

Platform Quality and AI Recommendation Quality in Building Customer Loyalty: The Mediating Role of Customer Trust and the Moderating Effect of Digital Literacy

Kurnia Asni^{1*}, Isthafan Najmi², Rizal Ansari³, Irwan Safwadi⁴, Agusmadi⁵

^{1,2,3,4,5} Universitas Abulyatama, Aceh Besar, Indonesia

*Corresponding author:

Email: kurniaasni.mm@abulyatama.ac.id

Abstract.

The rapid advancement of Artificial Intelligence (AI) has shifted e-commerce competition toward personalized and intelligent digital experiences. This study investigates the impact of AI-enabled Platform Quality and AI Recommendation Quality on Customer Loyalty, focusing on the mediating role of Customer Trust and the moderating effect of Digital Literacy. Utilizing a quantitative explanatory approach, data were collected through an online survey from 250 Lazada users residing in Aceh Province, Indonesia. The proposed research model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The empirical findings reveal that both AI-enabled Platform Quality and AI Recommendation Quality significantly enhance Customer Trust. Furthermore, while general platform quality directly drives Customer Loyalty, AI recommendation features require the complete mediation of Customer Trust to successfully foster long-term customer retention. Consequently, Customer Trust acts as a crucial psychological mechanism, partially mediating the effect of platform quality and fully mediating the effect of recommendation quality on customer loyalty. Interestingly, the study discovered that Digital Literacy does not moderate the relationship between AI capabilities and trust. Instead, it serves as a significant direct predictor of Customer Trust, suggesting that for the predominantly Gen-Z and Millennial user base, digital literacy operates as a foundational baseline skill rather than a differentiating factor. These findings provide theoretical advancements to the Information Systems Success Model and offer actionable managerial insights for e-commerce platforms to prioritize trust-building alongside algorithmic improvements.

Keywords: *AI-enabled Platform Quality, AI Recommendation Quality, Customer Trust, Customer Loyalty and Digital Literacy.*

I. INTRODUCTION

1.1. The Emergence of AI-Driven Competition in E-Commerce

The rapid advancement of Artificial Intelligence (AI) has fundamentally transformed the competitive landscape of electronic commerce. Unlike the first generation of e-commerce platforms that primarily competed through product assortment, pricing strategies, and logistics efficiency, contemporary digital marketplaces increasingly rely on AI-driven technologies to personalize customer experiences, predict consumer preferences, optimize search results, and automate customer interactions. Recommendation engines, intelligent search systems, conversational chatbots, dynamic pricing, and personalized promotions have become strategic capabilities that differentiate one marketplace from another. Consequently, competition among e-commerce platforms has gradually shifted from merely attracting new customers toward building long-term customer relationships through intelligent and personalized digital experiences. This transformation is particularly important because acquiring new online customers has become substantially more expensive than retaining existing ones. Marketing studies consistently demonstrate that customer retention contributes more significantly to long-term profitability than continuous customer acquisition. Loyal customers not only generate repeat purchases but also provide positive electronic word-of-mouth, increase customer lifetime value, and reduce marketing expenditures. Consequently, customer loyalty has become one of the most critical strategic objectives for digital marketplace providers operating in highly competitive environments.

Indonesia represents one of the largest digital commerce markets in Southeast Asia. Supported by rapid internet penetration, increasing smartphone ownership, expanding digital payment systems, and improved logistics infrastructure, online shopping has become an integral part of daily consumer behavior.

National and regional reports consistently indicate that Indonesia contributes the largest share of digital economy growth in Southeast Asia, with millions of consumers regularly purchasing products through online marketplaces. Such rapid expansion has intensified competition among major marketplace providers—including Shopee, Tokopedia, Lazada, Blibli, and TikTok Shop—forcing every platform to continuously innovate in order to maintain customer engagement and loyalty.

Although these platforms offer relatively similar product assortments, payment systems, and logistics services, their competitive performance differs considerably. Recent market indicators suggest that Shopee continues to dominate the Indonesian marketplace industry, while Lazada has experienced stronger competitive pressure despite substantial investments in technological innovation. Secondary data from Semrush, as reported by Databoks (2025), indicate that during the first quarter of 2025, Shopee accumulated approximately 470 million website visits, whereas Lazada recorded approximately 152 million visits during the same period. Monthly website traffic also shows a considerable gap, with Shopee consistently attracting more than 150 million monthly visits, compared with Lazada ranging between 43–58 million monthly visits. Although website visits cannot be interpreted as direct measures of customer loyalty, they provide a useful proxy for user engagement, revisit behavior, and the platform's ability to retain active customers over time. The considerable disparity between Shopee and Lazada raises an important managerial question. Despite continuous investments in AI-powered recommendation systems, platform enhancement, promotional campaigns, and logistics improvements, why do many consumers continue to prefer competing marketplaces? More importantly, what factors determine whether customers remain loyal to a particular platform after experiencing increasingly similar digital services across competing marketplaces?

