

The Effects of E-Service Quality and Sustainable E-Service Quality on Customer Satisfaction with the Shopee App in Yogyakarta

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ABSTRACT

The rapid development of e-commerce has intensified competition among marketplaces, making the quality of digital services a key factor in creating customer satisfaction. This study aims to analyze the influence of efficiency, fulfillment, system availability, privacy, and sustainable e-service quality on customer satisfaction among Shopee app users in the Special Region of Yogyakarta. The study employs a quantitative approach using primary data collected from 210 respondents via purposive sampling. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS 3.2.9 software and was supplemented with thematic coding of open-ended responses. The results indicate that efficiency ($\beta = 0.192$), fulfillment ($\beta = 0.279$), system availability ($\beta = 0.259$), privacy ($\beta = 0.197$), and sustainable e-service quality ($\beta = 0.291$) have a positive and significant effect on customer satisfaction, with a coefficient of determination (R^2) of 0.795. Sustainable e-service quality is the strongest predictor, confirming that consistency and sustainability of service quality are just as important as short-term technical performance. These findings extend the conventional e-service quality model to the context of e-commerce in Indonesia by integrating the dimension of sustainability.

INTRODUCTION

Technological advancements in the digital age have had a significant impact on various sectors—including information, business, and industry—which are now undergoing transformation and experiencing significant growth (Barus et al., 2024). One tangible manifestation of this development is the increasing number of internet users in Indonesia. According to data from the Ministry of Communication and Information Technology, the number of internet users has continued to rise from 172 million in 2019 to 213 million as of January 2023, indicating that the internet has become a primary necessity in people's lives (Alamin et al., 2023). As internet penetration increases, the e-commerce sector has also grown

rapidly, reflecting a shift in consumer behavior as people increasingly rely on digital services (Astuti et al., 2023).

In Indonesia, competition in the e-commerce industry is still dominated by large companies, one of which is Shopee (Handayani et al., 2021). Since officially launching in 2015, Shopee has grown to become one of the leading marketplaces in Southeast Asia. According to 2023 data from Similarweb, Shopee was recorded as the e-commerce platform with the highest number of visits in Indonesia, totaling 237 million visits in September 2023—an increase of approximately 38% compared to the beginning of the year—surpassing its main competitors such as Tokopedia, Lazada, Blibli, and Bukalapak (Ahdiat, 2023). This dominance makes service quality a strategic issue for the platform's sustainability.

The rapid growth of the service sector has intensified competition, compelling companies to provide high-quality services. Given that services are intangible and difficult to measure, understanding the aspects of service quality is crucial for organizations (Munawaroh, 2025). In the context of e-commerce, online service quality (e-service quality) serves as a key standard that emphasizes convenience and efficiency from the transaction process through to delivery. Customer satisfaction is achieved when the services provided meet customer expectations (Wulandary et al., 2023); therefore, improving e-service quality is an effective strategy for maintaining competitiveness (Fauziyah et al., 2022). E-service quality is generally measured through the aspects of efficiency, fulfillment, system availability, and privacy (Parasuraman et al., 2005; Prasetyo et al., 2023).

At the same time, the global business landscape is shifting as sustainability gains increasing attention and becomes more deeply integrated across various industrial sectors (Abdelaziz & Munawaroh, 2024). Sustainability is no longer viewed merely as an added value but has become a key factor in modern consumers' purchasing decisions. In this context, sustainable e-service quality is defined as the ability to consistently deliver high-quality digital services over the long term without disruption (Khan et al., 2023; Stamenkov & Dika, 2015). Kandampully and Menguc (2000) emphasize that sustainable e-service quality encompasses the ability not only to maintain customer satisfaction and loyalty but also to manage and expand them sustainably.

