation, fragmented solution packaging, the slow adoption of recent technologies in the mining sector, and a lack of mining's specific expertise teams. Externally, the research highlights opportunities such as increasing regulatory pressures regarding sustainability and emissions reporting, the rising adoption of technologies such as IoT, Cloud and AI, and the shift in the mining industry towards automation as key opportunities for TEDS. The external threats include intense competition from global and local tech providers and the lengthy procurement cycles within the mining industry.

The strategic recommendation results from Michael Porter's Generic Strategy is Integrated Cost Leadership and Differentiation and the TOWS matrix analysis results for the details strategy and using from strategy priority matrix are Maxi-maxi - SO (Strengths & Opportunities) and Mini-Maxi – WO (Weaknesses & Opportunities) hybrid strategies results focus on leveraging TEDS's strengths to seize opportunities combine with improving weaknesses to maximizing opportunities effectively in the mining industry. This research also proposes recommendations and implementation plan strategy, with a 3 years' timeline for scaling TEDS in the mining industry, through enhanced modular solutions, talent development & expansion, and stronger partnerships with mining companies, partner or vendor and government/regulatory. Leveraging consultative selling techniques and integrating customer-centric solutions are crucial for TEDS to succeed in this competitive and dynamic market.

This thesis aims to contribute to the discussion of how telecommunications company can transform their business direction to be digital solution providers/company in industrial sectors, give insights for TEDS and other companies that facing similar digital transformation and business challenges in emerging markets.

Keywords: TEDS, Mining Industry, Internal Analysis, External Analysis, Business Strategy Development, Business Model Canvas.

ABSTRAK

STRATEGI BISNIS B2B SOLUSI DIGITAL B2B DI PERUSAHAAN TELEKOMUNIKASI STUDI KASUS: TELKOMSEL ENTERPRISE SOLUSI DIGITAL DI INDUSTRI PERTAMBANGAN DI INDONESIA

Oleh
Muhammad Sa'ad
Student ID: 29121434
(Program Studi Magister Administrasi Bisnis)

Indonesia sebagai salah satu negara dengan perekonomian terbesar di Asia Tenggara, telah mengalami pertumbuhan ekonomi yang berkelanjutan dan menjadi pemain utama di pasar global. Pertumbuhan ekonomi Indonesia terutama didorong oleh sumber daya alamnya, termasuk minyak, gas, dan pertambangan, dengan sektor pertambangan memainkan peran yang penting. Program pemerintah seperti "Making Indonesia Digital 4.0" berupaya untuk mempercepat transformasi digital yang menempatkan Indonesia sebagai salah satu pemimpin dalam ekonomi digital. Upaya pemerintah seperti regulasi dan pedoman, investasi langsung, dan mengundang investasi asing terkait infrastruktur digital untuk mempercepat adopsi Teknologi Industri 4.0 ke semua sektor termasuk industri pertambangan.

Dalam konteks ekonomi digital Indonesia, PT. Telekomunikasi Selular (TSEL) sebagai pemimpin pasar operator/penyedia layanan seluler di Indonesia, menghadapi tantangan dan peluang bisnis yang signifikan saat berupaya memperluas bisnisnya di pasar solusi digital B2B, khususnya di industri pertambangan & mineral dan sektor industri lainnya. TSEL telah melihat bisnis inti B2C seperti layanan suara, SMS, dan data mengalami stagnasi pertumbuhan pendapatan dan marjin laba bersih menurun, mendorong perusahaan untuk melakukan diversifikasi ke bisnis digital.

Penelitian ini bertujuan untuk pengembangan bisnis strategis TSEL B2B/Enterprise Digital Solutions (TEDS) di industri pertambangan Indonesia, menyediakan studi kasus mendalam tentang upaya strategi bisnis digitalnya. Penelitian ini menggunakan kode data kualitatif dari wawancara informan utama dengan manajemen tingkat tinggi TEDS dan pakar digitalisasi pertambangan sebagai data primer dan data sekunder dari laporan, jurnal, makalah, dan internet. Penelitian ini menggunakan beberapa kerangka kerja strategis yang terdiri dari Aktivitas Rantai Nilai, VRIO, Lingkungan Umum PESTLE, Industri, Pesaing & Lima Kekuatan Porter, SWOT, matriks TOWS, Strategi Generik Michael Porter dan Kanvas Model Bisnis untuk menganalisis faktor Internal dan Eksternal TEDS (kekuatan, kelemahan, peluang, dan ancaman) di sektor pertambangan dan merumuskan strategi bisnis dengan Strategi Generik Michael Porter dan matriks

TOWS dan mengembangkan model bisnis baru yang sesuai dengan kanvas Model Bisnis. Penelitian ini menemukan bahwa kekuatan TEDS meliputi jangkauan jaringan yang luas, hubungan pemerintah yang kuat, dan kepemimpinan dalam menyediakan solusi digital yang lengkap (jaringan, IoT, platform, cloud, edge computing, dan AI). Namun, TEDS memiliki kelemahan seperti Merek dan reputasi yang berpusat pada Telco, paket solusi yang terfragmentasi, lambatnya adopsi teknologi terkini di sektor pertambangan, dan kurangnya tim ahli khusus pertambangan. Secara eksternal, penelitian ini menyoroti peluang seperti meningkatnya tekanan regulasi terkait keberlanjutan dan pelaporan emisi, meningkatnya adopsi teknologi seperti IoT, Cloud, dan AI, serta pergeseran industri pertambangan menuju otomatisasi sebagai peluang utama bagi TEDS. Ancaman eksternal meliputi persaingan ketat dari penyedia teknologi global dan lokal serta siklus pengadaan yang panjang dalam industri pertambangan.

Rekomendasi strategis yang dihasilkan dari Strategi Generik Michael Porter adalah Kepemimpinan Biaya Terpadu dan Diferensiasi dan hasil analisis matriks TOWS untuk strategi detail dan penggunaan dari matriks prioritas strategi adalah Maxi-maxi - SO (Kekuatan & Peluang) dan Mini-Maxi - WO (Kelemahan & Peluang) hasil strategi hibrida berfokus pada pemanfaatan kekuatan TEDS untuk meraih peluang yang dikombinasikan dengan perbaikan kelemahan untuk memaksimalkan peluang secara efektif dalam industri pertambangan. Penelitian ini juga mengusulkan rekomendasi dan strategi rencana implementasi, dengan jangka waktu 3 tahun untuk meningkatkan skala TEDS dalam industri pertambangan, melalui solusi modular yang ditingkatkan, pengembangan & perluasan bakat, dan kemitraan yang lebih kuat dengan perusahaan pertambangan, mitra atau vendor dan pemerintah/regulasi. Memanfaatkan teknik penjualan konsultatif dan mengintegrasikan solusi yang berpusat pada pelanggan sangat penting bagi TEDS untuk berhasil di pasar yang kompetitif dan dinamis ini.

Tesis ini bertujuan untuk berkontribusi pada diskusi tentang bagaimana perusahaan telekomunikasi dapat mengubah arah bisnis mereka menjadi penyedia/perusahaan solusi digital di sektor industri, memberikan wawasan bagi TEDS dan perusahaan lain yang menghadapi transformasi digital dan tantangan bisnis serupa di pasar negara berkembang.

Kata kunci: TEDS, Industri Pertambangan, Analisis Internal, Analisis Eksternal, Pengembangan Strategi Bisnis, Kanvas Model Bisnis.

**BUSINESS STRATEGY OF B2B DIGITAL SOLUTION IN
TELECOMMUNICATION COMPANY
CASE STUDY: TELKOMSEL ENTERPRISE DIGITAL
SOLUTION IN INDONESIA MINING INDUSTRY**

By
Muhammad Sa'ad
Student ID: 29121434
Master of Business Administration Program
Institut Teknologi Bandung

Approved

Date: July 11st, 2025

Supervisor



(Prof. Dr. Ir. Utomo Sarjono Putro, M. Eng)

DECLARATION OF NON-PLAGIARISM

Plagiarism is:

Taking, using, and submitting a work of another, including an idea, writing, or invention, as if it was her or his own.

Plagiarism includes (but not limited to):

1. **quoting verbatim** the work of another without acknowledgement of the source;
2. **paraphrasing** the work of another without acknowledgement of the source;
3. **using** the idea of another without acknowledgement of the source; 4. **submitting** the work of another without identifying clearly who did the work;
5. **colluding** by submitting the work of another as her or his own with consent from the other.

I understand that Plagiarism is wrong, a breach of academic integrity, and against Program, School, and University's Policy and Regulation.

I declare that all material in this Final Project is original, my own work, and does not involve plagiarism.

I have not allowed, and will not allow, another to copy my work with the intention of submitting it as her or his own work.

Name Muhammad Sa'ad Student ID 29121434



Signed _____ Date 11 July 2025

STATEMENT LETTER

Nomor : FR.01-RK.01Revisi : 0
Tanggal : 02-04-2018
Halaman : 1 dari 1

STATEMENT LETTER

The undersigned is:

Name : Muhammad Sa'ad

NIM : 29121434

Email*: muh.saad01@gmail.com

() please write another personal email not email sbm.itb.ac.id)*

Hereby declare that:

1. The manuscript has not been published or are in the process of submission in the other journals.
2. Scientific paper is free plagiarism.

If it is found in the future that there is plagiarism or other abuses in the submitted paper, I am willing to accept the sanctions in accordance with the provision of the legislation.

Sincerely,



Muhammad Sa'ad

FINAL PROJECT GUIDANCE

Unpublished masters' final project is registered and available in the Library of Bandung Institute of Technology, and is open for public, provided that the author owns the copyright in accordance with the intellectual property rights that are applicable in the Library of Institut Teknologi Bandung. Bibliographical references are allowed to be use in a limited manner; however, the citation and summarization can only be proceeded upon the author's permission and must include the scientific norm of stating this final project as the source.

This final project has to be cited as:

Sa'ad, Muhammad. 2025: *Business Strategy of B2B Digital Solutions in Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solutions in Indonesia Mining Industry*, Masters' Final Project, Institut Teknologi Bandung.

Reproduction or publication of parts or whole of the final project must be under the consent of the Head of Graduate School, Bandung Institute of Technology.

Bismillahirrahmanirrahim, Alhamdulillah

This final project is dedicated to my beloved wife (Levina Indrawati Kusuma) and my lovely children (Junna Rafassya El Sa'ad and Sienna Claradivya El Sa'ad), my beloved parents (Mr. Ngadiis and Mrs. Nafiah), who always support and courage me.

I hope this MBA journey to become inspiration for my children (Junna Rafassya El Sa'ad and Sienna Claradivya El Sa'ad) to always have fighting spirit and to pursue the educations and the dreams.

“An investment in knowledge pays the best interest.” – Benjamin Franklin.

ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim, Alhamdulillah, with sincere gratitude to God, I am delighted to announce the completion of my final project. This project is a last part of my Business Leadership Executive MBA study program at SBM ITB. The successful completion of the research and this last assignment would not have been possible without the invaluable support and direction provided by all stakeholders.

Thus, I hereby wish to extend my gratitude and convey my utmost appreciation to:

1. Professor Dr. Ir. Utomo Sarjono Putro, M. Eng, served as the supervisor for the final assignment, providing valuable time, knowledge, instructions, guidance, support and autonomy to complete this final project.
2. The entire academic community, including professors and prominent educators, while teaching in the BLEMBA ITB program. These efforts have contributed to delivering high-quality education and instilling leadership skills, both on an individual level and in the context of corporate and professional endeavours.
3. The colleagues at the Telkomsel that have demonstrated data transparency, engaged in high quality discussions, and give support in successfully finishing this final assignment.
4. The entire 66th BLEMBA team consistently offers assistance & support, engages in high quality discussions, and fosters a warm sense of friendship both within and beyond the classroom.

The critiques, feedback, recommendation and suggestion are very appreciated for the completion and perfection of this final project. I expected that this final assignment could make a valuable contribution and could give benefit for those who requires.

Jakarta, July 11st, 2025

Muhammad Sa'ad

TABLE OF CONTENTS

ABSTRACT.....	i
<i>ABSTRAK</i>	iii
VALIDATION PAGE	v
FINAL PROJECT GUIDANCE	viii
ACKNOWLEDGEMENTS	x
TABLE OF CONTENTS.....	xi
LIST OF APPENDICES	xiii
LIST OF FIGURES	xiv
LIST OF TABLES.....	xvi
LIST OF ABBREVIATIONS AND SYMBOLS	xvii
Chapter I Introduction.....	1
I.1 Background	1
I.2 Company Profile	6
I.3 Business Issue	16
I.4. Research Questions	21
I.5. Research Objectives	22
I.6. Research Scope and Limitations	22
Chapter II Literature Review.....	24
II.1. Theoretical Foundation	24
II.1.1. SWOT Analysis	24
II.1.2. Value chain Activity Analysis	27
II.1.3. VRIO Analysis.....	29
II.1.4. General Environment PESTLE Analysis.....	32
II.1.5. Industry & Competitor using Porter's Five ForcesAnalysis.....	36
II.1.6. TOWS Matrix	40
II.1.7. Business Strategy	43

II.1.8. Business Model Canvas (BMC).....	45
II.2. Conceptual Framework.....	50
Chapter III Research Methodology	52
III.1. Research Design.....	52
III.2. Data Collection Method	71
III.3. Data Analysis Method.....	74
Chapter IV Results and Discussion	78
IV.1. Analysis.....	78
IV.2. Business Solution.....	137
IV.3. Implementation Plan	148
Chapter V Conclusion and Recommendation	150
V.1. Conclusion	150
V.2. Recommendation	152
REFERENCE.....	154
APPENDICES	157

LIST OF APPENDICES

Appendix A Interview with Key Informants - PESTLE Analysis.....	157
Appendix B Interview with Key informants - Porter's Five Forces.....	173
Appendix C Interview with Key Informants - VRIO	188
Appendix D Interview with Key Informants - SWOT.....	206

LIST OF FIGURES

Figure I.1 ICT Tsel Addressable by Region	4
Figure I.2 TSEL Vision & Mission.....	7
Figure I.3 TSEL Milestone 1995 - 2017	9
Figure I.4 TSEL Milestone 2018 - 2023	10
Figure I.5 TSEL Corporate Structure.....	11
Figure I.6 TSEL Organization Structure.....	13
Figure I.7 TSEL Financial Highlights 2019 - 2023	15
Figure I.8 TSEL Operational Highlights.....	16
Figure I.9 TSEL Profit and Loss 2019 - 2023.....	17
Figure I.10 TSEL Customer Base 2019 - 2023.....	18
Figure I.11 TSEL Revenue Trend and Component 2014 - 2023	19
Figure I.12 TSEL Subscriber x Net Income 2014 - 2023	19
Figure I.13 Indonesia Coal and Mining Production Trends (2010 – 2022).....	20
Figure II.1 SWOT Analysis Model.....	25
Figure II.2 Porter’s Generic Value Chain Activity Analysis	28
Figure II.3 VRIO Model	31
Figure II.4 General Environment PESTLE Analysis Method	35
Figure II.5 Porter’s Five Forces, Industry & Competitors.....	39
Figure II.6 TOWS Matrix	42
Figure II.7 Michael Porter’s Generic Strategy	44
Figure II.8 Business Model Canvas Framework.....	49
Figure II.9 Conceptual Study Framework	51
Figure III.1 Research Design Flowchart	53
Figure III.2 Methodology to Collect Data and Information.....	74
Figure IV.1 Value Chain Activity Analysis Result.....	78
Figure IV.2 Mining & Mineral Industry Contribution to Indonesia GDP 2006 - 2022.....	104
Figure IV.3 Indonesia Resources & Mining Industry ICT Spending	105
Figure IV.4 Mining Industry Trends.....	106
Figure IV.5 Top technology Investment Priority in the next 5 years in Mining	

Industry	106
Figure IV.6 Percentage of ESG Metric Use by Mining Company	107
Figure IV.7 Value Chain Integrated Nickel Mining Upstream – Downstream EV Battery Industry in Indonesia.....	107
Figure IV.8 Roadmap of EV Charging Station 2020 – 2030.....	108
Figure IV.9 Digital Player at Glance of Digital Solutions Market in Indonesia Mining Industry	110
Figure IV.10 Competition Matrix Analysis - End to End Digital Solutions in Indonesia Mining Industry	110
Figure IV.11 Business strategy Solutions Priority Matrix.....	143
Figure IV.12 Business Model Canvas Development Results	144

LIST OF TABLES

Table III.1 Table Key Informants' Question Areas	55
Table III.2 Interview Question Related to SWOT	58
Table III.3 Interview Question Related to PESTLE	62
Table III.4 Question Related to VRIO	65
Table III.5 Question Related to Porter's Five Forces	68
Table IV.1 Qualitative Coding: VRIO Analysis Result.....	79
Table IV.2 Qualitative Coding: SW Analysis Result	84
Table IV.3 Qualitative Coding: PESTLE Analysis Result	91
Table IV.4 Qualitative Coding: Porter's Five Force Analysis Result.....	124
Table IV.5 Qualitative Coding: OT Analysis Result	129
Table IV.6 Qualitative Coding: SWOT Analysis Result	135
Table IV.7 TOWS Matrix Analysis Summary Results.....	138
Table IV.8 Timeline Strategy Implementation Plan	149

LIST OF ABBREVIATIONS AND SYMBOLS

ABBREVIATIONS	Name	Page of initial usage
4G LTE	Fourth Generation Wireless Long-Term Evolution	2
5G	Fifth Generation	5
AI	Artificial Intelligent	4
AR/VR	Augmented Reality / Virtual Reality	4
B2B	Business to Business	1
B2C	Business to Consumer	1
BMC	Business Model Canvas	45
BSSN	The National Cyber and Crypto Agency	101
CAGR	Compound Annual Growth Rate	4
CAPEX	Capital Expenditure	80
CIRTs	Cyber Incident Response Teams	101
CRM	Customer Relationship Management	81
CSR	Corporate Social Responsibility	35
DCS	Distributed Control System	99
ESG	Environmental, Social & Governance	2
ESO	Electronic System Operators	100
EV	Electric Vehicle	102
FMC	Fixed Mobile Convergence	8
FWA	Fixed Wireless Access	2
GDP	Gross domestic product	21
ICT	Information and Communication Technology	4
IoT	Internet of Things	1
KAM	Key Account Management	5
KPI	Key Performance Indicator	56
NGO	Non-Governmental Organization	103
O&M	Operations and Maintenance	123
OEM	original equipment manufacturer	82
OPEX	Operational Expenditure	80
OTT	Over the Top	2
PDP	People Data Protection Law	99
PESTEL	Political, Economic, Social, Technological, Environmental, Legal	5
PLC	Programmable Logic Controller	87
SCADA	Supervisory Control and Data Acquisition	87
RAM	Regional Area Account Management	124

RPJMN	National Medium Term Development Plan	1
SINGTEL	Singapore Telecom Mobile Pte Ltd	6
SLA	Services Level Agreement	129
SMS	Short Message Services	2
SOE	state owned enterprise	3
SWOT	Strength, Weakness, Opportunity, Threat	25
TAM	total addressable market	4
TEDS	Telkomsel Enterprise Digital Solutions	2
TELKOM	PT Telkom Indonesia	1
TKDN	Indonesia's local content regulations	91
TOWS	Threats, Opportunities, Weaknesses, Strength	42
TSEL	PT. Telekomunikasi Selular	1
uRLLC	Ultra-Reliable Low Latency Communication	2
VRIO	Valuable, Rare, Inimitable, Organized	30
WI-FI	Wireless Fidelity	107
YoY	Year on Year	94

Chapter I Introduction

I.1 Background

Indonesia economics condition undergoing a transformation, supported by economic growth and the commitment of government to modernization and digitalization. A pivotal point in this transformation is the government's strategic direction toward digital infrastructure development, as mandated by the 2020–2024 National Medium Term Development Plan (RPJMN), which includes the expansion of ICT infrastructure, its utilization, and support for digital transformation initiatives. These National policy and directions of “Making Indonesia Digital 4.0”, aiming Indonesia to be placed among the top ten global economies by 2030 through digital industrialization.

One of the key pillars in the trajectory is the transformation of telecommunications technologies as digital enabler, especially the development and adoption of 4G LTE and 5G networks. The fifth generation (5G) mobile network is not only about a technological upgrade, but it's also representing a paradigm shift in digital connectivity, offering ultra reliable low latency communication, massive machine type connectivity, and enhanced mobile broadband capabilities. The integration of 5G is expected to be a catalyse in transformation of the applications across industrial sectors by enabling autonomous systems, Artificial Intelligent (AI), Machine Learning, Internet of Things, smart Industry, and immersive digital experiences.

Within this national context, PT. Telekomunikasi Selular (TSEL) Indonesia as market leader in cellular network provider has assumed a corporate strategic role in driving digital transformation. A joint venture between PT Telekomunikasi Indonesia (Telkom) (65% shareholder) and Singapore Telecom Mobile Pte Ltd (35% shareholder), TSEL has pioneered digital innovation through initiatives such as the TSEL 5G Experience Centre, the 5G Industrial Day, and sector-specific digital solutions such as smart cities, transportation, education, and industrial automation. These initiatives

underline the company's transition from a traditional telecommunications provider to an integrated digital solution provider.

However, TSEL's market leadership is being challenged by rapid digital disruption, evidenced by stagnating revenues from traditional voice and SMS services and a shift in consumer behaviours toward data-centric and over the top (OTT) applications. To address this disruption, TSEL has one of its corporate strategy programs has launched enterprise level digital transformation, notably through Telkomsel Enterprise Digital Solutions (TEDS), focusing on Business to Business (B2B) digital services that serve to industry specific needs, including the mining, oil & gas, utility, logistics, finance, ICT, agriculture, government and manufacturing sectors.

Benchmark to several global telecommunications operator providers, they have demonstrated that successful 5G monetization strategies require tailored digital value propositions, collaborative ecosystems, and vertically integrated digital services. First use case, SK Telecom in South Korea has developed immersive Augmented Reality (AR)/ Virtual reality (VR) platforms and Artificial Intelligent (AI) based enterprise tools. Second use case by Verizon in the United States of America that already focus on Fixed Wireless Access (FWA) and Ultra Reliable Low Latency Communication (uRLLC) applications in the consumers and industry. The global benchmarks shown that 5G monetizing 5G depends not only on technical but also on the application or real use cases that align with Industry demand and Industry digitalization readiness.

In line with the industry business growth, the Indonesian mining segment shows the need, suitability and readiness in 5G use cases. This indicates from its operational, safety, and ESG requirements to increase productivity, efficiency, and compliance to the safety and ESG that necessary to be monitored real-time with geographic remote/rural area limitation. 5G technology that have Low latency and higher bandwidth features can enable autonomous vehicles, smart and AI CCTV surveillance, Smart fleet

management, remote operation, and IoT driven monitoring systems that can solve the mining sectors demand and requirements. However, the challenges in 5G also exist like government spectrum availability, huge infrastructure investment, and the Regulatory/Government frameworks readiness.

TSEL as a Market leader in cellular operator/provider during thirty years, with support from its holding company TELKOM as SOE and SINGTEL as a one of global cellular operators and solution providers. Since TSEL establish, its consistent not only leading as the largest market share in the Indonesia's telecommunications sector but also shown the good quality, strong operational performance and strong financial value. However, the present condition shown that this long historical market dominance is not sufficient to maintain business growth during the digital disruption era.

Over the last decade, TSEL indicates business stagnation, shown from its annual financial report history with decline in revenue and business growth. This deceleration is a sign of business trend shifting in the telecommunications industry, the decline of legacy services such as voice and Short Message System (SMS), switch by the rise of data and digital services such as streaming, digital platforms, cloud base applications, and OTT systems. These changes are a results of the consumer behaviours change affected by global change in digital trends.

TSEL seen the disruptive change as an opportunity, began to adapt and initiate a strategic transformation aimed at redefining its core business. Align the business with the global digital trends and national/government directions, TSEL transform from a telecommunications operator provider to an integrated digital solutions provider. The strategy to leverage its existing infrastructure, expertise, and market reach to pursue the opportunity in digital era, one of it through B2B/Enterprise services.

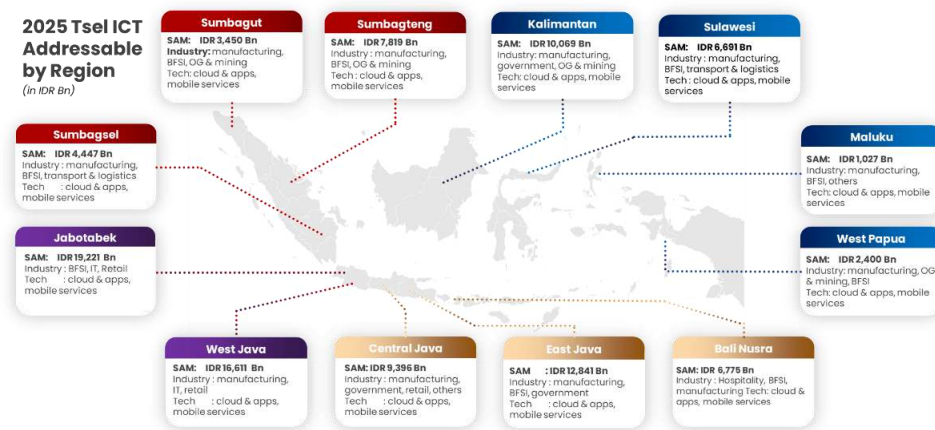


Figure I.1 ICT Tsel Addressable by Region
(Source: TSEL Research Data Internal by OMDIA Report, 2024)

Refer to TSEL internal independent market assessment, Total addressable market (TAM) outlook for Information and Communication Technology (ICT) is projected to reach IDR 221 trillion in 2025. TSEL assess the potential Services Addressable Market (SAM) is estimated at 45%, or IDR 100.7 trillion defined by the type of the services. Indonesia ICT market outlook growth shown by its Compound Annual Growth Rate (CAGR) forecast of 16.4% from 2025 to 2028. This condition is justified as a great opportunity for expansion for TSEL to scale its digital business to various industries.

From a sectoral perspective, demand for ICT services is heavily concentrated in industries undergoing rapid digitalization, notably mining, manufacturing, financial services and insurance, retail, and logistics. These sectors are increasingly reliant on ICT driven solutions to enhance operational efficiency, customer analytics, and data informed decision making. At the same time, regional disparities in ICT adoption evident in the concentration of spending in Jakarta and West Java (accounting for IDR 26 trillion or 37% of national spending) versus the underrepresented eastern provinces such as Maluku (with only IDR 693 billion in 2023) underscore the need for a differentiated, regionally sensitive digital strategy.

TSEL's digital transformation officially commenced in 2012 with internal organizational reforms intended to create a foundation for long term innovation. This transformation reached a critical inflection point in 2019 with the establishment of TSEL Enterprise, signalling the company's formal entry into the B2B domain. Through TSEL Enterprise, the company now delivers bespoke digital solutions tailored to the specific requirements of corporate clients, spanning cloud services, IoT integration, cybersecurity, smart connectivity, AI, and industry specific platforms.

Considering the change of TSEL corporate strategies, the present research aims to investigate the best strategy processes underlying TSEL's Enterprise/B2B digital solution (TEDS) deployment, with a specific focus on the Indonesia mining and mineral industry. Mining Company operation mostly in remote and harsh environmental conditions. And Its face critical challenges related to automation, remote operations, predictive maintenance, and real-time data analytics. TEDS leveraging 4G LTE, 5G, IoT, Edge Computing, Cloud, and AI end to end solutions and offer a compelling unique value proposition in addressing mining industry operational challenge.

The research seeks to provide deep analysis of how the strategies can be aligned with mining industry specific pain points and performance goals. In Addition, it aims to examine the wider implications such as alignment with sustainable & ESG for Digital Industry 4.0, contribute to both academic and strategic policy design in Indonesia's ICT and Digitalization.

According to the background, this research aims to conduct a strategic analysis of Telkomsel's B2B/Enterprise digital solutions (TEDS), with a focus on the implementation in Indonesia's mining industry. The research utilizing frameworks such as General Environment PESTEL, Industrial, Competitor & Porter's Five Forces, Value Chain, VRIO Model and the SWOT Analysis, the research seeks to evaluate TEDS's competitive positioning, strategic capabilities, and digital readiness for providing digital solution in Mining

industry. The research results can be utilized not only for TSEL's internal strategic planning but also as an insight for the similar or other industry digitalization.

I.2 Company Profile

PT Telekomunikasi Selular (TSEL) that established on 26 May 1995, is a subsidiary of PT Telekomunikasi Indonesia Tbk (TELKOM), the State-Owned telecommunication Enterprise of the Indonesian government (SOE). After the merge of Indihome from TELKOM to TSEL, TELKOM holds a major share of 69.9%, while Singapore Telecommunications Ltd. (SINGTEL) holds 31.1%. The merging move plan to consolidate fixed mobile converged services under a unified entity that mostly handle the B2C business. This merger not only strengthen TSEL's service portfolio but also reinforced TELKOM's control of mobile broadband segment, also proportionally diluting SINGTEL's share from its previous 35% share.

TSEL reputation as Indonesia's market leader of mobile telecommunications operator, have subscribers base of approximately 157 million users as of 2024. It operates network Base Transceiver stations over 265,000 across 2G, 3G, 4G LTE, and 5G. TSEL has frequency licenses range spanning from 900 MHz 1800 MHz, 2100 MHz to 2300 MHz. TSEL technological advanced and infrastructure readiness have positioned it at the pioneer of digital transformation aligned with Indonesia Government Agenda.

TSEL's general service offering the basic connectivity such as prepaid and postpaid segments, represented under brands such as Telkomsel PraBayar (an integrated brand unifying simPATI, kartuAs, and LOOP) and Telkomsel Halo (formerly kartuHalo). These brands differentiate not only by the pricing and billing payment models but also by their market segmentation. These enable TSEL to serve a vary of Indonesian consumers, from mass-market users with prepaid to enterprise or B2B users with postpaid.

With widest network infrastructure coverage in Indonesia, widest service branch, and integrated strategic partnerships, TSEL continues positioning as key player in Indonesia's national digitalization plan and agenda. Its transformation from a telecommunication operator company to a digital solutions provider marks a significant pivotal business to support wider objectives not only connectivity, but also digital literacy, and Industry 4.0 adoption.



Figure I.2 TSEL Vision & Mission
(Source: TSEL Annual Report, 2023)

Since established in 1995, TSEL has contribute to shape Indonesia telecommunications sector and aggressively expand its service portfolio from voice and SMS to include advanced mobile broadband, digital content platforms, IoT services, and enterprise digital solutions. In 2023, TSEL serve 159 million subscribers across the nation, supported by a network of more than 265,000 BTS sites and nationwide coverage across 2G, 3G, 4G LTE, and emerging 5G. Its widest network infrastructure and end to end solutions with

integration capabilities position TSEL as one of Indonesia leading digital Solution provider.

Align with its transformation, TSEL introduced its strategic theme “Semangat Indonesia” (The Spirit of Indonesia) in 2023, Bold its commitment to be Digital Company with culture like innovation and sustainable development. This initiative shown the company’s intentions to deliver digital experiences, empower under-served communities, and contribute directly to Indonesia’s Long term socio-economic goals. As part of SOE, by embedding this nationalism into its corporate culture and strategy, TSEL not only strengthens brand identity and reputations but also reinforces its role as a catalyst for digital economic growth, driving towards the Indonesia Government program: Making Indonesia 4.0 and the Vision of Indonesia Gold 2045.

TSEL achievements in 2023 was the successful execution of the Fixed Mobile Convergence (FMC) transition through the integration of IndiHome, Telkom’s fixed broadband unit. This merge significantly completing TSEL portfolio, enable the delivery of household digital solutions, including high-speed internet, entertainment, and smart home services. Strengthening its positions as a fully converged digital service provider. The FMC ownership show the change in TSEL’s value proposition, enhance service quality, network coverage and efficiency, and customer experience across both mobile and fixed platforms.

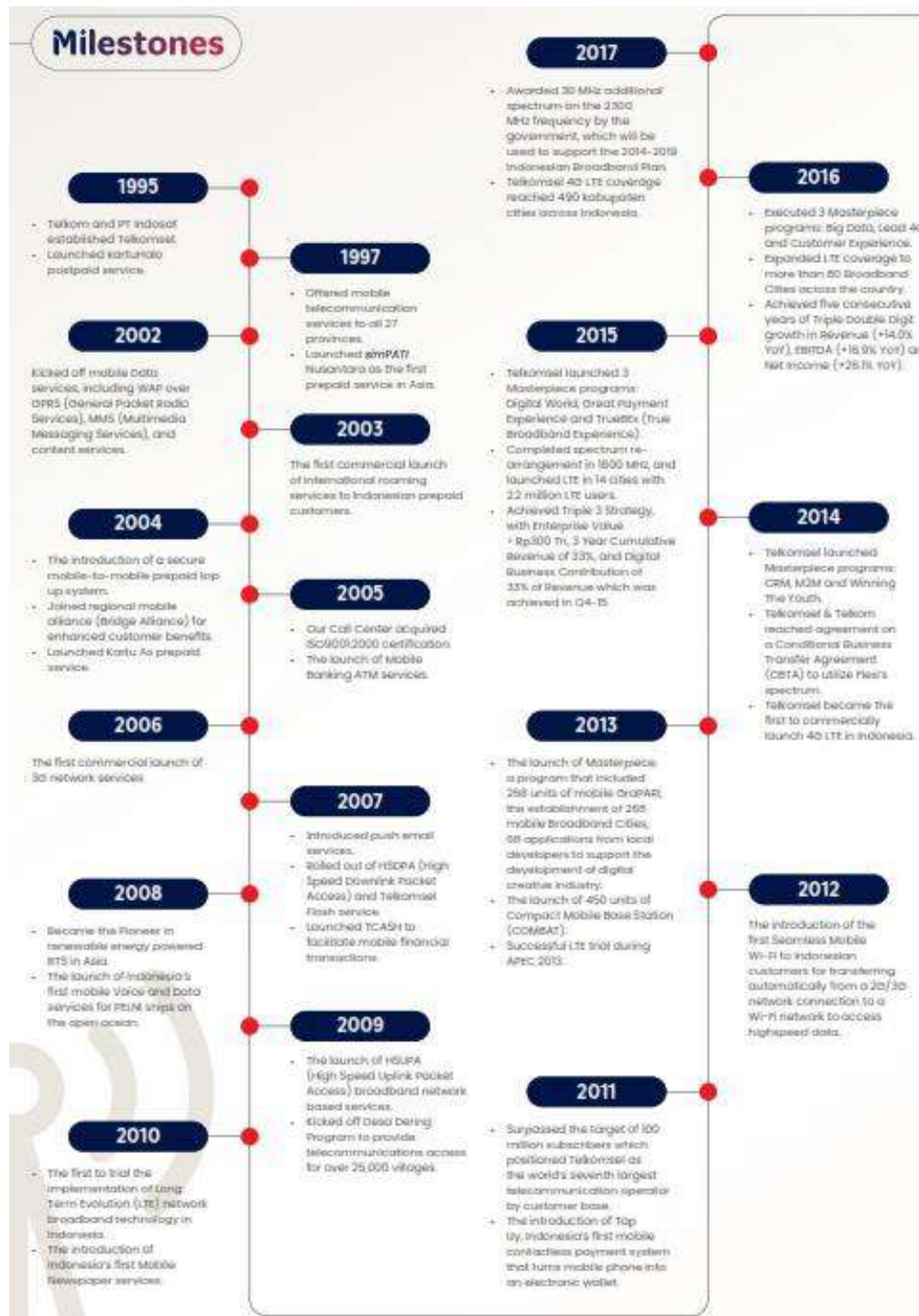


Figure I.3 TSEL Milestone 1995 - 2017
(Source: TSEL Public Annual Report, 2023)

This transformation results in strong financial outcomes, with TSEL increase 15.0% in total revenue and maintain EBITDA margin with 50.9%. These indicators reflect the TSEL operational excellence and cross segment

synergies. The results also show TSEL's resilience in navigating post-pandemic covid-19 market fluctuation and underline its ability to capitalize on emerging digital trends.



Figure I.4 TSEL Milestone 2018 - 2023
(Source: TSEL Public Annual Report, 2023)

In 2023, Guided by corporate theme, "Reach Beyond, Advancing the Nation", TSEL has launched several initiatives aimed at reinforcing its competitive edge in

digitalization Era. These included also expansion in digital services in specific target/sector and enhance customer centric or consultative selling strategies. As a result, while the mobile segment recorded low revenue growth only 0.1%, the subscribers increased by 1.6%. These indicates saturated and matured market. The merge of IndiHome give additional of 425,000 fixed broadband subscribers, highlighting well market acceptance of TSEL's fixed mobile converged offerings & services. TSEL's strategy towards digital businesses in B2C recorded 7.6% growth YoY in its B2C Digital Business segment, demonstrate a successful business transition from legacy services such as voice and SMS to the digital services. This performance shows TSEL's position not only as a mobile operator but as a digital solutions provider.

TSEL is well positioned and planned to lead Indonesia's digital business by continuously Improve its business model, innovative partnerships, and creating digital solutions that empower communities, businesses, and institutions.

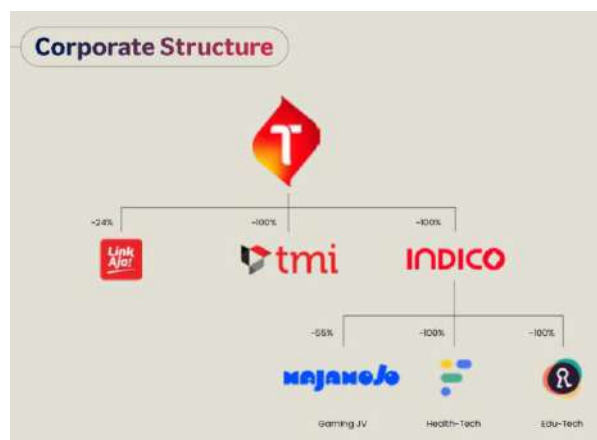


Figure I.5 TSEL Corporate Structure
(Source: TSEL Public Annual Report, 2023)

TSEL has established several key subsidiaries that operate as enablers within it expanding its business in digital ecosystem. These entities reflect company's proactive engagement with technological innovation like start-up, financial Technology, and Ventures Capital for Digital Ecosystem. Showing as a National leader in Indonesia's evolving digital economy. The key subsidiaries of TSEL as below:

- **LinkAja (PT Fintek Karya Nusantara)**
LinkAja is a subsidiary of TSEL's that focused on digital financial services, operate with licensed Electronic Money Issuer and Digital Financial Services Provider under the supervised and acknowledged by Bank Indonesia. LinkAja established under consortium of several entities of SOE including Pertamina, BRI, BNI, Mandiri Bank, BTN, Danareksa, and Jiwasraya. LinkAja services offering mobile payment, QR based transactions, and financial inclusion solutions. Its business under TSEL's portfolio, supports the strategic ambition of developing a seamless, interoperable digital financial ecosystem.
- **Telkomsel Ventures (formerly name: Telkomsel Mitra Inovasi)**
Rebranded in 2023, TSEL Ventures serves as the corporate venture capital (CVC) of TSEL, the business focus on strategic equity investments in early and growth stage digital startups that have high-potential & unique products, portfolio, innovation, business scale up, future valuation. Originally established as Telkomsel Mitra Inovasi (TMI), the business is identifying and scaling disruptive innovations, enabling TSEL to remain agile and future-ready in the middle of rapid technological change. Fostering strategic alliances and create ecosystem with visionary entrepreneurs and Start-up, TSEL Ventures contributes not only to internal innovation but also to enhance ecosystem development across areas such as Health tech, Edu tech, Green-tech, mobility, and AI.
- **INDICO**
INDICO is established with focus on developing digital technology with value propositions as incubator that advance participation in the digital economy. The business focused on digital community empowerment, and startup enablement/Incubator. INDICO actively collaborates with local talent, MSME, and social enterprises to promote sustainable digital adoption and to reduce barriers to entry in underserved regions and demographics.

Together, these subsidiaries form an integrated digital ecosystem that supports TSEL's transition from a legacy telecom operator to a digital Solutions

provider. TSEL utilizing financial technology, venture capital, and ecosystem development not only enhancing its competitive agility but also contributing to the realization of Indonesia Government Digitalization Plan. TSEL's position as one of the key orchestrator of the Indonesia digital landscape.

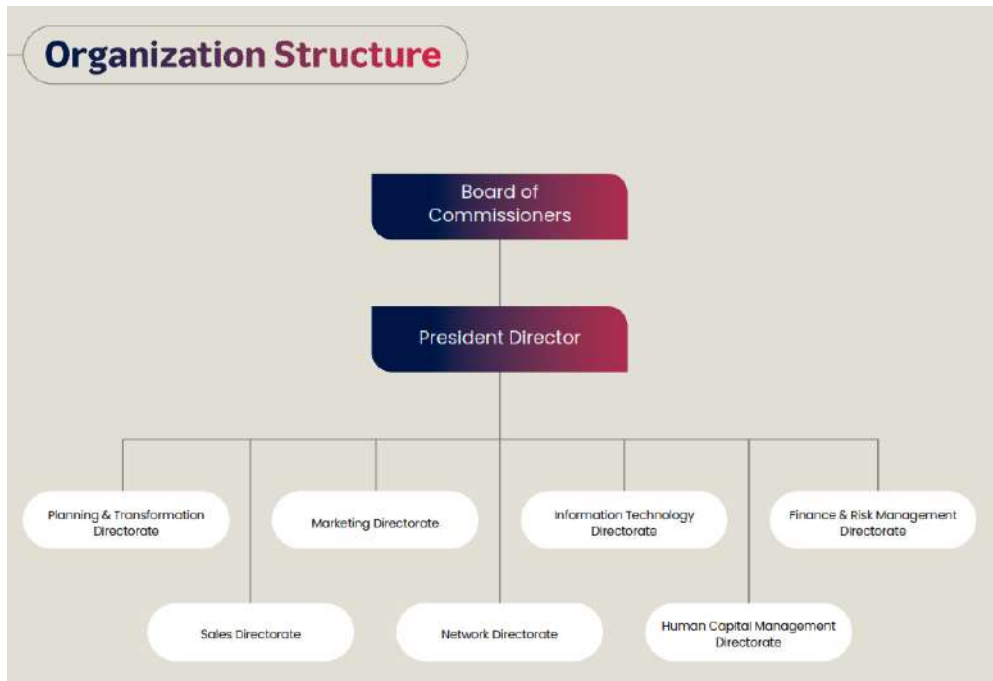


Figure I.6 TSEL Organization Structure
(Source: TSEL Public Annual Report, 2023)

TSEL's organization structure is under the leadership of the President Director, who concurrently serves as the Chief Executive Officer (CEO). Supporting the CEO are seven directorates lead by board of directors or managing directors. Each director responsible for key business in TSEL. These directorates are:

- Planning & Transformation Directorate
- Sales Directorate
- Marketing Directorate
- Network Directorate
- Information Technology Directorate
- Human Capital Management Directorate
- Finance & Risk Management Directorate

The Planning & Transformation Directorate serves as the strategic centre of the organization that responsible to formulate long-term corporate planning & strategies, driving enterprise digital transformation, and Driving innovation. The Directorate responsible to ensure TSEL's sustained competitiveness in dynamic technological and market change.

One of the key functions of this directorate is Telkomsel Enterprise Digital Solutions (TEDS), the sub-directorate responsible with developing and delivering enterprise digital solutions to the needs of enterprise or B2B customer segments such as government, SOE, large corporations, and industry sectors. TEDS's responsible also in products and solutions research and development (R&D), enterprise connectivity services, and the deployment of digital platforms and AI aligned with government direction and Industry market demands. The Planning & Transformation Directorate reflects TSEL's strategically also focused on B2B, innovation, and ambition to transform to digital solutions provider.

The Directorate not only reinforces functional agility and strategic Direction within the organization but also ensures that TSEL remains well positioned to be a leader in Indonesia's national digital transformation and to meet Market & Customers demands across both consumer and enterprise Industry segments.

Financial Highlights

DESCRIPTION (in billion Rupiah)	2023	2022	2021	2020	2019
PROFIT AND LOSS					
Total Revenues	102,371	88,039	87,506	87,103	81,088
Legacy	10,671	16,109	19,275	24,775	32,852
Digital Business	78,473	72,930	68,231	62,328	58,237
IndiHome B2C	13,227	-	-	-	-
Total Expenses (exclude Depreciation & others)	50,293	38,551	37,485	36,010	41,870
EBITDA	52,078	50,498	50,021	51,094	49,218
Net Income	21,878	18,367	26,160	25,062	25,799
FINANCIAL POSITION					
Current Assets	20,505	15,937	12,288	19,488	18,657
Non-current Assets	92,461	85,055	89,014	84,164	64,073
Total Assets	112,966	100,991	101,302	103,652	82,730
Current Liabilities	40,009	31,272	31,654	28,897	20,892
Non-current Liabilities	42,308	38,677	30,205	23,568	12,629
Equity	30,649	30,042	39,443	51,088	49,209
Total Liabilities and Equity	112,966	100,991	101,302	103,652	82,730
CASH FLOWS					
Cash Flows from Operating Activities	41,685	43,021	40,982	39,770	41,478
Cash Flows for Investing Activities	(14,302)	(8,652)	(12,943)	(10,923)	(13,448)
Cash Flows for Financing Activities	(28,601)	(30,783)	(34,427)	(28,277)	(25,943)
Cash and Cash Equivalents at Beginning of Year	6,352	2,766	9,154	8,583	6,497
Cash and Cash Equivalents at End of Year	5,135	6,352	2,766	9,154	8,583
FINANCIAL RATIOS					
EBITDA Margin ¹	51%	57%	57%	59%	54%
Net Income Margin ²	21%	21%	30%	29%	28%
Return on Assets ³	20%	18%	26%	27%	31%
Return on Equity ⁴	72%	53%	58%	50%	51%

Figure I.7 TSEL Financial Highlights 2019 - 2023

(Source: TSEL Public Annual Report, 2023)

Operational Highlights

	2023	2022	2021	2020	2019
CUSTOMERS - IN THOUSANDS					
Mobile	159,340	156,812	175,977	169,542	171,105
IndiHome B2C	8,694	-	-	-	-
LEGACY BUSINESS DRIVERS					
MoU Total - in billion minutes	63	92	123	151	179
SMS Total - in billion units	8	11	27	39	54
CORE BUSINESS DRIVERS					
Data-enabled Users - in thousand	127,128	120,907	120,516	115,938	110,253
Data Payload - in TB	17,901,034	16,426,853	13,837,050	9,654,742	6,715,227
ARPU - IN THOUSAND RUPIAH					
Mobile	48	44	44	44	46
IndiHome B2C	253	-	-	-	-
NETWORK DATA - UNITS					
Total BTS - 2G	48,980	50,158	50,241	50,252	50,297
Total BTS - 3G/4G/5G	198,492	215,036	200,875	180,920	161,938
Total BTS	247,472	265,194	251,116	231,172	212,235
EMPLOYEE DATA					
Total Employees (incl. subs & associated co)	6,455	5,658	5,535	5,371	5,465

Figure I.8 TSEL Operational Highlights
(Source: TSEL Public Annual Report, 2023)

I.3 Business Issue

TSEL as market leader in Indonesia Mobile Operators is undergoing a strategic transformation. The transformation is to adapt with disruptive market forces that driven by digitalization and change of consumer behaviours in the post-pandemic era. Also, the stagnation business shown in revenue streams Business to Consumer (B2C) segment in legacy services such as voice and SMS.

Facing the challenges and ensure sustainable long term business growth, TSEL has expanded its Business to Business (B2B) offerings through the development of TEDS. This division now provides an end to end solutions of

digital solutions, including connectivity infrastructure, IoT, cloud platforms, cybersecurity services, customer engagement tools, AI and industry sectors specific innovations such as Smart Manufacturing and Smart Mining.

TSEL was launch the Smart Mining Solution event in February 2023. The event indicates TSEL commitment and intention to become a digital solutions provider in the mining industry. TSEL sees that Mining Industry as one of Indonesia's most critical industries with huge opportunity and high buying power but still lagging in the digitalization. This move is also aligned with the Government program to encourage digitalization the mining sector, enhance ESG compliance, and contribute to Indonesia commitment to net zero emissions by 2050.

