

Analysis of the Service Connection Process Flow to Achieve Increased Electricity Sales Using an Application Design

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Abstract

The telecommunications industry is crucial for social and economic growth in the digital era, with Indonesia's fixed broadband market expanding rapidly amid intensifying competition among ISPs. PT Telkom Indonesia's Indihome, as market leader with 11,329,973 subscribers in 2025, faces declining market share, which has decreased by an average of 5.13% annually over the past three years to approximately 64%. This study integrates the ISP Service Quality model and Customer Satisfaction Index (CSI) framework to examine how Network Quality, Customer Service, Information Quality, Security, Brand Image, Customer Expectations, Perceived Value, Perceived Price, and Perceived Service Quality affect customer satisfaction and loyalty. Using PLS-SEM with 431 respondents. The results indicate that the proposed model demonstrates a satisfactory level of fit, with an SRMR value of 0.077. The direct effect analysis reveals that NQ, CS, and IQ have positive and significant effects on PSQ. Within the CSI framework, BI, EX, PV, and PSQ are found to have positive and significant effects on CSI, whereas SR and PR do not exhibit significant effects. The findings further indicate that Customer Satisfaction serves as the primary determinant of Customer Loyalty, as evidenced by its positive and significant relationship with Customer Loyalty. In addition, Network Quality and Customer Service emerge as the most influential determinants in shaping Perceived Service Quality within the ISP context, while Customer Expectations represent the strongest determinant of Customer Satisfaction. These findings are expected to provide strategic insights into enhancing service quality and strengthening Customer Loyalty in the increasingly competitive fixed broadband market.

INTRODUCTION

The telecommunications industry has a strategic role in supporting access to information, economic growth, and social development in the digital era (Hamelink, 1997; Oladele, 2024; Wickramasinghe & Abd Razak, 2022). As one of the main infrastructures of the modern economy, this sector allows individuals and organizations to adapt to increasingly rapid technological developments. In addition, telecommunications contribute to reducing the digital divide between urban and rural areas, creating jobs, and supporting the development of the education, health, and culture sectors. In Indonesia, the fixed broadband market continues to show significant growth with the number of customers increasing year on year. The market potential is still very large considering that the broadband penetration rate is relatively low compared to the number of national households, while the need for stable internet connectivity continues to increase as digital technology, smart homes, and the implementation of Fiber to the Home (FTTH) networks develop.

PT Telkom Indonesia through its IndiHome service is the market leader in the fixed

broadband segment in Indonesia. IndiHome offers fiber-optic services that include high-speed internet, Voice over Internet Protocol (VoIP) based landlines, and interactive television in Triple Play packages. Although the number of subscribers continues to grow, this growth has not been able to maintain market share dominance. Increasingly fierce competition, the number of new internet service providers, and the ease of customers switching services have led to the company's main challenge of not only acquiring new customers, but also maintaining existing customer loyalty.

In recent years, IndiHome's market share has shown a downward trend followed by an increase in the number of competitor customers and a still high customer churn rate. This condition indicates that customer loyalty has not been formed optimally. In addition, the company still faces various challenges in maintaining service quality, especially related to network stability and the number of customer outage reports that are still above the company's target. This situation shows that the increase in the number of customers must be balanced with the improvement of service quality in order for customer satisfaction and loyalty to be maintained on an ongoing basis.

Service quality is a very important factor in the telecommunication service industry because it is able to create satisfaction while maintaining customer loyalty. Various studies show that network quality, customer service, information quality, and security are the main dimensions that shape customer perception of the quality of internet service providers. In contrast to the SERVQUAL and E-S-Qual models developed for public services and internet-based services in general, fixed broadband services have more specific characteristics so that they require a service quality measurement approach that is tailored to the characteristics of the Internet Service Provider (ISP).

A number of previous studies have proven that service quality, value perception, brand image, customer expectations, and customer satisfaction are the main determinants of customer loyalty in the telecommunications industry. Thaichon et al. (2014) developed ISP-specific dimensions of Service Quality that include Network Quality, Customer Service, Information Quality, and Security, and showed that these dimensions affect the perception of service quality, satisfaction, trust, commitment, and customer loyalty. Further research by Quach et al. (2016) strengthens these findings by showing that the quality of ISP service impacts customer loyalty with different usage patterns, both attitudinal and behavioral loyalty. In the context of customer satisfaction measurement, Prasetyo et al. (2025) integrated the SERVQUAL framework and the Customer Satisfaction Index (CSI) to identify the key factors that influence satisfaction and loyalty in the telecommunications industry, with the finding that value perception exerts the strongest influence on customer satisfaction, followed by SERVQUAL dimensions, customer expectations, and brand image. However, research that integrates the ISP Service Quality dimension with the Customer Satisfaction Index (CSI) to explain the formation of behavioral loyalty in fixed broadband services in Indonesia is still relatively limited, so there is still a research gap that needs to be studied further.