Various previous studies, such as those by Faisal et al. (2020) and Sharma and Lijuan (2015), indicate that e-service quality significantly influences customer satisfaction and loyalty on online shopping platforms. However, most of these studies remain limited to conventional concepts of e-service quality and have not yet integrated the sustainability perspective, which is now a primary concern for consumers. To address this need, Stamenkov and Dika (2015) developed a sustainable e-service quality model that emphasizes the importance of sustainability in the provision of digital services. By combining these two concepts, this study aims to analyze how digital service quality—which is not only effective and efficient but also sustainable—influences customer satisfaction.

The research focuses on the Special Region of Yogyakarta because this region has the highest internet penetration rate on the island of Java, at 88.73% (databoks.katadata.co.id,

2024), resulting in high usage of e-commerce services in the area. This study builds upon the research by Ighomereho et al. (2023) in the context of internet banking in Nigeria and the study by Stamenkov and Dika (2015), which introduced a service sustainability model, by expanding its scope to the e-commerce context in Indonesia. The research gap addressed by this study is the limited number of studies that integrate conventional e-service quality and sustainable e-service quality dimensions into a single model, particularly on e-commerce platforms and in regions with specific consumer characteristics such as Yogyakarta. Based on this description, this study aims to examine the effects of efficiency, fulfillment, system availability, privacy, and sustainable e-service quality on customer satisfaction among Shopee app users in Yogyakarta.

Efficiency refers to the simplicity and speed of using a website or application, including ease of navigation and efficient information retrieval (Prasetyo et al., 2023). When consumers feel that the transaction process runs smoothly, quickly, and is not confusing, their satisfaction with the service tends to increase. A number of studies have shown a significant positive effect of efficiency on customer satisfaction (Amin, 2016; Prasetyo et al., 2023; Rahman et al., 2022; Stamenkov & Dika, 2016), although some other findings indicate non-significant results (Fidia, 2022; Widya & Elisabet, 2022). This inconsistency forms the basis for retesting on a different sample. Therefore, the following hypotheses are formulated:

H1a: Efficiency has a positive effect on customer satisfaction.

Fulfillment is the ability of a digital service to deliver products or services on time and accurately in accordance with customer expectations (Mujinga, 2020). Timeliness and reliability in order fulfillment reinforce customers' positive perceptions of service quality and contribute to the development of satisfaction. These findings are supported by Kundu and Datta (2015), Nigatu et al. (2023), Prasetyo et al. (2023), and Rahman et al. (2022). Therefore, the following hypothesis is formulated:

H1b: Fulfillment has a positive effect on customer satisfaction.

System availability refers to the proper technical functioning of a system, including the stability and accessibility of the platform during use (Jin & Chen, 2020; Prasetyo et al., 2023). Optimal system availability allows services to run without interruption, thereby enhancing users' positive perceptions and impacting satisfaction. This is supported by the findings of Kundu and Datta (2015), Prasetyo et al. (2023), and Stamenkov and Dika (2016). Therefore, the following hypothesis is formulated:

H1c: System availability has a positive effect on customer satisfaction.

Privacy refers to the level of security and privacy protection a website provides for customer data (Prasetyo et al., 2023). Transaction security in an electronic environment has been shown to be a key factor influencing user satisfaction (Arcand et al., 2017; Szymanski & Hise, 2000). The higher the level of privacy protection, the greater the sense of security consumers feel when conducting online transactions, which ultimately increases satisfaction. These findings are consistent with those of Kundu and Datta (2015), Prasetyo et al. (2023),

Rahman et al. (2022), and Stamenkov and Dika (2016). Therefore, the following hypothesis is formulated:

H1d: Privacy has a positive effect on customer satisfaction.

Awareness of the importance of sustainable e-service quality helps companies remain relevant in an ever-changing market and enhances their competitiveness (Apriliani et al., 2024; Gupta et al., 2018). Sustainable e-service quality encourages companies to consistently maintain and improve their services over time while considering social, environmental, and economic aspects (Stamenkov & Dika, 2015). A study by Stamenkov and Dika (2015) showed that sustainable e-service quality has a positive and significant effect on customer satisfaction, although it was limited to the banking sector, leaving a gap in the context of e-commerce. Therefore, the following research questions are formulated:

H2: Sustainable e-service quality has a positive effect on customer satisfaction on the Shopee app in Yogyakarta.

