

HOW LOGISTICS COST DRIVES SATISFACTION AND CONTINUOUS-USE INTENTION IN E-COMMERCE

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Abstract:

The rapid growth of e-commerce volume in Indonesia has led consumers to demand logistics service providers that are fast, efficient, and of high quality. This phenomenon creates challenges in logistics cost management, which can influence customer satisfaction and their intention to continue using the service. This study analyses how logistics cost management influences customer satisfaction, which has a long-term impact on customers' continuous-use intention of logistics services in the e-commerce context. This research collected online survey data from 191 active online sellers across various e-commerce platforms in Indonesia and was analysed using the PLS-SEM method with SmartPLS 4 software. The results show that cost has a significant positive effect on service quality, technology usage, transportation time, and product condition. In addition, technology usage, transportation time, and product condition are also found to have a significant positive effect on customer satisfaction. However, service quality does not have a significant effect on customer satisfaction. Furthermore, customer satisfaction has a significant positive effect on continuous-use intention, confirming that customer satisfaction is a key factor in fostering customer loyalty and encouraging repeated use of the same logistics services. These findings highlight the importance of cost efficiency, technological adoption, delivery speed, and optimal product condition in strengthening business competitiveness and customer retention in the e-commerce industry. This study contributes theoretically and extends the academic literature on the importance of cost management in logistics services to maintain business sustainability, particularly in the e-commerce sector.

Keywords: Logistics Cost, Logistics Service Quality, Customer Satisfaction, Continuous-use Intention

INTRODUCTION

The digital transformation in Indonesia has shifted consumer behavior toward a dominant e-commerce ecosystem, where the ease of access to technology and more secure market opportunities have encouraged the rise of online sellers without physical stores (Natsya et al., 2024; Wardhana, 2024). According to data from Bank Indonesia (2025), the volume of e-commerce transactions in Indonesia

increased significantly from IDR 205.5 trillion in 2019 to IDR 487.01 trillion in 2024. This surge highlights the importance of customer satisfaction as a key factor in maintaining customer loyalty, especially given the wide range of online shopping platforms available (Lin et al., 2023; Putri, 2024). Customers tend to feel satisfied when their service experience meets expectations, which subsequently drives continuous-use intention to reuse the same

e-commerce logistics services (Bhattacharjee, 2001; Ngah et al., 2021; Lin et al., 2023). Therefore, improving customer satisfaction serves as a vital strategy for building long-term customer loyalty.

However, current literature reveals a significant research gap. Asawawibul et al. (2025) found that service quality and transportation time did not significantly affect customer satisfaction, as these factors were considered basic service expectations in a highly competitive e-commerce market. Conversely, Lin et al. (2023) dan Liu et al. (2024) reported contrasting results. This inconsistency indicates that the drivers of satisfaction are evolving, particularly in Indonesia, one of the largest e-commerce markets in Southeast Asia, where research on the integration of cost, technology usage, and product condition remains surprisingly limited (Ng, 2025; Asawawibul et al., 2025).

The novelty of this study lies in developing a more comprehensive research model by incorporating continuous-use intention as a long-term positive outcome of customer satisfaction, while also examining the role of cost, measured through several variables (service quality, technology usage, transportation time, and product condition), in shaping customer satisfaction and continuous-use intention. Accordingly, the objective of this study is to evaluate the influence of cost-based logistics performance on customer satisfaction and to determine how these factors may affect the continuous use intention of online sellers in Indonesia. This allows the findings to emphasize logistics service performance and be broadly applicable across various e-commerce platforms.

THEORETICAL FRAMEWORK

Cost

Cost refers to the total value exchanged by consumers to obtain the benefits of owning a product or using a service (Kotler et al., 2005). In recent decades, factors beyond cost have also become important variables influencing consumer purchasing decisions. This means that quality, service, and brand play crucial roles in shaping customer preferences. Therefore, businesses should not only focus on price competition but also on the added value they provide to their customers. Effectively managed costs have been proven to have a positive impact on operational efficiency and customer satisfaction (Syafrianita et al., 2025).

Service Quality

Service quality is the measurement of how well a service meets customer expectations (Foster, 2017). Service quality is perceived as good by consumers when the service provided consistently meets their expectations (Thai, 2014). Assessing service quality is more challenging than evaluating product quality because it is subjective and created through a high level of customer involvement (Foster, 2017).

Technology Usage

Technology usage refers to integrating digital information technology systems into service operations to enhance the effectiveness and efficiency of logistics processes (Kalkha et al., 2023). By implementing information and communication technologies such as the Internet of Things (IoT), artificial intelligence (AI), blockchain, cloud computing, 5G, and others, e-commerce businesses can improve their services and better manage rapidly changing market demands. The use of such technologies enables logistics service providers to offer

real-time, accurate, and secure shipment tracking and to provide customers with delivery date information. Furthermore, companies can prevent delays and optimize delivery routes (Arroffi et al., 2021).