DESCRIPTION (in billion Rupiah)	2023	2022	2021	2020	2019
PROFIT AND LOSS					
Total Revenues	102,371	89,039	87,506	87,103	91,088
Legacy	10,671	16,109	19,275	24,775	32,852
Digital Business	78,473	72,930	68,231	62,328	58,237
IndiHome B2C	13,227	-	-	-	-
Total Expenses (exclude Depreciation & others)	50,293	38,551	37,485	35,010	41,870
EBITDA	52,078	50,488	50,021	51,094	49,218
Net Income	21,878	18,367	26,160	25,062	25,799

Figure I.9 TSEL Profit and Loss 2019 - 2023

(Source: TSEL Public Annual Report, 2023)

Refer to the financial reports, TSEL has experienced a decline trend in its customer bases also in net profit margin. This decline affected by change in consumer behaviours, market saturation, and competition in the mobile operator in the past five years from 2019 to 2023. This issue needed for strategic innovation and business model transformation to maintain long-term business growth.

	2023	2022	2021	2020	2019
CUSTOMERS - IN THOUSANDS					
Mobile	159,340	156,812	175,977	169,542	171,105
IndiHome B2C	8,694	-	-	-	-

Figure I.10 TSEL Customer Base 2019 - 2023
(Source: TSEL Public Annual Report, 2023)

In 2023, TSEL shown increase in the business positively affected by merged with IndiHome, Indihome as the market leader in fixed broadband service merged into TSEL operational structure, strengthening the portfolio with additional Fixed Mobile Convergence (FMC) and reinforcing the positions in the B2C broadband market. The Indonesian telecommunications sector is concurrently facing the disruption. Not only Digital disruption but also the entrance of low earth orbit (LEO) satellite providers, such as Starlink that offer high-speed, low-cost internet access across Indonesia. This conditions also introduces a competitive threat to TSEL's digital business sustainability.

TSEL already begun the diversify its business toward its Business to Business (B2B) Digital Solutions segment, which currently only contribute the revenue for approximately 7% of total revenue. However, it is expected to become a new engine of business growth. One of the segments that most promising is the mining industry. On the other hand, Mining Company in Indonesia as one of key pillar of economy also start undergoing transformation driven by macroeconomic, digitalization and sustainability mandates. TEDS's for Smart Mining solutions aligns with the regulatory and environmental trends. TEDS offer digital solutions designed to help mining industry to modernize and optimize their mining operations.

The significant challenge due to the maturity and stagnation of the traditional telecommunication market. Almost a decade (2014–2023), TEDS's financial business including revenue, net profit, and subscriber bases shown little to no growth and even decline, indicating a stagnant in market expansion and

profitability. This prolonged stagnation threatens TSEL's ability to sustain its business, market leader position and long-term financial health.

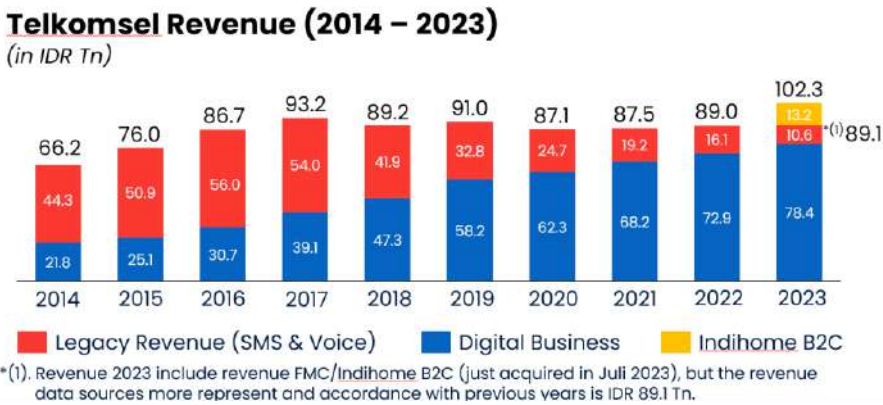


Figure I.11 TSEL Revenue Trend and Component 2014 - 2023
(Source: recreate from TSEL Public Annual Report, 2014 - 2023)

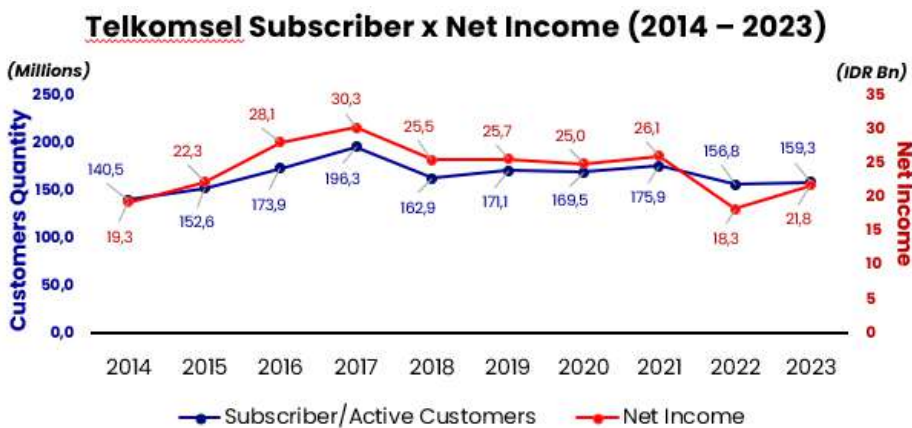


Figure I.12 TSEL Subscriber x Net Income 2014 - 2023
(Source: recreate from TSEL Public Annual Report, 2014 - 2023)

In response, TSEL has strategically pivoted towards expanding and diversifying its digital business portfolio, particularly on the B2B segment. Within this shift, targeting sector specific customers, especially the Mining Industry, has been identified as a critical growth opportunity. However, the challenge remains in effectively penetrating these enterprise markets and successfully leveraging digital solutions to revitalize revenue streams.

In 2023, TEDS launched the Smart Mining Digitalization program as part of its corporate strategy to capture growth opportunities in the digitalization of the mining industry. The management recognizes the mining sector as a substantial market with significant and huge potential for digital transformation and this can be seen in the Mining industry business trends in several years, and Mining Industry in Indonesia also one of the pillars of the national economics. However, a critical challenge remains, determining the most feasible and impactful business strategy to effectively serve this sector. The Mining Industry productions and business trends describes in following figure:

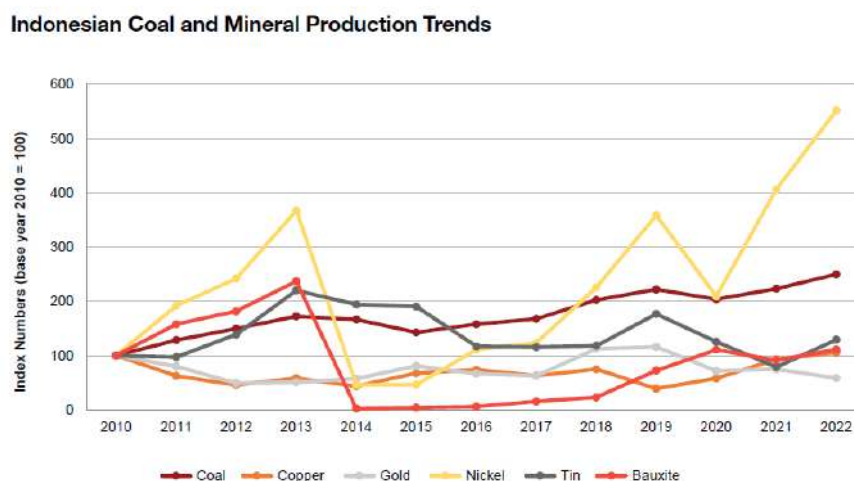


Figure I.13 Indonesia Coal and Mining Production Trends (2010 – 2022)
(Source: Ministry of Energy and Mineral Resources Report, PWC Indonesia Mining Report/Whitepaper, 2022)

To succeed in digital market in Indonesia Mining Industry, TEDS shall develop a tailored business strategy grounded on key factors such as value proposition, financial goals, operational capabilities, regulatory compliance, and market objectives.

This situation gives rise to two fundamental business issues:

1. What business strategy is the best fit for Telkomsel B2B in Digital Mining Industry that can be implemented?

The strategy must align with Telkomsel's strengths and the mining sector's needs, ensuring sustainable business growth and competitive advantage.

2. How can Telkomsel address the barriers associated with the chosen strategy?

These barriers may include regulatory constraints, technological adoption hurdles, market competition, Specific Skills employee, and operational complexities within the mining sector.

Addressing these questions is vital for TSEL to unlock the full potential of the digital mining market and reinforce its leadership in Indonesia's evolving digitals and telecommunications landscape.

I.4. Research Questions

Based on the previously outlined background, the research problem in this study can be articulated as follows:

1. What is the gap/weakness of Telkomsel B2B Digital Solution current condition and developments needed in implementing business strategy in Mining industry?
2. What are the internal and external factor that could affect Telkomsel B2B Digital Solution Business strategy in Mining Industry in Indonesia?
3. What are the challenge and key success factors that could affect Telkomsel B2B Digital Solution Business strategy in Mining Industry?
4. What is the fit and best strategy that Telkomsel B2B Digital Solution can implement in Indonesia Mining Industry?

This inquiry aims to investigate the gap and conditional of the company and develop strategy that suitable with TSEL in leveraging existing Internal and External analysis methodologies to enhance value creation, optimize operational efficiency, and drive innovation through digital solutions tailored for the mining sector. It further explores the alignment between strategic decision-making processes and the broader objectives of industrial

transformation and technological advancement in a highly dynamic and sustainability-driven business environment.

I.5. Research Objectives

The primary objective of this research is to explore and critically analyse the current conditions of TSEL and develop the suitable Business Strategy of B2B Digital Solution in Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry, particularly in the context of TSEL Digital Solution deployment in Indonesia's mining industry. This study aims to:

1. Analyze and define the weaknesses as well as supports and developments needed in Telkomsel B2B Digital Solution for implementing business strategy in Mining Industry.
2. Obtained the situational condition that affecting Telkomsel B2B Digital Solution business strategy in Mining Industry Indonesia.
3. Determine the key factors influencing Telkomsel B2B Digital Solution Business strategy in Mining Industry selection
4. Obtained and select the most effective business strategy for Telkomsel B2B Digital Solution in mining industry based on defined criteria.

I.6. Research Scope and Limitations

The scope of this research is centred on the strategic development planning and implementation of B2B Digital Solutions, with a specific focus on use case within Indonesia's mining industry.

This study is structured into several chapters, each with distinct objectives:

- Chapter 1 introduces the research topic and outlines the contextual background, while also identifying the core issues and challenges that necessitate in-depth analysis.
- Chapter 2 elaborates on the theoretical foundations and conceptual framework underpinning the research, serving as a lens through which the application of situational internal and external Analysis as a foundation to

develop business strategy in Telkomsel's B2B digital solution in mining Industry.

- Chapter 3 presents the research design, detailing the methodologies applied for data collection, processing, and analysis to ensure the validity and reliability of the findings.
- Chapter 4 delivers a comprehensive analysis of the identified gaps and challenges, followed by the formulation of tailored business strategy solutions and a structured implementation roadmap.
- Chapter 5 concludes the study by summarizing key insights and offering strategic recommendations to support TSEL's business strategy development and execution of B2B digital solutions in Indonesia's mining sector.

The scope of this research is limited only to the strategic formulation and implementation within TEDS initiatives, specifically as applied to the mining industry in Indonesia. The study does not extend to other sectors or general consumer-based B2C strategies but rather focuses exclusively on TSEL's B2B/enterprise level digital service deployment and its strategic alignment with the needs and transformation agenda of the national mining sector.

Chapter II Literature Review

This literature review research of Business Strategy of B2B Digital Solution in Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry is a critical chapter as a fundamental that define Theoretical foundations and Conceptual frameworks. The Theoretical foundations define as basis Theory utilized for the research analysis while Conceptual framework as a framework and flow of the research. This literature review also examines the correlation between method and analysis to create conceptual of the research with business strategy formulation using specific methods and frameworks. This literature review contains following:

II.1. Theoretical Foundation

This Theoretical Foundation section will describe the fundamental theory like method, analysis and tools that utilized in the research. The Theoretical foundations in this research utilized Internal Factors Analysis such as SW Analysis, Value Chain Activity and VRIO Method, External Factors Analysis such as General Environment PESTEL Analysis, Porter's Five Force, Industry Trend & Competitor and OT Analysis, in the business strategy formulation to develop business solution of the research utilized TOWS matrix and Business Model Canvas. The Detail Theoretical foundations utilized in the research in below:

II.1.1. SWOT Analysis

SWOT Analysis is acronym of Strength, Weakness, Opportunity, and Threat. The analysis is commonly utilized for conditional and situational assessment tool to create strategic planning and development. The analysis utilized to evaluate both internal and external factors that affecting the organization or business performance. The analysis utilized as tool that to defines internal Strengths and Weaknesses, as well as external Opportunities and Threats that provide a fundamental framework for formulation or development a strategy.



Figure II.1 SWOT Analysis Model

(Source: <https://www.websiteca.com/blog/what-is-swot-analysis>)

Below is The Components of SWOT Analysis:

1. Strengths

Strengths in the SWOT analysis refer to the organization internal competencies and resources that give competitive advantage. The strength factors like strong brand or reputation, Asset infrastructure, advance technologies, operational efficiency, a highly skill team, or financial resources. The strength factors utilized for the organization to pursue the goals like win the market.

2. Weaknesses

Weaknesses is internal factors that limiting and hinder organizational performance to pursue the goals. The Examples like obsolete infrastructure, gap in skills of teams, high operational costs, poor innovation, or slow delivery and business process. Mapping the weakness necessary as a reflection to improve the weakness to enhance organizational capability and resilience to pursue the goals.

3. Opportunities

Opportunity is external conditions or factors that business organization or individual can leverage to take advantage. If the factors leverage well,

it can accelerate growth and profits. The example of opportunities in B2B is new market segments, shifts in consumer behaviours, technological disruptions, or regulations. Mapping the opportunities is important to exploit it to take advantages for the organization goals.

4. Threats

Threats is external risks or disruptions that impact negatively to the organization or business. These factors such as dynamic macroeconomics, market competition, change of regulatory, disruptive technologies or others. Mapping the threats is necessary to know to prepare strategy for mitigation to ensure the competitive positions.

Below is Methodology for Conducting a SWOT Analysis:

1. Defining the Scope of Analysis

Defining the scope of SWOT analysis begin with the determine the goals or objective based on business issue occurs in organization or business.

2. Data Collection and Factors Mapping

The next steps is Data collection, mapping and assessing the internal factors details like capabilities, business processes, strategy, infrastructure, financial and etc, and external factors details like macroeconomics, technology trends and advancement, regulatory & policy, environment, and etc.

3. Categorization

The third step is Categorization, by organizing and identifying Internal and external factors into their Strength, Weakness, Opportunity and Threat categories.

4. Strategy Formulation

The last step to utilize the SWOT matrix to formulate the strategies. These include leveraging strengths to exploit opportunities, addressing internal weaknesses, capitalizing the market conditions, and prepare risk mitigation and strategic plan to counter the threats.

The Value and Benefits of SWOT Analysis to the organization or business as below:

- Enhanced Decision Making
- Optimize Strategic Planning
- Increase Competitive Advantage
- Effective Resource Allocation

With understanding of the factors and detail components of SWOT framework, it will give the organizations with the insight of the organization conditions and situations to formulate strategic positioning. By identifying internal capabilities and external conditions, decision makers or high-level management can develop strategies that leverage strengths, address weaknesses, seize opportunities, and mitigate threats, effectively develop competitive advantage strategy in dynamic/fluctuation market conditions.

II.1.2. Value chain Activity Analysis

Value Chain Analysis is a strategic management development tool developed by Michael Porter, the tool utilized to create value also to identify the organization or company business process and value chain activity to gain a competitive advantage. The analysis consists of activities of the company, defines with primary and support activities that describes the details of cost drivers and differentiation sources. By utilizing this activities analysis, the company business can have deep understanding to improve the productivity & efficiency, reduce costs, and enhance value proposition for customers, with the goal to increases company profitability. This method utilized to defines details activities to use in the next Internal analysis using VRIO and SW.

Figure 1: Porter's Generic Value Chain

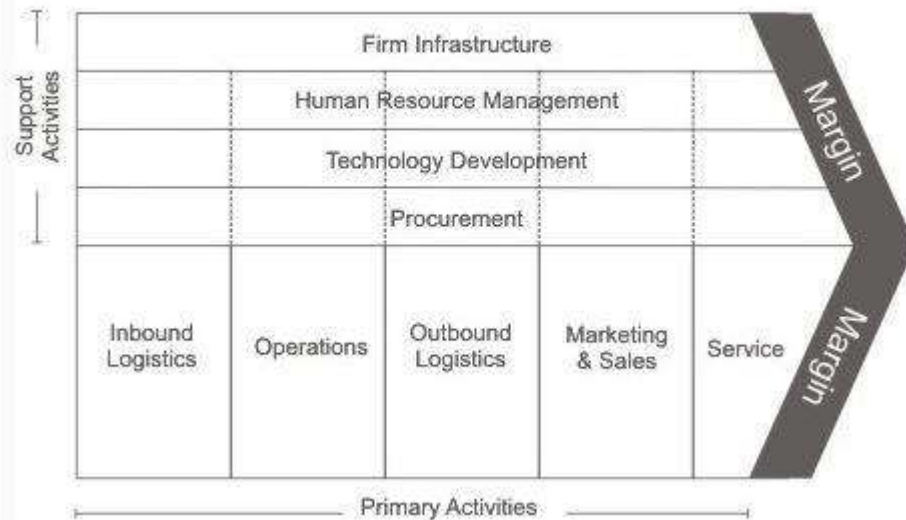


Figure II.2 Porter's Generic Value Chain Activity Analysis

(Source: Porter, M. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Simon and Schuster.)

The Value Chain Analysis divided the activities by Primary activities and secondary activities.

1. Primary activities

Primary activities are activities that impact directly into the services, products or solutions development and the implementation or execution of services/solutions, the activities details describe as below:

- **Inbound logistics**

Activities that are related to Internal supply chain activities such as receiving, warehousing, and inventory management of source materials and components.

- **Operations**

Activities that are related to process operations, process raw materials to be finished products or services.

- **Outbound logistics**

Activities that are related to External supply chain activities like distribution of the products or services, including packaging, sorting, and shipping/delivery.

- **Marketing and sales**

Activities that are related to the marketing and sales of products, solutions or services such as promotion, advertising, and pricing strategy

- **Services**

Activities that are related to Services like after a sales activity such as installation, training, quality assurance, repair, and customer service.

2. Secondary activities

Secondary activities are the activities that support primary activities that operate to be more effective and efficient to create competitive advantage. The activities are described below:

- **Procurement**

Activities that are related to the sourcing of raw materials, components, equipment, and services.

- **Technological development**

Activities that are related to research and development such as product design, market research, and process developments.

- **Human resources management**

Activities that are related to the manpower or human resources such as recruitment, hiring, training, development, retention, and compensation & benefit of employees.

- **Infrastructure**

Activities that are related to the company's overhead and infrastructure that support the operations and management, including financing, planning, legal and similar.

II.1.3. VRIO Analysis

VRIO analysis is an analysis with resource-based theory that is used to understand the driving factors underlying the competitive advantage of a company, organization or business. The analysis conduct to evaluate the resources and capabilities using four factors or elements: Value, Rarity, Imitability, and Organization. With this analysis, the Company can assess

more deeply and identify the actual core competencies that support the performance of the organization, company or business. The details elements of the VRIO analysis will be describe as below:

1. Value

Value is a resources or capabilities the organization or individual have that can be utilized to seize opportunities and mitigate the risk of threats effectively. if the resources or capabilities not utilized properly, it will not create value but even generate cost and inefficiency in the organization or business. The effective and efficient way to create value with aligning resources and capabilities with market demands and leverage the value to grab the opportunities.

2. Rarity

Rarity is a factor that limited but needed which is owned by only a few individuals, organizations or business. These factors distinguish the company or business resources or portfolio from the competitor. The rarity factor in value that market demanding create strategic advantage. Rarity can occur, such as exclusive solutions, patents or trademarks, and etc. But rarity will work effectively if it combines with other factors to pursue sustained competitive advantage.

3. Inimitability

Inimitability considered the most critical factor in VRIO analysis. Inimitability is a resources or capability that hard to copy, replicate or imitate. These factors create barriers to the competitors in the business or company. Imitability occurs when Resources and capabilities that appears from unique conditions, complex networks, secret knowledge, or embedded culture that difficult to imitate. The barriers like cost and time required for competitors to imitate or substitute these resources define the sustained competitive advantage. The company, organization or business shall continuously maintain and reinforce these barriers through investing, innovation, knowledge protection, and organizational learning to maintain the competitive advantage.

4. Organization

The last factor in VRIO, Organization is internal factor that related to systems and managerial competence that utilized effectively with using valuable, rare, and inimitable resources and capability. This organization factor highlights that have resources and capabilities but not properly managed with organizational design, processes, culture, and incentives will weaken competitive advantage. Organizational readiness covers the setting of organizational structure, setting the governance, performance management systems, and cross-functional coordination necessary for resource allocation and management.

The VRIO framework also provides a paradigm that explains why company or business performance differs within an industry. Companies that acquire and maintain VRIO-compliant resources and embed them in an organizational context that enables them to achieve sustainable competitive advantage, characterized by above-average returns and strong market positions. Companies that lack one or more VRIO elements will only achieve temporary advantage, competitive parity, or even competitive disadvantage.

Valuable?	Rare?	Difficult to Imitate?	Supported by Organization?	Competitive Implications	Performance
No	--	--	Yes	Competitive Disadvantage	Below Normal
Yes	No	--		Competitive Parity	Normal
Yes	Yes	No		Temporary Competitive Advantage	Above Normal
Yes	Yes	Yes		Sustained Competitive Advantage	Above Normal

Figure II.3 VRIO Model

(Source: Firm resources and sustained competitive advantage, Barney, J.B., 1991)

For use case example, Apple's ability to integrate innovative hardware design (valuable, rare, and inimitable) with an efficient organization and ecosystem show how VRIO factors influence to sustained market leadership. On the contrary, Novell, despite possessing valuable technological innovations, stagnating due to organizational factor incapacities to commercialize and scale up their innovations, this is proved that show how the lack of the 'Organizational' factor weakens competitive advantage. Optimizing VRIO resources and capabilities requires strategic vigilance, dynamic capability development, and organizational adaptation.

II.1.4. General Environment PESTLE Analysis

As a strategic management tool and assessment utilized to define the external forces or elements such as Political, Economic, Social, Technological, Legal, and Environmental. PESTLE analysis can affect an organization, company or business strategy direction. The analysis assesses these external forces that influence organizational and Business Conditions in the current dynamic and uncertain market. The Details Forces or factors of PESTLE analysis will be described as below:

1. Political Factors

Political as its name, related to the government issues such as political stability, public policy, taxation, trade regulations, and international relations. These political elements establish the regulatory and operational conditions that will affect the organizations, companies or business.

2. Economic Factors

Economic variables encompass macroeconomic indicators such as interest rates, inflation, exchange rate volatility, GDP growth, labour costs, and overall consumer spending trends. Understanding these indicators is essential for forecasting market behaviours and evaluating the financial feasibility of strategic initiatives. Economic factors like macroeconomic conditions (interest rates, inflation, labor costs,

exchange rate volatility, GDP growth, Tax, spending trends and others) that affect the organization, companies or business. Comprehending the economic factors is critical, it can be utilized for forecasting market behavior & demand also evaluate financial feasibility.

3. Social Factors

Social factors refer to dynamic social conditions or circumstances that affect consumer or customer behaviours such as change of lifestyle, change of demographic, cultural attitudes, education levels, and the norms in the social life. These trends can establish demand on the market and also affect organization, company, or business.

4. Technological Factors

Technological factors describe as technology developments and advancement such as IoT, automation, digital platforms, data analytics, edge computing, cloud, machine learning and artificial intelligence that affect the business or industry. The companies or Organizations shall continuously assess how innovation and updated technologies affect the business such as in business services, delivery, product development, and research & development.

5. Legal Factors

The legal factors is a jurisdiction by regulatory both national government and International. Legal factors affect the organization and business running such as labour laws, health and safety standards, intellectual property rights, and industry regulations. Stay update to the legal factors is necessary to ensure the compliance and mitigate legal risks that can affect the business.

6. Environmental Factors

Environmental factors focus on environment conditions, ecological and sustainability concerns, such as climate change, greenhouse gases, carbon footprint, deforestation, resource scarcity, waste, corporate social responsibility (CSR) and others. The Businesses shall align and comply with environmental factors to maintain and secure long-term business continuity.

To conduct the PESTLE analysis that feasible and align with the business, following is the methodological stages:

1. Define the Scope

Define the goals or objectives, scope of study or research then boundaries or limitations, this will make the research more focused and clearer to conduct the analysis that can sees latest and emerging trends.

2. Data Collection

Gather data and information from cross functional teams and sources with different department and level. This to ensure a multi perspectives and insights that enrich the deep of analysis.

3. Identify Reliable Sources

Using multi-information sources and then check the credibility and validity of the sources for each of the PESTLE elements. With doing the identifications and validation will affect the quality and relevancy of the data that impact to the relevant analysis.

4. Data Aggregation and Organization

Aggregate and organize the data & information into a framework for comparative analysis and mapping.

5. Prioritization of Factors

Assess and prioritize the relevance, significance and risk associated with each factor, specifically with its potential impact on organizational objectives.

6. Strategic Mapping

Formulating and mapping strategies and plans to seize the opportunities or mitigate threats that identified with the analysis.

7. Stakeholder Engagement

Inform and coordinating the issue, analysis and strategies to internal and external stakeholders, create a forum for dialogue around strategic priorities.

8. Action Planning and Monitoring

Translate insights into actionable plans & strategies, then implement the plans or strategies with regular monitoring and periodic evaluations.



Figure II.4 General Environment PESTLE Analysis Method

(Source: <https://pestleanalysis.com/amazon-pestel-analysis/>, Jim Makos, 2025)

To maximize the effectiveness of PESTLE analysis, practitioners or researchers should:

- Encourage Collaboration in cross functional and multidiscipline teams to capture a multi-perspective of risks and insights.
- Leverage the other strategics frameworks or tools like SWOT, Porter's five forces, scenario planning to be integrated with PESTLE to get more deep analysis in multi perspective.
- Ensure the accuracy of analysis with avoid gather too much data but emphasize in the interpretation of the data.
- using PESTLE analysis continuously as a component of strategic planning processes.

PESTLE analysis will become a powerful strategic tool if used systematically. The analysis using to anticipate uncertainty conditions in the market or economics, anticipate change in the market and political, and etc to ensure the competitive advantage.

II.1.5. Industry & Competitor using Porter's Five Forces Analysis

Porter's Five Forces framework used to defines and describes the competitive forces that affecting industry and competition. The analysis focus on external factors that affect the companies or business conditions. These frameworks showing that industry structure and the intensity of competition will determine company or business performance. Below are the five competitive forces details:

1. Threat of New Entrants

The entry of new entrants or new competitors into the market is a force or threat that can reduce the market share portions. New entrants as new competitors increase competition by increasing supply, disrupting market price, driving innovation, and disrupting existing value chains. The scale of this threat depends on the barriers to entry the market. The barriers that determine the difficulties or ease for new players can join and survive in the market. These barriers listed as below:

- **Business Scale**

The Big company or corporation benefit from financial back up and cost advantages due its volume production or established partnership with principals making the smaller entrants/competitors difficult to compete on price.

- **Capital & Financial resources**

Upfront capital and investment can hinder new entrants who do not have financial resources or backing.

- **Product Differentiation**

The Existing brands or players often have strong customer loyalty as well as strong products that new entrants must be defeated.

- **Customer Engagement & Relationship**

The existing players have established long relationships and engagement with clients in the market. Also have existing contracts with clients and contract between existing players and principals can limit the market access for new entrants.

- **Government Policies and Regulations**

The existing players have long relationship with regulatory and government. Existing players also used to work with Regulation compliance, Licensing, and tariffs that creates the barriers for new entrants.

The existing players can reinforce the barriers for new entrances through continuous innovation, customer engagement, and operational excellence to secure their position in the market.

2. Threat of Substitute

The Products or Services Substitutes are alternative products or services that fulfil the customer need but often offer with different technologies. The Attractiveness of substitutes usually in the pricing offer or quality of products or services to the industry by providing customers with lower & special price or better products or services for penetrate the market. The existing Companies must monitor these changes, emphasize product innovation, enhance the services quality, enhance customer value, and differentiate the offerings to mitigate the substitute threats.

3. Bargaining Power of Buyers

The Buyers have power to determine the products or services demands, requirements and price that affect the market. The buyers used to demand lower prices, higher quality, and better service that make the competition among suppliers in the market. Buyers have more power to bargain when:

- Buyers requires large volume or quantity
- Standard or common Products and services
- Low Switching costs and risk
- Buyers have knowledge and information for product quality and products market prices.
- Buyers can directly to manufacturer, OEM, or principals.

To reduce buyer power, the services or solutions providers shall enhance for product differentiation, building switching costs through loyalty programs, give additional value to the services, customizing offerings, or

creating bundled solutions that increase buyer dependency. Strong engagements, customer relationships, and brand equity also serve as effective counters against buyer power.

4. Bargaining Power of Suppliers

The Suppliers have a power to give pressure with raising costs or reducing the quality or availability of products or services. The Suppliers have the power to bargain in the market when:

- Supplier's products or services only have few alternatives to buyers in the market.
- Suppliers offer highly differentiated or critical inputs.
- Switching suppliers is costly or complex.
- Suppliers can credibly threaten forward integration.

To counter of the supplier power, the companies can diversify their suppliers, negotiate long term contracts, or direct to manufacturers or principals. Also, can do the partnerships that provides incentives that can also enhance supply chain stability and reduce vulnerability.

5. Industry Rivalry

The competition in industry directly impacts pricing, marketing expenditures, and innovation rates. Competition occurs when:

- Numerous competitors of roughly equal size exist.
- Industry growth is slow or stagnant.
- Fixed costs are high, exit barriers high
- Common Products in the market.
- Strategic segments and Company's commitment.

The Companies do price competition, advertising competition, product launches, and customer service improvements. The company developing a competitive advantage through innovation, efficiency in operational, or product differentiation. The Companies also engage in alliances, mergers, or acquisitions to increase the market share and competitive position.

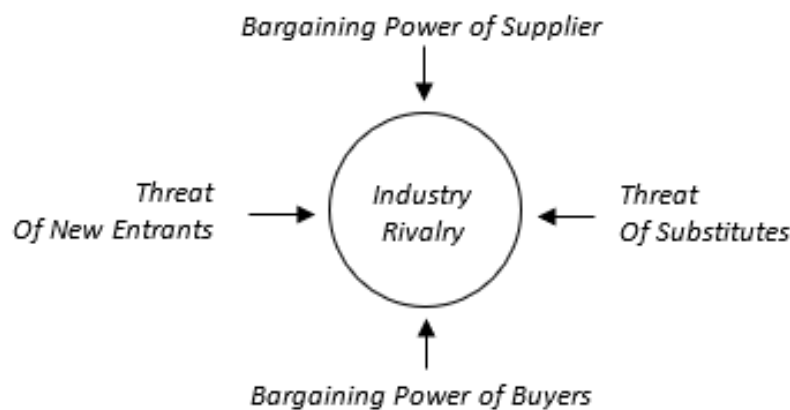


Figure II.5 Porter's Five Forces, Industry & Competitors
 (Source: The Five Competitive Force That Shape Strategy, Harvard
 Business Review, Porter, Michael E., 2008)

To implement of Porter's Five Forces, need strong understanding of the five forces that enable the companies to develop the strategies to anticipate facing the industry dynamics. The anticipation and mitigation examples as below:

- To mitigate the threat of new entrants, the existing players can exploit brand loyalty, business scale, and distribution agreements. Also the companies can invest in product innovations that create high entry barriers.
- To manage supplier power, Companies can diversify supplier networks, maintain collaborative relationships, vertically integrate to the manufacturer or principals that can reducing the cost.
- To reduce buyer power, the strategies like product customization, increasing switching costs through loyalty programs, or developing unique value propositions that solve the client's problem and reduce price sensitivity.
- To counter substitute products, the companies shall prioritize continuous improvement and innovation, cost reduction, and deep customer insight to maintain the position.

- To direct industry competition, the companies must process operational excellence, strengthen differentiation, and consider strategic consolidation or partnerships.

Porter's Five Forces Framework provides a systematic approach to defines pressures, threats, opportunities, and formulating strategy that build sustained competitive advantage in dynamic market.

II.1.6. TOWS Matrix

The TOWS matrix Analysis is strategic management tools for Strategy Formulation that using internal factors (Strength and Weakness) and external factors (Opportunity and Threats). TOWS matrix analysis is known as an advance stage of SWOT analysis, because the TOWS matrix using the results from SWOT analysis as a basis to formulate the details strategy.

The SWOT analysis or method has several weaknesses; the main weakness of this analysis is that there is no priority and the analysis not giving solutions, alternative decision, and clear implementation strategy. Furthermore, the analysis can be too subjective, potentially to be bias, lack of External inputs, not considered the interactions between the factors which interact and influence each other's. Despite the weakness, SWOT analysis still one of the strategic mapping tools that can be utilizing to understand the company position or conditions and plan the strategy.

To close the gap and limitation on SWOT analysis, the next stage or extension of SWOT analysis known as TOWS Matrix analysis. limitations, a more dynamic and action-oriented extension of the SWOT analysis known as the TOWS Matrix. TOWS matrix is more systematic problem solving in formulating the strategy, starting with Threats and Opportunities assessment or analysis (external factors), then assessment Weaknesses and Strengths (internal factors).

The TOWS Matrix is strategic formulation tools that bridge the gap between SWOT analysis and strategic implementation and formulation. Form TOWS Matrix, the analysis generates combination strategy from internal and external factors to develop four categories of strategies that can be implemented, as follow:

1. SO (Strengths–Opportunities) – Maxi Maxi Strategies: These strategies leverage internal strengths to capitalize on external opportunities. They represent the most proactive and growth-oriented strategic choices.
2. WO (Weaknesses–Opportunities) – Mini Maxi Strategies: These strategies focus on overcoming internal weaknesses by exploiting external opportunities, often involving capacity-building or resource development.
3. ST (Strengths–Threats) – Maxi Mini Strategies: These strategies utilize internal strengths to mitigate or counteract external threats, serving as a means of maintaining market position and reducing vulnerability.
4. WT (Weaknesses–Threats) – Mini Mini Strategies: These are defensive strategies aimed at minimizing internal vulnerabilities while avoiding or preparing for potential external threats. They are often employed in turnaround or risk mitigation scenarios.

In Figure 2.5 shown TOWS matrix structure, with internal factors (Strengths and Weaknesses) plotted vertical, and external factors (Opportunities and Threats) plotted in horizontal. The intersection or combination of these matrix generates the four strategy groups; each strategy has its strategy intent and implications.



Figure II.6 TOWS Matrix

(Source: www.bitesizelearning.co.uk/resources/tows-matrix-explained-example, 2025)

The primary advantage of the TOWS approach lies in its ability to systematically prioritize and integrate internal and external strategic factors into clearly articulated strategy alternatives. Unlike traditional SWOT analysis, which often remains descriptive and static, the TOWS matrix encourages active synthesis and decision-oriented reasoning by forcing organizations to contemplate actionable responses to environmental and organizational realities.

However, the TOWS framework is not without its limitations. One of the most noted drawbacks is its structural rigidity, which excludes potential strategic combinations such as SW (Strengths–Weaknesses) or OT (Opportunities–Threats). These combinations, while less commonly emphasized, may offer valuable insights into internal trade-offs or external balancing acts that can also inform strategic choices.

Moreover, the effectiveness of the TOWS matrix depends on the quality and objectivity of the initial SWOT analysis. If the baseline assessment is biased, incomplete, or outdated, the strategic alternatives generated by the TOWS matrix may be misaligned or ineffective.

In conclusion, while SWOT analysis remains a foundational tool for strategic assessment, the TOWS matrix extends its utility by transforming diagnostic insights into actionable strategies. TOWS Matrix offers a framework that aligning organizational capabilities with environmental conditions. When the analysis applied strictly and used along with other strategic tools, the TOWS matrix can enhance the quality and relevance of strategic planning and formulation, especially in dynamic and competitive market conditions.

II.1.7. Business Strategy

Business strategy is a strategic plan that defines the way or the method of company or organization to achieve the Business goals/objectives in the long-term period, to develop value for customers and to gain competitive advantage. The process such as actions and decision making, and as a guidance like step by step and roadmap of the company/organization to pursue business goals/objectives based on several factors such as market conditions, customers' requirements, and competition landscape. The Key aspects of the business strategy as follow:

- **Objective/Goal Setting**
Defines and sets long term goals, specific objectives that want to pursue of the company.
- **Market Understanding**
Identify the market like customer requirements, industry trends, and competitors.
- **Resource Allocation**
Defines the method to utilize optimally the resources such as finances, human resources, assets, technology, connection/engagement and etc to achieve the company objectives.
- **Competitive Advantage**
Defines strength and create value proposition to pursue the opportunity to gain competitive advantage in the market.

- **Adaptability**

Adapt and agile to change of the strategy to response of the change of market requirements and customers behaviours.

- **Alignment**

Aligning to All cross functional department in the company to make sure the executions work according to the same goals and vision.

Business level strategy defines the method and strategy of company in a specific industry or market. Below are the types of the strategy:

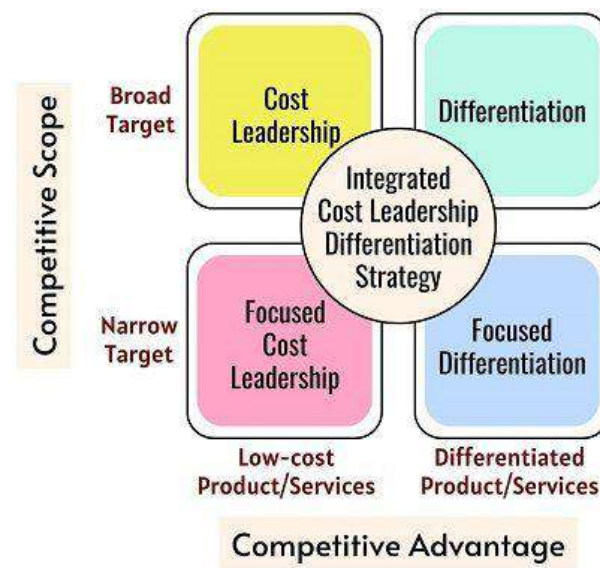


Figure II.7 Michael Porter's Generic Strategy

(Source: <https://theinvestorsbook.com/business-level-strategy.html> and adapted from Michael E. Porter, *Competitive Strategy*, 1980)

1. Cost Leadership

The strategy that focused on cost of production to be the lowest in the market. The strategy that minimizes the costs in overall value chain or process business but still maintain profitability then impact to the cost of goods sold of solutions or services with lower price that propose to the customers.

2. Focused Cost Leadership

The strategy that focusses on lower/lowest cost of production to gain the competitive advantage to the specific market segment.

3. Differentiation

The strategy that focuses on unique value proposition propose to the customers that differentiate with other competitors, with this the company able to gain high price and profit.

4. Focused Differentiation

The strategy that focusses on unique value proposition propose to the customers in the specific target market.

5. Integrated Cost Leadership and Differentiation

The strategy that utilizes both of cost leadership and differentiation. The strategy utilizes solutions or services offering with low cost and differentiated value proposition

II.1.8. Business Model Canvas (BMC)

The Business Model Canvas (BMC) is a strategic management tool utilized a visual chart format that consist of nine components. The framework provides a structured methodology for mapping or outlining, analysing, and innovating the core of business goals/objectives.

Leveraging the BMC is like systematically developing a strategic framework that covers the essential elements necessary to effectively develop, manage, and scale up a business model. It enables entrepreneurs, business leaders, and stakeholders to share a unified strategic vision and clarity when evaluating current operations or launching new ventures.

The objectives of utilizing the Business Model Canvas is to assist entrepreneurs, startups, and established companies in mapping and visually communicating the elements of their business model in a simple, intuitive and widely understandable way for all departments and stakeholders.

Using BMC this tool, businesses can design and refine the business models that align with market needs and requirements, organizational capabilities, and long-term strategy & goals. With using BMC, it can improve internal communication and also used as catalyst to uncover both opportunities and vulnerabilities in a company value proposition and business process.

Furthermore, the BMC can be used as a platform to raise the innovation, identifying gaps in the business structure, generating new value propositions, and laying the groundwork for long-term scalability and sustainability.

The BMC can be used in business planning and development. The key advantage of BMC defines as below:

1. Ease of Use

The canvas format simplifies complex strategic concepts into an accessible and understandable structure. Even those without a background in business strategy can intuitively navigate through the nine building blocks, making it an ideal entry point for aspiring entrepreneurs.

2. Visual Appeal and Clarity

For visual learners and decision-makers, the BMC presents a compelling visual layout that enhances comprehension and engagement. It enables stakeholders to see the business model in its entirety, thereby streamlining discussions and decision-making.

3. Flexibility and Adaptability

In the early stages of a business, change is inevitable. The BMC is designed to accommodate adjustments quickly and efficiently. Businesses can revise individual components without disrupting the entire model, which supports agility and responsiveness in a dynamic market environment.

4. Collaborative Framework

The BMC fosters interdisciplinary collaboration by serving as a shared language among teams. It enables cross functional group's marketing,

operations, finance, and more to contribute insights and co-create strategic plans with coherence and synergy.

5. Strategic Focus

With its nine well defined components, the BMC encourages strategic focus by isolating each critical element of a business model. It drives clarity, prioritization, and alignment across all levels of the organization.

Despite its many advantages, the BMC is not without its constraints:

1. Limited Scope

The BMC addresses only the core elements of a business and may overlook supplementary but significant areas such as legal frameworks, risk management, competitive benchmarking, or detailed operational workflows.

2. May Not Suit All Business Types

While highly effective for startups and SMEs, the BMC may fall short in capturing the nuances of highly complex, regulatory-heavy, or highly specialized business models, such as those in aerospace, biotechnology, or multinational conglomerates.

3. Requires Thoughtful Engagement

Although conceptually simple, effectively filling out a BMC demands critical thinking, market research, and strategic alignment. It is not a plug-and-play solution and rushed or superficial usage may lead to misleading conclusions.

The Nine Core Elements of the Business Model Canvas, below are the details:

1. Customer Segments

Identifying and understanding the specific groups of people or organizations of business aims to serve is fundamental. Segmentation helps tailor offerings and optimize resource allocation. Critical questions include: What are our customers trying to accomplish (jobs)? What gains do they expect? What pains do they experience?

2. Value Propositions

This is the heart of any business model, the unique bundle of products or services that create value for a specific customer segment. A compelling value proposition addresses unmet needs or resolves pain points better than competitors, offering tangible benefits such as superior design, pricing, convenience, or innovation.

3. Channels

These are the pathways through which a company delivers its value proposition to customers. Channels include both direct (e.g., in-store, online sales) and indirect (e.g., partner networks, distributors) methods. Effective channel strategies optimize customer reach and satisfaction while controlling costs.

4. Customer Relationships

Building and maintaining customer relationships is essential for customer retention and lifetime value. Businesses must decide whether they aim for personal assistance, automated services, co-creation, or self-service models and how to engage customers across the journey from acquisition to post-sale support.

5. Revenue Streams

Revenue streams reflect the income generated from each customer segment. This includes not only direct sales but also subscription fees, licensing, leasing, and advertising revenue. Understanding what customers are willing to pay and why is crucial to financial sustainability.

6. Key Activities

These are the mission-critical operations that a business must perform to deliver on its value proposition, reach markets, maintain customer relationships, and generate revenue. Examples include production, marketing, software development, and logistics.

7. Key Resources

Key resources are the assets required to support the key activities. These may be physical (factories, logistics systems), intellectual (patents, brands), human (skilled employees, leadership), or financial (capital, lines of credit).

8. Key Partnerships

Strategic alliances with suppliers, technology providers, distributors, or even competitors (co-opetition) can help reduce risk, accelerate innovation, and expand market access. Identifying the right partners is essential to operational efficiency and strategic leverage.

9. Cost Structure

This outlines all the costs involved in operating the business. A clear understanding of fixed costs (e.g., rent, salaries) versus variable costs (e.g., raw materials, delivery charges) enables better budgeting, profitability analysis, and resource optimization.

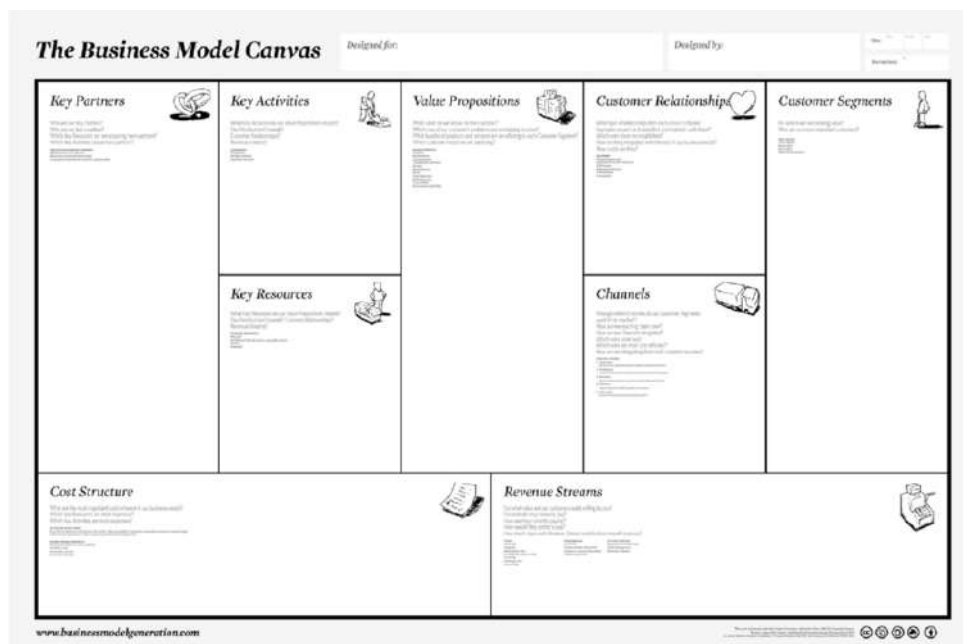


Figure II.8 Business Model Canvas Framework

(Source: Business Model Canvas, Alexander Osterwalder & Pigneur, 2009)

Once all components of the BMC are developed, businesses can use the framework to craft a financial forecast, an essential tool for understanding cost structure, projecting revenues, and determining profitability.

Forecasting involves differentiating between fixed costs (unchanged regardless of production volume) and variable costs (which fluctuate

based on business activity). The goal is to ensure that revenue exceeds cost, leading to profitability. The breakeven point, where total revenue equals total costs marks the threshold of business viability.

In summary, the Business Model Canvas offers numerous strategic benefits:

- It facilitates structured thinking and a holistic understanding of the business.
- It supports iterative design and real-time pivoting in dynamic environments.
- It enhances team collaboration and fosters innovation.
- It enables data-driven decision-making by clearly connecting strategic choices to financial outcomes.

By investing time in building and analysing a comprehensive BMC, companies regardless of size can significantly improve their chances of long-term success and adaptability in an ever-evolving marketplace.

II.2. Conceptual Framework

The conceptual framework serves as the foundational blueprint that illustrates the interrelationships among the core variables under investigation, guiding the direction and logic of the research inquiry. It functions not only as a visual representation of the theoretical constructs but also as an analytical tool to demonstrate how these flow constructs are hypothesized to interact within the context of the study. This structured model not only assists in hypothesis formulation and variable measurement but also ensures consistency between theoretical assumptions and empirical testing. The conceptual framework thus acts as both a roadmap and a boundary for the scope of analysis, ensuring that the research process remains in the corridor of methodologically and theoretically.