Based on the theoretical review and hypothesis development, the research model illustrating the relationships among the variables is presented in Figure 1. E-service quality is operationalized as four separate variables (efficiency, fulfillment, system availability, and privacy), while sustainable e-service quality serves as a distinct independent variable that influences customer satisfaction as the dependent variable.

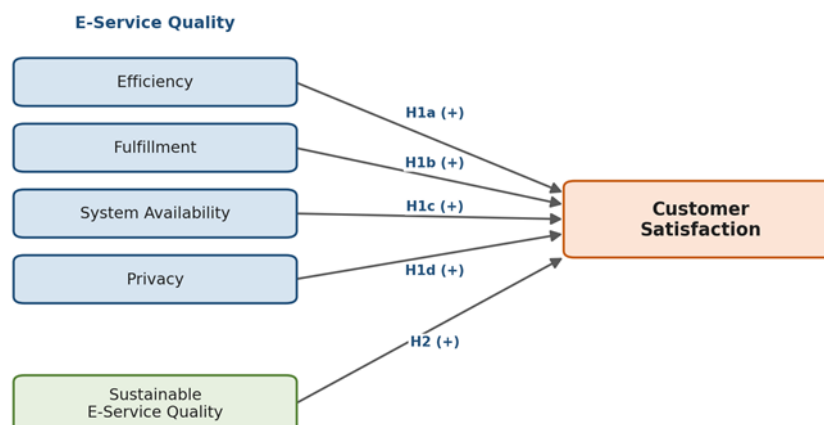


Figure 1. Research Model

RESEARCH METHOD

This study employs a quantitative approach with an explanatory survey design. The research object is the Shopee Indonesia platform, while the research subjects are consumers who use the Shopee app in the Special Region of Yogyakarta. The data used consists of primary data collected directly from respondents through the distribution of questionnaires (Sekaran & Bougie, 2016).

The research population consists of all Shopee app users in the Special Region of Yogyakarta. The sampling technique used non-probability sampling with a purposive sampling method, which involves selecting samples based on specific criteria (Sekaran & Bougie, 2016). According to Roscoe (1975), the ideal sample size ranges from 30 to 500 respondents; this study targeted a minimum of 200 respondents and obtained 210 valid respondents. Respondent criteria included: (1) residing in the Yogyakarta region; (2) being at least 17 years old; (3) having actively used the Shopee app for at least the past three months; and (4) being willing to complete the questionnaire honestly and in full.

Data collection was conducted via a Google Forms-based questionnaire distributed online through WhatsApp and in person, taking place from November 5 to 24, 2025. Measurements used a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). In addition to closed-ended statements, the questionnaire included open-ended questions to obtain qualitative information that enriches the analysis results. The operational definitions and indicators for each variable are presented in Table 1.

Table 1. Operational Definitions and Indicators of Variables

Variable	Operational Definition	Indicators (Questionnaire Items)
Efficiency	Users' perceptions of the ease and speed of accessing and using Shopee features (Prasetyo et al., 2023).	EF1–EF5: ease of finding products; transaction speed; page loading speed; feature consistency; clarity of information presentation.
Fulfillment	Users' perceptions of Shopee's accuracy in fulfilling orders and the reliability of delivery times (Prasetyo et al., 2023).	F1–F3: services tailored to needs; order processing as promised; speed of response to service requests.
System Availability	Users' perceptions of the app's stability for use at any time without technical disruptions (Prasetyo et al., 2023).	SA1–SA2: the app is always available when needed; the app rarely experiences disruptions.
Privacy	Users' perception of Shopee's efforts to maintain the confidentiality of personal data and protect it from misuse (Prasetyo et al., 2023).	P1–P2: does not share personal information; protects the security of personal data.
Sustainable E-Service Quality	Users' perceptions of Shopee's ability to provide high-quality electronic services sustainably over the long term (Kandampully & Menguc, 2000; Khan et al., 2023).	SEQ1–SEQ4: stable quality in the past; consistent to the present; increased confidence in the future; remains satisfactory in the long term.
Customer Satisfaction	Users' perceptions of satisfaction levels after shopping on Shopee, based on a	CS1–CS3: met expectations; interested in using the service again;

