



An Integrated Model of E-Service Quality, Trust, E-Satisfaction, and E-Loyalty in Digital Commerce

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ABSTRACT: This study investigates how Integrated Marketing Communication shapes brand preference through the mediating roles of Brand Awareness and Brand Image within the ceiling and interior materials industry in Indonesia. Using survey data from 345 consumers and analysed through Partial Least Squares Structural Equation Modeling, the study demonstrates that Integrated Marketing Communication has significant positive effects on awareness, image, and preference. Brand Awareness and Brand Image also emerge as strong predictors of brand preference, indicating that both familiarity and favourable associations are central to consumer decision making. The results further reveal a sequential mediation pathway in which Integrated Marketing Communication enhances awareness, awareness strengthens image, and image ultimately drives preference. These findings contribute to a deeper understanding of the cognitive and evaluative processes linking communication strategy to consumer choice. The study offers practical insights for firms seeking to build brand equity in competitive markets.

Keywords: integrated marketing communication, brand awareness, brand image, brand preference, consumer decision making

INTRODUCTION

The growth of e commerce in Indonesia has accelerated rapidly as internet access and mobile penetration expand nationwide. Recent market analyses show that Indonesia is now the largest digital economy in Southeast Asia, with its online retail sector experiencing sustained annual growth (Lestari, 2023). Scholars argue that this expansion has fundamentally altered consumer purchasing practices and intensified competition among digital platforms (Sahoo & Basu, 2025). In this evolving environment, cultivating e loyalty has become central because loyal customers contribute to stable revenue streams, lower acquisition costs, and long term platform sustainability. Consequently, understanding the determinants of e loyalty remains a key priority in digital commerce research.

Although international studies have consistently identified e service quality and consumer trust as critical predictors of e loyalty, empirical findings across countries remain inconsistent. For example, service performance in digital settings is often heterogeneous, which reduces the clarity of its effect on loyalty outcomes service performance in digital settings is often heterogeneous, which reduces the clarity of its effect on loyalty outcomes (Zhang et al., 2021). In Indonesia, concerns regarding transaction security, delivery consistency, and seller credibility persist, making consumer trust a fragile construct that requires ongoing validation (Tolegenov et al., 2024) Prior studies in the Indonesian context have tended to evaluate e service quality and trust separately and have often treated e satisfaction as a simple outcome rather than



as a central mechanism that explains how perceptions translate into loyalty (Aminullah et al., 2024). This fragmented approach creates a conceptual gap in explaining how these constructs interact in emerging digital markets.

To address this gap, the present study proposes an integrated structural model linking e service quality, trust in the e commerce platform, e satisfaction, and e loyalty. Contemporary research highlights that e satisfaction plays a pivotal role in translating cognitive evaluations of service quality and trust into favorable behavioral intentions (Qing et al., 2023). By collecting empirical data from Indonesian e commerce users, the study aims to test the extent to which satisfaction mediates these relationships within a rapidly growing but still institutionally developing digital ecosystem. This contextualization is essential because consumer perceptions in emerging markets may diverge from patterns observed in more mature digital economies (Zhang et al., 2021).

The novelty of this study lies in its simultaneous examination of direct and mediated pathways in a single model within the Indonesian e commerce setting. While mediation models involving satisfaction have been tested in other countries, few studies have applied such an integrated framework in Indonesia despite its position as a major digital economy (Aminullah et al., 2024). Furthermore, evolving platform designs and algorithmic features in Indonesian e commerce require updated empirical evidence, as user expectations regarding speed, security, and reliability continue to shift (Islam, 2024). By situating the analysis in this dynamic environment, the study offers fresh empirical insights and extends global theorization of loyalty formation to a context that remains underrepresented in current scholarship.

The study contributes theoretically by refining the understanding of satisfaction as a mediating mechanism that connects e service quality and trust to loyalty outcomes. This aligns with the broader literature calling for more nuanced models that incorporate psychological constructs as pathways rather than endpoints (Kim & Yum, 2024; Oliver et al., 2015). Practically, the findings carry implications for Indonesian e commerce managers seeking to strengthen customer retention strategies. Prior research suggests that improving perceived service quality and cultivating trust can substantially increase satisfaction and loyalty when implemented in a coordinated manner. Insights from this study may therefore inform platform design, policy development, and customer relationship strategies in Indonesia's competitive digital marketplace.

LITERATURE REVIEWS

Theoretical Foundation

The relationships among e service quality, trust, e satisfaction, and e loyalty are grounded in several established theories that explain how consumers evaluate online platforms and develop long term behavioral commitments. A central theoretical basis is the Expectation Confirmation Theory, which posits that consumers form satisfaction when perceived performance meets or exceeds initial expectations, leading to continued usage intentions or loyalty (Bhattacharjee, 2001). Recent studies reaffirm the relevance of this theory in digital commerce, showing that perceived service quality in online environments strongly shapes expectation confirmation and affects satisfaction outcomes (Dos Santos Gonçalves et al., 2021). In the Indonesian e commerce context, high variability in delivery reliability, product accuracy, and customer support makes expectation confirmation particularly salient, as unmet expectations can quickly disrupt satisfaction formation (Aminullah et al., 2024).