Based on these conditions, this study aims to build an integrative model that combines the dimensions of ISP Service Quality and Customer Satisfaction Index (CSI) in explaining the process of forming IndiHome customer loyalty. The study used the Partial Least Squares–Structural Equation Modeling (PLS-SEM) method with the help of SmartPLS software to analyze the direct and indirect relationships between the variables Network Quality, Customer

Service, Information Quality, Security, Brand Image, Customer Expectations, Perceived Value, Perceived Price, Perceived Service Quality, Customer Satisfaction, and Behavioral Loyalty. This approach is expected to provide a more comprehensive picture of the factors that affect customer loyalty in the fixed broadband industry.

The formulation of the research problem focuses on how the ISP Service Quality dimension affects the perception of service quality, how the Customer Satisfaction Index shapes customer satisfaction, and how the integration of the two models explains IndiHome's customer loyalty. This research aims to build a model of intervariable relationships, identify the most dominant factors in shaping customer satisfaction and loyalty, and formulate strategic recommendations for PT Telkom Indonesia in improving service quality and customer experience. Academically, this research is expected to enrich the development of theories regarding service quality, satisfaction, and customer loyalty in the telecommunications industry, as well as a reference for further research on fixed broadband services and other service sectors.

METHOD

This research was causality research with a quantitative approach that aims to analyze the cause-and-effect relationship between variables in the field of management through hypothesis testing. This approach is used to explain how a variable affects other variables based on theory and empirical data so as to produce findings that can be used as a basis for scientific development and practical recommendations. The research is included in the hypothesis testing research category with the Structural Equation Modeling (SEM) analysis method based on Partial Least Squares (PLS-SEM) using SmartPLS software. The PLS-SEM method was chosen because it is able to test direct and indirect relationships between variables, evaluate measurement models and structural models, and is suitable for social and management research involving many latent constructs.

The research population is all active customers of IndiHome Area 3 which includes Central Java, East Java, Bali, and Nusa Tenggara with a total population of 3,269,037 customers. The sampling technique uses probability sampling through the Simple Random Sampling (SRS) method so that each member of the population has an equal chance of being selected as a respondent. The respondent criteria include active IndiHome customers, aged 17–60 years, and have subscribed for at least 60 days to have passed the installation warranty period. The minimum number of samples was determined using the Cochran formula with a confidence level of 95% and a margin of error of 5%, so that a minimum of 384 respondents were needed. The research stages start from problem identification, literature review, conceptual model preparation, determination of operational variables and research instruments, data collection through questionnaires, data processing using SmartPLS, evaluation of measurement models and structural models, hypothesis testing and mediation analysis, to interpretation of results and preparation of conclusions along with research implications.

RESULTS AND DISCUSSION

Fit Model Analysis

The evaluation of the fit model in this study was carried out using two software, namely SmartPLS and LISREL. The use of SmartPLS is carried out because the main method of this

study is Partial Least Squares Structural Equation Modeling (PLS-SEM), so that the model evaluation follows procedures and indicators commonly used in the PLS-SEM approach. Meanwhile, LISREL is used as an additional benchmark to see the suitability of models based on the SEM COVARIANCE-BASED (CB-SEM) approach. Thus, the evaluation of the fit model is not only seen from a prediction-oriented PLS-SEM perspective, but also compared to the CB-SEM approach which emphasizes the model's suitability to the covariance matrix.

In SmartPLS, the evaluation of the fit model is carried out through several indicators, namely Standardized Root Mean Square Residual (SRMR), d_ULS, and d_G. The SRMR value is used to see the average difference between the empirical correlation and the correlation predicted by the model. The model is declared to have a good level of conformity if the SRMR value is below 0.08. Based on the results of the SmartPLS test, the SRMR value is 0.077, so the model can be declared to meet the model fit criteria. In addition, the d_G value of 0.910 was also below the limit of the criteria used, while the d_ULS value of 2.914 did not meet the limit of the rule of thumb used in this study. Therefore, the results of the fit model on SmartPLS show that the model in general has an adequate level of conformity, especially based on the SRMR value as the main indicator.

Table 1. Model Fit Test Results

Goodness of Fit	Estimated model	Rule of Thumb	References
SRMR	0.077	< 0.080	(Hanseler, et al., 2017)
d_ULS	2.914	< 0.95	(Hanseler, et al., 2017)
d_G	0.91	< 0.95	(Hanseler, et al., 2017)

Source: Primary data processed using SmartPLS 4, 2026

An RMSEA value of 0.055 indicates that the model is in the acceptable fit category, because the value is below the limit of 0.08. This indicates that the model's approximation error rate is still within acceptable limits. Furthermore, the GFI value of 0.88 is slightly below the ideal limit of 0.90, so it can be categorized as marginal fit. This means that the model has not fully met the absolute fit criteria under the GFI, but it is still close to the recommended limit.

Meanwhile, an NFI value of 0.98 indicates that the model has a good level of suitability compared to the basic model or independence model. This value has met the good fit criteria because it is above 0.90. Thus, although the model does not meet the criteria based on Chi-Square and GFI is still in the marginal category, the RMSEA and NFI values indicate that the model has a sufficient level of conformity.

