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ANALYSIS OF TECHNOLOGICAL COMPETITIVENESS THROUGH MANAGERIAL RELATIONSHIPS AND MARKETING INNOVATION WITH CUSTOMER VALUE INTERVENTION IN THE TELECOMMUNICATIONS INDUSTRY COMPETITION IN INDONESIA WITH STARLINK

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Abstract

The increase in internet penetration in Indonesia has led to increasingly fierce competition in the internet service provider industry, especially with the arrival of satellite-based services such as Starlink, which offers high-speed technology and wide coverage. This situation requires local internet service providers to improve their technological competitiveness through appropriate strategies. This study aims to analyze the influence of managerial relationship capabilities and marketing innovation on technological competitiveness with the mediating role of customer value. The study uses a quantitative approach with a survey method of 150 respondents who are internet service users. Data were collected through an online questionnaire and analyzed using SmartPLS-based Structural Equation Modeling (SEM). The results of the study indicate that managerial relationships and marketing innovation do not directly affect technological competitiveness. However, both variables have an indirect effect through customer value as a mediating variable. Customer value is also proven to have a positive and significant effect on technological competitiveness. These findings confirm that the creation of customer value is a key factor in enhancing technology-based competitive advantage in the telecommunications industry. Therefore, companies need to focus their managerial strategies and marketing innovation on efforts to increase perceived customer value in order to maintain competitiveness amid increasingly dynamic technological competition.

Keywords: Technological Competitiveness, Marketing Innovation, Customer Value, Managerial Relationships, Telecommunications Industry.

INTRODUCTION

Internet demand in Indonesia is increasing over time. In 2022, the number of Indonesians who had accessed the internet was 66.48% of the total population (Central Statistics Agency, 2022). This number increased in 2023 to 78.19% and as of February 2024, it has reached 79.5% of the total population in Indonesia (APJII, 2024). This increasing internet penetration rate can be an opportunity for the internet service provider industry to compete and win the market competition. However, to do so, internet service providers need to understand their value in order to compete. This is a challenge for the industry in this sector because companies need to assess the technology they have and evaluate whether it is competitive when compared to the technology used by competitors.

Creating competitiveness requires taking into account market desires and needs. Products must be useful in order to be absorbed by the market, so management needs to develop strategies to penetrate the market because only in this way can products provide competitiveness for the company (Farida & Setiawan, 2022). Through market penetration, business actors will know whether a product or service has met or even exceeded consumer expectations (Sudirjo, 2023). This is referred to as customer value creation. This process certainly requires managerial skills so that the goal of making products accepted by the market can be achieved. Previous literature by Sánchez-Gutiérrez et al. (2019) has introduced the theory that the

value of a product or service is created through management's ability to manage customer relationships and how they innovate in marketing activities so that the product is well absorbed by the market. In the context of technological competitiveness in Indonesia, existing local internet service providers, such as IndiHome, Biznet, MNC, First Media, and others, are faced with a new challenge with the arrival of the Starlink internet service alternative (Beatrix et al., 2024). These companies must adapt to rapid changes and innovate to maintain their market share, as innovation is the key to gaining a competitive advantage (Farida & Setiawan, 2022). Starlink, a satellite internet service provider managed by SpaceX, is reported to be entering the Indonesian market by offering product advantages that have low latency and wide coverage to remote areas that were previously difficult to reach by traditional internet service providers thanks to Low Earth Orbit (LEO) technology or satellites that orbit close to the earth's surface. Starlink's internet speed can reach 360 megabits per second with an average speed of 250 Mbps (Santika, 2024). This average speed is very high when compared to the speeds of local ISPs: Telkomsel with 24.48 Mbps (Ahdiat, 2023), Biznet with 37 Mbps, First Media with 26.1 Mbps, and Indihome with 18.6 Mbps (CNBC, 2023).

The news about Starlink's operational potential in Indonesia reveals an important phenomenon for the development of research on technological competitiveness in the communications industry, especially in Indonesia. This is because Starlink is able to offer new product advantages that have never been provided by local internet service providers, thus potentially becoming a strong competitor (Rahayu, 2024). However, according to data published by Databoks, 63.8% of internet users said that Starlink could be an attractive alternative, but they did not need it yet.