The second theoretical lens informing this study is the Stimulus Organism Response framework. This framework conceptualizes service quality and trust as external stimuli that influence internal cognitive and affective evaluations, which subsequently shape behavioral responses such as loyalty (Russell & Mehrabian, 1974). Contemporary digital commerce research frequently employs this framework to examine how platform characteristics influence consumer psychology (Zhu et al., 2022). In this study, e service quality and trust function as stimuli, e satisfaction serves as the organism representing internal evaluations, and e loyalty is the behavioral response. Empirical evidence supports the applicability of this framework in online retail, demonstrating that positive platform stimuli enhance satisfaction and, in turn, strengthen loyalty intentions (Kim & Yum, 2024).

A third theoretical foundation is Commitment Trust Theory, which argues that trust is a critical antecedent to cooperative and enduring relational behavior in marketing exchanges (Morgan & Hunt, 1994). In online commerce, trust becomes even more central due to the absence of physical interaction and the heightened uncertainty associated with digital transactions. Recent findings show that trust reduces perceived risk, enhances perceived value, and promotes stronger loyalty behaviors in online marketplaces

(Fournier-Tombs et al., 2023; Suhartanto et al., 2022). Scholars studying Southeast Asian e-commerce emphasize that trust mechanisms, such as transparent transaction processes and secure payment systems, are key determinants of sustained user engagement (Tolegenov et al., 2024). Thus, Commitment Trust Theory provides a conceptual basis for understanding the role of trust in predicting both e-satisfaction and e-loyalty.

The mediation role of e-satisfaction is further supported by the Attitude Formation Theory, which explains how positive evaluations of service encounters lead to favorable attitudes and future behavioral intentions. Recent studies suggest that satisfaction often mediates the effect of service quality and trust on loyalty because satisfied users develop stronger attitudinal commitments that translate into repeat patronage (Qing et al., 2023). In emerging markets, including Indonesia, satisfaction has been shown to be a critical psychological mechanism that bridges platform evaluations and loyalty outcomes due to varying levels of technological maturity and user familiarity (Islam, 2024).

Collectively, these theoretical perspectives offer a coherent foundation for examining how e-service quality and trust influence loyalty both directly and through satisfaction. By integrating Expectation Confirmation Theory, the Stimulus Organism Response framework, Commitment Trust Theory, and Attitude Formation Theory, the present study builds a comprehensive model that explains loyalty formation in Indonesian e-commerce. This integrated theoretical grounding ensures a robust basis for the proposed hypotheses and strengthens the alignment between empirical testing and established scholarly discourse.

Hypotheses Development

E-service quality has been widely identified as a foundational determinant of consumer evaluations in digital commerce environments. It encompasses elements such as reliability, responsiveness, system usability, and assurance, all of which shape consumers' perceptions of platform performance (Zeithaml et al., 1996). More recent scholarship affirms that high service quality strengthens positive evaluations of online shopping experiences and encourages favorable behavioral intentions (Dos Santos Gonçalves et al., 2021). In emerging digital markets, consumers often rely heavily on platform service efficiency because it reduces transaction uncertainty and enhances perceived value (Kim & Yum, 2024). Evidence from Indonesia suggests that online shoppers place particular importance on delivery accuracy, complaint handling, and the clarity of product information when assessing service quality (Aminullah et al., 2024). When these service encounters meet or exceed expectations, consumers are more likely to continue engaging with the platform. Based on this reasoning, the study proposes that higher levels of e-service quality lead to greater e-loyalty.

H1. E-service quality positively influences e-loyalty.

E-service quality also plays a critical role in shaping e-satisfaction. According to Expectation Confirmation Theory, satisfaction arises when consumers perceive that the service performance of an online platform aligns with or surpasses their pre-purchase expectations (Bhattacharjee, 2001). Scholars have consistently found that e-service quality is one of the most salient drivers of satisfaction because it reflects consumers' overall experiences at multiple touchpoints, including product browsing, payment processes, and after-sales support (Qing et al., 2023). In the Indonesian context, heterogeneous seller quality, inconsistent logistics systems, and variable customer service responsiveness heighten the importance of service quality in shaping satisfaction (Tolegenov et al., 2024). When consumers encounter reliable platform features and smooth transactional processes, they experience higher satisfaction, which further enhances their likelihood of continued use. Thus, the study posits that perceived e-service quality exerts a positive influence on e-satisfaction.

H2. E-service quality positively influences e-satisfaction.

Trust constitutes another essential determinant of consumer evaluations in online commerce. Commitment Trust Theory asserts that trust is a central foundation for long-term relational exchange because it reduces perceived risk and promotes cooperative behavior (Morgan & Hunt, 1994). In e-commerce settings where consumers lack physical interaction with sellers, trust becomes even more crucial. Recent research has demonstrated that trust in a platform's integrity, competence, and security features strengthens consumer commitments and increases their intention to remain loyal (Islam, 2024). Studies

conducted within Southeast Asian digital markets reveal that trust influences repeat purchase decisions because it provides psychological assurance in environments characterized by risk and information asymmetry (Suhartanto et al., 2022). For Indonesian users, platform trust is shaped by transparent review systems, secure payment features, and consistent communication throughout the transaction process (Islam, 2024). On this basis, trust is expected to strengthen loyalty toward e-commerce platforms.

H3. Trust in the e-commerce platform positively influences e-loyalty.

Trust is also recognized as a powerful antecedent to satisfaction in online shopping environments. When users believe that a platform is reliable and capable of protecting their interests, they experience reduced uncertainty and greater confidence in the transactional process. This psychological assurance contributes positively to post-purchase evaluations, which leads to satisfaction (Zhu et al., 2022). Prior studies consistently show that trust enhances satisfaction by enabling users to feel safe and valued throughout their digital interactions (Guo, 2022). In Indonesia, where online fraud and inconsistent seller credibility remain consumer concerns, trust is particularly influential in shaping satisfaction outcomes (Tolegenov et al., 2024). A trusted platform can mitigate these concerns and foster positive affective responses. Therefore, the present study proposes that trust significantly contributes to e-satisfaction.

