

User Experience, Perceived Quality, and Service Quality as Determinants of E-Commerce Loyalty Mediated by Trust

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Abstract

Purpose: This study investigates the effects of user experience, perceived quality, service quality, and customer engagement on customer loyalty in e-commerce, with consumer trust as a mediating variable.

Research Methodology: A quantitative approach was applied using survey data collected from 389 e-commerce users in Indonesia. The data were analyzed using Structural Equation Modeling (SEM) to examine the proposed relationships.

Results: User experience, perceived quality, and service quality significantly enhance consumer trust. Consumer trust positively influences customer loyalty and mediates the relationship between these factors and loyalty. Customer engagement significantly affects loyalty both directly and indirectly through consumer trust. However, service quality does not show a significant direct effect on customer loyalty.

Conclusions: Consumer trust plays a central role in developing customer loyalty in e-commerce. Enhancing user experience, perceived quality, service quality, and customer engagement can strengthen trust and encourage long-term customer relationships.

Limitations: This study is limited to Indonesian e-commerce users and employs a cross-sectional design, which may restrict broader generalization.

Contributions: This study extends e-commerce loyalty research by demonstrating the mediating role of consumer trust and highlighting customer engagement as both a direct and indirect determinant of loyalty.

Keywords: *Customer Engagement, Customer Loyalty, Consumer Trust, Perceived Quality, Service Quality, User Experience*

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1. Introduction

The rapid expansion of e-commerce has fundamentally transformed business operations and consumer decision-making processes. However, sustaining customer loyalty in digital markets remains a major challenge because online transactions involve higher levels of uncertainty, limited physical interaction, and greater dependence on consumers' perceptions of reliability and credibility. Consequently, consumer trust has emerged as a critical mechanism that determines whether customers are willing to maintain long-term relationships with e-commerce platforms. Previous studies have emphasized that trust influences consumers' willingness to transact, repurchase, and develop loyalty toward online retailers ([Pereira, Cardoso, & Dionísio, 2017](#); [Shaheen et al., 2020](#)). Nevertheless,

existing research has largely examined trust as an outcome of individual factors, such as website security, perceived risk, or service reliability, rather than investigating how multiple experiential and relational factors collectively shape trust and subsequent loyalty formation.

Recent studies indicate that user experience, perceived quality, service quality, and customer engagement represent important determinants of customer loyalty in e-commerce environments. User experience reflects consumers' overall interactions with digital platforms, including usability, convenience, and interface effectiveness. Previous research demonstrates that intuitive website design, seamless navigation, and efficient purchasing processes contribute to customer satisfaction and repeat purchase intentions ([Khan et al., 2023](#)). Similarly, perceived quality, which encompasses product information, website quality, and service reliability, influences consumers' evaluations and confidence in online transactions ([Jiang et al., 2016](#)). Service quality, including delivery performance, responsiveness, and after-sales support, has also been recognized as an important factor affecting online customer relationships ([Sopyan et al., 2023](#)). Furthermore, customer engagement has gained increasing attention because active interactions with brands through digital platforms can strengthen emotional attachment and encourage loyalty behaviors ([Molinillo et al., 2020](#)).

However, despite extensive research on these determinants, several theoretical limitations remain. First, previous studies have frequently investigated these factors separately, resulting in limited understanding of how experiential, quality-related, and relational factors simultaneously interact in explaining customer loyalty. Second, existing findings regarding direct relationships between service-related factors and loyalty remain inconsistent, suggesting that the mechanisms underlying loyalty formation may involve intervening psychological processes. Third, although consumer trust has been acknowledged as an important predictor of loyalty, its mediating role in connecting customers' perceptions and engagement behaviors with loyalty outcomes remains insufficiently explored, particularly in emerging e-commerce markets such as Indonesia.

Previous research provides fragmented evidence regarding these relationships. For example, [Saputra \(2021\)](#) found that user experience does not directly influence loyalty but enhances loyalty through customer satisfaction, indicating that psychological mechanisms may explain the relationship between digital experiences and behavioral outcomes. [Meanwhile, Zhang \(2023\)](#) demonstrated that customer experience dimensions, including usability, service experience, product quality, and logistics efficiency, directly contribute to loyalty in cross-border e-commerce platforms. These contrasting findings indicate that customer loyalty cannot be fully explained through direct effects alone and requires a more integrated model incorporating trust as a central explanatory mechanism.

Therefore, this study addresses these theoretical gaps by developing an integrated framework that examines the simultaneous effects of user experience, perceived quality, service quality, and customer engagement on customer loyalty through consumer trust. Unlike previous studies that primarily focus on isolated antecedents, this research positions consumer trust as a mediating mechanism that explains how customers' evaluations and interactions with e-commerce platforms are transformed into loyalty behaviors. By doing so, this study contributes to e-commerce literature by providing a more comprehensive understanding of loyalty formation and offering practical insights for e-commerce platforms seeking to strengthen customer relationships in competitive digital markets.