Transportation Time

Transportation time refers to the customer's perception of product delivery time according to their expectations (Mentzer et al., 2001). Additionally, transportation time includes aspects such as the accuracy of order delivery, product condition upon arrival, product quality, and the speed of issue resolution by the service provider when products do not match expectations. Efficient transportation time reflects that the logistics provider has a superior, professional system and operates effectively (Maesazshandy & Tohir, 2025).

Product Condition

Product condition refers to the physical state of a product received by the customer that can be used immediately without any damage occurring during the delivery process (Mentzer et al., 2001). Product condition implies that the company ensures the product's condition upon delivery by guaranteeing there are no damages or defects, maintaining product safety, and ensuring that the quantity received matches the customer's order (Sangkereng & Ikhsan, 2021).

Customer Satisfaction

Customer satisfaction is the feeling experienced by customers after comparing their expectations with the actual performance of a product or service (Chandra et al., 2020). Customer satisfaction is the result of customer's post-purchase evaluation regarding how well a product or service meets their expectations (Hui et al., 2025). When customer

expectations are met or even exceeded, satisfaction occurs, which can encourage customers to reuse the same product or service.

Continuous-Use Intention

Continuous-use intention refers to customer's tendency or willingness to continue using the same service repeatedly after having prior experience with it (Nghah et al., 2021). The concept of continuous-use intention differs from intention to use, which focuses more on the customer's first-time usage. Continuous-use intention emphasizes returning customers who have used the service before and wish to continue using it because of their satisfaction (Zuhra, 2023). In the rapidly growing e-commerce industry, understanding continuous-use intention is crucial, as there are numerous logistics service providers, and retaining existing customers is more effective than acquiring new ones.

Hypothesis Development

Cost and Service Quality

Based on the study conducted by Syafranita et al. (2025) on Shopee Express Bandung Raya, cost has a significant positive effect on the service quality of logistics service providers. Cost influences the performance of logistics operations, where higher expenses lead to improved service quality, faster delivery times, and increased customer satisfaction. When customers perceive the cost as fair, they tend to feel that the service quality provided meets their expectations and needs (Josua et al., 2017).

H1: Cost has a significant positive effect on Service Quality.

Cost and Technology Usage

According to the study by Al Zadajali & Ullah (2024) Cost has a significant

positive effect on technology usage in the logistics industry. Higher investment costs enhance the use of logistics management technologies that optimize operational processes and improve delivery efficiency. Therefore, when companies allocate more funds to invest in technology, technology use becomes more advanced, reducing operational costs through increased efficiency in logistics operations.

H2: Cost has a significant positive effect on Technology Usage.

Cost and Transportation Time

According to Elvhidia et al. (2023) Cost has a significant positive effect on transportation time. This is because higher logistics costs are often associated with premium services such as priority schedules and better fleets, leading to faster product deliveries to customers. This positively impacts customer satisfaction and enhances business competitiveness, as customers tend to feel more satisfied with faster delivery times, even when they pay higher fees.

H3: Cost has a significant positive effect on Transportation Time.

Cost and Product Condition

In the logistics sector, product quality such as product condition and conformity with promised specifications is a crucial factor influencing customer satisfaction. For logistics service provider, maintaining good product condition is both a regulatory requirement and a competitive advantage. Online sellers tend to choose service providers that can guarantee products arrive in good condition, even if this results in higher costs for customers (Asawawibul et al., 2025). Therefore, the influence of cost on product condition is significantly positive, meaning that the higher costs allocated to ensure product quality during

shipment, the better the product condition received by customers.

H4: Cost has a significant positive effect on Product Condition.

Cost and Customer Satisfaction

The study by Vasić et al. (2021) shows that cost has a significant positive effect on customer satisfaction. Reasonable, transparent shipping fees that correspond to the quality of service provided create positive perceptions among customers and enhance their satisfaction with e-commerce services. However, Hui et al. (2025) found differing results, where cost had a significant negative effect on customer satisfaction. This suggests that customers tend to be more satisfied when they receive service quality that meets their expectations, even if it requires paying higher prices (Naini et al., 2022). Therefore, determining fair pricing is important for encouraging repeat purchases, but it may not be sufficient to increase overall customer satisfaction. Hence, businesses should not rely solely on price fairness to improve satisfaction but must also consider overall service quality (Asawawibul et al., 2025).

H5: Cost has a significant positive effect on Customer Satisfaction.