Table 2. LISREL 8 Fit Model Test Results

Fit Model Index	LISREL Value	Rule of Thumb	Interpretation
Chi-Square	901,30	p-value > 0,05	Not compliant
RMSEA	0,055	RMSEA ≤ 0,08	Meet
GFI	0,88	GFI ≥ 0,90	Marginal fit
NFI	0,98	NFI ≥ 0,90	Meet

Source: Primary data processed using LISREL 8, 2026.

Overall, the test results of the LISREL fit model show that the model is in the category of sufficient fit or acceptable fit. However, these results still need to be interpreted carefully because the main evaluation of the study used the PLS-SEM approach through SmartPLS, while LISREL was used as a covariance-based SEM comparison analysis. Although some of the fit model indices on LISREL show good results, they need to be interpreted with caution because the LISREL output also shows a matrix not positive definite warning. The warning indicates a very high latent correlation between constructs, so there is a potential problem of discriminant validity or model specification. In addition, the results of LISREL are not used as the main basis for research decision-making because the main method used in this thesis is PLS-SEM through SmartPLS. Thus, LISREL is used as a comparative analysis, while the main interpretation of the model remains to refer to the SmartPLS results

Mediation Effect Testing Analysis (Indirect Effect)

Based on the results of the indirect effect test using the bootstrapping method, most of the indirect relationships between constructs in the research model showed a positive and significant influence. The indirect influence was declared significant if the t-statistics value was ≥ 1.96 and the p-values ≤ 0.05 at a significance level of 5% with a two-tailed approach.

Table 3. Mediation Effect Test Results (Indirect Effect)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Summary
NQ $\rightarrow$ PSQ $\rightarrow$ CSI	0.077	0.077	0.022	3.501	0.000	Supported
EX $\rightarrow$ CSI $\rightarrow$ CL	0.228	0.228	0.037	6.206	0.000	Supported
PR $\rightarrow$ CSI $\rightarrow$ CL	0.042	0.041	0.029	1.419	0.156	Not Supported
SR $\rightarrow$ PSQ $\rightarrow$ CSI	0.009	0.009	0.009	1.004	0.315	Not Supported
PSQ $\rightarrow$ CSI $\rightarrow$ CL	0.141	0.141	0.037	3.764	0.000	Supported
PV $\rightarrow$ CSI $\rightarrow$ CL	0.148	0.148	0.041	3.654	0.000	Supported
CS $\rightarrow$ PSQ $\rightarrow$ CSI $\rightarrow$ CL	0.053	0.053	0.016	3.345	0.001	Supported
SR $\rightarrow$ PSQ $\rightarrow$ CSI $\rightarrow$ CL	0.006	0.007	0.006	0.998	0.318	Not Supported
NQ $\rightarrow$ PSQ $\rightarrow$ CSI $\rightarrow$ CL	0.056	0.056	0.016	3.450	0.001	Supported
IQ $\rightarrow$ PSQ $\rightarrow$ CSI $\rightarrow$ CL	0.022	0.022	0.009	2.481	0.013	Supported
CS $\rightarrow$ PSQ $\rightarrow$ CSI	0.073	0.073	0.022	3.393	0.001	Supported
BI $\rightarrow$ CSI $\rightarrow$ CL	0.139	0.140	0.035	3.979	0.000	Supported
IQ $\rightarrow$ PSQ $\rightarrow$ CSI	0.030	0.030	0.012	2.482	0.013	Supported

Source: Primary data processed using SmartPLS 4 (Bootstrapping Method), 2026

The test results showed that all indirect relationships between variables had a positive coefficient value. This means that the direct and indirect relationship between variables is in a positive direction. Next, we will analyze the results of t-statistic and p-value from the indirect relationship of each construct.

The test results showed that the relationship between Perceived Service Quality and Customer Satisfaction had a t-statistical value of 3,501 and a p-value of 0,000, so it was declared significant. These results show that Perceived Service Quality plays a role in

increasing customer satisfaction with Indihome's services. Furthermore, the relationship between Expectation and Customer Loyalty through Customer Satisfaction showed a t-statistical value of 6,206 and a p-value of 0.000, so that the relationship was declared significant. These results show that customer expectations are able to increase customer loyalty through customer satisfaction as a mediating variable. In addition, the relationship between Perceived Value and Customer Loyalty through Customer Satisfaction also showed significant results with a t-statistics value of 3,654 and a p-value of 0.000. These results indicate that the value of the service perceived by customers can increase customer loyalty through the formation of customer satisfaction. The relationship between Brand Image and Customer Loyalty through Customer Satisfaction also showed significant results with a t-statistics value of 3,979 and a p-value of 0,000, which shows that Indihome's brand image is able to increase customer loyalty if customers are satisfied with the services received.

In the ISP Service Quality dimension, the relationship between Customer Service and Customer Loyalty through Perceived Service Quality and Customer Satisfaction shows a t-statistical value of 3,345 and a p-value of 0.001, so it is declared significant. Furthermore, the relationship between Network Quality and Customer Loyalty through Perceived Service Quality and Customer Satisfaction also showed significant results with a t-statistics value of 3,450 and a p-value of 0.001. In addition, the relationship between Information Quality and Customer Loyalty through Perceived Service Quality and Customer Satisfaction has a t-statistics value of 2,481 and a p-value of 0.013, so it is also stated to be significant. These results show that the quality of ISP services consisting of network quality, customer service quality, and information quality are able to increase customer loyalty through the perception of service quality and customer satisfaction.

