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Review of scenario planning and future strategy of PT. Telkomsel's fixed mobile convergence (FMC) service implementation

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Abstract

Purpose: This abstract provides a brief overview of a review article that explores the scenario planning approach and future strategies for the implementation of Fixed Mobile Convergence (FMC) services by PT. Telkomsel. This study aimed to analyze the limitations and contributions of scenario planning in shaping future strategies for FMC service implementation.

Research methodology: This study uses a scenario planning method that aims to identify the driving forces for the future of the telecommunications industry in Indonesia in 2030 and then formulates a scenario for the future of telecommunications services in Indonesia. These scenarios are used as the basis for recommendations for PT. Telkomsel's business strategy for implementing FMC services, which is carried out through a qualitative approach.

Results: The research results found that, in the future, network coverage and technology will no longer be a competitive advantage for telecommunications companies in Indonesia. The research results show four possible future scenarios for the telecommunications industry in Indonesia: New Glory, Win Back Domination, Digital Colonialism, and Business as Usual.

Conclusion: PT. Telkomsel must always invest in additional infrastructure to meet customer bandwidth needs. The implementation of FMC services is crucial to increase the company's competitive advantage, but it requires careful anticipation of volatile, uncertain, complex, and ambiguous (VUCA) conditions to minimize future business risks. Scenario planning becomes necessary to develop an adaptive and resilient corporate strategy.

Limitation: This study is limited to scenario planning analysis based on qualitative data and focuses on Indonesia's telecommunications industry context toward 2030.

Contribution: The study contributes to providing strategic insights and future-oriented recommendations for PT. Telkomsel to optimize FMC service implementation under potential industry changes.

Keywords: *Fixed Mobile Convergence (FMC), Scenario Planning, Strategy Management*

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1. Introduction

The strategy and product integration of fixed and mobile convergence services have become very important for telecommunications operators as mobility and data communications have become very

attractive to customers, and the implementation of fixed mobile convergence (FMC) services can create opportunities for telecommunications operators to increase new competitive advantages and improve existing business services (Mellin, 2009; Moradi & Beigi, 2020; Rozanna, 2023). The implementation of FMC services by telecom operators can increase cost savings in terms of OPEX in the following years; thus, when competing in the market, telecom operators can provide a competitive advantage. Another benefit is the possibility of maintaining its market share, which has a broader impact on profitability than on cost savings (Rokkas et al., 2009). Based on a study in Japan, if only the merging of fixed and mobile services emerges as the main strategy in the FMC market, the competition resulting from the introduction of FMC does not stimulate competitive pricing (Khan, 2020; Nakamura, 2011).

The dynamics in the current and future business world will be higher when the problems that arise are volatile, uncertain, complex, and unclear (ambiguity), often called VUCA. These conditions make the big picture of the business world unpredictable, and the future is not clear enough (van Duijne & Bishop, 2018). In general, to deal with uncertainty, an organization or company will prepare different scenarios to find future results from several possible events that might occur (Schwarz, Ram, & Rohrbeck, 2019). The increasing level of turbulence and complexity of problems make conventional forecasting and strategic planning less accurate and appropriate for managing uncertainty; therefore, scenario analysis methods have proven to be efficient strategic planning methods (Alizadeh & Soltanisehat, 2020; Naab & Bans-Akutey, 2021).

Therefore, breakthrough innovation is needed to create a new competitive advantage to increase company revenue, and a new strategy is needed to save operational costs so that the company can always grow and survive in various circumstances. The implementation of fixed mobile convergence (FMC) services at PT Telkomsel is expected to create a new competitive advantage in competing in the market, saving operational costs and another benefit is the possibility of maintaining its market share, which has a wider impact on the company. However, PT Telkomsel must also pay attention to the dynamics in the current and future business worlds, where problems that arise are volatile (volatility), uncertain, complex, and unclear (ambiguity), often called VUCA. To deal with uncertainty, PT Telkomsels must prepare different scenarios to find future results from several possible events that might occur. For this reason, a scenario planning review is needed to see the future picture of the telecommunication needs of Indonesian people so that PT. Telkomsels can provide and prepare the best FMC service for their customers.

The key question in this research is "what is the alternative of future in the telecommunications industry in Indonesia in 2030 due to the VUCA world era." To answer this key question, based on the research background and problem formulation described above, through the stages of the scenario planning process according to Cairns and Wright (2018), namely, setting the agenda, determining driving forces, clustering driving forces, defining cluster outcomes, compiling scenarios, scoping the scenarios, and developing scenarios. Therefore, the research question in this study concerns scenario planning and future strategies for PT Telkomsel's Fixed Mobile Convergence (FMC) service implementation.

