

IMPACT OF INFORMATION AND SYSTEM QUALITY ON CUSTOMER SATISFACTION AND LOYALTY ON PLATFORM E-COMMERCE IN EAST JAKARTA INDONESIAN

Joelianti Dwi Supraptiningsih^{1*}

¹DBA Programme, Philippines Women's University, Manila, Philippines

Abstract. This study aims to analyze the influence of information quality and system quality on customer satisfaction and its impact on customer loyalty on e-commerce platforms in East Jakarta, with customer satisfaction as a mediating variable. The rapid growth of the e-commerce industry in Indonesia has led to increasingly fierce competition between platforms, so that improving service quality has become an important factor in customer retention. In the context of the digital economy, a company's ability to provide accurate, relevant, and easy-to-understand information, along with a reliable, responsive, and secure system, is key to building a positive customer experience. This study used a quantitative approach with a survey method of 300 respondents, active e-commerce users who had made transactions in the past six months. The data analysis technique used was Structural Equation Modeling (SEM) based on Partial Least Squares (PLS). The results showed that information quality and system quality have a positive and significant influence on customer satisfaction. Furthermore, customer satisfaction has a positive and significant influence on customer loyalty. Customer satisfaction was also shown to mediate the relationship between information quality and system quality on customer loyalty. These findings indicate that the better the quality of digital services provided, the higher the level of customer satisfaction, thus encouraging long-term loyalty. This research provides theoretical contributions to the development of digital consumer behavior and practical implications for e-commerce platform managers in improving service quality to strengthen customer loyalty and maintain competitiveness in a competitive marketplace.

* Corresponding author: 2023t1093@pwu.edu.ph

1 Introduction

The rapid advancement of digital technology has transformed global business practices, including in developing countries like Indonesia. Expanding internet penetration and mobile device usage have significantly accelerated the growth of e-commerce platforms like Tokopedia, Shopee, Lazada, and Bukalapak. These platforms have become primary channels for online transactions, reshaping consumer purchasing behavior. Fierce competition among e-commerce providers has shifted the strategic focus from customer acquisition to customer retention. In the digital marketplace, customer loyalty is influenced not only by product attributes but also by the quality of the systems and information provided. Consumers increasingly expect a fast, accurate, secure, and user-friendly digital environment. This study aims to examine the mediating role of customer satisfaction between system quality and information quality on loyalty in the context of Indonesian e-commerce. The development of platforms like Tokopedia, Shopee, and Lazada demonstrates that digital service differentiation is a key factor in winning the competition. System quality encompasses application reliability, access speed, ease of navigation, and transaction security, while information quality relates to the accuracy, relevance, completeness, and timeliness of product information. When these two aspects are optimally managed, consumers tend to experience a positive shopping experience, ultimately increasing their satisfaction with the platform. Although various studies have examined the influence of system quality and information quality on customer satisfaction and loyalty, studies specifically examining customer satisfaction as a mediating variable in the context of Indonesian e-commerce are still relatively limited. Therefore, this research is important for its empirical contribution to enriching the literature on information systems and digital marketing, while also providing managerial implications for e-commerce companies in formulating strategies for increasing sustainable customer loyalty.

2 Theoretical Framework

The development of information technology significantly impacts the growth of digital businesses. Information quality and system quality are key factors determining the success of technology-based services. Customer satisfaction is a key indicator of organizational success, while customer loyalty indicates a customer's long-term commitment to the service. This research contributes theoretically and practically to the development of digital business strategies. Information quality refers to the accuracy, relevance, completeness, and timeliness of the information an e-commerce system provides to users. High-quality information helps consumers make more effective, efficient purchasing decisions, increasing customer satisfaction.

Conversely, inaccurate or incomplete information can foster distrust and potentially decrease customer satisfaction with the e-commerce platform. System quality is a crucial factor in determining the success of an e-commerce platform implementation. A quality system is characterized by high reliability in carrying out its functions. This reliability

reflects the system's ability to operate consistently without disruption or failure. System stability is crucial because technical disruptions can hinder transactions.