Variables in the ISP Service Quality dimension also show a significant indirect influence on Customer Satisfaction through Perceived Service Quality. Hubungan Network Quality against Customer Satisfaction through Perceived Service Quality shows a T-Statistics value of 3.501 and a P-value of 0.000, while the relationship between Customer Service against Customer Satisfaction through Perceived Service Quality It shows a T-Statistics value of 3.393 and a P-value of 0.001. Furthermore, the relationship Information Quality against Customer Satisfaction through Perceived Service Quality It also showed significant results with a T-Statistics value of 2.482 and a P-value of 0.013. These results show that network quality, customer service quality, and information quality are able to increase customer satisfaction through the perception of service quality perceived by customers. These findings reinforce previous research that stated that the ISP Service Quality dimension directly affects customer loyalty. This finding is interesting, because specifically in Indonesia, customers only focus on services that are directly felt such as network stability, customer service and information quality. however, it is necessary to analyze more deeply in the future about (Thaichon, et al., 2014) Security and privacy awareness in Indonesia, so that the variable Security remain relevant and felt by customers directly.

However, not all indirect relationships in the research model showed significant results. The relationship between Price and Customer Loyalty through Customer Satisfaction has a t-statistical value of 1.419 and a p-value of 0.156, so it does not meet the significance criteria. In addition, the relationship between Security and Customer Loyalty through Perceived Service Quality and Customer Satisfaction also did not show significant results with a t-statistical value

of 0.998 and a p-value of 0.318. These results show that price and service security aspects have not been able to have a significant indirect influence on Indihome customer loyalty through mediation variables in the research model.

This finding is interesting, in a broadband market with relatively high churn and an increasingly aggressive price war, it turns out that customers still value a service by the quality they get. In the study, Zeong et al (2024) stated that improving service quality has an important role in encouraging customer interest in the services offered by the company. The results of the study show that the pricing strategy in the telecommunications industry is not solely determined by cost factors, but also influenced by the quality of services, added value provided, and customer perception of the benefits of the services received. Therefore, telecommunications companies need to maintain a balance between service quality, product and service innovation, and pricing strategies to increase customer satisfaction and loyalty.(Zong, et al., 2024)

Overall, the results of the indirect effect test show that Customer Satisfaction and Perceived Service Quality have an important role as mediator variables in explaining the relationship between the dimensions of service quality, expectations, brand image, service value, which ultimately shapes customer loyalty.

Discussion of Research Hypotheses

The results of the study are an interpretation of a series of PLS-SEM tests using SmartPLS 4 by comparing t-statistic and p-value according to the parameters in the direct effect test results. The discussion of the results of the study refers to the results of the direct effect test in table 4 in accordance with the previous research hypothesis.

Table 4. Hypothesis Test Results

H. No	Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Decision
H1	BI -> CSI	0.191	0.192	0.047	4.055	0.000	Supported
H2	EX -> CSI	0.313	0.313	0.049	6.382	0.000	Supported
H3	PSQ -> CSI	0.194	0.193	0.051	3.824	0.000	Supported
H3.1	NQ -> PSQ	0.400	0.400	0.047	8.572	0.000	Supported
H3.2	CS -> PSQ	0.377	0.377	0.047	8.091	0.000	Supported
H3.3	IQ -> PSQ	0.157	0.156	0.046	3.401	0.001	Supported
H3.4	SR -> PSQ	0.046	0.047	0.042	1.094	0.274	Not Supported
H4	PV -> CSI	0.204	0.204	0.055	3.676	0.000	Supported
H5	PR -> CSI	0.057	0.057	0.040	1.421	0.155	Not Supported
H6	CSI -> CL	0.728	0.729	0.024	30.752	0.000	Supported

Source: Primary data processed using SmartPLS 4 (Bootstrapping Method), 2026

1. H1. Brand Image (BI) has a positive effect on Customer Satisfaction (CSI)

Based on the results of the direct effect hypothesis test, Brand Image has been proven to have a positive and significant effect on Customer Satisfaction. The results are shown by a t-statistical value of 4,055 and a p-value of 0.000, so that H1 is declared accepted. These results show that a good Indihome brand image is able to increase customer satisfaction levels with

the home internet services used. Customers tend to feel more satisfied when Indihome is perceived as a reputable, reliable, and positive internet service provider in the community.

These findings are in line with previous research that states that brand image is one of the important factors in shaping customer perception and satisfaction of a service. This is in line with other research in the telecommunications industry, stating that (Prasetyo, et al., 2025) Brand Image, which includes the Company's image and competence, is an important factor for customers in assessing the service provider's services. (Hayati & Andrawina, 2020)

2. H2. Customer Expectations (EX) have a positive effect on Customer Satisfaction (CSI)

Customer Expectations have been proven to have a positive and significant effect on Customer Satisfaction. The results are shown by a t-statistics value of 6,382 and a p-value of 0.000, so that H2 is declared accepted. These results show that customer expectations for the quality and performance of Indihome's services play an important role in shaping customer satisfaction. The higher the level of service conformity with customer expectations, the higher the satisfaction felt by customers with Indihome services.