Below illustrates the conceptual framework of this research of Business strategy of B2B Digital Solution of Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry:

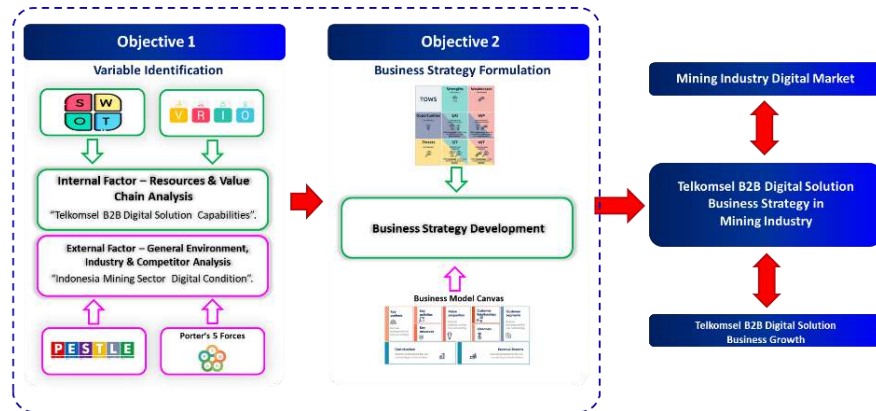


Figure II.9 Conceptual Study Framework

Chapter III Research Methodology

III.1. Research Design

This research adopts a qualitative research design as the primary methodological approach for data collection, analysis, and interpretation. A qualitative approach is particularly suitable for exploring complex social phenomena, as it seeks to generate rich, contextualized, and understandings rather than quantifying variables or testing statistical hypotheses. The aim of this research method is to explore the deeper meanings, experiences, and viewpoints that influence the behaviours and interactions of individuals within a specific organizational.

Qualitative research is interpretive and inductive, focusing on the development of themes, patterns, and categories that emerge from the field data. It emphasizes subjective perspective and explores how individuals or groups have strategic & critical thinking to the specific Issues. The method aligns with the objective of the research which seeks to investigate and describe B2B strategies utilized by TEDS in its digital solutions in mining Industry. In this research, the data is collected in narrative and descriptive forms not in numerical. This method using a deep exploration of organization, decision-making, and communication.

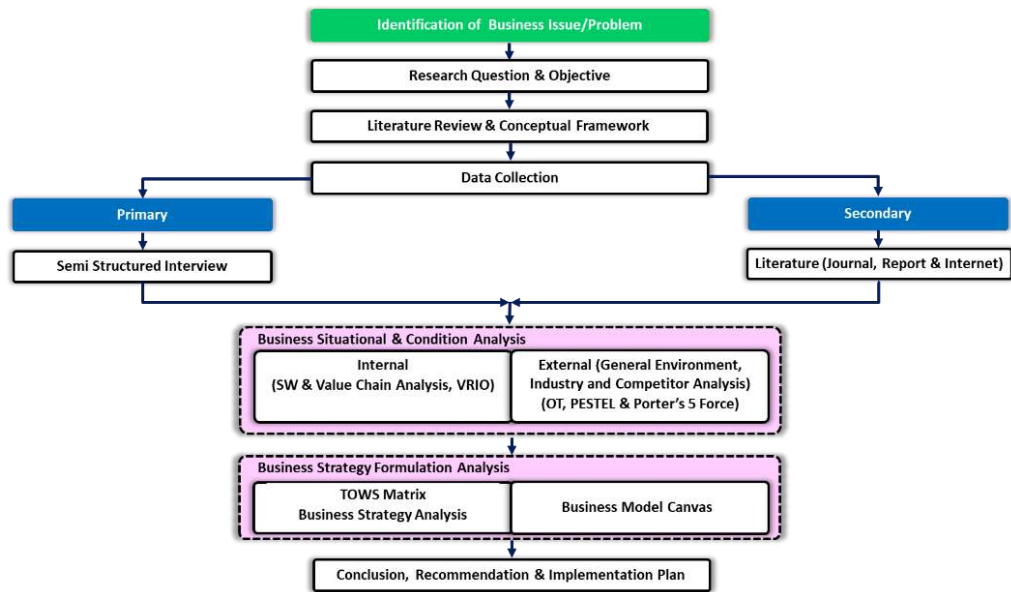


Figure III.1 Research Design Flowchart

This research flow process using qualitative framework through interview data as primary data and data from report, journal, news and internet for secondary data. The research questions are refined, and data is collected through a key informant interview, document analysis, and observations using SWOT, Value Chain Analysis, VRIO, General Environment PESTLE and Industry and Competitor Analysis using Porter's Five forces framework. Then using triangulation to combine and enhances the validity of the research results. This research utilizes a qualitative descriptive approach that suitable for exploring and mapping the business issue or theme. The descriptive approach makes the researcher to construct a detailed and holistic view of the B2B conditions of TEDS in Indonesia mining industry. SWOT analysis that already combine the data analysis from SW, VRIO, OT, PESTLE and Porter's Five forces framework then used as basis data and insight as a baseline to be explore the strategy formulation using TOWS matrix. TOWS matrix will be used to develop the effective and suitable strategy based on internal conditions and external influences. Then using Business model canvas to develop new business model that match the requirement of TEDS conditions and objectives.

This research approach not only contributes to a understanding of the subject matter but also enhances the applicability of the results to real-world strategic practices in B2B digital markets.

1. Subjects and Objects of the Research

a. Subjects of the Research

In the context of this research, individuals who give information as sources under interview are commonly referred as key interview informants. These key informants are purposely selected based on their experience, knowledge, direct involvement, and specialized understanding of the issues being examined.

In this research, the key informants comprise key strategic stakeholders occupying authoritative roles in decision making and policy formulation within the digital and telecommunications sectors. Internal key informants include senior executives from TEDS, such as:

- Vice President (VP) of B2B Sales
- Vice President (VP) of Digital Product Management and Development
- Vice President (VP) of Enterprise Product Enablement and Solutions
- General Manager (GM) of Enterprise Product Strategy, Partnership, and Performance
- General Manager (GM) of Enterprise Customer Solutions Management
- General Manager (GM) of B2B Corporate Business Strategy Development

The research also integrates external perspectives through interviews with:

- Expert Staff on Digitalization, Ministry of Industry (*Kementerian Perindustrian - Kemenperin*)

- Customer Mining Digitalization Expert – Digitalization & System Integration Manager, PT Indexim Coalindo

The inclusion of this diverse and high-level management of informants is designed to support a multi-perspective and holistic analysis of the development of business strategy and implementation within TEDS. Moreover, it facilitates a deeper understanding of the strategic and policy-driven implications of digital innovation within the mining sector, particularly within the context of inter-organizational collaboration and technological integration between TEDS and its industrial partners.

Table III.1 Table Key Informants' Question Areas

No	Question Areas	Respondents
1	Strategic approach to B2B client acquisition in the mining sector	Vice President (VP) of B2B Sales
	Sales performance metrics for digital solutions	
	Client relationship and retention strategies	
	Challenges in aligning sales with digital product offerings	
2	Innovation process in digital solution development	Vice President (VP) of Digital Product Management and Development
	Integration of customer feedback into product iteration	
	Role of emerging technologies (IoT, AI, 5G) in product design	
	Time-to-market and scalability considerations	
3	Strategies for internal capability development to support B2B offerings	Vice President (VP) of Enterprise Product
	Collaboration mechanisms across departments	
	Product readiness and deployment frameworks	
	Organizational learning from mining sector projects	

		Enablement and Solutions
4	Strategic positioning of Telkomsel's digital B2B products	General Manager (GM) of Enterprise Product Strategy, Partnership, and Performance
	Value proposition design for the mining industry	
	Competitive analysis and benchmarking	
	Long-term roadmap for industry-specific digital solutions	
5	Technical challenges in developing enterprise-grade solutions	General Manager (GM) of Enterprise Customer Solutions Management
	Customization and integration with client systems	
	Use of platforms and APIs	
	Alignment with industry-specific operational requirements	
6	Strategic sales planning for enterprise segments	General Manager (GM) of B2B Corporate Business Strategy Development
	Channel management and partner ecosystems	
	Forecasting and KPI tracking in B2B segments	
	Go-to-market strategies specific to mining industry clients	
7	Government perspectives on digital technology adoption in the extractive industry sector	Expert Staff on Digitalization – Ministry of Industry (Kemenperin)
	Industry 4.0 policies for the mining sector	
	Role of regulations in fostering B2B collaboration between industry and digital solution providers	
	Government support and challenges in accelerating industrial digitalization	

8	Client perspective on digital solution implementation in mining operations	Customer Mining
	Technology integration challenges within mining workflows	Digitalization
	Evaluation of vendor collaboration and support	Expert – PT
	Impact of digital transformation on operational productivity and safety	Indexim Coalindo

b. Objects of the Research

In qualitative research, the research object denotes the primary focus or core subject to systematic examination, interpretation, and analysis. It may involve an organization, process, phenomenon, or specific issue that encapsulates the central research problem. Given the inherent complexity and deeply contextual nature of qualitative inquiries, delineating the research object is essential for uncovering deeper meanings, dynamics, and influences. A well-defined research object, paired with carefully selected informants, ensures greater validity, rigor, and contextual relevance of the study's findings.

In this Study, the research object centres on the analysis of the situational and business strategy development within a B2B framework, with a focused examination on how TEDS are leveraged to drive digital transformation in Indonesia's mining industry. This encompasses:

- Strategic Frameworks such as VRIO, Value Chain Activity Analysis, General Environment PESTLE, Industry & Competitor, Porter's Five Forces, SWOT and TOWS matrix, are operationalized within TEDS's strategic formulation and digitalization pathways in the mining sector.
- Operational Dimensions, the practical mechanisms through which TEDS designs, deploys, and evaluates its digital B2B solutions, including stakeholder alignment, technological integration, and performance measurement.

- Impact on Innovation & Competitiveness, The extent to which TEDS's strategy fosters innovation, operational efficiency, and competitive differentiation among mining clients.

By foregrounding this object of study, the research seeks to provide a comprehensive and portrait of how digital business strategy development propels business transformation in a traditional, resource-intensive industry like mining, revealing both best practices and contextual barriers. Below is the research question details to the Key informants:

c. SWOT Related Interview Question

Table III.2 Interview Question Related to SWOT

Respondents	SWOT Dimension	Questions
Vice President (VP) B2B of Sales	Strengths	• What are Telkomsel's key competitive strengths in securing B2B digital solution contracts with mining clients? • How do your sales strategies maximize Telkomsel's value proposition in industrial digitalization?
	Weaknesses	• What challenges are faced when selling complex digital solutions to mining enterprises? • Are there gaps in client readiness or internal resources that affect your ability to close deals?
	Opportunities	• What sales opportunities do you see emerging in the mining sector, especially with the government's push toward Industry 4.0? • How is demand evolving for integrated digital solutions in mining?
	Threats	• What external threats (e.g., competitor pricing, economic shifts) impact Telkomsel's B2B sales performance? • How do clients' procurement cycles and regulatory constraints affect your sales pipeline?

Vice President (VP) of Digital Product Management and Development	Strengths	• What product features or technologies represent Telkomsel's core strengths in the B2B mining solution space? • How does your product roadmap reflect innovation leadership?
	Weaknesses	• What development bottlenecks or resource constraints hinder product scalability? • Are there any internal gaps in aligning product design with mining industry needs?
	Opportunities	• How do you identify and integrate emerging technologies (e.g., AI, IoT, edge computing) into new digital solutions? • What product-led growth opportunities do you foresee in industrial sectors beyond mining?
	Threats	• What external tech trends or market entrants could threaten your digital product advantage? • How do cybersecurity regulations and interoperability standards challenge your innovation process?
Vice President (VP) of Enterprise Product Enablement and Solutions	Strengths	• What internal enablement processes or platforms help deliver digital solutions efficiently to enterprise clients? • How does cross-functional collaboration improve solution implementation for mining clients?
	Weaknesses	• What operational or integration challenges do you face in deploying solutions across complex mining environments? • Are there legacy systems or tools that hinder solution scalability?
	Opportunities	• What potential do you see for bundling Telkomsel solutions with partner technologies for greater value delivery?

		• Can mining clients' increasing focus on automation and safety open up new solution spaces?
	Threats	• Are there any regulatory or interoperability risks that may delay solution enablement? • How do you assess the threat of mining clients opting for in-house digital development?
General Manager (GM) of Enterprise Product Strategy, Partnership and Performance	Strengths	• How do strategic partnerships strengthen Telkomsel's position in the mining sector? • What makes Telkomsel's digital portfolio strategically aligned with industry needs?
	Weaknesses	• Are there gaps in strategic alignment between product vision and client requirements in the mining sector? • What performance issues need to be addressed for long-term B2B competitiveness?
	Opportunities	• How can new alliances or joint ventures enhance Telkomsel's access to mining clients or capabilities? • What performance trends in the mining sector present growth levers for Telkomsel?
	Threats	• Do you foresee changes in client procurement behavior that may impact current strategic directions? • How do external partnerships pose risks to Telkomsel's value control or IP protection?
General Manager (GM) of Enterprise Customers Solutions Management	Strengths	• What aspects of Telkomsel's customer solution management are most appreciated by mining industry clients? • How does Telkomsel ensure high levels of solution customization and support?
	Weaknesses	• What are the most common customer complaints or unmet needs in digital solution delivery?

		• Are there internal misalignments affecting post-sales service quality?
	Opportunities	• How can proactive customer engagement create upselling or cross-selling opportunities in the mining vertical? • What new service models (e.g., managed services, subscription) are clients demanding?
	Threats	• Are there risks of client churn due to unmet SLAs or performance issues? • How do competitor after-sales strategies pose a threat to Telkomsel's customer retention?
General Manager (GM) of B2B Corporate Business Strategy Development	Strengths	• What are Telkomsel's strategic advantages in positioning its B2B digital business across heavy industries like mining? • How effective is the long-term roadmap in driving digital leadership in B2B?
	Weaknesses	• What strategic barriers hinder Telkomsel's scale-up efforts in the mining sector? • Are there constraints in cross-unit alignment that affect strategic execution?
	Opportunities	• How can Telkomsel align its B2B strategy with Indonesia's national digital transformation agenda for the mining sector? • What role does data-driven decision-making play in identifying new market spaces?
	Threats	• What macroeconomic or policy changes could derail Telkomsel's B2B growth in mining? • How do global tech firms entering Indonesia pose strategic threats to your business model?

d. PESTLE Related Interview Question

Table III.3 Interview Question Related to PESTLE

Respondents	PESTLE Factor	Questions
Vice President (VP) B2B of Sales	Political	How do government mining and telecommunication policies influence your sales strategy in the B2B segment?
	Economic	In what ways have recent macroeconomic trends (inflation, mining sector investments) impacted your B2B revenue performance and forecasts?
Vice President (VP) of Digital Product Management and Development	Technological	What are the key technological enablers or barriers in developing digital solutions tailored for the mining industry?
	Legal	How do current and upcoming digital compliance and data privacy regulations affect the product lifecycle and feature development process?
Vice President (VP) of Enterprise Product Enablement and Solutions	Economic	How do shifts in mining companies' capital expenditures affect your product enablement priorities and customer solutions roadmap?
	Environmental	To what extent do sustainability goals and environmental pressures shape the features of enterprise digital solutions?
General Manager (GM) of Enterprise Product Strategy,	Political	How does the national digital economy agenda influence your enterprise product partnership decisions with mining companies?
	Technological	What role does innovation in network and IoT technologies play in aligning product

Partnership and Performance		strategy with the mining sector's digital transformation?
General Manager (GM) of Enterprise Customers Solutions Management	Social	How do differences in regional workforce readiness and digital culture among mining clients affect solution deployment?
	Legal	How do mining safety regulations or telecommunication licensing policies affect the customization of your enterprise solutions?
General Manager (GM) of B2B Corporate Business Strategy Development	Environmental	How are ESG standards and environmental regulations influencing long-term strategic planning for Telkomsel's B2B digital solutions?
	Social	What social shifts (e.g., workforce automation concerns, digital inclusion) are most relevant to your corporate digital strategy in the mining industry?
Expert Staff on Digitalization – Ministry of Industry (Kemenperin)	Political	How do current government policies and regulations support or hinder the adoption of B2B digital solutions in Indonesia's mining sector?
	Economic	In your view, how do macroeconomic trends (e.g., inflation, interest rates, investment climate) affect the digital transformation efforts in the mining industry?
	Social	What are the key social or workforce-related challenges (e.g., digital readiness, resistance to change) in promoting industrial digitalization?

	Technological	How is the Ministry supporting innovation and infrastructure to accelerate the use of advanced digital solutions in mining?
	Legal	Are there any legal or regulatory barriers (e.g., data protection, cybersecurity laws) that might impact the deployment of digital technologies in mining?
	Environmental	How do environmental regulations and sustainability goals influence the direction of digital transformation in the industrial sector?
Customer Mining Digitalization Expert – Digitalization & System Integration Manager (PT. Indexim Coalindo)	Political	How does government engagement (e.g., policies, incentives) affect your company's decision to adopt or scale digital solutions from providers like Telkomsel?
	Economic	What financial or economic considerations most influence your company's investment in digitalization technologies?
	Social	How receptive are your operational teams and workforce to changes brought by digital systems and automation?
	Technological	What are the main technological requirements or challenges when integrating Telkomsel's digital solutions into your mining operations?
	Legal	What legal concerns (e.g., data sharing, licensing, compliance) must be addressed when partnering with digital solution providers?
	Environmental	How do your environmental commitments drive the need for or shape the adoption of

		digital technologies in your mining processes?
--	--	--

e. VRIO Related Interview Question

Table III.4 Question Related to VRIO

Respondents	VRIO Element	Questions
Vice President (VP) B2B of Sales	Valuable	What aspects of Telkomsel's sales force or processes deliver unique value to B2B clients in the mining industry?
	Rare	Are there specific client engagement models or negotiation practices in your team that competitors find hard to replicate?
	Inimitable	How does your long-standing client trust or institutional knowledge create advantages that competitors cannot easily imitate?
	Organized	Is your sales structure adequately organized to scale and capture value from growing opportunities in the mining sector?
Vice President (VP) of Digital Product Management and Development	Valuable	Which features or functionalities of Telkomsel's digital solutions provide critical value to mining clients' operations?
	Rare	Are there proprietary technologies or design capabilities that differentiate your digital solutions from the market?
	Inimitable	What internal processes or culture of innovation make it difficult for competitors

		to duplicate your product development approach?
	Organized	Do you have the right product development governance to ensure consistent value creation and rapid deployment?
Vice President (VP) of Enterprise Product Enablement and Solutions	Valuable	What internal capabilities enable Telkomsel to deploy B2B solutions efficiently and reliably in complex mining environments?
	Rare	Are there integration methods or delivery frameworks unique to Telkomsel's operations team?
	Inimitable	How does the experience and institutional know-how of your enablement team create barriers to imitation?
	Organized	How well-structured are your resources and processes in capturing operational value from these deployments?
General Manager (GM) of Enterprise Product Strategy, Partnership and Performance	Valuable	How do strategic partnerships enhance the value proposition of Telkomsel's solutions for the mining sector?
	Rare	Are there exclusive alliances or frameworks that give Telkomsel a unique positioning in the ecosystem?
	Inimitable	How do these strategic partnerships create synergies that would be hard for competitors to replicate?
	Organized	Is the organization fully aligned to execute and extract value from these partnerships effectively?

General Manager (GM) of Enterprise Customers Solutions Management	Valuable	What service or support elements in Telkomsel's post-sales strategy offer high-value impact to enterprise customers in mining?
	Rare	Are there client management practices that are exclusive or rare in the B2B telecom landscape?
	Inimitable	How does the depth of your customer relationship management system make it difficult for rivals to catch up?
	Organized	Do you have structured systems and training to consistently deliver and scale customer value?
General Manager (GM) of B2B Corporate Business Strategy Development	Valuable	What elements of Telkomsel's B2B strategic direction are most valuable for long-term competitiveness in mining digitalization?
	Rare	Is Telkomsel's strategic planning capability for heavy industries unique compared to other digital service providers?
	Inimitable	How does your internal alignment and foresight in strategy make it hard for competitors to copy?
	Organized	Are your planning and execution frameworks maturing enough to capture value from identified strategic opportunities?

f. Porter's Five Forces Related Interview Question

Table III.5 Question Related to Porter's Five Forces

Respondents	VRIO Element	Questions
Vice President (VP) B2B of Sales	Buyer Power	How do mining clients influence pricing, customization, and contract terms in your B2B sales process?
	Competitive Rivalry	How intense is the competition among digital solution providers in the mining sector, and how does it affect your sales strategy?
Vice President (VP) of Digital Product Management and Development	Threat of Substitution	What alternative technologies or internal IT developments by mining clients could substitute Telkomsel's digital offerings?
	Supplier Power	How dependent is Telkomsel on third-party platforms, devices, or infrastructure for developing its mining solutions?
Vice President (VP) of Enterprise Product Enablement and Solutions	Threat of New Entry	How do you assess the risk of new entrants, such as startups or global tech players, entering the mining digital solutions market?
	Buyer Power	How demanding are mining enterprises regarding solution integration, support services, and innovation delivery?
General Manager (GM) of Enterprise Product Strategy,	Supplier Power	How do partnerships with technology vendors or infrastructure providers affect your ability to deliver competitive value?
	Competitive Rivalry	What key strategies help Telkomsel stay ahead in the digital B2B space for mining compared to its competitors?

Partnership and Performance		
General Manager (GM) of Enterprise Customers Solutions Management	Threat of Substitution	Are clients exploring substitutes such as in-house digital transformation teams or international platforms instead of Telkomsel's solutions?
	Buyer Power	What negotiation patterns do mining clients commonly exhibit that affect your solution delivery?
General Manager (GM) of B2B Corporate Business Strategy Development	Threat of New Entry	What market entry barriers currently protect Telkomsel's position in B2B mining digital services, and are they sustainable?
	Competitive Rivalry	How does Telkomsel's strategic positioning mitigate risks from aggressive market competition in the mining digital segment?
Expert Staff on Digitalization – Ministry of Industry (Kemenperin)	Competitive Rivalry	How would you describe the current level of competition among digital solution providers in Indonesia's industrial sector, particularly in mining?
	Supplier Power	From a regulatory viewpoint, how much influence do digital technology vendors have in setting terms, pricing, and innovation pace in industrial solutions?
	Buyer Power	To what extent do large mining companies have bargaining power in influencing the scope and customization of digital solutions?
	Threat of Substitution	What is your assessment of the risk that traditional or alternative (non-digital)

		methods still pose to the adoption of digital transformation in mining operations?
	Threat of New Entry	How easy or difficult is it for new digital solution players, including startups, to enter and compete in the mining technology sector in Indonesia?
Customer Mining Digitalization Expert – Digitalization & System Integration Manager (PT. Indexim Coalindo)	Competitive Rivalry	How do you evaluate the competition between digital solution providers (like Telkomsel, others) in terms of features, support, and pricing?
	Supplier Power	To what extent can vendors of digital platforms dictate integration standards, pricing, or service levels in your mining operations?
	Buyer Power	How much influence does your company have in negotiating terms, customization, and support from B2B digital solution providers?
	Threat of Substitution	Are there traditional or alternative technologies that your company still considers viable instead of adopting full digital solutions? Why or why not?
	Threat of New Entry	What is your view on the potential of new digital entrants disrupting or offering better solutions in the mining sector in the near future?

2. Time and Location of the Research

The fieldwork for this study was conducted over three months, from April to June 2025, a timeframe strategically selected to accommodate the sequential stages of data collection, analysis, and the systematic development of the final research report. Data gathering was carried out

through on-site at the headquarters of TSEL, as well as to the operational facilities of several of its strategic partners within the mining industry. These partner organizations were purposively selected based on their active implementation of B2B oriented digital technologies and communication strategies, rendering them ideal case studies for exploring the integration of digital solutions within Indonesia's industrial landscape.

By embedding the research within these real-world operational environments, the study ensures that its findings are grounded in practical realities and context-specific dynamics. This approach enhances the ecological validity of the research by capturing the multifaceted challenges, strategic considerations, and implementation outcomes associated with digital transformation in the mining sector. The field-based methodology also enables the identification of contextual enablers and barriers that influence the success of digital B2B strategies, thereby contributing to a deeper and more actionable understanding of organizational decision-making in technologically evolving industries.

III.2. Data Collection Method

To obtain comprehensive and in-depth data for analysing the condition of the company and the development of Business Strategy in TEDS within the mining industry sector, this study employs a triangulated approach encompassing three primary data collection techniques: interviews, documentation, and literature review. These methods are selected to ensure the richness, relevance, and reliability of both primary and secondary data sources.

1. Interviews

Interviews were conducted as a key qualitative data collection method to gather firsthand insights directly from informants who are knowledgeable and experienced in the subject matter. The interviews were using open ended questions, this type of exploration used to deep dive the subject matter expert or key informant perspective related to the

business issue. This type of interview is effective in extract authentic and experiential data from key informants that directly involved in the decision making in the organization or companies in the mining industry.

2. Documentation

The research documentation utilized to collect data or research materials that provide record and evidence for the research. The documentation used as a raw data obtained through interviews. The use of documentation ensures a systematic validation of verbal data and enrich the empirical foundation of the research.

3. Literature Review

A Literature review was conducted to provide a theoretical and conceptual foundation for the research. The literature was using analysis of academic literature, including books, journal articles, papers, research reports, company reports, third party consultant and other publications that relevant to the theme of digitization, B2B strategies, technological innovation, and strategic development in the mining industry. The literature review has two objectives. First, it establishes the theoretical framework that guides the research design and data interpretation. Second, it allows for comparative analysis between the primary data of the research and secondary data.

4. Data Sources and Triangulation

Data sourcing and combined with triangulation approach utilized to increase the validity of the research. This research using triangulation approach by integrating both primary and secondary data sources. This method utilized to obtain a comprehensive and multiperspective understanding of the issues.

- **Primary Data**

Primary data used as the main information gathered from relevant sources with interview. Primary data obtained through deep interviews with key informants that have deep knowledge, strategic authority, and direct involvement in the research subject. These

informants like senior management level and high-level officials and also decision makers within TEDS, as well as the external stakeholders that actively involve in the digital transformation processes within Indonesia's Mining Industry.

The interviews are designed to obtain rich, contextual, and experience-based insights, enabling a nuanced interpretation of the implementation and strategic implications of Business Strategy development in B2B digital solution frameworks. The firsthand nature of this data is pivotal in capturing the lived realities, perspectives, and challenges encountered in the field.

- **Secondary Data**

Secondary data, on the other hand, comprises information that has been previously published or documented, and is not generated directly by the researcher. For the purposes of this study, secondary data is sourced from a variety of academic and corporate publications, including scholarly books, peer-reviewed journal articles, technical reports, white papers, corporate brochures, company reports and profiles, and publicly available documentation from TSEL.

Obtaining These materials play a dual role: first, they contribute to the development of the theoretical and conceptual framework that underpins the study; and second, they offer contextual depth and supporting evidence that enrich the interpretation and triangulation of the primary data. Secondary data provides a broader lens through which empirical findings can be critically analysed and positioned within existing academic and industry discourse.

The synthesis of primary and secondary data enables a more holistic, balanced, and academically rigorous analysis. Through data triangulation, the study mitigates potential biases and enhances the credibility of the conclusions drawn. This integrated approach ensures

that the findings not only reflect empirical realities on the ground but are also anchored within established theoretical and industrial contexts, thus offering a well-rounded and substantiated understanding of the strategic deployment of digital B2B solutions in Indonesia's mining sector.

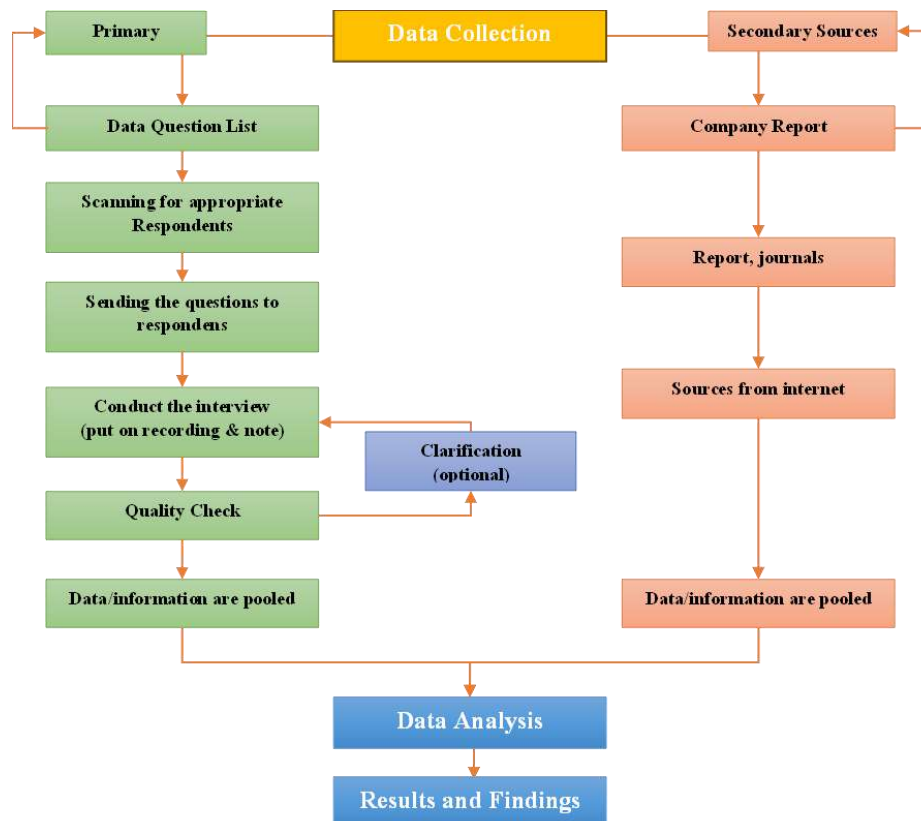


Figure III.2 Methodology to Collect Data and Information

III.3. Data Analysis Method

III.3.1. Data Analysis

This analytical framework, widely regarded for its rigor and iterative nature, comprises a dynamic sequence of interconnected procedures that collectively enable a comprehensive interpretation of qualitative data. The model encompasses four principal stages:

1. Data Collection

The analytical process begins with the systematic gathering of qualitative data through in-depth interviews, participant observations, and

document/literature reviews. All data is recorded in detailed field notes, which are categorized into:

- Descriptive notes: capturing direct observations, conversations, and contextual details.
- Reflective notes: documenting the researcher's preliminary insights, interpretive thoughts, and emerging hypotheses.

These field notes serve as the foundational corpus of data for subsequent stages of analysis.

2. Data Reduction

Once collected, the data undergoes a reduction process, whereby irrelevant, redundant, or extraneous content is filtered out. This stage focuses on isolating information directly aligned with the research objectives and thematic focus. Through coding, categorizing, and synthesizing, the data is distilled into core themes and meaningful patterns. Importantly, data reduction is not a one-time activity, but a continuous, iterative process conducted throughout the research lifecycle.

3. Data Display

After reduction, the refined data is organized into structured formats that facilitate interpretation and analytical reflection. These displays may include:

- Narrative summaries
- Thematic matrices
- Flowcharts and diagrams
- Conceptual maps or visual models

Data display functions both as a tool for sense-making and as a mechanism for unveiling relationships, trends, and patterns among the data categories.

4. Conclusion and Verification

The final stage involves drawing and verifying conclusions. Initial interpretations are developed early and are continuously tested and refined as new data is analysed. Once data saturation is achieved and consistency across sources is established, robust conclusions are formulated. These conclusions offer evidence-based answers to the research questions and are subjected to further verification for credibility and reliability.

III.3.2. Interpretation Strategy

In qualitative research, data analysis is not merely descriptive but inherently interpretive. It seeks to uncover the underlying meanings, relational dynamics, and contextual insights embedded within the data. This interpretive approach involves an active dialogue between:

- Empirical findings (from interviews, documents, and observations), and
- Theoretical constructs (from existing literature on digital transformation, B2B strategy development models).

This dialogic engagement allows for cross-validation of empirical insights and enables the study to make a theoretical contribution to the academic discourse on strategic digital innovation.

III.3.3. Contextual Application in This Study

Within the framework of the current study “Business Strategy of B2B Digital Solution of Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry”, the data analysis process focuses on the strategic and operational development and implementation of B2B digital solutions by TSEL. This includes:

- Strategic frameworks guiding digital solution deployment,
- Execution and optimization of B2B initiatives,

- Evaluation of impact through technological, managerial, and partnership lenses.

The interpretation synthesizes empirical insights with theoretical models of B2B strategy and digital transformation to offer a nuanced understanding of TSEL's role in driving innovation within Indonesia's mining sector.

Chapter IV Results and Discussion

IV.1. Analysis

The Analysis utilized in the study is Internal Analysis (Value Chain Activity, VRIO and SW) & External Analysis (General Environment PESTEL, Industry & Competitor analysis using Porter's Five Forces, and OT) and combine with SOWT Analysis. The Analysis using qualitative method with the sources data from Interview with the high-level management and expert in TEDS and External expert also using sources form internet, report, and journal.

IV.1.1 Internal Analysis

IV.1.1.1 Value Chain Activity Analysis

The Value Chain Activity used to analyse internal condition based on resources and activities of TEDS to see the company conditions to sustained competitive advantage in the Mining Industry digital market. Refer to the summary interview results with TEDS Internal Team management and secondary data from internet and company data, the value chain activity analysis results in Digital Solutions in Mining Industry are defined as follow:

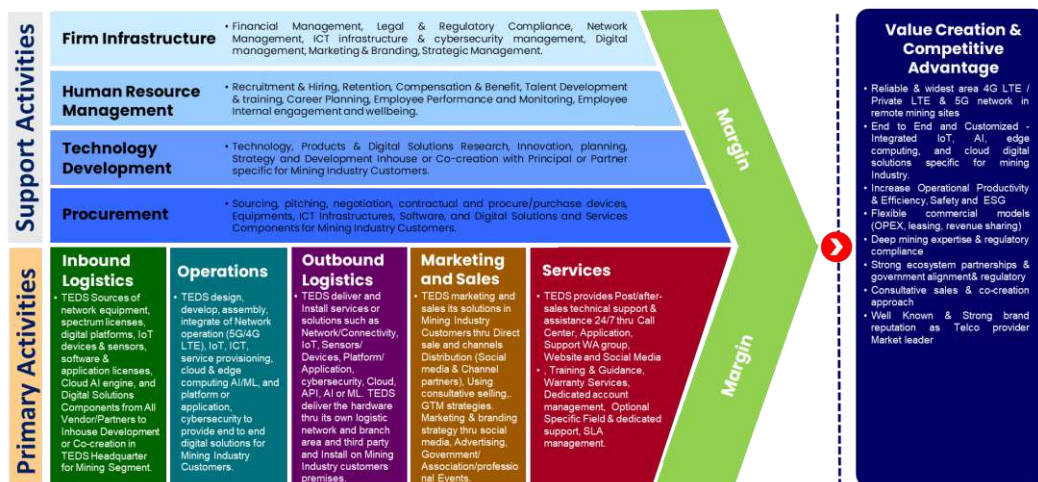


Figure IV.1 Value Chain Activity Analysis Result

Refer to the detail analysis above, the summary of TEDS value chain in Mining Industry utilized combinations of traditional telecommunication provider competencies with agile digital technology solutions provider. Utilizing and Combining Network (4G LTE, 5G, and Private Network), IoT, Devices/Sensors, Cloud & edge computing, Application/platform, and AI & Machine Learning across the value chain specifically in operations and service layers, TEDS can enhance the revenues while enhancing resilience, innovation, and customer-centricity in Mining Industry. Customizing the value chain to meet demands and requirements of the Digital Solutions in Mining Sector is essential for optimizing operations and driving value creation.

IV.2.1.1 VRIO Analysis

The VRIO framework used to analyse internal condition based on resources and capabilities of TEDS to see the company conditions to sustained competitive advantage in the market. Refer to the interview results with TEDS Team management, the VRIO parameters and results in Digital Solutions in Mining Industry are defined as follow:

Table IV.1 Qualitative Coding: VRIO Analysis Result

Resources	Valuable?	Rare?	Inimitable?	Organized to Capture Value?	Competitive Implication
Industry-specialized Key Account Managers (KAMs), Area Account Managers and Technical Mining Expertise	Yes	Yes	Yes	Yes	Sustainable Competitive Advantage
Co-creation & Joint Solution Development	Yes	Yes	Yes.	Yes	Sustainable Competitive Advantage
Nationwide Network Coverage & Technical Support	Yes	Yes	Yes	Yes	Sustainable Competitive Advantage
Flexible Commercial Models (OPEX, Revenue Share)	Yes	Yes	Yes	Yes.	Sustainable Competitive Advantage
Parents Company as Stated Owned Enterprise and Infrastructure Synergy	Yes	Yes	Yes	Yes	Sustainable Competitive Advantage
Deep Regulatory and Local Representative	Yes	Yes	Yes	Yes.	Sustainable Competitive Advantage
Long-standing Client Relationships and Institutional Knowledge	Yes	Yes	Yes	Yes	Sustainable Competitive Advantage
Strategic Ecosystem Partnerships	Yes	No	No	Yes	Competitive Parity
Cross-functional Innovation Culture	Yes	Yes	Yes	No	Unused Competitive Advantage
Internal Misalignment and Talent Gaps	No	No	No	No.	Competitive Disadvantage
Client Portfolio Concentrated on Large Players	No	No	No	No	Competitive Disadvantage

a. Account Managers & Technical Support

- Valuable: Specialized KAMs & Area Account provide tailored consultative sales supported by Technical Solution engineer and Solution Architect that have deep understanding of mining operational needs and pain points.
- Rare: Only Few competitors that invest in deep mining-specific sales expertise that provide end to end solutions capability.
- Inimitable: Takes time & investment to build domain expertise and clients in Mining Industry trust.
- Organized to Capture value: Fully integrating Account Manager with other units like Solutions engineer, Solutions Architect, Product team, Delivery, Strategic, marketing, regulatory, legal, finance, after sales.

b. Co-creation & Joint Solution Development

- Valuable: TEDS enables highly customized and Join development or co-creation with client's demand and conditions, Return on Investment or benefit for client's focused that bring significant impact and value from solutions beyond generic offerings.
- Rare: To develop Co-creation and join solutions development requires cultural and organizational alignment that is hard to replicate.
- Inimitable: TEDS team dependent on good internal culture in product development & innovation, client trust, and multi-disciplinary collaboration.
- Organized to Capture value: Consultative solutions and cross-functional teams support co-creation well.

c. Network Coverage & Technical Support

- Valuable: Critical for mining clients in remote, harsh environments requiring reliable connectivity and 24/7 support.
- Rare: Other major telcos and other digital competitors have less networks coverage, may lack remote focus, and limited area support.

- Inimitable: Need Big investment and time to expand and catch up to TSEL Network infrastructure Coverage and Technical support.
- Organized to Capture value: TEDS is well-organized to deploy and maintain network services all around Indonesia and remote area.

d. Commercial Models

- Valuable: Flexible commercial models like OPEX based (manage services/rental, Instalment, usage based) and revenue shared options met client CAPEX constraints and improve adoption of the digitalization.
- Rare: Several Telco's operators or others Digital Solution provider company offer flexibility but not as TEDS flexibility in commercial model due to competitor capital, but integration with mining context is rare.
- Inimitable: Pricing flexibility like TEDS hard to be copied and need time due need big capital, risk assessment and appropriate internal policy shifts.
- Organized to Capture value: Account managements or Sales trained to cross collaboration and coordination with cross functional teams such as product/strategy/finance/legal teams.

e. Parents Company as SOE and Infrastructure Synergy

- Valuable: Parents Company (TELKOM) as one of the biggest SOE and widest fixed infrastructure synergies also have close relationship with other SOE, Other Big Company, and Government/Regulatory.
- Rare: There is none of competitor in Digital solutions that have strength parent company that also stated owned enterprise that close to the regulatory/government and other stated owned enterprise, also have widest fixed infrastructure enabler for digitalization.
- Inimitable: Widest digital enabler fixed asset synergy and strength backing that close to regulatory/government and other SOE is very hard to imitate to competitor.
- Organized to Capture value: TEDS personnel trained and used to collaborate and cross functional coordination with Parent company

Team and high-level management as a group, also to sister company to deliver project as a bundle.

f. Deep Regulatory and Local Representative

- Valuable: The deep engagement and close relationship built over years with government and regulatory is essential for regulatory compliance and supports like frequency license, data sovereignty and ESG mandates to accelerate digital adoption, close relationship with clients also built over years by local representative account manager and technical support.
- Rare: Foreign and local competitors often lack this regulatory familiarity and close relationship also local representative that spread across Indonesia.
- Inimitable: Built over years with government and industry relationships.
- Organized to Capture value: Organizational structures support regulatory compliance workflows and local representative, and technical support used to support the clients across Indonesia.

g. Long-standing Client Relationships

- Valuable: Trusted by clients, facilitates early engagement and smoother project execution.
- Rare: Built over the years requires significant effort and a proven track record to deliver quality of services and support.
- Inimitable: Highly difficult, need time and big investment to imitate Client's trust and networks.
- Organized to Capture value: management systems well organized through established Customer Relationship Management (CRM) system and customer relationship well managed.

h. Strategic Ecosystem Partnerships

- Valuable: Complements core capabilities with IoT, OEMs, system integrators, and government.
- Rare: Competitor aggressively alliances create differentiated, bundled offerings similar with TEDS.

- Inimitable: Competitor aggressively alliances and partnership with partner and principals.
- Organized to Capture value: Dedicated partnership management teams enable smooth execution.

i. Cross-functional Innovation Culture

- Valuable: TEDS enables agile culture, client-centric solution development and innovation culture.
- Rare: It's common in Multi-National or Global Technology company but still not common in traditional telco players, requires cultural buy-in.
- Inimitable: Embedded in organizational DNA and processes, challenging to replicate for common telco provider, but for global technology digital provider and start-up have similar culture.
- Organized to Capture value: organized in culture Innovation but still in product B2C, and in progress to TEDS.

j. Internal Misalignment and Talent Gaps

- Valuable: Reduces efficiency, speed, and client trust & satisfaction.
- Rare: Common in many organizations undergoing transformation.
- Inimitable: Competitors can exploit these weaknesses.
- Organized to Capture value: Current organizational structure needs strengthening.

k. Client Portfolio Concentrated on Large Players

- Valuable: Limits growth in emerging segments and increases exposure to client risk.
- Rare: Many competitors have broader client mixes.
- Inimitable: Competitors targeting mid-sized and regional players can gain market share.
- Organized to Capture value: Sales strategies need diversification focus.

In Summary, TEDS's VRIO framework in Indonesia mining digital solutions shows a strong competitive advantage driven by its deep sector expertise, network infrastructure, financial & commercial model,

customized & cocreation end-to-end solutions, Parents Company SOE and Infrastructure Synergy, consultative selling & long-standing engagement, local representative, and regulatory alignment. This positions TEDS as a trusted partner in digital transformation journeys, well beyond traditional telco services. However, internal gaps in mining-specific technical expertise and Internal Misalignment, business process and local technical supports specific mining sectors pose challenges that could slow time-to-value delivery and erode client trust if left unaddressed. Externally, competitive pressures from global and local digital technology provider and fast-moving startups are intensifying, requiring TEDS to accelerate product innovation (AI, edge computing, mining-specific IoT and etc) and strengthen commercial agility to navigate procurement delays and macroeconomic uncertainty.

IV.1.1.2 SW Analysis

The SW (Strength and Weakness) analysis framework used to analyse internal condition and part of SWOT Analysis, based on Internal Strength and Weakness of TEDS to see the company conditions. Refer directly to the interview results as the first layer primary data with TEDS Internal Team management, the SW parameters in Digital Solutions in Mining Industry are defined as follow:

Table IV.2 Qualitative Coding: SW Analysis Result

Code	Excerpt	Source	Theme
Widest network coverage in remote mining areas	"Telkomsel has widest 4G and 5G coverage (97% Indonesia), including remote areas... critical for mining clients."	VP B2B Sales, Telkomsel	Internal Strength
Strong parent company support & government synergy	"Telkomsel benefits from Telkom Indonesia Group infrastructure and BUMN synergy, boosting trust and compliance."	VP B2B Sales, Telkomsel	Internal Strength
Comprehensive, scalable end-to-end digital portfolio	"Private LTE, IoT, AI analytics, cloud infrastructure; flexible & tailored for mining operational KPIs."	GM Enterprise Product Strategy, Telkomsel	Internal Strength
Consultative sales & co-creation approach	"Sales act as advisors, use PoC pilots to build credibility and align solutions with client business KPIs."	VP B2B Sales, Telkomsel	Internal Strength
Data-driven account management & customer engagement	"Use analytics to customize roadmaps, anticipate client needs and deepen relationships."	GM Enterprise Customer Solutions Management, Telkomsel	Internal Strength
Legacy system integration challenges	"Mining tech stack includes SCADA, PLC, proprietary hardware – integration is complex and costly."	Multiple respondents (VP B2B Sales, GM Solutions)	Internal Weakness
Limited mining-specific expertise across teams	"Need more embedded OT/IT mining experts in sales, engineering, delivery to compete with specialized firms."	VP B2B Sales, VP Product Management	Internal Weakness
Fragmented solution packaging & internal coordination	"Solutions can seem fragmented; cross-unit alignment gaps delay deployment and reduce customer experience."	GM Enterprise Customer Solutions Management	Internal Weakness
Sales team reskilling needed for consultative selling	"Traditional telco sales DNA; transitioning to Consultative & value-based selling focused on ROI and KPIs is ongoing."	VP B2B Sales	Internal Weakness
Limited local field support in remote mining regions	"Insufficient boots on the ground in remote areas impacts SLAs and client confidence."	GM Enterprise Customer Solutions Management	Internal Weakness
Brand Image as a Telco provider, not digital solution provider	"Journey from being seen purely as a telco to being recognized as a trusted transformation partner comes with real challenges... Perception Shift from Telco to Digital Partner"	VP B2B Sales	Internal Weakness

a. Strength

Based on the Interview data and Secondary data analysis and research conducted, here is a detailed breakdown of TEDS's internal strengths in Indonesia mining industry:

- **Widest Network Coverage in Remote Mining Areas**

TEDS's vast network infrastructure is one of its most significant strengths, especially in Indonesia's remote mining regions where connectivity is critical as enabler to digitalization for productivity and operational efficiency. The company's 4G LTE, private LTE, and 5G network ensures that mining companies operating in isolated, rural and geographically challenging environments can stay connected, enabling real-time data transmission, remote control of mining equipment, and monitoring of operations. Mining companies also require reliable communication and data networks to enable IoT devices, real-time monitoring, automation, and AI applications that are essential for productivity, safety and efficiency. A robust network infrastructure allows remote monitoring, predictive maintenance, and emergency response capabilities, ensuring that operations run smoothly without delays or downtime due to connectivity issues.

- **Strong Parent Company Support & Government Synergy**

As part of the TELKOM Group (one of the biggest SOE), TEDS benefits from significant parent company support in terms of financial resources, regulatory & government close relationship, and vast digital infrastructure investment across the nation. Additionally, TEDS has strong synergy with the Indonesian government, especially with Industry 4.0, mining & minerals regulatory and ESG (Environmental, Social, Governance) initiatives that support digital adoptions. TEDS's close relationship with the government ensures compliance with Indonesian regulations, particularly those relating to data sovereignty and ESG mandates that are vital for mining clients. The government's push for digitalization (Indonesia Digital

4.0 and 4G LTE & 5G Deployment) creates opportunities for TEDS to leverage its government support in subsidized infrastructure projects, helping to make digital solutions more accessible to the mining sector. TEDS also can tap into government-backed mining digital transformation projects, positioning itself as a trusted partner in the implementation of national digitalization initiatives.