System quality also encompasses users' perceived ease of use. The ease of the checkout process also. Research shows that even a few seconds of delay can reduce sales conversion rates. Customer satisfaction is a crucial indicator of e-commerce business success, as satisfied customers are more likely to make repeat purchases and recommend the platform to others. From a modern marketing perspective, customer satisfaction is not just a short-term goal but also a strategic factor in building customer loyalty. Customer loyalty reflects a customer's commitment to consistently use a product or service in the future, despite the availability of various alternatives.

In Indonesia's e-commerce platforms, customer loyalty is a consumer's commitment to repeat purchases and recommending the platform to others, even when faced with competing alternatives. Amid intense competition among platforms such as Tokopedia, Shopee, Lazada, and Bukalapak, customer loyalty is a strategic asset that determines business sustainability. Loyalty is reflected not only in transaction frequency but also in emotional attachment, level of trust, and satisfaction with the shopping experience. Factors such as system quality, information quality, transaction security, application ease of use, promotional programs, and after-sales service play a significant role in shaping this loyalty. In Indonesia, consumers' price sensitivity and responsiveness to promotions make incentive strategies such as free shipping and cashback crucial tools for customer retention.

However, sustained loyalty is more influenced by consistent service quality and a positive user experience than simply short-term incentives. Therefore, e-commerce platforms need to strategically manage customer relationships through a customer relationship management (CRM) approach to create long-term value and maintain a competitive position in the national digital market. Previous research has focused on the relationship between information quality, system quality, customer satisfaction, and customer loyalty. Many studies have shown that information quality and system quality influence customer satisfaction, and customer satisfaction ultimately influences customer loyalty. These results vary depending on the research context, respondent characteristics, and the business environment under study. Therefore, further research is needed to better understand these relationships, particularly in the context of e-commerce businesses in Indonesia, which has unique and dynamic market characteristics.

3 Methods

This study uses a quantitative explanatory approach involving 300 e-commerce customers in East Jakarta to examine the effect of information quality and system quality on customer loyalty, with customer satisfaction as the mediating variable. Data were collected using a structured, Likert-scale questionnaire distributed digitally. Data analysis used Structural Equation Modeling–Partial Least Squares (SEM-PLS) with the help of SmartPLS 4.0 software to evaluate direct and indirect relationships between variables. Validity and reliability were assessed using Confirmatory Factor Analysis (CFA), Average

Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha. Hypothesis testing used bootstrapping techniques with 5,000 subsamples to ensure statistical robustness, model accuracy, predictive consistency, and reliable empirical findings in supporting improved micro-business performance.

The research instrument used a structured questionnaire with a 4-point Likert scale to measure perceptions of information quality, system quality, customer satisfaction, and customer loyalty. Validated multidimensional indicators were used to ensure theoretical relevance, contextual accuracy, and measurement reliability. Descriptive statistical analysis was used to summarize respondent characteristics and variable distributions through frequency, percentage, mean, standard deviation, skewness, and kurtosis to assess data representativeness and normality. In the PLS-SEM analysis, the measurement model (outer model) was evaluated to ensure indicator reliability, construct validity, and internal consistency. Structural model testing, mediation analysis, bootstrapping, and Variance Inflation Factor (VIF) testing were conducted to verify causal relationships, predictive power, and overall model integrity, thus enabling an accurate evaluation of information quality, system quality, customer satisfaction, and customer loyalty.

4 Research and Discussion

Based on the results of data collection on research respondents, a description of characteristics was obtained including age, gender, duration of suffering from the condition, and other clinical variables relevant to the focus of the research. The demographic profile of respondents shows that e-commerce customers are in the productive age group.

Aged under 20 years to over 50 years, totaling 3 people (1%), followed by those aged 20–30 years with 23 people (8%). Younger respondents aged 30–40 years numbered 110 people (37%), while respondents above 40–50 years numbered 127 people (46%). Respondents above 50 years numbered 27 (9%). In terms of education level, most respondents had a high school education, totaling 62 people (20%), followed by bachelor's degree holders with 216 people (72%). Master's 22 respondents (8%). This finding shows that e-commerce customers are dominated by customers with education below high school to master's.