This finding is in line with the expectancy-disconfirmation theory popularized by Oliver (1980) which emphasizes the importance of the initial expectations of a product rather than actual product performance can affect customer satisfaction. This reinforces the results of the latest research on the telecommunications industry conducted by (Alsaqer et al., 2024) which emphasizes the important role of customer expectations in shaping overall satisfaction. The results of the study show that service providers need to ensure that the services provided are able to meet and align with customer expectations,

3. H3. Perceived Service Quality (PSQ) has a positive effect on Customer Satisfaction (CSI)

Construct Perceived Service Quality proven to have a positive and significant effect on Customer Satisfaction. The results were shown by a t-statistical value of 3.824 and a p-value of 0.000, so that H3 was declared accepted. These results show that customer perception of Indihome's service quality has an important role in increasing customer satisfaction. In context, these findings support the ISP Service Quality model in shaping customer trust. Stable network quality, user-friendly clarity of information, customer service and responsive technical support affect customer trust in internet service providers. In fact, it can further affect customer commitment in subscribing. (Paramaporn Thaichon, 2014)

The service quality of ISPs (Internet Service Providers) has a multidimensional character that includes aspects of network quality, customer service, information quality, and service security. In a telecommunications industry that relies heavily on the quality-of-service connections and interactions, customer perception of service quality is an important factor in shaping the overall service user experience. Therefore, a good quality of service will create a more positive customer experience and have an impact on improving customer satisfaction. (Quach, et al., 2016)

4. H3.1 Network Quality (NQ) has a positive effect on Perceived Service Quality (PSQ)

Network Quality has been proven to have a positive and significant effect on Perceived Service Quality. The results are shown by the t-statistics value of 8,572 and p-values of 0.000, so that H3.1 is declared accepted. These results show that network quality is the main factor in shaping customer perception of Indihome's service quality. Network stability, internet connection speed, and minimal service interruptions are aspects that greatly affect customer

assessment of service quality.

These findings are in line with previous research conducted in Korea. The suitability of internet speed is the main determinant in the influence Network Quality to customer satisfaction. Internet speed is a key attribute in network performance. In ISP services, network quality is the main core of service because it is directly related to the technical performance of the internet service received by customers. Therefore, network quality is the most dominant dimension in shaping (Kim, et al., 2007) Perceived Service Quality on Indihome services.

5. H3.2 Customer Service (CS) has a positive effect on Perceived Service Quality (PSQ)

Customer Service has been proven to have a positive and significant effect on Perceived Service Quality. The results are shown by a t-statistical value of 8,091 and a p-value of 0.000, so that H3.2 is declared accepted. These results show that the quality of customer service has an important contribution in shaping customer perception of the quality of Indihome's services. The speed of response, the ability of officers to handle complaints, and the quality-of-service communication are important factors in shaping the customer experience of the service.

Customer Service has an important role in handling and responding to customer inquiries or needs. This has a significant relationship with the quality of service, given that fixed broadband services are complex with potential disruptions. In another study in the telecommunications industry, it was stated that companies with (Hayati & Andrawina, 2020) Customer Service and technical support will be able to provide a good perception to customers in terms of service. (Santouridis & Trivellas, 2010)

6. H3.3 Information Quality (IQ) has a positive effect on Perceived Service Quality (PSQ)

Information Quality has been proven to have a positive and significant effect on Perceived Service Quality. The results were shown by a t-statistical value of 3,401 and a p-value of 0.001, so that H3.3 was declared accepted. These results show that the quality of information provided by Indihome to customers also plays a role in shaping the perception of service quality. Clear, relevant, and easy-to-understand information will help customers understand the service and improve the experience of using internet services.

These findings are in line with research related to ISP Service Quality determinants, customers build trust and commitment to internet service providers based on their perception of the quality and quantity of information provided by the Company. The findings of this study reaffirm the importance of information in shaping the perception of service quality felt by customers. (Quach, et al., 2016)

7. H2.3 Security (SR) has a positive effect on Perceived Service Quality (PSQ)

Security has not been shown to have a significant effect on Perceived Service Quality. The results were shown by a t-statistical value of 1.094 and a p-value of 0.274, so that H3.4 was declared rejected (not supported). These results show that the service security aspect has not yet become the main factor that customers consider in shaping the perception of Indihome's service quality.