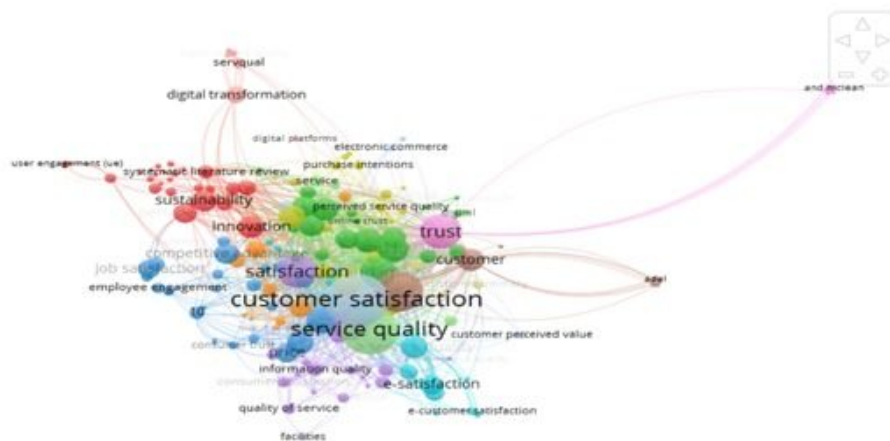


Figure 1. Output of Vos viewer/ research gap and novelty

The VOSviewer analysis as presented in Figure 1 indicates that existing research on e-commerce loyalty has primarily focused on well-established constructs, such as service quality, customer satisfaction, and trust, which demonstrate strong and densely connected relationships within the literature. In contrast, constructs related to digital user experience and customer engagement appear to be less integrated within these established research networks. This pattern suggests that the current literature has not yet fully captured the interconnected role of digital experiences, perceived quality, and customer engagement in explaining customer loyalty formation.

More specifically, limited attention has been given to understanding how user experience, perceived quality, and customer engagement simultaneously influence customer loyalty through consumer trust as an underlying mechanism. Previous studies have largely examined direct relationships between service-related factors and loyalty outcomes, with less emphasis on the process through which customers' digital experiences and engagement behaviors develop trust and subsequently strengthen loyalty. As a result, the theoretical pathways connecting experiential, cognitive, and relational factors in e-commerce loyalty models remain fragmented.

Therefore, this study addresses this gap by examining the mediating role of consumer trust in the relationships between user experience, perceived quality, service quality, customer engagement, and customer loyalty. By integrating these constructs into a unified framework, this research contributes to a deeper understanding of loyalty development in digital commerce environments and provides practical insights for e-commerce platforms seeking to enhance customer relationships through improved experiences, quality perceptions, and engagement strategies. The research gap of this study shown in Table 1.

Table 1. Research Gap Mapping

Theme / Variable	What Existing Research Has Established	Identified Gaps	Implications for Current Study
Consumer Trust in E-Commerce	Consumer trust is recognized as a critical determinant of e-commerce adoption and loyalty, influenced by factors such as website credibility, perceived security, service quality, and online reviews (Misra & Pandey, 2022; Pereira et al., 2017; Shaheen et al., 2020).	Previous studies have mainly examined individual antecedents of trust, providing limited insight into how multiple customer experience factors collectively shape trust and loyalty.	This study examines trust as a central mechanism connecting user experience, perceived quality, service quality, and customer engagement with customer loyalty.
Perceived Quality	Perceived quality, including product information, website quality, security, and service reliability, influences customer evaluations and trust in online transactions (Hariharan et al., 2023; Jiang et al., 2016).	Existing research has rarely integrated perceived quality with other experiential and relational factors to explain loyalty formation through trust.	This study incorporates perceived quality into an integrated loyalty framework mediated by consumer trust.
Service Quality	Service quality dimensions, such as delivery reliability, responsiveness, and return management, contribute to customer satisfaction and loyalty (Jiang et al., 2016; Sopyan et al., 2023).	The role of service quality in developing loyalty through trust remains insufficiently explored, particularly when combined with digital experience factors.	This study investigates how service quality contributes to trust development and loyalty outcomes within a comprehensive model.
Customer Engagement	Customer engagement through personalization, social interaction, and digital communities strengthens customer relationships and loyalty intentions (Molinillo et al., 2020; Ashiq & Hussain, 2024).	Limited studies examine how customer engagement interacts with user experience, perceived quality, and service quality in building trust-based loyalty.	This study evaluates customer engagement as both a direct predictor of loyalty and an indirect driver through trust.
Interaction Among Factors	Previous studies suggest that multiple customer experience dimensions jointly influence loyalty outcomes in digital commerce (Fan et al., 2022).	Existing models remain fragmented, with limited integration of experiential, quality, and relational variables within a unified framework.	This study develops an integrated model combining user experience, perceived quality, service quality, engagement, trust, and loyalty.

Theme / Variable	What Existing Research Has Established	Identified Gaps	Implications for Current Study
Mediating Role of Trust	Prior research has highlighted satisfaction as a mediator between user experience and loyalty (Saputra, 2021), while other studies demonstrate direct effects of experience dimensions on loyalty (Zhang, 2023).	The mediating role of trust in explaining how customer perceptions and interactions translate into loyalty remains underdeveloped.	This study positions consumer trust as a key mediator to explain the psychological mechanism underlying e-commerce loyalty formation.
Contextual Variation in E-Commerce	Research across different e-commerce contexts demonstrates that UX, logistics, and payment experiences influence customer loyalty differently (Zhang, 2023).	Findings remain context-dependent, and further evidence is needed from emerging e-commerce markets such as Indonesia.	This study provides empirical evidence from Indonesian e-commerce users to extend understanding of loyalty development in digital markets.

This study aims to address existing research gaps by providing a more comprehensive understanding of how e-commerce experiences influence consumer loyalty through the mediating role of trust. Although e-commerce has rapidly transformed consumer–firm interactions, maintaining customer loyalty remains challenging due to increasing competition and uncertainty in digital transactions. Prior studies have emphasized the importance of trust in shaping loyalty; however, most research has examined isolated factors, such as website design, security, perceived quality, or service quality, rather than exploring how these elements collectively contribute to trust development and loyalty formation. Furthermore, the mechanism through which trust mediates the relationship between customer experience factors and loyalty remains insufficiently understood. Existing findings are also often context-specific, particularly in cross-border e-commerce settings, limiting their applicability to broader digital commerce environments. Therefore, this study integrates user experience, perceived quality, service quality, and customer engagement into a unified framework to examine how these factors jointly influence customer loyalty through consumer trust.