The characteristics of e-commerce customers show that most of the respondents are high school students, 12 respondents (4%), followed by private employees, 40 respondents (13%). Civil servants are 148 (49%), while business people represent 100 respondents (34%). Based on the number of respondents, most of them earn a monthly income of less than 5 million and more than 10 million rupiah.

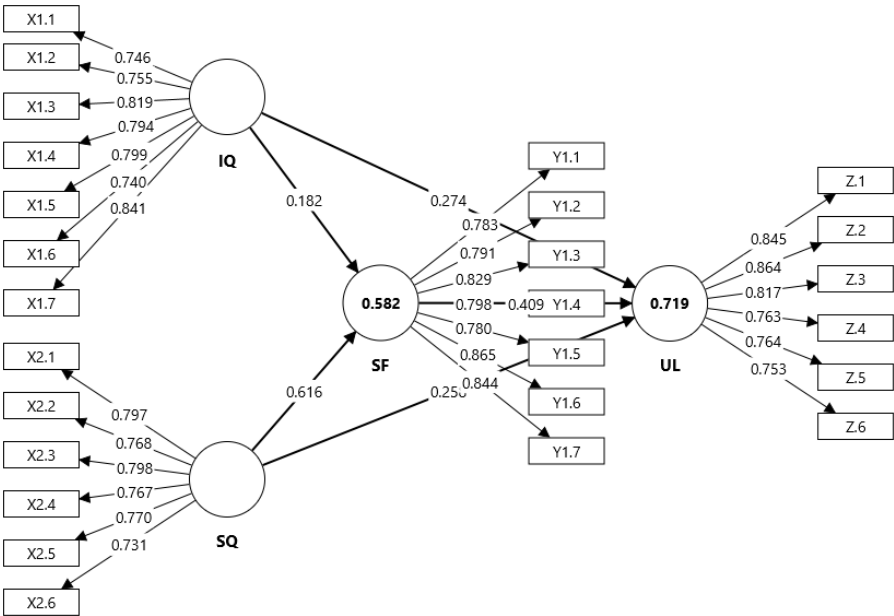
The average shopping time is 67 (22%) respondents shop 1 to 5 times in one month, 183 (61%) respondents shop online 5 to 10 times in one month, 50 (17%) respondents shop more than 10 times in one month. The frequency of shopping on e-commerce platforms is 24 (8%) respondents shop on Lazada, 95 (32%) respondents shop on the Toko Pedia platform and 181 (60%) customers shop on the Shopee platform.

The empirical findings confirm the first hypothesis (H-1), which indicates that Information Quality has a significant and strong influence on Customer Satisfaction. This

is supported by a path coefficient of 0.746 and a p-value of 0.000, indicating high statistical significance.

The confidence interval further confirms the reliability of this relationship. The first hypothesis (H1) was accepted because information quality was proven to have a significant effect on customer satisfaction. The analysis showed a path coefficient of 0.653 and a p-value of 0.000 (<0.005), indicating a positive, significant effect. The f^2 value of 0.742 indicated a strong contribution to the structural model.

These findings indicate that the more accurate, relevant, and complete the information provided by an e-commerce platform, the higher the level of customer satisfaction.H2: System Quality → Customer Satisfaction. The second hypothesis (H2) was also accepted because system quality has a positive and significant influence on customer satisfaction. The path coefficient of 0.561, with a p-value of 0.000 (<0.005), indicates a statistically significant relationship.



The effect size (f^2) of 0.460 indicates a moderate contribution in the model. This means that access speed, system security, ease of navigation, and platform stability play a significant role in increasing e-commerce user satisfaction. H3: Information Quality → Customer Loyalty The third hypothesis (H3) was accepted because information quality was proven to have a significant effect on customer loyalty.