Service Quality and Customer Satisfaction

Service quality perceived by customers when using logistics services can enhance their perceived value, which in turn contributes to higher levels of customer satisfaction. The higher the service quality, as reflected in the balance between customer expectations and actual experiences, the greater the increase in customer satisfaction and business success (Walean et al., 2024). Key aspects of service quality that contribute to higher customer satisfaction include packaging quality,

delivery timeliness, reliability, and customer engagement (Liu et al., 2024).

H6: Service Quality has a significant positive effect on Customer Satisfaction.

Technology Usage and Customer Satisfaction

Technology usage has a significant positive effect on customer satisfaction. When logistics service providers effectively utilize technology, customer satisfaction increases because the services offered align more closely with customer expectations (Arroffi et al., 2021). Technology in logistics services serves as a bridge, facilitating digital payment systems, real-time shipment tracking, and user-friendly website interfaces that meet customer needs. Therefore, it is highly recommended for e-commerce businesses to invest in technological development to enhance customer satisfaction and strengthen competitiveness (Waseem-Ul-Hameed et al., 2018).

H7: Technology Usage has a significant positive effect on Customer Satisfaction.

Transportation Time and Customer Satisfaction

Research conducted by Hariyanto (2023) on PT Pos Indonesia, it was found that transportation time has a significant positive effect on customer satisfaction. When customers receive their orders quickly, their satisfaction increases, indicating that delivery speed is a significant contributor to customer satisfaction. Therefore, logistics service providers must manage and improve delivery punctuality by determining more efficient routes and integrating technology into their operations (Maesazshandy & Tohir, 2025).

H8: Transportation Time has a significant positive effect on Customer Satisfaction.

Product Condition and Customer Satisfaction

The positive influence of product condition on customer satisfaction has been confirmed by several studies, including Hariyanto (2023) on PT Pos Indonesia. The findings show that customers who receive products in good condition, free from damage, matching product descriptions, and complete tend to report higher levels of customer satisfaction. Conversely, when customers receive damaged products, they are more likely to return their orders, leading to lower satisfaction levels (Sangkereng & Ikhsan, 2021).

H9: Product Condition has a significant positive effect on Customer Satisfaction.

Customer Satisfaction and Continuous-Use Intention

The study by Lin et al. (2023) demonstrates that customer satisfaction acts as a mediator linking the five dimensions of logistics service quality with customer continuous-use intention. Satisfied customers are more likely to reuse the same services and recommend it to others Hui et al. (2025). This occurs because customers have developed positive perceptions of the service. Therefore, it is crucial for logistics service providers to continuously improve service quality to maintain customer loyalty.

H10: Customer Satisfaction has a significant positive effect on Continuous-Use Intention.

RESEARCH METHODOLOGY

This study is classified as basic research because it focuses on testing, refining, and developing existing theories. Based on its purpose, this research is a causal study, since it aims to identify cause-and-effect relationships among variables. The study employs a

quantitative research approach, involving numerical data processing and statistical analysis of measurable data.

The population of this study includes all online sellers using e-commerce platforms in Indonesia. The data source used is primary data, which was collected directly from respondents through an online questionnaire distributed via Google Forms under the title “How Logistics Cost Drives Satisfaction and Continuous-Use Intention in E-Commerce.” The questionnaire was completed by respondents who met specific criteria: (1) at least 17 years old; (2) have operated an active online store on an e-commerce platform for at least one year; (3) have used logistics services at least three times within the last six months. These criteria were established to ensure that the selected respondents could provide relevant and valid data for the study variables.

The sampling technique used in this research is non-probability sampling, meaning not all members of the population had an equal chance of being selected as samples. The sampling design used is purposive sampling, based on specific criteria set by the researcher. This approach ensures that the collected data aligns with the research objectives. A total of 191 respondents who met the requirements were included in the analysis. This sample size meets the minimum criteria for quantitative research, which requires at least 100 respondents and at least five times the number of measurement indicators used in the questionnaire (Hair et al., 2014).

The measurement scale used in this study is the interval scale, which has consistent spacing and clearly measurable differences between scale points. A Likert scale was employed to measure respondents’ attitudes, opinions, or

perceptions, ranging from “1” = strongly disagree to “5” = strongly agree.

The collected data were processed and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The PLS-SEM method was chosen because the research model involves multiple latent variables, making it relatively complex. The data analysis was conducted in two stages. The first stage involved testing the measurement model (outer model) to assess the validity and reliability of each indicator, including the analysis of outer loading, average variance extracted (AVE), composite reliability (CR), cronbach’s alpha, and discriminant validity. Once the indicators and model were confirmed to be valid and reliable, the second stage involved testing the structural model (inner model) using the bootstrapping technique to evaluate the significance and strength of relationships between latent variables, including analyses of path coefficients, t-statistics, p-values, and R².