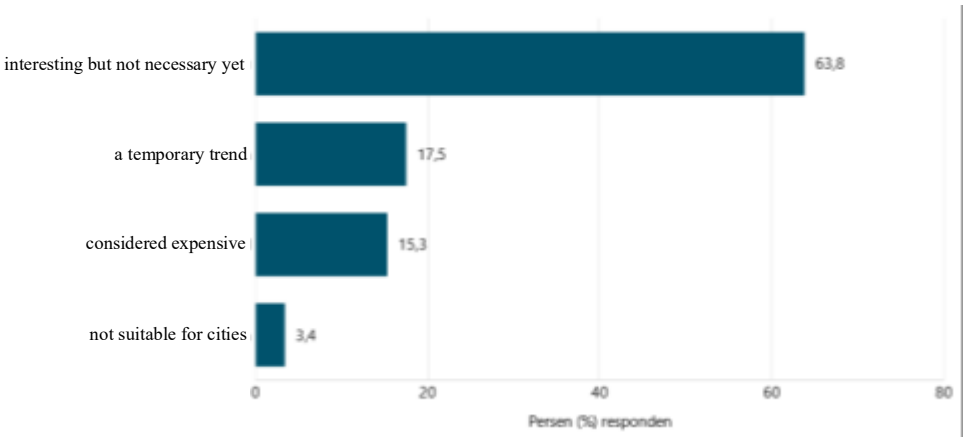

Figure 1. Respondents' Perceptions of Starlink Internet (May 31, 2024)
Source: Databoks

The above data can certainly serve as a basis for local internet service providers to assess existing market opportunities. Although Starlink has a number of product advantages, the public has shown reluctance to switch to Starlink. Meanwhile, 15.3% consider Starlink to be expensive, with the cheapest hardware priced at Rp7,800,000 and a monthly subscription fee of Rp700,000 (CNBC, 2024). The above percentage is supported by the fact that 946 out of 1,489 total data points show negative sentiment by netizens about the emergence of Starlink, according to research revealed by (Paula et al., 2024). This opportunity needs to be utilized by internet service providers in Indonesia to increase the value of their products so that they can compete with foreign internet service providers, such as Starlink, entering the Indonesian market. However, the presence of Starlink, as well as other foreign internet service providers, entering the Indonesian market has the potential to change the competitive landscape in the telecommunications industry by presenting innovative and efficient alternatives (Beatrix et al., 2024; Satryoko & Runturambi, 2020). On the other hand, this competitive threat can be a stimulus for local internet service providers to innovate. In a study cited by Beatrix et al. (2024), the presence of Starlink can actually spur improvements in the quality of service and infrastructure of local operators in response to competitive pressure. The study also states that Starlink, as a foreign internet service, can encourage

government policies and regulations that support the development of more equitable communication technology and infrastructure throughout Indonesia. Local internet service providers need to develop marketing strategies to compete with Starlink's new technology. Of course, the hope is to provide competitive advantages to counter the technological innovations offered by Starlink (Beatrix et al., 2024; Paula et al., 2024). If ignored, Starlink's innovations could potentially lead to predatory pricing or monopoly by causing customers of local internet service providers to switch to Starlink. However, with the right strategic approach, local internet service providers can control customer perceptions of their products or services so that they do not easily switch to Starlink (Rahayu, 2024). Effective marketing strategies can shape positive perceptions about the quality, innovation, and technological superiority offered by companies. Positive customer perceptions of a company's technology can increase the competitiveness of that technology. If customers view a technology product or service as innovative, high quality, and meeting their needs, they are more likely to choose and recommend that product (Rahayu, 2024; Wasnawa et al., 2023).