2. Literature Review and Hypotheses Development

2.1 User Experience and Customer Trust

User experience (UX) represents consumers' overall perceptions and responses resulting from interactions with digital platforms, including usability, accessibility, efficiency, and emotional responses. In e-commerce, UX plays an important role in reducing uncertainty because consumers rely on digital interfaces when evaluating products and services. Based on the Technology Acceptance Model (TAM), perceived ease of use and usefulness influence users' acceptance and confidence toward technology-based platforms. A positive UX therefore increases consumers' confidence that an e-commerce platform is reliable and capable of fulfilling their expectations.

Previous studies demonstrate that intuitive navigation, efficient checkout processes, responsive interfaces, and personalization enhance customer satisfaction and perceived reliability in digital environments ((Gusfi et al., 2024); (Prasetyo & Larasae, 2024)). However, UX research has primarily focused on usability outcomes, while its role in developing consumer trust remains less explored. Therefore, this study argues that a superior UX strengthens consumer trust by reducing perceived uncertainty and improving confidence in online transactions.

2.2 Perceived Quality and Customer Trust

Perceived quality refers to consumers' overall evaluation of a product, service, or platform based on whether performance meets their expectations. According to Expectation Confirmation Theory,

consumers evaluate quality by comparing perceived performance with prior expectations. Meanwhile, Signaling Theory explains that quality indicators, such as accurate information, professional website design, and reliable services, function as signals that reduce information asymmetry between consumers and online sellers.

Previous studies indicate that perceived quality improves satisfaction, purchase intention, and trust in e-commerce platforms (([Avriyanti & Handriana, 2022](#)); ([Widjaya & Padmoprayitno, 2022](#))). Nevertheless, existing studies often examine perceived quality as an outcome variable rather than as a mechanism influencing loyalty through trust. This study extends previous research by positioning perceived quality as an antecedent of consumer trust.

2.3 Hypotheses Development

2.3.1 Effects of User Experience, Perceived Quality, Service Quality, and Customer Engagement on Customer Trust

In digital commerce, trust develops when consumers perceive that platforms are easy to use, reliable, and capable of delivering expected outcomes. Based on TAM and Signaling Theory, positive experiences and quality signals reduce uncertainty and increase consumer confidence. A well-designed user experience improves platform credibility, while perceived quality and service quality provide evidence of reliability. Furthermore, according to Social Exchange Theory, active customer engagement strengthens relational connections and trust.

Therefore, the following hypotheses are proposed:

H₁: User experience positively influences customer trust

H₂: Perceived quality positively influences customer trust

H₃: Service quality positively influences customer trust

H₄: Customer engagement positively influences customer trust

2.3.2 Effects of User Experience, Perceived Quality, Service Quality, and Customer Engagement on Customer Loyalty

Customer loyalty is developed through positive evaluations and meaningful interactions with digital platforms. Based on Relationship Marketing Theory, customers are more likely to maintain relationships when they perceive consistent value and satisfactory experiences. Superior UX improves satisfaction and encourages repeated usage, while perceived quality and service quality strengthen positive evaluations. Additionally, engaged customers develop stronger emotional connections with brands, increasing loyalty intentions. Thus, the following hypotheses are proposed:

H₅: User experience positively influences customer loyalty

H₆: Perceived quality positively influences customer loyalty

H₇: Service quality positively influences customer loyalty

H₈: Customer engagement positively influences customer loyalty

2.3.3 Mediating Role of Customer Trust on Customer Loyalty

Trust serves as a psychological mechanism that transforms positive customer experiences into loyalty behaviors. According to Commitment-Trust Theory, trust encourages customers to maintain relationships because it reduces perceived risk and increases confidence in future interactions. In e-commerce, consumers who trust a platform are more likely to repurchase, recommend, and maintain long-term relationships.

Previous studies confirm that trust enhances loyalty by strengthening customers' confidence in digital platforms (([Iglesias et al., 2019](#)); [[Sharma & Klein, 2023](#)]). Therefore, trust is expected to mediate the

relationships between customer experience factors and loyalty. The hypothesis is formulated as follows:

H₉: Customer trust positively influences customer loyalty

Based on the theoretical framework and the relationships identified in the literature review, this study proposes an integrated research model to examine the determinants of customer loyalty in e-commerce environments. The model positions consumer trust as a key mediating mechanism that explains how user experience, perceived quality, service quality, and customer engagement influence customer loyalty. The proposed framework combines experiential, quality-related, and relational perspectives to provide a comprehensive understanding of loyalty formation in digital commerce. The direct and indirect relationships among the constructs are illustrated in Figure 2.