Variable	Operational Definition	Indicators (Questionnaire Items)
	comparison of expectations and experiences (Kalia et al., 2016; Kotler, 2000).	willing to recommend.

Source: Processed data (2025)

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.2.9 software. This method was chosen because it can handle complex models, relatively small sample sizes, and does not require a normal data distribution (Hair et al., 2019). The evaluation was conducted in two stages. First, the evaluation of the measurement model (outer model) included convergent validity (outer loadings ≥ 0.70 and AVE ≥ 0.50), discriminant validity (Fornell-Larcker criteria, HTMT < 0.90 , and cross-loadings), and reliability (Cronbach's alpha and composite reliability ≥ 0.70). Second, the evaluation of the structural model (inner model) included VIF values (< 5), R-squared, effect size (f^2), Q-squared (> 0), goodness of fit (SRMR ≤ 0.08), and hypothesis testing via the bootstrapping procedure with criteria of a t-statistic ≥ 1.96 and a p-value < 0.05 . Responses to open-ended questions were analyzed through thematic coding to generate qualitative triangulation of the quantitative findings.

RESULTS AND DISCUSSION

4.1 Respondent Characteristics

This study obtained 210 valid respondents who met the criteria. The respondent profile showed that the majority were in the 20–22 age group (34.3%), indicating a predominance of early working-age adults with high technology usage. In terms of gender, female respondents were in the majority (54.3%). Most respondents held a diploma or bachelor's degree (69.0%) and worked as private-sector employees (30.0%). Based on place of residence, the majority were from Sleman Regency (39.0%). In terms of transaction frequency, most respondents made transactions more than four times (35.7%), with fashion and accessories being the most frequently purchased categories (27.8%). A summary of respondent characteristics is presented in Table 2.

Table 2. Respondent Characteristics (n = 210)

Characteristics	Category	Frequency	Percentage
Age	20–22 years (dominant category)	72	34.3%
Gender	Female	114	54.3%
	Male	96	45.7%
Highest Level of Education	Diploma/Bachelor's Degree (predominant)	145	69.0%
Occupation	Private Sector Employee	63	30.0%

Characteristics	Category	Frequency	Percentage
	(predominant)		
Residence	Sleman Regency (predominant)	82	39.0%
Transaction Frequency	More than 4 times (predominant)	75	35.7%
Product Category	Fashion and accessories (dominant)	141	27.8%

Source: Processed primary data (2025)

4.2 Descriptive Analysis

Descriptive analysis was conducted by grouping the mean values into five interval categories (very low to very high). The results in Table 3 show that all variables fall into the high category. Customer satisfaction had the highest average score (4.103), followed by privacy (3.986) and sustainable e-service quality (3.968). These findings indicate that respondents' perceptions of service quality and satisfaction are generally at a good level.

Table 3. Results of the Descriptive Analysis of Variables

Variable	Mean	Category
Efficiency	3.905	High
Fulfillment	3,946	High
System Availability	3,910	High
Privacy	3,986	High
Sustainable E-Service Quality	3,968	High
Customer Satisfaction	4,103	High

Source: SmartPLS 3.2.9 Output (2025)

4.3 Evaluation of the Measurement Model (Outer Model)

4.3.1 Convergent Validity and Reliability

The results of the convergent validity test in Table 4 show that all indicators have outer loadings above 0.70 and all constructs have AVE values above 0.50, thus meeting the criteria for convergent validity (Hair et al., 2019). Reliability tests show that all constructs have Cronbach's alpha and composite reliability values above 0.70, indicating that all constructs are reliable and consistent in measuring their respective constructs.