RESULT AND DISCUSSION

The relationships analyzed in this study were examined using primary data obtained from online surveys distributed to online sellers across various e-commerce platforms in Indonesia via Google Forms. Of the 230 respondents, only 191 met the selection criteria. The characteristics of the respondents are presented in Table 1.

Table 1. Respondent profile

Characteristics	Frequency	Percentage
Gender		
Male	119	62,30%
Female	72	37,70%
Age		
17-20 Years	25	13,09%
21-40 Years	152	79,58%
41-60 Years	14	7,33%
Highest Level of Education		

Characteristics	Frequency	Percentage
High School	128	67,02%
Bachelor	60	31,41%
Postgraduate	3	1,57%
Marital Status		
Single	158	82,72%
Married	31	16,23%
Divorced	2	1,05%
Occupations		
Students	120	62,83%
Entrepreneurs	37	19,37%
Private Employees	23	12,04%
Civil Servants	10	5,24%
Housewife	1	0,52%

The validity test aims to measure the accuracy of the indicators in assessing the intended latent variables. The first validity test involves examining the outer loadings, which indicate the degree to which each indicator contributes to its latent variable. An indicator is considered valid if it has an outer loading value of $\geq 0,7$ (Hulland et al., 1996). The second validity test is the average variance extracted (AVE), which measures the extent to which a latent variable explains the variance of its indicators. A variable is

considered valid if the AVE value is $\geq 0,5$ (Fornell & Larcker, 1981).

The reliability test aims to measure the consistency of the indicators used to assess a single latent variable. The first reliability test is composite reliability (CR), which assesses the internal consistency of the indicators within a variable. A construct is considered reliable if its CR value is $\geq 0,6$ (Bagozzi & Yi, 1988). The second reliability test is Cronbach's alpha, which measures the inter-item correlation and internal consistency of indicators within the same construct. A variable is considered reliable if its cronbach's alpha value is $\geq 0,7$ (Hair et al., 2014). The test results are presented in Table 2.

The results of the outer loading test show that all indicators have values above 0,7, indicating that the indicators are valid and can accurately represent the latent variables. The average variance extracted values for all variables are also above 0,5, suggesting that each latent variable effectively explains and aligns with its respective indicators.

Table 2. Validity and Reliability Test

Variable	Indicator	Outer Loading	AVE	CR	Cronbach's Alpha
Cost	Cost 1	0,906	0,810	0,927	0,883
	Cost 2	0,886			
	Cost 3	0,907			
Service Quality	SQ 1	0,891	0,762	0,905	0,843
	SQ 2	0,848			
	SQ 3	0,878			
Technology Usage	TU 1	0,787	0,651	0,918	0,893
	TU 2	0,808			
	TU 3	0,818			
	TU 4	0,798			
	TU 5	0,813			
	TU 6	0,816			
Transportation Time	TT 1	0,913	0,776	0,912	0,856
	TT 2	0,842			
	TT 3	0,887			
Product Condition	PC 1	0,858	0,753	0,901	0,836
	PC 2	0,855			
	PC 3	0,890			
	CS 1	0,714	0,510	0,926	0,913

Variable	Indicator	Outer Loading	AVE	CR	Cronbach's Alpha
Customer Satisfaction	CS 2	0,716	0,581	0,847	0,760
	CS 3	0,706			
	CS 4	0,703			
	CS 5	0,721			
	CS 6	0,740			
	CS 7	0,709			
	CS 8	0,709			
	CS 9	0,719			
	CS 10	0,716			
	CS 11	0,706			
	CS 12	0,703			
Continuous-Use Intention	CUI 1	0,764			
	CUI 2	0,708			
	CUI 3	0,784			
	CUI 4	0,791			

Furthermore, both composite reliability and cronbach's alpha values for all constructs meet the minimum thresholds of 0,6 and 0,7, respectively. This indicates that the constructs in this study are highly reliable and consistent. Therefore, all variables in this research can be considered valid and reliable, making them suitable for accurate and consistent analysis.

The next stage of the analysis is the discriminant validity test, which aims to ensure that each latent variable is distinct from other variables in the research model. Discriminant validity is considered

acceptable if the heterotrait-monotrait ratio (HTMT) value is $\leq 0,9$ (Henseler et al., 2015). Based on the results presented in Table 3, the HTMT values between all variables are below 0,9, indicating that the model demonstrates good discriminant validity. Consequently, it can be concluded that the indicators used in this study effectively represent their respective latent variables and that there is no multicollinearity or conceptual redundancy among them. This strengthens the credibility of the measurement model.

Table 3. Discriminant validity test - HTMT

Variables	Cost	CS	CUI	PC	SQ	TT	TU
Cost							
CS	0,568						
CUI	0,467	0,674					
PC	0,735	0,638	0,389				
SQ	0,687	0,572	0,356	0,797			
TT	0,669	0,615	0,429	0,847	0,854		
TU	0,779	0,640	0,416	0,868	0,877	0,819	

CS refers customer satisfaction, CUI refers continuous-use intention, PC refers product condition, SQ refers service quality, TT refers transportation time, TU refers technology usage.