2. Literature Review

2.1. Theory and Framework

2.1.1 Scenario Planning

Scenarios are descriptions of future situations and the course of events that allow one to move forward from the actual to the future situation and Scenario planning techniques are often used by managers to articulate their mental models of the future to make better decisions (Amer, Daim, & Jetter, 2013; Syarif & Riza, 2022; Syarif, Rumengan, & Gunawan, 2021). The uncertainty of the future increases as we move away from the present and look further into the future when highlighting the widening of the scenario cone and the expansion of the realm of future possibilities of various factors that can affect the direction of the future development of an enterprise, as shown in Fig. 2.3 (Amer et al., 2013). As a decision-maker in a highly dynamic situation, a company or organization may not fully understand the complexity and ambiguity of the future that will occur with scenario thinking that the company or organization will gain information in support of decision-making that includes and integrates

consideration of the full range of political, economic, social, technological, ecological, and legal (PESTEL) factors that will shape the future. On the other hand, the future cannot be read as an extension of the past; however, scenario thinking provides a structured and easy-to-understand way of investigating volatility, uncertainty, complexity, and ambiguity (VUCA) issues.

According to Amer et al. (2013), there are three main groups of approaches to scenario development that have several sub-techniques: two of these three main approaches to scenario development started from the US and the UK Kingdom, and one emerged from France.

2.1.2. Framework Foresight

Strategic foresight differs from traditional planning approaches that are generally built on models. Strategic foresight is particularly useful in the face of VUCA conditions. VUCA is Volatile, Uncertain, Complex and Ambiguous. These conditions make the world largely unpredictable and the future is unknown. In the VUCA field, traditional planning approaches no longer provide reliable results. Strategic foresight methods have been designed to address the challenges in VUCA environments. Therefore, a framework is required to address the challenges in VUCA environments. The Foresight Framework is a structured approach for forecasting and planning (van Duijne & Bishop, 2018). The framework begins by defining the domain of what is being studied. This is followed by an assessment of the current conditions of the stakeholders. Next, a more in-depth analysis of the forces of change helps to look at the baseline future, which is expected based on the current insights. Based on the forces of change, uncertainty is also used, which helps consider alternative futures that are expected to occur. The baseline future and alternative futures certainly have implications. From the results of the Foresight Framework, the organization can respond to this by designing policies, plans, and actions to better face future challenges.

2.1.3. Fixed Mobile Convergence

The last decade has witnessed the evolution of Information and Communication Technology (ICT) towards realizing a network society. It is foreseen that emerging ICT solutions will play a more important role in creating industrial infrastructure that supports economic efficiency and urban infrastructure, enabling the Internet of Things (to) enhance public safety and security. In this evolution, new business models and social roles have been enabled, depending on local geographical realities, with operator-owned technologies deployed on their networks. The 5G network paradigm currently being discussed in the ICT industry is being designed with promises to fulfill demands and expectations. Most networks are set to evolve towards supporting seamless service delivery with the concept of access network technology, which has been known in the industry to date as fixed-mobile convergence (FMC).

According to the European Telecommunications Standards Institute (ETSI), Fixed Mobile Convergence (FMC) is the availability of network capabilities separate from access techniques, where the construction combines network architecture and standards support to provide services that can be accessed over fixed, mobile, or a combination of both. An important feature of fixed mobile convergence is the separation of subscribers and services from individual access points and terminals, thus allowing users to access services consistently over fixed or mobile terminals through a variety of compatible access points.

2.2 Framework of Thought

To develop the framework, the authors adapted the foresight framework from van Duijne and Bishop (2018) to obtain the operating variables in the scenario planning process, which include the following:

1. Domain definitions, such as objects, geographical location boundaries, observation time, and key issues aligned with the object and objectives of the research.
2. Current conditions consist of political, economic, social, technological, environmental, and legal aspects, and the determination of these parameters is assisted by the STEEP Analysis tool.
3. Forces of change obtained from domain definition and current conditions consist of ongoing trends, announced plans, potential events, emerging issues, and new ideas.

4. From the results of in-depth interviews from the operational variables above, then proceed with the stages of the data reduction process and drawing conclusions to obtain the conclusion of the forces of change. After the forces of change on the future of services in the Indonesian Telecommunications industry. The next step was to conduct a trend-uncertainty analysis by placing these items into the impact-uncertainty matrix table based on the results of interviews with sources.

Cluster outcomes in the area of high degree of uncertainty and high level of impact are used as the basis for identifying two scenario dimensions that are the result of combining or grouping closely related critical uncertainties. Then, from the obtained scenario dimension, the extreme values of both are determined to develop scenarios consisting of baseline and alternative futures. Next, the impact and strategy of each scenario were analyzed. The final step is to provide recommendations for the implementation of PT Telkomsel FMC (fixed mobile convergence) service based on the results of the resulting scenarios.

