Effect of Technology Application on Customer Satisfaction Mediated by Service Quality and Business Processes at XYZ Express Logistics Company

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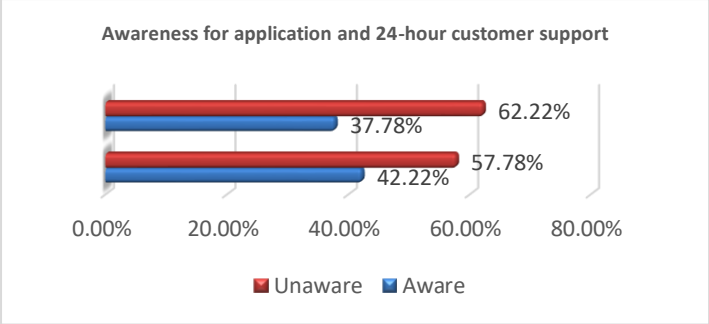
Abstract: This study explores the influence of technology usage on customer satisfaction in XYZ Express Logistics, mediated by service quality and business process performance. The study is driven by increasing digitalization in the logistics sector. Using a quantitative research method and analyzed using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach. The findings confirm that technology usage significantly affects both service quality and business process, which in turn positively impact customer satisfaction. Both service quality and business process are validated as partial mediators, indicating that the influence of digital tools is not only direct but also operates through internal service improvements and workflow efficiency. The study highlights that investments in digital tracking, customer support systems, and user-friendly platforms are crucial to meet rising expectations in e-commerce-driven logistics. This research contributes to the practical development of customer-oriented digital strategies in logistics services, and offers theoretical reinforcement to models linking operational digitalization, service excellence, and consumer satisfaction. Moreover, it aligns with broader efforts to advance digital transformation in Indonesia's logistics infrastructure as part of industry 4.0 readiness.

Keywords: Technology Usage, Customer Satisfaction, Service Quality, Business Process, Express Logistics, Digital Transformation SDG

1. Introduction

The growth of e-commerce in Indonesia has also driven the development of the logistics business in Indonesia. In 2020, demand for delivery services increased by 39 percent compared to the previous period, with the majority of people using delivery services to send goods purchased from e-commerce/marketplaces (85.2 percent) and 72 percent of people becoming more selective in choosing delivery services (Dachi et al., 2024). Increased demand for logistics services has driven the growth of the logistics business, resulting in increasingly fierce competition in the logistics sector. Competition in the logistics sector is dominated by seven companies out of more than 60 logistics companies operating in Indonesia, accounting for nearly 80% of the market. These seven companies are PT Pos Indonesia, JNE, J&T Express, TIKI, Si Cepat, Anteraja, and Wahana (Zahra et al., 2024). Based on the XYZ customer satisfaction survey conducted in 2024, four customer voices were identified, Delivery performance, Area coverage, availability of delivery vehicles, easily accessible customer service, user-friendly website, real-time tracking application. Customers expect improvements not only in terms of products and services, but also in terms of business support in the form of real-time tracing technology, websites, and web support for customers. Based on the results of the 2024 customer survey, 62.2% of customers are unaware of express delivery applications, as shown in the table below.



This study was conducted to determine the effect of information technology use on customer satisfaction using business processes and service quality as mediators.

2. Literature Review

This study refers to various previous studies related to customer satisfaction, logistics digitisation, business processes, and service quality to build a theoretical foundation, especially for the logistics business field. Supply chain is the integration of a process in which several entities work together to obtain and manage raw materials into finished products and distribute those products to end users (Henry & Nusraningrum, 2020). Logistics is basically the activity of realising or providing needs. Generally, logistics is defined as the process of delivering goods, information, people, and services from the point of production to the point of delivery.

Business processes are a series of activities or steps in business operations; these activities transform inputs into outputs to achieve specific objectives (Matwiejczuk, 2020; Mc Loughlin et al., 2023; Mulyana et al., 2024). Logistics companies today face increasingly complex challenges such as ever-changing customer demands, maintaining operational efficiency, and fierce competition, so that the logistics business process itself has evolved from a simple distribution process into a more complex modern logistics process. (Cahyaningrum, 2023; Raza et al., 2020).