After all research indicators were confirmed to be valid and reliable, the next step was hypothesis testing, which aimed to analyze the direct effects among latent variables. The hypothesis testing in

this study used a significance level of $\alpha = 5\%$. This testing was conducted using the bootstrapping technique in SmartPLS 4. The first test performed was the R^2 test, which measures the percentage of the

variance in endogenous variables explained by exogenous variables. The closer the R^2 value is to 1, the stronger the explanatory power. An R^2 value of 0,75 is considered strong, 0,50 is moderate, 0,25 is weak (Hair et al., 2021). The next step was analyzing the t-statistic and p-value, which serve as the basis for determining the level of significance. The t-statistic

value indicates how strongly the exogenous variables affect the endogenous variables. A relationship between variables is considered significant if the t-statistic value $\geq 1,96$ (Hair et al., 2017). Meanwhile, the p-value is used to statistically determine whether the hypothesis is significant. A hypothesis is accepted if the p-value $\leq 0,05$.

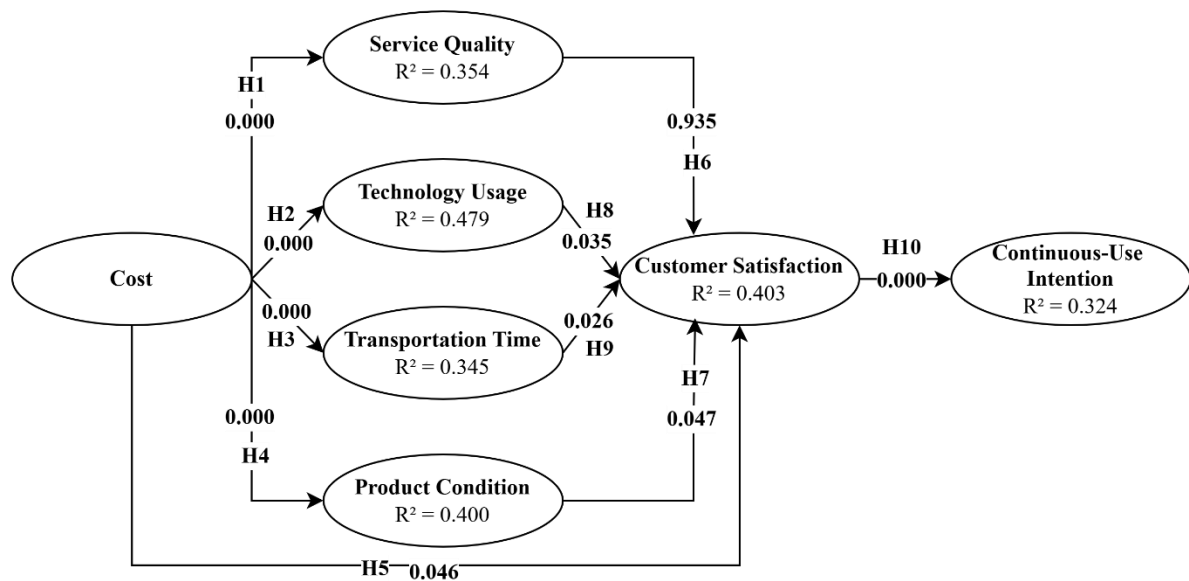


Figure 1. Research model test results

The results of the R^2 test, as shown in Figure 1, indicate that the R^2 value for service quality is 0,354; technology usage is 0,479; transportation time is 0,345, and product condition is 0,400. These results show that the four variables have a moderate level of explanatory power. Among them, technology usage shows the highest R^2 value, indicating that the factors influencing technology use in logistics services are better captured by the model than those for other variables. Furthermore, the R^2 value for customer satisfaction is 0.403, which falls within the moderate category, indicating that these variables explain customer satisfaction reasonably well.

Meanwhile, the R^2 for continuous-use intention is 0,324, indicating a weak

to moderate category, suggesting that customer satisfaction has a sufficient impact on customer's intention to reuse e-commerce logistics services. This indicates that although customer satisfaction influences users' intention to continue using e-commerce logistics services, there are likely other external factors not included in the model. Overall, the R^2 test results indicate that the research model has moderate explanatory power across all variables. This suggests that the model provides a reasonably strong foundation for understanding the relationships among cost, service quality, technology usage, transportation time, product condition, customer satisfaction, and continuous-

use intention within the context of e-commerce logistics services in Indonesia.

