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The Influence of WebQual 4.0 on E-Service Quality of the Shopee Application: Evidence from Users in Bandung, Indonesia

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Abstract
Digital service quality has become increasingly important as e-commerce users rely on applications not only to complete purchases but also to obtain information and post-purchase support. This study investigates whether Usability Quality, Information Quality, and Service Interaction Quality, the three dimensions of WebQual 4.0, influence perceived E-Service Quality among Shopee users in Bandung, Indonesia. The study used a quantitative cross-sectional survey of 200 active users who had completed at least one Shopee transaction in the preceding 30 days. Responses to a 26-item questionnaire were analysed using partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4. The measurement model satisfied the required criteria for convergent validity, discriminant validity, and internal consistency. The structural model explained 62.1% of the variance in E-Service Quality ($R^2 = .621$; adjusted $R^2 = .616$). Information Quality showed the largest effect ($\beta = .343$, $t = 6.480$, $p < .001$), followed by Usability Quality ($\beta = .318$, $t = 5.872$, $p < .001$) and Service Interaction Quality ($\beta = .295$, $t = 5.270$, $p < .001$). PLSpredict produced positive Q^2_predict values for all four E-Service Quality indicators (.334–.453), and PLS-SEM RMSE was lower than the linear-model benchmark for every indicator. The results place information quality as the first improvement priority, while usability, transaction security, and dependable post-purchase support remain important parts of the overall service experience.

INTRODUCTION

Indonesia's Digital Macroeconomic Landscape in 2026

Indonesia's digital commerce environment continues to expand alongside widespread internet adoption. The 2026 survey of the Indonesian Internet Service Providers Association reports 235.26 million internet users and a national penetration rate of 81.72%. This scale of connectivity increases the relevance of application-based commerce and strengthens the need to evaluate not only digital access, but also the quality of services delivered through e-commerce platforms (Asosiasi Penyelenggara Jasa Internet Indonesia [APJII], 2026).

High connectivity, however, does not automatically translate into a satisfactory digital marketplace. E-commerce transactions involve information asymmetry, interface dependency, payment and privacy risks, and post-purchase service requirements. Consequently, service quality in the online environment must be assessed through dimensions that capture the digital interface, information, and service interactions rather than relying solely on conventional face-to-face service attributes (Parasuraman et al., 2005; Wolfinbarger & Gilly, 2003; Zeithaml et al., 2000).

The Paradox of Hyper-Growth: The Escalation of the Consumer Service Crisis

The expansion of digital transactions has also been accompanied by a substantial consumer-protection burden. In 2025, the Indonesian Ministry of Trade received 7,887 consumer reports, including 7,836 related to transactions through electronic systems; the disputed transaction value reached Rp18.19 billion, 379% higher than in 2024 (Prayudhia, 2026). These figures show that growth in digital transactions must be accompanied by service processes that reduce information errors, transaction uncertainty, and post-purchase friction.

The reported issues included problems involving product specifications, electronic transactions,

balance top-ups, paylater services, and credit-card use (Prayudhia, 2026). From an e-service-quality perspective, such problems are closely related to information accuracy and completeness, ease and reliability of interaction, transaction security, and the accessibility of support when service failure occurs.

These conditions make E-Service Quality a central managerial issue for marketplaces because users evaluate not only whether a transaction can be completed, but also whether the platform provides accurate information, efficient navigation, secure interaction, and dependable service recovery (Parasuraman et al., 2005; Zeithaml et al., 2000).

Shopee as a Microcosm of a Macro-Level Problem

Shopee provides a relevant empirical context because it operates through a mobile-first marketplace in which consumers depend on platform interfaces and seller-provided information throughout the transaction process. Prior Indonesian studies have examined e-commerce consumer behaviour and the relationship between service quality and customer satisfaction in the Shopee context (Harto & Sugiyanto, 2025; Suwanan & Allya, 2023).

However, the literature reviewed for this study provides limited evidence that simultaneously estimates the effects of the three WebQual 4.0 dimensions—Usability Quality, Information Quality, and Service Interaction Quality—on perceived E-Service Quality among recently active Shopee users in Bandung. Accordingly, the research question is: to what extent does each WebQual 4.0 dimension influence perceived E-Service Quality in this context? The study aims to estimate these three relationships and compare their relative explanatory strength using data from 200 users who completed a Shopee transaction within the preceding 30 days. Its specific contribution is the simultaneous assessment of the three WebQual dimensions within a recent-transaction, metropolitan e-commerce context.