H4. Trust in the e-commerce platform positively influences e-satisfaction.

Satisfaction itself is a well-established predictor of loyalty across service and digital commerce contexts. Attitude Formation Theory posits that positive evaluations of service encounters develop into favorable attitudes, which subsequently drive behavioral intentions such as repurchase or continued usage. Empirical studies widely confirm that satisfied users are more likely to repurchase, recommend platforms to others, and maintain long-term engagement because satisfaction strengthens their overall commitment to the platform (Kim & Yum, 2024; Qing et al., 2023). Studies conducted in Indonesia also show that satisfaction is among the strongest predictors of loyalty in online retail, especially because users compare their experiences across multiple competing platforms (Aminullah et al., 2024). Based on these findings, the study proposes a positive relationship between e-satisfaction and e-loyalty.

H5. E-satisfaction positively influences e-loyalty.

Beyond its direct effect, e-satisfaction is theorized to function as a mediating mechanism that links e-service quality to e-loyalty. The Stimulus-Organism-Response framework suggests that external stimuli such as service quality influence internal evaluations such as satisfaction, which then shape behavioral responses including loyalty (Russell & Mehrabian, 1974). Current digital commerce research affirms that satisfaction frequently mediates the relationship between service quality and loyalty because users who perceive high-quality service are more likely to feel satisfied, and satisfaction enhances loyalty intentions (Zhu et al., 2022). Studies from Indonesia similarly report that satisfaction channels the influence of service performance into loyalty formation (Aminullah et al., 2024). Thus, the study posits that satisfaction mediates this relationship.

H6. E-satisfaction mediates the relationship between e-service quality and e-loyalty.

A similar mediating role is expected in the relationship between trust and loyalty. Trust encourages users to perceive an online environment as safe, dependable, and predictable, which enhances their satisfaction with the platform (Tolegenov et al., 2024). Satisfaction then acts as the internal psychological mechanism that translates trust into sustained loyalty behaviors. Empirical evidence supports this chain of effects by showing that trust enhances satisfaction and that satisfaction mediates trust's influence on loyalty in digital commerce settings (Guo, 2022; Suhartanto et al., 2022). Considering the Indonesian context, where trust is highly decisive in shaping platform preferences, this mediation effect is expected to be significant.

H7. E-satisfaction mediates the relationship between trust in the e-commerce platform and e-loyalty.

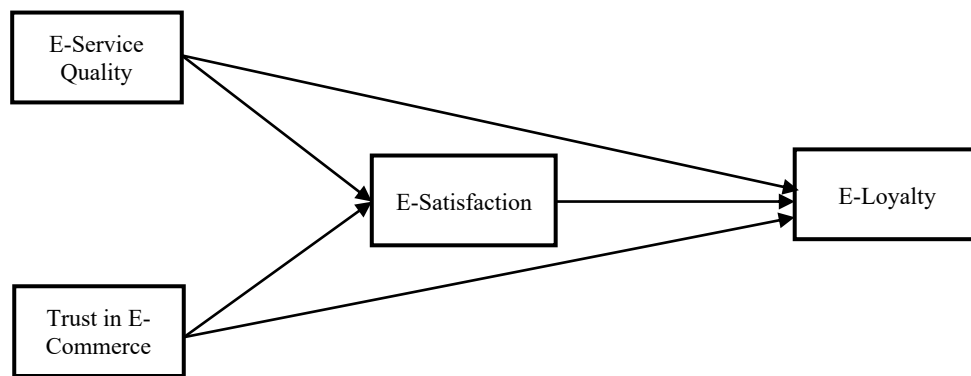


Figure 1. Research Framework

METHODS

This study employed a quantitative cross sectional survey design to examine the relationships among e service quality, trust, e satisfaction, and e loyalty in the Indonesian e commerce context. A self-administered online questionnaire was used because digital data collection is efficient for reaching active online consumers and is widely applied in studies of e commerce and digital behavior (Podsakoff et al., 2003). Data collection was conducted from March to June 2025 by distributing the survey link through major social media platforms including WhatsApp, Instagram, and Facebook. These channels were chosen due to their high penetration in Indonesia and their effectiveness in reaching diverse internet users.

The study employed a non-probability purposive sampling technique that targeted residents of South Sulawesi who had prior experience making purchases on e-commerce platforms. Purposive sampling is appropriate for understanding specific behavioral patterns among defined user groups, particularly in digital commerce studies where researchers often focus on active online shoppers (Etikan, 2016). However, this approach limits the generalizability of the findings because the sample may not fully represent all demographic segments or regional variations in Indonesia. Before initiating the questionnaire, participants were presented with an informed consent statement that described the study's purpose, assured confidentiality, and emphasized voluntary participation in accordance with standard research ethics guidelines. After screening for completeness and response quality, a total of 208 valid responses were retained for analysis, which exceeds the recommended sample size for structural equation modeling using partial least squares for models with four latent variables (Hair et al., 2021).

All constructs were measured using established reflective scales adapted from validated prior studies to ensure content accuracy and conceptual consistency. E service quality was assessed using six indicators that capture perceptions of usability, responsiveness, security, personalization, and interface quality, based on established scales developed by Ighomereho et al. (2022) and Jing et al. (2023). These dimensions reflect contemporary expectations of digital platform performance and are widely recognized as determinants of service evaluations in online retail environments.