Table 4. Hypothesis test results

Hypothesis	O	M	STDEV	t	p	Result
Cost -> SQ	0,595	0,598	0,054	10,987	0,000	Significant
Cost -> TU	0,692	0,695	0,043	16,282	0,000	Significant
Cost -> TT	0,587	0,591	0,057	10,248	0,000	Significant
Cost -> PC	0,632	0,635	0,051	12,348	0,000	Significant
Cost -> CS	0,148	0,151	0,074	1,994	0,046	Significant
SQ -> CS	0,008	0,004	0,093	0,082	0,935	Not Significant
TU -> CS	0,215	0,210	0,102	2,108	0,035	Significant
TT -> CS	0,185	0,191	0,083	2,231	0,026	Significant
PC -> CS	0,169	0,174	0,085	1,987	0,047	Significant
CS -> CUI	0,569	0,573	0,088	6,470	0,000	Significant

O refers original sample, M refers sample mean, STDEV refers standard deviation, t refers t-statistics, p refers p-value, SQ refers service quality, TU refers technology usage, TT refers transportation time, PC refers product condition, CS refers customer satisfaction, CUI refers continuous-use intention.

Based on the results of the path coefficient test shown in Table 4, using the bootstrapping technique in SmartPLS 4, most of the research variables have a significant effect on their respective endogenous variables. This is evident from t-statistic values greater than 1,96 and p-values less than 0,05, indicating that the corresponding hypotheses are significant. More specifically, the cost variable has a significant effect on all four dependent variables, confirming that H1-H4 are positive and significant. This finding demonstrates that cost is a key factor influencing multiple aspects of logistics services, including service quality, technology usage, transportation time, and product condition. However, one variable, service quality, showed an insignificant result, with a t-statistics value of 0,082 ($\leq 1,96$) and p-value of 0,935 ($\geq 0,05$). Therefore, H6 is rejected. This indicates that service quality does not have a direct significant effect on customer satisfaction in e-commerce logistics services.

In contrast, all other exogenous variables: cost, technology usage, transportation time, and product condition were found to have a significant positive

effect on customer satisfaction. This indicates that when costs are managed efficiently, technology is utilized effectively, deliveries are timely, and product conditions meet customer expectations, overall satisfaction increases. Thus, H5, H7-H9 are accepted. Finally, customer satisfaction was found to have a significant positive effect on continuous-use intention, meaning that customers who are satisfied with logistics services are more likely to reuse the same service. Therefore, H10 is accepted.

Based on the results of this study, the cost variable was found to have the third strongest significant positive effect on service quality in e-commerce logistics services. This indicates that the higher the costs allocated for service development, the higher the level of service quality perceived by customers. These results are consistent with the findings of Syafrianita et al. (2025), which showed that strategically allocated costs can improve logistics service performance and customer satisfaction. Furthermore, Josua et al. (2017) stated that customer satisfaction increases when customers perceive that the costs incurred

are proportional to the benefits or services received.

The study found that cost had the strongest significant effect on technology usage. This means that the higher the budget allocated for technological innovation, the greater the value derived from technology utilization in e-commerce logistics operations. This value includes improvements in logistics management efficiency and operational process optimization. These findings align with Al Zadajali & Ullah (2024), who emphasized that cost plays a crucial role in enhancing technology adoption within the logistics industry. Therefore, e-commerce logistics providers that invest in advanced technologies can streamline operations and improve customer satisfaction.

The role of cost was also found to have a significant positive effect on transportation time in e-commerce logistics. This suggests that higher logistics costs are associated with faster delivery times in e-commerce logistics services. In other words, increased logistics spending corresponds to shorter delivery durations, as higher costs often allow for the use of more modern fleets or prioritized delivery schedules. This finding is supported by Elvhidia et al. (2023), who demonstrated that logistics expenditure has a significant positive influence on transportation time because companies with higher budgets can offer more reliable facilities and services. Therefore, in the context of e-commerce, cost plays an important role in achieving faster services and improving customer satisfaction, as customers tend to be more satisfied when their orders arrive quickly, even if they pay higher fees.

The test results show that cost has the second strongest significant positive effect on product condition. This means that the greater the budget allocation, the better the assurance of the product's

condition upon delivery to the customer. This indicates that higher spending enables the implementation of stricter packaging and shipping standards to minimize the risk of product damage. Some online sellers even offer additional protection options at an extra cost to ensure products remain in good condition during delivery. This finding is supported by Asawawibul et al. (2025), who emphasized that product quality and conformity with the promised item are crucial factors influencing customer satisfaction in the logistics e-commerce sector.

Based on the results, cost was found to have a significant positive relationship with customer satisfaction. This implies that an increase in cost accompanied by an improvement in overall service quality tends to generate a positive customer response. This result is consistent with Tedjakusuma et al. (2024), who confirmed that shipping costs in e-commerce logistics significantly influence customer satisfaction, as customers perceive the prices paid as fair relative to the quality of service received. In other words, as costs increase, overall service quality tends to improve, leading to higher levels of customer satisfaction even when the associated expenses are greater.