The Evolution of Quality Management and E-Service Quality

Traditional service-quality models were developed primarily for settings in which consumers interact with employees and physical service cues. In digital commerce, many of those cues are replaced by interface design, information content, system performance, transaction security, and remote service recovery. E-Service Quality therefore extends conventional service-quality thinking to the effectiveness and efficiency with which a digital channel supports searching, purchasing, fulfilment, and post-purchase activities (Parasuraman et al., 2005; Zeithaml et al., 2000).

Complementary frameworks such as eTailQ similarly emphasise website design, fulfilment and reliability, privacy and security, and customer service as core components of online retail quality (Wolfinbarger & Gilly, 2003). Meta-analytic evidence further shows that E-Service Quality is multidimensional and meaningfully related to important consumer outcomes, reinforcing the need for structured evaluation of digital service quality (Blut et al., 2015).

The WebQual 4.0 Framework

WebQual was developed by Barnes and Vidgen to evaluate website quality from the user's perspective and was progressively refined across applications of web-based services (Barnes & Vidgen, 2000, 2002, 2003). WebQual 4.0 organises perceived website quality into three dimensions that are directly relevant to e-commerce: usability, information quality, and service interaction quality (Barnes & Vidgen, 2002).

1. Usability Quality: evaluates how easy the application is to learn, navigate, understand, and operate, including the clarity and attractiveness of its interface and the overall user experience

(Barnes & Vidgen, 2002).

2. Information Quality: evaluates the accuracy, credibility, timeliness, relevance, completeness, and presentation of information provided to users, including product descriptions, prices, stock information, and promotional content (Barnes & Vidgen, 2002).
3. Service Interaction Quality: evaluates the quality of the interaction experienced during digital transactions, including trust, security, privacy, reputation, personalisation, communication, and confidence in fulfilment and support (Barnes & Vidgen, 2002).

Hypothesis Development

Based on the theoretical framework and prior evidence, three hypotheses were specified:
H1: Usability Quality has a positive and significant effect on E-Service Quality. Clear navigation, understandable interaction, and an efficient interface reduce user effort and support successful task completion; therefore, higher usability should improve users' overall evaluation of digital service quality (Barnes & Vidgen, 2002).
H2: Information Quality has a positive and significant effect on E-Service Quality. In online purchasing, consumers cannot physically inspect products before purchase, making accurate, current, relevant, and complete information essential for reducing uncertainty and supporting informed decisions (Barnes & Vidgen, 2002).
H3: Service Interaction Quality has a positive and significant effect on E-Service Quality. Trust, privacy, transaction security, responsive support, and transparent service recovery reduce perceived transaction risk and strengthen users' evaluations of the platform's overall service quality (Parasuraman et al., 2005; Zeithaml et al., 2000).

METHODS

Research Design and Sampling

This study used a quantitative cross-sectional design to examine the relationships between the three WebQual 4.0 dimensions and perceived E-Service Quality at one point in time. The target population comprised Shopee application users in Bandung City, West Java. Bandung was selected as an urban digital-commerce setting within West Java, a province with high internet penetration in the 2026 APJII survey (APJII, 2026).
Respondents were recruited using non-probability convenience sampling with purposive eligibility criteria. Participants had to be Shopee users residing in Bandung and to have completed at least one purchase transaction through the application within the previous 30 days. The recency criterion was used to ensure that respondents evaluated the platform based on a recent transaction experience.
The final analytic sample comprised 200 valid respondents who met the screening criteria. All 200 cases were retained for the PLS-SEM analysis.

Variable Operationalization and Measurement Scales

Primary data were collected using a structured questionnaire with a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The instrument contained 26 reflective indicators: eight for Usability Quality, seven for Information Quality, seven for Service Interaction Quality, and four for perceived E-Service Quality. The WebQual indicators were operationalised from Barnes and Vidgen (2002), while the E-Service Quality construct reflected fulfilment, effectiveness, efficiency, and overall service satisfaction consistent with the electronic-service framing used in

the original study (Zeithaml et al., 2002). The operationalisation of the constructs is presented in Table 1.