E satisfaction was measured using three items adapted from Jameel et al. (2021). These items capture consumers' affective and cognitive evaluations of their online shopping experiences and have been validated in recent service management studies. E loyalty was assessed using three items from Malhotra et al. (2021), which capture intentions to continue purchasing, recommend the platform, and maintain a preferential attitude toward it. Trust was measured using three indicators adapted from Kim et al. (2021), focusing on perceived honesty, security, and overall reliability of the e commerce platform. All items were measured on a seven point Likert scale ranging from strongly disagree to strongly agree, which is consistent with current practices in digital marketing and consumer behavior research (Hair et al., 2021).

Table 1 presents the full list of items used in the survey. The instrument was pretested with a small group of participants to ensure clarity, readability, and contextual relevance for Indonesian users, consistent with recommendations for cross cultural scale adaptation. Minor wording adjustments were made to improve comprehension without altering construct meanings.

Table 1. Item Construct

Construct	Item Code	Item
E-Servqual	ESQ1	This e-commerce platform is easy to use for searching products.
	ESQ2	The time required to complete a transaction is reasonably fast.
	ESQ3	I feel safe when transacting on this platform.
	ESQ4	The platform is responsive to my questions or complaints.
	ESQ5	The platform's interface is attractive and easy to understand.
	ESQ6	This platform frequently provides recommendations that match my interests.
E-Satis.	ESAT1	I am satisfied with my shopping experience on this platform.
	ESAT2	This platform meets my expectations as a customer.
	ESAT3	Overall, I am pleased with the service from this platform.
E-Loyalty	ELOY1	I am likely to continue using this platform in the future.
	ELOY2	I would recommend this platform to others.
	ELOY3	I prefer shopping on this platform over others.
Trust	TRU1	I believe this platform protects my personal information.
	TRU2	I believe this platform handles my transactions honestly.
	TRU3	I feel this platform is trustworthy.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling. PLS SEM is particularly suitable for exploratory models, non-normal data distributions, and studies that seek to predict key outcomes such as satisfaction and loyalty (Hair et al., 2021). The technique is also widely employed in e-commerce studies due to its robustness in handling complex models with relatively modest sample sizes (Sarstedt et al., 2022). The analysis followed a two-stage approach. First, the measurement model was evaluated to assess indicator reliability, internal consistency, convergent validity, and discriminant validity. This step ensured that all constructs demonstrated adequate psychometric properties. Second, the structural model was tested to examine path coefficients, explanatory power, and mediation effects. Bootstrapping with five thousand subsamples was performed to assess the significance of direct and indirect relationships as recommended in contemporary SEM literature (Hair et al., 2021).

The study adhered to standard ethical procedures for human subjects research. Participation was entirely voluntary, and respondents could withdraw at any time without consequence. The survey did not collect personally identifiable information, and all responses were treated anonymously to protect participants' privacy. Ethical principles were guided by established frameworks for online survey research concerning informed consent, confidentiality, and the responsible handling of digital data.

RESULTS AND DISCUSSION

Respondent Profile

The demographic profile indicates that female users constitute a larger proportion of the sample than male users. This distribution aligns with recent findings that women in Indonesia tend to engage more actively in online shopping, especially on lifestyle and household related product categories (Lestari, 2023). The age distribution shows that the majority of respondents are between 18 and 34 years, reflecting the dominance of younger digital natives in Indonesia's e-commerce market. Younger users also tend to exhibit higher adaptability to online platforms, stronger preference for mobile based transactions, and a greater likelihood of engaging with platform recommendations.

Table 2. Respondent Demographics

Category	Subcategory	Frequency	Percentage
Gender	Male	84	40.4 percent
	Female	124	59.6 percent
Age	18 to 24 years	92	44.2 percent
	25 to 34 years	68	32.7 percent
	35 to 44 years	33	15.9 percent
	Above 44 years	15	7.2 percent
Education Level	Senior High School	48	23.1 percent

	Diploma	28	13.5 percent
	Bachelor's Degree	102	49.0 percent
	Master's Degree or Above	30	14.4 percent
Monthly Online Spending	Less than IDR 500,000	79	38.0 percent
	IDR 500,000 to 1,000,000	82	39.4 percent
	Above IDR 1,000,000	47	22.6 percent
Frequency of E Commerce Use	Once a month	36	17.3 percent
	Two to three times a month	89	42.8 percent
	More than three times a month	83	39.9 percent

In terms of education, nearly half of the respondents hold a bachelor's degree. This suggests that the sample is composed of relatively well educated users who are likely to have strong digital literacy, an important factor in evaluating e service quality, trust mechanisms, and platform usability. Studies also note that digitally literate consumers tend to be more critical and discerning regarding service performance and security features (Qing et al., 2023).

The distribution of monthly online spending reveals that most respondents spend up to one million Indonesian rupiah per month, which corresponds with national market reports showing that Indonesian consumers typically engage in frequent but moderate transaction values across multiple platforms. These spending patterns suggest an active user base that relies on e commerce for routine consumption rather than for high value purchases alone.

Finally, the frequency of e commerce use indicates that more than eighty percent of respondents shop online at least twice a month. This demonstrates a high level of engagement and transactional experience, which is essential for evaluating perceptions of service quality, satisfaction, and loyalty. Frequent users accumulate richer experiential knowledge of platform performance, making them suitable for studies examining behavioral constructs such as satisfaction and loyalty formation (Sarstedt et al., 2022).