Table 4. Results of Convergent Validity and Reliability Tests

Variable	Outer Loading	AVE	Cronbach's α	Composite Reliability
Efficiency	0.846–0.872	0.734	0.910	0.933
Fulfillment	0.880–0.905	0.793	0.869	0.920

Variable	Outer Loading	AVE	Cronbach's α	Composite Reliability
System Availability	0.898–0.909	0.816	0.775	0.899
Privacy	0.901–0.922	0.831	0.797	0.908
Sustainable E-Service Quality	0.864–0.898	0.770	0.900	0.931
Customer Satisfaction	0.822–0.874	0.727	0.812	0.889

Source: SmartPLS 3.2.9 Output (2025)

4.3.2 Discriminant Validity

Discriminant validity was tested using three approaches. Based on the Fornell-Larcker criteria (Table 5), the square root of the AVE for each construct (diagonal value) is greater than its correlation with other constructs. The HTMT results show that all values are below the 0.90 threshold (Henseler et al., 2015); the highest value is between sustainable e-service quality and customer satisfaction at 0.820. The cross-loading results also show that each indicator has the highest loading on its respective construct. Thus, all constructs meet the criteria for discriminant validity.

Table 5. Fornell-Larcker Criteria

Construct	CS	EF	F	P	SEQ	SA
Customer Satisfaction (CS)	0.853					
Efficiency (EF)	0.642	0.857				
Fulfillment (F)	0.679	0.488	0.890			
Privacy (P)	0.600	0.409	0.421	0.911		
Sustainable E-Service Quality (SEQ)	0.704	0.423	0.499	0.421	0.878	
System Availability (SA)	0.614	0.424	0.303	0.329	0.424	0.904

Source: SmartPLS 3.2.9 output (2025). The diagonal values (in bold in the output) are the square roots of the AVE.

4.4 Structural Model Evaluation (Inner Model)

Structural model evaluation was conducted to assess the model's quality and predictive ability. The VIF test results show that all indicators have values ranging from 1.636 to 2.817 (< 5), indicating no multicollinearity issues (Hair et al., 2019). The R-squared value for customer satisfaction of 0.795 means that 79.5% of the variation in customer satisfaction can be explained by the independent variables in the model, which falls into the substantial category. The Q-square value of 0.566 (> 0) indicates that the model has good predictive relevance, while the SRMR value of 0.054 (≤ 0.08) indicates a good fit between the model and the data. The effect size (f^2) values show that the largest contributions come from

sustainable e-service quality (0.262) and system availability (0.243). A summary is presented in Table 6.

Table 6. Summary of Structural Model Evaluation

Criteria	Value	Description
R-squared (Customer Satisfaction)	0.795	Substantial
Q-square (Customer Satisfaction)	0.566	Good predictive relevance
SRMR	0.054	Good model fit
VIF (all indicators)	1.636–2.817	No multicollinearity
f ² — Efficiency	0.116	Small effect
f ² — Fulfillment	0.241	Moderate effect
f ² — System Availability	0.243	Moderate effect
f ² — Privacy	0.136	Small effect
f ² — Sustainable E-Service Quality	0.262	Moderate effect

Source: SmartPLS 3.2.9 output (2025)

4.5 Hypothesis Testing

Hypothesis testing was conducted using the bootstrapping procedure. The results in Table 7 show that all paths have a positive and significant effect on customer satisfaction, with t-statistic values > 1.96 and p-values < 0.05. Thus, all hypotheses (H1a, H1b, H1c, H1d, and H2) are supported. The highest path coefficient was found for sustainable e-service quality ($\beta = 0.291$), making it the strongest predictor of customer satisfaction, followed by fulfillment ($\beta = 0.279$) and system availability ($\beta = 0.259$).