3. Methodology

3.1 Types of Research

Based on the objectives, this research falls into two categories: descriptive research and causal research. In descriptive research, researchers describe how a product is used to understand users' views of the product. Meanwhile, causal research aims to test whether the relationship between variables that have been studied previously is also applied in this study (Winarno & Indrawati, 2022). In this study, an inductive approach was used for theory development. The inductive approach, as explained by (Naab & Bans-Akutey, 2021); Sekaran and Bougie (2016); (D. N. Suharto, 2020) from these observations, general conclusions can be generated. Based on the research methodology, data collection techniques, and problems that occur, this research can be categorized as qualitative research. According to Widyaningrum (2020), qualitative research is conducted to explore phenomena that cannot be measured quantitatively and are descriptive in nature, such as describing the process of work steps, understanding various concepts, and identifying the characteristics of goods and services. This research had a minimal level of data intervention based on the level of researcher involvement. In this context, research does not intervene or manipulate data because researchers do not change data in a study.Furthermore, based on the unit of analysis, this research can be categorized as organizational research. This study examines one unit of the research object, PT Telkomel, which uses a cross-sectional design, where data collection is carried out in one period. In this method, data is collected in a certain period, then the data is processed, analyzed, and conclusions are drawn (Pratiwi, Luh Putu Agustini Karta, Ramanita, Aprilia, & Wardani, 2023; S. Suharto & Yuliansyah, 2023; Syarif & Riza, 2022). This study also used a scenario planning approach to obtain the perspective of the industry.

Table 1. Type of Research

No	Type of Research	
1	Research Objectives	Description
2	Based on Paradigm	Inter-pretivism
3	Approach to Theory Development	Inductive
4	Research Methodology	Qualitative
5	Research Strategy	Interview
6	Unit of Analysis	Organization
7	Research Involvement	Minimal
8	Research Setting	Non-Contrived
9	Time of Implementation	Cross Sectional

3.2. Data Collection and Data Sources

Data collection is an important step in research because the main purpose of this research is to obtain data (Sugiyono, 2013). Because of the importance of data collection, researchers must be able to plan the research well. Qualitative data was used in this study. According to Bungin (2007); Parela (2022); Yahya and Yani (2023), qualitative data are expressed in the form of sentences and descriptions of

conversations, and can even be short stories. In this study, a primary data collection strategy in the form of in-depth interviews was used, which were obtained through an in-depth interview process. In-depth interviews are an approach used in qualitative research. This method involved direct face-to-face interviews between researchers and interviewees. Through in-depth interviews, researchers can obtain verbal information directly from the sources. Indrawati (2015) mentioned that the advantage of in-depth interviews is to gain deep insight from each individual and can be used to understand unusual behavior. Primary data were obtained through interviews and questionnaires.

3.3. Data Validity Test

This research uses a qualitative data collection approach, so the validity test is also carried out qualitatively, namely, through data validity testing. According to Sugiyono (2013), validity refers to the extent to which the data collected from the object of research correspond to the reality that can be reported by researchers. Validity is useful for ensuring that the data produced are accurate. To ensure the validity of the data, the instruments used in this study must be tested. This was done so that researchers could obtain valid data in the study. The data validity test process begins by collecting all data obtained through observations and interviews. Furthermore, the results were analyzed by comparing them with related literature and references from expert sources. The validity of the data obtained from the interviews was tested through a credibility test using member checks. Member checks, as stated by Sugiyono (2013), involve checking the data obtained by the researcher to the data giver. If the data found are agreed upon by the data giver, the data are considered valid and credible. However, if there are significant differences in interpretation between the data found by the researcher and those provided by the data giver, researchers must update their findings and adjust them according to what the data giver provides. According to Sugiyono (2013), triangulation in the credibility test means verifying data from various sources using various methods and at different times.

3.4. Data Analysis Technique

In qualitative research, various data-collection techniques are used to obtain data from various sources until they reach a saturation point. During this continuous observation process, the data changes. According to Sugiyono (2009:426-427), data analysis is a systematic process of searching and summarizing data obtained from interviews, field notes, and other materials so that it can be easily understood, and the findings can be shared with others. The following is an explanation of each stage of data analysis.

1. Analysis before in the field
   According to Sugiyono (2019:320-321), data analysis in qualitative research is conducted before researchers enter the research field. At this stage, an analysis is carried out on secondary data that have been collected to determine the research factors. However, the focus of this research is temporary and will continue to develop after researchers enter the field.
2. Analysis during the field
   According to Miles and Huberman (in Sugiyono, 2019:321), qualitative data analysis is conducted interactively and continuously until it reaches saturation. Activities in the data analysis include the following:
   a. Data Collection
      Data collection was done through observation, in-depth interviews, and documentation, or a combination of the three, referred to as triangulation. Data collection was carried out over several days or months, so that the data obtained became significant and varied.
   b. Data Reduction
      Data reduction is the process of summarizing, selecting, and selecting the main items from the collected data. By reducing the data, a clearer picture can be obtained that can be studied by researchers.
   c. Data Presentation
      In qualitative research, data presentation is carried out in the form of brief descriptions, charts, relationships between categories, flowcharts, etc. However, in qualitative research, data presentation is often conducted using narrative texts.

4. Results and discussions

4.1 Characteristics of Respondents

The source of this research data was obtained from primary data sources, meaning that it was obtained from direct interview activities with sources. The sources of this research were selected from internal PT Telkomsel at the Vice President level with as many as three people and from externally involved in the Indonesian telecommunications industry with as many as two people and externally as a digital economy player, a director of a startup company engaged in e-commerce.