Research in the context of E-CRM states that the perception of security that includes transactions, protection of personal information, and online privacy has a very positive influence on customer satisfaction. Research in the context of telecommunications states that the protection of personal data has a significant direct effect on customer loyalty. However, there is still no research in the context of telecommunications that tests the direct influence on

the perception of service quality. This finding is interesting, especially in the context of Indonesian internet service users. Customers tend to focus more on network quality, information quality, and customer service, which are directly felt by customers. (Dehganpouri, et al., 2020) (Quach, et al., 2016) (Hayati & Andrawina, 2020) (Paramaporn Thaichon, 2014)

8. H4. Perceived Value (PV) has a positive effect on Customer Satisfaction (CSI)

Perceived Value has been proven to have a positive and significant effect on (Prasetyo, et al., 2025)Customer Satisfaction. The results were shown by a t-statistical value of 3.676 and a p-value of 0.000, so that H4 was declared accepted. These results show that customers who feel they get the appropriate benefits and value from Indihome's services tend to have higher levels of satisfaction.

These findings reinforce recent research conducted in the context of Filipino internet users, that Perceived Value has a continuous influence on customer satisfaction. In other studies, it has been shown that (Prasetyo, et al., 2025)Perceived Value affect customer trust in the brand used. (Monfort, et al., 2025)Perceived Value Reflects the customer's evaluation of the benefits of the service compared to the sacrifices made, both in terms of cost and time. When customers feel that the services received are commensurate with the benefits obtained, they will give a positive assessment of the service and feel more satisfied with the experience of using the service.

9. 1H5. Perceived Price (PR) has a positive effect on Customer Satisfaction (CSI)

Perceived Price has not been proven to have a significant effect on Customer Satisfaction. The results were shown by a t-statistical value of 1.421 and a p-value of 0.155, so that H5 was declared rejected (not supported). These results show that customer perception of service pricing does not affect customer satisfaction levels.

These findings are in line with previous research in the context of Filipino users. It is necessary to conduct a deeper analysis related to the influence of prices, especially in the dynamic telecommunications industry with various variations of products from competitors. Other research in the context of fixed broadband shows that the price structure has the least influence when compared to indicators that shape customer satisfaction such as customer service, network quality, and service added value. (Prasetyo, et al., 2025)(Thu & Hue, 2022)

Zong, et al., (2024) explained that improving service quality has been proven to be able to increase customer interest in the services offered by the company. The research shows that the pricing strategy in the telecommunications industry is not only influenced by the cost aspect, but also influenced by the quality of service, the added value of services, and customer perception of the benefits received. Thus, telcos need to balance service quality, service innovation, and pricing strategies to increase customer satisfaction and loyalty.(Zong, et al., 2024)

10. H6. Customer Satisfaction (CSI) has a positive effect on Customer Loyalty (CL)

Customer Satisfaction proven to have a positive and significant effect on Customer Loyalty. The results are shown by a t-statistical value of 30,752 and a p-value of 0,000, so that H6 is declared accepted. CSI construct → CL is the value of the direct relationship with the highest significance value. This is in line with previous research where customer satisfaction is the main factor in forming customer loyalty. Customers who are satisfied with the service tend to have a high commitment to continue using the Company's services for a long period of time.(Prasetyo, et al., 2025)(Gazi, et al., 2024)

Thangeda, et al., 2024 affirm that the dynamics of customer churn in the telecommunications industry are greatly influenced by customer satisfaction which is influenced by customer adaptability, customer service center, network availability, company employee capabilities and advertisements. Customer satisfaction that affects loyalty determines the customer's tendency to stay on the service or move to another competitor (Thangeda, et al., 2024).

In the telecommunications industry that has high and aggressive competitors, customer satisfaction is a distinguishing element of the Company in retaining customers. Customer loyalty is not only shown through the tendency to use the same service, but also through the willingness of customers to recommend products to others (net promoter score).

The research discussion discusses the results of the research in more depth by relating empirical findings to previous research, research objectives, managerial implications, recommendations for improvement, and research limitations. This discussion is important to show that the results of the PLS-SEM analysis not only produce statistical relationships between variables, but also provide theoretical and practical meaning for the development of Indihome's fixed broadband customer loyalty model.

The results of the study show that the ISP Service Quality and Customer Satisfaction Index (CSI) dimension integration model is able to explain the formation of Customer Loyalty of IndiHome customers. This is evidenced by the positive and significant influence of Customer Satisfaction on Customer Loyalty with a coefficient of 0.728. In terms of satisfaction formation, Brand Image, Customer Expectations, Perceived Value, and Perceived Service Quality have a positive and significant effect on Customer Satisfaction, while Perceived Price does not show a significant influence. The findings show that customer loyalty is more formed through satisfaction sourced from service experience, perceived benefits, brand image, service quality, and the fulfillment of customer expectations rather than price considerations.

First-order analysis shows that Network Quality, Customer Service, and Information Quality have a significant effect on Perceived Service Quality, while Security does not have a significant direct influence. However, the results of the second-order analysis show that the four dimensions are able to reflect the ISP Service Quality construct validly and reliably, with Customer Service outer loading of 0.846, Information Quality of 0.832, Network Quality of 0.822, and Security of 0.762. Furthermore, ISP Service Quality was proven to have a positive and significant effect on Perceived Service Quality with a coefficient of 0.813, t-statistics of 49.721, and p-values of 0.000. The relationship has an effect size of 1,949 which is in the large category and is able to explain 66.1% of the variation in Perceived Service Quality.