One possible explanation lies in the concept of customer trust (**Bawack et al. 2022**). In online environments characterized by information asymmetry and limited face-to-face interaction, trust represents the foundation upon which long-term customer relationships are established. Consumers who perceive an e-commerce platform as reliable, honest, secure, and competent are generally more willing to make repeat purchases and recommend the platform to others. Numerous studies have consistently identified customer trust as one of the strongest antecedents of customer loyalty within electronic commerce. However, trust itself does not emerge automatically; rather, it is developed through consumers' evaluations of the quality of the platform and the experiences they receive while interacting with digital technologies.

Among these antecedents, AI-enabled platform quality has attracted increasing scholarly attention. Traditional platform quality focused primarily on system reliability, information quality, ease of use, and transaction security (**Shareef et al. 2019**). However, the emergence of AI has expanded the meaning of platform quality beyond conventional website usability. Modern consumers increasingly evaluate digital marketplaces according to the intelligence embedded within the platform, including personalized interfaces, adaptive search functions, predictive recommendations, conversational AI assistants, and context-aware shopping experiences. Therefore, AI-enabled platform quality may represent a more comprehensive construct for explaining customer trust in today's digital marketplace ecosystem.

Another important determinant concerns AI recommendation quality (**Komiak & Benbasat 2006**). Recommendation systems have become the core technological infrastructure of almost every major e-commerce platform. Through machine learning algorithms, online marketplaces analyze consumers' browsing history, purchase behavior, demographic characteristics, and previous interactions to recommend products that are expected to match individual preferences. High-quality recommendations reduce consumers' search effort, improve decision quality, and enhance perceived personalization. Consequently, recommendation quality may strengthen customers' confidence that the platform understands their needs and is capable of providing relevant shopping experiences, thereby reinforcing customer trust.

Nevertheless, previous empirical findings remain fragmented. Many studies continue to examine website quality, service quality, or user experience using traditional information systems perspectives, while relatively few simultaneously investigate AI-enabled platform quality and AI recommendation quality as complementary drivers of customer trust and loyalty. Existing Indonesian studies also predominantly focus

on Shopee or Tokopedia, whereas empirical evidence concerning Lazada remains comparatively limited despite its strategic efforts to compete through AI-enabled personalization.

Furthermore, the effectiveness of AI technologies may not be uniform across consumers. The same recommendation algorithm can generate different behavioral responses depending on users' capability to understand, evaluate, and utilize digital technologies (Komiak & Benbasat, 2006). Consumers possessing higher levels of digital literacy are generally better able to interpret personalized recommendations, evaluate online information, recognize trustworthy digital interactions, and utilize advanced platform features. Conversely, consumers with limited digital literacy may exhibit greater skepticism toward AI-generated recommendations or may underutilize intelligent platform capabilities. Accordingly, digital literacy is expected to strengthen or weaken the influence of AI-enabled platform quality and AI recommendation quality on customer trust and subsequent customer loyalty.

From a theoretical perspective, this study addresses several important research gaps. Previous studies have primarily focused on conventional platform quality while paying limited attention to the role of AI-enabled capabilities, particularly AI recommendation quality, in fostering customer trust and loyalty. Furthermore, empirical research integrating platform quality, AI recommendation quality, customer trust, customer loyalty, and digital literacy within a single conceptual framework remains limited, especially in emerging economies. This gap is even more evident in the context of Lazada, despite its strategic efforts to strengthen its competitive position in Indonesia's increasingly AI-driven e-commerce market. Accordingly, this study develops an integrated model to investigate the effects of AI-enabled platform quality and AI recommendation quality on customer trust and customer loyalty, while examining the moderating role of digital literacy among Lazada users in Aceh Province. By focusing on a marketplace operating under intense competitive pressure, this study is expected to contribute to the growing literature on AI-enabled digital commerce and provide practical insights for marketplace managers seeking to strengthen long-term customer loyalty through intelligent platform capabilities.

1.2 Research Questions

This study seeks to examine the relationships among Platform Quality, AI Recommendation Quality, Customer Trust, Customer Loyalty, and Digital Literacy in the context of Lazada users in Indonesia. Specifically, it investigates whether Platform Quality and AI Recommendation Quality positively influence Customer Trust and Customer Loyalty, whether Customer Trust enhances Customer Loyalty and mediates the effects of Platform Quality and AI Recommendation Quality on Customer Loyalty, and whether Digital Literacy moderates the relationships between the antecedent variables and Customer Trust.