The rapid development and transformation of digital technology has driven an increase in demand for e-customers in the e-commerce era, requiring every logistics business to digitise so that they can closely monitor the movement of goods, thereby increasing public trust in the delivery services offered (Fitria Alayida et al., 2023b; Purbasari et al., 2023). In the field of logistics, digital transformation refers to the use of electronic technology to transfer information as quickly as possible from anywhere and at any time (Sayın & Arslandere, 2019).

Customer satisfaction is described as an evaluation of the difference between customer expectations and product or service performance (Oh & Kim, 2017; Rendhi Zilfiando, 2023). This difference can be seen from the evaluation of experiences related to the consumption of products/services. Customer satisfaction is the result of independently evaluating the perceived performance of a product or service, such as benefits and costs, with the expected consequences (Mittal et al., 2023).

Service quality is an activity or series of activities that are intangible in nature and occur as a result of interactions between consumers and employees or other elements provided by the service-providing company, aimed at resolving consumer issues (Djunaedi & Muh. Akil Rahman, 2023). Service quality is an important driver in fostering customer loyalty, in addition to having an indirect impact through customer satisfaction (Daniel Pereira et al., 2023).

3. Research Method

Research Design

This study uses quantitative methods. Quantitative research refers to the positivist philosophical view that every phenomenon in research can be classified, is relatively fixed, concrete, observable, measurable, and that the relationship between phenomena is causal (Rusydi A. Siroj et al., 2024).

Population and Sample

The population used in this study was customers or users of XYZ Logistic services during the 2024 period. The sampling technique used was simple random sampling. Simple random sampling is a technique for selecting samples from members of a population that is carried out randomly without regard to the strata within that population. In determining the sample size for this study, we used the Slovin formula with a margin of error of 4%. Using this method for a population size of 113 and a margin of error of 4%, the sample size is 95,697, rounded to 100 respondents.

Data Collection Methods

The data used is primary data or data obtained directly from original sources or informants related to the research variables (Syafnidawaty, 2020). The data collection method used is a questionnaire as a research instrument. Data collection was carried out using Google Forms as an online questionnaire medium to facilitate the data collection process. The instrument was developed using statements aligned with the research variables, each measured using

a **Likert scale** ranging from:

- 1 = Extremely Dissatisfied
- 2 = Dissatisfied
- 3 = Neutral
- 4 = Satisfied

Data Analysis Technique

The data was analyzed using **Partial Least Squares – Structural Equation Modeling (PLS-SEM)** via **SmartPLS Version 4.0**.

1. Analiysis Outer Model
   Outer model analysis is conducted to ensure that the measurements used are suitable for measurement (valid and reliable). There are several calculations in this analysis:
   a) Convergent validity is the factor loading value on latent variables with their indicators. The expected value is > 0.7.
   b) Discriminant validity is the crossloading factor value that is useful in determining whether the construct has adequate discrimination. This is done by comparing the target construct value, which must be greater than the other construct values.
   c) Average Variance Extracted (AVE) is the average variance, which should be at least 0.5.
   d) Composite reliability is a measure where if the reliability value is > 0.7, then the construct has high reliability.
   e) Cronbach's alpha is a calculation to validate composite reliability, with a minimum value of 0.6.
2. Analysis Inner Model
   This model analysis is to test the relationship between latent constructs. There are several calculations in this analysis:
   a) R Square is the coefficient of determination in endogenous constructs. According to Chin (1998) in Sarwono (2019), the criteria for the R-square value are classified into three categories: 0.67 as substantial, 0.33 as moderate, and 0.19 as weak.'
   b) Effect size (F-square) to assess the goodness of fit of the model. The interpretation of F-square values is as follows: 0.02 indicates a small effect; 0.15 indicates a moderate effect; and 0.35 indicates a large effect at the structural level.
   c) Prediction relevance (Q-square) or known as Stone-Geisser's. This test is conducted to assess the predictive capability of the values generated. If the values obtained are 0.02 (small), 0.15 (moderate), and 0.35 (large), it can only be applied to endogenous constructs with reflective indicators.
3. Hypothesis Measurement
   Hypothesis testing can be seen from the t-statistic value and probability value. For hypothesis testing using statistical values, for an alpha of 5%, the t-statistic value used is 1.96%. Therefore, the criteria for