Table 1. Research Variable Operationalization Matrix

Latent Variable	Sub-Dimensions / Operational Indicators	Number of Items
Usability Quality (X1)	Ease of learning; clear and understandable interaction; ease of navigation; overall ease of use; attractive appearance; design appropriateness; perceived competence; positive shopping experience.	8 Items
Information Quality (X2)	Accuracy; credibility; timeliness; relevance; clarity/ease of understanding; completeness/detail; appropriate information format (text, photo, video).	7 Items
Service Interaction Quality (X3)	Reputation; transaction security; data privacy; personalisation; community interaction; communication with sellers/customer service; delivery reliability.	7 Items
E-Service Quality (Y)	Fulfilment of shopping needs; transaction effectiveness; time efficiency; overall satisfaction with application service quality.	4 Items

Data Analysis Techniques

Data were analysed using partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4 (Ringle et al., 2024). PLS-SEM was used to evaluate the measurement properties of the reflective constructs and to estimate the structural relationships specified in the hypotheses (Hair et al., 2022).

The analysis proceeded in two stages: evaluation of the measurement model and evaluation of the structural model.

Measurement model evaluation assessed indicator reliability, convergent validity, internal consistency reliability, and discriminant validity. Outer loadings of at least .70, average variance extracted (AVE) of at least .50, and reliability coefficients of at least .70 were used as reference criteria. Discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT), with values below .90 indicating acceptable construct distinctiveness (Hair et al., 2022; Henseler et al., 2015).

Structural model evaluation examined collinearity using inner variance inflation factor (VIF), explanatory power using R^2 and adjusted R^2, local effect sizes using f^2, and the direction and significance of path coefficients. Hypothesis significance was assessed through bootstrapping using a two-tailed criterion of $p < .05$. The combined explanatory contribution of the three predictors was interpreted from R^2 rather than a conventional regression F-test. Predictive performance was additionally assessed with PLSpredict using Q^2_predict and comparison of PLS-SEM prediction errors with a linear-model (LM) benchmark (Hair et al., 2022; Ringle et al., 2024).

RESULTS AND DISCUSSION

Demographic Profile and Characteristics of Digital Consumers

The analysis included 200 valid respondents who met the study eligibility criteria and represented active Shopee users in Bandung.

Table 2. Demographic Profile of Respondents (N = 200)

Demographic Category	Classification	Frequency	Percentage (%)
Gender	Male	87	43.50%
	Female	113	56.50%
Age Group	< 17 Years	6	3.00%
	18 – 24 Years	76	38.00%

Demographic Category	Classification	Frequency	Percentage (%)
	25 – 34 Years	59	29.50%
	35 – 44 Years	35	17.50%
	> 44 Years	24	12.00%
Shopee Access Intensity (Last Month)	Very Rarely	7	3.50%
	Rarely	24	12.00%
	Often	100	50.00%
	Very Often	69	34.50%

Table 2 shows that 56.50% of respondents were female and 43.50% were male. The largest age group was 18–24 years (38.00%), followed by 25–34 years (29.50%). In terms of Shopee access intensity during the previous month, 50.00% reported using the application often and 34.50% very often. Thus, 84.50% of the sample consisted of respondents with relatively frequent recent exposure to the platform.

Measurement Model Evaluation (Outer Model)

The first step in PLS-SEM analysis is to assess the reliability and validity of the measurement model to ensure that the survey instrument accurately and consistently measures the intended latent constructs.

Convergent Validity and Construct Reliability

Table 3. Convergent Validity and Reliability Test Results Matrix

Latent Variable	Outer Loading Range	Average Variance Extracted (AVE)	Cronbach's Alpha	Composite Reliability (CR)
Usability (X1)	.777 – .839	.648	.922	.936
Information Quality (X2)	.763 – .805	.624	.900	.921
Service Interaction (X3)	.811 – .854	.690	.925	.940
E-Service Quality (Y)	.770 – .837	.663	.830	.887

As shown in Table 3, all indicator outer loadings exceeded the .70 reference level, with construct-level ranges extending from .763 to .854. AVE values ranged from .624 to .690, all above .50. These results support convergent validity for the four reflective constructs.

Cronbach's alpha values ranged from .830 to .925, while composite reliability values ranged from .887 to .940. All values exceeded the .70 reference criterion, indicating satisfactory internal consistency reliability.