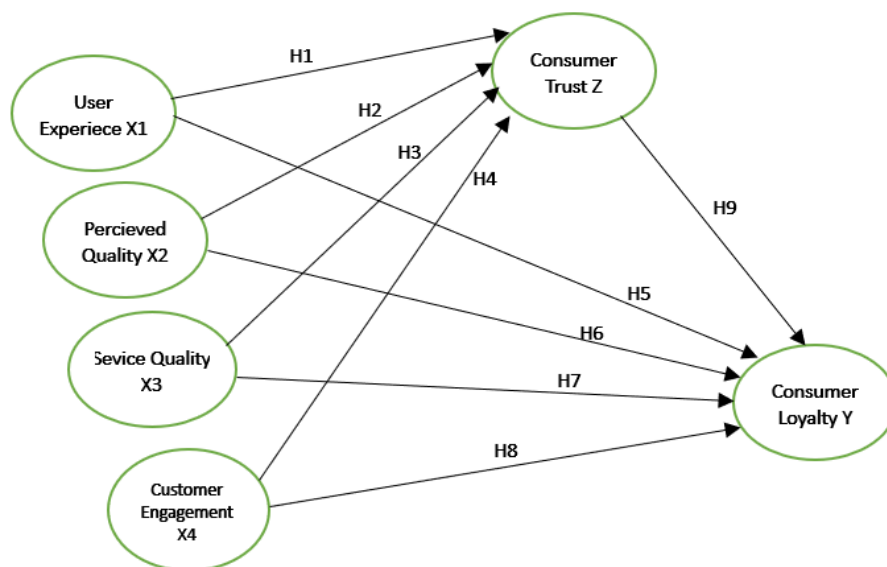


Figure 2. Framework model

Figure 2 illustrates the hypothesized relationships among the research variables. User experience (X1), perceived quality (X2), service quality (X3), and customer engagement (X4) are proposed as antecedents that influence consumer trust (Z) and customer loyalty (Y). Specifically, consumer trust is expected to function as a mediating variable that strengthens the relationship between customer experience-related factors and loyalty outcomes. The model proposes that higher levels of user experience, perceived quality, service quality, and customer engagement enhance consumer trust, which subsequently encourages customer loyalty. In addition, the framework examines the direct effects of these antecedent variables on loyalty to determine their independent contributions within the e-commerce context.

The framework is developed based on Technology Acceptance Model (TAM), Signaling Theory, Service-Dominant Logic, Social Exchange Theory, and Commitment-Trust Theory, which collectively explain how digital experiences, perceived value, service interactions, and relational engagement contribute to trust development and long-term customer relationships.

2.4 Service Quality and Customer Trust

Service quality represents the extent to which online retailers provide reliable, responsive, secure, and efficient services. The Service-Dominant Logic (SDL) perspective suggests that value is co-created through interactions between firms and customers, making service quality a fundamental element in relationship development. In e-commerce environments, service quality is reflected through delivery reliability, customer support responsiveness, privacy protection, and effective problem resolution. Prior studies confirm that high e-service quality enhances satisfaction and trust (([Rizal Awaluddin & Budi, 2024](#)); ([Pradnyadewi & Giantari, 2022](#))). However, the mechanism through which service

quality contributes to loyalty through trust requires further examination. Thus, this study investigates service quality as an important factor in building consumer trust.

2.5 Customer Engagement and Customer Trust

Customer engagement reflects consumers' cognitive, emotional, and behavioral involvement with an e-commerce platform beyond transactional activities. Based on Social Exchange Theory, continuous interactions between customers and firms strengthen relational bonds and encourage mutual trust. Digital interactions, personalized communication, and online communities enhance customer involvement and strengthen consumers' psychological attachment to brands. Previous research indicates that customer engagement contributes to loyalty and relationship development (([Ahmad et al., 2022](#)); ([Molinillo et al., 2020](#))). However, limited studies explain how engagement contributes to trust formation in e-commerce contexts. Therefore, this study examines customer engagement as an antecedent of consumer trust.

2.6 Customer Loyalty and Consumer Trust

Customer loyalty represents customers' willingness to maintain long-term relationships with an e-commerce platform through repeat purchases, positive recommendations, and continued usage. According to the Commitment-Trust Theory of Relationship Marketing, trust is a fundamental condition for developing strong and sustainable customer relationships.

Previous studies show that trust enhances purchase intention, satisfaction, and loyalty because trusted platforms reduce perceived risk and increase customers' willingness to continue transactions ([Tjahyono, & Mahmud, 2024](#); [Al-Ayed, 2022](#)). However, previous studies have frequently examined trust as a direct predictor rather than as a mechanism linking multiple customer experience factors with loyalty. This study therefore investigates trust as a central mediator in e-commerce loyalty formation.

3. Research Methodology

3.1 Respondents and Sampling Procedure

The target population of this study consists of consumers who have experience purchasing products or services through e-commerce platforms in Indonesia. Respondents were selected based on the following criteria: having made at least one purchase through an e-commerce platform within the last six months, being at least 18 years old, and having sufficient experience interacting with e-commerce platforms to evaluate user experience, perceived quality, service quality, customer engagement, trust, and loyalty.

This study employed a purposive sampling technique because the research required respondents with specific characteristics and direct experience with e-commerce transactions. The online questionnaire was distributed through digital channels, including social media platforms, online communities, and personal networks, to reach diverse groups of e-commerce users. To improve sample heterogeneity, respondents were selected from different demographic backgrounds, including age, gender, occupation, income level, and geographical location.

The minimum sample size was determined using Cochran formula for an unknown population size with a 95% confidence level and a 5% margin of error, resulting in a minimum requirement of 385 respondents. This sample size is also considered adequate for PLS-SEM analysis, which is appropriate for complex models involving multiple latent constructs and mediation relationships ([Hair et al., 2022](#)). A total of 389 valid responses were obtained and used for further analysis.

3.2 Data Collection and Measurement Instruments

Data were collected using a structured online questionnaire consisting of two sections. The first section collected respondents' demographic information, including age, gender, occupation, income level, shopping frequency, and preferred e-commerce platforms. The second section measured the research constructs using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The measurement items were adapted from previously validated instruments to ensure construct reliability and validity. User Experience (UX) was measured based on dimensions related to usability, ease of navigation, efficiency, and interaction quality, adapted from established UX measurement approaches developed by [Maier, Thatcher, Grover, and Dwivedi \(2023\)](#) and [Lim and Rasul \(2022\)](#). Perceived Quality was assessed using indicators related to product information accuracy, website quality, and overall platform performance, adapted from [Jiang, Jun, and Yang \(2016\)](#) and [Kim, Lee, and Jung \(2020\)](#).