1.3 Research Contributions

This study contributes to the literature by extending customer loyalty research through the integration of Platform Quality, AI Recommendation Quality, Customer Trust, Customer Loyalty, and Digital Literacy into a unified conceptual framework. It also enriches digital commerce research by examining Digital Literacy as a boundary condition that explains variations in consumers' responses to AI-enabled services and provides empirical evidence from Indonesia as an emerging e-commerce market. From a managerial perspective, the findings offer strategic insights for Lazada to enhance AI-driven platform capabilities, strengthen customer trust and loyalty, and support long-term customer retention through more effective AI-enabled customer experience design.

II. Theoretical Background and Hypotheses Development

2.1. Information Systems Success Model in AI-Enabled E-Commerce

This study is primarily grounded in the Information Systems Success (ISS) Model proposed by DeLone and McLean (2003), which explains that the quality of an information system represents a fundamental determinant of users' behavioral outcomes. The model argues that system quality, information quality, and service quality shape users' perceptions toward a digital platform, leading to trust, satisfaction, continued use, and ultimately long-term loyalty. Over the past two decades, the ISS Model has become one

of the most widely adopted theoretical foundations for explaining user behavior in online services, e-commerce, and digital platforms.

The rapid advancement of Artificial Intelligence (AI) has substantially expanded the scope of the ISS Model. Modern e-commerce platforms no longer compete merely through reliable systems and accurate information but increasingly through AI-enabled capabilities such as personalized recommendation engines, intelligent search functions, conversational chatbots, predictive analytics, and adaptive user interfaces. Consequently, consumers' evaluation of platform quality extends beyond traditional website characteristics toward the platform's capability to deliver intelligent, personalized, and context-aware shopping experiences. In this study, these intelligent capabilities are conceptualized through two complementary constructs, namely AI-enabled Platform Quality and AI Recommendation Quality (DeLone, W. H., & McLean, E. R. (2003). While the ISS Model explains how system characteristics influence users' behavioral outcomes, Trust Theory provides an additional psychological explanation regarding how consumers respond to technology-enabled platforms. Online shopping inherently involves uncertainty because consumers cannot physically inspect products or directly interact with sellers. Therefore, trust becomes a crucial psychological mechanism through which platform quality and AI capabilities translate into customer loyalty. Integrating the ISS Model with Trust Theory provides a comprehensive theoretical foundation for explaining customer loyalty in AI-enabled e-commerce environments.

2.2. AI-Enabled Platform Quality and Customer Trust

AI-enabled platform quality refers to consumers' overall evaluation of an e-commerce platform's capability to provide reliable, efficient, secure, and intelligent shopping experiences through the integration of Artificial Intelligence technologies. Unlike conventional platform quality, which primarily emphasizes website usability, information quality, and transaction security, AI-enabled platform quality also encompasses intelligent search functions, personalized interfaces, conversational AI services, predictive assistance, and adaptive customer experiences. These intelligent capabilities are increasingly becoming strategic differentiators among digital marketplaces (Bawack et al. 2022).

According to the Information Systems Success Model, users tend to develop positive perceptions toward digital platforms that consistently deliver superior system performance and high-quality information. AI-enabled platform capabilities further strengthen these perceptions by reducing consumers' search effort, simplifying decision-making, and creating smoother shopping experiences. As consumers perceive that the platform effectively understands their preferences and provides intelligent assistance, they are more likely to consider the platform reliable and trustworthy (Glikson & Woolley 2020).

Previous empirical studies generally support this relationship. Recent studies have reported that intelligent platform capabilities significantly improve consumers' trust in digital commerce environments because AI enhances convenience, personalization, and perceived competence of the platform. However, several scholars argue that sophisticated technologies alone may not automatically increase trust when consumers perceive AI systems as opaque, intrusive, or difficult to understand. These inconsistent findings indicate that the relationship between AI-enabled platform quality and customer trust remains worthy of further investigation, particularly in emerging markets where AI adoption continues to evolve (Shareef et al. 2019).

- **H1: AI-enabled Platform Quality positively influences Customer Trust.**

2.3. AI Recommendation Quality and Customer Trust

Recommendation systems have become one of the most important applications of Artificial Intelligence within modern e-commerce platforms. By analyzing consumers' browsing history, purchase behavior, search activities, and product preferences, AI recommendation systems provide personalized product suggestions that are expected to match individual customer needs. High-quality recommendations reduce information overload and assist consumers in making more efficient purchasing decisions (Komiak & Benbasat 2006).

From the perspective of information processing theory, personalized recommendations reduce consumers' cognitive effort because relevant alternatives are automatically identified by intelligent algorithms. Consequently, consumers experience greater convenience and perceive that the platform possesses a deeper understanding of their preferences. These experiences may increase consumers' confidence that the marketplace is capable of supporting better purchasing decisions, thereby strengthening customer trust (Puntoni et al. 2021).