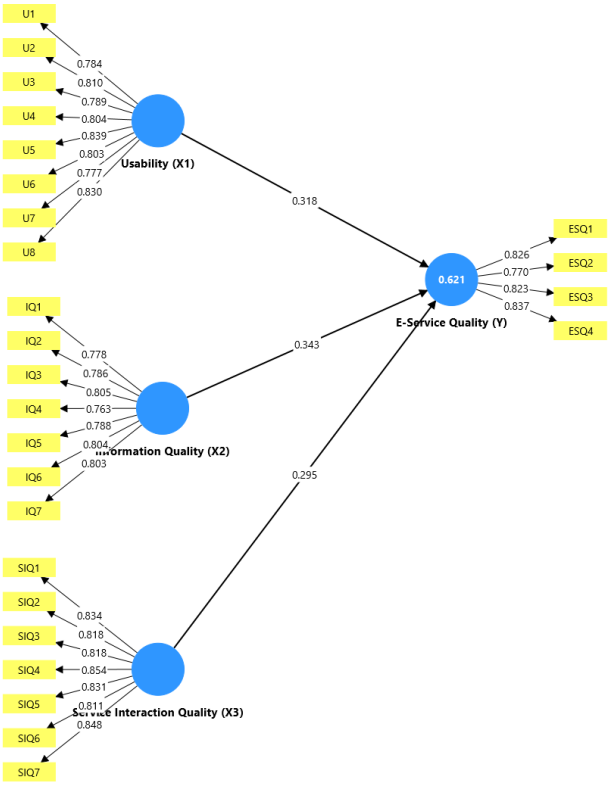

Figure 1. PLS-SEM Algorithm Results of the WebQual 4.0 Model

Figure 1 presents the PLS-SEM algorithm results. All indicator outer loadings exceeded the recommended .70 threshold, ranging from .763 to .854. The structural model explained 62.1% of the variance in E-Service Quality (R^2 = .621).

Discriminant Validity (HTMT Ratio)

Discriminant validity was assessed using the HTMT ratio because it provides a direct assessment of construct distinctiveness in variance-based structural equation modelling (Henseler et al., 2015).

Table 4. Heterotrait-Monotrait (HTMT) Correlation Ratio Matrix

Latent Variable	E-Service Quality (Y)	Information Quality (X2)	Service Interaction (X3)	Usability (X1)
E-Service Quality (Y)	-			
Information Quality (X2)	.743	-		
Service Interaction (X3)	.385	.153	-	
Usability (X1)	.539	.688	.091	-

The highest HTMT value was .743 for the relationship between Information Quality and E-Service Quality. All HTMT values were below .90, indicating acceptable discriminant validity among the four constructs.

Structural Model Evaluation (Inner Model) and Hypothesis Testing

Collinearity Assessment

Inner VIF values ranged from 1.448 to 1.653, well below the conservative threshold of 3.00; therefore, collinearity among the predictor constructs was not considered problematic.

Table 5. Inner VIF

Predictor	E-Service Quality inner VIF
Information Quality	1.448
Service Interaction Quality	1.653
Usability Quality	1.625

Explanatory Power and Effect Size

The three WebQual dimensions explained 62.1% of the variance in E-Service Quality ($R^2 = .621$; adjusted $R^2 = .616$). Information Quality produced the largest local effect ($f^2 = .215$), followed by Usability Quality ($f^2 = .164$) and Service Interaction Quality ($f^2 = .139$). Using conventional PLS-SEM effect-size benchmarks, the first two effects are medium and the third is small (Hair et al., 2022).

Table 6. Explanatory Power and Effect Size

Endogenous construct	R^2	Adjusted R^2
E-Service Quality	.621	.616
Predictor	**f^2**	**Effect interpretation**
Information Quality	.215	Medium
Usability Quality	.164	Medium
Service Interaction Quality	.139	Small

Hypothesis Testing

All hypothesised structural paths were positive and statistically significant, as summarised in Table 7.