Service Quality was measured using dimensions of reliability, responsiveness, fulfillment, and privacy/security adapted from the e-service quality framework developed by [Pradnyadewi and Giantari \(2022\)](#) and further applied in e-commerce studies. Customer Engagement was measured based on cognitive, emotional, and behavioral dimensions following the conceptualization of [Hollebeek, Menidjel, Sarstedt, Jansson, and Urbonavicius \(2024\)](#) and [Daghan and Albarq \(2022\)](#). Consumer Trust was evaluated through indicators related to platform reliability, security, integrity, and confidence in online transactions, adapted from [\(Andika & Renaldi, 2024\)](#). Finally, Customer Loyalty was measured through repurchase intention, recommendation intention, and commitment toward the platform based on scales developed by [\(Zhang, 2023\)](#). Before the main survey distribution, the questionnaire was reviewed to ensure clarity and relevance of the measurement items. The collected data were then screened to remove incomplete responses before conducting statistical analysis.

3.3 Data Analysis

This study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS to analyze the proposed research model. PLS-SEM was selected because the objective of this study is prediction-oriented, focusing on explaining the factors that influence customer loyalty and examining the mediating role of consumer trust in e-commerce environments. Unlike covariance-based SEM, which primarily focuses on theory confirmation and model fit evaluation, PLS-SEM is suitable for exploratory and predictive research models involving multiple latent constructs, complex structural relationships, and mediation effects [\(Hair et al., 2022\)](#). Furthermore, PLS-SEM does not require strict assumptions of multivariate normality and is appropriate for behavioral research involving relatively complex models and latent variables.

The analysis was conducted in several stages. First, descriptive statistics were used to summarize respondent characteristics and provide an overview of the research variables. Second, the measurement model was evaluated through reliability and validity assessments, including indicator loading, Cronbach alpha, composite reliability (CR), average variance extracted (AVE), and discriminant validity using the Fornell–Larcker criterion and heterotrait–monotrait ratio (HTMT). Third, the structural model was examined by evaluating path coefficients, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and hypothesis significance using bootstrapping procedures with 5,000 resamples. Finally, mediation analysis was conducted to assess the role of consumer trust in explaining the relationships between user experience, perceived quality, service quality, customer engagement, and customer loyalty. The indirect effects were evaluated through bootstrapping confidence intervals to determine the significance of the mediation relationships. The analysis results provide empirical evidence regarding how customer experience and engagement factors contribute to loyalty formation through consumer trust, offering theoretical and practical implications for e-commerce platforms seeking to strengthen long-term customer relationships.

4. Results and Discussions

The demographic profile in Table 2 of the 389 respondents indicates a relatively balanced distribution across gender, with 49.4% male and 50.6% female participants. This balanced composition provides a broad representation of consumer perspectives without substantial gender dominance. Regarding age, the majority of respondents are concentrated in younger and working-age groups, with 42.4% aged 25–34 years, followed by 35–44 years (25.2%) and 18–24 years (20.1%). Respondents aged 45 years or older represent 12.3% of the sample, indicating that the findings primarily reflect the perceptions of digitally active younger consumers.

Table 2. Respondent Demographic

Demographic Variable	Category / Range	Frequency (n 389)	Percentage (%)
Gender	Male	192	49.4
Gender	Female	197	50.6
Age	18–24 years	78	20.1
Age	25–34 years	165	42.4
Age	35–44 years	98	25.2
Age	45 years or older	48	12.3
Education Level	High school or equivalent	70	18.0
Education Level	Diploma / Associate degree (D-level)	95	24.4
Education Level	Bachelor degree	185	47.6
Education Level	Postgraduate / Graduate (master/doctoral)	39	10.0
Monthly income	< minimum threshold	105	27.0
Monthly income	middle income band	180	46.3
Monthly income	above middle income	104	26.7

In terms of educational background, respondents demonstrate relatively high educational attainment, with 47.6% holding a bachelor's degree and 10.0% possessing postgraduate qualifications. Meanwhile, 24.4% have diploma-level education and 18.0% completed high school education. This profile suggests that most respondents have sufficient digital literacy and experience to evaluate e-commerce-related factors, including user experience, service quality, perceived quality, and consumer trust.

The income distribution shows variation among respondents, with 46.3% classified within the middle-income group, 27.0% in the lower-income group, and 26.7% in the higher-income group. This distribution indicates that the sample represents consumers with diverse economic backgrounds. Overall, the demographic characteristics suggest that the sample captures the perspectives of active e-commerce users across different consumer segments. However, the relatively higher proportion of younger and educated respondents should be considered when interpreting the generalizability of the findings, particularly for older consumers or groups with lower digital adoption levels.

Table 3. Reflective Measurement Model

Construct	Questionnaire Statements (Items)	Outer Loading	α	Composite Reliability (CR)	AVE
User Experience (UX)	UX1: I find the site/app easy to navigate.	0.784	0.822	0.842	0.736
	UX2: The site/app layout and design are visually appealing.	0.815			
	UX3: Finding products or information on the site/app is straightforward	0.700			
Perceived Quality (PQ)	PQ1: The product information (description, images) is accurate and detailed.	0.795	0.861	0.886	0.706
	PQ2: The product delivered matches the description on the site/app.	0.842			