accepting or rejecting the hypothesis are that Ha is accepted and H0 is rejected when the t-statistic > 1.96. To reject the hypothesis using probability, Ha is accepted if the p-value < 0.05.

4. Results and Discussion

Descriptive Statistics Test

Table 2. Descriptive Variabel Results

Variabel	Mean	Std. Deviasi	Varians
X	3,61	0,87	0,75
Y	3,65	0,91	0,83
Z1	4,00	0,87	0,76
Z2	3,67	0,88	0,78

Source: Processed Data using SmartPLS (2025)

In general, all indicators in each variable show an average rating close to 4 (on a scale of 1–5), indicating a positive perception of these variables among respondents. The standard deviation across all variables is not significantly different, ranging from 0.87 to 0.91, indicating that the distribution of respondents' answers is relatively uniform and not extremely varied

Data Analysis Results

a. Convergent Validity

1. Convergent Validity Test using Outer Loadings

Validity testing is conducted to ensure that latent variables (unobserved variables) can be accurately measured through observed variables. An indicator is said to have good validity if its outer loading value is greater than 0.70.an outer loading value. The following table summarizes the loading factor results for each variable:

Table 3. Convergent Validity Test using Outer Loadings Results

Variable	Indicator	Loading Factor	Threshold	Result
Application of Technology (X)	X.1 – X.8	0.721 – 0.865	≥ 0.70	Valid
Customer Satisfaction (Y)	Y.1 – Y.6	0.764 – 0.888	≥ 0.70	Valid
Service Quality (Z1)	Z1.1 – Z1.19	0.701 – 0.951	≥ 0.70	Valid
Business Process (Z2)	Z2.1 – Z2.13	0.738 – 0.897	≥ 0.70	Valid

Source: Processed Data using SmartPLS (2025)

This study identifies and measures four variables using a quantitative approach based on indicators tested through outer loading values. All indicators in these variables show values > 0.7, which means they are valid and suitable for further analysis.

2. Convergent Validity Test using *Average Variance Extracted* (AVE)

The AVE value is used to assess the extent to which a construct can explain the variance of the indicators that measure it. In this case, a construct is said to have good convergent validity if its AVE value is greater than 0.5. This means that more than 50% of the indicator variance can be explained by the construct. The AVE values for each variable are as follows:

Table 4. Convergent Validity Test using AVE

Variable	(AVE)	Threshold	Result
Application of Technology (X)	0.608	> 0.50	Valid
Customer Satisfaction (Y)	0.738	> 0.50	Valid
Service Quality (Z1)	0.726	> 0.50	Valid
Business Process (Z2)	0.705	> 0.50	Valid

Source: Processed Data using SmartPLS (2025)

It can be seen that all variables used in this study have an Average Variance Extracted (AVE) value exceeding 0.5. An AVE value greater than 0.5 indicates that each construct in the model is able to explain more than 50% of the variance of the indicators that form it.

b. Discriminant Validity

1. Discriminant Validity Test Using Outer Loadings

Cross-loading analysis aims to assess whether indicators have adequate discriminatory power by comparing the correlation of indicators with their original constructs and with other constructs. This indicates that the latent construct is more capable of predicting indicators within its own block compared to indicators from other construct blocks, thereby concluding that the construct possesses good discriminant validity (Yusuf & Sartika, 2021).