The results showed a path coefficient of 0.835 with a p-value of 0.000 (<0.005) and an f^2 value of 2.459, indicating a very strong effect. These findings confirm that quality information not only increases satisfaction but also directly encourages customers to remain loyal to the platform. H4: System Quality → Customer Loyalty The fourth hypothesis (H4) was rejected because system quality did not significantly influence customer loyalty.

Although the path coefficient was 0.103, the p-value of 0.024 exceeds the significance threshold of 0.005, making it statistically insignificant. The f^2 value of 0.025 also indicates a very small contribution to the model. This suggests that system quality alone is not sufficient to directly shape customer loyalty. H5: Customer Satisfaction → Customer Loyalty The fifth hypothesis (H5) was rejected because customer satisfaction was not proven to have a significant effect on loyalty. The path coefficient of 0.019 and a p-value of 0.587 (>0.005) indicate an insignificant relationship. The very small effect size ($f^2 = 0.001$) further supports the conclusion that, in the context of this study, customer satisfaction cannot directly drive e-commerce user loyalty. H6: Mediating Customer Satisfaction in the relationship between Information Quality → Customer Loyalty. The sixth hypothesis (H6) was rejected because customer satisfaction did not play a significant role as a mediating variable between information quality and customer loyalty.

The path coefficient of 0.067 ($p = 0.025$) did not meet the significance criterion (<0.005). The VAF value of 0.0045 indicated a very weak mediation effect. Thus, the influence of information quality on loyalty is predominantly direct, without going through customer satisfaction. H7: Mediating Customer Satisfaction in the relationship between System Quality → Customer Loyalty. The seventh hypothesis (H7) was also rejected because customer satisfaction did not mediate the relationship between system quality and customer loyalty. The path coefficient of 0.011, with a p-value of 0.609 (>0.005), indicates no significant mediation effect. A VAF of 0.000 further confirms that customer satisfaction does not mediate the relationship. The results show that Customer Satisfaction significantly mediates the relationship between Information Quality and System Quality on Customer Loyalty.

These results strengthen the information system success model developed by William H. DeLone and Ephraim R. McLean, which emphasizes that system quality and information quality are the main determinants of user satisfaction and net benefit, expressed as loyalty. System quality has been shown to have a greater impact on customer satisfaction than information quality. This suggests that in Indonesian e-commerce, system stability, access speed, transaction security, and ease of navigation dominate the user experience.

Customer satisfaction has been shown to strongly mediate loyalty. This means that while system and information quality can directly influence loyalty, the effect is stronger when customers are already satisfied. These findings also have strategic implications for e-commerce platforms such as Tokopedia, Shopee, and Lazada, where investing in technology infrastructure and managing information quality are key to maintaining customer loyalty in a highly competitive digital market. Evaluation of the measurement model was carried out to ensure that all indicators were valid and reliable in measuring the research constructs, namely Information Quality (IQ), System Quality (SQ), Customer Satisfaction (CS), and Customer Loy

Table 1. Hypothesis Testing (Direct Effect)

Hypothesis	Path Coeff	P-Value	95% Interval trust Path Coefficient	F-Square
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			Upper Limit	Lower Limit	
H-1: Information Quality -> Customer satisfaction	0.653	0	0.579	0.725	0.742
H-2: System information-> Customer Satisfaction	0.561	0	0.437	0.672	0.460
H-3: Information quality - > Customer loyalty	0.835	0	0.892	0.934	2.459
H-4: System Quality -> Customer loyalty	0.103	0.024	0.008	0.188	0.025
H-5: Customer Satisfaction -> customer loyalty	0.019	0.587	-0.044	0.095	0.001

The results show that all direct effects are significant ($p < 0.05$).