4.2 Research Results

The research results are presented using quantitative methods by conducting interviews with internal and external sources of companies in the Indonesian telecommunications industry and external e-commerce start-up companies in Indonesia. To avoid bias, the interviewees were provided with data and facts about the telecommunications industry. Interviews were conducted online and recorded, and the audio results were converted into transcripts using the transcriber.com application. The results of the transcripts that have been checked and corrected for errors in the writing of words are submitted to the sources to be double-checked. After being confirmed by the interviewees, the interview transcripts were subjected to a reduction process to obtain the data that needed to be processed in the research framework.

Based on the results of the literature review of the telecommunications industry in Indonesia, the definition of the key focal issue in this research is the future of the telecommunications industry in Indonesia in 2030 due to the world era of volatility, uncertainty, complexity, and ambiguity (VUCA). This key focal issue forms the basis for exploring interviews with sources with predetermined question variables.

4.2.1 Domain Definition

Tabel 2. Conclusion Domain Definition 1

Variable	Question	Conclusion
Framework Foresight (Domain Definition)	What is the current competition map of the Indonesian telecommunications industry?	Competition in the telecommunications industry in Indonesia is becoming fierce and widening and competition is not only between operators but also with OTT services and companies that have IT infrastructure so that telecommunications operators must improve service to their customers.
Framework Foresight (Domain Definition)	What are the telecommunication needs of Indonesian people in 2030 (the future)?	Society's need for telecommunications will increasingly change from coverage / connectivity to solutions with services not only Human to Human developing into Human to Machine, Machine to Human and Machine to Machine and autonomous, dissemination of positive information, education, digital economy that spreads to remote areas.

The telecommunications industry not only consists of telecommunications company operators that deal directly with individual customers, but also includes infrastructure providers, telecommunications equipment suppliers, and application providers. The telecommunications industry globally, as well as in Indonesia, has now changed in that players in the telecommunications industry are not only operators but also the presence of over-the-top (OTT) applications.

"In Indonesia, the competition is getting fiercer, yes, in the field of the presence of the telecommunications industry itself that telecommunications players are not only cellular but there is also fixed in the future, it will be even more crowded because it is no longer crowded, the competitors are not only against themselves fellow telecommunication network providers but more towards competition related to competition. OTT yes. There will be more and more OTT in the future, which is a challenge for us." (Interview MF, August 13, 23. 00:00:31).

"Tight. Ji yes. Consolidation of players in Indonesia is increasing. Thus, if we know how many years ago, we had quite a lot of operators, and now there are fewer and fewer and continue to consolidate. Thus, the point is that it is getting. The tighter and tougher the competition becomes. It's tough" (IS interview, Oct 17, 23. 00:01:40).

Competition in the telecommunications industry in Indonesia is becoming fierce and widening, and competition is not only between operators but also with OTT services and companies that have IT infrastructure so that telecommunications operators must improve service to their customers. Therefore, telecommunications operators must consolidate to overcome this competition.

The domain definition of the telecommunications industry in Indonesia, which initially focused on providing voice and message telecommunications channels, has now changed to data communication. In the future, the coverage and technology of each operator in the telecommunications industry in Indonesia will not be much different; thus, network technology and coverage will no longer be a competitive advantage for telecommunications companies. Competition in the telecommunications industry will widen, where in the Industry 4.0, to maintain company growth, each company can invest in IT and leverage its IT assets to compete in the telecommunications industry in Indonesia. Therefore, in the future, services in the telecommunications industry will change from connectivity-to solution-based.

4.2.2 Social

This section analyzes the sociocultural variables in the foresight framework that explain the characteristics of society that can affect the Indonesian telecommunications industry. The question variables included health, population growth rate, religion, education, and income distribution.

4.2.2.1 Announced Plans – Forces of Change

The coverage and technology of telecommunication services continue to develop in remote areas so that people have more choices of telecommunication providers and make it easier for people to access the Internet.

"All operators will have the same coverage and connectivity in time, Indonesia will not change." (SP interview, 16 Aug 23. 00:36:07)
"In my opinion, in the future, it seems that it has already started, yes, Pak Aji, the coverage is the same, but what will be the consideration of the customer is maybe the service of each service bonus, maybe that will be the consideration for the customer, maybe yes." (IM interview, December 2 Dec 23. 00:09:06).

4.2.2.2 Potential Events – Forces of Change

Pandemics similar to COVID 19 may or may not happen again, but society has learned a lot that dealing with countermeasures and telecommunications is an important factor in dealing with pandemics.

"There may be potential for a new disease to occur, but. The world has learned from Covid, we will deal with it. Adapt faster. Whether there will be the potential for a bigger pandemic aftershock to 19 is not sure either." (SP interview, 16 Aug 23. 00:54:35)
"Yes, we don't know. There may or may not be a possibility, and it may be different. Maybe from the experience of the pandemic, maybe the anticipation is much better". (Interview MF, August 13, 23. 00:27:12).