- **Comprehensive and Scalable End-to-End Digital Portfolio**

TEDS offers a comprehensive digital portfolio that includes IoT, cloud services, AI, edge computing, and private LTE/5G networks. This end-to-end capability allows TEDS to provide mining clients with a holistic solution that can be scaled to meet the varying demands of the industry. Mining operations demand customized, integrated solutions that combine connectivity, automation, data analytics, and monitoring systems. TEDS's ability to deliver a fully integrated portfolio positions it as a one-stop solutions for mining companies. With solutions that scale from small mining operations to large multi-site operations, TEDS can support growing mining projects that require flexible solutions that evolve as the client's needs increase through staging development (e.g., network expansions, increased data processing needs). The ability to provide everything from connectivity to cloud-based analytics gives TEDS a competitive edge by offering more comprehensive solutions than competitors who might specialize in one area, such as just connectivity or just IoT.

- **Consultative Selling & Co-Creation Approach**

TEDS consultative selling model is an essential strength in the B2B digital solutions market, especially in the mining industry where the adoption of digital technologies requires deep understanding of client needs and pain points. The co-creation approach involves working closely with clients to design custom solutions tailored to their unique operational requirements. Mining clients are looking for solutions that are tailored to their specific operational challenges

(e.g., safety, productivity, maintenance, efficiency). By adopting a consultative and co-creation approach, TEDS can deliver bespoke solutions that maximize the impact of digital transformation. The focus on collaboration helps TEDS build strong, long-term relationships with mining clients, turning them into strategic partners rather than just customers. This approach increases client loyalty and reduces churn. Working together with clients ensures that TEDS's solutions are directly aligned with the client's needs, resulting in higher satisfaction and increased adoption of digital solutions.

- **Data-Driven Account Management & Customer Engagement**

TEDS has data-driven account management and customer engagement strategies, utilizing advanced CRM systems and analytics tools to gain deeper insights into customer behaviour, needs, and satisfaction levels. This allows TEDS to proactively manage client relationships, address pain points, and improve service delivery. By using data on client operations and needs, TEDS can anticipate issues, such as network failures or system downtimes, before they affect the client. This proactive approach is essential for the mining sector, where operational disruptions can result in significant financial losses. TEDS can identify specific client needs and offer personalized services or upgrades, enhancing the client experience. This allows TEDS to better address the complex requirements of mining companies, such as ESG compliance and operational efficiency. By tracking customer satisfaction and engagement metrics, TEDS can adjust its strategies to retain clients and drive growth through targeted offerings and tailored solutions for the mining sector

In summarize, TEDS for the mining industry benefit from several key internal strengths: Extensive network coverage in remote areas, which is critical for enabling connectivity in mining operations. Strong parent company and government synergy, providing TEDS with regulatory

alignment and strategic access to key government-backed projects. A comprehensive and scalable digital portfolio that meets the diverse and evolving needs of the mining industry. A consultative sales and co-creation approach, allowing TEDS to deeply engage clients in the development of customized, effective solutions. And data-driven account management, ensuring that TEDS can provide personalized, proactive services that align with clients' needs, driving long-term satisfaction. These strengths, combined, position TEDS as a leading player in the mining digital solutions space, with a competitive edge in connectivity, solution integration, and customer-centric innovation.

b. Weakness

Based on the Interview data and Secondary data results analysis, here's a detailed breakdown of the weaknesses that may affect TEDS's ability to implement and execute a successful business strategy in the Indonesian Mining Industry Digitalization business:

- **Legacy System Integration Challenges**

TEDS faces integration challenges when trying to connect its modern digital solutions (IoT, AI, 5G, Edge) with existing legacy systems in mining operations, such as SCADA (Supervisory Control and Data Acquisition) and PLCs (Programmable Logic Controllers). These legacy systems are often deeply embedded in mining processes, and the difficulty in integrating newer, modular solutions with these systems creates complexity and slow adoption. Mining clients may hesitate to adopt TEDS's advanced digital solutions due to concerns about compatibility with their existing systems. Integration complexity can cause delays in implementation, hinder TEDS from meeting the speed and flexibility that clients expect. Extensive time and resources are required to customize solutions for legacy system compatibility, leading to higher costs for both TEDS and the client. Clients in the mining industry may perceive TEDS's

solutions as too disruptive or difficult to integrate into their established operations.

- **Limited Mining Specific Expertise Across Teams**

Although TEDS possesses strong mining expertise in its teams, the knowledge is not sufficiently distributed across the teams, sales teams, and client support units. This lack of mining-specific expertise outside the core teams leads to inefficient solution delivery and sales engagement. Without mining expertise across all teams, TEDS risks not being able to scale its solutions effectively across Indonesia's vast mining sector. Sales teams may struggle to understand specific client pain points or recommend the right solutions, leading to missed opportunities in mid-market and regional segments. Mining clients may perceive TEDS as an outsider in the mining space, especially if the support team lacks mining-specific knowledge.

- **Fragmented Solution Packaging & Internal Coordination Gap**

TEDS packaging is sometimes fragmented, meaning that while TEDS offers comprehensive solutions, they may be difficult to sell or implement due to inconsistent business process delivery, bundling or lack of internal coordination between product, sales, and technical teams. Mining clients may face confusion or frustration when trying to navigate TEDS's offerings, which are not always clearly packaged for specific use cases (e.g., remote monitoring, predictive maintenance). Also, the lack of clear coordination can cause delays in the delivery and deployment of mining solutions, resulting in lower client satisfaction. TEDS may also miss opportunities to cross-sell or up-sell other integrated services (cloud, AI analytics, connectivity), as solutions are not bundled strategically for mining clients.

- **Sales Team Gap for Consultative Selling**

TEDS's sales team is traditionally accustomed to a B2C, and transactional sales approach focused on selling connectivity or telco

services, rather than consultative selling focused on the pain points, needs and outcomes of the mining clients. Mining clients require consultative discussions to understand their specific needs, which requires skilled salespeople who can position TEDS as a long-term partner, not just a products or services provider. Without the right skills and approach, sales teams may not effectively convert leads into clients. The lack of consultative selling also limits the sales team's ability to offer the full range of digital solutions tailored to mining-specific needs.

- **Limited Local Field Support in Remote Mining Regions**

Despite TEDS's broad network and team support in regional area, the lack of sufficient field support in remote mining regions is a significant weakness, especially for mining clients that require onsite technical assistance to ensure network reliability and solution uptime. Without reliable local support, mining clients may face longer response times, especially when facing operational issues in remote areas. Mining companies rely on high uptime for their critical operations. Slow or ineffective local field support could lead to dissatisfaction and loss of trust in TEDS's ability to deliver reliable solutions. Limited local presence hinders TEDS's ability to expand in remote or underserved mining regions.

- **Brand Image as a Telco Provider, Not Digital Technology Solution Provider**

TEDS's brand & reputation is strongly associated with Telecommunication or operator provider Indonesia market leader and may not be immediately recognized as a digital technology solutions provider in industries like mining, which could impact client perception. Mining clients may hesitate to adopt TEDS's solutions, viewing the company more as a telecom provider than a technology partner that can drive digital transformation. To position itself as a leader in mining digital solutions, TEDS must overcome its telco-centric image and educate clients about its comprehensive

digital portfolio for mining. This brand and reputation challenge could slow TEDS's entry into the broader mining industry market.

In Summary, TEDS's internal weaknesses such as legacy system integration, sales culture gaps, and limited field support in remote regions, represent critical challenges in fully executing its business strategy in the mining industry. Overcoming these weaknesses is essential for TEDS to scale its B2B digital solutions and capitalize on the growing opportunities in the mining sector.

IV.1.2 External Analysis

IV.1.2.1 General Environment PESTLE Analysis

The PESTLE framework utilized to analyse key external factors based on Political, Economic, Social, Technological, Legal, and Environmental that may affect the conditions of TEDS in the Indonesia Mining Industry Market. Refer to the interview results analysis with External expert in Digitalization from Government or regulatory, Customers Digitalization expert, and High-Level Management of TEDS also secondary data analysis. The key factors might be opportunities that could give competitive advantage or be threats that could threaten the business continuity of TEDS. The PESTLE factors in Digital Solutions in Mining Industry are defined as follow:

Table IV.3 Qualitative Coding: PESTLE Analysis Result

PESTLE Factor	External Factor	Excerpt	Strategy Implication
Political	Supportive government policies & regulatory frameworks encourage digitalization; bureaucracy and overlapping regulations slow adoption.	"Making Indonesia 4.0, data sovereignty (PP71), local content (TKDN) encourage automation and local innovation. Bureaucratic delays and unclear tech classification remain challenges."	Align products with government policies; ensure regulatory compliance.
Economic	Inflation, interest rates, and commodity price volatility affect investment budgets; flexible financing is critical.	"Inflation and rising costs delay projects; OPEX-based and leasing models improve affordability; downstream mining investments create new digital needs."	Develop flexible commercial models; target new greenfield projects.
Social	Workforce digital literacy varies; resistance to change and inclusion issues slow adoption; upskilling and change management are essential.	"Resistance to automation and digital tools exists, but training and involvement help increase acceptance; digital inclusion for remote workers is vital."	Focus on training programs; support workforce digital readiness and inclusion.
Technological	Need for reliable connectivity (private LTE, 5G); legacy system integration and data security are key challenges.	"Remote site connectivity must be robust; legacy SCADA/PLC systems require modular integration; data sovereignty demands local data storage and security."	Invest in modular, scalable tech solutions; enhance network reliability.
Legal	Data sovereignty laws (PP71), cybersecurity regulations, and multi-ministry compliance increase complexity but enforce trust and safety.	"Local data storage is mandatory; cybersecurity certifications needed; overlapping regulations require careful compliance."	Embed legal compliance in product design; maintain robust security standards.
Environmental	Increasing regulatory and investor pressure on emissions, resource use, and sustainability drives real-time monitoring and reporting needs.	"IoT sensors and analytics help track environmental metrics; sustainability is a core product feature; digital tools support ESG compliance and transparency."	Integrate ESG features; partner with green tech providers; enhance sustainability reporting.

a. Political

Digital transformation in the mining sector is strongly influenced by political factors, both nationally and globally. These factors shape the regulatory environment, government incentives, and industry priorities. Here's an in-depth look at how national and global political factors affect digitalization in the Indonesian mining industry. Indonesia government commitment to Industry 4.0 and local content regulations (TKDN) encourage digitalization. Making Indonesia 4.0 focuses on enhancing local innovation and automation, while PP71 enforces data sovereignty. Indonesia's local content regulations (TKDN) promote the use of domestic technology and suppliers. Mining companies are mandatory to implement local digital solutions, creating opportunities for Indonesian tech companies to integrate automation and digital systems into mining operations. The government encourages the mining sector to adopt advanced digital technologies to improve productivity, efficiency, reduce costs, and enhance safety & ESG. Indonesia's commitment to sustainable development under the United Nations Sustainable Development Goals is also a driver for digitalization in sectors like mining. The government's also increasing focus on environmental sustainability means that mining companies must invest in digital tools to monitor environmental impacts (e.g., emissions, waste, resource management). This regulatory pressure encourages the integration of IoT sensors and real-time analytics into mining operations. International initiatives like the Paris Agreement on Climate Change place increasing pressure on industries, including mining, to reduce emissions and optimize resource usage. These pressures have spurred global interest in sustainability-focused technologies, which the Indonesian mining sector must adopt to remain competitive on the international stage. Investors worldwide are becoming more ESG-conscious and are increasingly requiring companies to adopt sustainable practices. For Indonesian mining companies, meeting global ESG standards is a critical driver for

adopting real-time monitoring solutions, data analytics, and automation to track environmental and social impacts. Indonesia's data sovereignty law (PP71) requires that data from critical sectors, including mining, be stored locally. This law aims to enhance data security, but it also presents challenges for companies implementing cloud-based solutions unless they partner with local data centres or establish domestic data storage infrastructure. While Indonesia has data sovereignty laws (such as PP71), global data regulations like the General Data Protection Regulation (GDPR) in the EU, and cross-border data flow restrictions can impact international partnerships. Mining companies that need to integrate cloud solutions or share data across borders may face difficulties navigating international data protection laws.

The Indonesian government has introduced regulatory changes under Government Regulation 25 of 2024 (GR 25/2024) to streamline bureaucracy and enhance mining practices, which could facilitate digitalization efforts in the sector. Despite supportive policies, overlapping regulations and complex administrative processes can slow down the adoption of digital solutions in the mining industry. The adoption of global standards for digital technologies (such as 5G connectivity, Cloud, IoT, AI) is driving the digitalization of mining operations globally. Indonesia, as a key global mining player, must align with these standards to remain competitive. Even Geopolitical events such as trade wars or supply chain disruptions (e.g., from the COVID-19 pandemic) can affect the availability and cost of digital technology needed for mining operations. The reliance on foreign technology providers could be a double-edged sword, affecting the speed and cost of digital adoption.

Foreign Investment like Global Mining company and international technology companies, including those from the United States of America, European Country, EU, and China, are investing heavily in

Indonesia mining industry and also digital mining solutions such as automation and IoT platforms. This creates both opportunities and competition for TEDS. As the global demand for digital mining solutions increases, Indonesian mining companies are more likely to embrace digital technologies, making it essential for TEDS to maintain its competitive edge.

TEDS must Engage actively in policy advocacy to streamline regulatory processes and help reduce adoption barriers. Collaborate with global and international players to align with global technology standards while maintaining compliance with local regulations. Position itself as a leader in sustainable digital solutions, capitalizing on the global demand for ESG-compliant tools in mining.

b. Economical

Economic factors like global macroeconomic, Inflation, interest rates, exchange rates and commodity price volatility affect the Indonesia Mining Industry and TEDS. Indonesia's GDP grew by 5.03% in 2024, Bank Indonesia maintained its benchmark interest rate at 6.00% and maintained its benchmark interest rate at 5.50%, with inflation remaining low at 1.6% in May 2025, indicating a stable economic environment. But While exchange rate indicates moderate effects on exports during 2024, a weakening rupiah raises imported tech costs impacting CAPEX for digital solutions.

The Indonesia mining sector's contribution to GDP was approximately 6.8% in 2024, amounting to USD 104.88 billion. Indonesia achieved a record coal production of 836 million metric tons in 2024, surpassing the target of 710 million tons by nearly 18% and Coal exports reached approximately 555 million tons in 2024, marking a new high. In 2023, Indonesia produced about 2.2 million metric tons in 2023, approximately 58% of global production. 2024 Forecast Production is projected to increase to 2.38 million metric tons in 2024 increase 8%

YoY. The combined revenue of Indonesia's four major nickel companies surged from \$4.2 billion in 2021 to \$6.8 billion in 2023, marking a 60% increase. In 2024, Indonesia's nickel exports were valued between \$38 billion and \$40 billion, up from \$11.9 billion in 2020, driven by increased smelting capacity and global demand. Indonesia's nickel industry is poised for continued growth, with projections indicating that by 2028, annual output could reach over 3 million metric tons, potentially accounting for 65% of global supply. This expansion is driven by increased demand for electric vehicle batteries and Indonesia's strategic investments in smelting and processing infrastructure. While The Coal and Nickel prices experienced volatility in 2024, influenced by global supply-demand dynamics and macroeconomics factors like tensions between United States of America and China could reduce investment and put pressure on commodity prices. Price volatility can affect Indonesia mining companies spending, influencing the investment in digital technologies. Investment in Indonesia's mining sector was projected to decline by about 50% in 2024 compared to 2023 levels, reaching approximately USD 3.73 billion. The government launched a \$1.5 billion stimulus package in 2025 to stimulate consumer spending and support economic growth.

A growing economy, Volatility Commodity prices, and fluctuating investment levels in mining sector provide a challenge & conducive environment but also an opportunity for TEDS to expand its digital solutions offerings, cost-effective, modular, and scalable digital solutions that help mining companies optimize operations and reduce costs and in areas like ESG compliance, automation, and sustainability monitoring. TEDS can address this by offering flexible financing models, such as leasing, manage services/rental, OPEX based pricing, and even revenue share to ease the financial burden on clients. Create modular and scalable digital solutions that can be tailored to the specific

needs and budgets of different mining operations, especially in the face of commodity price volatility. Leverage government stimulus programs to co-develop projects that support the digital transformation of the mining sector, focusing on areas like automation, ESG compliance, and sustainability monitoring. Position TEDS as a strategic partner in digital transformation by emphasizing the long-term cost savings, efficiency gains, and regulatory compliance benefits of adopting advanced digital solutions.

In Summary, Economic factors in 2024, including stable inflation, interest rates, and GDP growth, present both opportunities and challenges for TEDS in Indonesia's mining sector. By offering flexible financing options, developing scalable solutions, aligning with government initiatives, and enhancing its value proposition, the company can effectively support the digital transformation of the mining industry and capitalize on emerging opportunities.

c. Social

Social factor is one of the PESTLE analyses that describes the factors like cultural, demographic, and societal trends that can influence the clients in Digital Mining Industry. A significant portion of the workforce in the Indonesia mining industry especially in remote area has lagged in digital technology adoption and limited experience with digital tools, automation, and advanced technologies like IoT, AI, Cloud and big data analytics. There is a gap in the digital literacy levels between urban and rural areas. While the workforce in more urbanized regions (e.g., Jakarta) may be more exposed to digital technology, employees in remote mining sites have limited access to training and upskilling opportunities. This disparity is compounded by the challenges of providing training in geographically isolated areas. The adoption of digital solutions is significantly slowed in mining operations where workers lack the skills to operate advanced digital tools. This limits the scope of TEDS offerings, as mines require a digitally literate workforce to maximize the utility of IoT sensors,

automation, and data analytics. TEDS should invest in training programs, focusing on upskilling employees at all levels to ensure that they can use and benefit from the technologies that are being implemented.

Mining companies in Indonesia often face resistance to change from their workforce especially in technology adoption that close relations with replace manpower issues. Employees are generally accustomed to traditional methods of working and may be sceptical and resistance of adopting automation, digitization, and other advanced technologies. There is a common fear that automation might lead to job displacement, even though digital solutions often augment human work rather than replace it. This perception can lead to a reluctance to adopt digital tools that might be seen as replacing traditional jobs. This Cultural barrier may hinder the acceptance and adoption of TEDS's digital solutions, especially in smaller, family-owned, or less technologically advanced mining companies. This resistance to adopting new tools limits the scalability of digital transformation projects. To overcome this challenge, TEDS must focus on change management initiatives, communicating the benefits of digital tools in terms of productivity gains and safety improvements rather than focusing solely on cost reductions or job cuts. Engagement programs and continuous education will be critical for overcoming resistance and ensuring that employees are comfortable with the changes being introduced. Inclusion issues in Indonesia's mining industry refer to the gender gap, geographic disparity, and education levels that limit equal access to digital transformation initiatives. Women and younger workers are often excluded from technical roles due to societal and cultural factors. Remote mining areas, often in rural or isolated locations, face infrastructure challenges that prevent workers from accessing online training programs or digital solutions. Moreover, gender disparities in the mining workforce mean that women may have less access to

upskilling and career development in the field of technology. TEDS should consider implementing inclusive training programs that focus on equal opportunity for men and women and provide remote learning options for employees in geographically isolated mining sites. By focusing on inclusive development and equitable access to training, TEDS can foster a more collaborative workforce, ensuring that all employees can participate in the digital transformation journey.

For TEDS to succeed in Indonesia's mining sector, it is essential to prioritize upskilling the workforce. Given the digital literacy gap, TEDS should lead the way in providing training modules designed for different levels of expertise, from basic digital literacy to advanced technology usage, such as AI-based predictive analytics for equipment maintenance. Successful change management involves not only training but also creating a positive organizational culture that embraces digital transformation. TEDS can implement on-the-ground support teams that guide workers through the implementation phases of new technologies, ensuring their engagement and comfort with the transition.

A trained workforce will help mining companies realize the full benefits of TEDS from safety and security enhancements to efficiency gains in mining operations. TEDS should focus on delivering customized training programs tailored to specific mining operations and job roles (e.g., technical operators, equipment maintenance teams, managers). It will allow employees to effectively operate and integrate digital tools into their daily tasks. Change management should also involve leadership buy-in from mining company executives to show commitment to digital transformation and ensure that top-down support is present for the workforce to embrace new technologies.

The social factors affecting TEDS in Indonesia's mining industry highlight several significant challenges related to workforce digital literacy, resistance to change and fear to job lost, inclusion issues, and the need for upskilling and change management. To successfully overcome these barriers, TEDS must focus on comprehensive training programs, change management initiatives, and inclusive digital strategies. These efforts will drive greater employee engagement, ensure smoother adoption of digital tools, and foster a workforce that is equipped to maximize the benefits of digital transformation.

d. Technological

Technological factors include information & communication resources, Engineering, production & operation, logistics, marketing, IT, network and sales technologies. These factors affect the way clients in Mining Industry work and operate in every sections. The adoption of TEDS in Indonesia's mining industry is significantly influenced by technological factors, particularly the need for reliable connectivity as digitalization enabler, challenges in integrating legacy systems, and concerns over productivity, efficiency, safety, ESG and data security.

Mining Area in Indonesia mostly located in remote and rural areas with limited access to reliable internet. This Connectivity issue hinders the deployment of digital solutions that require stable and high-speed internet. TEDS has been mapping this issue and come up with solution by offering private LTE and 5G networks customized for specific industrial applications. Like use case, TEDS and Freeport Indonesia implemented Southeast Asia's first 5G underground smart mining solution, provide reliable connectivity and low latency for real-time monitoring and remote control of mining equipment's. Reliable connectivity is the first gate and critical for digitalization, it's as a first gate of deployment of Internet of Things (IoT) devices, real-time data analytics, and automation in mining operations.

Most of mining companies in Indonesia still rely on old and rigid systems on site like Programmable logic Controller (PLC), Supervisory Control Data and Acquisition (SCADA), Distributed Control System (DCS) or other systems. This system often not compatible with modern digital solutions and necessary to be upgraded and integrated. The integration and upgrade have several challenges, such as obsolete hardware and limited interoperability between systems that impact to timeline and costs during the integration. Successful integration of old systems with new systems is critical for seamless digital transformation in the mining Industry.

Mining operations generate vast amounts of data, including proprietary information and personal employee details. Protecting this data from cyber threats is paramount. Indonesia's Personal Data Protection Law (PDP Law) mandates strict guidelines on data storage and processing, necessitating that companies implement robust data security measures. TEDS addresses these concerns by offering secure data network & connection, storage solutions and implementing advanced cybersecurity protocols. TEDS ensure data security is critical for regulatory compliance and maintain trust with stakeholders in the mining industry.

To be effectively penetrate in Indonesia's mining market, it is critical for TEDS to map the technological requirements and conditions like connectivity, legacy system integration, and data security. TEDS provides reliable connectivity solutions, integration of legacy systems, and ensure data security to support the mining industry digital transformation journey. These services will benefit the mining companies to increase productivity, enhance operational efficiency, ensure compliance with regulations.

e. Legal

Legal Factor in this PESTLE Analysis of TEDS in Indonesia's Mining industry like data storage regulations, cybersecurity Regulations, and other government Compliance. Government regulation Number 71 of 2019 establishes the framework for electronic systems and electronic data in Indonesia. It differentiates between public and private electronic system operators (ESO) and regulate data localization requirements. Public ESOs must storage and process data within Indonesia, while private ESOs can store data abroad under certain conditions. Data Localization regulation make TEDS must ensure that its digital solutions for the mining industry comply the regulations, especially for public sector clients.

Indonesia Cybersecurity Regulations like president mandate like Number 47 of 2023, provides guidelines for enhancing national cybersecurity and cyber crisis management. The regulation mandates the establishment of Cyber Incident Response Teams (CIRTs) and frameworks for managing cyber crises in the Company/Provider. TEDS must align and collaborate its digital solutions with BSSN to ensure cybersecurity resilience and establishing CIRTs within TEDS to address and manage cyber incidents.

Indonesian mining sector is regulated by several ministries, such as the Ministry of Energy and Mineral Resources, Ministry of Environment and Forestry, and Ministry of Communication and Informatics, Ministry of Industry. TEDS must ensure that its B2B digital solutions for the mining sector comply with the regulations which is regulated by Government and regulatory. Coordinating to regulatory compliance, including consultations with the ministries is crucial to mitigate legal risks.

The legal requirements in Indonesia's mining sector have both challenges and opportunities for TEDS. comply to data storage regulations, cybersecurity regulations, and other compliance requirements is critical for digital solutions. By overcoming these legal factors, TEDS can enhance its position as a reliable and compliant partner in the mining industry.

f. Environmental

Environmental factor form PESTLE analysis describes all those related to the physical environment and to general environmental protection requirements in TEDS in Indonesia Mining Industry. Indonesia Government already strict to all the company to the environmental issue, this shown by the regulations and mandate. Like recently in June 2025, Indonesia government revoked four nickel mining licenses in Raja Ampat due to severe environmental degradation over 500 ha of forest loss and marine pollution. The Government also launch of the mining and mineral tracking platform (SIMBARA) in 2024, mandated for real-time monitoring from extraction to processing for various minerals. These regulatory developments reinforce the requirement for continuous environmental oversight and real-time data capture, creating an urgent need for advanced digital solutions. Mining companies are increasingly evaluated by investors and customers on their environmental performance, including scope 3 emissions and biodiversity protection. While empowered by the government downstream program and nickel for EV growth, Indonesia faces criticism over “dirty nickel” due to coal powered smelters and deforestation, prompting a decarbonization roadmap by 2025. TEDS can support ESG leadership in mining by delivering integrated solutions that monitor emissions, energy consumption, waste, and resource use. Demand for Real-Time Environmental Monitoring Technologies, a recent Mining Technology report highlighted how IoT sensors improve not only productivity and safety but also environmental and compliance through continuous emissions, dust,

waste, and water quality monitoring. Implementation of IoT in mining includes solutions for real-time air quality, waste & water level, and noise monitoring. AI enhanced systems can also monitor dust/air pollutants automatically in mines, significantly improving health and safety. Such innovations present commercial opportunities for TEDS to integrate IoT, cloud, and AI solutions into its connectivity network, enabling environmental sensors and intelligent analytics. Like such case Environmental NGOs report that mining industry especially tin and nickel has extensively damaged mangroves and coral reefs, necessity to broader ecosystem monitoring. ESG reporting now includes water usage, land rehabilitation, and regulatory compliance data. TEDS can respond by developing digital modules for water, biodiversity, and ecosystem monitoring, tied into ESG management platforms that support mining companies in reporting, auditing, and market positioning. TEDS also can establish partnerships with NGOs and sustainability certifiers to strengthen credibility and access to climate finance. Pilot ecosystem tracking projects in high-risk areas to showcase TEDS's capability in addressing deforestation and habitat protection.

The regulatory push and investor demand for environmental concern in mining sector such as real-time monitoring and ESG. These create a demand and opportunity for TEDS by offer mining requirements for integrated connectivity, IoT, AI, and compliance tools. TEDS transform from a only telecom provider to be a strategic digital partner.

The PESTLE (Political, Economic, Social, Technological, Legal, and Environmental) analysis above, describes the external factors influencing TEDS in Indonesia's mining sector. In Indonesia's mining industry, TEDS business is directly affected by all those factors: political support, economic stability, social challenges, technological needs and trends, legal requirements, and environmental pressures. While supportive policies and

a stable economic give both opportunities and challenges, such as complex bureaucracy, low digital literacy, and the need for sustainable practices.

IV.1.2.2 Industry, Competitor and Porter's Five Force Analysis

1. Indonesia Mining Industry and Digitalization Overview

Indonesia Mining Industry is considered as one of the pillars of National economics, Mining Industry as one of the biggest contributors in Indonesian Gross Domestic Product. Between 2020 to 2022, Mining Sector contribute from 4.3% to 9.2% to Indonesia GDP. This shown that mining industry in Indonesia still be a huge market in development and market opportunity. The historical mining sector contribution to national GDP describes in the following figure:

Contribution of Mining Industry to Indonesian Gross Domestic Product ("GDP")

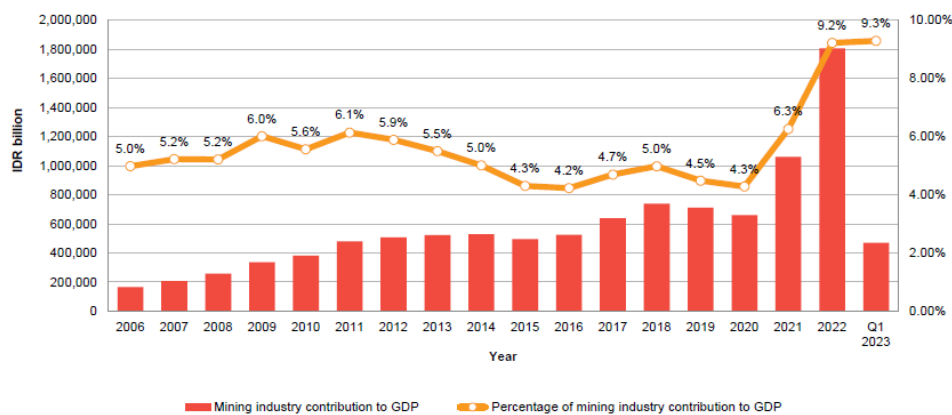


Figure IV.2 Mining & Mineral Industry Contribution to Indonesia GDP 2006 - 2022

(Source: Ministry of Energy and Mineral Resources Report, PWC Indonesia Mining Report/Whitepaper, 2022)

Indonesia ICT investment in Resources and Mining industry is estimated and projected to reach USD 392 million in 2022, with 8.0 percent annual growth by 2026. The services is the largest contributing factor led by cost reduction and a change from CAPEX to OPEX based models have guided enterprises to service-based models as the digital transformation

progresses. The detail of ICT spending trend in Indonesia Resources and Mining describes in the following figure:

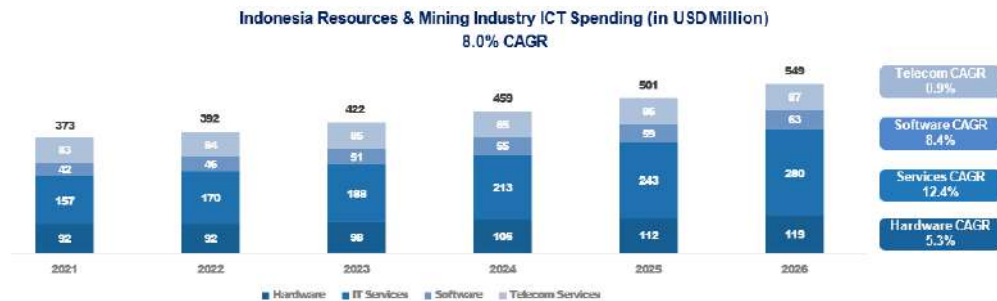


Figure IV.3 Indonesia Resources & Mining Industry ICT Spending
(Source: IDC Indonesia Mining Report, 2022)

The condition in digitalization Mining Industry Indonesia that still lagged, the pressure from the volatility of global commodity prices and the government regulation and endorsement related to the digitalization, sustainability and ESG push the mining industry to be more adaptive to accelerate the adoption of the digitalization to support the productivity, efficiency and sustainability & ESG. Ensuring the organizational digital resilience road map has clear objectives that target modern digital resources metrics will see projects succeed and scale. Building capabilities that can support operationalizing insights enabled through data, analytics, and intelligence is also critical. This will drive value in the business and build the resilience required to persevere through any challenges of Mining Industry in the future. The Technology trends that related to the mining industry such as Operational Insights, Sustainability and Electric Vehicle Driven (mining downstream government program and Nickel as key materials of Electric Vehicle) are the currents industry trends and challenge in Indonesia Mining Industry. The current Industry trends in mining industry describes in figure below:



Figure IV.4 Mining Industry Trends

Operation in Mining Industry is a core of business process, increase operation productivity and efficiency is an objective of the mining company to increase profitability in the uncertain global commodity prices. The digitalization is one of the method and tools to support productivity and efficiency in mining operations. Refer to the survey by IDC, AI/ML, Sensor technology, cloud technology, mobile technology, and wireless connectivity has been identified as the top five investment for the next five years. The details describe in the following figure:

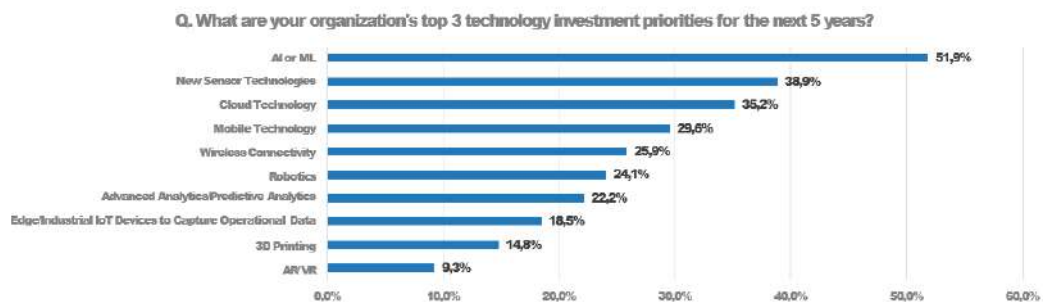


Figure IV.5 Top technology Investment Priority in the next 5 years in Mining Industry

(Source: IDC Worldwide of Future of Mining Operations Survey, 2021)

Sustainability is included in the top priority for mining companies as there is increasing pressure from government, investors, shareholders, stakeholders and Customers to integrate ESG into their corporate strategies and Operations. Recently, as mining companies have looked to mitigate potential safety and environmental incidents and appease their operational communities, the current common practice of measuring and

controlling an operation's environmental such as water, waste, carbon and energy has become a necessity. IDC's Worldwide Mining Decision Maker Survey, 2022, shown that 88.7% of mining organizations have site specific plans for ESG improvements, specifically targeting their ESG plans toward improving the businesses sustainability and safety performance.

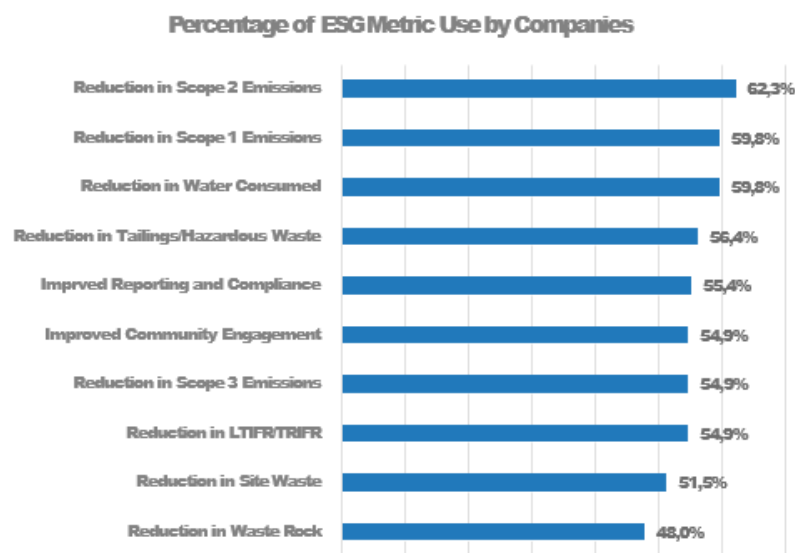


Figure IV.6 Percentage of ESG Metric Use by Mining Company
(Source: IDC's Worldwide Mining Decision Maker Survey, 2022)

Electric Vehicle is industry trends that related to the Indonesia mining industry, due to Indonesia have 30% of the world's nickel reserves with total of 21 million tons, in 2021. The Government program of nickel mining downstream from mining, smelter until EV battery manufacturing.

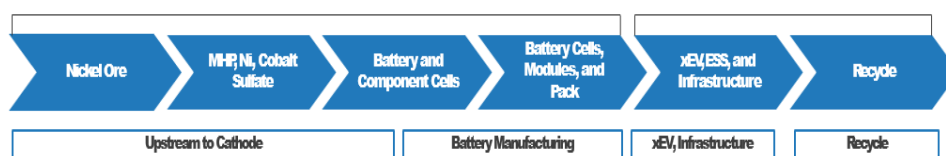


Figure IV.7 Value Chain Integrated Nickel Mining Upstream – Downstream EV Battery Industry in Indonesia

To support the EV program in Indonesia, the ESDM has planned to construct 1,558 EV charging station units by 2024 at strategic places such

as gas stations, government offices, shopping areas, public parking, and rest areas. Based on the government information, an investment of at least IDR 309 billion is required in 2020 for the construction of the EV charging station which will continue to increase to Rp 12 trillion in 2030 to develop over 7000 EV charging station.

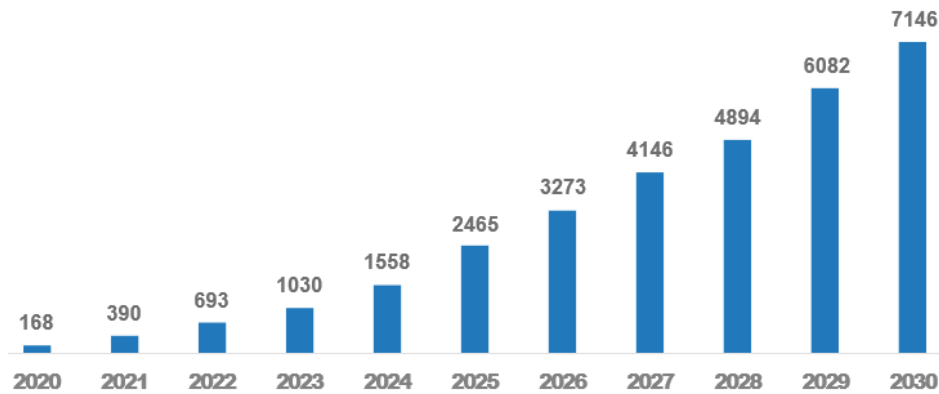


Figure IV.8 Roadmap of EV Charging Station 2020 – 2030

(Source: Strategic Plan of the Directorate General of Electricity, Ministry of Energy and Mineral Resources 2020 – 2024)

According to the Digitalization Mining Industry trends in the market, the key initiatives or drivers that are part of the journey of transformation are as follow:

- **Shifting to Digital Transformation and Business Focus**

Business process optimization and real time integration initiatives through digitalization, Mining Companies aimed to achieve operational efficiency and productivity gains. For Mining companies, business process should be seamless as part of the standard/guidance. The use of business applications, like ERP, SCM, HRM is determined as a method to enhance productivity of the organizations.

- **Operational Resiliency and Sustainability**

Digital technology adoption is driven to ensure the ability to work and operate remotely and more effective and efficient. Similar with other heavy asset industries, connected process/operation is also a

key focus in digitalization to mining companies. Many mining companies have considered on how to optimize business operation by integrating IT and OT (operational technologies) as well as SCADA in the business environment. To ensure mining operations remain competitive, Company are looking to digitally transform the operations to optimize every facet of the value chain using the most advanced means available by adopting advance analytics tools like AI/ML to aid in streamlining and optimizing their production processes and autonomous equipment to ensure tasks are completed efficiently. It is also important to have all operations connected and monitored, that's why Network infrastructure continues to be prioritized as digitalization enabler for enhancement. Mining companies also have looked to mitigate potential safety and environmental incidents and appease their operations. Organizations are building on this and will increase the monitoring of their environmental, health, and sustainability performance.

2. Competitors Overview

The digitalization in Mining Industry market is very huge, the digital provider/player size from Global Digital technology provider, Local Provider and even Digital Technology Start Up. The Digital Providers in the industry are vary from Sensor, devices & Operation Technology Provider, Cloud/Hyper scaler Provider, Mining Operation digital provider, Business Application and AI provider, Enterprise Resources System provider, Connectivity & Network provider, IT & system Integration Provider, and other specific industry digital player. The players at glance shown in the following figure:

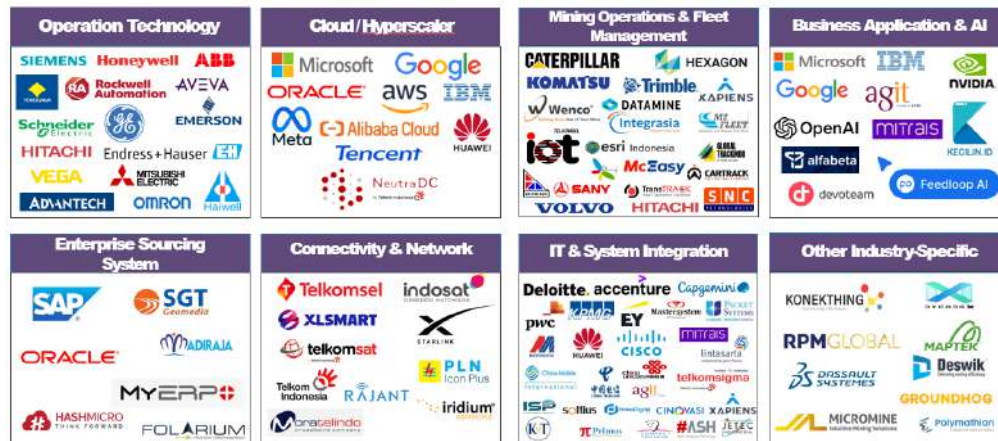


Figure IV.9 Digital Player at Glance of Digital Solutions Market in Indonesia Mining Industry

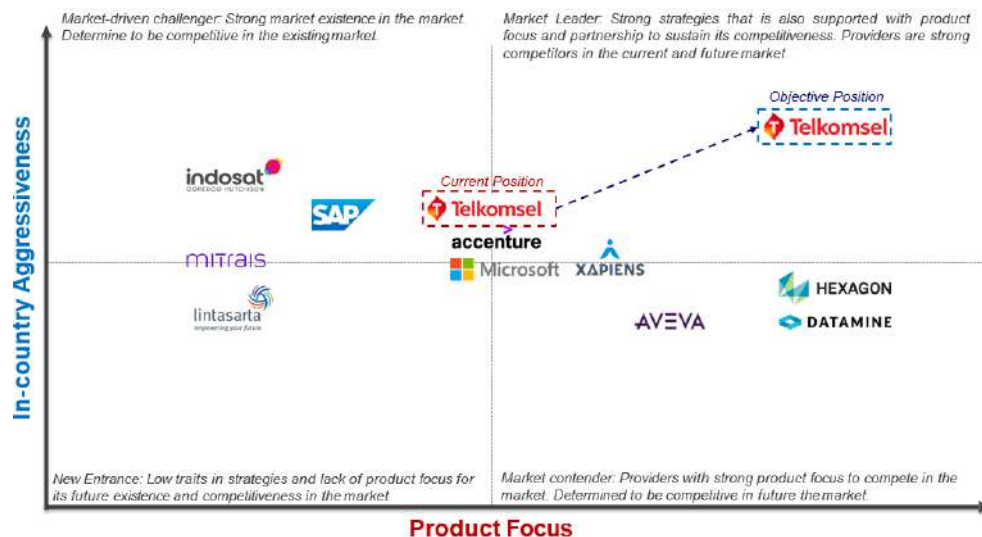


Figure IV.10 Competition Matrix Analysis - End to End Digital Solutions in Indonesia Mining Industry

Refer to the Competition Matrix analysis of Digital Solution providers in Indonesia mining industry and TEDS position in the digital mining industry market, several competitors chosen as representative from vary specifics type of products or solutions provider by the competitors from the type as below:

- Application/Cloud/Hardware Providers such as Aveva, Microsoft, Accenture, SAP.
- Mining Industry Specific Providers such as Hexagon and Datamine.

- System Integrators such as Accenture, Mitrais, Xapiens, and Lintasarta.

The details of competitors analysis from matrix above describes in the following:

- **HEXAGON**

Hexagon Mining is a subsidiary of Hexagon AB and provides products and solutions that specific to mining industry and operations by integrating, optimising, and automating critical workflows. Its products or solutions combine surveying, design, fleet management & asset movements, production optimisation, and collision avoidance together to enable mining company customers to operate more productive, more effective, more efficient and safer in the mine sites. It also provides engineering services, operational digital twins of the mine, and consulting services. It leverages data from planning to operations and from safety to sustainable reclamation, enabling optimal extraction of a mine's potential value throughout the value chain.

Hexagon is a recognize globally as leader in digital mining solutions provider, have differentiate strategy and premium products & services for premium customers/big companies. Hexagon market penetration strategy through global recognition of its premium products that already implement in multinational and global mining company, Regular mining Forums and Events to deliver latest insights on mining industry from numerous thought leaders and subject matter experts. Hexagon already have existing customers in Indonesia such as Kaltim Prima Coal, Adaro Indonesia, Pama Persada, Antareja Mahada Makmur, affiliated with Putra Perkasa Abadi, and PT Archi Indonesia. In Global, Hexagon already serve customers like MMG Australia (Rosebery mine), Rio Tinto Mongolia (Oyu Tolgoi), Ma'aden Saudi Arabia (Mansourah-Massarrah), Capstone Copper Canada & America, Gold Fields Ghana (Tarkwa) and etc.

Refer to data literature research and analysis, Hexagon strength like planning and scheduling tools are a part of the company's software suite, which is composed of software, covering resource modelling to extraction execution that cover end to end value chain of mining operations. Hexagon also have extensive network of offices around the world. Hexagon's suite of tools ingests real-time data, such as mine survey data, mine planning and scheduling, mining fleet management, mining safety detection, and etc. This enabling enhanced productivity, efficiency, and safety.

Hexagon has multiple weakness like limited of local and regional partner network that specialized in Mining industry. Integration between Hexagon's planning and scheduling tools has been reported to be complicated at times, resulting in issues when attempting to share tools rapidly between different programs. And Hexagon Mining's customers have expressed concern with the level of innovation. However, recently it announced a new innovative initiative called "Power of One," which is centralized on the convergence and sharing of all data streams. Hexagon also well known to be premium in price from its products, services and manpower, it's a reason Hexagon only used by Big Company.

- **DATAMINE**

Datamine is a company that specifically provides tools that target exploration, geoscience, resources, mine development and operation, and supply chain management. It has customer over 100 countries and they are serviced from local offices from 20 countries.

Datamine is Technology service provider that provide engineering services, consulting services, benchmarking of asset requirements, data science, and operational digital twins. Datamine has extensive software and tools solutions in the mining value chain from exploration, geology, planning, operations, intelligence, as well as ESG for use on premise or

on cloud. Datamine also offer Training and online learning to cover full spectrum of mining value chain for its customers.

Datamine already recognize globally for its services and experiences in mining industry, for market penetration strategy Datamine utilize regular mining forums and Events globally and locally to deliver latest insights on mining industry from numerous thought leaders and subject matter experts. Datamine also has local office presence and dedicated team in Jakarta to accommodate national support and drive client engagement through a local employee. Datamine also regularly active in government tender participation to provide exploration data management and processing.

Datamine strengths like extensive mine offering, its planning and scheduling tools are part of a very broad software suite targeting the mining industry. Mining customers have recognized the quality of the software to be excellent and beneficial to the sharing of information among tools. Datamine provides numerous ways for customer support, ranging from online knowledge libraries to direct support.

Datamine has several weaknesses like complete tool list does not seamlessly integrate with one another. This area slows the sharing of information among some tools, and an integration solution is in development. Datamine's tools require custom configuration/scripting to integrate with enterprise systems, such as ERPs (eg SAP, Oracle, & etc). Datamine requires customization to incorporate IoT capabilities into its platform which creates challenges when ingesting data as required to update schedules rapidly.

- **AVEVA**

AVEVA is a global industrial software provider that provides digital transformation to manage complex operational processes. The company was acquired by Schneider Electric and leveraged its

capabilities to deliver technology expertise in Asset Performance Management to planning and operation.

Multiple products Asset Performance Management portfolio, including APM Assessment, Enterprise Asset Management, Asset Strategy Optimization, AVEVA PI for centralized data and Insight. Unified Engineering and Operation focusing on end-to- end value chain from supply chain, production optimization, and operation control in a data centric environment supported by digital twin and analytics.

Increasing its footprint in the mining sector, develop its existing Production Management offering, formerly known as Ampla, through its planned acquisition of OSIsoft. AVEVA has 7 system integrators in the Indonesian.

AVEVA strengths lie on Leveraged parents' company, Schneider Electric's presence to engage with clients and as a go-to-market strategy. AVEVA has developed software designed to monitor and track mining-specific equipment Customer support. AVEVA offers a complete set of direct services for customers with high level of responsiveness. This further includes its global partner network. Adjacent offerings for engineering, monitoring and control, and planning and operations place AVEVA APM in the context of an overall unified platform for industrial operations performance management.