Tabel 2. Mediation Effect Hypothesis testing

Hypothesis	Path Coeff icient	P- Value	95% Confidence Interval of Path Coefficient		Upsilon V
			Lower Bound	Upper Bound	
H-4: Information Quality -> Customer satisfaction -> Customer Loyalty	0.025	0.006	0.123	0.845	0.025
H-5: System quality -> Customer satisfaction-> Customer Loyalty ->	0.609	0.025	-0.058	0.001	0.011

Table 3. R Square and Q square

	R square	Q square
Information Quality	0.424	0.421
System Quality	0.313	0.301
Customer Satisfaction	0.839	0.831

Based on Table 3, the value R^2 Square (R^2) show that Information Quality has a value of 0.424, which means that 42.4% of the variation in the construct can be explained by the variables in the model, so it is included in the moderate category. System Quality has an R^2 value of 0.313, which indicates that 31.3% of the variation can be explained by the model, indicating a sufficient level of explanation. Meanwhile, Customer Satisfaction has an R^2 value of 0.839, which means that 83.9% of the variation in customer satisfaction can be explained by the independent variables in the model, so it is included in the very strong category. In terms of predictive relevance, the R^2 value Q^2 Square (Q^2) for Information Quality of 0.421, System Quality of 0.301, and Customer Satisfaction of 0.831, all of which are above zero (>0). This indicates that the model has good predictive ability, even very strong, especially in predicting Customer Satisfaction. Therefore, it can be concluded that the research model has high explanatory power and predictive relevance to customer satisfaction.

Table 4. Standardized Root Mean Square Residu (SRMSR)

	Model Estimate
SRMR	0.056

Standardized Root Mean Square Residual (SRMR) is defined in Yamin (2022) as a metric for assessing model fit, specifically highlighting the disparity between the correlation metrics derived from the data and those estimated by the model. According to Hair et al. (2021), a favorable model fit is suggested by an SRMR value of less than 0.08; conversely, an adequate model fit is represented by an SRMR value ranging from 0.08 to 0.100, as noted by Karin Schemelleh et al. (2003). The model estimation result of 0.088 indicates an adequate model fit, thereby allowing for the interpretation of the relationship among the model's variables through empirical data.

Table 5. Go F Index

Average Commuality	Average R Square	GoF Index
0.622	0.525	0.572

Based on Table 5, the Average Commuality value of 0.622 indicates that, on average, the constructs in the model have good convergent validity, as this value exceeds the minimum threshold of 0.50. This means the indicators adequately explain the latent variables. Furthermore, the Average R Square value of 0.525 indicates that, on average, 52.5% of the endogenous variables in the model can be explained by the exogenous variables, which is included in the moderate to strong category. The Goodness of Fit (GoF) Index value of 0.572 indicates a high level of model suitability, as GoF values above 0.36 are generally categorized as large. Thus, it can be concluded that the research model has good measurement and structural quality, and is able to explain the relationships between variables comprehensively and adequately

5 Conclusion

Based on the analysis and discussion of the research, it can be concluded that information quality and system quality play a significant role in shaping customer satisfaction and loyalty on e-commerce platforms in Indonesia. Information quality, demonstrated through accuracy, relevance, completeness, and timeliness, increases consumer confidence in the purchasing decision-making process. Clear and reliable information reduces perceived risk and increases perceived value.

On the other hand, system quality, including ease of use, reliability, security, and access speed, contributes more significantly to customer satisfaction. A stable, responsive system creates a comfortable, efficient shopping experience, strengthening positive perceptions of the platform. This finding aligns with the information systems success model developed by William H. DeLone and Ephraim R. McLean, which asserts that system quality and information quality are key determinants of user satisfaction and the net benefit of loyalty.

Furthermore, this study shows that customer satisfaction mediates the relationship between information quality and system quality and customer loyalty. This means loyalty is not formed directly from the system's technical aspects, but through consistent, ongoing positive experiences. In Indonesia's highly competitive e-commerce market, customer loyalty is a strategic advantage that determines long-term business sustainability.

Overall, this study confirms that increasing customer loyalty requires the simultaneous, continuous integration of information quality management and system quality. A technology-based approach supported by effective customer experience management will be key to creating sustainable competitive value in the national e-commerce industry.

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