Table 7. Hypothesis Testing

Hypothesis	Relationship	β	t-statistic	p-value	Decision
H1	Usability Quality → E-Service Quality	.318	5.872	< .001	Supported
H2	Information Quality → E-Service Quality	.343	6.480	< .001	Supported
H3	Service Interaction Quality → E-Service Quality	.295	5.270	< .001	Supported

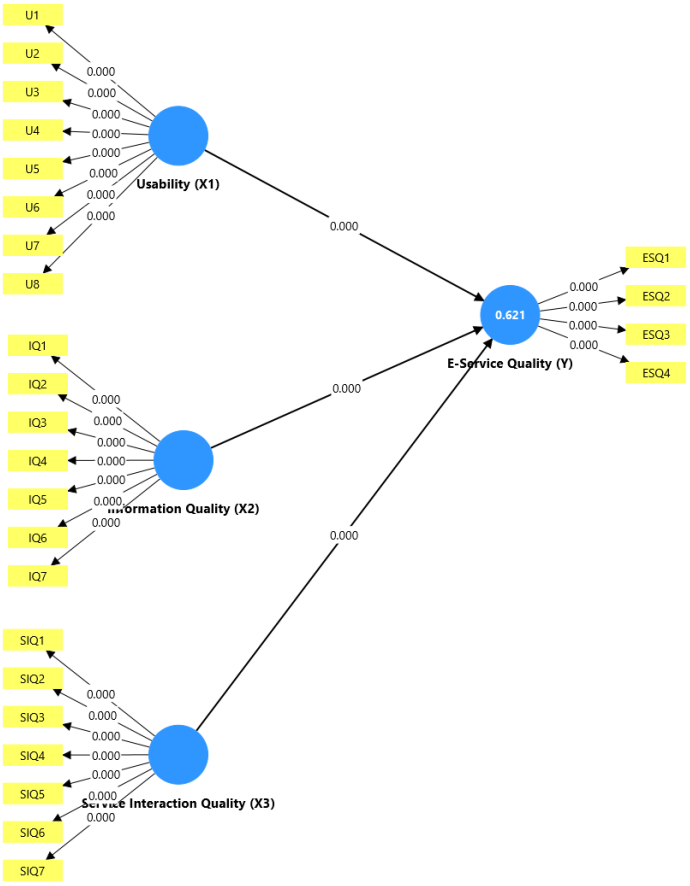

Figure 2. Bootstrapping Results of the Structural Model

Figure 2 presents the bootstrapping results for the structural relationships. Information Quality had the strongest positive effect on E-Service Quality ($\beta = .343$, $t = 6.480$, $p < .001$), followed by Usability Quality ($\beta = .318$, $t = 5.872$, $p < .001$) and Service Interaction Quality ($\beta = .295$, $t = 5.270$, $p < .001$). Therefore, H1, H2, and H3 were supported.

Predictive Assessment (PLSpredict)

PLSpredict confirmed out-of-sample predictive relevance for all four E-Service Quality indicators. Q^2_predict values were positive, ranging from .334 to .453. In addition, PLS-SEM produced lower root mean square error (RMSE) values than the linear-model benchmark for ESQ1, ESQ2, ESQ3, and ESQ4. The mean absolute error (MAE) was also lower for ESQ1, ESQ2, and ESQ4; for ESQ3, PLS-SEM MAE was .400 compared with .397 for the linear model. The consistently lower RMSE values support a high level of predictive performance for the reported model.

Table 8. PLSpredict Results for E-Service Quality Indicators

Indicator	Q^2_predict	PLS-SEM RMSE	LM RMSE	Assessment
ESQ1	.453	.469	.494	Predictive
ESQ2	.334	.597	.616	Predictive
ESQ3	.417	.514	.519	Predictive based on RMSE
ESQ4	.387	.570	.589	Predictive

DISCUSSION

The results support the three proposed relationships in the model. Usability Quality, Information Quality, and Service Interaction Quality were each positively associated with perceived E-Service Quality among the Shopee users surveyed in Bandung. Taken as a group, the three dimensions

explained 62.1% of the variance in E-Service Quality. For this sample, WebQual 4.0 therefore provides a useful way to distinguish the application features that shape users' overall assessment of digital service quality. This pattern is in line with the multidimensional treatment of website and electronic service quality in WebQual, E-S-QUAL, and eTailQ (Barnes & Vidgen, 2002; Parasuraman et al., 2005; Wolfinbarger & Gilly, 2003).

At a practical level, the results do not point to a single technical fix. Users' evaluations are shaped by what information they receive, how easily they can move through the application, and how secure and dependable the interaction feels. The discussion below considers these three effects separately before returning to their combined implications.