AVEVA's brand awareness is still relatively low in the global market and in Indonesia, but its product still in premium level and pricing. AVEVA has made a push for customers to move to the cloud, including subscription pricing models and a tokenised services and support model. As many mining organisations are currently reluctant to adopt substantial cloud strategies, the benefits of this will need clear

articulation. Limited product offerings aside from asset performance management and Centralized data product.

- **XAPIENS**

Xapiens is an Indika Energy Group's ICT company that offers IT user support, IT enterprise and IT business consulting businesses. In recent months, ZebraX, Indika Energy's other ICT services company that offers services in digital transformation, has merged into Xapiens to strengthen its capabilities and brand positioning in the Indonesian market, especially mining and energy industries.

Wide range of product and services to meet customer's demands and requirements from AI, Digital Platform, ERP, Cloud, Data and Analytics, IT Infrastructure, and Cyber Security. Xapiens Smart Mining portfolios ranges from Fleet Management System, Tank Monitoring, Asset Maintenance System, up to Warehouse Management System. Xapiens Mining use cases offerings from Asset Performance Management, Digital Control Tower, and Land and Marine Logistics Tracking.

Merged with ZebraX to strengthen its capabilities and brand positioning in the Indonesian mining market. Handled Indika Energy's business portfolio like developing Indika's subsidiaries Petrosea Mining contractor Digital Remote Operation Control Centre and smart mining named Minerva. Continuous development on its five pillar services, namely digital services (software), infrastructure and cloud, cyber security, smart industry, and managed Services. Xapiens also can leveraged its successful case study in driving the group's digital transformation portfolios and experiences as a key message to potential customers. Xapiens has extensive technological advancements and innovation for mining industry use cases supported by global technology partners.

The weakness of Xapiens lies on High dependency and reliance on Indika Energy Group projects. As majority of use cases and case projects obtained came from Indika Energy Group's network and business units. Xapiens' management understand that its services is extremely focus on project-based and has not yet put effort to develop its productization to increase brand awareness.

- **Microsoft**

As global technology leader company that offers a broad spectrum of products ranging from compute software, cloud to personal computers. In recent years, Microsoft has been sharing its vision of Azure as a ubiquitous computing platform that powers the intelligent cloud and the intelligent edge to develop its solutions in the mining industry.

The products or solutions like Cloud Solutions Stacks such as Azure, Dynamics 365, and Microsoft 365. Azure IoT portfolio consists of three categories of IoT products: IoT and Edge Device Support, Azure Services for IoT, and Azure IoT Solutions. Microsoft services for IoT span a wide variety of functionality across the cloud and edge, including messaging, integration, data management, analytics, device management, security, mixed reality, and DevOps. Apart from its solutions, Microsoft offers guidance on recommended architectures for various industrial IoT use cases, such as an asset monitoring solution. General products ecosystem adoption and security compliance as a key driver for extensive industrial adoption. Microsoft's partnership with OpenAI involves a strategic collaboration and significant investment, with Microsoft providing funding and cloud computing resources to OpenAI as a pioneer in GenAI in exchange for access to OpenAI's AI technology and models, particularly for use in Microsoft products like Copilot. Microsoft has 24 local partners in Indonesia that also offers IoT implementation mining industry in Ecosystem. Microsoft has been thoughtful in its approach to IoT, not only offering capabilities up and down the technology stack but also making sure the company's

portfolio appeals to a wide customer base. Microsoft has wide variety of capabilities in the realm of security Innovation. Microsoft also has a broad strategy to support edge computing that spans hardware and software across a variety of form factors and use cases. This is important for Mining companies that often need to run computing in remote locations.

Customers generally thought Microsoft is stronger in terms of being able to integrate with IT systems over OT systems, yet the face challenges building their own solutions on Azure. The mining industry is complex and will require Microsoft to partner with many different types across mining subsegments for successful strategy. Microsoft has a broad variety of tools to build applications, yet it does not have a more industrial specific use case.

- **Accenture**

A global company specialize in information technology and management consulting. It offers a wide range of services and solutions like management & business strategy, consulting, digital, ICT, and operations. Accenture helps organizations improve their performance and create sustainable value by leveraging technology, data, and AI. With operations in more than 120 countries and serving many the Fortune Global 500 company, Accenture brings deep industry expertise, innovative technologies, and extensive delivery capabilities.

Accenture helps mining companies transform operations by digitizing the value chain, enhancing productivity, and driving sustainability. Its solutions combine deep mining expertise with cutting-edge digital capabilities. Accenture offer Implementation of integrated operational dashboards and digital twins. Data driven planning and control to optimize yield and reduce downtime. Accenture also offer Smart Mining & Automation such as Autonomous equipment management, IoT condition monitoring and predictive maintenance, develop

centralized platforms for data visualization and analytics operations control rooms powered by AI, Cloud & Data Platforms. Accenture also provide Sustainability Solutions like decarbonization strategy, ESG compliance, water and energy management. Accenture provide Supply Chain & ERP Transformation such as SAP S/4HANA implementation tailored for mining operations, End-to-end supply chain visibility and planning, and Inventory optimization and cost reduction. Provide Training services like digital upskilling platforms.

Accenture market Penetration Strategy in the Mining Industry into the mining sector involves a combination of consulting, co-innovation, and local execution. Accenture can engage with top mining clients via strategic advisory focused on digitizing mining core operations. The Collaboration with clients to co-create tailored digital solutions using agile methods and design thinking. It can establish digitalization mining industry labs to showcase mining innovations (e.g., Perth, Johannesburg). Leverage the partnerships with global technology principals like AWS, Microsoft, Google, SAP, and tech startups to deliver end-to-end solutions. Publications mining insights, industry reports, and host C-level roundtables at events in mining industry. Combine global capabilities with regional delivery centres (e.g., Southeast Asia, Australia, Africa) and hire mining domain experts.

Accenture has Global Scale & Delivery Network over 120 countries, enabling global mining operations to standardize systems and strategies. Accenture has deep industry knowledge from its experiences with existing global mining clients (e.g., Rio Tinto, Vale, BHP, Anglo American). Its technology leadership like expertise in AI, cloud, digital twins, robotics, and cybersecurity tailored for mining industry. Cross Industry Insights ability from experiences in other sectors to bring innovation from manufacturing, energy, and logistics into mining

industry. It has strong credentials in ESG consulting, climate strategy, and carbon neutrality.

Accenture has also weaknesses like high cost of service with premium pricing may deter middle sized or low size company mining company. The dependence on client digital maturity value delivery depends on mining clients' readiness and internal capability. Accenture has limited ownership of physical mining technology unlike OEMs (e.g., Caterpillar, Komatsu), and relies on integration partners.

- **SAP**

Global market leader that offers enterprise application software to assist businesses from small to large enterprises in all industry to deliver management of business processes. Multiple products offering for cross-industry solution for management of business processes ranging from ERP, Financial Management, Asset management, until Human Capital Management. SAM Mining specific products such as SAP S/4HANA (Cloud-based ERP), SAP Environment, SHE (Safety, Health, & Environmental) Management, and SAP Asset Intelligence Network (Asset Management).

SAP strengthen its position in mining sector through acquiring process mining startups like Celonis and Signavio to deliver more benefits for mining customers. Given the large customer base of ERP adoption, SAP can leverage its existing customers to drive more products/services adoption. SAP has 19 local partners to deliver its mining solution in Indonesia. SAP's global recognitions, experiences and wide-reaching partner ecosystem provide customers support globally. SAP holds a strong position in the mining sector in particular ERP system and asset management capabilities. SAP's ERP-centric platform can provide overall strategic transformational vision of a company. The vast amount of data collected & centralized can optimize processes.

SAP is a new player in the specific digitalization mining industry and has limited experience in delivering mining focus end to end solutions. In the Indonesian mining landscape, SAP solution is still heavily based on its Enterprise Resource Planning (ERP) solution. While SAP offers integrations with its own adjacent systems straight out of the box, some challenges are known to exist when integrating its offering other third-party systems. SAP well know for its premium and high cost of services.

- **Indosat Ooredoo Hutchison (IOH)**

Indosat Ooredoo Hutchison is the second of Indonesia's leading telecommunications and currently transform into digital technology service providers, formed through the merger of Indosat Ooredoo and Hutchison 3 Indonesia in January 2022. As a result of this strategic merger, IOH has become a key player in Indonesia's digital telecommunication ecosystem, offering mobile and fixed broadband, digital platforms, Cloud, enterprise ICT services, Internet of Things (IoT), and AI solutions.

IOH is not a traditional telecommunication company but offers advanced connectivity and digital solutions that are crucial for the modern, data-driven mining sector. The relevant product offerings such as Private LTE / 5G Network, IoT, Sensors/Devices, Edge computing, Cloud, and Data Analytics/AI.

IOH market penetration strategy in the mining industry utilizes strategic Partnerships like collaborate with vendors, mining companies, system integrators, and principals like NVIDIA. IOH aggressively provide customize connectivity, network infrastructure and IoT for mining customers. IOH demonstrate successful deployments in Indonesian mining regions. IOH Active participation in forums and create even like Digitalization mining with AI. IOH currently starting to establish a

dedicated mining vertical within the enterprise division and employ solution architects and engineers familiar with mining operations.

The strength of IOH is Network Coverage, Strong presence across Indonesia, including several remote and rural mining areas. The low prices is one of its strengths in the mining industry. IOH backed by Global Telco Leaders and able to access international best practices via Ooredoo and Hutchison. IOH as one of trusted Indonesian telco provider with experience navigating regulatory frameworks.

IOH also has weaknesses like limited Mining Domain Expertise, compared to other competitor like pure mining tech providers, IOH may lack deep operational mining knowledge. Private LTE and 5G deployment in rugged terrains can be capital intensive. Faces competition from Telkomsel, XL Axiata, and independent network/IoT providers, IOH is lagged and just starting to penetrate in the mining industry. IOH relies heavily on technology and implementation partners to deliver complete mining solutions and has limited sales area, branch and field support for mining customers in outside of Java Island. IOH network coverage in rural area outside Java islands like Kalimantan, Sulawesi, Nusa Tenggara Island, and Papua is still lagged.

- **MITRAIS**

A member of CAC Holdings Group with offices in Indonesia and Singapore that offers a full range of IT and software development capabilities and product services in the mining, Finance, healthcare and other sectors. Mitrais mining software includes corporate management, laboratory management, spare parts management and transportation schedule. Software development solutions for desktop, web, and mobile application for Mining solutions for geological modelling of complex deposits, strategic mine planning and design, and mine management reporting. Mining services ranging from implementation, consulting, training, and mining technical services. Cyber security solutions from

cyber security consulting, vulnerability assessment, and penetration testing.

Following its merged into the CAC Holding in 2019, Mitrais determined to expand into Japanese and global markets. Partners with global technology provider from Microsoft, Sparx Systems, Mincom (ABB), and Precision Mining. Mitrais regularly join Forums and Events in the mining industry and has development Centre in Bandung, Yogyakarta, and Bali. As Part of CAC Holding. It can leverage its broad global experience and capabilities in the IT software industry. Mitrais is reputable company in the software development solutions with low-cost and excellent technical support delivers economic value for customers. Its Mining Scheduling System is a popular product to assist mining companies for their transportation and supply chain operations.

On the other hand, Mitrais has limited products and services to support a broader or advance mining solutions. Its CAC Holding group has no services in specific mining industry and only offered pharmaceutical, banking, and manufacturing services. Mitrais has only one killer product for mining solutions, i.e., Spry Scheduler (Mine Scheduling System). Its Enterprise Asset Management and Spare Parts Management Software has a limited adoption. Mitrais only recognized in IT & software development in general nor as a digital solutions provider in mining industry.

- **Lintasarta**

A subsidiary of Indosat Ooredoo Hutchison that offers solutions involving Data Communications, Internet and IT Services. It recently started to expand its services and made an entrance into the mining industry. Lintasarta extensive digital IT solutions ranging from Data Communication, Internet, Data Centre, Cloud, Security, Managed Services up to Digital solution. IoT solutions starting from asset management, telemetry data collection, and wastewater monitoring.

Mine Operation Monitoring System consist of a Fleet Management System, Fuel Management System, and Tire Management System.

Lintasarta partners with world-class principals like IBM, Cisco, VMWare, Microsoft, Oracle, and PaloAlto to deliver and implement solutions. Lintasarta also leveraged Indosat Ooredoo Hutchison's existing clients. Lintasarta has notable clients in Mining industry like Bumi Resources Minerals, Timah, and Sucofindo. Lintasarta also leveraged Indosat Ooredoo Hutchinson Group's capabilities to develop its digital IT services, AI and digital solutions to accommodate client's needs and includes access to IOH clients. Lintasarta is reputable company to deliver IT communication services with over two experience connectivity as a unique value proposition to offer for customers that require a mobility-based usecases.

The weakness of Lintasarta such as lack of experience, capabilities, and awareness in the mining industry. Lintasarta has a strong presence in implementing technology in banking and financial services industry but limited in mining sector. Lintasarta has limited products and services to support a broader or advance mining solutions needs aside from providing manage services, IT infrastructure, and connectivity. The company has just started to enter the mining industry and started to provide variety of digital solutions.

- **Telkomsel Enterprise Digital Solution (TEDS)**

TEDS current positions in the Digital Solution in Mining Industry market considered in the middle of the matrix, with the aggressivity above the average but the variety of products still general and not specific for mining Industry. TEDS still has competitive advantage like its widest network coverage in Indonesia for digitalization enabler in mining industry and has most specific industry and most quantity of area account management and branch across Indonesia. The details of

TEDS market penetration, strength and weakness will be explained in the SWOT analysis in the next sections.

3. Porter's Five Force

Porter's Five Forces utilized to analyse TEDS in Indonesia Mining industry's competitive forces. The five force elements are competition of rivalry, the threat of new entrants to the industry, supplier bargaining power, customer bargaining power, and the ability of customers to find product substitutes. The analysis summarizes in table IV.4 below:

Table IV.4 Qualitative Coding: Porter's Five Force Analysis Result

Porter's Force	External Factor Summary	Excerpt	Status (High/Medium/Low)
Competitive Rivalry	Intense and dynamic competition among diverse providers: local telcos, global tech vendors, startups, satellite operators. Providers compete on integrated digital solutions, customization, support, and flexible pricing.	"Competition among digital providers is intense with players ranging from local telcos to global vendors and startups. Mining clients demand integrated, customized, high-quality solutions."	High
Supplier Power	Vendors influence innovation and terms but are balanced by strict procurement regulations, local content rules, and government oversight. Partnerships critical for comprehensive offerings.	"Vendors drive innovation but pricing and terms are moderated by procurement regulations and local content requirements. Strong partnerships essential for solution breadth."	Medium
Buyer Power	Large mining companies wield strong bargaining power due to scale, capital investment, multisite deployments, and strict SLA demands. They negotiate customization, pricing, and multi-year contracts.	"Mining clients are strategic, large buyers with strong leverage to demand tailored solutions, volume discounts, and strict SLAs, shaping solution design heavily."	High
Threat of Substitution	Traditional/manual methods persist in remote or smaller sites but are diminishing. Internal IT solutions or alternative connectivity (e.g., satellite) are emerging but limited by cost, complexity, and regulations.	"Some mining sites still use manual processes or legacy systems; alternative solutions like internal IoT or satellite exist but clients prefer trusted partners like Telkomsel."	Medium
Threat of New Entry	Entry barriers include capital intensity, regulatory compliance, long procurement cycles, and need for local trust. Startups offer innovation but must partner or prove compliance to succeed.	"New entrants face high barriers due to capital, regulation, and trust requirements. Startups need partnerships and proven performance to enter mining digital market."	Medium

The details of the porter's Five Forces framework deep analysis based on qualitative interview results with External expert in Digitalization from Government or regulatory Customers Digitalization expert, and High-Level Management of TEDS also use triangulation with literature secondary data analysis from Public Report, News, Internet, and research journal / paper, the qualitative coding analysis results in Digital Solutions in Mining Industry are describe as follow:

a. Industry Rivalry – High

Refer to the analysis results, the current competitive rivalry forces condition is High. Local Telco providers like Indosat Ooredoo and XL Smart are strong local competitors providing digital connectivity and business solutions. They offer similar connectivity services but are left

behind and still more focused on traditional telecom services. The Major global players like AVEVA, Hexagon, Amazon Web Services (AWS), Google, Microsoft, IBM and other player are entering the mining sector with advanced solutions in Platform, cloud computing, AI, and big data analytics. A growing number of startups are emerging, offering specialized mining solutions, such as IoT platforms for asset tracking, machine learning, and predictive analytics for operational optimization. Satellite Operators like Starlink, Iridium, Inmarsat, and other providers are competing in the remote connectivity space, offering satellite-based solutions for areas that are difficult to cover with terrestrial networks. Technology Providers are competing to offer comprehensive digital solutions, including connectivity, IoT, AI, and data analytics. TEDS's unique advantage is its ability to integrate telecom infrastructure network services with advanced digital solutions for mining. The Competition is fierce on offering customized solutions and flexible pricing models. To maintain its market share, TEDS must focus on tailored packages, particularly for large mining operations that require specialized solutions. Local and international players also compete on cost effectiveness. TEDS must ensure that its pricing remains competitive, particularly in terms of long-term contracts and multi-site deployments.

b. Supplier Power – Medium

Refer to the analysis results, the current supplier power forces condition is medium. Technology principals play a crucial role in driving innovation, particularly in the areas of AI, machine learning, and IoT integration into mining operations. These vendors help shape the functional capabilities of digital solutions offered to mining companies. Indonesia's local content (TKDN) and data sovereignty (PP71) laws create additional compliance layers for foreign vendors. These regulations ensure that mining companies digital solutions include local technological components and store data domestically. The Indonesian government, through its Making Indonesia digital 4.0 initiative, is

focused on fostering innovation and driving digital transformation across key sectors, including mining. However, it also exerts regulatory control over the terms of digital contracts, particularly related to data security and local content compliance. As an incumbent telco provider, TEDS must partner with leading global tech vendors or invest heavily in R&D to stay competitive. It can position itself as a one-stop-shop by providing comprehensive digital solutions with telecom infrastructure backed by global tech vendors. The Adherence to TKDN rules and data sovereignty regulations means TEDS must invest in local data centres and comply with data security standards to meet regulatory requirements, particularly with mining clients who deal with sensitive data.

c. Buyer Power – High

Refer to the analysis results, the current supplier power forces condition is medium. Large mining companies like Freeport Indonesia, Bayan Resources, Sinarmas Mining, Kaltim Prima Coal, Amman Mineral and Vale Indonesia and even medium mining have significant bargaining power due to their scale and business, capital investment, and multisite operations. These companies demand high performance SLAs for uptime, maintenance, and real-time data transmission, putting pressure on TEDS to offer reliable and customized solutions. Mining companies often negotiate long-term contracts that include customized digital solutions, making it crucial for TEDS to offer flexible pricing and meet stringent technical requirements. Customization & Flexibility: To maintain client satisfaction and retention, TEDS must offer highly tailored solutions, customized for the specific needs of large mining companies. This will require investments in specialized systems and the ability to deliver bespoke SLAs. Mining companies have the bargaining to negotiate better pricing and multi-year contracts, pushing TEDS to provide flexible financing models (e.g., OPEX, manage services/rental, leasing, usage based, or even revenue sharing) to remain competitive.

d. Threat of Substitution – Medium

Traditional Methods Persisting in Remote Sites, many remote mining sites still rely on manual processes and traditional methods of operation due to lack of infrastructure, high cost of tech adoption, and complexity of implementation. There are alternative Connectivity Options like Satellite based communications (e.g., Starlink, Iridium, Inmarsat, or other) and Wi-Fi mesh technology are emerging as alternative connectivity solutions, particularly in regions where terrestrial network coverage is limited. Internal ICT Solutions in Large mining companies may choose to develop in-house digital solutions, which could serve as a substitute for TEDS's offerings, especially if they believe they can meet compliance or operational efficiency requirements on their own. Traditional methods may slow the adoption of digital solutions in smaller and more remote mining sites, which represent a key growth segment for TEDS. While satellite communication or Wi-fi Technology providers offer strong competition in remote mining areas, TEDS's advantage lies in offering integrated digital solutions combining connectivity and data management under one roof. TEDS will need to demonstrate its cost-effectiveness and integration capabilities to counter this threat.

e. Threat of New Entry – Medium

Entering the mining digital solutions market requires significant capital investment to develop technology, secure regulatory approvals, and establish infrastructure such as local data centres to comply with Indonesia's data sovereignty laws. The mining sector's long procurement cycles present a significant barrier for new entrants, making it harder to penetrate the market quickly. Also, Local partnerships and supports and a deep understanding of government regulations and mining sector needs are essential. New entrants, particularly startups, must establish trust and demonstrate compliance to succeed in this highly regulated industry. TEDS established position as a major telecom operator gives it an edge over new entrants,

especially since it already has the infrastructure, local supports across nation and local knowledge to meet regulatory requirements. New entrants or startups need to form strategic alliances with key industry players to overcome the barriers to entry. TEDS can solidify its position by leveraging its local expertise and existing partnerships to dominate the digital transformation of Indonesia's mining industry.

In Summary, The Porter's Five Forces analysis highlights several significant external threats for TEDS in the Indonesian mining industry like Intense competition from global tech players, local telcos, startups, and satellite operators offering customized and cost-effective solutions. Vendors or Principals influence on innovation and terms can be mitigated by partnerships and regulatory compliance to meet local content and data sovereignty rules. The bargaining power of large mining companies forces TEDS to offer customized solutions and flexible pricing in long-term contracts. Traditional mining practices and alternative satellite & Wi-fi technologies could delay the adoption of TEDS's digital solutions in remote sites, presenting substitute threats. Barriers to entry for new competitors are high due to capital intensity, regulatory hurdles, and the need to gain local trust giving TEDS as an advantage in its established position.

This analysis suggests that TEDS is well-positioned to capitalize on its strengths, but it must proactively address these external threats by staying agile, innovative, and responsive to market dynamics.

IV.1.2.3 OT Analysis

The OT (Opportunities and Threats) analysis framework used to analyse External condition/factors and part of SWOT Analysis, based on External Opportunities and Threats of TEDS in Indonesia Mining Industry. The result highlights of the analysis in table IV.5 below:

Table IV.5 Qualitative Coding: OT Analysis Result

Code	Excerpt	Source	Theme
Growing demand driven by Industry 4.0 & ESG compliance	"Government mandates and ESG standards push mining digitalization, including automation, safety, and monitoring."	GM Enterprise Product Strategy, VP Product Management	External Opportunity
Emerging tech adoption: AI, edge computing, IoT	"Investing in AI analytics, edge computing, rugged IoT sensors tailored for mining operational KPIs."	VP Product Management	External Opportunity
Flexible financing models increase adoption potential	"OPEX models, subscriptions, leasing, and revenue sharing ease client CAPEX constraints."	VP B2B Sales,	External Opportunity
Increasing client focus on automation and safety	"Demand for real-time worker safety monitoring, fatigue detection, asset tracking, and autonomous equipment."	VP Product Enablement & Solutions	External Opportunity
Intense competition from global hyperscalers and startups	"Global cloud providers and mining-focused startups with niche solutions threaten market share."	VP Product Management, VP B2B Sales	External Threat
Long, complex procurement cycles slow sales	"Multi-step tenders, regulatory approvals, budget cycles delay deal closure up to 6–18 months."	VP B2B Sales, GM Corporate Strategy	External Threat
Regulatory complexity around data sovereignty & safety	"Strict PP71, TKDN, and safety compliance require tailored local solutions, adding to deployment complexity."	VP Product Management, VP B2B Sales	External Threat
Macroeconomic volatility impacts client budgets	"Commodity price swings lead to delayed or canceled digital projects, reducing sales visibility."	VP B2B Sales	External Threat

Refer directly to the triangulation data combination based on interview results with External expert in Digitalization from Government or regulatory, Customers Digitalization expert, and High-Level Management of TEDS also secondary data analysis from Internet, report and paper, journal, the OT parameters qualitative coding in Digital Solutions in Mining Industry are describe as follow:

a. Opportunity Factors

Based on the Interview data and Secondary data analysis and research conducted, here is a detailed breakdown of TSEL's External Opportunities in B2B Digital Solutions within the Indonesian mining industry:

- **Growing demand driven by Industry 4.0 & ESG compliance.**

As Indonesia Government pushes forward with “Making Indonesia Digital 4.0” for digital adoption to support productivity increase, safety, efficiency and ESG compliance, the government promotes digital transformation across key industries, including mining and mineral as one of the economic pillars. Concurrently, regulatory bodies and investors are imposing stricter ESG mandates especially in Mining sector like coal and nickel, Nickel where Indonesia supplies over 50% of global demand. Government & Regulatory leadership are calling for urgent ESG transformation across mining This combination is generating a fast-growing demand for digital

solutions that enhance mining company sustainability reporting, environmental monitoring, and compliance, creating prime opportunities for TSEL's enabled digital solutions service offerings.

- **Emerging tech adoption: AI, edge computing, Cloud, IoT.**

Indonesia's digital ecosystem is rapidly evolving, its cloud market is expanding, and AI-optimized data centre capacity is expected to grow 20% YoY from USD 0.55 bn in 2024 to 0.66 bn by 2025. Global spending on edge computing is also projected to reach USD 232 bn in 2024. In mining, these technologies are being adopted for productivity, safety, predictive maintenance, automation, and compliance. Mining Indonesia companies are increasingly open to AI-powered mixed reality tools and IoT platforms to improve safety and sustainability. TEDS end-to-end digital portfolio is well-positioned to meet this rising demand for advanced AI, edge, cloud, and IoT solutions tailored to mining operations.

- **Flexible financing models increase adoption potential.**

Indonesia's Mining companies are managing significant investment risks due to interest rates (6% in 2024) and commodity price volatility especially in Coal and Nickel commodity that the pillar of mining Indonesia. Yet, despite a dip in mining investment (down ~50% in 2024), the move toward downstream processing and digitalization persists. TEDS's commercial models such as Rental/Manage Services, Instalment/leasing, OPEX, and revenue-sharing make digital adoption more accessible, removing upfront hurdles and aligning service costs with mining company's financial cycles. These models are increasingly crucial in volatile economic environments.

- **Increasing client focus on automation and safety.**

Indonesia Mining company face productivity, efficiency, health, safety, environmental and sustainability pressures, with some even deploying renewable energy to reduce emissions. Digital dashboard/platform and IoT solutions demonstrates how IoT

platforms can drastically improve productivity and ESG performance monitoring. The platform able to tracks coals or minerals from extraction, processing to loading to the barge and transaction. Mining clients are thus actively seeking productivity monitoring, automation, remote monitoring, and safety-enhancing digital tools. TEDS can capitalize on this demand by offering tailored custom solutions combining network connectivity, platform, analytics, and device integration to improve operational productivity, efficiency, safety and compliance.

In summary, TEDS for the mining industry can maximize from external opportunities. By leveraging its opportunities in connectivity, ecosystem partnerships, and consultative solutions. TEDS can lead the mining industry's digital transformation supporting clients through compliance, productivity, and ESG performance.

b. Threat Factors

Based on the Interview data and Secondary data combine triangulation analysis and research conducted, the following external threats are affecting TEDS for the mining industry in Indonesia. These threats come from competitive dynamics, regulatory challenges, and economic volatility, each of which can impact TEDS ability to fully capitalize on the growing demand for digital solutions in mining. here is a detailed breakdown of TEDS External Threat factors in B2B Digital Solutions within the Indonesian mining industry:

- **Intense competition from global Technology providers and startups.**

The mining digital solutions market in Indonesia is becoming increasingly competitive, driven by the entry of global tech giants such as Amazon Web Services (AWS), Microsoft, Google, HEXAGON, AVEVA and IBM. Additionally, startups offering specialized mining software solutions are emerging as formidable

competitors. Global players bring advanced technological capabilities, larger resources, and established global trust, giving them an edge in providing cutting-edge solutions at scale, which could challenge TEDS position in the market. In addition, startups offering niche solutions may undercut TEDS pricing in a bid to capture market share. Global providers already have strong brand recognition and reputation and pre-existing relationships with multinational mining companies, making it harder for TEDS to break into larger mining accounts or expand beyond regional players. Startups and tech giants may move faster to adopt and scale emerging technologies, such as AI, edge computing, and blockchain, while TEDS might be constrained by its traditional telecom infrastructure, potentially making it slower to innovate in the digital space.

- **Long and complex procurement cycles slow sales.**

The mining sector is typically slow-moving in its procurement decisions, often due to the complexity of the solutions and technologies involved. The Procurement flow process and cycle that long and strict, especially in SOE and large mining companies. The procurement process requires many approvals from every level management to meet the administration, technical, legal and commercial standards and requirements. This process can impact to delays in implementation, long Sales Cycle, delays decision making. These also make TEDS's sales cycle could last for months or even years and will significantly impact the speed to generate revenue. Long procurement cycles also slowing down the cash flow, as contracts can be delayed or cancelled due to mining clients shifting priorities or budget changes. On the other hand, TEDS's competitors especially that offer simple solutions or modular, it can secure deals faster, steals the opportunity and the market share while TEDS waits for approval.

- **Regulatory complexity.**

The government regulation number 71 in 2019, regulate electronic data storage in Indonesia. The regulations stated that critical data in Indonesia by Critical industries, including mining, shall be storage in Indonesia. These regulations make strict limitation for mining companies that implement cloud-based solutions, as they must build or partner with local data centres. The mining industry also faces strict regulations related to the protection of sensitive data and operational safety. TEDS shall ensure that all digital solutions comply with local data storage regulations and maintain the required cybersecurity certifications. This can increase operational costs and development timelines for TEDS's cloud-based mining solutions. Non-compliance risks and technical challenges related to ensuring local data sovereignty might make it harder for TEDS to compete with global players that have already invested heavily in data centres within Indonesia. Compliance could lead to delays in implementation, particularly if mining companies need to restructure their data infrastructure to meet local laws. This creates a barrier to rapid adoption of TEDS's digital solutions.

- **Macroeconomic volatility impacts client budgets.**

Economic factors such as commodity price volatility, fluctuations in mining revenues, and global macroeconomic instability (e.g., inflation, interest rates) impact the mining sector's investment budgets. In 2024, inflation in Indonesia remained stable at 1.6%, but the economic outlook remains uncertain due to global inflationary pressures (Bank Indonesia). Mining companies often allocate large portions of their budgets to production infrastructure, safety, and regulatory compliance. When faced with economic volatility, these budgets may be reduced, delaying investment in digital transformation initiatives. If mining companies experience a downturn in revenue due to global commodity price fluctuations (e.g., the price of coal or nickel), they may delay or scale back investments in digital solutions offered by TEDS. Mining companies

facing economic pressures may be more inclined to look for cheaper solutions, potentially moving toward low-cost providers or opting for simpler digital offerings that don't require significant upfront investment. As budgets tighten, the sales process for new solutions may lengthen, or mining companies may delay purchasing decisions altogether, which can slow TEDS's revenue growth in the mining segment.

In summary, TEDS for the mining industry can prepare mitigation from external threats. several external threats that faced by TEDS like Intense competition from global tech providers and startups which offer more specialized, innovative solutions, leading to pricing pressure. Long, complex procurement cycles that delay sales and cash flow, hindering TEDS's ability to quickly capitalize on market opportunities. Regulatory complexities, particularly around data sovereignty and safety, which increase compliance costs and delay the deployment of digital solutions. Macroeconomic volatility affects client budgets, reducing the ability of mining companies to invest in digital transformation during times of uncertainty.

To mitigate these threats, TEDS shall Differentiate itself through local expertise, flexible financing models, and strong relationships with mining clients. Strengthen strategic alliances with government bodies to navigate regulatory changes. Innovate in modular, scalable solutions that address the specific needs of mining companies at varying levels of investment.

IV.1.3 SWOT Analysis

The SWOT Analysis is utilized as conceptual framework to define the Internal factors and External factors that determine key factors that affect the business strategy of TEDS in Indonesia Mining Industry. The SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis utilized to

define the code from qualitative data analysis obtained based on triangulation data from Interview with key informants and literature data such as Report, journal, paper, news & Internet data. The researcher using qualitative code from SWOT analysis that combine the Internal factors qualitative coding from VRIO analysis and SW Analysis and External factors qualitative coding from PESTLE analysis, Porter's five force analysis, and OT analysis. The SWOT analysis results will be utilized as basis data to conduct TOWS matrix analysis in the next section to formulate the effective and suitable business strategy for TEDS in Indonesia Mining Industry.

Table IV.6 Qualitative Coding: SWOT Analysis Result

Strengths (S):	Weaknesses (W):
• Leader in Network coverage in remote mining areas Indonesia (S1) • Specialized mining expertise and consultative Selling (S2) • Comprehensive and Customized integrated digital solutions (S3) • Strong Relationship with government/Regulatory (S4) • Strong Financial and Flexible commercial models (S5) • Robust ecosystem partnerships (S6) • Strong Client Engagement and local Representative (S7)	• Resources Constraint: Organizational Misalignment and Delays (W1) • Resources Constraint: Manpower Limited mining-specific technical expertise (W2) • Difficulty on Complex legacy system integration(W3) • Dependence on large mining clients (W4) • Resources Constraint: Manpower local field support (W5) • Resources Constraint: Manpower Value based selling culture (W6) • Resources Constraint: CRM and institutional knowledge capture gaps (W7) • Brand Image still as Telco Operator (W8)
Opportunities (O):	Threats (T):
• Government push driving digital adoption (O1) • Expansion in downstream, integrated smelter, middle & small size of mining (O2) • Demand for flexible commercial models & Custom Solutions (O3) • Technological advances in AI, edge & cloud computing, and Network (O4) • Strategic partnerships to expand digital ecosystem and innovation capacity (O5) • Demand integrated and customized solutions (O6)	• Intense competition from global tech firms, local telcos, startups, and satellite providers (T1) • Regulatory complexity and bureaucratic delays (T2) • Macroeconomic volatility impacting mining investment cycles (T3) • Persistence of traditional manual operations limiting digital adoption (T4) • Moderate threat from new entrants requiring monitoring (T5)

The steps to SWOT Analysis are starting from List the details key Internal Strength, Key Internal Weakness, key External Opportunities, and Key External threats that defined based on analysis results. Defining the code of the factors describe as below:

1. Define Key Internal Strength

In accordance with internal strength analysis refer to qualitative data and coding from combination analysis of VRIO analysis and SW analysis based on analysis results in previous sections there are several internal strengths for TEDS in Indonesia Mining Industry that describes as below:

- S1. Leader in Network coverage in remote mining areas Indonesia.
- S2. Specialized mining expertise and consultative Selling.
- S3. Comprehensive and Customized integrated digital solutions.

- S4. Strong Parents Company synergy & Relationship with government/Regulatory.
- S5. Strong Financial and Flexible commercial models.
- S6. Robust ecosystem partnerships.
- S7. Strong Client Engagement and local Representative.

2. Define Key Internal Weaknesses

In accordance with internal weakness analysis refer to analysis results from the qualitative data and coding from combination analysis of VRIO analysis and SW analysis based on interview results with key informants refer to Appendix A and secondary data from report, journal and internet, there are several internal weaknesses for TEDS in Indonesia Mining Industry describes as below:

- W1. Resources Constraint: Organizational Misalignment and Delays.
- W2. Resources Constraint: Manpower Limited mining-specific technical expertise.
- W3. Difficulty on Complex legacy system integration.
- W4. Dependencies on large mining clients.
- W5. Resources Constraint: Manpower local field support.
- W6. Resources Constraint: Manpower Value based selling culture.
- W7. Resources Constraint: CRM and institutional knowledge capture gaps.
- W8. Brand Image still as Telco Operator.

3. Define Key External Opportunities

In accordance with External Opportunities analysis based on analysis results in previous sections with qualitative data and coding from combination analysis of PESTLE, Porter's Five Force analysis and OT analysis based on interview results with key informants refer to Appendix A and secondary data from report, journal and internet, there are several External Opportunities for TEDS in Indonesia Mining Industry describes as below:

- O1. Government push driving digital adoption.

- O2. Expansion in downstream, Integrated smelter, middle & small size of mining.
- O3. Demand for flexible commercial models & Custom Solutions.
- O4. Technological advances in AI, edge & cloud computing, and Network.
- O5. Strategic partnerships to expand digital ecosystem and innovation capacity.
- O6. Demand integrated and customized solutions.

4. Define Key External Threats

In accordance with External Threats analysis based on analysis results in previous sections from qualitative data and coding from triangulation combination analysis of PESTLE, Porter's Five Force analysis and OT analysis based on interview results with key informants refer to Appendix A and secondary data from report, journal and internet, there are several External threats for TEDS in Indonesia Mining Industry describes as below:

- T1. Intense competition from global technology firms, local telecommunication providers, local technology vendors, startups, and satellite providers.
- T2. Regulatory complexity and bureaucratic delays.
- T3. Macroeconomic volatility impacting mining investment cycles.
- T4. Persistence of traditional manual operations limiting digital adoption.
- T5. Moderate threat from new entrants requiring monitoring.

IV.2. Business Solution

IV.2.1. TOWS Matrix Analysis

In This research, TOWS Matrix Analysis is utilized as business formulations framework to develop the most effective business strategy using Internal and external factors assessment (SWOT analysis) from previous chapter to determine current competitive position and growth potential of the company. TOWS analysis is a systematic and

comprehensive strategic development tool that is a variant of the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis.

Table IV.7 TOWS Matrix Analysis Summary Results

SW OT		Opportunities (O)	Threats (T)
Strengths (S) S1. Leader in Network coverage in remote mining areas Indonesia S2. Specialized mining expertise and consultative selling S3. Comprehensive and Customized Integrated digital solutions S4. Strong Relationship with government/Regulatory S5. Strong financial and reliable commercial models S6. Robust ecosystem partnerships S7. Strong Client engagement and local representation		O1. Government push driving digital adoption O2. Expansion in downstream, integrated smelter, middle & small size of mining O3. Demand for Realtime commercial models & Custom Solutions O4. Technological advances in AI, edge & cloud computing, and network O5. Strategic partnerships to expand digital ecosystem and innovation capacity O6. Demand integrated and customized solutions	T1. Intense competition from global tech firms, local telcos, startups, and satellite providers T2. Regulatory complexity and bureaucratic delays T3. Macroeconomic volatility impacting mining investment cycles T4. Persistence of traditional manual operations hindering digital adoption T5. Moderate threat from new entrants requiring monitoring
		SO Strategies: 1. Leverage Widest Network coverage, deep mining expertise, Client engagement & widest local Representative & Integrated solutions to capitalize on Government support driving digital adoption. (S1, S2, S3, S4, S7, O1, O4) 2. Utilize Realtime commercial models to expand in the mining industry markets. (S5, O2, O3) 3. Expand partnerships (Global & Partner, principal, OEM, mining association, government & regulatory to accelerate implementation of Technology AI, edge, and 5G innovation adoption. (S4, S6, O4, O5)	ST Strategies: 1. Use strong Network coverage, local representative/support, Specialized mining for consultative selling, strong relationship with government and BUMN, flexibility business model, robust ecosystem partnership with client to differentiate against global, local and start-up competitors and to gain trust & confidence that Teltelcom 828 Digital Solutions able to support clients digitalization with flexible & reliable solutions and business model to increase productivity, efficiency and safety in the midst of mining macroeconomic volatility. (S1, S2, S3, S5, S6, S7, T1, T3, T4, T5) 2. Strengthen government relations & compliance also using as part of state-owned enterprise to navigate regulatory complexities to ensure project & services on time and meet clients expectation. (S4, T2)
Weaknesses (W) W1. Resources Constraint Organizational Misalignment and Delays W2. Resources Constraint Manpower Limited mining-specific technical expertise W3. Difficulty on Complex legacy system integration W4. Dependence on large mining clients W5. Resources Constraint Manpower local field support W6. Resources Constraint Manpower Value based selling culture W7. Resources Constraint CRM and Institutional knowledge capture gaps W8. Brand image still as Telco Operator		WO Strategies: 1. Address and Improve Internal Organizational misalignment, Internal process operation, Internal system tools (CRM) and & Skills (mining specific technical expertise in every team from sales to after sales) to be better on Consultative selling, Internal process, After sales and deliver the integrated customized solutions, new business model and new technology opportunities, and client demands in accordance to Government Mandate/Push and to change the reputation to the Digital provider. (W1, W2, W3, W5, W6, O1, O3, O4, O5) 2. Invest in Digital mining-specific talent and people development to strengthen internal capability to leverage innovation and technological advance (AI, edge computing, cloud, and network) to gain trust through consultative selling and change the reputation from telco operator to Digital Solutions, and to support clients demand in customized and integrated solution, and to expand the mining market in emerging tech, integrated smelter, mid-low, and downstream. (W2, W3, W4, W5, W6, O2, O4, O5) 3. Enhance the tools system & institutional knowledge & innovation, digital ecosystem and local field support team through strategic partnership with Digital player from global partner, local partner, principal, OEM and start up to increase client trust and confidence in remote regions. (W5, W7, W8, O4, O5)	WT Strategies: 1. Improve solution integration, Internal Organizational alignment, Tools & Business process, people technical & skills capability, sales transformation culture to reduce risks from competition from global & local tech provider, new entrants and regulations bureaucratic. The trust and confidence from client to the digital solution that give direct beneficial impact to the business in the Mining & mineral macroeconomic volatility 2. Expand and diversify client's base to downstream, integrated smelter, and middle-low mining company to reduce risks from new entrants. (W3, T1, T5)

The researcher using qualitative code results from SWOT analysis in previous chapter, then combine the Internal factors SW and External factors qualitative code from OT and then conduct TOWS matrix analysis of TEDS in Indonesia Mining Industry to formulate the effective and suitable business strategy. The formulation with combination analysis matching among internal strengths, internal weaknesses, external opportunities and external threats in matrix to define SO Strategies, ST Strategies, WO Strategies and WT Strategies. The Analysis summary results of TOWS matrix shown in Table below describes several of business strategies alternatives for TEDS in Indonesia Mining Industry implementation.

Refer to the TOWS matrix analysis above, there are 4 (Four) model/type of strategies generated as below:

1. SO - Maxi-Maxi Strategy

Maxi-maxi strategy – SO is business strategy that maximizing strengths to maximize Opportunities. Utilize and leverage the strengths to dominate and take over opportunities. TEDS in Indonesia Mining

industry Maxi-maxi strategy details according to the TOWS matrix analysis is shown below:

- Leverage Widest Network coverage, deep mining expertise, strong parents company as stated owned enterprise synergy, Client engagement & widest local representative & integrated solutions to capitalize on Government support driving digital adoption. (S1, S2, S3, S4, S7, O1, O6).
- Utilize flexible commercial models to expand in the mining industry markets. (S5, O2, O3).
- Expand partnerships (Global & Partner, principal, OEM, mining association, government & regulatory to accelerate implementation of Technology: AI, edge, and 5G innovation adoption. (S4, S6, O4, O5).

2. ST - Maxi-Mini Strategy

Maxi-Mini Strategy – ST is business strategy that maximizing strengths to minimize the Threats. In this strategy, it uses and leverages the company strengths to minimize the external threats the company will encounter. TEDS in Indonesia Mining industry Maxi-Mini strategy according to the TOWS matrix analysis is shown below:

- Utilised strong and widest Network coverage, local representatives /supports, Specialized mining for consultative selling, strong relationship with government and SOE, flexibility business model, robust ecosystem partnership and long relationship with client to differentiate against global, local and startup competitors and to gain trust & confidence that TEDS able to support clients digitalization with flexible & reliable solutions and business model to increase productivity, efficiency and Safety in the middle of mining macroeconomic volatility. (S1, S2, S3, S5, S6, S7, T1, T3, T4, T5).
- Strengthen government relations & compliance also using as part of state-owned enterprise to navigate regulatory complexities to ensure project & services on time and meet client's expectation. (S4, T2).

3. WO - Mini-Maxi Strategy

Mini-Maxi Strategy - WO is business strategy that take advantage of what's happening in the market to improve weak points inside the company. It's finding a way to Improve company weaknesses by taking advantage of the opportunities available to the company. TEDS in Indonesia Mining industry Mini-Maxi strategy details according to the TOWS matrix analysis is shown below:

- Address and Improve internal Organizational misalignment, internal business process operation, Internal System tools like CRM tools and & Skills (mining specifics technical expertise in every team related from sales, product, engineering, technical support to after sales) to be better on Consultative selling, Internal process, After sales and deliver the Integrated customize solutions, new business model and new technology opportunities, and client demands in accordance to Government Mandate/Push and to change the reputation to the Digital provider. (W1, W2, W6, W7, W8, O1, O3, O4, O6).
- Invest in Digital mining-specific talent and people development to strengthen internal capability to leverage innovation and technological advance (AI, edge computing, cloud, IoT and network) to gain trust through consultative selling and change the reputation from telecommunication operator to Digital Solutions provider, and to support clients demand in customize and integrated solution, and to expand the mining market in emerging tech, integrated smelter, middle-low, and downstream. (W2, W3, W4, W5, W6, W8, O2, O4, O6).
- Enhance the tools systems, Institutional knowledge, Innovation, digital ecosystem and local field support team through strategic partnership with Digital player from global partner, local partner, principal, original equipment manufacturer (OEM) and start up to increase client trust and confidence in remote regions. (W5, W7, W8, O4, O5).

4. WT - Mini-Mini Strategy

Mini-Mani Strategy - WT is business strategy that used for worst case scenario, it's business strategy that focusing on minimize and reduce the company's weaknesses to minimize and reduce the external threats company faces. TEDS in Indonesia Mining industry Mini-Mini strategy details according to the TOWS matrix analysis is shown below:

- Improve solution integration, Internal Organizational alignment, Tools & Business process, people technical & skills capability, sales transformation culture to reduce risks from competition from global & local tech provider, new entrants and regulations bureaucratic. The trust and confidence from client to the digital solution that give direct beneficial impact to the business in the Mining & mineral macroeconomic volatility. (W1, W2, W4, W5, W6, W7, W8, T2, T3, T4).
- Expand and diversify client's base to downstream, integrated smelter, and middle-low mining company to reduce risks form new entrance. (W3, T1, T5).

IV.2.2 Business Strategy

TEDS current business level strategy refers to the generics porters based on Interview result summary with Internal high-level management is Differentiation business strategy that focuses on its unique value proposition from its strength like widest network coverage, largest numbers of branch offices, widest technical support, end to end & quality of digital solutions (integrated connectivity, IoT, sensors/devices, cloud & edge computing, platform & AI/ML), integrated partner ecosystem and largest numbers & widest Area and specific Account management propose to the customers that differentiate with other competitors, with this TEDS propose and gain high price and profit. But TEDS position threatened with the mining industry conditions and competitors more aggressive in the penetration the mining industry market thus make the TEDS to develop the effective and

right business strategy that fit the mining industry and competition current conditions.

Based on analysis from the current conditions, and Internal (value Chain, VRIO & SW Analysis), External analysis (General Environment PESTLE Analysis, Industry, Competitor and Porter's Five Forces, & OT Analysis), and the formulation strategy using TOWS matrix and Micheal Porter's Generic Strategies, **The Effective and Fit business strategy is Integrated Cost Leadership and Differentiation for TEDS in Indonesia Mining Industry**. This strategy for TEDS offers products, solutions or services with unique features at a lower price than competitors to achieve a competitive advantage. This Integrated Cost Leadership and Differentiation business strategy will implement utilized the result of TOWS matrix strategy formulations that described in the below summary.