Previous literature has conveyed how customer value creation greatly influences the formation of competitiveness (Sánchez-Gutiérrez et al., 2019a). However, with the current phenomenon of competition between local and foreign internet service providers, customer value creation will remain a challenge for management. There needs to be an appropriate corporate strategy to align customer needs and desires with the resources owned by the company to create competitiveness (Beatrix et al., 2024; Farida & Setiawan, 2022). This strategy includes improving the company's relationship with customers and utilizing these relationships to identify business opportunities (Hossain et al., 2021; Sánchez-Gutiérrez et al., 2019). Customer relationships play a direct and indirect role in competitive advantage (Hossain et al., 2021). On the other hand, in a crowded business competition, there needs to be a marketing innovation strategy so that businesses can differentiate themselves (Gupta et al., 2016; Nooraisyah et al., 2024). Part of this strategy is to respond quickly to changes in consumer preferences and improve the overall customer experience through creative and engaging strategies (Gupta et al., 2016).

This study aims to provide new insights into the discussion of customer value creation in order to give competitive advantage to internet service providers as part of the telecommunications industry. These new insights are needed because previous studies have not specifically discussed the relationship between technological competitiveness and variables such as managerial relationship capabilities and marketing innovation, which use a mediation approach with customer value creation variables. This study compares Starlink services with local ISPs, allowing users to provide direct insights into the differences in services and the technological benefits they experience. Additionally, this study seeks to investigate other business sectors beyond retail and manufacturing, using the telecommunications sector as its object of study.

LITERATURE REVIEW

Theory of Resource-Based View

The Theory of Resource-Based View (RBV) explains that a company's competitive advantage depends on its ability to utilize internal resources that are valuable, rare, difficult to imitate, and inimitable (VRIN). In the context of this study, RBV is used to understand how managerial relationships and marketing innovation function as strategic resources that can drive a company's technological competitiveness. These two resources not only play a direct role in enhancing technological superiority, but also shape customer value as an important intangible asset in creating differentiation and sustainable superiority. Thus, this research model positions managerial relationship capabilities and marketing innovation as variables that drive technological competitiveness, both directly and through the mediating role of customer value, in line with the RBV perspective that emphasizes the importance of managing unique resources as the basis for competitive advantage. From the Resource-Based View (RBV) perspective, a company's competitive advantage stems from the utilization of internal resources that are valuable, rare, difficult to imitate, and non-substitutable (VRIN). In this study, managerial relationship capabilities and marketing innovation are viewed as strategic capabilities of the company. Managerial

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relationship capabilities enable companies to build strong networks and access valuable information, while marketing innovation produces creative and relevant strategies that are difficult for competitors to imitate. These two capabilities contribute to the creation of customer value, namely the unique benefits and experiences felt by consumers, which in turn become mediators in increasing technological competitiveness. By effectively utilizing internal capabilities, companies can improve their technological performance and maintain their competitive advantage, in line with the RBV principle that the combination of VRIN resources forms the basis for long-term success.

Managerial Relationship Skills

Managerial relationship skills are social skills (soft skills) needed to lead, motivate, and manage conflict. Some other examples of managerial relationship skills are communicating effectively, working together, fostering participation, and empowering colleagues and subordinates (Hwang & Ng, 2013). According to Siagian (2009), managerial skills are the ability to manage a business, such as planning, organizing, motivating, supervising, and evaluating. Managerial activities cover many aspects, on which management experts offer varying opinions. The main and most essential aspects of managerial activities, as described in an academic article by Fattah (2008), are planning, organizing, leading, and controlling. Managerial capabilities refer to a manager's ability to establish social relationships when carrying out these key managerial activities.

Marketing Innovation

Marketing innovation is a process that involves new or significantly improved marketing methods that enable companies to efficiently use their resources to meet customer demand and create superior customer value (Wang et al., 2020). Thus, marketing innovation is the implementation of new and innovative marketing techniques. It involves significant variations in design or packaging, positioning, brand image, or pricing. Factors that represent marketing innovation are innovative distribution methods, innovative promotion schemes/methods, extraction of potential market demand, and others (Lin et al., 2010).