4.2.2.3 Emerging Issues – Forces of Change

Telecommunications technology and coverage continue to develop to reach remote areas of the country, with telco services that will meet the needs of the community, such as information, education, and economic improvement.

"More and more Indonesian people are very literate in technology. in which many things can be accessed using this technology. The more facilitated one's life is with the development of this technology, for example, in the past, when we accessed information, we had to read books and others. Maybe on one hand, in education, an increasing number of online classes are offered to the community. Therefore, they can access information faster. (RJ interview, 2 Dec 23. 00:07:22).

4.3.1 Technological

In this section, we analyze the technology variables in the foresight framework, which explains the technology roadmap that can affect the Indonesian telecommunications industry.

4.3.1.1. Ongoing Trends – Forces of Change

In the future, almost all data access will pass through the Cloud, this is the "tower of the future of telecommunications" the implementation of cloud technology requires a Data Center. Operators with many data centers dominate the telecommunications industry. Open RAN technology (network virtualization) will provide benefits to operators by saving capex and opex. All operators' networks will become head-to-head so that coverage and the network are no longer the competitive advantage of telecommunication operators.

"In my opinion, this will become the future tower tower, the one with the most towers controls the telecommunications industry, the one with the most clouds / data centers controls the communications industry, especially when there will be a need. The upper data points increase. All companies need it for storage servers and transactions, and do not invest on their own. Similar to tower incidents, there must be this investment. The development of my opinion. It's amazing." (SP interview, 16 Aug 23. 00:41:56)

"Maybe yes this is against the open RAN yes. Can you tell? Perhaps the impact in the future sir. I think. If this open RAN occurs, where will Indonesia be? Only one vendor provides it. The module module, perhaps as we know the RRU, where is the RRU, UBB? We are. We update as much as possible and what is needed, so that there is still momentum. Later one. In the future, the module will have multiple operators accessing the same module. Do not know if this will happen. Will Indonesia apply this? But as far as I know, this application has been done in America. Several operators used the same module. What is the impact? In future, many operators will use the same module. Later, they only needed to differentiate between the frequency (RJ interview, 2 Dec 23. 00:32:06).

4.3.1.2. Announced Plans – Forces of Change

The technology roadmap is clear in accordance with the guidelines of 3GPP, but the concern is the extent of its adoption in the community because it must be supported by the ecosystem (Device and Application). Device Application–The network must be a unified ecosystem.

"Telecommunication technology now is actually getting bigger, bigger, what is it, higher, the sophistication of the next level is increasing. Impact on telecommunications industry. Actually, if you look at it, it is getting. The name of the competition is also getting tighter. Therefore, if, for example, the development of 5G, actually 5G is that we want to move to 5G, but the technology around it is. There is already something that can support 5G or not when we want to go to 5G, but 4G is still not complete; it is still enough. It's a bit what? In my opinion, the telecommunications industry is approaching the next level, but it must be balanced with other technologies that follow. If, for example, only telecommunications continues to upgrade, but in terms of what, other fields of technology do not follow. It's also difficult to develop." (IM interview, December 2 Dec 23. 00:15:56).

"Okay, from the roadmap, maybe Indonesia is currently adopting 4G technology, sir, maybe. 4G technology is still similar. Starting to be adopted. Closer to the people of Indonesia, not too many people in Indonesia are literate in 5G. In the future, our target for the roadmap is to introduce 5G. Why do we have to be with 5G in both the operators and society? In the future, we are because. Alternatively, for telecommunications in this global context, we follow 3GPP. Released. We have a back, yes or like?

Agreement with all operators. In this world and telecommunication providers that every approximately 10 years/decade, we must have developments in telecommunications where it will be 6G, maybe it will come out in. Year 2030. A little bit further.

4.3.1.3. Potential Events – Forces of Change

Over The Top (OTT) media services will continue to grow and will become a competitor of telecommunications operators, making the map of competition in the telecommunications industry in Indonesia even wider.

"This will continue to grow because I think it is inevitable and the public's search for OTT services will have a big impact on the telecommunications industry. Why? It is difficult for the OTT to work together in a mutually beneficial manner. OTT services tend to take almost all benefits when making business deals. Why are we now going there as an operator to become a dump pipe because it turns out that it is still more profitable to be a dump pipe than to work with the OTT? At that time, they will still take most of the profit because they feel that the end user is ours'. (SP interview, 16 Aug 23. 00:44:32).

"Yes, it has also been said that OTT will definitely. It grows rapidly because there are many applications that make it easier for us to use OTT. The effect on the industry is positive. For the telecommunications industry, especially for operators, it is a challenge in itself and we must also enter the OTT to be part of the solution." (Interview MF, August 13, 23. 00:22:43).

4.3.2 Economic

In this section, we analyze the technology variables in the foresight framework that explain the economic factors, especially the digital economy, that can affect the Indonesian telecommunications industry.

4.3.2.1 Ongoing Trends – Forces of Change

The development of telecommunications technology will support economic growth from urban to rural areas, and become an important factor in the growth of the digital economy developed by startup companies.