Among the three predictors, Information Quality had the largest coefficient ($\beta = .343$; $f^2 = .215$). This result is understandable in an online marketplace because users have to judge products before they can inspect them directly. They depend on descriptions, prices, stock information, photographs, promotional terms, and seller claims when deciding whether to purchase. When these details are incomplete, outdated, or inconsistent, uncertainty increases even if the application is easy to use. The finding supports Barnes and Vidgen's (2002) view that information quality is a separate component of website quality. It also adds detail to earlier Shopee research on service quality by showing that, when the three WebQual dimensions are estimated together, Information Quality makes the largest contribution to perceived E-Service Quality (Harto & Sugiyanto, 2025).

Usability Quality had the second-largest effect ($\beta = .318$; $f^2 = .164$). Users therefore evaluated E-Service Quality more positively when the application was easy to learn, navigate, and operate. This relationship is consistent with WebQual's emphasis on ease of use and interaction and with technology-based service research showing that user effort and interface characteristics shape evaluations of self-service encounters (Barnes & Vidgen, 2002; Dabholkar, 1996). Platform operators should consequently examine search, product comparison, checkout, payment, tracking, and help functions for avoidable friction.

The Usability result can also be read from the sequence of activities users complete in the application. Shopping on Shopee involves searching and filtering products, comparing alternatives, checking information, placing an order, choosing payment, tracking delivery, and sometimes contacting support. Difficulty at one stage can add effort to the whole transaction. The positive Usability path therefore reflects more than visual appearance; it also reflects how smoothly users can move through the full process. This is consistent with technology-based self-service research, where efficiency and user control form part of the service experience itself (Dabholkar, 1996). For platform evaluation, this means that navigation, search relevance, checkout clarity, error messages, payment transitions, order tracking, and access to help should be examined as connected parts of one process.

Service Interaction Quality also had a positive and significant effect ($\beta = .295$; $f^2 = .139$). Although its local effect was smaller than those of Information Quality and Usability Quality, the result confirms the importance of trust, privacy, transaction security, communication, and service recovery in the overall user experience. This is consistent with E-Service Quality frameworks that emphasise security, privacy, responsiveness, and recovery as critical components of online service evaluation (Parasuraman et al., 2005; Zeithaml et al., 2000). Clear dispute-resolution procedures, accessible customer support, transparent refunds, and secure transaction mechanisms can therefore strengthen users' confidence in the platform.

The three coefficients also show that the WebQual dimensions should not be treated as substitutes for one another. Each dimension contributed to E-Service Quality, and the HTMT results indicate

that the constructs remained empirically distinct. In practical terms, good performance in one area cannot fully cover weakness in another. Accurate product information will not remove frustration caused by a confusing checkout process, and an easy-to-use interface will not remove concerns about privacy, refunds, or transaction security. The results therefore support the multidimensional logic of WebQual, E-S-QUAL, eTailQ, and related E-Service Quality research (Barnes & Vidgen, 2002; Blut et al., 2015; Parasuraman et al., 2005; Wolfinbarger & Gilly, 2003). They also show that these dimensions remain useful for evaluating a contemporary mobile marketplace, not only the earlier website settings in which many of these measures were developed.

The wider consumer-protection context helps explain why these dimensions matter in practice. The Ministry of Trade recorded 7,836 reports related to electronic-system transactions in 2025, including complaints involving product specifications and electronic transactions (Prayudhia, 2026). Those national figures are not part of the present sample, and this study did not test complaint behaviour, so they should not be interpreted as evidence of a causal link. Even so, the types of problems are relevant to the dimensions measured here. Product-specification problems concern information accuracy and completeness, while transaction and post-purchase difficulties may involve usability and service interaction. This correspondence gives the model practical relevance beyond the statistical relationships reported for the Bandung sample and shows why growth in digital transactions needs to be accompanied by attention to service quality.

The requirement that respondents had completed a Shopee transaction within the preceding 30 days was intended to keep the evaluation close to an actual recent experience. This is useful in a digital service setting because interfaces, payment options, promotions, and support procedures can change relatively quickly. However, the recency criterion does not remove the limitations of non-probability sampling or self-reported data. The 200 respondents represent accessible active users in Bandung rather than the full population of Shopee users in Indonesia. The size and ordering of the coefficients should therefore be read within that context. Replication in other cities, user groups, transaction-frequency categories, and competing platforms is needed to determine whether Information Quality remains the strongest dimension elsewhere.