Table 5. Cross Loadings for Discriminant Validity

Indikator	Application of Technology (X)	Customer Satisfaction (Y)	Service Quality (Z1)	Business Process (Z2)
X1	**0.771**	0.345	0.273	0.431
X2	**0.721**	0.133	0.266	0.381
X3	**0.865**	0.285	0.399	0.408
X4	**0.810**	0.178	0.318	0.352
X5	**0.744**	0.185	0.193	0.238
X6	**0.729**	0.149	0.209	0.318
X7	**0.752**	0.229	0.422	0.359
X8	**0.831**	0.279	0.486	0.410
Y1	0.285	**0.764**	0.193	0.211
Y2	0.302	**0.880**	0.341	0.315
Y3	0.280	**0.865**	0.376	0.308
Y4	0.210	**0.880**	0.324	0.407
Y5	0.236	**0.870**	0.315	0.373
Y6	0.247	**0.888**	0.351	0.444
Z1.1	0.444	0.261	**0.873**	0.401
Z1.2	0.351	0.341	**0.918**	0.372
Z1.3	0.358	0.374	**0.863**	0.455
Z1.4	0.345	0.405	**0.783**	0.428
Z1.5	0.395	0.307	**0.856**	0.401
Z1.6	0.383	0.314	**0.856**	0.379
Z1.7	0.372	0.281	**0.839**	0.383
Z1.8	0.354	0.283	**0.826**	0.329
Z1.9	0.365	0.309	**0.853**	0.373
Z1.10	0.353	0.321	**0.890**	0.397

Z1.11	0.351	0.341	**0.918**	0.372
Z1.12	0.394	0.347	**0.951**	0.424
Z1.13	0.402	0.344	**0.832**	0.335
Z1.14	0.394	0.343	**0.853**	0.315
Z1.15	0.343	0.272	**0.915**	0.425
Z1.16	0.350	0.336	**0.810**	0.260
Z1.17	0.302	0.275	**0.846**	0.306
Z1.18	0.324	0.263	**0.701**	0.265
Z1.19	0.372	0.327	**0.768**	0.329
Z2.1	0.340	0.269	0.366	**0.845**
Z2.2	0.335	0.316	0.374	**0.842**
Z2.3	0.376	0.332	0.379	**0.883**
Z2.4	0.465	0.369	0.359	**0.758**
Z2.5	0.398	0.332	0.257	**0.738**
Z2.6	0.426	0.310	0.328	**0.897**
Z2.7	0.445	0.222	0.337	**0.885**
Z2.8	0.441	0.382	0.301	**0.752**
Z2.9	0.359	0.318	0.385	**0.885**
Z2.10	0.357	0.319	0.397	**0.883**
Z2.11	0.340	0.329	0.406	**0.793**
Z2.12	0.410	0.442	0.395	**0.860**
Z2.13	0.418	0.448	0.413	**0.870**

Source: Processed Data using SmartPLS (2025)

2. Discriminant Validity Test Using Fornell-Larcker

Table 6. Fornell-Larcker Criterion Values of Research Variables

Variabel	Application of Technology (X)	Customer Satisfaction (Y)	Service Quality (Z1)	Business Process (Z2)
Application of Technology (X)	0.779	0.298	0.432	0.474
Customer Satisfaction (Y)	0.298	0.859	0.376	0.410
Service Quality (Z1)	0.432	0.376	0.852	0.432
Business Process (Z2)	0.474	0.410	0.432	0.840

Source: Processed using SmartPLS (2025)

All constructs show higher correlation values with their own indicators than with other constructs. This indicates that each latent construct meets the criteria for discriminant validity, as it has stronger predictive power for indicators within its block than for indicators outside that block.