Table 7. Hypothesis Test Results

Hyp.	Path	Coefficient (β)	t-Statistic	p-Value	Notes
H1a	Efficiency → Customer Satisfaction	0.192	4.729	0.000	Supported
H1b	Fulfillment → Customer Satisfaction	0.279	6.052	0.000	Supported
H1c	System Availability → Customer Satisfaction	0.259	8.195	0.000	Supported
H1d	Privacy → Customer Satisfaction	0.197	4.347	0.000	Supported
H2	Sustainable E-Service Quality → Customer Satisfaction	0.291	7.184	0.000	Supported

Source: SmartPLS 3.2.9 Output (2025)

4.6 Results of Open-Ended Question Coding

To enrich the quantitative findings, responses to open-ended questions were coded into 14 thematic categories. Application performance and stability were the issues most frequently raised by respondents (35 respondents), particularly regarding slow application performance during major promotional periods. The categories of costs and promotions (29 respondents), ease of transactions (28 respondents), and data and account security (26 respondents) were also major concerns. These qualitative findings provide triangulation that reinforces the results of the hypothesis testing, particularly in explaining the urgency of system availability and the sustainability of service quality. A summary of the main categories is presented in Table 8.

Table 8. Summary of Main Categories of Open-Ended Response Codification

Category	Number of Respondents	Theme Illustration
Application Performance & Stability	35	Lag and performance degradation during high traffic (double dates).
Feature completeness & functionality	31	Appreciation for feature variety and expectations for further development.
Cost & promotions	29	Expectations for consistent service costs and ease of using vouchers.
Transaction Ease	28	Ease of the shopping and checkout process, with some challenges during peak hours.
Shipping & Logistics	27	Delivery speed and tracking accuracy.
Data & Account Security	26	Concerns about data breaches and fraud committed in the name of Shopee.
Search & recommendation system	25	Expectations regarding search accuracy and the relevance of product recommendations.
Payment Methods	24	Diversity of methods with occasional technical disruptions (VA/QRIS).

Source: Processed primary data (2025); summarized from 14 coding categories

4.7 Discussion

4.7.1 The Effect of Efficiency on Customer Satisfaction

The research results indicate that efficiency has a positive and significant effect on customer satisfaction ($\beta = 0.192$; H1a is supported). The faster, easier, and more structured the Shopee app's services are, the higher the level of customer satisfaction experienced. Efficiency is a crucial aspect because users directly experience the ease and smoothness of

service processes on the online platform (Endwia et al., 2021). These findings align with those of Amin (2016), Prasetyo et al. (2023), and Rahman et al. (2022), although they differ from those of Fidia (2022) and Widya and Elisabet (2022), who found that efficiency is not always significant. These quantitative results are reinforced by the coding in the categories of transaction ease (28 respondents) and payment methods (24 respondents), which confirm that the ease of the process and the variety of payment options enhance transaction efficiency, while also highlighting criticism regarding a decline in efficiency during peak hours.

4.7.2 The Effect of Fulfillment on Customer Satisfaction

Fulfillment has a positive and significant effect on customer satisfaction ($\beta = 0.279$; H1b supported) and is one of the strongest predictors. Fulfillment refers to a company's ability to ensure customers receive products as ordered, encompassing on-time delivery, order accuracy, and product condition (Blut, 2016). This aspect is only experienced after payment and thus serves as concrete evidence of service quality during the post-purchase stage. In online shopping, customers are more prone to experiencing a mismatch between expectations and reality because they cannot see the products in person (Liao & Keng, 2013; Rita et al., 2019). These findings support those of Kundu and Datta (2015), Nigatu et al. (2023), Prasetyo et al. (2023), and Rahman et al. (2022), and are reinforced by the codification within the delivery and logistics categories.