Construct	Questionnaire Statements (Items)	Outer Loading	α	Composite Reliability (CR)	AVE
	PQ3: Packaging and physical quality of the product meet my expectations." PQ4: "Overall, the products from this platform feel high quality for the price.	0.766			
Service Quality (SQ)	SQ1: Orders are delivered on time.	0.836	0.895	0.839	0.759
Service Quality (SQ)	SQ2: The checkout/payment process works smoothly.	0.749			
Service Quality (SQ)	SQ3: Customer support responds promptly when there is an issue.	0.810			
Service Quality (SQ)	SQ4: The return/refund process (if needed) is handled efficiently.	0.782			
Service Quality (SQ)	SQ5: The platform ensures secure payment and protection of my personal data	0.826			
Customer Engagement (CE)	CE1: I frequently visit / browse the site/app even when I don't plan to buy.	0.818	0.915	0.972	0.880
Customer Engagement (CE)	CE2: I participate in reviews, ratings or provide feedback.	0.788			
Customer Engagement (CE)	CE3: I follow/promote the platform (e.g. share products, refer friends).	0.747			
Customer Engagement (CE)	CE4: I feel involved and connected to the platform's community / updates.	0.859			
Consumer Trust (CT)	CT1: I trust this platform to deliver products as promised.	0.885	0.902	0.883	0.784
Consumer Trust (CT)	CT2: I feel safe providing payment information on this site/app.	0.813			
Consumer Trust (CT)	CT3: I believe the platform is honest and transparent about products and policies.	0.747			
Consumer Trust (CT)	CT4: I feel confident that my personal data will be protected.	0.834			
Consumer Trust (CT)	CT5: I trust that the platform will handle problems (e.g. returns, complaints) fairly.	0.792			
Consumer Loyalty (CL)	CL1: I prefer to shop again on this platform rather than others.	0.740	0.877	0.895	0.847
Consumer Loyalty (CL)	CL2: I will recommend this platform to others.	0.814			
Consumer Loyalty (CL)	CL3: I intend to continue using this platform in the future.	0.808			
Consumer Loyalty (CL)	CL4: I have a high willingness to repurchase from this platform.	0.739			

The measurement model assessment in Table 3 indicates that all constructs demonstrate satisfactory reliability and validity. The indicator loadings for all latent variables, including User Experience, Perceived Quality, Service Quality, Customer Engagement, Consumer Trust, and Customer Loyalty, meet the recommended threshold of 0.700, with values ranging from 0.700 to 0.885, confirming indicator reliability.

Internal consistency reliability was also established, as Cronbach alpha values ranged from 0.822 to 0.915, while Composite Reliability (CR) values ranged from 0.839 to 0.972, exceeding the recommended criteria for reflective constructs. Furthermore, convergent validity was confirmed because all constructs achieved Average Variance Extracted (AVE) values above 0.50, indicating that each construct explains a substantial proportion of variance in its measurement indicators.

Overall, the measurement model results confirm that the instruments used in this study possess adequate reliability and validity. Therefore, the constructs are considered appropriate for further structural model evaluation to examine the relationships among user experience, perceived quality, service quality, customer engagement, consumer trust, and customer loyalty in the e-commerce context.

Table 4. Structural Model of Direct Effect

Path (Hypothesis)	Path (Hypothesis)	B	t-value	p-value	Result
H1	User Experience → Consumer Trust	0.323	3.684	0.000	Supported
H2	Perceived Quality → Consumer Trust	0.451	6.000	0.000	Supported
H3	Service Quality → Consumer Trust	0.280	3.119	0.002	Supported
H4	Customer Engagement → Consumer Trust	0.253	2.631	0.009	Supported
H5	User Experience → Customer Loyalty	0.187	2.257	0.024	Supported
H6	Perceived Quality → Customer Loyalty	0.226	2.862	0.004	Supported
H7	Service Quality → Customer Loyalty	0.150	1.839	0.068	Not Supported
H8	Customer Engagement → Customer Loyalty	0.274	3.070	0.002	Supported
H9	Consumer Trust → Customer Loyalty	0.532	8.154	0.000	Supported

The structural model results in Table 4 indicate that most hypothesized relationships are supported. User Experience significantly influences Consumer Trust ($\beta = 0.323$, $t = 3.684$, $p < 0.001$), indicating that a better digital experience enhances consumers' confidence in e-commerce platforms. Similarly, Perceived Quality ($\beta = 0.451$, $t = 6.000$, $p < 0.001$), Service Quality ($\beta = 0.280$, $t = 3.119$, $p = 0.002$), and Customer Engagement ($\beta = 0.253$, $t = 2.631$, $p = 0.009$) significantly strengthen Consumer Trust. These findings support previous research emphasizing that positive digital experiences, reliable service performance, and meaningful customer interactions are important determinants of trust formation in online environments ([Susanto, 2024](#)).

Regarding direct effects on Customer Loyalty, User Experience ($\beta = 0.187$, $p = 0.024$), Perceived Quality ($\beta = 0.226$, $p = 0.004$), and Customer Engagement ($\beta = 0.274$, $p = 0.002$) demonstrate significant positive effects. These results indicate that consumers are more likely to remain loyal when they experience convenient interactions, perceive high platform quality, and actively engage with e-commerce platforms. However, Service Quality does not have a significant direct effect on Customer Loyalty ($\beta = 0.150$, $p = 0.068$), suggesting that service performance alone may not be sufficient to directly generate loyalty.

The insignificant direct effect of Service Quality on Loyalty may be explained by the mediating role of psychological mechanisms, particularly trust. In competitive e-commerce environments, service quality dimensions such as delivery reliability, responsiveness, and customer support are increasingly considered basic expectations rather than unique differentiating factors. Consequently, service quality may influence loyalty primarily by increasing consumer confidence and reducing perceived uncertainty. Previous studies have similarly found that e-service quality often affects loyalty indirectly through trust and satisfaction rather than through direct pathways ([Djuuna, Sayidah, & Ady, 2024](#)).

This finding highlights that improving service quality should be accompanied by strategies that strengthen consumer trust to achieve sustainable loyalty.