Descriptive Statistics

The mean score for e service quality is 5.37 on a seven point scale, indicating that respondents generally perceive the performance of Indonesian e commerce platforms to be above average. This suggests that users find platforms easy to use, responsive, secure, and visually appealing. Contemporary studies show that higher perceived service quality is common in markets with rapidly improving logistics and digital infrastructure, including Indonesia's expanding e commerce ecosystem. The relatively low standard deviation of 0.75 suggests that perceptions of service quality are fairly consistent across respondents, indicating shared expectations and experiences among users in South Sulawesi.

Table 3. Descriptive Statistics of Constructs (n = 208)

Construct	Mean	Standard Deviation	Minimum	Maximum
E-Service Quality	5.37	0.75	1	7
E-Satisfaction	5.47	1.00	1	7
E-Loyalty	5.56	1.10	1	7
Trust	5.88	1.01	1	7

E satisfaction registers a mean of 5.47 with a standard deviation of 1.00, reflecting that most respondents are satisfied or highly satisfied with their online shopping experiences. Satisfaction levels appear slightly more varied than service quality perceptions, which is consistent with literature suggesting that satisfaction is shaped by both platform performance and subjective expectation confirmation (Bhattacharjee, 2001). The broader dispersion indicates that while many users experience strong satisfaction, some report lower levels, possibly due to issues such as delivery inconsistencies or product mismatches, which remain common challenges in Indonesian e commerce (Tolegenov et al., 2024).

The mean for e loyalty is 5.56 with a standard deviation of 1.10, suggesting that respondents demonstrate generally favorable loyalty intentions, including intentions to repurchase, recommend the platform, and prefer it over competitors. The slightly higher variability reflects the competitive landscape of Indonesia's e commerce market, where consumers often use multiple platforms simultaneously and may switch platforms

depending on promotions, product availability, or specific transactional needs (Islam, 2024). Even so, the overall high mean indicates that the platforms represented in the sample have successfully cultivated a positive behavioral commitment among users.

Trust exhibits the highest mean among all constructs at 5.88, with a standard deviation of 1.01. This indicates that respondents perceive e-commerce platforms as highly trustworthy, particularly regarding transaction security, data protection, and the integrity of platform operations. Recent Indonesian studies suggest that improvements in secure payment systems, transparent review features, and dispute resolution mechanisms have contributed significantly to heightened trust among digital consumers (Suhartanto et al., 2022). The elevated mean score for trust is theoretically significant because trust is a foundational antecedent of satisfaction and loyalty in digital environments, especially where users rely on platform assurances to mitigate risk (Islam, 2024).

Collectively, these descriptive statistics illustrate a user base with generally positive perceptions of service quality, high satisfaction levels, strong trust, and favorable loyalty tendencies toward e-commerce platforms. The presence of minimum values at one and maximum values at seven across all constructs suggests that although the overall pattern is positive, some respondents still report very low evaluations. This indicates variability in individual experiences and highlights the importance of analyzing structural relationships to understand how service quality and trust translate into satisfaction and loyalty outcomes.

Common Method Variance Test

Assessment of common method bias was conducted to ensure that the relationships among variables were not artificially inflated due to the use of a single data collection method. Harman’s single factor test revealed that the first unrotated factor accounted for 37.8 percent of the total variance, which is below the commonly accepted threshold of fifty percent. This suggests that no single factor dominates the variance structure of the dataset, indicating that common method variance is unlikely to threaten the validity of the findings (Podsakoff et al., 2003).

Table 4. Common Method Bias Assessment

Test	Criterion	Result
Harman’s Single-Factor Test	A single factor should not account for more than fifty percent of total variance	First unrotated factor explains 37.8 percent of variance
Common Latent Method Variance (CMV) Test	Average variance inflation factor (VIF) values should be below 3.3 to indicate no substantial common method bias (Kock, 2015)	All full collinearity VIF values range from 1.82 to 2.46

In addition, the common latent method variance assessment was performed using full collinearity VIF values. All constructs produced VIF scores between 1.82 and 2.46, which fall well below the recommended threshold of 3.3. According to Kock (2015), VIF values below this benchmark indicate that the model is free from substantive common method bias. The results therefore confirm that the dataset does not exhibit problematic inflation of covariance among variables due to measurement method effects.

Taken together, the results from both procedures demonstrate that common method bias is not a concern in this study. Although the self-report design and online survey format may introduce some degree of shared method influence, the diagnostic tests suggest that such effects are minimal and do not compromise the interpretation of structural relationships among e-service quality, trust, e-satisfaction, and e-loyalty.

Measurement Model

The measurement model demonstrates strong psychometric properties across all constructs. All standardized loadings exceed the recommended minimum value of 0.70, which indicates that each indicator provides substantial explanatory value for its corresponding latent construct (Hair et al., 2021). The lowest loading value is 0.783 for ESQ6, and the highest loading is 0.929 for ELOY3, both of which fall within an acceptable range and demonstrate robust indicator reliability.