4.7.3 The Effect of System Availability on Customer Satisfaction

System availability has a positive and significant effect on customer satisfaction ($\beta = 0.259$; $t = 8.195$; H1c supported), with the highest t-statistic value among all paths. Stable system availability allows services to run without interruption, thereby enhancing users' positive perceptions. These findings are consistent with those of Kundu and Datta (2015), Prasetyo et al. (2023), and Stamenkov and Dika (2016). The practical relevance of this variable is particularly evident in the coding: the categories of application performance and stability were the issues most frequently raised by respondents (35 respondents), particularly complaints about lag and performance degradation during major promotions. This reaffirms that system stability is the foundation of a satisfying user experience.

4.7.4 The Effect of Privacy on Customer Satisfaction

Privacy has a positive and significant effect on customer satisfaction ($\beta = 0.197$; H1d is supported). A sense of security during transactions and the belief that personal data is protected serve as important psychological factors influencing satisfaction, given that users are required to enter sensitive data when conducting online transactions (Fortes et al., 2017; Rita et al., 2019). These findings are consistent with those of Kundu and Datta (2015), Prasetyo et al. (2023), Rahman et al. (2022), and Stamenkov and Dika (2016), although they differ from those of Fidia (2022) and Widya and Elisabet (2022). The coding results for the data and account security category (26 respondents) reinforce these findings; concerns about

data breaches and fraud committed under the guise of Shopee indicate that data protection has a direct impact on user satisfaction.

4.7.5 The Effect of Sustainable E-Service Quality on Customer Satisfaction

Sustainable e-service quality has a positive and significant effect on customer satisfaction ($\beta = 0.291$; H2 supported) and is the strongest predictor in the model. These results indicate that the more consistent and sustainable the service quality perceived by users, the higher their satisfaction with the Shopee app. This finding aligns with Stamenkov and Dika (2015), who emphasize that service quality is not static but must be consistently maintained and improved to continue meeting user expectations. Kandampully and Menguc (2000) reinforce this by highlighting the ability to consistently deliver quality service over time while managing customer loyalty. Theoretically, these findings contribute to expanding the conventional e-service quality model by adding a dimension of sustainability, and empirically demonstrate its relevance in the context of e-commerce in Indonesia. The results of the coding in the categories of app performance and stability, as well as costs and promotions, confirm that customer satisfaction is influenced not only by momentary service quality but also by the consistency and continuous improvement of the service.

CONCLUSION

This study concludes that the five independent variables—efficiency, fulfillment, system availability, privacy, and sustainable e-service quality—have a positive and significant effect on customer satisfaction among Shopee app users in Yogyakarta. Sustainable e-service quality is the strongest predictor ($\beta = 0.291$), followed by fulfillment ($\beta = 0.279$) and system availability ($\beta = 0.259$). The research model explains 79.5% of the variation in customer satisfaction. These findings confirm that e-commerce customer satisfaction is determined not only by the technical performance of the service at a given moment but also by the consistency and sustainability of service quality over the long term.

Theoretically, this study contributes by integrating conventional e-service quality and sustainable e-service quality models into a single analytical framework within the context of e-commerce in Indonesia, while also expanding the application of the service sustainability model—which has previously been extensively studied in the banking sector. Practically, Shopee is advised to: (1) maintain the ease and speed of transactions as well as the smoothness of payments; (2) improve delivery accuracy and the reliability of the return process; (3) maintain app stability, especially during spikes in user traffic during promotional periods; (4) strengthen personal data protection and account security; and (5) ensure consistency and continuous improvement in service quality.

This study has limitations. First, the research was conducted only among Shopee users in the Yogyakarta region, so caution is needed when generalizing the results to other regions or platforms. Second, the variables studied were limited to five constructs. Future research is recommended to include relevant variables such as trust, customer loyalty, and repurchase

intention, as well as to expand the geographical and platform scope to enrich the understanding of the role of sustainability in shaping customer satisfaction and long-term relationships with customers.

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