"Yes, if it is called very influential, yes, the conclusion must be very influential because it is like the infrastructure we use is still the infrastructure in communication, what is telecommunications technology, there is nothing for the industry that is not supported by telecommunications technology, right?" (AZ Interview, December 3, 23. 00:20:23).

"The economy will be more advanced. Thus, by providing telecommunication services first, will it accelerate the economy in the area, and there is already research on that, right? A certain percentage of broadband growth increases economic growth by a certain percentage, and each country is different. Yes, the more underdeveloped the country is, the higher we are, but the point is. If we want to improve the economy in one place, one region in one country, we must provide telecommunication services because that is what we want to do? Become a catalyst for economic growth that used to be, for example, potato farmers did not know what the price of potatoes was, now by providing that service they know in the city what the price of potatoes is so that they are not deceived by middlemen and all kinds of middlemen and we". (Interview IS, October 17, 23. 00:32:20).

4.3.2.2. Announced Plans – Forces of Change

In the era of the digital economy, a sharing economy was formed, which is an economic model based on sharing, exchanging, or renting products and services, where someone gains access to the ownership of these goods (Botsman, 2010).

"And in my opinion, the sharing economy is one of the most powerful usecases for what's the name? To leverage the telecommunications industry, people used to gojek, maybe they did not have to have an ojek ojek ojek, they did not have to have a cellphone that could data, they also used a feature phone,

even 2G, now inevitably they have to use data that can 4G data, so yes, they have to buy a package that goes, it's a significant change." (Interview SP, 16 Aug 23. 00:32:47)
"The impact is big because it is precisely because that is the main infrastructure, right?" (Interview AZ, December 3, 23. 00:28:53).

The sharing economy is one of the most powerful uses in the telecommunications industry, and telecommunication is the main infrastructure.

4.3.2.3. Potential Events – Forces of Change
According to ATSI (2016), the digital economy is based on digital technology, including digital communication networks such as the Internet, computers, software, and other IT resources. Or digital economy is also referred to as "internet economy," "new economy" or "web economy." In this era, new economic infrastructure provides a global foundation for relationships, communication, collaboration, and information retrieval between people and organizations. In this era, telecommunications was the backbone for the development of the digital economy.

"It will be very fast, so here it is. Digital technology will develop very quickly if it is supported by a reliable telecommunications industry". (Interview MF, 13 Aug 23. 00:17:58)

"Yes, this supports each other. Therefore, the digital economy will need telecommunications because communication is once again based on coverage and connectivity. Yes, coverage, telecommunications, and telecommunications are increasing. Based on the use cases that exist in the digital economy, yes, because if not, people will still only call, right, what makes it above the telephone is beyond telephone calling calling, it's the digital economy". (Interview SP, 16 Aug 23. 00:34:43)

The digital economy will support the development of the Telecommunications Industry and vice versa; therefore, the digital economy has become a new stream of revenue in the telecommunications industry.

4.3.2.4. Emerging Issues – Forces of Change
In the future, the connectivity business will not be the dominant revenue of operators. In the future, operators must create a bundling strategy to sell connectivity based on customer solutions.
"No, no, no, people don't sell connectivity anymore, they buy the solution package connectivity is the same as we are now. Selling what voice is a bonus from the data package". (Interview SP, 16 Aug 23. 00:35:38).

4.3.2 Environment
In this section, the researchers analyzed the environmental variables in the foresight framework, which explained the environmental factors that could affect the Indonesian telecommunications industry.

4.3.2.1. Ongoing Trends – Forces of Change
Based on the Kominfo press release, the No. 276/HM/KOMINFO/07/2022 on Developing Environmentally Friendly Digital Infrastructure, Kominfo Emphasizes Three Aspects. According to Dedy Permadi, the Ministry of Communication and Information supports a green digital economy through three aspects: connectivity, data infrastructure, and applications.
"In the aspect of connectivity, operationally, the 5G network is a more environmentally friendly technology, with more data bits per kilowatt of energy than the previous wireless generation. The second aspect of data infrastructure, the Ministry of Communication and Information, encourages the development of green data centers that use renewable energy more efficiently. The third aspect of application, the Ministry of Communication and Information, facilitates the development of the smart city master plan. "One of the dimensions of smart city development is 'smart environment,' where digital innovations such as digital twins can be used to simulate solutions for the environment virtually and reduce operational costs," he said.

"With the sensor, we can select this to sort out which is organic and which is inorganic, it should be possible. By using IOT sensors that are developing today". (Interview MF, 13 Aug 23. 00:19:58)
"In terms of usecases in IT and telco, it can be done. Like for example. Now, there are already several operators of what waste banks, such as Mountrash, are using. He is like sharing the economy and creating an application. People enter the application and then the garbage is picked up at the house using the technology; right, just let us pick it up and later the garbage is paid because the garbage is resold again, which is chosen and sold. Nowadays, for parents and friends of their house friends, there are some areas that use the application to collect garbage and give it to garbage collectors. IT technology but if. From the hardware itself. We both know what technology waste actually becomes." (Interview SP, 16 Aug 23. 00:38:09).