Customer Value

Customer value is the perception of the value of a product or service to customers compared to existing alternatives. Value here means whether customers feel they are getting more benefits and services than the amount they pay (Mahajan, 2020). Customer value is a combination of benefits and sacrifices that occur when customers use goods or services to meet certain needs. Parasuraman & Grewal (2000) state that the domain of customer value is reflected in the definition of value, which is measured based on consumer expectations or preferences that will influence their decision to purchase something. Customer value is also considered a dynamic concept that needs to be monitored over time. Woodall (2003) states that within customer value, there are two measurements, namely value for customers (perceived value and received value) and value for companies (customer value received by companies).

Technological Competitiveness

One of the criteria that determines a country's success and achievement in reaching its goals of increasing income and economic growth is competitiveness. Competitiveness is known as a matter of productivity, which is the amount of output produced for each input used. This increase in productivity is caused by an increase in the amount of physical capital and labor inputs used, an increase in the quality of inputs used, and an increase in technology (Porter, 2008). Technological competitiveness is the ability of companies to use technology to differentiate themselves from competitors and gain a competitive advantage. This is a key factor in the ability of companies to: anticipate new markets, improve organizational performance and sustainability, access new technologies and rules in doing business, and collaborate with other economic actors (Alvarez-Aros & Bernal-Torres, 2021).

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METHOD

This study uses a quantitative approach that focuses on hypothesis testing, causal inference, and objective statistical analysis to evaluate the relationship between management and marketing variables. The population in this study is all individuals who subscribe to the internet through internet service providers. In order to reduce errors in the data collection and testing processes, the sample size was determined to be the most optimal in representing the large population of internet service users. According to Hair (2009), a sample size of 100 is considered optimal in representing the population, especially for studies with models that have up to five constructs. In this study, this number will be used as the minimum limit for sampling. Since the population is not known with certainty, the formula from Hair et al. (2017) was used by multiplying the total number of indicators by 10 (constant value) to obtain 150 respondents. Meanwhile, data was collected through an online questionnaire via Google Form with the assistance of researchers to maintain data quality.

This study will test the hypothesis using the Structural Equation Modeling approach, commonly abbreviated as SEM, with SmartPLS software. This method is considered appropriate for large populations with unknown numbers, requiring a minimum sample size to be determined (Hair et al., 2021;3). The SEM analysis used has two stages in its analysis, namely measurement model analysis (outer model) through validity testing (outer loading value > 0.70) and reliability testing (Cronbach's alpha > 0.70). Next, a structural model test (inner model) was conducted, which included a multicollinearity test (VIF < 5), a path coefficient test to determine the direction of the relationship, and a t-test and p-value to see the significance of the influence between variables. The researcher also measured the strength of the influence through the F-Square test and assessed the overall feasibility of the model using the Goodness of Fit (GoF) test (Hair et al., 2021).

RESULTS AND DISCUSSION

Path Coefficient Test

Path coefficients attempt to determine the direction of the relationship between variables, such as whether the relationship is negative or positive. A positive relationship is indicated if the path coefficient values are between 0 and 1, while if the path coefficient values are in the range of -1 to 0, the relationship is considered negative (Sekaran, 2017).

Table 1. Path Coefficient Test

	Technological Competitiveness	**Customer Value**
Marketing Innovation	0.188	0.588
Managerial Relationship Capabilities	-0.004	0.269
Customer Value	0.668	

The table shows the results of path analysis (path coefficient) that describes the influence between variables in the structural model. Each value in the table represents the magnitude of the direct influence of one variable on another variable that is the target (dependent). The following is the interpretation:

1. Marketing innovation has a positive effect on technological competitiveness because the path coefficient value is positive, namely 0.188
2. Marketing innovation has a positive effect on customer value because the path coefficient value is positive at 0.588.
3. Managerial relationship skills have a negative effect on technological competitiveness because the path coefficient value is negative at -0.004.
4. Managerial relationship ability has a positive effect on customer value because the positive path coefficient value is 0.269

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5. Customer value has a positive effect on technological competitiveness because the positive path coefficient value is 0.668

F-Square Test

The following are the results of the F-square test, interpreted in the table below:

Table 2. F-Square Test

	Technological Competitiveness	Customer Value
Marketing Innovation	0.027	0.355
Managerial Relationship Capabilities	0.000	0.074
Customer Value	0.450	