Thus, the main findings of the study confirm that ISP service quality is a multidimensional construct that needs to be managed in an integrated manner. Although the power of direct influence of each dimension is different in the first-order model, Customer Service, Information Quality, Network Quality, and Security collectively form a strong ISP Service Quality in improving Perceived Service Quality. Increasing the perception of service quality further contributes to Customer Satisfaction and ultimately encourages Customer Loyalty of Indihome customers.

Comparison with Previous Research

The results of this study are generally in line with previous research which states that service quality, customer satisfaction, brand image, customer expectations, and perceived value

are important factors in shaping customer loyalty in the telecommunications industry. Brand Image, Customer Expectations, Perceived Service Quality, and Perceived Value have been proven to have a positive and significant effect on Customer Satisfaction. These findings support the research of Prasetyo et al. (2025), Monfort et al. (2025), and Alsaqer et al. (2024), who affirm that customer satisfaction is not only shaped by the quality of service, but also by brand image, the suitability of expectations, and the benefits of the service perceived by customers. In the context of Indihome, customers tend to feel satisfied if the service received is in accordance with expectations, has adequate benefit value, and comes from a reputable brand.

In the ISP Service Quality dimension, the results of the study show that Network Quality, Customer Service, and Information Quality have a positive and significant effect on Perceived Service Quality. These findings are in line with Thaichon et al. (2014), Quach et al. (2016), Kim et al. (2007), and Santouridis and Trivellas (2010), who show that network quality, customer service support, and information quality are important components in shaping customer loyalty. In fixed broadband services, customers assess the quality of service primarily through direct experience, such as connection stability, internet speed, lack of interference, officer response, and clarity of service information.

However, there are differences in the findings in the Security and Perceived Price variables. Security has not been shown to have a significant effect on Perceived Service Quality, in contrast to research by Thaichon et al. (2014), Quach et al. (2016), and Dehganpouri et al. (2020), which places security and privacy as important factors in forming customer trust and loyalty. In addition, Perceived Price also does not have a significant effect on Customer Satisfaction. These findings show that in the context of Indihome customers, price and safety aspects have not been the main factors in shaping satisfaction and perception of service quality. Customers emphasize more aspects that are directly felt, especially network quality, customer service quality, information quality, benefit value, and service compliance with expectations.

The strongest finding in this study is the effect of Customer Satisfaction on Customer Loyalty. These results are in line with Oliver (1999), Zeithaml et al. (1996), Prasetyo et al. (2025), Gazi et al. (2024), and Thangeda et al. (2024), who explain that customer satisfaction is a major factor in forming loyalty and suppressing customers' tendency to switch services. Thus, this study strengthens previous findings while providing contextual development that Indihome's fixed broadband customer loyalty is formed through the integration of ISP Service Quality and Customer Satisfaction Index dimensions, with Customer Satisfaction as the main factor that bridges the service experience to customer loyalty.

Achievement of Research Objectives

Based on the results of the PLS-SEM test, the research objective to build and test the integration model of the ISP Service Quality, Customer Satisfaction Index (CSI), and Customer Loyalty dimensions has been achieved. The research model successfully explained the relationship between Network Quality, Customer Service, Information Quality, and Security to Perceived Service Quality, then related Brand Image, Customer Expectations, Perceived Value, Perceived Price, and Perceived Service Quality Customer Satisfaction, and testing the influence of Customer Satisfaction on Customer Loyalty. The test results showed that most of the relationships in the model proved to be significant, so the integrative model developed was able to explain the mechanism of establishing Indihome customer loyalty empirically.

The goal of the study to identify the variables that contribute most to shaping customer satisfaction and loyalty has also been achieved. The results of the study show that Network Quality is the main determinant in forming Perceived Service Quality, while Customer Expectations are the most powerful factor in forming Customer Satisfaction. Furthermore, Customer Satisfaction has proven to be the main determinant in forming Customer Loyalty. Thus, this study not only succeeded in proving the relationship between variables in the model, but also produced a basis for strategic recommendations for companies to increase customer loyalty through improving network quality, customer service, information quality, expectation management, and overall customer satisfaction.

Theoretical Implications

This research provides the latest theoretical contribution to the telecommunications literature through the preparation of a comprehensive framework to explain customer satisfaction and loyalty. This research expands on previous research by replacing the traditional service quality dimension with the ISP dimension service quality (Prasetyo, et al., 2025). ISP Dimensions Quality It is considered more relevant to shape customer perception in feeling the telecommunication services used. Significance in ISP dimensions service quality having an influence on the causality relationship, customer satisfaction and loyalty also strengthens the theory of dimensions Service Quality proposed by Thaichon et al (2014).(Paramaporn Thaichon, 2014) (Thaichon, et al., 2014)(Quach, et al., 2016)

In this study, the ISP service quality dimension was proven to be able to form customer satisfaction and loyalty through the mediation of the perception of service quality felt by customers. Meanwhile, the relationship between security and customer satisfaction can provide a deeper understanding of the importance of security in using services that have not yet formed the perception of service quality. This is a space in future research where customers tend to judge what they feel directly in using services.