The results revealed one insignificant hypothesis, namely that service quality did not have a significant effect on customer satisfaction. This finding can be interpreted within the context of Indonesia's e-commerce logistics sector, where customers tend to prioritize other aspects such as speed, safety, convenience in the delivery system, and cost efficiency. Although service quality is one strategy to enhance customer satisfaction, it is not always the primary determinant. This result aligns with the findings of Akmal et al. (2023), who found that service quality had no significant effect on customer

satisfaction. This may occur because customers with long-standing relationships with a company already have a strong sense of trust, making service quality less impactful on satisfaction. Similarly, Nimeesha & Fachira (2025) found that business customers' focus has shifted toward cost efficiency and product quality rather than service quality aspects. Moreover, the increasingly competitive e-commerce market in Indonesia has led customers to perceive good service as a standard requirement rather than a differentiating factor. Thus, service quality alone is not strong enough to significantly influence overall customer satisfaction.

The study found that technology usage had a significant effect on customer satisfaction. This indicates that integrating technology into logistics services helps customers reduce uncertainty, track product delivery in real-time, and access information quickly. These factors build customer trust and directly enhance satisfaction. According to Arroffi et al. (2021), the use of technology aligned with service needs such as easy payment systems, real-time tracking transparency, and user-friendly interface design can improve service performance in line with customer expectations. Similarly, Waseem-Ul-Hameed et al. (2018) demonstrated that technology plays a crucial role in e-commerce logistics by increasing satisfaction through delivery tracking transparency. Therefore, logistics service providers are encouraged to invest in technological innovation and development to strengthen competitiveness and operational reliability.

Transportation time had a significant positive effect on customer satisfaction. Faster delivery times lead to greater customer satisfaction. In e-commerce, efficient and optimal logistics delivery times enhance satisfaction and trust

because they directly affect customers' shopping experience. This can be achieved by ensuring products are delivered according to the estimated schedule, thereby preventing customer disappointment (Rafmadini et al., 2025). Conversely, delivery delays can reduce satisfaction and discourage customers from using the same service again, ultimately impacting customer loyalty. Therefore, logistics service providers should implement effective operational strategies, such as optimizing delivery routes and integrating digital technologies (Maesazshandy & Tohir, 2025). Effective time management in delivery is a key strategy for businesses to improve customer satisfaction and gain a competitive advantage in the increasingly dynamic logistics industry.

The test results show that product condition had a significant positive effect on customer satisfaction. This means that the better the condition of the product received by customers, the higher their level of satisfaction. Customers not only expect quick and accurate service but also value the assurance that products will arrive in good condition. Additional packaging, such as sturdy boxes or bubble wrap provided by logistics services, demonstrates the seller's commitment to product safety and adds perceived value for customers. This finding supports Akil & Ungan (2022), who stated that products must arrive undamaged and consistent with their descriptions, as this is a key factor influencing customer satisfaction. Proper packaging minimizes damage during delivery and enhances customer trust in logistics providers. Maintaining product condition during shipment also strengthens business reputation. Therefore, this study emphasizes that ensuring product integrity throughout

delivery is essential for increasing customer satisfaction.

Customer Satisfaction had a significant positive effect on continuous-use intention. This indicates that when the services provided meet or even exceed their expectations and generate satisfaction, customers are more likely to reuse the same service in the future. This behavior reflects a sense of trust and emotional attachment that develops over repeated satisfactory experiences. Satisfied customers not only make repeat purchases but also demonstrate loyalty behaviors, such as choosing the same logistics provider over competitors, providing positive reviews, and recommending the service to peers through word of mouth (Budiono & Kusumawardhany, 2025). This creates a positive impact on consumer behavior and strengthens business competitiveness in the long term. These results are consistent with Kim & Yum (2024), who found that higher levels of customer satisfaction lead to stronger customer loyalty and greater likelihood of recommending the service to others. Similarly, Monoarfa et al. (2024) confirmed that customer satisfaction is a key driver of continuous-use intention, emphasizing that customers who are emotionally and cognitively satisfied are more committed to maintaining ongoing relationships with service providers. Hence, these results highlight that maintaining and improving customer satisfaction is crucial for logistics service providers, especially in the highly competitive e-commerce industry. In turn, this will lead to sustained customer loyalty, enhanced market competitiveness, and stable revenue growth in the long run.

CONCLUSION

Based on the analysis conducted using SmartPLS 4, the results indicate that most of the hypothesis in this research

model show a significant positive influence on endogenous variables. This finding provides strong empirical support for the proposed conceptual framework. The main findings reveal that cost is the most dominant factor affecting four variables service quality, technology Usage, transportation time, and product condition.