Refer to the business strategy formulation research result in the previous chapter, there are 4 (Four) strategies describe from TOWS matrix analysis, SO (Strength & Opportunities) – Maxi-Maxi Strategy, ST (Strength & Threats) – Maxi-Mini Strategy, WO (Weakness & Opportunity) – Mini-Maxi Strategy, and WT (Weakness & Threats) Mini-Mini Strategy. Based on the analysis and the current condition & priority of TEDS from the interview analysis result with TEDS Internal High Level Management, the strategies that effective and suitable with TEDS describes as following figure:



Figure IV.11 Business strategy Solutions Priority Matrix

Refer to figure of Business strategy solutions priority matrix analysis above, the best and suitable business strategy shall be the Hybrids strategy of SO and WO. The priority matrix above describes that the SO and WO strategies in Quadrant 1 as First Prioritize/Quick Win: High Business impact in the market with Low Business Effort and Quadrant 2 as Second Prioritize/Strategic Investment: High Business impact in the market with High Business Effort. Refer to TEDS the High-Level Management interview summary, the Q1 (SO) and Q2 (WO) hybrid strategies are the best and effective strategy in the current situation and current priority. TEDS's existing strengths are unique assets (network & support, mining knowledge, ecosystem, government relationship, stated owned enterprise parent group synergy), and should be leveraged fully alongside closing gaps. Ignoring internal weaknesses (misalignment, business process, talent gaps, packaging and branding) would limit TEDS's ability to deliver on opportunities like mid-market expansion, ESG-driven digitalization, and downstream growth. With SO-WO Hybrid business strategy, TEDS could Maximize competitive advantage:

- Leverages network leadership, mining relationships, and modular ecosystem solutions.

- Overcomes internal execution hurdles: Ensures mining-specific talent, regional support, and faster deployment for complex mining sites.
- Targets high-potential growth pockets: Mid-market, downstream, and ESG-driven transformation, where large mining clients are already saturated.
- Positioning as a compliance-ready, consultative digital technology solutions partner, not just a telco provider in Indonesia's mining digital future.

In Summary, The SO-WO hybrid strategy enables TEDS in Indonesia mining Industry to fully exploit its leadership position in connectivity, synergy and mining digital innovation and close internal gaps to accelerate deployment and increase market share growth in mid-sized and downstream mining segments. Differentiate as a trusted, mining-centric digital solutions partner, building a future-ready business in a complex and competitive sector.

IV.2.3 Business Model Development

The research utilizes Business Model Canvas to develop a new business model that suitable with new business strategy of TEDS in Indonesia Mining Industry. Here's the details explained below:



Figure IV.12 Business Model Canvas Development Results

1. Customer Segments

In this research, with the context of TEDS in Indonesia Mining Industry identifying the Customer Segments details as below:

- Large Mining corporations
- Middle sized and Small sized mining companies
- Downstream mining & processing plants
- Mining Operations and Maintenance (O&M) Contractors
- Mining Equipment OEM
- Mining Vendors and System Integrator
- Mining Association
- Government and regulatory bodies for compliance-driven projects

2. Value Propositions

The value proposition of TEDS in Indonesia Mining Industry that can be offered to the customers is details below:

- Reliable & widest area 4G LTE / Private LTE & 5G network in remote mining sites
- End to End and Customized and Integrated IoT, AI, edge computing, and cloud digital solutions specific for mining Industry
- Flexible commercial models (OPEX, leasing, usage based, and revenue sharing)
- Deep mining expertise & regulatory compliance
- Strong ecosystem partnerships & government alignment & regulatory
- Consultative sales & co-creation approach
- Well Known & Strong brand reputation as Telco provider Market leader and its quality of services

3. Revenue Stream

Revenue stream is how the company generates revenue from customer segment. In TEDS, the revenue streams define from several sources as below:

- B2B Digital solutions (IoT Connectivity, IoT Device, Sensor, Gateway, Edge computing, Solution platform, Cloud, AI) One Time Charge Project

- Licensing, Subscriptions & Usage-based fees
- Instalment Fees, Manage Services/Rental fees
- Revenue sharing models
- Digital Consulting, integration, and compliance advisory

4. Channels

Channels define the way of communication between company and customers to deliver its value propositions. Based on the research results, TEDS in Indonesia mining industry have several channels such as:

- Direct Sales & Specialized mining corporate Account management
- Regional Area Account management, field support and Representative
- Branch Office in Every Province and Big City across Indonesia
- Digital Channel platforms (Website, Instagram, Linkedin and Media)
- Mining industry events, government forums, and Mining Sectors Conference
- Channel Partner/distributors
- Parents Company Synergy channel

5. Customer relationship

In TEDS of Indonesia mining industry research, customer relationship defined the interactions and connection through business to the customers that maintained as below:

- High touch Specific Account Management for consultative sales, support and co-creation
- Lifecycle Dedicated client management & training: pre-sales, implementation, and post-sales technical and account support
- Customer Services: 24/7 Online Support through several channels like Call Center, Application/platform, Support WA group, Website and social media
- Warranty & Manage Services

6. Key Activities

Based on the research, the key activities and process that TEDS shall do to make the business strategy in Indonesia Mining Industry running effectively and smoothly as below:

- Consultative Sales, Pre-Sales & Marketing
- Consulting & Tailored digital mining product and solution development
- Network Deployment
- Operations & Maintenance/Manage Services
- Product R&D, Co-creation & Innovation
- Partnership, Telkom Synergy, and Government & regulatory management
- Delivery and Implementation
- Client training and lifecycle After Sales support
- People Development

7. Key Resources

Refer to this study result, The key resources of TEDS to create value to the clients in Indonesia Mining Industry as below:

- Network & IT infrastructure
- Key Corporate Account management, Regional Account management, Engineering, product, IT, Delivery & after sales, Regulatory, Network, Marketing, Strategic Team
- IoT devices, AI, edge computing, Cloud, platforms
- Strategic technology partner, Partner channel, Telkom Synergy, Association & government partnerships
- License for Telco & Digital Provider
- Strong Brand as Telco Provider Market Leader

8. Key Partners

Refer to the study results of TEDS in Indonesia Mining Industry, the key partners as relationship with other entities like suppliers, vendors, manufacturers, principals, and consultants provide key support that help the business to function effectively. The list of key partners as below:

- IoT, Devices/Sensor, Cloud & AI technology Principals or providers
- Mining equipment OEMs & system integrators
- Government & Regulatory bodies (Ministry of Digital & ICT, Ministry of Industry, Ministry of Energy and Mineral Resources, Ministry of environment and forestry)
- Local supplier, local service providers, Digital Technology Start-up & Regional partners
- Mining Industry and Digitalization Association

9. Cost Structure

Refer to the study results of TEDS in Indonesia Mining Industry, the cost structure to operate a business to Creating and delivering value proposition, maintaining Customer Relationships, and generating revenue. all incur costs in is below:

- Network infrastructure & Technology R&D CAPEX
- Devices, IoT, Platform, Edge Computing, AI CAPEX
- Operational costs (support, operation & maintenance, sales, marketing, product)
- Talent acquisition and development Investment
- Compliance, License, Legal & certification Cost
- Partnership management & Innovation Initiatives Investment

IV.3. Implementation Plan

Refer to the business strategy formulation results from TOWS matrix analysis and new business model canvas as business strategy solution, the Implementation plan shown below is suggestion and proposed by author for TEDS to the Indonesia Mining Industry market. The details of the plan and criteria shall be discussed, agreed upon, and detailed with Company Management. The Implementation plan step by step defines as below:

Table IV.8 Timeline Strategy Implementation Plan

			Timeline																																			
No.	Key Activity	Area	2025				2026								2027								2028															
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2																				
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	Refine the Telkomsel Corporate strategy with B2B Digital Solution in Mining Industry	Business																																				
2	Define and execute the Resources and Investment Plan	Business																																				
3	Define and Collaborate with ecosystem technology partners to refine future technology roadmap, Continuous improvement, and Product Innovation	Technology																																				
4	Define and execute Internal Misalignment business Process improvement and change management for Operational Excellence	Business, Human Capital																																				
5	Expand and deepen the partnerships with stakeholders, Government/Regulatory, Technology Principal, Vendor, Association	Business, External Relation																																				
6	Define and execute the Specific Talent Acquisition/Hiring and Internal People development	Human Capital																																				
7	Develop mining workforce digital literacy & Operational Experience in B2B Digital Solutions in Mining Industry	Technology, Human Capital																																				
9	Develop and execute of market & clients deep analysis, product roadmap and go to market roadmap strategy to be the market leader in B2B Digital Solution in Mining Industry	Business, Technology																																				
10	Develop and execute marketing strategy and campaign for Telkomsel B2B Digital Solution in Mining Industry	Business																																				
11	Develop and execute multi market segment size pricing and flexible commercial models	Business																																				
12	Develop and execute the internal research and development of Digital products and solutions to fit all market segment in Mining Industry	Technology																																				
13	Refine and execute the Co-creation and Piloting to the strategic Clients	Business, Technology																																				
14	Develop and execute Product/Solutions R&D of customize / staging, easy Integration and update with specific Technology advancement (AI, edge, ESG)	Technology																																				
15	Expand regional field support hubs and Implement advanced CRM and knowledge management systems.	Technology, Human Capital																																				
16	Define and execute business strategy implementation monitoring, evaluation and Continuous Improvement	Business, Technology, HC, External Relation																																				

Chapter V Conclusion and Recommendation

To Build a competitive advantage and robust strategy as key factors of business growth, business continuity and reinforce TEDS role as the trusted digital transformation partner in Indonesia Mining Industry Market. This study conducts using analysis of the company's Internal factor and external factors with the aim of enhancing competitive advantage to win the market. The results of the study can be summarized in the following conclusions.

V.1. Conclusion

The Business Analysis conclusion is the business solution summary results to answer the research questions and objectives, there are:

1. Telkom B2B (Enterprise) Digital Solutions in Indonesia Mining Industry weaknesses current conditions include internal misalignment and business process, limited mining-specific expertise, fragmented solution packaging, over-reliance on large clients, inadequate/Limited regional support, transactional sales culture, and weak CRM knowledge capture requiring improved governance. The development needed to solve the gap/weakness to implement business strategy.
2. Refer to the Business Condition - Internal & External (using SWOT, VRIO, PESTLE and Porter's 5 Forces analysis) that affect Telkom B2B (Enterprise) Digital Solutions Business strategy in Indonesia Mining Industry as below:
 - Internal Factors: The strengths like Widest in network coverage, mining expertise & consultative selling by account management or sales, comprehensive End to end solutions, strong government and client relationships, strong financial, flexible commercial models, robust ecosystem partnership, and Strong client engagement & regional area support. However, the challenges/weaknesses like organizational misalignment, limited technical talent, complex customer integration, reliance on large clients, constraint of local field support & value based selling culture, constraint of CRM system, and only telco operator

image requires focused development internally of people, internal organization system, Advanced technology, Technical & Operational Business process support, and marketing to sustain growth and expand deeply into mining segments.

- External Factors: The Opportunities like Government push driving digital adoption, Expansion in downstream mining, Demand for flexible commercial models & Custom Solutions, Technological advances (AI, edge & cloud computing, and Network), Strategic partnerships to expand digital ecosystem and innovation capacity, and Demand integrated and customized solutions. However, the Threats also exist like Intense competition from global tech firms, local telcos, startups, and satellite providers, Regulatory complexity, bureaucratic and Mining Company procurements stage that make the delays, Macroeconomic volatility impacting mining investment cycles, Persistence of traditional manual operations limiting digital adoption, and Moderate threat from new entrants also require monitoring.

3. The Challenges and key success factors influencing Telkom B2B (Enterprise) Digital Solution Business strategy in Indonesia Mining Industry as follow:

- Challenges: Pressure from competitor like global, local, and emerging tech players, Regulatory complexities and procurement bureaucracy slowing deployments. Economic uncertainty impact mining investment & spending, Legacy system and manual process barriers digital adoption, building trust in mid-market and downstream segments that are new to digital solutions.
- Key Success Factors: Client Centric and Co-Creation like Deep collaboration with mining clients to tailor solutions for operational KPI's and site-specific challenges. Ecosystem Partnerships, Integration with mining OEMs, Principals, system integrators, and start up tech players for end-to-end solutions. Operational Excellence, Impactful, Fast deployment, reliable local support, and proactive Service Level Agreement (SLA) management. Compliance & ESG, government

regulatory, and data sovereignty as core solution differentiators. Flexible Commercial Models: like one time project, Subscription, leasing/Instalment, rental/manage services, usage based and revenue-sharing matching mining company's cash flow constraints. Consultative Selling, be an Expert Mining technology advisor and consultant that give consultations and solutions that give direct impact and benefit to the mining industry.

4. Based on The TOWS Matrix Analysis and Michael Porter's generic Strategy, the most effective and suitable business strategy considering the matrix priority and current conditions of Telkom's B2B (Enterprise) Digital Solution in Indonesia mining industry are Integrated Cost Leadership and Differentiation business strategy to gain competitive advantage and the details of the strategy utilize formulation results from SO and WO hybrid Business Strategy. Hybrid Combination strategy of SO (Maxi - Maxi) – WO (Mini – maxi). TEDS should adopt a hybrid strategy (SO) that combines leveraging strengths (network, Segmented team, integrated and customized solutions, commercial flexibility, strong stated owned enterprise synergy and government alignment) to seize Opportunities (downstream mining segment expansion, Government & regulatory mandate, growing middle market) and (WO) with overcoming internal weaknesses (Talent skills gap, internal alignment & business process, local field support, selling culture, Tools/CRM system, and brand image) to exploit opportunities. This Strategy chosen because TEDS has majority strength that can take advantage optimally to win the market, and to ensure the Sustainable & long-term Competitive advantage. WO Strategy chose because TEDS only have a few critical weaknesses that can be solved quickly with well planning improvement and management support. The Business Canvas Model based on TOWS Matrix was developed to provide a structured approach to the new business model that is effective, suitable and creates a tactical and implementation plan of the business strategy.

V.2. Recommendation

Refer to the business solutions and conclusion, The Recommendation for Telkom Enterprise or B2B Digital Solutions in Indonesia Mining industry:

1. The Recommendation Details for development are written in the implementation plan.
2. With The Recommendation Implementation plan, Telkom B2B (Enterprise) Digital solution in Indonesia Mining Industry able to run the business tactically with suitable and effective strategy to pursue the business growth target.
3. The Details for each stage are in Implementation plan but still need to be developed and studied deeply to ensure the Sustainability business in Digital market in Indonesia Mining Industry.
4. The Future research that be able to conduct deeply refer to the thesis:
 - Talent Hiring & Development research in to pursue the Mining Segment.
 - Corporate Organization, Business Process and Change Management in B2B that effective for Mining Industry Segment.
 - Detail Development plan of Marketing to change the Brand Image to be Digital Solution.
 - Detail Product Strategy, Research and Development plan in B2B Mining Segment.

REFERENCE

- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17:99-120.
- David, F. (2008). *Strategic management (12th ed.)*. Prentice Hall.
- David, F., & David, F. (2016). *Strategic Management, A Competitive Advantage Approach, Concepts and Cases (16th ed.)* Pearson. Pearson.
- Gurel, E., & Tat, M. (2017). SWOT analysis: A theoretical review. *The Journal of International Social Research*, 10 (51), 994-1006.
- Hapriyanto, A. R. (2024). Strategi Inovatif dalam Meningkatkan Daya Saing Bisnis di Era Digital. *Nusantara Journal of Multidisciplinary Science*, 108-117.
- IDC. (2021). *IDC Worldwide of Future of Mining Operations Survey*. IDC.
- IDC. (2022). *IDC's Worldwide Mining Decision Maker Survey*. IDC.
- IDC. (2022). *Indonesia Mining Report*. Jakarta: IDC.
- Jim Makos. (2025). <https://pestleanalysis.com/amazon-pestel-analysis/>. Retrieved from <https://pestleanalysis.com>: <https://pestleanalysis.com/amazon-pestel-analysis/>
- Magretta, J. (2012). *Understanding Michael Porter: The essential guide to competition and strategy*. Harvard Business Review Press.
- Ministry of Energy and Mineral Resources. (2022). *Indonesia Ministry of Energy and Mineral Resources Report*. Jakarta: Indonesia Ministry of Energy and Mineral Resource.
- Ministry of Energy and Mineral Resources. (2024). *Strategic Plan of the Directorate General of Electricity*. Jakarta: Ministry of Energy and Mineral Resources.
- Mogg, K. (2021). *How to create a business transformation strategy for effective change*. Standley Systems.
- Nurfalah, I., & Rusydiana, A. (2019). DIGITALISASI KEUANGAN SYARIAH MENUJU KEUANGAN INKLUSIF: KERANGKA MAQASHID SYARIAH. *Ekspansi: Jurnal Ekonomi, Keuangan, Perbankan dan Akuntansi*, 55 – 76.
- OMDIA. (2024). *ICT Telkomsel Addressable by Region*. Jakarta: OMDIA.
- Osterwalder, A., & Pigneur. (2009). *Business Model Canvas*.

- Osterwalder, A., Pigneur, Y., Smith, A., & 470 practitioners, f. (2010). *Business Model Generation: A handbook for visionaries, game changers and challengers*. Hoboken, New Jersey: John Wiley and Sons, Inc.
- Porter, M. (1980). *Competitive strategy: Techniques for analysing industries and competitors*. Free Press.
- Porter, M. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Simon and Schuster.
- Porter, M. (1987). From competitive advantage to corporate strategy. *Harvard Business Review*, 5.
- Porter, M. (2008). The Five Competitive Force That Shape Strategy. *Harvard Business Review*.
- Porter, M. E. (1990). The Competitive Advantage of Nations. *Harvard Bussiness Review*, 1-21.
- PWC Indonesia. (2014 - 2024). *Mining in Indonesia: Investment, Taxation and Regulatory Guide*. Jakarta: PWC Indonesia.
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Telkomsel. (2014). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2015). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2016). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2017). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2018). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2019). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2020). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2021). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2022). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2023). *Telkomsel Annual Report*. Jakarta: Telkomsel.
- Telkomsel. (2024, Desember 15). <https://www.telkomsel.com/en/about-us/investor-relations>. Retrieved from <https://www.telkomsel.com/>: <https://www.telkomsel.com/en/about-us/investor-relations>
- Telkomsel. (2025, April 12). *Pelayanan Digital*. Retrieved from Telkomsel: <https://www.telkomsel.com/about-us/inovasi/pelayanan-digital>

theinvestorsbook.com. (2025). <https://theinvestorsbook.com/business-level-strategy.html>. Retrieved from www.theinvestorsbook.com: <https://theinvestorsbook.com/business-level-strategy.html>

Vek Lath and Greg Peacocke (McKinsey Company). (2020, March). How digital innovation will transform Indonesia's mining industry. *Digital Transformation*.

websiteca. (2024, September 6). <https://websiteca.com/blog/what-is-swot-analysis>. Retrieved from <https://websiteca.com>: <https://websiteca.com/blog/what-is-swot-analysis>

Wheelen, T., & Hunger, J. (2010). *Strategic management and business policy, achieving sustainability (12th ed.)*. Prentice Hall.

www.bitesizelearning.co.uk. (2025). www.bitesizelearning.co.uk/resources/tows-matrix-explained-example. Retrieved from www.bitesizelearning.co.uk: www.bitesizelearning.co.uk/resources/tows-matrix-explained-example

APPENDICES

Appendix A Interview with Key Informants - PESTLE Analysis

Study Title: Business Strategy of B2B Digital Solution of Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry.

Sub-study: Exploration of Telkomsel B2B Digital Solution Strategy in Indonesia Mining Industry.

Interview Instrument: PESTLE Analysis

Respondent: Expert Staff on Digitalization – Ministry of Industry (Kemenperin) & Digital Task Force of Ministry of Stated Owned Enterprise

PESTLE Factor	Interview Details
Political	How do current government policies and regulations support or hinder the adoption of B2B digital solutions in Indonesia's mining sector?
	Government policies and regulations play a pivotal role in shaping the adoption of B2B digital solutions in Indonesia's mining sector, with both supportive and challenging aspects but the goals are to regulate and protect the Indonesia Digitalization and give benefits to All Indonesia people and all the stakeholders. On the supportive side, initiatives like the Making Indonesia 4.0 roadmap and Industry 4.0 acceleration programs encourage mining companies to adopt automation, IoT, and advanced analytics to improve productivity, safety, and environmental compliance. Regulations mandating data sovereignty (PP71/2019) and local content requirements (TKDN) push vendors and clients to invest in domestic digital infrastructure and services, fostering local innovation and ensuring

	data security. Furthermore, ESG reporting requirements and stricter environmental regulations drive demand for real-time monitoring and compliance solutions, accelerating digital adoption and protect Indonesia resources and environmental for the future. However, some regulatory complexities and bureaucracy, such as lengthy procurement processes, unclear classification of emerging technologies in tender documents, and overlapping jurisdiction between ministries can slow down project approvals and create uncertainty for both vendors and mining companies. Overall, while government policies set a positive direction and create incentives for digital transformation, ongoing efforts are needed to streamline regulations, enhance clarity, and facilitate faster adoption of innovative B2B digital solutions in the mining sector."
Economic	• In your view, how do macroeconomic trends (e.g., inflation, interest rates, investment climate) affect the digital transformation efforts in the mining industry? • Macroeconomic trends have a significant influence on digital transformation in Indonesia's mining industry. For instance, inflation, rising tax and rising interest rates increase the cost of capital and imported technology, which can constrain mining companies' budgets for digital investments. This often leads to delays or scaling back of digital projects, especially those requiring significant upfront capital. At the same time, the investment climate, including foreign direct investment policies and government incentives, plays a critical role. Positive signals encourage mining firms to commit to long term digital initiatives, including smart mining technologies and automation. Conversely, economic uncertainty or commodity price volatility can make companies more cautious, prioritizing core operational expenses over digital innovation. Therefore, while macroeconomic conditions can create challenges, targeted policies, subsidies, and flexible financing models can help mitigate risks and sustain digital transformation momentum in the mining sector.
Social	• What are the key social or workforce related challenges (e.g., digital readiness, resistance to change) in promoting industrial digitalization?

	• Promoting industrial digitalization in Indonesia faces several important social and workforce related challenges. Human/Workforce as part of Digitalization quadrant also the key of the digitalization. Digital readiness varies significantly across the workforce. Many workers, especially in heavy industries like mining, may lack the necessary digital skills or familiarity with new technologies, which can slow adoption. There is also often resistance to change, a natural human response to unfamiliar processes or fear of job displacement due to automation and digitalization. This can create barriers to implementing new systems and tools. The gap in digital literacy and training infrastructure means that upskilling and continuous learning need more attention and investment to prepare workers for digital roles. Additionally, ensuring inclusive access to digital tools, especially for remote or contract workers, is critical to avoid leaving segments of the workforce behind. To address these challenges, coordinated efforts involving government, industry players, and educational institutions are essential, focusing on digital skills development, change management, and inclusive digital policies.
Technological	• How is the Ministry supporting innovation and infrastructure to accelerate the use of advanced digital solutions in mining? • The Ministry of Industry is actively supporting innovation and infrastructure development to accelerate advanced digital solutions in mining. We promote this through the Making Indonesia 4.0 roadmap, which encourages adoption of Industry 4.0 technologies including IoT, AI, and automation within mining and other heavy industries. The other ministry like Ministry of Communication, Information Technology and Digital, Ministry of Energy and Mineral Resources, Ministry of Environment and Forestry and Ministry of State-Owned Enterprises also supporting the innovation, regulation and infrastructure to accelerate digitalization in Mining sector. To support infrastructure, the Ministry collaborates with relevant stakeholders to improve digital connectivity in remote mining regions, ensuring reliable access to high-speed networks such as private LTE and 5G. We also facilitate pilot programs and innovation hubs where mining companies can test and develop smart mining technologies, supported by government incentives and grants. Additionally, the Ministry works closely with educational institutions, incubate Local start up and

	support industry players to develop skill development programs that prepare the workforce for digital transformation. By combining policy support, infrastructure development, and capacity building, the Ministry aims to create an ecosystem conducive to rapid and sustainable digital innovation in the mining sector."
Legal	• Are there any legal or regulatory barriers (e.g., data protection, cybersecurity laws) that might impact the deployment of digital technologies in mining? • Yes, there are several legal and regulatory considerations that can impact the deployment of digital technologies in the mining sector. First, data protection and sovereignty laws, especially Government Regulation No. 71/2019 (PP71), require that critical operational data, particularly those related to national resources and worker safety be stored and processed within Indonesia. This means mining companies and service providers must ensure compliance with local data residency, which can complicate cloud deployments if offshore solutions are used. Second, cybersecurity regulations mandate strict protection measures to safeguard critical infrastructure from cyber threats. Mining operations, given their strategic importance, fall under heightened scrutiny, requiring robust security frameworks and certifications (such as ISO 27001). Third, evolving environmental and safety regulations may require digital systems to support real-time monitoring, reporting, and compliance, adding complexity to system design and implementation. Lastly, the interplay of regulations across multiple ministries including Industry, Resources & Energy, and State-Owned Enterprises means that digital projects often require navigating overlapping permits, standards, and compliance audits. While these legal frameworks aim to protect national interests and promote safety, they also present challenges that companies and vendors must carefully manage to successfully deploy advanced digital solutions in mining.
Environmental	• How do environmental regulations and sustainability goals influence the direction of digital transformation in the industrial sector?

	• Environmental regulations and sustainability goals are major drivers shaping the digital transformation of Indonesia's industrial sector. Increasingly stringent regulations around emissions, waste management, and resource use require industries to adopt real time monitoring and reporting systems. Digital technologies such as IoT sensors, data analytics, and AI help companies track environmental performance accurately and comply with regulations. Sustainability goals, aligned with global standards like GRI and ISO 14001, push industries to enhance transparency and reduce their carbon footprint. This encourages the adoption of energy-efficient technologies, smart mining processes, and automated environmental compliance tools. Furthermore, digital transformation enables better resource optimization and circular economy practices, supporting long-term sustainability. Overall, environmental and sustainability imperatives steer industries toward integrated digital solutions that not only ensure regulatory compliance but also promote competitive advantage through responsible and efficient operations.
--	--

Respondent: Customer Mining Digitalization Expert – Digitalization & System Integration Manager

PESTLE Factor	Questions
Political	• How does government engagement (e.g., policies, incentives) affect your company's decision to adopt or scale digital solutions from providers like Telkomsel?
	• Government engagement plays a significant role in shaping our digital transformation decisions. Policies such as the Making Indonesia 4.0 roadmap and regulations on data sovereignty (PP71) provide clear frameworks and incentives that encourage us to prioritize digital adoption, particularly with providers who can demonstrate compliance and alignment with these regulations. Incentives like tax breaks, grants, or support for innovation lower our financial barriers and accelerate investment in advanced technologies. Moreover, when providers like Telkomsel actively engage with government bodies and align their solutions to national priorities such as ESG compliance,

	local content requirements (TKDN), and connectivity in remote areas, it builds our confidence in their offerings and long-term viability. Overall, government policies and incentives serve as both enablers and risk mitigators, influencing us to adopt scalable, compliant digital solutions that support our operational and sustainability goals.
Economic	• What financial or economic considerations most influence your company's investment in digitalization technologies?
	• The financial and economic factors guiding our digital technology investments are multifaceted. Primarily, return on investment (ROI) and total cost of ownership (TCO) are critical. We need clear evidence that digital solutions will give real impact and benefit, improve productivity, operational efficiency, reduce downtime, or lower maintenance costs within a reasonable payback period. Capital expenditure (CAPEX) budgets are often tight, so we look favourably on solutions that offer flexible financing models, such as subscription based, lease base or OPEX structures, which spread costs over time and reduce upfront investment burdens. Additionally, commodity price volatility directly impacts our cash flow and investment appetite; during downturns, we tend to delay discretionary digital projects. We also consider risk mitigation, ensuring technologies enhance safety and regulatory compliance, which can prevent costly incidents or fines. Lastly, alignment with government incentives and local content (TKDN) requirements can influence decision-making by improving cost effectiveness and supporting compliance. In summary, we carefully balance cost, value, and risk when deciding on digitalization investments.
Social	• How receptive are your operational teams and workforce to changes brought by digital systems and automation?
	• The receptiveness of our operational teams and workforce to digital systems and automation varies but is generally improving. Initially, there is natural resistance due to concerns about job security, unfamiliar technology, and changes to established workflows. Some employees may feel uncertain about how automation impacts their roles. However, through effective change management programs, training, and clear communication, we have been able to build greater awareness of the benefits such as enhanced safety, reduced manual effort, and improved decision-

	making support. We actively involve the workforce early in pilot projects and provide continuous upskilling opportunities, which helps ease transitions and gain their trust. Overall, while challenges remain, the growing recognition of digital tools' positive impact is increasing acceptance and enthusiasm across our teams.
Technological	• What are the main technological requirements or challenges when integrating Telkomsel's digital solutions into your mining operations?
	• Integrating Telkomsel's digital solutions into our mining operations involves several key technological requirements and challenges. Firstly, ensuring reliable connectivity in remote and Harsh environments is critical. Mining sites are often located in areas with limited infrastructure, so solutions like private LTE and satellite links must be robust and resilient. Secondly, compatibility and integration with existing legacy systems such as SCADA, PLC, ERP is a major consideration. Our operations rely heavily on these systems, so seamless interoperability is essential to avoid disruption. Thirdly, data security and compliance with regulations like data sovereignty laws require that data handling and storage meet strict standards, which adds complexity to system design. Additionally, scalability and flexibility are important so that solutions can evolve with changing operational needs without requiring costly overhauls. Lastly, user-friendliness, training, after sales support are necessary to ensure our workforce can effectively adopt, utilize and manage these digital tools. Addressing these requirements and challenges collaboratively with Telkomsel helps us maximize the value of digital transformation in our operations.
Legal	• What legal concerns (e.g., data sharing, licensing, compliance) must be addressed when partnering with digital solution providers?
	• When partnering with digital solution providers, several legal concerns must be carefully addressed to protect our operations and comply with regulations. First, data sharing and privacy is paramount. We must ensure that any data collected, whether operational, environmental, or workforce-related is handled securely and in accordance with Indonesia's data protection laws and regulations like PP71/2019. This includes clear agreements on data ownership,

	usage rights, and protection measures. Second, licensing and intellectual property rights need to be clearly defined, specifying who owns the software, analytics, and any custom-developed solutions, as well as the terms for usage and updates. Third, regulatory compliance with mining, environmental, labour, and cybersecurity laws must be embedded in the solution design and delivery to avoid legal risks and ensure audit readiness. Fourth, contractual terms around service levels, liability, and dispute resolution are critical to manage risks related to system downtime, data breaches, or performance failures. Lastly, compliance with local content requirements (TKDN) and procurement regulations must be factored into vendor selection and contracting. By addressing these legal concerns upfront, we ensure smooth collaboration, safeguard our interests, and maintain regulatory compliance throughout the partnership.
Environmental	• How do your environmental commitments drive the need for or shape the adoption of digital technologies in your mining processes?
	• Our environmental commitments are a major factor driving the adoption of digital technologies in our mining operations. We face increasing regulatory requirements and stakeholder expectations to reduce emissions, manage water usage, monitor biodiversity, and ensure sustainable practices. Digital technologies like real-time environmental sensors, IoT monitoring, and advanced analytics enable us to track key environmental indicators accurately and transparently. These tools support proactive management and allowing us to detect issues early, optimize resource use, and generate reliable reports for regulatory compliance and ESG disclosures. Moreover, embracing these technologies aligns with our corporate sustainability goals and strengthens our social license to operate. In short, our environmental commitments not only motivate digital adoption but also shape the selection and design of solutions that deliver measurable sustainability outcomes.

Respondent: Vice President (VP) B2B of Sales

PESTLE Factor	Interview Details
Political	How do government and regulatory in mining industry, telecommunication and digitalization policies influence your sales strategy in the B2B Mining segment?
	"Government policies are absolutely central to how we craft our B2B sales strategy in mining. For instance, the government is pushing hard on down streaming the mining & mineral industry, they want local smelters and mineral processing, not just raw exports. That's a huge opportunity for us to offer digital solution like private LTE, IoT, and smart analytics to these new facilities, which are more open to digital from day one. Then there's Industry 4.0, the Ministry of Industry and ESDM are encouraging mines to modernize with smart safety systems, energy tracking, and digital twins. So, we bundle sensor-based solutions and compliance tools directly into our pitches. Of course, we can't ignore worker safety and labour rules, like fatigue monitoring and PPE compliance. We partner with certified safety tech firms to meet those mandates while respecting privacy and local labour sensitivities. On the telecom side, private LTE licensing from Komdigi is a must. We help mines secure legal spectrum use and position ourselves as the go to partner for that connectivity. And finally, data sovereignty is huge, with PP71, mining clients want their data stored locally. We lean on Telkom Group's local cloud or International Hyperscale's that already build their Datacentre in Indonesia and edge infrastructure to meet those needs. To Put it simply: regulations shape everything in our business, what solutions we sell, how we bundle them, and even how we position value in mining. So, we make sure our offers are meet the compliance, local content, and support directly to what the government is pushing for."
Economic	1. In what ways have recent macroeconomic trends (inflation, global mining & mineral price, mining sector investments, global tax and etc) impacted your B2B digital segment mining revenue performance and forecasts?
	Currently, macroeconomic factors are definitely shaping how we sell and deliver digital solutions to the mining sector. Let me break it down:

	• Inflation and currency fluctuations have made imported IoT hardware more expensive. Mining clients are cautious with big upfront investments, so we're shifting to OPEX's based models like managed services and subscriptions to make it easier for them to adopt digital solutions without heavy CAPEX. • Volatile global mining and mineral prices, especially for nickel and coal, mean some mining projects get delayed or accelerated. Our focus is on Tier-1 mining clients and modular deployments, so they can scale up when the market is strong but not overcommit if prices drop. • On the flip side, government driven down streaming investments like building smelters are fuelling new digital infrastructure needs. These greenfield projects are perfect for private LTE, IoT, and AI deployments, and we're seeing strong demand here. • Finally, there's a big push around ESG compliance and global tax pressures. Mining clients want to track carbon, water, and safety in real time to meet global standards. That's why we're offering ESG compliance Toolkits bundled with IoT sensors, cloud analytics, and emissions dashboards. All of this means that while some projects may slow down due to economic headwinds, there's still strong upside for digital solutions tied to ESG, down streaming, and productivity. So, we're adapting our offers, focusing on long term, regulation driven opportunities, and helping mining clients stay compliant and competitive even in a volatile market."
--	--

Respondent: Vice President (VP) of B2B Digital Product Management and Development

PESTLE Factor	Questions
Technological	• What are the key technological enablers or barriers in developing digital solutions tailored for the mining industry? • For mining, the key enablers are reliable connectivity like Public LTE & private LTE, rugged IoT devices that can handle harsh environments, centralized Platform and advanced AI and analytics that turn data into actionable insights. On the other hand, barriers include integrating with legacy systems that many mines still use, navigating data sovereignty and cybersecurity regulations, and the complexity of deploying tech in remote locations.

	We focus on overcoming these barriers by building flexible & modular solutions even by staging and partnering closely with clients and technology principal & partners to ensure smooth integration and compliance.
Legal	• How do current and upcoming digital compliance and data privacy regulations affect the product lifecycle and feature development process?
	• Compliance and data privacy regulations like PP71 really shape how we design and develop our products. From the start, we build in data sovereignty, ensuring data is stored and processed locally, which adds complexity but is essential for trust. These regulations mean we have to work closely with legal and security teams throughout the product lifecycle to make sure features meet strict privacy and cybersecurity standards. It can slow down development somewhat because we need extra testing and certification steps, but it also pushes us to create more secure, reliable solutions that clients can confidently use. Overall, these rules are an important driver for innovation, making us build products that not only perform well but also protect client data and meet regulatory requirements.

Respondent: Vice President (VP) of Enterprise Product Enablement and Solutions

PESTLE Factor	Interview Details
Economic	• How do shifts in mining companies' capital expenditures affect your product enablement priorities and customer solutions roadmap?
	• Shifting in mining companies' capital expenditures have a direct impact on how we prioritize our product development and customer solutions. When clients CAPEX budgets tighten, clients tend to delay large upfront

	investments in new technology. In response, we shift focus to flexible, Leasing based, OPEX-based solutions like subscription services and managed offerings that reduce upfront costs and event offer revenue sharing. We also emphasize modular, scalable products that allow clients to start small and expand their digital footprint as budgets allow. This approach keeps our solutions accessible and aligned with client financial cycles, while still delivering value and positioning us for growth when investment picks up again. So, our roadmap is designed to be adaptive, balancing innovation with affordability to meet fluctuating CAPEX trends in the mining sector.
Environmental	• To what extent do sustainability goals and environmental pressures shape the features of enterprise digital solutions? • Sustainability and environmental pressures from government and global regulations are shaping our solutions more and more every day. Mining clients are under growing regulatory and investor pressure to track emissions, manage water use, water & waste treatment and reduce environmental impact. This drives us to develop features like real-time environmental monitoring sensors, emissions and carbon footprint dashboards, and automated compliance reporting. We also focus on energy-efficient connectivity and computing solutions to help reduce the carbon footprint of digital operations. Overall, sustainability isn't just a nice-to-have, it's a core part of how we design and prioritize features, ensuring our clients can meet their ESG goals while improving operational efficiency.

Respondent: General Manager (GM) of Enterprise Product Strategy, Partnership and Performance

PESTLE Factor	Interview Details
Economy	• How does the national digital economy agenda influence your enterprise product partnership decisions with mining companies?

	• The national digital economy agenda, especially Indonesia's push for Industry 4.0 by the Making Indonesia 4.0 roadmap, Indonesia mining downstream program, Indonesia data sovereignty and Indonesia sustainability and ESG program has a significant impact on how we approach our enterprise product partnerships, particularly in the mining sector. Firstly, this agenda encourages us to align our solutions with national priorities, such as digital transformation, sustainability, and regulatory compliance. For instance, the push for data sovereignty and environmental accountability influences our choice of partners who can provide secure, locally compliant cloud infrastructure and green technology solutions. It also pushes us to collaborate with innovative technology providers and industry leaders to build smarter, more integrated solutions that meet both local and global standards for efficiency, safety, and sustainability in mining operations. Furthermore, the government's focus on improving digital infrastructure and fostering ecosystem partnerships within sectors like mining opens new opportunities to partner with public and private organizations to scale up digital adoption, create value through automation, and improve mining sector productivity. In essence, the national digital economy agenda guides us to build partnerships that not only align with our clients' digital needs but also contribute to the broader development goals of the country, ensuring that we remain competitive, compliant, and forward-looking in the mining industry.
Technological	• What role does innovation in network, IoT technologies, and AI play in aligning product strategy with the mining sector's digital transformation? • Innovation in network, IoT, and AI technologies is absolutely central to aligning our product strategy with the mining sector's digital transformation. For the mining sector, reliable and high-performance network infrastructure like private LTE and 5G is the backbone of everything from remote monitoring to autonomous vehicles. These innovations enable the seamless and low latency connectivity required to support IoT devices and real-time data analytics. IoT technologies allow us to integrate sensors, wearables, and smart equipment that provide crucial operational insights, such as predictive maintenance, safety monitoring, and resource optimization. These technologies are integral to creating smart mining solutions that improve efficiency, reduce downtime, and ensure

	worker safety, which are key goals for the industry’s digital transformation. Our focus on innovative IoT enabled platforms, which integrate with advanced AI analytics, ensures that our solutions can help mining companies move towards fully automated and data-driven operations, aligning with their need for operational excellence and sustainability. So, innovation in network, IoT, and AI technologies doesn’t just enable digital transformation but it’s the core of how we tailor our solutions to address mining sector challenges and support clients on their journey towards smart and sustainable operations.
--	--

Respondent: General Manager (GM) of Enterprise Customers Solutions Management

PESTLE Factor	Interview Details
Social	• How do differences in regional workforce readiness and digital culture among mining clients affect solution deployment? Differences in regional workforce readiness and digital culture significantly influence how we approach solution deployment for mining clients. In regions where the workforce has higher digital literacy and familiarity with technology, adoption tends to be faster and smoother, allowing us to implement advanced solutions with less resistance and well cooperation Conversely, in areas with limited digital experience or where traditional practices prevail, we often face challenges such as reluctance to change, need for more comprehensive training, and longer onboarding periods. To address this, we tailor our deployment plan by providing localized training programs, change management support, and sometimes starting with pilot projects to build confidence. Understanding and adapting to these cultural and readiness differences is essential to ensure successful adoption and maximize the value of our digital solutions across diverse mining operations.

Legal	• How do mining safety regulations or telecommunication licensing policies affect the customization of your enterprise solutions?
	Mining safety regulations and telecommunication licensing policies play a crucial role in shaping how we customize our enterprise solutions. Safety regulations mandate features like worker tracking, fatigue monitoring, and real-time hazard alerts, so our solutions must integrate these capabilities to ensure compliance and enhance operational safety. Meanwhile, telecommunication licensing policies, especially regarding private LTE spectrum usage and data sovereignty laws, require us to design network architectures that comply with legal standards often involving licensed frequencies and local data storage. These regulatory requirements mean we tailor each solution not only to operational needs but also to legal frameworks, ensuring our clients meet compliance while benefiting from advanced digital capabilities. Our close collaboration with regulatory bodies and clients helps us stay ahead in aligning customization with evolving rules, minimizing deployment risks and supporting sustainable operations.

Respondent: General Manager (GM) of B2B Corporate Business Strategy Development

PESTLE Factor	Interview Details
Environmental	• How are ESG standards and environmental regulations influencing long term strategic planning for Telkomsel's B2B digital solutions?
	• ESG standards and environmental regulations are increasingly shaping Telkomsel's long-term strategic planning for our B2B digital solutions. We recognize that mining and other heavy industries face growing pressure from regulators, investors, and communities to demonstrate sustainability and environmental responsibility. As a result, our product roadmap integrates features that support real time environmental monitoring, emissions tracking, carbon tracking, energy monitoring and automated compliance reporting, helping clients meet ESG mandates efficiently.

	Moreover, we prioritize partnerships and technologies that enhance energy efficiency and reduce carbon footprints, aligning our solutions with broader sustainability goals. Strategically, embedding ESG considerations helps us stay relevant, open new market opportunities, and position Telkomsel as a responsible, forward-looking partner for our clients' digital transformation journeys.
Social	• What social shifts (e.g., workforce automation concerns, digital inclusion) are most relevant to your corporate digital strategy in the mining industry? • Several social shifts significantly influence our corporate digital strategy in mining. Workforce automation concerns are top of mind. While automation improves safety and efficiency, it raises questions about job displacement. We focus on solutions that augment human work, providing digital tools and training to help workers transition and upskill rather than replace them outright. Second, digital inclusion is critical. Mining operations often span remote areas with limited connectivity, so ensuring access to reliable communication and digital services for all workers including contractors and local communities is a priority. Then, growing emphasis on health, safety, and wellbeing drives demand for wearables, fatigue monitoring, and real-time alerts, which support safer workplaces and meet regulatory standards. Community engagement and sustainability awareness are increasingly important. Our digital solutions support transparent reporting and communication that help mining companies maintain social licenses to operate. By addressing these social factors, Telkomsel's digital strategy not only drives operational gains but also fosters responsible and inclusive mining practices."

Appendix B Interview with Key informants - Porter's Five Forces

Study Title: Business Strategy of B2B Digital Solution of Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry.

Sub-study: Exploration of Telkomsel B2B Digital Solution Strategy in Indonesia Mining Industry.

Interview Instrument: Porter's Five Forces

Respondent: Expert Staff on Digitalization – Ministry of Industry (Kemenperin) & Digital Task Force of Ministry of Stated Owned Enterprise

Porter's 5 Force	Interview Details
Competitive Rivalry	• How would you describe the current level of competition among digital solution providers in Indonesia's industrial sector, particularly in mining?
	• The competition among digital solution providers in Indonesia's industrial sector, especially in mining, is increasingly intense and dynamic but still fair and positive. We see a diverse of players from traditional telecommunications companies and global technology vendors to specialized local system integrators and innovative startups, all competing to capture a share of this rapidly growing market. Mining companies demand highly reliable, customized, and integrated digital solutions that cover connectivity, IoT, automation, and data analytics, raising the bar standard for solution quality and innovation. This competitive environment drives providers to continuously innovate, form strategic partnerships, and offer flexible commercial models to meet the complex needs of mining clients. At the same time, the government's push for Industry 4.0 and sustainable mining practices creates both opportunities and pressure for providers to align with national priorities, compliance standards, and local content requirements. Overall, the competitive landscape fosters innovation and growth but also requires solution providers to maintain strong local presence, deep industry expertise, and robust ecosystems to succeed.

Supplier Power	• From a regulatory viewpoint, how much influence do digital technology vendors have in setting terms, pricing, and innovation pace in mining industrial solutions?
	• From a regulatory perspective, digital technology vendors hold significant but balanced influence in shaping terms, pricing, and the pace of innovation in mining industrial solutions. Vendors drive innovation by introducing new technologies and solutions that can improve productivity, safety, and sustainability, which regulators actively encourage to meet national digitalization and local content goals. However, pricing and contractual terms are often subject to procurement regulations, especially in state-owned enterprises and industries with strong government oversight like mining. These rules ensure transparency, fair competition, and alignment with local content requirements (TKDN). Regulators also set standards on interoperability, data sovereignty, and cybersecurity, which guide how vendors design solutions and innovate within the legal framework. Ultimately, while vendors push technological advancements and commercial models, their influence is moderated by regulatory policies to ensure solutions are compliant, equitable, and support national industrial development objectives.
Buyer Power	• To what extent do large mining companies have bargaining power in influencing the scope and customization of digital solutions?
	• In General, Mining Sectors still one of the biggest GDP contributors, also one of the biggest tax contributors as well, the capital investment in mining also very huge and absorb a lot of labours. Furthermore, Large Mining companies in Indonesia also possess significant bargaining power when it comes to shaping the scope and customization of digital solutions. Due to their scale of operations and capital investment, they represent high-value clients whose requirements strongly influence solution design. Vendors often tailor products to meet their specific operational challenges, such as remote connectivity, production and operational monitoring, safety monitoring, and regulatory compliance. Furthermore, these companies typically engage in long procurement cycles and require strict adherence to standards and local regulations, pushing providers to offer flexible, scalable, and highly customized solutions.

	Their bargaining power is also supported by their ability to leverage multisite deployments and volume purchasing, which gives them negotiating leverage on pricing and service levels. Overall, large mining firms are key drivers of innovation and customization in the digital solutions market, and vendors must align closely with their evolving needs to remain competitive."
Threat of Substitution	• What is your assessment of the risk that traditional or alternative (non-digital) methods still pose to the adoption of digital transformation in mining operations? • Traditional or non-digital methods still present a notable risk to the adoption of digital transformation in mining operations, but this risk is gradually diminishing. While Mining Industry absorb a lot of labours, Automation and digitalization seen as a substitute of the labours, but in fact the automation and digital develop to increase productivity but not replace the labours. Many mining operations, especially in more remote or smaller sites, continue to rely on manual processes, paper-based reporting, and legacy equipment. This can lead to resistance to change, slower decision-making, and reduced data accuracy. Additionally, workforce challenges such as limited digital literacy and skepticism about new technologies contribute to the persistence of traditional methods. However, the increasing regulatory pressure for safety, environmental compliance, and operational productivity (Target) & efficiency, combined with competitive pressures, is pushing the industry toward embracing digital tools. To mitigate these risks, comprehensive change management, workforce upskilling, and pilot projects are essential to demonstrate tangible benefits and build trust. In summary, while traditional methods remain a barrier in some contexts, ongoing efforts by government, industry, and technology providers are successfully encouraging the shift toward digital transformation in mining.
Threat of New Entry	• How easy or difficult is it for new digital solution players, including startups, to enter and compete in the mining technology sector in Indonesia?