An R^2 of .621 means that the three WebQual dimensions explained a sizeable share of the variation in perceived E-Service Quality in this sample, while 37.9% remained outside the model or unexplained. That remaining variance is important because it shows that WebQual 4.0 is not a complete explanation of marketplace experience. Other factors—such as logistics performance, trust, satisfaction, price perceptions, promotional experience, seller behaviour, and previous familiarity with the platform—may also affect how users judge the service. The present model is therefore best used as a focused diagnostic of digital service quality rather than as a full model of consumer behaviour. This interpretation is consistent with broader E-Service Quality research, which treats service quality as multidimensional and related to, but conceptually different from, outcomes such as satisfaction and behavioural intention (Blut et al., 2015; Parasuraman et al., 2005).

PLSpredict adds a second perspective to the R^2 result. All four E-Service Quality indicators had positive Q^2_predict values, and the PLS-SEM RMSE was lower than the linear-model benchmark for each indicator. The model therefore did not only explain variation in the estimation sample; it also showed useful predictive performance under the reported PLSpredict assessment. This matters because good explanatory power does not automatically imply good prediction. In this study, the explanatory and predictive results point in the same direction and support the practical use of the three WebQual dimensions as a compact set of indicators for evaluating perceived E-

Service Quality among the surveyed Shopee users.

The effect sizes also provide a practical order of priority. Information Quality produced the largest local effect, followed by Usability Quality and Service Interaction Quality. If improvement resources are limited, information accuracy and completeness deserve early attention, particularly consistency in product specifications, promotional terms, prices, and stock information. Usability improvements should reduce unnecessary steps and effort across search, comparison, checkout, payment, and order tracking. Service Interaction improvements should focus on security, privacy, complaint handling, refund procedures, and customer support. The smaller f^2 for Service Interaction Quality does not make the dimension unimportant; all three structural paths were significant. The results support prioritising the dimensions in stages while still managing them as parts of one service-quality system.

Managerial Implications

For platform operators and digital sellers, the results point to several concrete actions. Product and transaction information needs to be accurate and regularly updated, while the application interface should make the main stages of the customer journey easy to complete. Transaction security, privacy protection, complaint handling, and post-purchase support also need to be dependable. Improvements in these areas can reduce avoidable service problems and strengthen users' confidence in the marketplace. Entrepreneurial resilience was not measured in this study, so any possible resilience benefit remains a managerial consideration rather than an empirical finding. Users experience the marketplace as a combined service system, which means platform quality and seller execution are difficult to separate completely from the customer's point of view. Sellers shape Information Quality through product titles, descriptions, images, variants, stock data, and promotional claims, while the platform determines how that information is organised and presented. For that reason, interface improvements should be accompanied by clear seller-content standards and monitoring. Post-purchase service also depends on coordination among sellers, platform support, payment services, and logistics partners. This study did not estimate the contribution of each actor separately, but the significant Service Interaction Quality path shows that users include these interactions in their overall judgement of service quality. Improvement efforts should therefore follow the complete service process rather than focus only on isolated technical features.

CONCLUSION

This study examined the effects of Usability Quality, Information Quality, and Service Interaction Quality on perceived E-Service Quality among 200 Shopee users in Bandung. All three dimensions had positive and significant effects, and the model explained 62.1% of the variance in E-Service Quality (adjusted $R^2 = .616$). Information Quality was the strongest predictor, followed by Usability Quality and Service Interaction Quality. PLSpredict further showed positive Q^2_predict values for all E-Service Quality indicators (.334–.453), with lower PLS-SEM RMSE values than the linear-model benchmark across all four indicators, supporting high predictive performance.

These results suggest that e-commerce platforms should improve the accuracy and completeness of product information, maintain an intuitive application interface, and strengthen transaction security and post-purchase support. These priorities correspond to the three service-quality dimensions that were empirically significant in the model.

The study is limited by its non-probability sampling approach, its focus on a single city and

platform, and its cross-sectional design. The findings should therefore not be generalised beyond the studied population without caution. Future research should use broader probability-based samples where feasible, compare multiple e-commerce platforms or regions, and examine additional outcomes such as trust, satisfaction, repurchase intention, logistics performance, and entrepreneurial resilience. Longitudinal or experimental designs could also strengthen evidence regarding temporal and causal relationships.

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