This relationship suggests that greater investment in logistics operations, infrastructure, and technology leads to improved service performance across multiple dimensions. This demonstrates that the greater the cost invested in logistics services, the higher the service quality, technological effectiveness, delivery speed, and product condition perceived by customers.

Moreover, the results also show that technology usage, transportation time, and product condition have significant positive effects on customer satisfaction. This indicates that customers' satisfaction levels in e-commerce logistics are largely determined by how efficiently technology facilitates transactions, how quickly goods are delivered, and how well products are maintained during shipment. Overall, these findings confirm that strategic cost allocation and operational efficiency play a central role in enhancing customer satisfaction and sustaining competitive performance in the e-commerce logistics industry.

However, one variable service quality was found to be insignificant in influencing customer satisfaction. This result suggests that, unlike traditional service settings, service quality may not be the primary determinant of satisfaction in the context of e-commerce industry. This is likely because, in Indonesia's e-commerce sector, customers tend to value speed, product condition, and transactional convenience over direct service interactions, as online customers rarely engage with sellers face-

to-face. Therefore, for logistics providers, the key to enhancing customer satisfaction lies not solely in improving service interaction but in strengthening operational excellence.

Lastly, the analysis reveals that customer satisfaction has a significant positive effect on continuous-use intention, reinforcing the importance of maintaining a positive post-purchase experience. This finding suggests that satisfied customers are more likely to continue using the same logistics services in future transactions, reflecting a strong behavioral loyalty between users and service providers. Therefore, e-commerce businesses need to focus on strategies that enhance customer satisfaction, such as optimizing technology use, ensuring timely deliveries, and maintaining product integrity. By prioritizing these aspects, companies can build long-term customer trust and loyalty, which in turn promotes repeat usage, strengthens brand reputation, and secures a competitive edge in the dynamic e-commerce market.

IMPLICATION

Theoretically, this study extends the existing literature on logistics management by providing empirical evidence of the complex relationship between cost efficiency and long-term customer loyalty in the e-commerce sector. A key theoretical contribution is the finding that service quality does not significantly influence customer satisfaction, which supports arguments that in high-speed digital markets, technical performance and efficiency outweigh general service perceptions. This research proves that cost is not merely a financial constraint but a strategic driver that enhances technology adoption and delivery reliability, which are the actual anchors of customer satisfaction in Indonesia.

The findings of this study also provide several practical implications for e-commerce stakeholders, particularly online sellers and logistics service providers. First, since cost was found to be the most influential variable across multiple service aspects, companies should allocate their budgets strategically to improve operational efficiency without compromising service quality. For example, investing in technology-driven logistics management systems (such as real-time tracking, route optimization, and improved user interface design) can enhance delivery speed and reduce operational errors.

Second, the finding that technology usage has the strongest impact on customer satisfaction suggests that e-commerce actors must maximize the use of digital technologies. Tools such as AI-powered chatbots for customer service and real-time order tracking systems can improve transparency, accelerate service processes, and strengthen customer trust.

Third, as both transportation time and product condition significantly affect customer satisfaction, logistics providers should enhance delivery reliability and packaging quality. This can be achieved through partnerships with reputable logistics firms and the implementation of quality control systems to ensure products arrive safely in customers' hands.

Overall, the findings indicate that improving customer satisfaction in e-commerce logistics should not rely solely on service quality, but also on system efficiency, delivery speed, and product safety. With effective cost management and the implementation of advanced technology, e-commerce players can improve customer satisfaction and sustain long-term loyalty in a competitive marketplace.

LIMITATIONS AND FUTURE RESEARCH

Although this study contributes to the academic literature on e-commerce logistics, several limitations should be noted for future research. First, the research sample was limited to online sellers in Indonesia, which means the results may not fully represent end-consumer perspectives or be generalizable to other countries. Future research should therefore expand the respondent base to include a wider range of participants across different stakeholder groups and regions.

Second, this study employed a quantitative approach, which may not capture deeper contextual factors such as geographic conditions, economic factors, platform characteristics, or product category variations. Future studies are encouraged to adopt mixed methods, combining quantitative analysis with qualitative interviews to gain richer insights.

Lastly, the finding that service quality had no significant effect on customer satisfaction presents an opportunity for further exploration. Future research could focus on identifying which dimensions of service quality remain relevant and influential in the current e-commerce era. This would help determine which service aspects most strongly impact customer satisfaction today.

In summary, future studies are expected to broaden the range of variables and refine model testing to strengthen the understanding of how cost, service quality, technology usage, transportation time, and product condition collectively influence customer satisfaction, which in turn drives continuous-use intention within the e-commerce logistics industry.

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