Nevertheless, previous findings remain inconclusive. While many studies report positive effects of recommendation quality on trust and purchase intention, other researchers suggest that consumers may become skeptical when recommendations appear excessively personalized or when algorithmic decision-making lacks transparency. Such contradictory findings suggest that recommendation quality may influence customer trust differently across consumer groups and marketplace contexts (Rzepka & Berger 2018).

- **H2: AI Recommendation Quality positively influences Customer Trust.**

2.4. AI-Enabled Platform Quality and Customer Loyalty

Customer loyalty represents consumers' commitment to continue using a particular marketplace despite the availability of competing alternatives. Loyal customers demonstrate repeat purchasing behavior, provide positive recommendations to others, and maintain long-term relationships with the platform. In increasingly competitive e-commerce markets, customer loyalty has become one of the most valuable strategic assets because retaining existing customers is generally less costly than continuously acquiring new customers (Grewal et al. 2020).

High platform quality contributes directly to customer loyalty by creating positive user experiences. Consumers are more likely to revisit platforms that provide reliable transactions, user-friendly interfaces, secure payment systems, and intelligent shopping support. AI-enabled platform capabilities further enhance these experiences by delivering adaptive and personalized interactions that differentiate one marketplace from its competitors (Pillai et al. 2020). Empirical studies consistently report positive relationships between platform quality and customer loyalty. Nevertheless, several scholars argue that as AI technologies become standardized across competing marketplaces, platform quality alone may no longer be sufficient to sustain long-term loyalty. Instead, additional psychological mechanisms such as customer trust may be required to explain why consumers continue using one marketplace over another.

- **H3: AI-enabled Platform Quality positively influences Customer Loyalty.**

2.5. AI Recommendation Quality and Customer Loyalty

Artificial Intelligence recommendation systems play an increasingly important role in shaping customer experiences throughout the online shopping journey. Personalized recommendations expose consumers to products that closely match their interests, thereby increasing shopping efficiency and reducing the effort required to search among thousands of available products. Such personalized experiences are expected to strengthen consumers' attachment to the marketplace (Davenport et al. 2020).

Several recent studies suggest that recommendation quality positively influences customer satisfaction, purchase intention, and continued platform usage because consumers perceive greater relevance and personalization. However, other studies argue that excessive algorithmic personalization may reduce consumers' autonomy or create privacy concerns, which may weaken long-term loyalty. Therefore, the direct influence of AI recommendation quality on customer loyalty remains theoretically open for further examination (Kumar et al. (2019)).

- **H4: AI Recommendation Quality positively influences Customer Loyalty.**

2.6. Customer Trust and Customer Loyalty

Customer trust refers to consumers' willingness to rely on an e-commerce platform based on positive expectations regarding its reliability, integrity, competence, and security. In digital commerce, trust plays a particularly important role because transactions occur under conditions of uncertainty, where consumers cannot physically evaluate products before purchase (Kim et al. 2008).

Trust Theory argues that consumers who trust a service provider are more willing to maintain long-term relationships and engage in repeated transactions. Numerous studies have consistently demonstrated that customer trust is among the strongest predictors of customer loyalty in online commerce. Trust reduces perceived risk, increases confidence in purchasing decisions, and strengthens consumers' commitment toward a particular platform. (Chetioui et al. 2021). Although the positive relationship between trust and loyalty has been widely supported, some scholars suggest that trust alone may not guarantee continued usage in highly competitive digital markets where consumers can easily switch to competing platforms offering superior incentives. Nevertheless, customer trust remains a central psychological mechanism underlying long-term customer retention.

- **H5: Customer Trust positively influences Customer Loyalty.**

2.7. The Mediating Role of Customer Trust

The Information Systems Success Model suggests that system characteristics influence behavioral outcomes through users' psychological evaluations. In the context of AI-enabled e-commerce, consumers first evaluate the intelligence and quality of the platform before developing trust. This trust subsequently encourages continued usage and long-term loyalty (Hargittai & Micheli (2019). AI-enabled platform quality and AI recommendation quality are expected to strengthen customer trust because they improve shopping convenience, reduce uncertainty, and demonstrate the competence of the marketplace. Once consumers develop trust, they become more willing to continue shopping through the same platform and recommend it to others (Mohammadyari & Singh 2015).

Although previous studies have examined trust as a mediator in online shopping contexts, empirical evidence integrating AI-enabled platform quality and AI recommendation quality within a unified trust-mediated loyalty framework remains limited (Kannan & Li (2017).

- H6: Customer Trust mediates the relationship between AI-enabled Platform Quality and Customer Loyalty.
- H7: Customer Trust mediates the relationship between AI Recommendation Quality and Customer Loyalty.