Table 5. Measurement Model Evaluation

Construct	Item	Loading	Cronbach Alpha	Composite Reliability	AVE
E Service Quality	ESQ1	0.812	0.886	0.913	0.637
	ESQ2	0.846			
	ESQ3	0.821			
	ESQ4	0.784			
	ESQ5	0.806			
	ESQ6	0.783			
E Satisfaction	ESAT1	0.892	0.878	0.921	0.796
	ESAT2	0.876			
	ESAT3	0.905			
E Loyalty	ELOY1	0.904	0.899	0.936	0.830
	ELOY2	0.889			
	ELOY3	0.929			
Trust	TRU1	0.893	0.886	0.926	0.806
	TRU2	0.871			
	TRU3	0.921			

Cronbach alpha values for all constructs range from 0.878 to 0.899, which surpasses the threshold of 0.70 typically used to indicate internal consistency (Nunnally, J.C. & Bernstein, I.H, 1994). Composite reliability values also fall between 0.913 and 0.936, further confirming that the measurement model exhibits excellent internal consistency. Composite reliability is considered more appropriate than alpha in PLS SEM because it accounts for differing indicator loadings, and all values in this study exceed the recommended 0.70 guideline (Sarstedt et al., 2022).

The average variance extracted values for all constructs are above 0.63, with the highest being 0.830 for e loyalty. Since all AVE values exceed the recommended threshold of 0.50, this indicates that each construct captures more than half of the variance of its indicators, demonstrating adequate convergent validity (Fornell & Larcker, 1981). Constructs such as e satisfaction and trust exceed AVE values of 0.79, reflecting exceptionally strong convergence among their indicators.

Taken together, the results confirm that the measurement model exhibits high reliability and convergent validity. These findings provide a strong foundation for subsequent structural model evaluation, ensuring that the relationships among e service quality, trust, e satisfaction, and e loyalty can be tested with confidence in the quality of the measurement properties.

Table 6. Discriminant Validity (Fornell Larcker Criterion)

Construct	E Service Quality	E Satisfaction	E Loyalty	Trust
E Service Quality	0.798			
E Satisfaction	0.632	0.892		
E Loyalty	0.601	0.721	0.911	
Trust	0.587	0.679	0.693	0.898

The discriminant validity of the constructs was assessed using both the Fornell Larcker criterion and the HTMT ratio, which are widely recommended in PLS SEM research for evaluating construct distinctiveness (Sarstedt et al., 2022).

The square root of each construct's AVE, shown on the diagonal, is greater than its correlations with other constructs. For example, the square root of the AVE for e satisfaction is 0.892, which exceeds its correlations with e service quality (0.632), e loyalty (0.721), and trust (0.679). This pattern holds across all constructs and indicates that each latent variable shares more variance with its own indicators than with other variables in the model. Thus, the Fornell Larcker test confirms satisfactory discriminant validity (Fornell & Larcker, 1981).

Table 7. Heterotrait Monotrait Ratio (HTMT)

Construct Pair	HTMT Value
E Service Quality – E Satisfaction	0.708
E Service Quality – E Loyalty	0.654
E Service Quality – Trust	0.612
E Satisfaction – E Loyalty	0.781
E Satisfaction – Trust	0.752
E Loyalty – Trust	0.769

All HTMT values fall between 0.612 and 0.781, well below the conservative threshold of 0.85 recommended for conceptually distinct constructs (Henseler et al., 2015). These results further support the conclusion that the constructs in this study are empirically distinct and do not suffer from conceptual overlap. The highest HTMT value is 0.781 for the relationship between e satisfaction and e loyalty, which remains acceptable given that satisfaction and loyalty are theoretically related yet distinct constructs in consumer behavior literature (Oliver et al., 2015).

The combined evidence from both tests confirms that the measurement model possesses strong discriminant validity. This means that e service quality, trust, e satisfaction, and e loyalty are reliably measured as separate constructs in the perception of Indonesian e commerce users. Establishing discriminant validity is essential for accurate interpretation of the structural paths, ensuring that the observed relationships reflect true theoretical linkages rather than measurement artifacts.

Structural Measurement

The coefficient of determination (R^2) reflects the extent to which the independent variables explain the variance in the endogenous constructs. The R^2 value for e satisfaction is 0.58, meaning that e service quality and trust jointly explain 58 percent of the variance in satisfaction. According to Hair et al. (2021), this represents a medium to substantial level of explanatory power for behavioral research. The R^2 for e loyalty is 0.67, indicating that e service quality, trust, and e satisfaction collectively explain 67 percent of the variance in loyalty. This level demonstrates strong explanatory power and aligns with research suggesting that satisfaction is a robust predictor of loyalty in digital commerce (Kim & Yum, 2024).

Table 8. Model Fit and Predictive Power

Construct	R^2	Q^2 (Blindfolding)	Interpretation of Predictive Relevance
E Satisfaction	0.58	0.41	Medium to strong predictive relevance
E Loyalty	0.67	0.46	Strong predictive relevance
Predictive Power			
Path	f^2	Effect Size Interpretation	
E Service Quality → E Satisfaction	0.18	Medium	
Trust → E Satisfaction	0.26	Medium to strong	
E Satisfaction → E Loyalty	0.39	Strong	
E Service Quality → E Loyalty	0.07	Small	
Trust → E Loyalty	0.11	Small to medium	

The Q^2 values obtained through blindfolding are 0.41 for e satisfaction and 0.46 for e loyalty. As Q^2 values above zero indicate predictive relevance, and values above 0.35 demonstrate strong predictive capability Chin (1998), these results confirm that the model exhibits excellent out-of-sample predictive relevance. This strengthens confidence that the structural relationships hold practical utility for predicting real consumer behavioral outcomes.