Furthermore, Consumer Trust demonstrates the strongest effect on Customer Loyalty ($\beta = 0.532$, $t = 8.154$, $p < 0.001$). This result confirms the central role of trust in e-commerce relationship development, as consumers who perceive platforms as reliable, secure, and credible are more likely to continue purchasing and recommend the platform to others. The finding reinforces the argument of Commitment-Trust Theory that trust represents a fundamental mechanism underlying long-term customer relationships. Overall, the results suggest that while UX, perceived quality, and customer engagement directly contribute to loyalty, trust serves as a critical mechanism that strengthens loyalty formation in e-commerce environments.

Table 5. Structural Model of Direct Effect

Indirect Path Hypothesis	Indirect Effect (β)	t-value	p-value	Mediation Result
User Experience $\rightarrow$ Trust $\rightarrow$ Loyalty	0.171	2.948	0.003	Supported
Perceived Quality $\rightarrow$ Trust $\rightarrow$ Loyalty	0.240	3.692	0.000	Supported
Service Quality $\rightarrow$ Trust $\rightarrow$ Loyalty	0.149	1.863	0.063	Not Supported
Customer Engagement $\rightarrow$ Trust $\rightarrow$ Loyalty	0.135	2.177	0.030	Supported

The mediation analysis Table 5 demonstrates that Consumer Trust plays an important role in explaining how customer experience factors translate into Customer Loyalty. The results indicate that Consumer Trust significantly mediates the relationships between User Experience and Customer Loyalty ($\beta = 0.171$, $p = 0.003$), Perceived Quality and Customer Loyalty ($\beta = 0.240$, $p < 0.001$), and Customer Engagement and Customer Loyalty ($\beta = 0.135$, $p = 0.030$). However, the indirect effect of Service Quality on Customer Loyalty through Consumer Trust is not significant ($p = 0.063$), indicating that trust does not significantly transmit the influence of service quality on loyalty in this research context.

The significant mediation of User Experience suggests that a convenient, intuitive, and reliable digital interaction increases consumers' confidence in e-commerce platforms, which subsequently strengthens loyalty intentions. This finding supports previous research showing that positive online experiences contribute to trust development and encourage continued purchasing behavior ([Dewi & Giantari, 2022](#)). Similarly, the mediation effect of Perceived Quality indicates that consumers' evaluations of product information, platform performance, and overall quality perceptions enhance trust, which becomes an important pathway toward loyalty formation ([Utama et al., 2022](#)).

Furthermore, the significant indirect effect of Customer Engagement through Consumer Trust demonstrates that active interactions with e-commerce platforms, including participation, feedback, and digital engagement activities, strengthen relational confidence and encourage loyalty. This finding supports previous studies highlighting engagement as an important driver of trust-based customer relationships in digital environments ([Aliifa & Rofiaty, 2023](#)).

In contrast, the insignificant mediation of Service Quality suggests that service-related attributes may not automatically translate into loyalty through trust. In highly competitive e-commerce markets, delivery reliability, payment convenience, and customer support may be perceived as fundamental requirements rather than distinctive sources of competitive advantage. Therefore, service quality may require additional mechanisms, such as satisfaction or perceived value, to generate stronger loyalty outcomes, as reported in previous studies ([Wulandari & Thabrani, 2023](#)).

Overall, these findings confirm that Consumer Trust functions as a critical psychological mechanism linking customer experience factors with loyalty outcomes. The results extend previous e-commerce research by demonstrating that trust is particularly important in converting positive experiences, perceived quality, and customer engagement into long-term customer loyalty.

4.1 Discussion

The findings provide empirical evidence that customer loyalty in e-commerce is primarily developed through trust-based mechanisms. The structural model demonstrates that User Experience, Perceived Quality, Service Quality, and Customer Engagement significantly enhance Consumer Trust, while Consumer Trust represents the strongest predictor of Customer Loyalty. These findings highlight that customers' loyalty decisions are not only influenced by direct evaluations of e-commerce platforms but also by their confidence in the platform's reliability, security, and ability to fulfill expectations.

The significant effect of User Experience on Consumer Trust supports the perspective of the Technology Acceptance Model (TAM), which suggests that perceived ease of use and effective interaction with technology influence users' acceptance and confidence toward digital platforms. A seamless interface, intuitive navigation, and efficient purchasing process reduce uncertainty and create positive perceptions of platform reliability. This finding is consistent with previous studies showing that favorable digital experiences strengthen consumer trust in online environments ([Susanto, 2024](#)).

Similarly, the positive influence of Perceived Quality on Consumer Trust confirms the role of quality signals in reducing information asymmetry between consumers and e-commerce providers. According to Signaling Theory, consumers rely on observable quality indicators, such as accurate product information, reliable platform performance, and professional presentation, to evaluate the credibility of online sellers. Therefore, higher perceived quality increases consumer confidence and facilitates trust development, supporting previous findings that platform and product quality contribute to e-commerce trust formation ([Utama et al., 2022](#)).

The significant relationship between Service Quality and Consumer Trust indicates that reliable delivery processes, responsive customer support, and secure transactions remain important foundations of online trust. However, the insignificant direct effect of Service Quality on Customer Loyalty suggests that service quality alone may not be sufficient to create long-term customer commitment. In competitive e-commerce markets, service attributes such as delivery accuracy, payment security, and customer assistance are increasingly viewed as basic expectations rather than unique sources of differentiation. Consequently, customers may acknowledge good service quality without necessarily developing stronger loyalty unless additional relational factors, such as trust or satisfaction, are established. This finding is consistent with previous studies indicating that service quality often influences loyalty indirectly through psychological mechanisms rather than through direct effects ([McGuire & Rosary, 2022](#)).