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Table 7. HTMT Results of Research Variables

Variabel	Application of Technology (X)	Customer Satisfaction (Y)	Service Quality (Z1)	Business Process (Z2)
Application of Technology (X)	–	0.316	0.434	0.490
Customer Satisfaction (Y)	0.316	–	0.385	0.414

Service Quality (Z1)	0.434	0.385	–	0.442
Business Process (Z2)	0.490	0.414	0.442	–

Source: Processed using SmartPLS (2025)

Based on Table 7, it can be seen that the AVE square root value for each variable is higher than the correlation value between other variables. This indicates that all variables in the research model have met the criteria for good discriminant validity according to the Fornell-Larcker approach. Furthermore, validity testing was conducted using the Heterotrait-Monotrait (HTMT) ratio, where the required HTMT value must be less than < 0.90. Thus, this model is deemed to have met the criteria for discriminant validity according to the opinion of (Hair, 2021).

c. Reability Tests

Table 8. Results of Cronbach's Alpha and Composite Reliability

Variable	Cronbach's Alpha	Composite Reliability
Application of Technology (X)	0.908	0.925
Customer Satisfaction (Y)	0.929	0.944
Service Quality (Z1)	0.979	0.980
Business Process (Z2)	0.965	0.969

Source: Processed using SmartPLS (2025)

The Cronbach's alpha test shows that a construct can be considered reliable if it has a Cronbach's alpha value > 0.6. A construct is considered reliable in terms of composite reliability if it has a composite reliability value > 0.7. Table 8 shows that the Cronbach's alpha and composite reliability values are above the standard requirements, so the variables can be considered reliable. This indicates that all constructs demonstrate **strong internal consistency reliability.**

d. Determination Coefficient Test / R-Square (R^2) and Q^2 Predictive Relevance Value

The coefficient of determination (R-Square) test was conducted to determine the extent to which endogenous latent variables could be explained by exogenous latent variables in the research model. Meanwhile, to measure the predictive ability of the model, the Q-Square (Q^2) or predictive relevance test was used.

Table 9. R-Square (R^2) and Q^2 Predictive Relevance Value

Variable	R-SQUARE	Q-SQUARE (Q^2)
Application of Technology (X)	–	0.000
Customer Satisfaction (Y)	0.220	0.152
Service Quality (Z1)	0.186	0.131
Business Process (Z2)	0.225	0.154

Based on the analysis results, the R-Square values are below the 0.25 category, which according to the classification by Latan and Ghozali (2021) falls into the weak category. This means that the exogenous variables in the model can only explain a small portion of the variance of each endogenous variable, so the model's ability to explain the relationship between variables is still limited.

Based on the interpretation of Latan and Ghozali (2021), a Q^2 value of 0.02 indicates weak predictive relevance, 0.15 indicates moderate relevance, and 0.35 or higher indicates strong relevance. Therefore, this model has moderate predictive ability for Customer Satisfaction and Business Process, but weak predictive ability for Service Quality. Meanwhile, a value of Q^2 = 0.000 for Technology Use indicates that this variable has no predictive relevance because it is an exogenous variable not predicted by other variables.

e. Goodness of Fit (GoF)

The Goodness of Fit Index (GoF) is one of the measures used to evaluate how well a statistical model, especially in Structural Equation Modelling (SEM), fits or matches the observed dataThe GoF value criteria are as follows: 0.10 = Small, 0.25 = Medium, and 0.36 = Large (Rianto Rahadi, 2023). The results of the Goodness of Fit (GoF) test in this study are as follows:

$$\text{Gof} = \sqrt{AVE \; x \; R^2}$$
$$\text{Gof} = \sqrt{0{,}694 \; x \; 0{,}210}$$
$$\text{Gof} = \sqrt{0{,}14574} = 0{,}38$$

Note:

AVE = (0,608 + 0,738 + 0,726 + 0,705) / 4 = 0,694
R^2 = (0.220+0,186+0,225) /3 = 0,210

Based on calculations, the Goodness of Fit (GoF) value is 0.38. This value is above the threshold of 0.36, indicating that the structural model as a whole has a strong level of fit between the theoretical model and empirical data. Therefore, this research model can be declared feasible for further analysis.