Based on Table 2 of the F-test results, several conclusions can be drawn as follows:

1. Marketing innovation has a low effect on technological competitiveness (F-square = 0.027), indicating that the higher the marketing innovation, the smaller its contribution to increasing technological competitiveness.
2. Marketing Innovation has a high effect on customer value (F-square = 0.355), indicating that the higher the marketing innovation, the more significant the increase in customer perceived value.
3. Managerial relationship skills show no effect on technological competitiveness (F-square = 0.000) because the F-square value is below the low category.
4. Managerial relationship skills have a low influence on technological competitiveness (F-square = 0.074), indicating that the higher the managerial relationship skills, the less significant their contribution to improving technological competitiveness.
5. Customer value has a high effect on technological competitiveness (F-square = 0.450), making it the most significant factor in enhancing technology-based competitive advantage.

Goodness of Fit Test

The Goodness of Fit value is considered low if it has a result of 0.1; moderate if it has a result of 0.25; and high if it has a result of 0.35 (Tenenhaus et al., 2004). Therefore, researchers need AVE and R-square values.

Table 3. Goodness of Fit Test

	AVE	R-Square
Technological Competitiveness	0.709	0.680
Customer Value	0.686	0.677
Average	0.698	0,679

Researchers can determine the model's suitability through the AVE and R-square values. However, it can also be calculated using the formula below:

$GoF = \sqrt{Average\ AVE} \times Average\ R^2$

$GoF = \sqrt{0.698} \times 0.679$

$GoF = \sqrt{0.474}$

$GoF = 0.688$

Based on the Goodness of Fit (GoF) calculation results, this research model is declared to have high feasibility with a GoF value of 0.698. This value is well above the minimum threshold of 0.35, which indicates that the model is able to explain the relationship between variables well and comprehensively. The high GoF value indicates that the model structure is statistically adequate and reliable for further analysis in achieving the research objectives.

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T-Test

The following are the results of the t-test interpreted in the table below:

Table 4. Hypothesis Testing (T-Test)

Hypothesis	Hubungan antar Variabel	T Statistics	P Values
H1	Managerial Relationship Capabilities -> Technological Competitiveness	0.036	0.971
H2	Marketing Innovation -> Technological Competitiveness	1.678	0.094
H3	Managerial Relationship Capabilities -> Customer Value -> Technological Competitiveness	2.393	0.017
H4	Marketing Innovation -> Customer Value -> Technological Competitiveness	4.421	0.000
H5	Customer Value -> Technological Competitiveness	7.931	0.000

Based on the results in the table above, the following is the interpretation:

1. Managerial relationship capabilities do not affect technological competitiveness. This can be seen based on p-value=0.971>0.05 or t-count=0.036<1.96, which means that there is no effect. Therefore, it can be concluded that Hypothesis 1 (H1) is accepted.
2. Marketing innovation has no effect on technological competitiveness. This can be seen based on the p-value = 0.094 > 0.05 or t-count = 1.678 < 1.96, which means that there is no effect. Therefore, it can be concluded that Hypothesis 2 (H2) is accepted.
3. Customer value mediates the relationship between managerial relationship capabilities and technological competitiveness. This can be seen based on p-value=0.017<0.05 or t-count=2.393>1.96. This means that there is no effect. Therefore, it can be concluded that Hypothesis 3 (H3) is accepted.
4. Customer value mediates the relationship between marketing innovation and technological competitiveness. This can be seen based on p-value=0.000<0.05 or t-count=4.421>1.96. This means that there is no effect. Therefore, it can be concluded that Hypothesis 4 (H4) is accepted.
5. Customer value affects technological competitiveness. This can be seen based on p-value=0.000<0.05 or t-count=7.931>1.96. This means that there is no effect. Therefore, it can be concluded that Hypothesis 5 (H5) is accepted.