The development of telecommunications technology can help solve environmental issues; for example, satellite imaging can help handle forest fires, the existence of IOT sensor technology can process waste effectively and efficiently, and telecommunications support the emergence of waste bank applications and other applications.

4.3.2.2. Announced Plans – Forces of Change
In August 2023 the Minister of Administrative Reform and Bureaucratic Reform (PANRB) Abdullah Azwar Anas on August 16, 2023 issued circular No.17/2023 regarding Work From Home (WFH) during the ASEAN Summit, of course WFH cannot run well without adequate telecommunications infrastructure support. In Indonesia, especially in big cities, telecommunications infrastructure is very supportive for employees to perform their work activities from home so that it can reduce human mobility, which has an impact on reducing air pollution.
"The impact is very large online meetings and all kinds of this. Yes, especially if there is already virtual reality." (Interview MF, 13 Aug 23. 00:20:51)

"Yes, sir. Yes, everyone can suddenly solve problems through Vicon. Yes, then all of a sudden, all companies make applications like banking so that all transactions are in the application, yes, of course, the contribution is extraordinary. And reducing the trips people used to have to go to the bank now there is no need for people to go to the office' (Interview SP, Aug.16, 23. 00:40:14)

Telecommunication creates online meeting services and accelerates the creation of banking applications and others to reduce the physical journey of the community, which has an impact on reducing pollution.

4.3.2.3. Potential Events – Forces of Change
The government, through the Ministry of Communication and Information, has made an appeal in press release no. 276/HM/KOMINFO/07/2022 for Developing Environmentally Friendly Digital Infrastructure. The Ministry of Communication and Information encourages the development of green data centers that use renewable energy more efficiently.

To generate electrical energy. One of the things offered by Huawei is that we are for rural places sir, yes we started providing solar, solar, solar BBU sir, so that we do not need external energy from the value of coal or connected to PLN directly. Well, so in those places it only requires. Solar panel solar panels to be made. The BTS is alive to provide the network; that is, one of them. One was also one of the others. One of the other is feature sir. Well, not only will we spare our doors, we have the name dormant cells where at the BTS we. Maybe in less hours. Less. Use. Less use of the consumer network, such as at 3:00 or that hour, can be used. The dormant cell feature deactivates some cells at the BTS to minimize the use of power." (Interview RJ, December 2, 23. 00:46:18).

Energy consumption is one of the main issues for telecommunications operators to save operational costs; alternative energy that has begun to develop is implemented in operators as solar energy sources.

4.3.2.4. Emerging Issues – Forces of Change

The prevention of global warming has become a program for telecommunication companies, one of which is the implementation of power-saving features in every telecommunication device.

"One of them we are also wrong. One of these features is the pack feature. Well, not only will we spare our doors, we have the name dormant cells where we are at the BTS. Maybe in less hours. Less. Use. Less use of the consumer network, such as at 3:00 or that hour, can be used. The dormant cell feature deactivates some cells at the BTS to minimize the use of power." (Interview RJ, December 2, 23. 00:46:18).

4.3.3 Politic

4.3.3.1 Ongoing Trends – Forces of Change

Indonesia is a country of law, so the company's policies and strategy implementation must be in accordance with applicable laws.

"Currently, there are many Yeses that favor telecommunications companies. An example of this is the frequency setting. Turning off what type of analog is digital and so on. That will be a new resource for telecommunications in the future ". (Interview MF, 13 Aug 23. 00:05:17)

"Very impactful, for example frequency. However, this is still unclear. We do not know which frequency for 5 g and we have not been given an event. When the tender will be and where, we do not know if it will collide with satellites, because there is a frequency, there is one thing that really becomes the basis of the telco world". (Interview SP, 16 Aug 23. 00:13:57)

Government regulations in the telecommunications industry are very impactful, for example, for the regulation of frequencies, which are the backbone of telecommunications and licenses for technology implementation, but the issuance of regulations can still often be said to be late.

4.3.3.2 Announced Plans – Forces of Change

"Yes, the government should prohibit it to protect local players. Even if they have to enter, TKDN must be as minimal as possible. So, local players can become the host." (Interview MF, 13 Aug 23. 00:08:48)

"Very impactful, so for example. Space x xx. Elon Musk's star link is him. He is in geo-orbit and several above Indonesia. Now, if it is not regulated, can they sell cellular in Indonesia, right? That is why it must be. This is because it is regulated so that space x/starlink cannot sell; they must work with local operators, so. This impact can alter this rule. It must exist if it does not work. Indonesia's air wealth can be controlled by foreigners'. (Interview SP, 16 Aug 23. 00:16:29)

Indonesian government regulations to date have been very protective of the interests of local operators; if global operators are to enter, they are limited to infrastructure providers only.

4.3.3.3 Potential Events – Forces of Change

In the future, optical support poles will be regularized using optical cables planted in an underground dak provided by the local government.