Furthermore, this research also strengthens the concept of Customer Satisfaction Index (CSI) by showing that the Customer Expectations, Perceived Service Quality, Perceived Value, and Brand Image has a significant influence on Customer Satisfaction. These findings show that customer satisfaction is not only shaped by the quality of service alone, but also influenced by the conformity of the actual service with customer expectations, the perception of service value, and the Company's brand image. These findings reinforce previous research that stated that service value is a key determinant in shaping customer satisfaction. The high significance of brand image and customer expectations also provides a new perspective in assessing the services with the highest market share in Indonesia. On the other hand, the low relationship between price and customer satisfaction also provides a deeper perspective on the dynamics of price suitability with the services received also strengthens the theory about (Prasetyo, et al., 2025)pricing strategy in the telecommunications industry.(Zong, et al., 2024)

This study also strengthens the literature on the role of customer satisfaction mediation in shaping customer loyalty by proposing strategies through technical and non-technical approaches. This perspective is in line with the development of the literature on the dynamics of telecommunication customer loyalty. (Akroush & Mahadin, 2019) (Alsaqer, et al., 2024) (Gazi, et al., 2024) (Hoa & Ngoc, 2015) (Joudeh & Dandis, 2018) (Kim, et al., 2007) (Prasetyo, et al., 2025)

Managerial Implications

Practically, the results of this study show that companies need to prioritize improving network quality as a key factor in shaping the perception of customer service quality. The stability of the internet connection, access speed, and minimal service interruption are the aspects that customers pay the most attention to in using fixed broadband services. Therefore, companies need to improve the quality of their network infrastructure and the effectiveness of handling service interruptions to improve the overall customer experience.

In addition to network quality, customer service quality is also an important factor in shaping the perception of service quality and customer satisfaction. The results show that customers pay great attention to the speed of response, problem-solving ability, and quality of customer service communication. Thus, companies need to improve the competence of customer service officers, speed up the process of handling disturbances, and optimize digital-based customer service systems to improve the quality of customer experience.

This research also shows that Indihome customers consider service quality, service benefits, and user experience more than service price factors. Therefore, companies not only need to focus on competitive pricing strategies, but also need to improve service quality and service innovation that provides added value for customers. In addition, companies need to maintain their brand image and build realistic customer expectations through good service communication in order to be able to increase customer satisfaction and loyalty on an ongoing basis.

Recommended Improvements

The suggestions for future research taking into account the limitations of this research are as follows:

1. The next research is suggested to involve a wider range of respondents with more diverse demographic characteristics in order to be able to represent all Indihome customers more comprehensively.
2. Further research is suggested to be more general and not just specific products. So that it is able to analyze the behavior of fixed broadband customers in Indonesia. In addition, further research can also compare customer loyalty characteristics between home internet service providers to obtain a more comprehensive picture of customer behavior in the telecommunications industry.
3. The next research is recommended to evaluate the predictive ability of the model so that the research model not only explains the causal relationship between constructs, but also has the ability to predict customer behavior in the future. The use of advanced analytics approaches such as machine learning can also be considered to identify customer behavior patterns.
4. The next research is suggested to add other variables that have the potential to directly affect or moderate customer satisfaction and loyalty, such as customer experience, switching cost, perceived innovation, digital experience, customer engagement, or other variables. The addition of these variables is expected to be able to expand the development of customer loyalty models in the fixed broadband industry

Research Limitations

This research has several limitations that need to be considered in interpreting the results of the research, including:

1. The study uses a probability sampling method that is only limited to Indihome customers in the Central Java, East Java, Bali, and Nusa Tenggara areas so that there is a potential for answer bias based on service conditions according to social geography.
2. This research focuses on Indihome customers, so the results of the research cannot necessarily be generalized to all home internet services and other telecommunication service providers. Customer characteristics, service quality, network coverage, and service strategies in each company can be different and affect customer behavior differently.
3. This study uses an integration model between the dimensions of ISP Service Quality, Customer Satisfaction Index (CSI), and Customer Loyalty without considering moderation variables so that there is still a possibility that there are other variables outside the research model that can affect customer loyalty, such as the quality of digital experience, perception of service innovation, switching costs, and market competition factors

CONCLUSION

Based on the results of the study, it can be concluded that the ISP Service Quality dimension has an effect on the perception of IndiHome's customer service quality, where network quality, customer service, and information quality are proven to have a positive and significant effect, while the security aspect does not have a significant influence. Customer satisfaction is positively influenced by brand image, customer expectations, value perception, and service quality perception, while price perception has no significant effect. The research model also shows that customer loyalty is formed through a gradual process, namely service quality forms the perception of service quality, then together with the variables in the Customer Satisfaction Index form customer satisfaction, which further increases customer loyalty. Network quality is the most dominant factor in shaping the perception of service quality, while customer expectations are the strongest factor that affects customer satisfaction. In addition, customer satisfaction has proven to be a key variable that shapes and mediates customer loyalty. Therefore, the recommended strategy for IndiHome is to prioritize improving network quality, customer service, information quality, and managing customer expectations through providing a better service experience, so as to be able to increase customer satisfaction and loyalty on an ongoing basis.

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