The f^2 values provide insight into the contribution of each predictor to its respective endogenous construct. The effect sizes for the paths leading to e satisfaction show that trust ($f^2 = 0.26$) has a stronger influence on satisfaction than e service quality ($f^2 = 0.18$). This aligns with literature emphasizing trust as a central psychological determinant in online environments where uncertainty is high (Suhartanto et al., 2022).

The effect size of e satisfaction on e-loyalty is strong ($f^2 = 0.39$), confirming its pivotal role as a mediating construct that transforms perceptions into behavioral intentions. In contrast, the direct effects of e service

quality ($f^2 = 0.07$) and trust ($f^2 = 0.11$) on loyalty are smaller, suggesting that their influence operates more powerfully through satisfaction rather than through direct pathways. This pattern is consistent with the Stimulus Organism Response framework and supports your mediation hypotheses.

The combination of strong R^2 values, high Q^2 values, and meaningful effect sizes indicates that the model demonstrates robust predictive performance. Satisfaction emerges as the most influential construct in shaping loyalty, and trust plays a dominant role in shaping satisfaction. These results collectively validate the theoretical model and provide a strong foundation for mediation testing and structural path interpretation.

Hypothesis Testing

The path from e service quality to e loyalty ($\beta = 0.18, p = 0.016$) is positive and significant, indicating that users who perceive higher levels of service quality tend to exhibit stronger loyalty toward e commerce platforms. Although the effect is modest, this aligns with prior findings that service quality exerts both direct and indirect effects on loyalty in digital retail environments (Dos Santos Gonçalves et al., 2021).

E-service quality also exerts a significant positive effect on e satisfaction ($\beta = 0.34, p < 0.001$). This finding is consistent with Expectation Confirmation Theory, which posits that perceived performance drives satisfaction (Bhattacharjee, 2001). The magnitude of this effect indicates that improvements in usability, responsiveness, security, and personalization significantly enhance user satisfaction.

The path from trust to e loyalty ($\beta = 0.22, p = 0.003$) is also significant. This result supports Commitment Trust Theory and confirms that trust remains a central determinant of behavioral intentions in online commerce where perceived risk is high (Morgan & Hunt, 1994; Suhartanto et al., 2022). Users who have confidence in platform integrity and security are more likely to remain committed.

Trust demonstrates the strongest direct effect on e satisfaction ($\beta = 0.41, p < 0.001$). This underscores the centrality of trust as a psychological assurance mechanism that enhances positive evaluative judgments, especially in contexts such as Indonesian e commerce where platform reliability varies (Tulegenov et al., 2024). This path represents the strongest predictor of satisfaction in the model.

E satisfaction strongly predicts e loyalty ($\beta = 0.49, p < 0.001$), representing the highest magnitude among all direct effects. This aligns with the Attitude Formation Theory and extensive empirical evidence showing that satisfaction is the most powerful determinant of loyalty in online purchasing (Kim & Yum, 2024; Oliver et al., 2015).

Table 9. Direct Effect

Hypothesized Path	β Coefficient	t Value	p Value	Significance
E Service Quality \rightarrow E Loyalty	0.18	2.41	0.016	Significant
E Service Quality \rightarrow E Satisfaction	0.34	5.12	< 0.001	Significant
Trust \rightarrow E Loyalty	0.22	2.97	0.003	Significant
Trust \rightarrow E Satisfaction	0.41	6.08	< 0.001	Significant
E Satisfaction \rightarrow E Loyalty	0.49	7.44	< 0.001	Significant

The indirect effect of e service quality on e-loyalty through e satisfaction ($\beta = 0.17, p < 0.001$) indicates partial mediation. This means service quality influences loyalty both directly and through satisfaction. The mediated effect is nearly as strong as the direct effect, confirming the importance of satisfaction as a psychological mechanism.

Similarly, the indirect effect of trust on e-loyalty through e satisfaction ($\beta = 0.20, p < 0.001$) also indicates partial mediation. The magnitude of this indirect effect is even larger than the direct effect, demonstrating that trust contributes most strongly to loyalty by first enhancing satisfaction. This pattern reinforces theoretical assertions that satisfaction serves as a key internal pathway linking cognitive assessments such as trust to behavioral outcomes.

Table 10. Indirect Effect

Mediation Path	Indirect β	t Value	p Value	Mediation Type
E Service Quality \rightarrow E Satisfaction \rightarrow E Loyalty	0.17	4.83	< 0.001	Partial Mediation
Trust \rightarrow E Satisfaction \rightarrow E Loyalty	0.20	5.51	< 0.001	Partial Mediation

The results collectively confirm all hypothesized relationships. Trust emerges as the most influential precursor of satisfaction, and satisfaction is the strongest predictor of loyalty. The significance of both mediated pathways highlights the central role of satisfaction in shaping loyalty formation in Indonesian e-commerce.

Discussion

The results of this study confirm that e-service quality and trust both play substantial roles in shaping e-satisfaction and e-loyalty among Indonesian e-commerce users. The structural model demonstrates that trust exerts the strongest influence on satisfaction, while satisfaction itself is the most powerful predictor of loyalty. These findings support established theoretical perspectives such as Expectation Confirmation Theory, which posits that positive performance perceptions generate satisfaction, and the Stimulus Organism Response framework, which explains loyalty as a behavioral response to cognitive and affective evaluations (Bhattacharjee, 2001; Russell & Mehrabian, 1974).