"The possibility of not even using poles so they have to be planted under the dak what is underground so that the government should provide dak cables (for optical operators)." (Interview MF, 13 Aug 23. 00:07:12)

"Now each of us can know that the red and white color actually has a telephone. If there is Indosat's yellow in the excel world, there are two of them. However, what I know is that if the current rules like Jakarta are not on the pole but on the cable, it is entered into the ground. Thus, the dak cable was connected. That's what I know now, but if it is a pole, I think. I don't know yet. (Interview IS, October 17, 23. 00:14:48))

4.3.3.4 Emerging Issues – Forces of Change

In the future, the telecommunication world will widen. Unlike the current telecommunications industry in Industry 4.0, all companies that have telecommunications / IT infrastructure will leverage their assets so that competition in the telecommunications industry in the infrastructure provider sector will be fierce.

"In the past, maybe the telecommunications industry was identical to its cellular communication tools, the competition was big between cellular operators but now it's no longer so cellular operators are already competing with fixed operators. What in the same field, namely, the telco field, but also with fields outside Telco, such as broadcast TV and even? PLN and PLN began to enter the telecommunications industry to offer themselves in the Telco world, which has widened out of the old understanding of communication, if I really think that one day all companies will be able to become companies. Now, when a company becomes a center, the basis must be strong in telecommunications. In this context, all companies will enter the world of telecommunications to widen competition. Not only with the operators but also outside the operators, there is competition." (Interview SP, 16 Aug 23. 00:01:55)

5. Conclusions

5.1 Conclusions

Based on the research findings, the following conclusions were drawn:

1. Trends in the global telecommunications industry based on research from resource persons and the literature are as follows:
   a. The data consumption of both fixed and mobile networks by customers will continue to increase, especially for video content.
   b. IOT device connections will continue to increase, starting from the medical, automotive, and transportation sectors, computers, the electronics industry, and various customer needs.
   c. Increased capex in 5G implementation accompanied by a revenue revenue dilemma that is starting to saturate
   d. The behavior of society is increasingly digital; people demand seamless connections to various aspects of life as a solution to the problems they face.
2. In the future, the coverage and technology of telecommunication networks will no longer be a competitive advantage for telecommunication companies in Indonesia.
3. The future competitive advantage of telecommunication companies will be fulfilling customer solutions that are integrated into the ecosystem.
4. Based on this research, four scenarios may occur in the future of the telecommunications industry in Indonesia.
   a. Scenario 1 (*New Glory*)
   A condition where the government constantly makes studies regarding the needs of the telecommunications industry in Indonesia so as to produce fast and precise regulations, these regulations can be utilized by telecommunications companies to control networks and create new business schemes based on customer solutions that are integrated with the ecosystem.

   b. Scenario 2 (*Win Back Domination*)
   A situation in which the government waits and sees the dynamics of Indonesia's telecommunications industry. This situation makes telecommunications industry players more cautious in innovating, customer needs have changed a lot from connectivity based to solution based business experience in the industry and a deep understanding of customers makes telecommunications companies succeed in creating new business schemes to serve customers based on an integrated ecosystem.

   c. Scenario 3 (*Digital Colonialism*)
   A situation in which the government waits and sees the dynamics that occur in the Indonesian telecommunications industry. This situation makes telecommunications industry players more cautious in innovating and the need for customer solutions continues to be urgent. As they focus more on connectivity services, telecommunications companies fail to become ecosystem enablers. This situation is utilized by OTTs to provide new breakthroughs to meet customer needs.

   d. Scenario 4 (*Business as Usual*)
   A condition where the government always conducts studies regarding the needs of the telecommunications industry in Indonesia to produce fast and precise regulations. This situation is

equally utilized by telecommunications companies and OTT players to compete in providing integrated solutions for customers. Because of their agile culture, OTT companies that have experience building customer digital ecosystems can win the competition to provide integrated solution services to customers. With the strength of network control, telecommunication companies have created B2B connectivity business schemes with OTT players.

5.2 Suggestions

The following practical and academic suggestions can be conveyed by researchers based on the analysis and conclusions of the research results:

1. The PT Telkomsel plays an active role in encouraging the creation of regulations that can safeguard the interests of local operators.
2. In anticipation of the future of the Indonesian telecommunications industry, PT. Telkomsel is advised to strengthen the business of the vetura investment subsidiary which focuses on telecommunications ecosystem investment and strengthen the business of subsidiaries engaged in digital business incubation of the telecommunications ecosystem.
3. Use of AI Technology for PT. The Telkomsel network operation is more effective and efficient.
4. PT Telkomsel conducts RnD with a short delivery to market products based on the telecommunications ecosystem.
5. Improve skills or recruit employees in the fields of software engineering, cloud computing, network virtualization, AI, and network security.
6. Massive development of fiber-to-the-home (FTTH) optics and fiber-to-the-tower (FTTT) optics has increased the dominance of broadband services with low latency to customers.
7. Building partnership cooperation with OTT players and global technology.

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