Furthermore, Customer Engagement significantly influences both Consumer Trust and Customer Loyalty. This finding supports Social Exchange Theory, which explains that repeated and meaningful interactions between customers and firms strengthen relational bonds. Features such as personalized recommendations, online reviews, feedback mechanisms, and interactive communication can increase customer involvement and strengthen confidence toward e-commerce platforms. Thus, engagement functions not only as a behavioral outcome but also as a mechanism for developing trust-based relationships.

The strong positive effect of Consumer Trust on Customer Loyalty reinforces the central proposition of Commitment-Trust Theory, which identifies trust as a fundamental condition for maintaining long-term relationships. In e-commerce settings, trust reduces perceived risk and increases customers' willingness to repurchase, recommend, and continue using a platform. The finding supports previous research demonstrating that trust is a key determinant of loyalty in digital commerce environments ([Martio & Moko, 2023](#)).

The mediation analysis further clarifies the mechanism underlying loyalty formation. Consumer Trust significantly mediates the relationships between User Experience, Perceived Quality, and Customer Engagement with Customer Loyalty. These findings indicate that these factors do not merely influence loyalty directly but operate by strengthening consumers' confidence in the platform. In contrast, the mediation effect of Service Quality through Consumer Trust is not supported, suggesting that service-related factors may require additional mechanisms to generate stronger loyalty outcomes. This distinction highlights that different customer experience dimensions contribute to loyalty through different psychological pathways.

From a practical perspective, e-commerce providers should prioritize strategies that enhance trust-building mechanisms rather than focusing solely on operational performance. Improving website usability, providing transparent and accurate product information, encouraging customer interaction, and maintaining reliable services can collectively strengthen trust and loyalty. However, service improvements should be complemented with relational strategies because functional service quality alone may not create strong customer attachment.

Overall, this study extends e-commerce loyalty literature by demonstrating that Consumer Trust serves as a critical mechanism linking customer experience dimensions with loyalty outcomes. The findings suggest that loyalty formation in digital commerce is a multidimensional process in which technological experience, perceived quality, and customer engagement contribute to sustainable relationships primarily through trust development.

5. Conclusions

5.1 Conclusion

This study demonstrates that customer loyalty in e-commerce is primarily shaped through trust-based mechanisms. The findings reveal that User Experience, Perceived Quality, Service Quality, and Customer Engagement significantly enhance Consumer Trust, while Consumer Trust has the strongest positive influence on Customer Loyalty. Furthermore, User Experience, Perceived Quality, and Customer Engagement directly improve loyalty, whereas Service Quality does not show a significant direct effect.

The mediation analysis further confirms that Consumer Trust mediates the relationships between User Experience, Perceived Quality, and Customer Engagement with Customer Loyalty. However, the indirect effect of Service Quality through Trust is not supported, indicating that service quality may require additional relational mechanisms to generate stronger loyalty outcomes. These findings suggest that functional improvements alone are insufficient; e-commerce platforms must create trustworthy digital experiences through usability, quality assurance, and meaningful customer interactions.

Theoretically, this study contributes to e-commerce loyalty literature by demonstrating the central role of Consumer Trust as a mechanism that converts customer experiences and engagement into loyalty outcomes. By integrating experiential, quality, and relational factors into a unified framework, this research extends previous studies that often examine these determinants separately.

From a practical perspective, e-commerce platforms should prioritize trust-building strategies by improving user experience, maintaining perceived quality, and encouraging customer engagement. While service quality remains important for establishing reliability, trust appears to be the critical factor that transforms positive platform evaluations into long-term customer relationships.

5.2 Research Limitations

This study has several limitations. First, the cross-sectional research design limits the ability to establish causal relationships and observe changes in consumer trust and loyalty over time. Future research should employ longitudinal approaches to examine how these relationships develop dynamically. Second, the study relies on self-reported survey data, which may introduce response bias and does not fully capture actual consumer behavior. Future studies could incorporate behavioral data,

such as purchase records, platform activity, or retention metrics, to provide stronger evidence of loyalty behavior.

Third, although the study examines important predictors of e-commerce loyalty, other relevant factors, such as perceived risk, customer satisfaction, perceived value, brand reputation, and privacy concerns, were not included in the model. Future research may expand the framework by incorporating additional mediators, moderators, or contextual factors across different consumer segments and e-commerce environments.

5.3 Suggestions and Directions for Future Research

Future research is encouraged to extend this study by applying longitudinal research designs to capture changes in consumer trust and loyalty over time. Future studies may also integrate objective behavioral data, such as transaction history, purchase frequency, customer retention, and platform interaction patterns, to complement self-reported perceptions and provide a more comprehensive understanding of actual loyalty behavior. Furthermore, subsequent research may expand the proposed model by incorporating additional variables, including perceived risk, customer satisfaction, perceived value, brand reputation, and privacy concerns, which may provide deeper insights into the mechanisms influencing e-commerce loyalty. Researchers are also encouraged to examine potential moderating factors, such as consumer demographics, digital literacy, platform type, and cultural differences, to identify whether the relationships among user experience, perceived quality, service quality, customer engagement, trust, and loyalty vary across different consumer segments and e-commerce contexts.

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Author Contributions

All authors have made substantial contributions to this study and approved the final version of the manuscript. AS was responsible for conceptualization, research design, and methodology development. NPP contributed to data interpretation, validation, visualization, and manuscript refinement. NFG were involved in data collection, data curation, and formal analysis. All authors contributed to writing the original draft and participated in reviewing and editing the manuscript. SS authors provided supervision and managed project administration. All authors have read and approved the final manuscript and agree to be accountable for all aspects of this work.

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