f. Hypothesis Testing Results

Table 9. Hypothesis Testing Results

Hipotesis	Variabel for Direct Effects	Original Sample	T statistics	P values	Conclusion
H1	Application of Technology (X) è Service Quality (Z1)	0.432	5.984	0.000	Positif Significant
H2	Application of Technology (X) è Business Process (Z2)	0.474	4.598	0.000	Positif Significant
H3	Application of Technology (X) è Customer Satisfaction (Y)	0.298	0.593	0.553	Negatif
H4	Service Quality (Z1) è Customer Satisfaction (Y)	0.226	2.493	0.013	Positif Significant
H5	Business Process (Z2) è Customer Satisfaction (Y)	0.281	2.629	0.009	Positif Significant
Hipotesis	**Variabel for Indirect Effects (Mediation))**	**Original Sample**	**T statistics**	**P values**	**Conclusion**
H6	Application of Technology (X) è Service Quality (Z1) è Customer Satisfaction (Y)	0.098	2.202	0.028	Positif Significant
H7	Application of Technology (X) è Business Process (Z2) è Customer Satisfaction (Y)	0.133	2.235	0.025	Positif Significant

Source: Processed using SmartPLS (2025)

Hypothesis 1 (H1): Application of Technology(X) → Service Quality (Z1)

The test results show that the Application of Technologyhas a positive and significant effect on service quality, with a t-statistic of 5.984 (>1.660) and a p-value of 0.000. This finding is supported by (Purbasari et al., 2023), who state that the digitalisation of logistics through the planning, implementation, and control of the flow of goods or services and information in digital format has been proven to support e-logistics performance in terms of efficiency, effectiveness, and differentiation. Another finding from (Venkatakrishnan et al., 2023) found that there is a positive relationship between the moderating effect of web design and trust in the relationship between electronic service quality and customer satisfaction, which was also explored.

Hypothesis 2 (H2): Application of Technology(X) → Business Process (Z2)

Technology has been proven to significantly improve business processes (t-statistic 4.598; p = 0.000). This aligns with the findings (Jean-François Arvis et al., 2018) stating that technological advancements have driven the emergence of online trade competition, altering the direction of domestic logistics business growth. Another finding (Raza et al., 2020) is that the digitalisation of logistics has a positive impact on logistics business processes for companies. Another relevant finding is from (Fitria Alayida et al., 2023a), which states that the application of digital technology to logistics process needs can make manual tasks more practical and modern. In the logistics field, the application of digital technology helps transform manual activities into more practical ones. In conclusion, technology not only improves service quality but also strengthens internal business processes.

Hypothesis 3 (H3): The Application of Technology in Enhancing Customer Satisfaction

The direct relationship between technology and customer satisfaction is not significant (t = 0.593; p = 0.553), indicating that technology alone does not have a significant direct impact. Other findings also suggest that Chatbot interactions should be designed to have a human touch by incorporating customer needs to enhance customer satisfaction (Haugeland et al., 2022). These findings support the assertion that technology needs to be accompanied by variables such as service quality and business processes to achieve optimal satisfaction.

Hypothesis 4 (H4): Service Quality Towards Customer Satisfaction

Service Quality has a direct and significant effect on Customer Satisfaction (t = 2.493; p = 0.013). These findings are consistent with the findings of a study (Zubairi Rohman et al., 2024) which states that the results of the study show a positive effect of Price, Promotion and Service Quality on the satisfaction of SiCepat delivery service customers in Surabaya. The same findings were also found in research conducted by Prasti Saogo & Yanti (2024) on another logistics company. The results showed that there was a significant influence of Service Quality, Information Quality, and Price Perception on Customer Satisfaction in the case study of Pos Aja! app users at PT. Pos Indonesia Branch in Batam. Thus, service quality has proven to be the main foundation in building customer satisfaction.

Hypothesis 5 (H5): Business Processes Affecting Customer Satisfaction

Business Processes have been proven to have a significant effect on Customer Satisfaction (t = 2.629; p = 0.009). This finding is consistent with research by (Matwiejczuk, 2020), which states that logistics business processes should be developed not only as concepts related to materials, goods, and information flow management, but also as determinants of business success and instruments (tools) for creating competitive advantages for companies, supply chains, and networks. Another study found that controlling business processes through operational control positively impacts the performance of logistics companies and customer satisfaction (Sumekar et al., 2022). Another study consistent with these findings is that of (Mc Loughlin et al., 2023b), which states that new business processes for sustainable supply chain practices are assessed as capable of improving customer satisfaction and competitive advantage.