2.8. The Moderating Role of Digital Literacy

Digital literacy refers to an individual's ability to access, understand, evaluate, and effectively utilize digital technologies in everyday activities. Within AI-enabled e-commerce, digital literacy also reflects consumers' capability to interpret intelligent recommendations, recognize trustworthy platform features, and utilize advanced digital services to support purchasing decisions.

Consumers possessing high levels of digital literacy are generally more capable of understanding AI-enabled functionalities and evaluating their usefulness. Consequently, they may develop stronger trust when interacting with intelligent platforms and AI recommendation systems. Conversely, consumers with limited digital literacy may experience uncertainty, confusion, or skepticism when interacting with AI-driven services, thereby weakening trust formation (Mohammadyari, S., & Singh, H. 2015).

Although previous studies have identified digital literacy as an important factor influencing technology adoption and online purchasing behavior, its moderating role in explaining how AI-enabled platform quality and AI recommendation quality influence customer trust remains largely unexplored.

- H8: Digital Literacy positively moderates the relationship between AI-enabled Platform Quality and Customer Trust, such that the relationship is stronger among consumers with higher levels of Digital Literacy.
- H9: Digital Literacy positively moderates the relationship between AI Recommendation Quality and Customer Trust, such that the relationship is stronger among consumers with higher levels of Digital Literacy.

2.9. Conceptual Framework

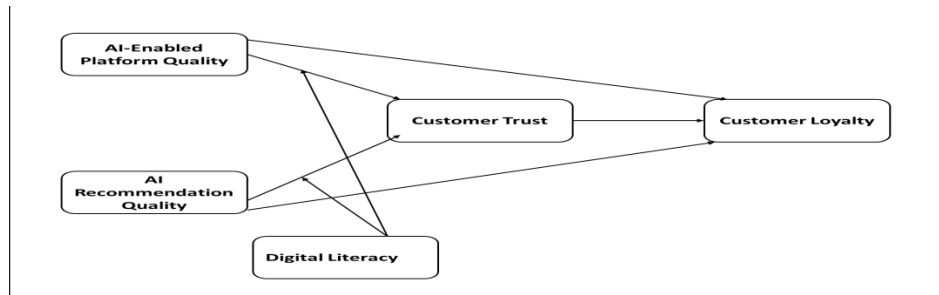


Fig. 2.1. Conceptual Framework of AI-Enabled Platform Quality and Loyalty

III. RESEARCH METHOD

3.1. Research Design and Research Context

This study employed a quantitative research design using an explanatory approach to investigate the relationships among Platform Quality, AI Recommendation Quality, Customer Trust, Digital Literacy, and Customer Loyalty within the context of Lazada users in Aceh Province, Indonesia. A cross-sectional survey design was adopted because the data were collected at a single point in time to explain the causal relationships among the proposed constructs.

The conceptual model integrates the Information Systems Success Model and Trust Theory. Platform Quality and AI Recommendation Quality represent the independent variables, Customer Trust serves as the mediating variable, Customer Loyalty represents the dependent variable, while Digital Literacy functions as the moderating variable. The proposed framework seeks to explain how AI-enabled shopping experiences contribute to customer loyalty through trust formation and how digital literacy strengthens these relationships.

3.2. Population and Sampling Technique

The target population of this study comprised consumers residing in Aceh Province who had experience purchasing products through the Lazada marketplace. To ensure that respondents possessed sufficient experience to evaluate the proposed constructs, several screening criteria were established. Respondents were required to:

1. Be at least 17 years old.
2. Have purchased products through Lazada at least once during the previous six months.
3. Have experience using AI-based recommendation features provided by the Lazada platform.

Since the exact number of Lazada users in Aceh is unknown, this study employed a non-probability sampling technique using purposive sampling. This approach allows researchers to select respondents who meet specific criteria relevant to the research objectives. A minimum sample size of 250 respondents was targeted, which exceeds the recommended minimum requirement for Partial Least Squares Structural Equation Modeling (PLS-SEM). Sample size was calculated by multiplying the amount of indicators by 10 (Hair et al., 2019).

3.3. Measurement of Constructs

The research instrument consisted of two sections. The first section collected respondents' demographic information, while the second section measured the latent constructs included in the proposed research model. All measurement items were adapted from previously validated studies and modified to fit the context of AI-enabled e-commerce. All constructs were measured using a five-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). Prior to the main survey, the questionnaire was reviewed to ensure clarity and content validity.