Discussion

Managerial Relationship Skills Affect Technological Competitiveness

This study found that managerial relationship skills do not affect technological competitiveness. These results differ from previous studies which stated that managerial relationship skills enhance collaboration in technology management, encourage innovation, and increase responsiveness to market demand (Dereli, 2017). The implementation of good management practices is essential for successful corporate change, indicating that managerial skills have a significant impact on technological competitiveness by ensuring alignment with strategic objectives, corporate culture, and daily operations (Mittal et al., 2025). However, other studies also state that managerial relationship skills do have a significant impact on technological competitiveness. Nevertheless, many large companies often fail to utilize technology effectively due to a lack of technology management skills, not because of a lack of technology itself (Tajuddin, 2025).

Marketing Innovation Affects Technological Competitiveness

This study found that marketing innovation does not affect technological competitiveness. The results of this study differ from previous studies by Ievseitseva & Mihalatii (2024). Marketing innovation enhances technological competitiveness by introducing innovative strategies that attract consumer attention, optimizing marketing processes, and adapting to market changes. This adaptability enables

companies to meet evolving consumer needs, ensuring sustainable competitive advantage in a rapidly changing business environment.

Customer Value Mediates the Influence of Managerial Relationships and Marketing Innovation on Technological Competitiveness

This study finds that customer value acts as a mediator between managerial relationships and marketing innovation on technological competitiveness. The results of this study are consistent with previous studies which state that customer value acts as a mediator for marketing innovation by increasing the perceived value of high-tech products, thereby increasing competitiveness. Innovation in marketing and product features modernizes customer value, meets diverse consumer needs, and fosters brand loyalty (Wiechoczek, 2016). In addition, a company plays a key role in strategic relationship management, as this certainly leads to a better understanding of customer perceptions and needs (O'Cass & Ngo, 2012). The creation of high customer value will in turn strengthen technological competitiveness, as companies can adapt technology to better meet market needs, innovate in a targeted manner, and survive in the midst of competition. In addition, companies can continue to improve and seize every opportunity that is detected. These opportunities create the development and management of strategic relationships for customer value creation (Sullivan et al., 2012). So it can be concluded that improving managerial relationship capabilities and marketing innovation increases customer value, which in turn increases the competitiveness of the company due to the use of advanced technology (Sánchez-Gutiérrez et al., 2019).

Customer Value Affects Technological Competitiveness

This study found that customer value affects technological competitiveness. This is in line with previous studies stating that technological competitiveness can be improved by analyzing market trends and customer needs (Bekkers, 2016). Customer value significantly affects technological competitiveness because it encourages companies to innovate and adapt to meet ever-changing customer expectations (McFarlane, 2013). Customer value is crucial for technological competitiveness because it focuses on solving consumer problems and preventing inconvenience. Companies must create a diverse set of values tailored to their clients so that they can maintain a competitive advantage in the market (Czarniewski, 2014). Superior customer value is essential for companies to transition from a market-driven to a market-moving position, ensuring sustainable competitive advantage. Customer value significantly influences technological competitiveness because it encourages companies to innovate and adapt to meet ever-changing customer expectations (McFarlane, 2013). However, there are previous studies that show slightly different results. These studies state that emphasizing technological innovation alone can be misleading, because non-technological innovations, including marketing, significantly influence innovation trends and company performance (Bartoloni & Baussola, 2013). In addition, previous studies suggest that marketing innovation can enhance technological competitiveness when synergistically combined with product innovation, challenging the assumption that marketing innovation has no influence on technological competitiveness (Tinoco, 2010).

CONCLUSION

Based on the results of the study, it was found that managerial relationships and marketing innovation do not directly increase technological competitiveness in the telecommunications industry in Indonesia. Although a number of previous studies have emphasized the importance of these two factors in driving innovation and competitive advantage, this study shows that their influence is only significant when facilitated by customer value. This means that without an increase in perceived value by customers, managerial efforts and marketing innovation are not yet able to optimally drive technological competitiveness.

This finding confirms that customer value plays an important role as a bridge between a company's internal strategies and its expected competitive results. When companies are able to create value that is

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relevant and in line with customer needs, the technology adopted will be more targeted, adaptive to the market, and support the sustainability of competitive advantage. Thus, the main focus of companies should be directed at strengthening customer value as the basis for designing effective managerial and marketing strategies.

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