	• Entering and competing in Indonesia’s mining technology sector presents both opportunities and significant challenges for new digital solution players, including startups. On one hand, the sector’s growing digitalization creates demand for innovative solutions, giving startups a chance to introduce disruptive technologies like AI, IoT, and advanced analytics. However, the mining industry is highly capital intensive and regulated, with complex procurement processes that Favor established vendors with proven track records and offer commercial flexible models. New entrants often face barriers such as stringent local content requirements (TKDN), data sovereignty laws, and the need to comply with multiple overlapping regulations from different ministries. Moreover, building trust and long-term relationships with large mining companies takes time, which can slow startups’ market penetration. To succeed, new players typically need to partner with established firms, demonstrate strong technical capabilities, and align their solutions with national digital and environmental priorities. In summary, while opportunities exist, startups and new entrants must navigate a challenging landscape that demands strategic partnerships, compliance readiness, and patience.
--	---

Respondent: Customer Mining Digitalization Expert – Digitalization & System Integration Manager

Porter’s Force	Questions
Competitive Rivalry	• How do you evaluate the competition between digital solution providers (like Telkomsel, others) in terms of features, support, and pricing?
	• The competition among digital solution providers in the mining sector is quite dynamic, and we evaluate them based on several key factors. First, features and technology capabilities are critical. We look for providers offering integrated solutions that combine reliable connectivity, IoT sensors, data analytics, and automation tailored

	specifically to our mining operations. Second, support and service quality are very important, especially given the remote and challenging environments of mining sites. Providers like Telkomsel who offer dedicated account management, fast response times, and strong local presence and local technical support score highly in this area. Pricing is also a key consideration, but we balance cost against the total value delivered. Providers offering flexible commercial models, such as usage-based pricing or managed services, help us manage budgets better. Overall, we prefer partners who demonstrate a good mix of robust technology, proactive support, and fair, transparent pricing aligned with our operational needs and strategic goals.
Supplier Power	• To what extent can vendors of digital platforms dictate integration standards, pricing, or service levels in your mining operations?
	• Vendors certainly play an important role in shaping integration standards, pricing, and service levels, but the influence is balanced by our operational requirements and governance. When it comes to integration standards, we expect vendors to adhere to industry best practices and ensure compatibility with our existing systems like SCADA, PLC, Platform and ERP. However, we retain control over defining interoperability requirements to maintain operational continuity. Regarding pricing, while vendors propose their commercial terms, we negotiate to align with our budget cycles and financial constraints. We prefer flexible models such as usage-based pricing or managed services that reduce upfront capital expenditure. For service levels, we set strict SLAs focusing on uptime, response times, and support availability, given the critical nature of mining operations that operate continuously for 24 hours and 365 days a year. Vendors must meet these standards or risk penalties. Ultimately, successful partnerships depend on vendors' ability to be adaptable and responsive to our needs, while we ensure compliance with our strategic and operational frameworks.
Buyer Power	• How much influence does your company have in negotiating terms, customization, and support from B2B digital solution providers?

	• Our company holds significant influence when negotiating terms, customization, and support with B2B digital solution providers. Given the scale of our operations and long-term digital transformation plans, providers recognize us as strategic partners and are usually willing to tailor solutions to our specific operational and regulatory needs. We negotiate customized network setups, IoT integrations, and analytics dashboards that align with our KPIs, safety standards, and environmental compliance. In terms of contracts, we push for clear Service Level Agreements (SLAs) that guarantee uptime, response times, and dedicated support teams. Furthermore, our procurement processes especially for large-scale projects and multisite allow us to influence pricing models, including volume discounts, multi-year commitments, and flexible billing. Overall, our position as a major client gives us strong leverage to shape the solution design and service delivery to fit our unique requirements.
Threat of Substitution	• Are there traditional or alternative technologies that your company still considers viable instead of adopting full digital solutions? Why or why not? • While we are strongly committed to digital transformation, certain traditional or alternative technologies remain viable in specific contexts. For example, in very remote or harsh environments where connectivity infrastructure is limited, we may still rely on manual monitoring, paper-based reporting, or basic radio communications as a fallback or interim solution. Additionally, some legacy systems like SCADA and certain control systems continue to function reliably and are deeply integrated into our operations, so replacing them requires careful planning. However, these traditional technologies often lack the real-time remote data visibility, predictive capabilities, and automation benefits that digital solutions provide. Therefore, while we may maintain certain non-digital or hybrid approaches for operational continuity or cost reasons, our overall direction is toward full digital integration to enhance safety, efficiency, and compliance. The goal is to phase out legacy methods as digital infrastructure and workforce readiness improve.

Threat of New Entry	• What is your view on the potential of new digital entrants disrupting or offering better solutions in the mining sector in the near future?
	• I believe new digital entrants bring both opportunities and challenges to the mining company like us. On the positive side, startups and innovative tech companies often introduce cutting edge technologies like AI-driven analytics, advanced IoT devices, or blockchain for supply chain transparency that can significantly enhance productivity, efficiency and safety. Their agility allows them to experiment and iterate rapidly, potentially offering more tailored or cost-effective solutions compared to established vendors. However, mining is a complex, capital intensive, and highly regulated industry. New entrants face challenges in understanding operational realities, meeting stringent compliance requirements, and scaling solutions across diverse, remote sites. To succeed, they need to build trust, demonstrate proven performance, and often collaborate with established players or integrators. In summary, new digital entrants have strong potential to disrupt, but their impact will depend on their ability to navigate industry complexities and align with mining companies' strategic priorities.

Respondent: Vice President (VP) B2B of Sales

Porter's 5 Force	Interview Detail
Buyer Power	1. How do mining clients influence pricing, customization, and contract terms in your B2B sales process?
	Mining clients have a huge influence over how we sell digital solutions. First, they're big volume buyers with high buying power. Because they operate large scale sites and need constant connectivity even in remote areas, they have strong leverage to push for volume discounts because the pricing scheme in remote area would be high, long term pricing stability, and bundled deals.

	Second, mining is a tough environment, so standard solutions won't work. Clients want customized setups and industrial grade, like private LTE networks, rugged IoT devices, and dashboards tailored to mining KPIs like productivity, safety, equipment uptime and etc. This pushes us to cocreate solutions and be really flexible. Third, their procurement and contracts are strict. Mining companies usually want multiyear deals to ensure stability. They demand tight SLAs for uptime and rapid support, and they might ask for usage-based billing or revenue sharing to match project phases. At Telkomsel, we're ready for this. We assign dedicated Key Account Managers who know mining inside-out. We tailor solutions, and we partner with system integrators and tech vendors to deliver a full package solution. Plus, we're investing in flexible pricing and delivery models to stay competitive and meet their needs. So, while mining clients have a lot of bargaining power, we see it as an opportunity. Their demands push us to innovate and deliver integrated, high-value solutions that go way beyond connectivity."
Competitive Rivalry	1. How intense is the competition among digital solution providers in the mining sector, and how does it affect your sales strategy?
	The competition in the mining sector for digital solutions is definitely intense. We're seeing local telco providers like Indosat and XL pushing hard, while global players like Hexagon, Aveva, Huawei and niche mining tech firms are also very active. Even satellite providers like Starlink are getting into the mix with connectivity for remote sites. This competitive pressure shapes how we approach the market in a few keyways. First, we're moving beyond just selling connectivity. We focus on value-based selling, showing how we can improve productivity, efficiency, safety and ESG compliance. Mining clients want partners who can tailor solutions for their specific sites and needs, not just sell them data plans. We also emphasize deep customization and co-creation. We're building solutions with mining clients, integrating IoT, analytics, and rugged devices in ways that match their workflows. That's something not every player can do. Because mining deals are complex and clients are very demanding, we also deploy specialized account teams who really understand mining—people who can talk to the engineers and operations managers, not just procurement. Finally, we're adopting more flexible commercial models, like leasing, managed services, usage-based pricing and even revenue sharing, because mining companies often face commodity price swings and want flexibility in how they buy and deploy digital solutions.

	The intense competition pushes us to be more consultative and more innovative, making sure we're truly delivering solutions that align with mining operations, not just selling technology."
--	--

Respondent: Vice President (VP) of B2B Digital Product Management and Development

Porter's Force	Interview Detail
Threat of Substitution	• What alternative technologies or internal IT developments by mining clients could substitute Telkom's digital offerings? • "That's an important question. Some mining clients are investing in their own private networks using wifi mesh or point to point radio or in-house IoT platforms, aiming to control their data and reduce vendor reliance. Others might explore open-source or cloud-based solutions from global hyperscalers to build customized analytics and AI capabilities internally. There's also growing interest in satellite connectivity alternatives, like Starlink, especially for remote sites. While these alternatives exist, what sets Telkom apart is our deep local experience, customer after sales & support spread across the country, integrated end-to-end services, and compliance with Indonesian regulations, things that can be challenging for clients to replicate on their own. So, while internal developments and alternatives are a factor, many clients still prefer partnering with a trusted provider like Telkom to reduce the investment cost, time and people internally, to manage complexity and ensure reliability."
	• How dependent is Telkom on third-party platforms, devices, or infrastructure for developing its mining solutions?

Supplier Power	- While Telkomsel has strong core capabilities, like our private LTE network and local cloud infrastructure, we do also rely on third party partners to collaborate for certain specialized devices, IoT sensors, and advanced analytics tools. These partnerships are essential because they allow us to offer comprehensive, best in class solutions without reinventing the wheel. For example, rugged sensors or mining-specific analytics often come from trusted vendors we integrate with. At the same time, we maintain tight control over integration, security, and service quality, ensuring the overall solution meets the standards and client expectations. - So, it's a collaborative ecosystem, with Telkomsel as the central integrator and trusted partner for mining clients.
-----------------------	---

Respondent: Vice President (VP) of Enterprise Product Enablement and Solutions

Porter's 5 Force	Interview Details
Threat of New Entry	How do you assess the risk of new entrants, such as startups, local or global tech players, entering the mining digital solutions market? - We take the entry of startups, local and global tech players seriously, they bring fresh innovation and can move quickly, which challenges us to stay agile. Startups and local tech player often focus on niche solutions like specialized AI, system integrator or sensor tech that can disrupt parts of the market. Global tech players have vast resources and advanced platforms that can appeal to some clients. However, Telkomsel's deep local experience, trusted client relationships, and integrated end-to-end solutions, and flexible business model give us a strong competitive advantage. We also work closely with partners, including startups and global firms, to collaborate rather than compete head-on. So, while new entrants increase competition, they also push us to innovate and strengthen our ecosystem, helping us maintain leadership in Indonesia's mining digital space.

Buyer Power	• How demanding are mining enterprises regarding solution integration, support services, and innovation delivery?
	• Mining enterprises are extremely demanding when it comes to integration, support, and innovation. They operate in complex, high-risk environments where downtime can be very costly. So, they expect seamless integration of new digital solutions with their existing legacy systems, and they need those solutions to work reliably from day one. Support services have to be responsive and proactive, mostly requiring 24/7 availability given remote locations and critical operations adjust to their operational working hours (24 hours continuous operation), and often necessary to deploy representative engineer on site to be stand by follow client's schedule. On innovation, mining clients want partners who continuously improve and adapt solutions whether through AI-driven analytics, new IoT devices, or automation features—to keep pace with evolving operational and regulatory needs. Meeting these demands means we have to be highly agile, deeply knowledgeable, and consistently focused on delivering real business value.

Respondent: General Manager (GM) of Enterprise Product Strategy, Partnership and Performance

Porter's 5 Force	Interview Details
Supplier Power	• How do partnerships with technology vendors or infrastructure providers affect your ability to deliver competitive value?
	• Partnerships with technology vendors, principals and infrastructure providers are crucial to our ability to deliver competitive value in the market. These partnerships extend our capabilities by giving us access to cutting edge technologies, whether it's IoT sensors, advanced analytics platforms, or cloud infrastructure. This allows us to offer

	a more comprehensive, end to end solution to our clients, ensuring we meet all their digital transformation needs. Partnering with reliable infrastructure providers like cloud services or network specialists ensures we have the scalability, security, and performance needed for large-scale deployments, especially in remote or challenging environments like mining. Moreover, these alliances help us accelerate innovation, keeping us ahead of competitors who may not have the same breadth of partnerships. It enables us to offer modular, customizable solutions faster, while ensuring high quality service and quick time to market. Overall, our technology partnerships help us offer best in class solutions, provide unmatched service reliability, and stay agile in a competitive market, which directly drives value for our clients.
Competitive Rivalry	• What key strategies help Telkomsel stay ahead in the digital B2B space for mining compared to its competitors? • Telkomsel has several key strategies that help us stay ahead in the digital B2B space, especially in mining, where the competition is increasing. First, our deep industry expertise and local presence give us a strong competitive edge. We understand the unique challenges of the mining sector such as remote area operations, regulatory compliance, and safety concerns which allows us to tailor our solutions effectively and develop trusted, long-term relationships with clients. Second, we focus on end to end, integrated solutions. Unlike many competitors who provide fragmented services, Telkomsel combines connectivity, IoT, Edge computing, AI analytics, and cloud infrastructure into a seamless offering. This makes it easier for mining companies to adopt and scale digital transformation without the complexity of dealing with multiple vendors. Third, our strategic partnerships with global and local technology vendors, system integrators, and infrastructure providers enable us to deliver cutting-edge solutions faster and more efficiently. These collaborations also allow us to co-innovate and stay at the forefront of technological advancements, particularly in areas like predictive maintenance, autonomous systems, and environmental monitoring. Lastly, we prioritize customization and flexibility. We understand that mining operations are unique and often require tailored solutions. Our ability to design and implement modular, staging, and scalable solutions that can evolve with our clients' needs helps us maintain strong, adaptable value propositions. By focusing on innovation, industry specific

	solutions, and strong partnerships, Telkomsel continues to deliver unparalleled value and maintain a leadership position in the mining sector's digital transformation.
--	---

Respondent: General Manager (GM) of Enterprise Customers Solutions Management

Porter's 5 Force	Interview Details
Threat of Substitution	• Are clients exploring substitutes such as in-house digital transformation teams or international platforms instead of Telkomsel's solutions? Yes, some clients are exploring alternatives like building in-house digital teams or using international platforms, but this comes with challenges. In house teams offer control and customization but require significant investment in labour quantity and skills, technology, and ongoing maintenance, which many mining companies find resource intensive. International platforms may provide advanced features but often face hurdles related to local data regulations, integration with Indonesian infrastructure, and lack of localized support. Telkomsel's advantage lies in our deep local presence, regulatory compliance, tailored solutions, and strong support network, which many clients find difficult to replicate with substitutes. We continue to focus on partnering closely with clients, offering flexible, integrated solutions that complement their capabilities rather than compete directly.
Buyer Power	• What negotiation patterns do mining clients commonly exhibit that affect your solution delivery? Mining clients typically exhibit strong negotiation patterns due to their large-scale operations, multi-site or location and strategic importance. Even They have high buying power and capital, but they often demand volume discounts and long-term pricing stability because their projects span multiple sites and require extensive connectivity and digital services. Clients also seek customized solutions tailored to their specific operational and safety needs, which can extend

	the pre-sales and design phases. Procurement processes are usually rigorous and involve multilevel approvals from technical, safety, finance, to executive stakeholders, sometimes lengthening deal cycles. Additionally, they often request strict SLAs with guaranteed uptime, rapid response times, and dedicated support, reflecting the critical nature of mining operations. Understanding and adapting to these negotiation patterns is key to delivering solutions that meet client expectations while ensuring project feasibility.
--	--

Respondent: General Manager (GM) of B2B Corporate Business Strategy Development

Porter's Force	Interview Details
Threat of New Entry	• What market entry barriers currently protect Telkomsel's position in B2B mining digital services, and are they sustainable? • Telkomsel's position in B2B mining digital services is protected by several significant market entry barriers. First, our extensive and reliable network infrastructure including private LTE and backbone and IOT connectivity provides coverage in remote and challenging mining locations that new entrants find difficult and costly to replicate. Second, we benefit from local presence from our branch and support across Indonesia and long standing client relationships and deep mining industry expertise, which build strong trust and make it harder for competitors to penetrate our accounts. Third, our compliance with local regulations such as data sovereignty laws and environmental standards requires specialized knowledge and capabilities that raise the bar for new players. Additionally, our integrated ecosystem of partners and technology vendors enables us to offer comprehensive, end-to-end solutions that go beyond simple connectivity. While these barriers are currently strong and sustainable, we remain vigilant and continuously invest in innovation, customer experience, and strategic partnerships to maintain and strengthen our competitive edge over time.

Competitive Rivalry	• How does Telkomsel’s strategic positioning mitigate risks from aggressive market competition in the mining digital segment? • Telkomsel’s strategic positioning is designed to effectively mitigate risks from aggressive competition in the mining digital segment. We focus on delivering integrated, end to end solutions that combine robust connectivity with IoT, analytics, and cloud services offering more comprehensive value than competitors who may provide fragmented offerings. Our deep local expertise and established client relationships create strong trust and loyalty, making it harder for new entrants to displace us. Additionally, we leverage strategic partnerships with global and local technology providers to accelerate innovation and maintain solution relevance. We also emphasize flexible commercial models that align with client budget cycles, helping us stay competitive on pricing without compromising quality. Through these strategies, Telkomsel builds resilience against competitive pressures while continuing to grow its market leadership in mining digital solutions.
----------------------------	---

Appendix C Interview with Key Informants - VRIO

Study Title: Business Strategy of B2B Digital Solution of Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry.

Sub-study: Exploration of Telkomsel B2B Digital Solution Strategy in Indonesia Mining Industry.

Interview Instrument: VRIO (Valuable, Rare, Inimitable, Organized to Capture Value)

Respondent: Vice President (VP) B2B of Sales

VRIO Element	Interview Detail
Value	1. Question: What aspects of Telkomsel’s Sales force or processes deliver unique value to B2B clients in the mining industry? Answer: Telkomsel’s sales force and sales processes deliver unique value to B2B clients in the digital mining industry by combine deep industry value chain understanding, technological aspect, and consultative selling. Here are the key aspects that differentiate Telkomsel: a. Industry/Segment Specialized Corporate Account Teams • Telkomsel assigns Key Account Managers (KAMs) specifically to industries, including mining. • These teams undergo sector-specific training to understand mining operations, safety requirements, and remote infrastructure needs. • This ensures that client engagements are consultative, not transactional. b. Co-Creation and Solution Design • Instead of offering products, Telkomsel co-develops / co-creation digital solutions with mining companies as per requirements and pain points.

	• Sales engineers and solution architects work alongside the client to design End to End solutions e.g., Private Network LTE/5G, IoT mining deployments, Smart mining Platform and data analytics dashboards tailored to mining operation specific conditions, also deliver measurable benefits or ROI. c. Widest Nation Network coverage & technical support • Telkomsel leverages its nationwide network reach and technical support and its parents holding company Telkom Indonesia reach, including in remote and underserved areas. d. Rapid Deployment & After-Sales Support • Telkomsel's sales processes are designed for agile deployment through pre-built service packages that can be customized. • Post sales, dedicated technical support is aligned to SLA, with 24/7 escalation paths for mission-critical services. e. Flexible and Transparent Commercial Models • Sales personnel are trained to offer custom pricing models such as: ◦ Usage-based billing ◦ OPEX/Rental/Manage Services driven model ◦ Project based phase billing ◦ Revenue Share model ◦ Bundle Package Solutions model • Contracts are explained clearly, with a focus on long-term value rather than short-term gains. e. Digital Tools and Sales Enablement • Telkomsel uses digital platforms like salesforce platform build internally, which allows clients to: ◦ Monitor service usage ◦ Adjust packages ◦ Submit support tickets • The sales force is equipped with CRM-integrated tools for faster response and personalized offers.
--	--

	f. Ecosystem Oriented Sales Approach • Sales & product strategy involves partnering with OEMs, Principals, system integrators, and regulatory stakeholders to deliver end to end solutions. • bundled with hardware (sensor or devices), AI, SCADA, ERP integration.
Rare	1. Are there specific client engagement models or negotiation practices in your team that competitors find hard to replicate?
	Yes, Telkomsel's sales team employs several client engagement models and negotiation practices that deliver unique value and are difficult for competitors to replicate, particularly in the digital mining sector. These practices are embedded in both its organizational culture and strategic positioning. Here are the standout elements: 1. Co-Creation and Joint Development Model Telkomsel does not just sell products—it co-develops solutions with mining clients through: • Workshops, site visits, and technical discovery phases. • Collaborative proof-of-concept (PoC) or pilot projects before full deployment. • Engagement of internal R&D, engineering, and solution design teams early in the sales process. Why it's hard to replicate: This requires significant organizational coordination, multi-disciplinary technical resources, and a client-first culture that many competitors—especially pure tech or telco players—lack. 2. Embedded Industry Expertise in Sales Teams • Telkomsel invests in industry-specific training for its Key Account Managers (KAMs), enabling them to speak the operational language of mining clients. • These KAMs act as advisors, not just salespeople, often being involved from the planning stage of new mining projects. Why it's hard to replicate: Competitors with generalist B2B teams cannot match this level of domain knowledge and long-term relationship-building. 3. Multi-Level Stakeholder Engagement

	• Telkomsel uses a tiered stakeholder engagement model: ◦ Technical discussions with IT and OT teams. ◦ Financial modeling with procurement/finance units. ◦ Strategic dialogue with C-level or government-linked stakeholders. • Engagements often include joint value assessments or ROI forecasting workshops. Why it's hard to replicate: Requires access to multiple organizational layers, strong relationship capital, and internal cross-functional collaboration. 4. Embedded Negotiation Flexibility with Guardrails • Sales reps are empowered to offer: ◦ Customized pricing structures. ◦ Phased deployment and billing terms. ◦ Performance-based incentives. • However, these negotiations are framed within guardrails set by revenue management and legal teams, ensuring consistency. Why it's hard to replicate: Competitors may offer flexibility but lack the internal systems and trust that allow controlled decentralization of authority. 5. Lifecycle Account Management Model • After the sale, Telkomsel assigns dedicated post-sales teams (account managers + technical support + solution architects) to oversee: ◦ Deployment ◦ Monitoring ◦ Optimization ◦ Upselling/cross-selling
--	---

	Why it's hard to replicate: Many providers lack integrated customer success models, especially those without long-term service orientation.
	6. Government and Regulatory Alignment - As a partly state-linked entity, Telkomsel often aligns with national digitalization agendas, such as Indonesia 4.0 and rural connectivity mandates. - This alignment strengthens its position in regulated sectors like mining and natural resources. Why it's hard to replicate: Competitors—especially foreign or private-only firms—may lack government alignment or trust. 7. Trusted Brand and Legacy Relationships - Telkomsel's long-standing presence in Indonesia and legacy partnerships with major mining conglomerates (e.g., ANTAM, Freeport, etc.) give it entrenched advantages in client loyalty and renewal cycles. Why it's hard to replicate: Relationship-based trust and past performance credibility take years to build. Conclusion Telkomsel's client engagement model combines deep personalization, strategic partnerships, cross-functional expertise, and government alignment—a combination that is culturally embedded and structurally supported. These factors make it difficult for competitors to replicate without significant internal transformation. Let me know if you'd like this section added to the formal report or turned into a competitive intelligence brief.
Inimitable	1. How does your long-standing client trust or institutional knowledge create advantages that competitors cannot easily imitate?
	Our long-standing relationships and deep knowledge of the mining industry give us some very real advantages. First, we know how mining operations actually work, whether it's an open pit mine or an underground site, we understand their connectivity challenges and how their systems are set up. This helps us cut down onboarding time and avoid the mistakes that can come with one-size-fits-all solutions.

	Second, we've spent years building trust with key decision-makers in the mining sector. Because of that, we often get involved before a project is even tendered. Clients trust us to co-create solutions with them because they know we're not just here for a quick sale. Third, we have a proven track record of keeping things running in tough environments like deep in the jungles or remote islands. That's something you can't fake or replicate without real-world experience. On top of that, we steal the start and have years of historic data and deployment benchmarks from different mining sites. This helps us make more accurate proposals and reduce risk for our clients. We also know how to navigate the client's internal bureaucracy like how procurement or legal works, so we can get things moving faster and avoid delays. Finally, many mines already use our legacy networks, so expanding or upgrading with us is seamless, while competitors might face real integration headaches. Put simply, our experience and relationships give us a competitive edge that's hard for newcomers to match because it's built on years of hands-on work and mutual trust."
Organized	1. Is your sales structure adequately organized to scale and capture value from growing opportunities in the mining sector?
	We're well positioned in many ways, but there's room to improve the gap. On the positive side, we have dedicated Key account managers and mining focused teams, which is key because mining projects are complex and need deep understanding. Our strong partnerships with IoT and system integrators help us deliver full packages without overstretching our own resources. Plus, we leverage digital platforms to help our sales teams manage more accounts efficiently. Our nationwide network also means we can activate new sites quickly.

	But we also see areas to strengthen. For instance, while we have solid mining account managers, we need to deepen that expertise—especially in areas like safety tech and predictive maintenance. We also need to speed up decision-making and make sure our sales and implementation teams are fully integrated so we can deliver quickly and smoothly. Another challenge is that we're often focused on the big mining players, and we can do more to target mid-sized or regional mines who might have different needs. So overall, our structure is strong for managing relationships and leveraging our network, but to really scale and capture all the growth potential, we're investing in more specialized teams, faster processes, and more tailored solutions for different mining segments."
--	---

Respondent: Vice President (VP) of B2B Digital Product Management and Development

VRIO Element	Questions
Valuable	• Which features or functionalities of Telkomsel's digital solutions provide critical value to mining clients' operations? • Our digital solutions offer several key features that mining clients rely on every day. First, our Enterprise public Connectivity provide connectivity for corporate employee to support operational mining. Then our private LTE networks provide reliable, secure connectivity in remote and challenging mining environments making sure critical systems stay online Second, we deliver IoT sensor integration that monitors everything from equipment tracking & health to environmental conditions like air quality and emissions. Third, our real time analytics and AI tools help predict equipment failures before they happen, improving uptime and safety.

	We also offer custom dashboards tailored to mining KPIs, so operators can Productivity performance, track fleet performance, maintenance performance, and safety compliance at a glance. Finally, our solutions include robust security and on premise or local data hosting, ensuring compliance with Indonesian regulations and protecting sensitive operational data. Together, these features help mines boost productivity & efficiency, improve safety, and meet regulatory demands, all crucial for modern mining operations.
Rare	• Are there proprietary technologies or design capabilities that differentiate your digital solutions from the market? • Absolutely, One of our key differentiators is our ownership and expertise in private LTE networks designed specifically for remote and challenging environments like mining sites. This gives us a reliable, secure connectivity backbone that many competitors can't match. We also have proprietary IoT platform capabilities that enable seamless device management, data collection, and real time analytics tailored to mining operations. Our platform integrates ruggedized devices and supports edge computing, allowing data processing close to the site for faster, more secure insights. Additionally, we leverage Telkom Group's local backbone Fiber optic & leased line/metro Ethernet & cloud infrastructure to comply with Indonesia's strict data sovereignty laws, which many global players struggle with. Finally, our deep vertical expertise and co-creation approach means we design solutions hand in hand with clients, ensuring they fit perfectly with their operational needs, something off-the-shelf solutions can't offer.
Inimitable	• What internal processes or culture of innovation make it difficult for competitors to duplicate your product development approach? What really sets us apart is our culture of Innovation, close collaboration and agility. We have cross-functional teams: product, sales, engineering & solution architect, technology strategy, delivery, working tightly together from day one, so we build solutions that truly meet client needs. We also emphasize co-creation with clients and partners, especially in complex sectors like mining. This means we're not just delivering products off the shelf; we're innovating alongside the client, adapting quickly based on real feedback.

	Our deep industry knowledge, built over years, is embedded into our processes, making our solutions highly tailored and practical. Plus, our ability to leverage the whole Telkom ecosystem from local/On premise and cloud to network infrastructure creates a unique integrated platform that's hard to replicate. All this makes our innovation cycle fast, client-focused, and difficult for competitors to copy."
Organized	• Do you have the right product development governance to ensure consistent value creation and rapid deployment? • Yes, we do. We've established a clear governance framework that balances speed and quality. Our teams follow agile development practices, allowing us to rapidly build and iterate solutions based on client requirements & feedbacks. We have cross functional steering committees that include product managers, engineers, Solution Architect, sales, delivery and customer services, so decisions are well rounded and aligned with market needs. We also use data-driven KPIs to track value creation, like adoption rates and uptime to make sure we're delivering real impact, not just features. Finally, strong collaboration with our partners and internal units ensures we can deploy solutions quickly and consistently across mining clients. This governance model helps us innovate fast while keeping quality and client value front and centre.

Respondent: Vice President (VP) of Enterprise Product Enablement and Solutions

VRIO Element	Interview Details
Valuable	• What internal capabilities enable Telkomsel to deploy B2B solutions efficiently and reliably in complex mining environments?

	• Our ability to deploy solutions efficiently and reliably in mining comes down to several key internal strengths. First, we have dedicated, industry focused teams from sales, pre-sales (solution engineer & architecture), product development, project management, delivery, and after sales who understand the unique challenges of mining operations. Second, our robust network infrastructure, including private LTE and edge computing, gives us the backbone needed for remote and harsh condition on sites. Third, we have strong cross-functional collaboration processes that align sales, technical, and support teams to ensure smooth deployment and ongoing service. Fourth, our experience working in tough environments has built operational resilience and problem-solving skills that help us handle unexpected challenges quickly. All these capabilities allow us to deliver dependable digital solutions that meet the high requirements and standards of mining clients.
Rare	• Are there integration methods or delivery frameworks unique to Telkomsel's operations team? • Yes, Telkomsel's operations team uses integration and delivery frameworks tailored specifically for Indonesia's complex enterprise environments like mining. We have developed a modular, phased / staging deployment approach that allows us to integrate with legacy systems step-by-step while minimizing operational disruption. This approach is supported by our standardized API frameworks and middleware solutions designed for diverse industrial protocols. Additionally, we emphasize close coordination across field teams, technical experts, and client stakeholders through dedicated account squads to ensure smooth project execution. Our operations leverage local knowledge combined with digital tools like real-time monitoring dashboards and remote support platforms to maintain high service levels even in remote locations. We also leverage our area technical support team hat spread across Indonesia. These methods ensure that our deployments are reliable, scalable, and aligned with client operational needs, making us stand out in the market.
Inimitable	• How does the experience and institutional know-how of your enablement team create barriers to imitation?

	• Our enablement team's deep experience and knowledge create a strong barrier for competitors. We've spent years working closely with mining clients, learning their unique challenges—from rugged environments to complex workflows. This means our team knows exactly how to tailor and deploy solutions effectively. We know client processes, procurement cycles, and regulatory requirements, which helps us navigate deals and implementations smoothly. This kind of insight takes time to build and can't be copied quickly. It gives Telkomsel a real competitive advantage because clients trust our proven track record and operational know how.
Organized	• How well-structured are your resources and processes in capturing operational value from these deployments? • Our resources and processes are designed to capture and maximize operational value very effectively. We have dedicated cross-functional teams including product, sales, engineering, project management, delivery and customer after sales that work together throughout the deployment lifecycle to ensure alignment with client goals. Our processes include continuous monitoring of key performance indicators like system uptime, testing & commissioning and client satisfaction, enabling us to quickly identify areas for improvement. We also leverage data analytics and feedback loops to optimize service delivery and demonstrate tangible benefit like ROI to clients. This structured approach ensures we don't just deploy solutions but continuously deliver measurable business value.

Respondent: General Manager (GM) of Enterprise Product Strategy, Partnership and Performance

VRIO Element	Interview Details
Valuable	• How do strategic partnerships enhance the value proposition of Telkomsel's solutions for the mining sector?

	• Strategic partnerships play a vital role in enhancing Telkomsel's value proposition for the mining sector. By collaborating with Principal, technology providers, system integrators, start up, device/hardware manufacturers and OEM mining equipment manufacturers, we can offer comprehensive, integrated solutions that address the full spectrum of mining operations from connectivity to IoT, AI analytics, and automation. These partnerships allow us to leverage specialized expertise and cutting-edge technologies that complement our core capabilities, enabling us to deliver more innovative, scalable, and customized solutions tailored to the unique needs of mining clients. Additionally, by aligning with global players and local partners, we gain access to expanded resources, faster deployment capabilities, and enhanced credibility factors that help us strengthen our position as a trusted, end-to-end partner in the digital transformation of the mining industry.
Rare	• Are there exclusive alliances or frameworks that give Telkomsel a unique positioning in the ecosystem? • Yes, Telkomsel has developed several exclusive alliances and frameworks that provide us with a unique position in the ecosystem. One key advantage is our synergy partnership with our parent holding Telkom Indonesia Group, which allows us to integrate and leverage a wide range of existing technologies and services across telecom, Fiber Optic network infrastructure, Satellite, Cloud Data Centre, and IT solutions. This gives us a comprehensive, end to end offering, and present spread across the Indonesia area that many competitors can't match. Additionally, we have exclusive relationships with local and global IoT providers, as well as system integrators, which enable us to offer highly specialized, industry specific solutions that are tailored for sectors like mining and energy. Furthermore, our ability to navigate local regulations and work with government initiatives such as Indonesia's Industry 4.0 push & direction gives us an edge in terms of compliance and solution adaptation for local markets. These exclusive alliances and frameworks enable Telkomsel to not only stay ahead in terms of technology but also to leverage deep industry knowledge and trusted relationships, ensuring that we provide unique value to our clients.
Inimitable	• How do these strategic partnerships create synergies that would be hard for competitors to replicate?

	• Our strategic partnerships create unique synergies by combining Telkomsel’s core strengths like our robust network infrastructure, local knowledge, and regulatory expertise with the specialized capabilities of our partners. For example, our collaboration with mining equipment manufacturers and IoT devices providers allows us to offer highly integrated solutions that address specific operational needs, like remote monitoring, predictive maintenance, and safety compliance, all within a single framework. Additionally, our partnerships with cloud providers and AI/analytics companies give us access to cutting-edge technologies, which we can tailor to mining clients’ unique requirements. This means we can deliver solutions that are both innovative and deeply embedded within the mining sector’s operational context. What unique synergy also is our ability to leverage Telkom Group’s broader ecosystem, integrating everything from network connectivity to cloud infrastructure under one roof. This integrated approach ensures faster deployment, easier management, and better performance making it difficult for competitors, especially those without a similar ecosystem, to replicate. Finally, our long-standing local presence and established relationships with regulatory bodies and industry players give us an unmatched ability to navigate complex market dynamics, further strengthening our competitive advantage.
Organized	• Is the organization fully aligned to execute and extract value from these partnerships effectively? • Yes, Telkomsel is well aligned to execute and extract value from our strategic partnerships effectively. We have a dedicated partnership management structure in place that ensures seamless collaboration across all relevant teams, product development, sales, marketing, and operations. This cross functional coordination allows us to maximize synergies with our partners and drive faster solution deployment. Moreover, our executive leadership plays an active role in overseeing and nurturing these partnerships, ensuring that they align with our long term strategic goals. We also have clear KPIs and performance metrics to track the success of these partnerships, ensuring that they deliver tangible business outcomes for both Telkomsel and our partners. In addition, our ability to integrate new technologies, operational processes, and local market expertise into these partnerships gives us a unique competitive advantage.

	This ensures that we don't just execute, but also continuously extract value from these collaborations, driving innovation and growth in the long term.
--	---

Respondent: General Manager (GM) of Enterprise Customers Solutions Management

VRIO Element	Interview Details
Valuable	• What service or support elements in Telkomsel's post-sales strategy offer high-value impact to enterprise customers in mining Industry? In Telkomsel's post sales strategy, several service and support elements deliver high-value impact to our mining enterprise customers. First, our dedicated Key Account Managers (KAMs) ensure personalized attention and act as a single point of contact, facilitating smooth communication and quick resolution of issues. Second, we provide 24/7 network monitoring and rapid incident response, which is critical for maintaining uptime in remote and mission-critical mining operations. Third, our proactive maintenance and periodic health checks help prevent disruptions by identifying and resolving potential problems before they escalate. Fourth, we offer tailored training programs for client teams to ensure effective use and adoption of digital solutions, boosting operational efficiency. Lastly, our collaborative approach with clients, involving regular performance reviews and feedback loops, ensures continuous improvement aligned with evolving operational needs. These elements together build trust, reduce downtime risks, and support sustainable digital transformation for mining customers.
Rare	• Are there client management practices that are exclusive or rare in the B2B Telkomsel landscape? Yes, Telkomsel has developed some client management practices that are quite rare and exclusive in the B2B space. One key practice is our deep vertical specialization, where dedicated teams focus exclusively on sectors like mining,

	allowing us to speak the client’s language and anticipate specific operational challenges. We also employ a cocreation approach, partnering closely with clients from solution design through deployment, which goes beyond traditional vendor-client relationships. Another unique aspect is our multi-tiered engagement model, involving not just operational contacts but also direct access to senior executives to facilitate strategic alignment and faster decision-making. Additionally, we integrate real time analytics dashboards into client management, providing transparency and enabling data-driven discussions. These practices build a level of trust and collaboration that many competitors struggle to match, positioning Telkomsel as a true digital transformation partner.
Inimitable	• How does the depth of your customer relationship management system make it difficult for rivals to catch up? The depth of our customer relationship management system creates a strong competitive barrier that’s hard for rivals to replicate and catch up. We have built comprehensive, data-driven profiles for each mining client, covering their operational structures, digital maturity, procurement cycles, and unique business challenges. This allows our teams to anticipate needs, personalize engagements, and deliver solutions precisely aligned with their goals. Our system integrates real-time insights from sales, support, and field teams, enabling proactive issue resolution and continuous value delivery. Moreover, our long-term relationships mean we have accumulated deep institutional knowledge and trust, which are embedded in our CRM workflows and client interactions. Competitors often lack this level of detailed client intelligence and the integrated processes to act on it swiftly, which gives Telkomsel a meaningful advantage in responsiveness, customization, and client satisfaction.
Organized	• Do you have structured systems and training to consistently deliver and scale customer value? Yes, Telkomsel has well-structured systems and comprehensive training programs designed to consistently deliver and scale customer value. We utilize integrated platforms that enable our teams to track client interactions, monitor service performance, and identify opportunities for value enhancement. On the training side, we run regular upskilling programs for our sales, technical, and support teams, focusing on industry knowledge, solution expertise, and customer engagement best practices although it still need to be improved continuously. We also has established and still in progress improve to be more complete the standard operating procedures and playbooks tailored to sectors like mining, , ensuring consistent quality and scalability in solution delivery. This combination of technology,

	training, and process rigor enables us to maintain high service standards while expanding to meet growing client demands effectively.
--	---

Respondent: General Manager (GM) of B2B Corporate Business Strategy Development

VRIO Element	Interview Details
Valuable	• What elements of Telkomsel's B2B direction are most valuable for long term competitiveness in mining digitalization? • Several key elements of our B2B direction are critical for maintaining long term competitiveness in mining digitalization. Our focus on end to end digital solutions integrating connectivity, IoT, AI analytics, and cloud services ensures we address the full range of mining operational needs, from productivity to safety to environmental to sustainability compliance. Our commitment to deep mining industry specialization allows us to tailor solutions precisely to mining clients' unique challenges, enhancing relevance and value. Then Strategic partnerships and ecosystem development expand our capabilities and speed innovation, enabling us to offer comprehensive, scalable solutions. We also emphasize flexible commercial models, including OPEX based subscriptions Leasing/instalment based, and even revenue shared, to align with client investment cycles and reduce adoption barriers. Our strong local presence and regulatory expertise help us navigate compliance and build trusted, long-lasting client relationships. All of these elements position Telkomsel as a resilient, trusted partner that can support the mining sector's evolving digital transformation needs over the long haul.

Rare	• Is Telkomsel's strategic planning capability for heavy mining industries unique compared to other digital service providers? • Yes, Telkomsel's strategic planning capability for the heavy mining sector is uniquely strong. Our deep understanding of Indonesia's mining landscape, combined with decades of experience in telecommunications and digital services, allows us to craft tailored strategies that align closely with the complex operational, regulatory, and economic realities mining companies face. Unlike many competitors, we integrate connectivity, IoT, data analytics, and cloud solutions into a unified roadmap that supports clients' long term digital transformation journeys. Moreover, our close partnerships with government bodies, industry players and association, and technology vendors give us valuable insights and collaborative leverage that few can match. Also We have flexible commercial models, including OPEX based subscriptions Leasing/instalment based, and even revenue shared that others Global or local competitor don't have. This comprehensive, locally grounded, ecosystem driven approach, and flexible commercial models sets Telkomsel apart and enables us to deliver more effective and sustainable strategic plans for heavy mining clients.
Inimitable	• How does your internal alignment and foresight in strategy make it hard to be copied by competitors? • Our internal alignment and strategic foresight create a strong competitive moat that's difficult for others to replicate. We maintain close coordination across all business units from product development and sales to partnerships and operations, ensuring everyone moves in sync toward shared goals. This alignment allows us to rapidly adapt to market changes, efficiently allocate resources, and deliver consistent value to clients. Additionally, our foresight is built on deep market insights, scenario planning, and continuous engagement with industry stakeholders. This enables us to anticipate emerging trends and craft proactive strategies. Competitors often struggle to match this level of integration and forward-thinking because it requires years of experience, strong culture, and trust built within the organization, all of this we have cultivated at Telkomsel.

Organized	• Are your planning and execution frameworks maturing enough to capture value from identified strategic opportunities?
	• Yes, our planning and execution frameworks are well developed and designed to effectively capture value from strategic opportunities. We have established robust processes that link market insights, opportunity identification, and resource allocation with clear execution roadmaps. Our frameworks emphasize cross functional collaboration, ensuring that product, sales, and operations teams are aligned and accountable. We also incorporate regular performance tracking and feedback loops to monitor progress, identify risks early, and make necessary adjustments. While there's always room for continuous improvement, our current frameworks have proven effective in driving growth and delivering tangible outcomes in complex sectors like mining.

Appendix D Interview with Key Informants - SWOT

Study Title: Business Strategy of B2B Digital Solution of Telecommunication Company – Case Study: Telkomsel Enterprise Digital Solution in Indonesia Mining Industry.

Sub-study: Exploration of Telkomsel B2B Digital Solution Strategy in Indonesia Mining Industry.