Table 3.1. Measurement of Latent Constructs

Construct	Code	Measurement Description
AI-Enabled Platform Quality (PQ)	PQ1–PQ5	Measures users' perceptions of the platform's ease of use, visual appeal, information quality, system reliability, and transaction efficiency.
AI Recommendation Quality (AIQ)	AIQ1–AIQ5	Measures users' perceptions of the relevance, personalization, usefulness, and overall quality of AI-generated product recommendations.

Customer Trust (CT)	CT1–CT5	Measures consumers' confidence in the platform's reliability, security, honesty, privacy protection, and commitment to customers.
Customer Loyalty (CL)	CL1–CL5	Measures consumers' intention to repurchase, continue using, prefer, and recommend the platform to others.
Digital Literacy (DL)	DL1–DL5	Measures consumers' ability to effectively use digital technologies, understand online platform features, evaluate online information, and conduct secure digital transactions.

3.4. Data Collection Procedure

Data were collected using an online questionnaire administered through Google Forms. The questionnaire link was distributed through various online communities and social media platforms, including WhatsApp, Facebook, Instagram, and other digital communities frequented by Lazada users in Aceh. Data collection was conducted over approximately 4 weeks.

Participation in this study was entirely voluntary. Respondents were informed that their participation was anonymous and that all responses would be used solely for academic purposes. An informed consent statement was provided on the first page of the questionnaire before respondents proceeded to complete the survey.

3.5. Data Analysis

The proposed research model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. PLS-SEM was selected because the study aims to examine complex relationships involving mediation and moderation while simultaneously predicting customer loyalty in the context of AI-enabled e-commerce.

The data analysis procedure consisted of two stages. First, the measurement model was evaluated by examining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Second, the structural model was assessed by evaluating collinearity, path coefficients, and coefficients of determination (R^2). Hypothesis testing, including mediation and moderation effects, was performed using the bootstrapping procedure with 5,000 resamples.

Table 3.2. Criteria for Measurement and Structural Model Assessment

Model Stage	Evaluation	Assessment Parameter	Indicator / Test	Standard Threshold Criteria	Primary References
1. Measurement Model Assessment (Outer Model)		Indicator Reliability	Outer Loadings	> 0.708 (Values 0.40 - 0.70 may be retained if AVE is maintained)	Hair et al. (2021)
		Internal Consistency Reliability	Composite Reliability (CR)	0.70 - 0.95 (Values > 0.95 indicate indicator redundancy)	Hair et al. (2019, 2021)
			Cronbach's Alpha	> 0.70	Hair et al. (2019)
		Convergent Validity	Average Variance Extracted (AVE)	> 0.50	Fornell & Larcker (1981); Hair et al. (2021)
		Discriminant Validity	Fornell-Larcker Criterion	Square root of AVE of a construct > correlations with other constructs	Fornell & Larcker (1981)
2. Structural Model Assessment (Inner Model)		Explanatory Power	Coefficient of Determination (R^2)	0.75 (Substantial), 0.50 (Moderate), 0.25 (Weak)	Hair et al. (2019, 2021)
		Statistical Significance	Path Coefficients (beta, t-stat, p-value)	t-value > 1.96 (two-tailed, 5% significance level), p-value < 0.05	Hair et al. (2021)

Note: The above criteria refer to the main standard from Hair et al. (2021) (A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), 3rd Edition).

IV. RESULT AND ANALYSIS

4.1. Respondent Profile

This study involved 250 respondents residing in Aceh Province and experienced using the Lazada e-commerce platform. The demographic and behavioral characteristics of the respondents were designed to reflect a representative profile of e-commerce users in the region.

Based on gender, the majority of respondents were female (152 people) (60.8%), while 98 were male (39.2%). In terms of age, respondents were dominated by Generation Z and Millennials, with 115 (46.0%) aged 18–24 and 92 (36.8%) aged 25–34. This demographic concentration aligns with the primary profile of e-commerce users in Indonesia.

Geographically, respondents were concentrated in urban areas with adequate internet and logistics infrastructure, with the majority coming from Banda Aceh (34.0%), Aceh Besar (16.8%), and Lhokseumawe (15.2%). Respondents were predominantly students (35.2%) and private sector employees (26.8%).

Regarding platform usage behavior, over 72% of respondents have used Lazada for more than 1 year (44.8% for 1–3 years; 27.2% > 3 years). This ensures that respondents have sufficient experience to evaluate the AI-based recommendation feature. The majority of respondents shop once or twice a month (43.2%), with the most frequently purchased product categories being Fashion & Accessories (35.6%) and Beauty & Personal Care (24.8%).

4.2. Evaluation of the Measurement Model (Outer Model)

Outer model evaluation is carried out to assess the validity and reliability of the indicators forming the latent variables.

4.2.1. Convergent Validity and Construct Reliability

Convergent validity is measured using the Average Variance Extracted (AVE) value, where the recommended standard value is > 0.50. Reliability is measured using Cronbach's Alpha and Composite Reliability (CR) with a standard value of > 0.70.