The significant effect of e-service quality on both satisfaction and loyalty aligns with previous research showing that usability, responsiveness, reliability, and interface design are crucial determinants of online consumer evaluations. Empirical studies in Indonesia and other emerging markets have demonstrated that improvements in service performance strengthen customer satisfaction and retention in online shopping contexts (Ighomereho et al., 2022; Jing et al., 2023). Research also suggests that users in Southeast Asia place high value on delivery timeliness, clear product information, and efficient customer support, all of which are central components of e-service quality (Dos Santos Gonçalves et al., 2021). The present findings corroborate these insights, indicating that service quality remains an essential foundation for fostering positive consumer responses.

Trust also strongly predicts satisfaction and loyalty, with its effect on satisfaction being the strongest among all predictors. This is consistent with Commitment Trust Theory, which identifies trust as a central element in sustaining long-term relationships in digital environments characterized by risk and limited physical interaction (Morgan & Hunt, 1994). Recent work in e-commerce demonstrates that perceptions of platform integrity, security, and transaction fairness significantly increase satisfaction and repurchase intentions (Kim & Yum, 2024; Suhartanto et al., 2022). Indonesian studies similarly report that trust is critical for mitigating concerns about product authenticity, data security, and seller transparency (Tolegenov et al., 2024). The current findings thus reinforce the consensus that trust is indispensable for shaping customer evaluations in digital retail settings.

Satisfaction emerges as the strongest direct predictor of loyalty, which supports a substantial body of literature demonstrating that satisfied users are more likely to maintain platform preference, repeat purchases, and engage in positive word-of-mouth behavior (Kim & Yum, 2024; Oliver et al., 2015). In Indonesian e-commerce, satisfaction has been shown to play a central role in influencing consumers' continued engagement, particularly in competitive environments where switching costs are low and multiple platforms offer similar services (Aminullah et al., 2024). The results from this study provide updated regional evidence that satisfaction remains the primary mechanism through which consumers translate platform evaluations into behavioral loyalty.

The mediation analysis reveals that satisfaction partially mediates the effects of both e-service quality and trust on loyalty. This pattern is theoretically aligned with the Stimulus Organism Response model, which suggests that external platform attributes influence internal psychological states, which then shape behavioral outcomes (Russell & Mehrabian, 1974). Recent empirical studies in e-commerce report similar mediation effects, indicating that service quality and trust contribute more strongly to loyalty when they first enhance satisfaction (Qing et al., 2023; Zhang et al., 2021). The partial nature of the mediation in this study suggests that while satisfaction is a key psychological mechanism, service quality and trust also exert some direct influence on loyalty, indicating a combination of cognitive and affective pathways.

A further contribution of this study lies in clarifying the relative magnitude of trust and service quality in shaping satisfaction and loyalty in an Indonesian context. Some prior studies have reported inconsistent effects of trust depending on platform type, product category, or user experience (Liu & Wang, 2025). However, the present findings show a robust and significant effect of trust across all pathways, reinforcing the importance of building and maintaining trust in an environment where online fraud, counterfeit products, and delivery issues remain consumer concerns. This highlights the strategic value of transparency,

secure payment systems, and reliable customer service in strengthening trust among Indonesian e-commerce users.

Overall, the findings provide strong evidence that loyalty in Indonesian e-commerce is formed through a multi-stage process in which service quality and trust shape satisfaction, and satisfaction in turn drives behavioral commitment. This supports recent calls for more integrative models of online consumer behavior that combine multiple psychological and platform-related antecedents (Sun et al., 2024). The study therefore contributes theoretically by validating a comprehensive framework that integrates cognitive, affective, and behavioral components, and practically by highlighting key areas where e-commerce platforms in Indonesia can intervene to strengthen user loyalty.

CONCLUSION

This study examined how e-service quality and trust shape e-satisfaction and e-loyalty within the Indonesian e-commerce environment. The findings show that both e-service quality and trust significantly enhance satisfaction, while satisfaction itself emerges as the strongest predictor of loyalty. Trust demonstrated the greatest influence on satisfaction, underscoring its importance in online transactions where concerns about security, fairness, and reliability are prominent. Satisfaction also partially mediates the effects of both service quality and trust on loyalty, indicating that loyalty develops through a sequence of evaluations rather than through direct perceptions alone. These results collectively highlight the interconnected roles of platform performance, psychological assurance, and experiential evaluations in fostering long-term user loyalty.

The study offers practical implications for platform managers and policymakers. Strengthening trust through secure payment systems, transparent operations, and effective customer support is essential for cultivating satisfaction and encouraging repeat use. Enhancing service quality through improved usability, responsiveness, and personalization can further reinforce positive user experiences. For regulators, the findings point to the value of supporting consumer protection frameworks that enhance platform credibility and ensure fair digital marketplace practices.

Nonetheless, several limitations should be acknowledged. The use of non-probability purposive sampling limits broader generalization, as the sample represents active users concentrated in South Sulawesi. The cross-sectional design does not capture changes in satisfaction or loyalty over time, and reliance on self-reported measures may introduce perceptual bias.

Future research should expand sampling across multiple regions to enhance representativeness and incorporate longitudinal designs to better understand evolving user evaluations. Further studies may include additional constructs such as perceived value, platform governance, or algorithmic transparency. Mixed method approaches could also enrich understanding by capturing deeper qualitative insights into user trust and satisfaction formation.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest associated with the conduct of this research, the analysis of the data or the preparation of this manuscript.

DATA AVAILABILITY

The data supporting the findings of this study are available from the corresponding author upon reasonable request. Due to the involvement of identifiable business respondents, the dataset has been anonymised to protect confidentiality and cannot be publicly shared.

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