Interview Instrument: SWOT Analysis

Respondent: Vice President (VP) B2B of Sales

SWOT Dimension	Interview Detail
Strengths	1. What are Telkomsel's key competitive strengths in securing B2B digital solution contracts with mining clients? Key competitive strengths that position it strongly in securing Telkomsel B2B digital solution contracts with mining clients, particularly in Indonesia: a. Widest Network Coverage in Mining Remote/rural Areas and has Enterprise Customer base also has technical support and branch spread across Indonesia. Telkomsel has widest coverage in Indonesia also in Mining operations are typically located in remote & rural areas outside Java Island. Telkomsel "Telkomsel As Indonesia's largest mobile operator, Telkomsel has the widest 4G and 5G, has advantage with network coverage 97% in Indonesia, including remote and rural areas especially outside Java Island in Kalimantan Island, Sulawesi Island, Maluku, Nusa Tenggara and Papua which is critical for mining clients needing stable connectivity for operations, safety, and employee. Telkomsel also has existing more than 40.000 enterprise customer base provide basic connectivity and has technical support and branch spread across in Indonesia." b. Strong Holding Parents Company from Telkom Indonesia Group and State-Owned Enterprise (BUMN) Synergy and Government/Regulatory. Being part of the Telkom Indonesia Group, Telkomsel access to integrated digital infrastructure (Fiber optic backbone, data centres, satellite services and etc). Mining Companies also often work closely with Telkom group as one of the largest Digital infrastructure companies. Telkomsel also relatively has close and good relationship with other BUMN and government of regulatory. Telkomsel's as subsidiaries of BUMN status

	boosts trust and alignment with national priorities, particularly for digitalization, energy, mining & minerals, and ESG targets. c. Financial and Operational Stability. As a leading and profitable telco, Telkomsel provides assurance of long-term support, service-level agreements (SLAs), and the ability to invest in infrastructure and innovation. Telkomsel also offer multiple payment scheme e.g., One Time Project, Instalment, Rental/manage services and even revenue sharing and this capability offer long term partnership. d. Strength in Digital Enabler and Digital Ecosystem proven with Digital Solutions Portfolio for Mining. Start with Private LTE/5G network for critical communication and network as Digital enabler, Telkomsel also develop automation Cloud and edge computing Workforce safety and monitoring (wearables, geofencing, emergency alerts) Value Proposition, IoT-based fleet management (vehicle tracking, fuel monitoring), Smart mining solutions (predictive maintenance, environmental sensors, Digital Control Centre Platform, analytics and AI/ML). Telkomsel offers customized, scalable, and secure digital solutions tailored to the operational needs of mining clients. Telkomsel has an established portfolio of mining clients (e.g., Freeport, Bayan, Vale, Bukit Asam and etc), making it a trusted vendor familiar with mining-specific compliance, safety & ESG, and operational & technological challenges. Telkomsel Enterprise also works with a broad ecosystem of international principals (e.g., Huawei, Ericsson, Microsoft, AWS, Google, Cisco, ZTE and etc) and partners (e.g., local system integrators, Digitalization Start Up and etc) to deliver end-to-end solutions capable to integrate legacy existing system with modern digital platforms.
	2. How do your sales strategies maximize Telkomsel's value proposition in mining industrial digitalization? Telkomsel's B2B sales strategy in the mining industry is purpose-built to deliver maximum value by aligning with operational realities, risk thresholds, and digital transformation goals of mining clients. The strategy is not transactional—it is consultative, vertically integrated, and outcome-driven, creating a differentiated client experience and long-term engagement model. a. Consultative and Industry-Focused Engagement Our sales teams function as strategic advisors, supported by industry experts and solution architects. We address specific mining pain points—such as safety, uptime, and cost efficiency—by offering end-to-end digital solutions tailored to operational KPIs, not just selling connectivity. b. Infrastructure Advantage and Private LTE Capabilities

	Telkomsel leverages its national coverage and remote area reach, offering private LTE and hybrid networks with RF design and site-specific planning. This enables real-time operations and automation in hazardous and isolated zones—an edge few competitors can match. c. Co-Creation and Proof-of-Concept (PoC) Model We adopt a co-creation approach, involving client teams early and offering PoCs or pilot projects. This builds credibility, validates ROI early, and accelerates solution adoption—especially for IoT and digital mining applications. d. Outcome-Based Value Communication Our proposals emphasize tangible business results, such as: Increased Operational productivity with fleet productivity, Reduced fuel consumption, Enhanced safety and compliance, Predictive maintenance to reduce downtime. This ensures alignment with both operational and executive priorities. e. Executive-Level Engagement and Relationship Management We engage existing multi-level stakeholders, from IT and operations to procurement and C-suite executives. These relationships allow Telkomsel to enter strategic boardroom conversations and influence long-term planning. f. Partnership Ecosystem Integration Telkomsel builds digital mining ecosystems by collaborating with OEMs, tech startups, integrators, and platform providers (e.g., ERP, SCADA, AI). This positions Telkomsel not just as a service provider, but as the digital backbone for mining transformation. g. Data-Driven Account Management We leverage analytics and usage data to guide account planning and digital maturity assessments. This enables customized roadmaps that progressively drive clients toward deeper digital integration.
Weakness	1. What challenges are faced when selling complex digital solutions to mining enterprises? While Telkomsel has made tremendous progress in becoming a strategic digital enabler for Indonesia’s key industries, including mining, we’re fully aware that the journey from being seen purely as a telco to being recognized as a trusted transformation partner comes with real challenges—both internal and external." 1. Perception Shift from Telco to Digital Partner

	"One of our biggest hurdles is overcoming the legacy perception. Many mining clients still see Telkomsel as just a mobile connectivity provider. That makes it harder for us to position solutions like IoT, analytics, and private LTE as core enablers of operational transformation. Changing that narrative takes time and strategic engagement at multiple levels of the organization." 2. Domain Expertise at Scale "While we have pockets of strong expertise, scaling mining-specific knowledge across all sales regions remains a work in progress. Mining is highly specialized, and to compete with players like Hexagon, AB, Siemens, Schneider, Aveva and ABB and etc, we need more embedded subject matter experts who understand both OT and IT." 3. Integration with Legacy Systems "The tech stack in mining is often a mix of old SCADA systems, industrial PLCs, and proprietary hardware. That creates real integration complexity. It means we either partner smartly or develop tailored solutions—which takes more time and upfront investment." 4. Infrastructure Deployment in Remote Sites "Building digital infrastructure in remote and hazardous sites is not just a technical task, it's also operational and regulatory. We often face deployment delays due to permits, safety protocols, or site readiness, especially for edge computing and IoT rollouts." 5. Sales Capability Gaps in Solution Selling "Our traditional sales DNA is telco-focused & B2C—connectivity, SIMs, enterprise internet. Transitioning that team into consultative, value-based sellers who can talk about business outcomes, ROI, and KPI improvements is something we are actively developing through enablement and reskilling." 6. Data Privacy & Sovereignty Concerns "Mining clients are understandably cautious about where their data goes. Compliance with local data laws like PP 71/2019 and internal governance policies means we must have clear, local data hosting strategies—something we're addressing with hybrid cloud and edge solutions." 7. Business Case Modelling for ROI "Unlike in telco, digital investments in mining often require rigorous ROI justification. Clients want solid TCO modelling, benchmarks, and proven value. We're building that capability, but it's not something you can fabricate overnight—it requires use cases, historical data, and client trust."
--	---

	8. Internal Coordination Across the Telkom Group "As part of the broader Telkom ecosystem, we sometimes face overlap with other subsidiaries like Metra or PINS. That can cause confusion or fragmentation if not managed well. We're actively working on a more unified go-to-market approach to ensure clarity for the customer." "In short, we're making strong inroads into the mining sector, but success requires a blend of operational alignment, ecosystem coordination, and a mindset shift internally. We're addressing each of these challenges systematically because the opportunity in mining is too important—and too big—to approach half-heartedly." 2. Are there gaps in Telkomsel B2B Mining customer readiness in digitalization or internal resources that affect your ability to close deals? "That's a very relevant question. We absolutely see both client-side readiness gaps and some internal resource limitations that can impact our ability to close and scale complex digital solutions in the mining industry. These challenges are real, but we're actively addressing them because the mining sector holds strategic digital growth potential for Telkomsel." 1. Mining Client Readiness Gaps a. Low Digital Maturity on the Ground "Many mining operators in Indonesia are still running manual processes, or legacy SCADA systems with minimal exposure to technologies like IoT, AI, or predictive maintenance. For us, this means investing more time upfront in education and vision-building before we even get to a proposal." b. Lack of Skilled Digital Talent at Site Level "In many cases, the operational teams at mining sites don't have the IT/OT expertise to implement or interpret the tools we provide. This forces reliance on central IT at HQ, which can delay implementation. So, we often include training and enablement as part of our offering." c. Budget Constraints and OPEX Aversion "Another challenge is financial: mining companies still tend to prefer capital-heavy investments in physical assets over operational expenditure on digital services. To overcome this, we're introducing more flexible commercial models—leasing, managed services, outcome-based billing, and even possible revenue sharing." d. Siloed Decision-Making
--	---

	"One of the more subtle but significant challenges is navigating organizational silos—IT, operations, and safety teams often have conflicting priorities. We've learned that successful deals depend on aligning all three, which requires us to be both educators and integrators." e. Lack of a Clear Digital Roadmap "Finally, many mining firms don't yet have a structured digital strategy. Engagements are often reactive, triggered by an inspection or incident. That puts the burden on us to not only sell but help shape their roadmap, which lengthens the sales cycle but adds long-term value." 2. Internal Gaps within Telkomsel a. Limited Mining-Specific Sales Specialists "Internally, while we have very strong generalist B2B teams, mining requires a different conversation. Understanding pit-to-port operations, haulage systems, or mine safety compliance is key. We're investing in upskilling and bringing in more domain-aligned talent." b. Integration Limitations "Another challenge is system integration. Not all our IoT or analytics offerings are plug-and-play with older mining infrastructure. We often work with third-party integrators, but this raises client concerns around delivery risk—which we're working to mitigate with tighter partnerships and standardized solution stacks." c. Fragmented Offerings and Go To Market Alignment "As a growing digital player, some of our solutions can appear fragmented across business units. Clients want a one-stop-shop, and that's not always the experience they get. We're now prioritizing unified solution packaging—bundling connectivity, devices, digital platform, analytics, and support into one clear value proposition." d. Limited Local Support in Remote Areas "We have support across Indonesia but for some of the more isolated mining regions, we simply don't have enough boots on the ground for immediate support. That affects client confidence in SLAs. We're addressing this by expanding local presence through partnerships and regional enablement hubs." "In summary, yes—we face challenges. But we see them as a roadmap. Each obstacle we overcome—whether it's digital education, integration, or internal alignment—moves us closer to becoming not just a telco, but a true digital transformation partner for Indonesia's mining sector. We're committed to that evolution."
--	---

Opportunities	2. What sales of Telkomsel B2B digital product opportunities do you see emerging in the mining sector, especially with the government's push toward Industry 4.0? "Great question. The mining sector in Indonesia is at a digital crossroads, and Telkomsel is uniquely positioned to play a transformative role. With the government actively driving initiatives like Making Indonesia 4.0 and stricter ESG mandates, there's a tremendous opportunity to embed digital technologies at the heart of mining operations—and that's exactly where we're heading." 1. Private LTE and 5G for Remote Operations "Many of Indonesia's mines are located in highly remote areas, where traditional connectivity doesn't cut it. We're bringing private LTE and even 5G capabilities to enable critical use cases—autonomous trucks, remote surveillance, and real-time operational control. Our ownership of spectrum and national infrastructure gives us a clear edge here." 2. Industrial IoT (IIoT) Platforms "The need for sensor-based monitoring—for everything from equipment health to environmental compliance—is only growing. Through platforms like our IoT Control Centre, we can offer integrated monitoring of vibration, fuel, water quality, and more, all feeding into predictive analytics." 3. AI & Data Analytics as a Service "Mining generates a massive amount of operational data, but most of it goes unused. We're closing that gap by offering AI and analytics as a service, powered by Telkom Indonesia Group's big data capabilities. This enables yield optimization, downtime prediction, and anomaly detection—aligned perfectly with Industry 4.0 goals." 4. Smart Surveillance & Safety Compliance "Worker safety is now a board-level issue, with zero harm policies and regulatory mandates in place. Our Insight Video Analytics platform, combined with edge computing, supports everything from PPE compliance to fatigue monitoring—ensuring mines stay both safe and compliant." 5. Digital Worker and Asset Tracking "Knowing where your people and assets are at all times is fundamental. We offer smart ID badges, LoRa/RFID tracking, and location dashboards to give mining clients full visibility of personnel and high-value equipment in real-time." 6. Edge Computing and Hybrid Cloud Solutions
---------------	---

	"Data sovereignty is a major concern, especially with regulations like PP 71/2019. With Telkom Indonesia Group's NeutraDC data centre, we're able to offer hybrid edge-cloud deployments—ensuring local compute while enabling centralized intelligence." 7. ESG & Compliance Dashboards "As ESG rises in importance for licensing, reporting, and investor trust, we're offering ESG-as-a-Service: aggregating IoT data, environmental metrics, and compliance logs into real-time dashboards tailored for stakeholder transparency." 8. Digital Command Centre "Many mining groups are now looking to centralize operations from multiple remote sites. With our network reach, IoT stack, and visualization tools, we're building integrated command centres that bring fleet, safety, productivity, and ESG data into a single pane of glass." Strategic Fit with National Priorities "We're fully aligned with national agendas—whether it's Making Indonesia 4.0, supporting green mining, or enabling smarter industrial zones. Our capabilities directly address these mandates through real-world use cases." Our Go-to-Market Focus To truly seize this opportunity, we're: • Bundling solutions into outcome-focused offers like "Smart Mine Operation & safety" or "Connected workers Pack." • Building alliances with equipment OEMs, principals, integrators, technology start up and regulators to enhance interoperability. • Enabling OPEX-friendly commercial models to ease adoption. • Training a dedicated mining solution salesforce across regions like Kalimantan, Sumatra, and Papua. "We're not just bringing connectivity—we're delivering strategic value to mines through integrated digital transformation. As regulations tighten and expectations grow, Telkomsel is ready to be the partner of choice for modern, safe, and sustainable mining operations in Indonesia."
	2. How is demand evolving for integrated digital solutions in mining in Indonesia?

	The demand for integrated digital solutions in Indonesia's mining sector is growing faster than ever. We're seeing this shift driven by a combination of government policy, operational pressures, and broader ESG and investor expectations." Key Drivers Accelerating Digital Adoption 1. Government Push for Industry 4.0 "The Indonesian government's Making Indonesia 4.0 roadmap and Presidential Regulation No. 18/2020 are setting clear expectations for digital transformation across industries—including mining. Mining companies are now required to report, audit, and digitize various operational and sustainability practices, which opens the door for Telkomsel to help them meet those mandates." 2. Productivity & Cost Pressures "Global commodity cycles are pushing mines to do more with less. There's a real need for real-time visibility across fleets, equipment, fuel, and labours, so integrated IoT and data solutions have gone from 'nice to have' to mission-critical." 3. Safety, Environmental & ESG Compliances "Worker safety, environmental impact, and regulatory scrutiny are major drivers. Mines need solutions for PPE compliance, fatigue monitoring, and emissions tracking all of which map directly to our digital safety and ESG solutions." 4. Capital Projects & Downstream Processing "With Indonesia building out downstream mineral processing facilities like Mining Integrated smelters for EV batteries, there's a golden opportunity to embed digital solutions right from day one. Private LTE, IoT, and smart systems are no longer afterthoughts, they're part of the foundational blueprint for these greenfield projects." 5. Global ESG Standards & Investor Demands "International buyers and investors want transparent ESG data, from carbon footprint to traceability. Mines must meet GRI, TCFD, ISO 14001 and that creates a surge in demand for digital dashboards and data management tools." Evolving from Point Product to Integrated Platforms Solutions. "In the past, mines might have bought isolated devices or standalone CCTV systems. Now, they're demanding integrated platforms that combine IoT, analytics, and robust connectivity—with local deployment and SLAs tailored for Indonesia."
--	--

	What Clients Expect Today "Mining clients are clear about what they want: Scalable solutions that can expand from pilots to enterprise-wide rollouts. End-to-end offerings, not stand-alone rigid products. Local support that ensures compliance and continuous uptime. Outcome-based ROI, not just fancy tech. They want to see safety impact, TCO reductions, and productivity improvements." Top Digital Solutions in Demand "The hottest areas we're seeing are: Private LTE/5G as the backbone for autonomous and remote operations. Smart safety and surveillance to meet compliance and reduce incidents. IoT for asset and fleet management to optimize productivity. Environmental monitoring for ESG compliance. Centralized data integration platforms for command centres across multi-site operations. AI and predictive analytics to drive cost efficiencies and optimize yield." Our Positioning and the Opportunity, Telkomsel is uniquely positioned to bundle these capabilities, we own the spectrum, have nationwide infrastructure, and can bring private LTE, IoT, data analytics, and local enablement under one roof. That's our biggest differentiator: we're not just a connectivity provider; we're aiming to be the industrial digitalization partner of choice for Indonesian mining." "To fully capture this momentum, we know we need to move fast and in lockstep with our mining clients' digital roadmaps. That's why we're: Packaging integrated outcome-driven solutions. Strengthening alliances with mining OEMs and ecosystem partners & principals. Investing in OT/IT talent in Mining sectors and support to meet client demands on the ground." "The future of mining is digital and Telkomsel is ready to power that future."
Threats	1. What external threats (e.g., competitor pricing, economic shifts) impact Telkomsel's B2B sales performance in Mining Sector?

	"That's an important question, and one we're very mindful of. While we see huge potential for digital solutions in Indonesia's mining sector driven by productivity, safety, and ESG imperatives, there are also significant external threats that we need to navigate." 1. Intense Competitive Pressure and Market Saturation "First, there's no doubt we're operating in a competitive arena. Smaller system integrators and IoT startups are aggressively undercutting on price, offering modular or open-source solutions that can look attractive at first glance. At the same time, major telcos like XL and Indosat are working closely with global hyperscalers (AWS, Huawei, and NVIDIA) to strengthen their positioning. This can blur the lines for clients and create confusion about differentiation. To stand out, we're focusing on value-based selling, making sure clients understand the end-to-end benefits and ROI of Telkomsel's integrated offerings. We're also making our commercial models more flexible offering modular packages, managed services, and OPEX-based subscriptions that are easier on client budgets." 2. Macroeconomic & Commodity Volatility "Indonesia's mining and mineral sector is particularly vulnerable to swings in global commodity prices especially nickel and coal. When prices drop, CAPEX investments can freeze, delaying digital adoption planning & project. We're countering that by emphasizing OPEX based models, subscription pricing, leasing, and managed services. This allows mines to adopt critical digital solutions without heavy upfront costs, which is especially relevant when budgets are constrained." 3. Technology Adoption Barriers & Legacy Systems "A lot of mining clients are still working with older SCADA and OT systems that don't integrate seamlessly with newer cloud or AI-based solutions. There's a real concern about vendor lock-in and interoperability. To build trust, we're offering open APIs, hybrid architectures, and data portability guarantees, ensuring clients maintain flexibility and can integrate new solutions at their own pace. We're also investing in pre-integration templates and stronger partnerships with system integrators to reduce implementation friction." 4. Regulatory & Policy Uncertainty "Regulatory shifts like export bans or evolving ESG rules can disrupt client priorities. There's also uncertainty around environmental and labour mandates that might change how mining companies invest in digital tech. We're staying closely aligned with regulatory bodies like ESDM to ensure our solutions remain compliance ready." 5. Global Supply Chain Disruptions & Security Concerns
--	---

	"Supply chain issues like device/equipment shortages or port congestion can delay device deliveries. Plus, clients are increasingly worried about cybersecurity and data sovereignty, especially for critical infrastructure like mining. To manage this, we're pre-stocking key devices locally and working with multiple suppliers to avoid bottlenecks. On the security front, we're bundling our solutions with ISO-certified cybersecurity layers and local data hosting options to meet PP 71/2019 and other Indonesian regulations as per our experiences to secure consumers data." Overall Positioning "Despite these challenges, Telkomsel's strength is our ability to deliver an integrated, full-stack digital solution combining connectivity, IoT devices & platform, analytics, and local support under one roof. This aligns with what mining clients increasingly expect: e.g., Scalability across multiple sites Compliance and ESG readiness, proven local references, Outcome focused solutions tied to productivity and safety" "The bottom line is this: external threats are real competition is fierce, and macroeconomic factors are out of our control. But by focusing on flexibility, proven value, and trusted local delivery, we're confident we can turn these challenges into opportunities and continue to be the partner of choice for Indonesia's mining digitalization journey." 2. How do Telkomsel mining Industry clients' procurement cycles and regulatory constraints affect your sales pipeline? "Great question. In the mining sector, procurement cycles and regulatory rules really slow down our sales motion compared to other industries. Let me break it down: • Procurement cycles are long and rigid. Mining clients, especially state-owned and multinationals, follow multi step tenders process like pre-qualifications, RFIs, Bidding, and multiple signoffs. These processes often stretch 6–18 months and require a lot of upfront work from our side like site visits, demos, and compliance checks. • Budgeting is tied to annual Capex cycles. Even when there's clear technical interest, projects can get postponed to the next fiscal year if commodity prices drop or operational costs spike. • Regulatory hurdles add another layer. Environmental, health, and safety laws mean our solutions need certifications, local audits, and sometimes union approval—especially if they involve worker tracking or surveillance.
--	---

	• Data sovereignty rules (PP71) are strict. Clients want assurance that data is stored locally and compliant with Indonesian law. We need to highlight our domestic cloud and cybersecurity readiness in every pitch. • Stakeholder alignment is critical. We can't just sell to IT. We have to bring Operation, maintenance, HR, legal, and HSE teams on board early, or risk project delays even after technical buy-in. All of this slows down deal timeframe and adds complexity, but it also creates an opportunity for Telkomsel to show up as a long-term partner not just a vendor by proactively helping clients meet compliance and local content goals. That's why we're investing in local infrastructure, regulatory certifications, and building trust with multiple departments inside these companies."
--	---

Vice President (VP) of B2B Digital Product Management and Development

SWOT Dimension	Questions
Strengths	• What product features or technologies represent Telkomsel's core strengths in the B2B mining solution space? • Telkomsel's core strengths in mining come down to a few key pillars. First, we have a robust public connectivity backbone, and our private LTE networks are critical for remote mining sites that need reliable, high-capacity links. Second, we're strong in Industrial IoT (IIoT). We offer ruggedized sensor integration, device provisioning, and remote monitoring platforms tailored to mining KPIs like fleet efficiency, fuel usage, and environmental safety. Third, we're investing heavily in AI and analytics. This lets us turn all that sensor and connectivity data into real-time insights like productivity forecast, predictive maintenance, worker safety alerts, or emissions dashboards so clients can make smarter decisions, faster. Finally, our local cloud infrastructure through the Telkom Group's data centres means we can comply with data sovereignty laws while keeping data secure and close to operations. So, our core strengths are in combining these pieces of connectivity, IoT, AI, and local compliance into end to end digital solutions that mining clients can trust.

	• How does your product roadmap reflect innovation leadership? • Our product roadmap is all about staying ahead of what mining clients need today and tomorrow. For example, we're investing in advanced AI and analytics, like predictive maintenance and environmental compliance dashboards, to help clients make data-driven decisions in real time. We're also rolling out edge computing to process data closer to the mine sites, which improves speed and keeps sensitive data secure. And we're not stopping at connectivity, we're bundling Private LTE, rugged device IoT, local cloud, Platform and AI into complete packages, making it easier for clients to adopt digital solutions end to end. On top of that, we're working closely with Mining OEM, principals & partners like mining equipment makers, Devices IoT principal, system integrators and startups to co-create new solutions, like autonomous Pit & haulage control & dispatching system or fleet & fatigue monitoring, tailored to Indonesia's mining needs. All of this shows that our roadmap is forward looking, it's built to support smart mining, automation, and sustainability goals, not just traditional telco services."
Weaknesses	• What development bottlenecks or resource constraints hinder product scalability? • We see several challenges as we look to scale our digital products in mining. First, deep domain technical expertise is critical, mining & mineral value & process chain is complex, and we sometimes need more specialized talent in control/automation and safety systems, predictive maintenance, rugged IoT or AI/Analytics to build the most tailored solutions. Second, we still rely on centralized decision-making for things like pricing and customization approvals. That can slow us down when we're trying to meet fast-moving client needs in mining. Third, integrating across different systems, sales, technical support (solution engineering & architect), product, and delivery implementation can be tough. We're working to break down these silos so that once we win a deal, we can deploy fast and reliably. Finally, mid-sized or regional mines sometimes need different product features than the big players, and we're still refining how to customize and scale for that segment.

	So while we have strong core capabilities, we're focusing on developing our product to fit the mining requirements and standards, seek experience talent in technical mining & minerals, upskilling our current talent, decentralizing decision-making, and improving internal integration to make sure we can scale our mining solutions even faster." • Are there any internal gaps in aligning product design with mining industry needs? • Yes of course, there are some gaps we're actively working to close. For example, mining has very specific operational challenges, like productivity & efficiency, worker safety, remote fleet monitoring, availability of equipment and environmental compliance. While we have strong digital tools and connectivity, we're still refining how we tailor product features like rugged device IoT, smart video analytics, smart fleet management system, fuel monitoring system, maintenance management, or fatigue monitoring specifically for those needs. Another area is cross-team collaboration, our sales, technical support (solution engineering & architect), product, and delivery implementation teams sometimes need tighter integration to ensure that what we promise to clients is exactly what we deliver. Finally, we're working to expand mining specific expertise within our product teams, so we can move beyond generic digital solutions and truly speak the language of mining. We see these gaps as opportunities to co-create with clients and partners, so we're not just selling connectivity, but delivering end-to-end solutions that mining operations really value.
Opportunities	• How do you identify and integrate emerging technologies (e.g., AI, IoT, edge computing) into new digital solutions? • We approach this in three key steps. First, we listen to the market, we work closely with mining clients, principals & partners, and regulators to understand their challenges and spot opportunities where emerging tech can help. Second, we test and learn fast, we build proof of concept projects and pilots that let us validate new tech like AI-powered Detection Camera, predictive maintenance or edge computing in real mining environments. Third, we partner up, we work with hardware and software vendors, system integrators, and mining tech specialists so we're not starting from scratch. That lets us bundle advanced tech like rugged IoT sensors or AI analytics directly into our solutions.

	Overall, it's about blending what's new in technology with what's real problems and requirements in the field, so we're not just following trends, but delivering solutions that solve real problems in mining.
	• What product-led growth opportunities do you foresee in industrial sectors beyond mining?
	• While mining & mineral industry is one of big focus, we see huge potential in other industrial sectors too like oil & gas, energy, manufacturing, logistics, and plantations. For example, smart factories are growing fast. We're seeing demand for private 5G, IoT-based energy monitoring, and predictive maintenance just like in mining, but in a factory setting. In logistics and ports, there's real need for fleet tracking, real-time supply chain monitoring, and AI-powered operational & safety systems especially as Indonesia ramps up infrastructure. And in plantations, whether palm oil or forestry, clients are asking for IoT-based production & environmental monitoring, worker safety tools, and data analytics to boost yield and sustainability. What's exciting is that our core strengths, connectivity, IoT, AI, edge computing apply across these sectors. So we're building product bundles and co-creating solutions with clients to extend our digital backbone beyond mining.
	• What external tech trends or market entrants could threaten your digital product advantage?
Threats	• That's a great point; there are definitely some external threats we're keeping a close eye on. First, new global players like Starlink are coming in with low-earth orbit satellite services that can disrupt connectivity, especially in remote sites. Second, hyperscalers like AWS, Microsoft and Google Cloud are expanding into industrial IoT and data analytics. If they move fast and go deep with local partners, they could become strong competitors in the analytics and edge space. Third, niche & local tech providers, like mining-focused AI or safety startups are getting very specialized. Their deep focus on mining could pull clients away if we don't stay relevant. So we're making sure our local strengths and integration capabilities, like Indonesian data compliance, managed services, and trusted relationships remain a strong differentiator. And we're partnering with these global players too, so we're part of the ecosystem, not left behind.
	• How do cybersecurity regulations and interoperability standards challenge your innovation process?
	• That's a great question, and it's a real balancing act for us.

	Cybersecurity regulations, like data sovereignty laws (PP71), ISO or International standards, are critical for our mining and industrial clients. They mean we have to build secure, compliant products from day one, which sometimes slows us down when we want to move fast with new ideas. Interoperability standards are another piece. Mining and industrial systems are already very fragmented, so making sure our digital solutions integrate smoothly with different platforms, whether it's legacy SCADA or modern cloud dashboards can be complex and resource intensive. But at the same time, these challenges make our solutions more trusted. So we see them not as obstacles but as guardrails to ensure our innovations are secure, reliable, and built for the real needs of Indonesia's industrial clients."
--	--

Vice President (VP) of Enterprise Product Enablement and Solutions

SWOT Dimension	Interview Details
Strengths	• What internal enablement processes or platforms help deliver digital solutions efficiently to enterprise clients? • To deliver digital solutions efficiently, we rely on a few key internal processes and platforms. our IoT connectivity platform is critical. It streamlines everything from client onboarding and service provisioning to usage monitoring, making it easier for both our teams and clients to manage services smoothly. We also have strong cross functional enablement teams including sales team, product team, technical pre-sales team (solution engineer & solution architect), delivery implementation team, project management team and customer success and after sales team that collaborate closely to ensure solutions are tailored and deployed quickly. We also use customer relationship management and data analytics tools to track client engagement and anticipate needs, which helps us be proactive rather than reactive. Finally, continuous training and certification programs keep our sales and technical teams up to date on the latest technologies and industry best practices, ensuring we bring the right expertise to every client. Together, these processes and platforms allow us to deliver complex digital solutions at scale, with speed and quality.

	• How does cross functional collaboration improve solution implementation for mining clients? • Cross-functional collaboration is critical to our success in delivering solutions to mining clients. By bringing together experts from product development, sales, technical teams, and customer support, we ensure that every aspect of the solution from design to deployment is aligned with the unique challenges and requirements of mining operations. This teamwork helps us identify and solve potential issues early, customize solutions effectively, and accelerate deployment timelines. It also enables us to provide seamless support after implementation, improving client satisfaction and trust. In such a complex industry like mining, this collaboration reduces risks, ensures smoother project delivery, and ultimately leads to better business outcomes for our clients.
Weaknesses	• What operational or integration challenges do you face in deploying solutions across complex mining environments? • Deploying solutions in mining environments comes with several unique challenges. First, mining sites are often in remote, harsh conditions with limited infrastructure, which makes connectivity setup and ongoing maintenance more difficult. Second, there's the challenge of integrating new digital solutions with legacy systems like old SCADA, PLCs, or proprietary hardware that mining clients have used for years. Ensuring seamless interoperability without disrupting operations requires deep technical expertise. Third, regulatory compliance around data security and local data storage means we have to carefully design solutions that meet strict requirements, sometimes needing on-prem or hybrid cloud setups. Finally, coordinating across multiple client's operations & maintenance, safety, IT, procurement and aligning on project timelines and expectations adds complexity. Despite these hurdles, our experience, local/area representation presence, and strong partner ecosystem enable us to navigate these challenges and deliver effective, reliable solutions. • Are there legacy systems or tools that hinder solution scalability? • Yes, legacy systems do present challenges. Many mining clients still rely on older SCADA, PLC, or proprietary hardware that wasn't designed for modern digital integration. These systems can be rigid and make it difficult to

	smoothly scale new IoT, analytics, or cloud-based solutions. Integrating with these legacy platforms often requires custom workarounds or additional hardware & middleware, which can impact the timeline of deployment and increase costs. However, our deep experience in mining and strong partnerships help us create flexible, modular solutions that bridge these gaps and allow for gradual/staging, scalable modernization rather than a costly full system replacement.
Opportunities	• What potential do you see for bundling Telkomsel solutions with partner technologies for greater value delivery? • Bundling our solutions with partner technologies offers significant potential to create comprehensive, end to end offerings that truly meet the complex needs of mining clients. By combining Telkomsel's reliable connectivity and local edge computing and local cloud infrastructure with specialized IoT devices, analytics platforms, and industry-specific software from trusted partners, we deliver more integrated and scalable solutions. This not only simplifies the client's procurement process but also enhances performance and speeds up deployment. It allows us to address multiple operational challenges such as productivity, efficiency, safety and compliance in a unified way. Moreover, partnerships foster innovation and agility, helping us stay ahead of evolving client demands and technology trends. Overall, bundling strengthens our position as a trusted, full-stack digital transformation partner for the mining sector." • Can mining clients' increasing focus on automation and safety open up new solution spaces? • Absolutely, As mining companies push harder on automation and safety, it creates many new opportunities for digital solutions. Automation requires reliable, low-latency connectivity like our private LTE and 5G networks to support remote-controlled equipment and autonomous operations and vehicles. Safety demands real-time monitoring with IoT sensors, wearables, and smart video analytics to track worker health, detect fatigue, and ensure compliance with safety protocols. These needs open the door for us to offer integrated platforms combining connectivity, AI-driven insights, and compliance tools all designed specifically for the mining environment.

	So yes, this growing focus is expanding the digital solution landscape significantly, and Telkomsel is well positioned to help clients meet these new demands.
Threats	• Are there any regulatory or interoperability risks that may delay solution enablement?
	• Yes, there are some regulatory and interoperability challenges that can impact how quickly we enable solutions for mining clients. On the regulatory side, strict data sovereignty laws like PP71 require data to be stored locally and securely, which means we have to design solutions with compliant local cloud or edge computing infrastructure. Getting all certifications and approvals can take time and add to project timelines. Interoperability is also a challenge because many mining operations still use legacy systems like older SCADA or proprietary equipment that don't easily integrate with modern IoT or analytics platforms. We often need custom integration work to ensure smooth operation without disrupting existing workflows. While these risks can cause delays, our experience and strong technical capability and partnerships help us navigate them efficiently and keep projects moving forward.
	• How do you assess the threat of mining clients opting for in-house digital development?
	• This is an important consideration. Some mining clients are indeed investing in building their own digital capabilities to have more control over their operations and data. However, in-house development often comes with significant challenges such as the need for talent specialized skills, ongoing maintenance, and integration complexities across diverse sites and legacy systems. Telkomsel's advantage lies in providing end-to-end, proven solutions backed by deep industry experience, reliable connectivity, and compliance with local regulations. We also offer flexibility through partnerships and modular services that clients can tailor without the heavy investment of building everything themselves. While in-house efforts may grow, many clients still prefer partnering with a trusted provider like Telkomsel to reduce risk, accelerate deployment, and benefit from our scale and expertise.

General Manager (GM) of Enterprise Product Strategy, Partnership and Performance

SWOT Dimension	Interview Details
Strengths	• How do strategic partnerships strengthen Telkomsel's position in the mining sector?
	• Strategic partnerships are absolutely vital for Telkomsel's success in the mining sector. By collaborating with technology providers, system integrators, sensors or devices and mining equipment manufacturers, we can offer comprehensive, integrated solutions that go beyond connectivity, covering IoT, analytics, automation, and more. These partnerships also allow us to accelerate innovation by leveraging the latest technologies without developing everything inhouse, which helps us respond faster to client needs. Moreover, working closely with trusted partners helps us build credibility and trust with mining clients, as they see a strong ecosystem supporting their digital transformation. Ultimately, these alliances enhance our value proposition and strengthen our position as the preferred digital partner in Indonesia's mining industry.
	• What makes Telkomsel's digital portfolio strategically aligned with industry needs?
	• Telkomsel's digital portfolio is carefully designed to match the evolving needs of industries like mining. First, we focus on end-to-end solutions, combining connectivity, IoT, AI analytics, and cloud infrastructure to address the digital transformation challenges. Second, our portfolio is built with flexibility and scalability in mind, so clients can start with pilot projects and expand as their digital maturity grows. Third, we integrate regulatory digital transformation roadmap and compliance and local data sovereignty directly into our offerings, which is crucial for industries operating under strict government mandates. Finally, our solutions are developed through close collaboration with industry experts and partners, ensuring they are practical, relevant, and future ready. All these factors make our portfolio strongly aligned with what industries truly need to improve productivity, efficiency, safety and sustainability.
Weaknesses	• Are there gaps in strategic alignment between product vision and client requirements in the mining sector?

	• While we strive for close alignment, there can be gaps between our product vision and roadmap and the evolving requirements of mining sector. Mining operations are complex and diverse, and client needs and requirements can shift quickly, due to regulatory changes, operational priorities, or new technology trends. Sometimes, our broader product roadmaps may need faster adaptation to very specific, niche demands like increase productivity or increase efficiency, unique safety features or integration with legacy systems. To address this, we maintain ongoing dialogue with clients, leverage co-creation approaches, and continuously refine our product strategy to stay aligned with their most challenges that need to be resolve as priority. This proactive and consultative engagement helps us close gaps early and deliver solutions that truly support their business goals.
	• What performance issues need to be addressed for long-term B2B competitiveness? • For us to maintain long-term competitiveness in B2B, especially in sectors like mining, there are several key performance areas to focus on. Speed of solution deployment is critical. Clients expect rapid, seamless implementation, because delays can cost them heavily, so we need to streamline our processes and reduce bottlenecks. Service reliability and uptime must be top-notch. Mining operations run 24/7 in harsh environments, so any downtime impacts productivity and safety, making consistent performance is essential. Speed of Innovation is also important; we must keep evolving our digital offerings to stay ahead of client needs or requirements and stay ahead than competitor advances. Customer support and account management need to be proactive and responsive, ensuring issues are resolved quickly and clients feel valued. We must continuously improve cost efficiency and pricing flexibility to offer competitive, value-based solutions without sacrificing quality. Addressing these areas ensures Telkomsel stays a trusted, preferred partner for B2B clients over the long term."
Opportunities	• How can new alliances or joint ventures enhance Telkomsel's access to mining clients or capabilities? • New alliances, joint ventures or Collaboration with strategic partnership are key to expanding our reach and capabilities in the mining sector. By partnering with specialized technology providers, system integrators, sensors or devices manufacturer or mining equipment manufacturers, we can offer more comprehensive, tailored solutions that directly address mining clients' complex needs. These partnerships also open doors to new client relationships, our

	partners often have established trust and presence that complement ours, helping us engage earlier in project cycles. Collaboration also can accelerate innovation by combining expertise and resources, enabling us to develop and deploy cutting-edge digital solutions faster. In short, alliances help us broaden our solution portfolio, deepen client engagement, and accelerate market penetration in a competitive industry.
	• What performance trends in the mining sector present growth levers for Telkomsel? • There are several key performance trends in mining that create strong growth opportunities for Telkomsel. First, the drive of increase target of production by Government or regulatory and growth of the mining & mineral business the the drive toward digital transformation and Industry 4.0 means mines are investing more in IoT, automation, and data analytics, all areas where we have strong offerings that will give benefit to increase productivity, increase efficiency, increase safety and ESG compliance. There's also an increasing focus on safety and environmental compliance, which requires real-time monitoring and advanced reporting solutions—another space where our connectivity and analytics solutions fit perfectly. And as mining operations expand into more remote and challenging locations, the demand for reliable, secure connectivity like private LTE and network backhaul grows. Finally, the trend of asset optimization and predictive maintenance pushes the need for integrated digital platforms that combine sensor data with AI-driven insights. These trends align well with Telkomsel's strengths and position us to capture significant growth in the mining sector.
Threats	• Do you foresee changes in client procurement behaviour that may impact current strategic directions? • Yes, we are observing shifts in client procurement behaviour that could influence our strategy. Mining clients are becoming stricter using tender and bidding method that also impact the project timeframe to be delayed and possibility Telkomsel can be lose due to the price war. Mining clients also focused on flexible purchasing models, preferring OPEX-based subscriptions or managed services over large upfront CAPEX investments. There's also a trend toward long term partnerships with vendors who can deliver end-to-end solutions and ongoing innovation, rather than one-off product sales. Additionally, procurement processes are increasingly emphasizing local content compliance (TKDN) and strict standard and regulatory adherence, which impacts vendor selection. These changes

	encourage us to prioritize modular, scalable solutions, strengthen local partnerships, and enhance our ability to deliver comprehensive digital transformation services, meet standards and regulatory compliance, increase the engagement and pricing flexibility aligned with evolving procurement expectations.
	• How do external partnerships pose risks to Telkomsel's value control or Intellectuals property protection? • External partnerships are crucial for expanding our offerings, but they can introduce risks related to value control and intellectual property (IP). When collaborating with partners especially technology vendors or integrators, there's a risk that our proprietary technology or sensitive business information might be shared beyond intended boundaries, which could dilute our competitive advantage. Additionally, differences in IP policies and practices between partners can complicate ownership and usage rights of jointly developed solutions. To manage these risks, we establish strong legal agreements and clear IP frameworks upfront. We also maintain close oversight on joint projects to protect our core innovations. Building partnerships based on trust and aligned goals helps ensure that we safeguard our IP while benefiting from shared expertise. We also have experience building partnership for decade in B2C product that using external partnership and have experience to manage the risk and prepare the mitigation by legal binding in the legal agreement.

General Manager (GM) of Enterprise Customers Solutions Management

SWOT Dimension	Interview Details
Strengths	• What aspects of Telkomsel's customer solution management are most appreciated by mining industry clients? Mining industry clients highly appreciate several key aspects of Telkomsel's customer solution management. Firstly, our dedicated Key Account Managers (KAMs) provide personalized, proactive support tailored to the unique challenges of mining operations. This close relationship helps us understand their evolving needs and respond quickly. Secondly, clients value our end-to-end solution approach, from connectivity with private LTE, through IoT

	device integration, to advanced analytics and support services delivered as a seamless package. Thirdly, our robust service level agreements (SLAs) ensure high network uptime and rapid issue resolution, which is critical in remote and mission-critical mining environments. Additionally, mining clients appreciate our flexibility in customizing solutions to fit their operational workflows, safety requirements, and compliance mandates. Lastly, our local presence and field support teams enable timely deployment and ongoing maintenance, which builds trust and reliability. Together, these aspects reinforce Telkomsel's reputation as a trusted digital partner for the mining sector. • How does Telkomsel ensure high levels of solution customization and support? Telkomsel ensures high levels of solution customization and support through several integrated approaches. First, we maintain dedicated industry focused teams, including experts who deeply understand the mining sector's unique operational challenges. This allows us to tailor solutions precisely to client needs. Second, our collaborative co-creation process involves close engagement with clients and technology partners during solution design, enabling us to customize network configurations, IoT integrations, and analytics platforms. Third, we leverage our platform and modular service architecture, which provide flexibility in bundling connectivity, devices, software, and support services to match specific client requirements. Fourth, we invest in robust after-sales support, including 24/7 monitoring, dedicated account managers, and rapid response teams located near client sites. Lastly, continuous feedback loops and regular performance reviews help us refine solutions over time, ensuring they evolve with client operations. This comprehensive approach ensures our clients receive personalized, reliable, and scalable digital solutions.
Weaknesses	• What are the most common customer complaints or unmet needs in digital solution delivery? While we strive for excellence, some common customer complaints or unmet needs we encounter include: 1. Customization Complexity: Some clients feel that solutions could be further tailored to their highly specific operational workflows, especially in complex mining environments where one-size-fits-all approaches fall short. 2. Integration Challenges: Customers occasionally report difficulties integrating new digital systems smoothly with existing legacy infrastructure, which can delay deployment and impact operational continuity. 3. Response Times in Remote Areas: Given the geographic challenges of mining sites, clients sometimes experience delays in onsite support or issue resolution, particularly in very remote locations.

	4. Pricing Transparency: Some customers seek clearer, more flexible pricing models that align better with their fluctuating project budgets and phased deployment plans. 5. Change Management Support: Clients often express a need for more comprehensive training and change management services to ensure their workforce can effectively adopt new technologies. Addressing these areas remains a priority for us as we continually enhance our solution design, support services, and client engagement strategies. • Are there internal misalignments affecting post-sales service quality? Yes, like many large organizations, we occasionally face internal misalignments that can impact post sales service quality. One area is coordination between sales, technical teams, after sales team, and field operations, sometimes expectations set during sales don't fully align with deployment realities, causing delays or gaps in service delivery. Another challenge is the communication flow across departments, especially when escalating issues or managing complex technical support, which can lead to slower response times. Resource allocation can also be uneven, particularly in very remote mining locations where local support staff availability is limited. Limited product Team member and technical engineering compared to the project, when the load of project already full, this creates the response and coordination issue. We recognize these issues and are actively working on strengthening cross-functional collaboration, improving the technical & sales skills, improving handover processes, and enhancing our field support capabilities to ensure consistent, high-quality post-sales service. Continuous training and internal alignment initiatives are also underway to close these gaps.
Opportunities	• How can proactive customer engagement create upselling or cross-selling opportunities in the mining vertical? Proactive customer engagement is key to unlocking upselling and cross selling opportunities in the mining sector. By maintaining regular, consultative dialogue with mining clients, we gain deeper insights into their evolving operational challenges and digital transformation goals. This understanding allows us to anticipate needs and recommend complementary solutions, such as adding advanced IoT analytics, enhanced cybersecurity layers, or expanded private LTE coverage to existing service packages. Engagement also builds stronger relationships and trust, making clients more open to pilot new technologies or scale successful trials. Furthermore, sharing industry best practices and success stories helps demonstrate added value and encourages adoption of broader solution bundles.

	Overall, proactive engagement transforms our role from a vendor to a strategic partner, which naturally drives business growth through tailored upselling and cross-selling. • What new service models (e.g., managed services, subscription) are clients demanding? Clients in the mining sector are increasingly demanding flexible and scalable service models to better manage costs and complexity. Managed services are very popular, where clients prefer to outsource the operation, monitoring, and maintenance of their digital infrastructure, allowing them to focus on core mining activities without worrying about technical details. Subscription-based models are also gaining traction, enabling clients to spread costs over time instead of large upfront capital expenditures. This aligns well with their fluctuating project budgets and investment cycles. Additionally, clients seek usage-based pricing for IoT and analytics services, which provides transparency and scalability based on actual consumption. Lease based model also option that mining client demanding. The newest one is revenue sharing still under development with initial investment in the technology provider like telkomsel, and the customer will share the revenue based on its performance production & revenue, this will benefit mining client to reduce investment and capital budget also sharing the risk of volatile mining & minerals price, but the legal and transparency needed to run this model but telkomsel also open for this commercial model. These new service models offer clients agility, predictable budgeting, and easier adoption of advanced technologies so Telkomsel is actively developing and offering these flexible options."
Threats	• Are there risks of client churn due to unmet SLAs or performance issues? Yes, there is always a risk of client churn if SLAs and performance expectations are not consistently met. Mining clients operate in challenging environments where network reliability, uptime, and rapid issue resolution are critical. Any downtime or delays can directly impact their operations and safety, which affects their trust and satisfaction. We recognize that unmet SLAs or service disruptions could lead clients to reconsider their partnerships or explore alternative providers although the churn possibility during the contract considered low but there is also penalty risk. To mitigate this risk, we invest heavily in proactive monitoring, dedicated support teams, and continuous improvement processes to ensure we meet or exceed SLA commitments. Regular communication and transparency with clients also help manage expectations and address issues before they escalate. Maintaining high service quality is a top priority to ensure client retention and long-term relationships, because in B2B services, trust is the critical matter for long term engagement.

	• How do competitor after-sales strategies pose a threat to Telkomsel's customer retention?
	Competitors' after-sales strategies can indeed pose a threat to our customer retention if they offer more attractive or responsive support. Some competitors differentiate themselves by providing faster on site service, extended support hours, or more personalized customer care, which can appeal to mining clients operating in remote and demanding environments. Others may offer innovative managed services or bundled support packages at competitive prices, making it easier for clients to consolidate their digital needs. This raises the bar standard for us to continuously enhance our after sales capabilities, not just meeting SLAs but exceeding client expectations through proactive engagement, technical expertise, and seamless issue resolution. We see this as an opportunity to innovate and deepen our relationships by emphasizing our local presence, industry knowledge, and integrated solutions. Ultimately, maintaining strong after sales performance is critical to differentiating Telkomsel and ensuring long term loyalty.

General Manager (GM) of B2B Corporate Business Strategy Development

SWOT Dimension	Interview Details
Strengths	• What are Telkomsel's strategic advantages in positioning its B2B digital business across heavy industries like mining?
	• Telkomsel's strategic advantages in serving heavy industries like mining & mineral sector come from a combination of our deep market understanding, robust infrastructure, and comprehensive solution portfolio. Our extensive network coverage, including private LTE and backbone connectivity, enables us to serve remote and challenging mining sites where reliable communication is critical. We offer end-to-end digital solutions from IoT devices and data analytics to cloud services and AI-driven insights that address the unique operational challenges of mining, such

	as productivity monitoring, safety monitoring, asset tracking, and environmental compliance. our strong local presence and branch spread across Indonesia and long-standing relationships with key mining players give us insight into industry specific needs and regulatory landscapes, allowing us to tailor solutions effectively and gain client trust. Additionally, our strategic partnerships with technology providers and system integrators expand our capabilities and accelerate innovation, ensuring we stay ahead in a competitive market. Together, All these factors position Telkomsel as a trusted, integrated digital partner that can support mining companies' complex transformation journeys with reliable, scalable, and compliant solutions.
	• How effective is the long-term roadmap in driving digital leadership in B2B?
Weaknesses	• Our long term roadmap is a critical tool that effectively drives Telkomsel's digital leadership in the B2B space. It provides a clear vision and strategic direction focused on innovation, customer centricity, and market responsiveness. By prioritizing investments in cutting-edge technologies like private LTE, edge computing, IoT, AI, and cloud, we ensure our solutions evolve ahead of client needs and industry trends. The roadmap also emphasizes building strong ecosystems through partnerships and enhancing operational excellence, which are key to delivering integrated, scalable solutions. Importantly, it incorporates regular reviews and feedback loops with clients and internal teams to stay agile and adapt to changing market dynamics. Overall, this structured approach has enabled us to consistently launch relevant, competitive offerings that solidify our leadership and create sustainable value for B2B customers." • What strategic barriers hinder Telkomsel's scale up efforts in the mining sector? • There are several strategic barriers that challenge Telkomsel's efforts to scale up in the mining sector. The complexity and length of mining procurement cycles can slow deal closures and extend project timelines, requiring sustained engagement and flexibility. Legacy infrastructure and system integration challenges in mining operations often demand customized solutions, which can limit scalability and increase deployment costs. The limited availability of mining-specific digital expertise and specialized sales resources in Telkomsel can constrain our ability to fully capitalize on emerging opportunities. Regulatory compliance requirements, such as data sovereignty and environmental standards, add layers of complexity to solution design and delivery. Last but not least, intense

	competition from both global technology players and local providers requires us to continuously innovate and differentiate to maintain market share. Addressing these barriers requires a focused approach on deepening industry expertise, enhancing flexible commercial models, strengthening partnerships, and streamlining internal processes to accelerate time to market.
	• Are there constraints in cross unit alignment that affect strategic execution? • Cross-unit alignment is crucial but can present challenges that impact strategic execution. Different business units sometimes have varying priorities and timelines, which can lead to delays or miscommunication. For example, sales teams may push for rapid deal closure while product teams focus on longer development cycles. Additionally, siloed information and processes can limit transparency and collaboration across units, reducing efficiency. To overcome these constraints, we are actively working to strengthen integrated planning, foster a culture of open communication, and implement cross functional governance frameworks that align objectives, share accountability, and accelerate decision-making. While challenges exist, our commitment to improving alignment is helping us execute strategies more effectively across the organization.
Opportunities	• How can Telkomsel align its B2B strategy with Indonesia’s national digital transformation agenda for the mining sector? • Aligning Telkomsel’s B2B strategy with Indonesia’s national digital transformation agenda, particularly for mining, is both a responsibility and an opportunity. We ensure our product and service offerings support the government’s Making Indonesia 4.0 roadmap, focusing on Industry 4.0 adoption, automation, and smart mining solutions that increase productivity, efficiency, safety and sustainability. Then we prioritize compliance with key regulations like data sovereignty (PP71) and environmental standards, integrating these into our solution design to help clients meet national requirements. We also actively collaborate with government agencies, industry Association, and partners to participate in pilot projects and scale digital innovation across mining operations. We tailor our commercial models to encourage wider adoption by offering flexible OPEX-based, leased, and even revenue shared solutions and support for local content development (TKDN), which align with national economic goals. By embedding these elements

	into our B2B strategy, Telkomsel not only supports Indonesia's digital ambitions but also strengthens its position as the go-to digital partner for the mining sector.
	• What role does data driven decision making play in identifying new market spaces?
	• Data driven decision making is fundamental to identifying and capturing new market opportunities. By analyse customer usage patterns, market trends, and operational data, we can uncover unmet needs and emerging demands within sectors like mining. This approach helps us prioritize investments, tailor solutions more precisely, and predict where digital adoption will accelerate. Furthermore, it enables us to validate hypotheses quickly, reduce risks, and allocate resources efficiently. Overall, leveraging data empowers Telkomsel to be proactive and agile, positioning us to lead in new and evolving market spaces.
Threats	• What macroeconomic or policy changes could derail Telkomsel's B2B growth in mining?
	• There are several macroeconomic and policy factors that could impact Telkomsel's B2B growth in the mining sector. Commodity price volatility such as sharp drops in nickel or coal prices can lead mining companies to delay, hold or reduce investment in digital transformation projects, affecting our sales pipeline. Currency fluctuations and inflation could increase costs for imported technology components, squeezing margins and client budgets. On the policy side, changes in mining regulations or export restrictions could shift operational priorities or stall new projects. Additionally, evolving data sovereignty laws and cybersecurity requirements could complicate solution deployment if compliance becomes more stringent or unclear. To mitigate these risks, we closely monitor market and regulatory developments and maintain flexibility in our offerings and commercial models to adapt quickly.
	• How do global tech firms entering Indonesia pose strategic threats to your business model?
	• Global tech firms entering Indonesia certainly represent a significant strategic threat. They bring advanced technologies, large-scale resources, and strong brand trust & recognition, which can attract clients seeking cutting-edge solutions. These firms often offer comprehensive cloud, AI, and analytics platforms that can compete directly with our offerings, sometimes bundling services at competitive prices. Their global experience allows them to deploy innovations rapidly. However, Telkomsel's deep local market knowledge, extensive network infrastructure, and

	regulatory expertise give us a strong advantage in tailoring solutions that meet Indonesia's unique needs. To stay competitive, we focus on building strong local and international partnerships, continuously innovating, and delivering end to end solutions that integrate connectivity, IoT devices, cloud, edge computing, AI and industry-specific applications areas where global entrants may face integration or compliance challenges.
--	--