Hypothesis 6 (H6): Business processes are thought to be an intervening variable in the relationship between technology use and customer satisfaction.

Business Process acts as an intervening (mediating) variable in the relationship between Technology Use and Customer Satisfaction, which aligns with the view (Matwiejczuk, 2020) that logistics business processes should be developed not only as concepts related to materials, goods, and information flow management, but also as a determinant of business success and an instrument (tool) for creating competitive advantage for the company, as well as for the supply chain and network.

Hypothesis 7 (H7): Service Quality is suspected to be an intervening variable in the relationship between Technology Use and Customer Satisfaction.

Service Quality also acts as an intervening variable in the relationship between Technology Use and Customer Satisfaction, in line with research by (Venkatakrishnan et al., 2023) which found that electronic service quality has an effect on customer satisfaction and customer loyalty. The moderating effect of web design and trust in the relationship between electronic service quality and customer satisfaction was also explored.

5. Conclusion and Recommendations

Conclusion

1) The use of technology has been proven to have a significant positive effect on service quality. This shows that the higher the level of technology utilisation, the better the quality of service experienced by customers, especially in terms of speed, reliability, and efficiency of service.
2) The use of technology has been proven to have a significant positive effect on business processes. This means that technology can effectively support the smooth running and optimisation of operational activities within logistics companies.
3) The use of technology does not have a significant direct impact on Customer Satisfaction. This indicates that the impact of technology is not directly felt by customers without improvements in service quality or business processes.
4) Service Quality has been proven to have a significant positive impact on Customer Satisfaction. The better the service quality provided by the company, the higher the level of satisfaction felt by customers.
5) Business Processes have also been proven to have a significant positive impact on Customer Satisfaction. This shows that improvements in internal business processes can directly impact customer perception and satisfaction.
6) Business Process has been proven to be an intervening variable in the relationship between Technology Use and Customer Satisfaction. This means that the use of technology will first improve business processes before ultimately impacting customer satisfaction.
7) Service Quality has been proven to be an intervening variable in the relationship between Technology Use and Customer Satisfaction. In other words, the influence of technology on customer satisfaction occurs through improvements in service quality.

Recommendations

Based on the findings and conclusions of the study, the following suggestions can be made for companies and future researchers:

1) **Strengthen Factors Affecting Service Quality**
   Based on the research results, Service Quality has the lowest R-Square and Q-Square values compared to other constructs, indicating that the model is not yet fully capable of explaining service quality comprehensively. Therefore, companies need to identify additional factors that influence service quality, such as frontline employee behaviour, complaint handling speed, and service information transparency.
2) **Evaluate Technology Strategies on Customer-Oriented Value**
   The use of technology has been proven to have no significant direct impact on customer satisfaction. This indicates that technology investments have not yet provided experiences that are directly felt by customers. Therefore, companies are advised to integrate technology systems with direct customer interactions, such as real-time tracking features, chatbot-based automated communication, or user-need-based notifications.
3) **Develop Technology-Based Service Quality.**
   To strengthen Service Quality as a mediator, companies should utilise technology not only for internal efficiency but also to enhance value-added services, such as accelerating delivery times, simplifying information access, and improving delivery data accuracy.
4) **Focus on Customer Experience and Needs.**
   Since the impact of technology is only felt through business processes and service quality, companies should regularly measure customer experience, for example through satisfaction surveys and evaluations of technology-based service systems.
5) **Explore Opportunities for Further Research.**

Given the presence of variables with low explanatory power, future researchers may consider adding other variables, such as customer trust, perceived ease of use, or customer engagement, to more comprehensively explain service quality and customer satisfaction.

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