Table 4.1. Validity and Reliability Test Results

Variables	Cronbach's Alpha	Composite Reliability (rho_c)	AVE	Conclusion
AI Recommendation Quality	0.867	0.905	0.656	Valid & Reliable
AI-enabled Platform Quality	0.869	0.906	0.658	Valid & Reliable
Customer Loyalty	0.750	0.833	0.499	Valid & Reliable
Customer Trust	0.704	0.805	0.477	Valid & Reliable
Digital Literacy	0.859	0.898	0.637	Valid & Reliable

Based on Table 4.1, all variables have Cronbach's Alpha and Composite Reliability values above 0.70, indicating an excellent level of internal reliability. For convergent validity, the majority of variables have AVE values above 0.50. Although the AVE values for Customer Trust (0.477) and Customer Loyalty (0.499) are slightly below 0.50, this model is still acceptable because the Composite Reliability values of both variables are very high (> 0.80), in accordance with Fornell & Larcker's guidelines, which state that convergent validity is still adequate if CR > 0.60 even though the AVE is slightly below 0.50.

4.2.2. Discriminant Validity

Discriminant validity is measured using the Fornell-Larcker criterion, where the square root of the AVE of a variable (diagonal value) must be greater than its correlation with another variable.

Table 4.2. Discriminant Validity (Fornell-Larcker Criterion)

	AI Rec. Quality	AI-enabled Platform	Customer Loyalty	Customer Trust	Digital Literacy
AI Rec. Quality	0.810				
AI-enabled Platform	0.749	0.811			
Customer Loyalty	0.663	0.631	0.707		
Customer Trust	0.760	0.667	0.761	0.690	
Digital Literacy	0.656	0.634	0.770	0.663	0.798

The data in Table 4.2 shows that all bold diagonal values (square roots of AVE) are greater than the inter-construct correlations below them. This proves that all research variables have good discriminant validity.

4.3. Structural Model Evaluation (Inner Model)

The strength of the prediction model is measured through the Coefficient of Determination (R^2).

Table 4.3. R-Square Value

Endogenous Variables	R-Square	Category
Customer Trust	0.635	Moderate - Substantial
Customer Loyalty	0.609	Moderate - Substantial

The R^2 results show that AI Recommendation Quality, AI-enabled Platform Quality, and Digital Literacy can explain 63.5% of the variance in Customer Trust. Furthermore, the overall model can explain 60.9% of the variance in Customer Loyalty. This indicates that the research model has strong and adequate explanatory power.

4.4. Hypothesis Testing

Hypothesis testing was conducted using a bootstrapping procedure to determine the direct effects (Path Coefficients), indirect effects (Specific Indirect Effects), and moderation. The hypothesis was accepted if the T-statistic > 1.96 and the P-value < 0.05 .

4.4.1. Direct Effects

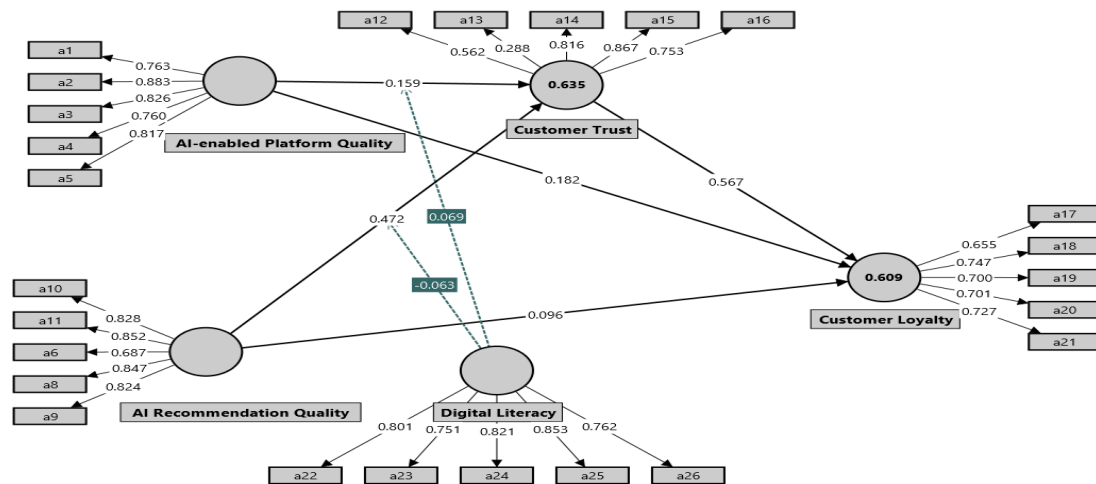


Fig. 4.1 Structural Hypotheses Testing

Based on bootstrapping results:

- **H1 (Accepted):** AI-enabled Platform Quality has a significant positive effect on Customer Trust (Beta = 0.159; T = 2.183; P = 0.029).
- **H2 (Accepted):** AI Recommendation Quality has a significant positive effect on Customer Trust (Beta = 0.472; T = 6.224; P = 0.000).
- **H3 (Accepted):** AI-enabled Platform Quality has a significant positive effect on Customer Loyalty (Beta = 0.182; T = 2.393; P = 0.017).
- **H4 (Rejected):** AI Recommendation Quality does not have a significant direct effect on Customer Loyalty (Beta = 0.096; T = 1.091; P = 0.275).
- **H5 (Accepted):** Customer Trust has a significant positive effect on Customer Loyalty (Beta = 0.567; T = 9.038; P = 0.000).

4.4.2. Mediation Effects (Indirect Effects)

Table 4.3. Specific Indirect Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
AI Recommendation Quality ->	0.267	0.267	0.051	5,250	0.000

Customer Trust -> Customer Loyalty					
AI-enabled Platform Quality -> Customer Trust -> Customer Loyalty	0.090	0.089	0.042	2,167	0.030

- **H6 (Accepted):** Customer Trust was shown to significantly mediate the relationship between AI-enabled Platform Quality and Customer Loyalty (Beta = 0.090; T = 2.167; P = 0.030). Since the direct effect (H3) was also significant, this form of mediation is partial mediation.
- **H7 (Accepted):** Customer Trust has been shown to mediate the relationship between AI Recommendation Quality and Customer Loyalty (Beta = 0.267; T = 5.250; P = 0.000). Since its direct effect (H4) is not significant, this form of mediation is a full mediation.

4.4.3. Moderating Effects

- **H8 (Rejected):** Digital Literacy does not moderate (strengthen/weaken) the relationship between AI-enabled Platform Quality and Customer Trust (Beta = 0.069; T = 0.794; P = 0.427).
- **H9 (Rejected):** Digital Literacy does not moderate the relationship between AI Recommendation Quality and Customer Trust (Beta = -0.063; T = 0.840; P = 0.401).

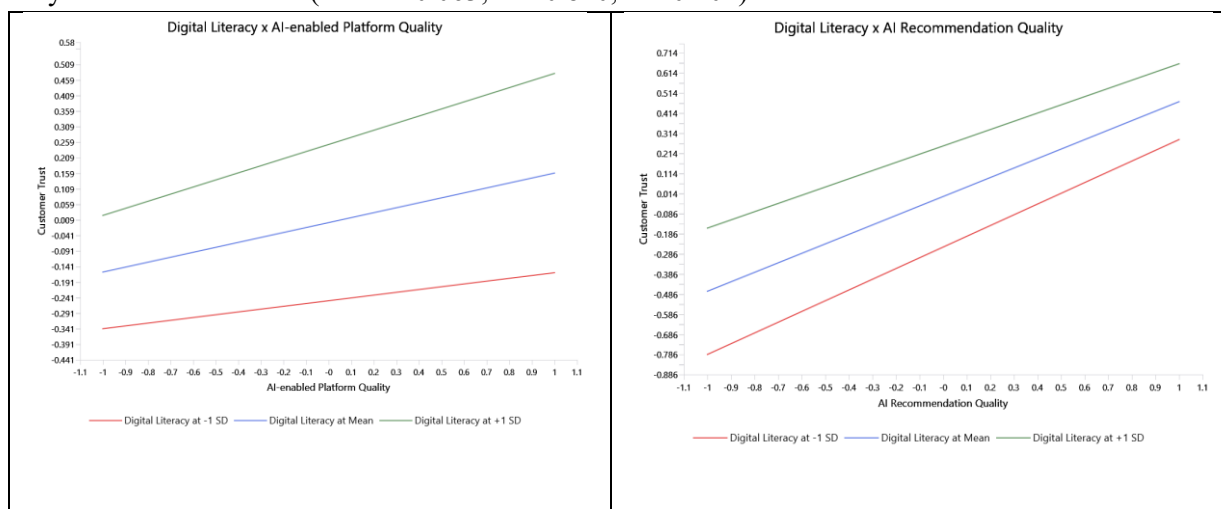


Fig. 4.2 Moderation Slope

Moderation graph analysis 4.2 (Figure of the interaction between Digital Literacy x AI-enabled Platform Quality and Digital Literacy x AI Recommendation Quality) shows that the slope lines (SD+1, Mean, SD-1) tend to be parallel and do not cross each other sharply. This visually confirms that the moderation interaction is not significant.

4.5. Discussion of Research Results

1. The Central Role of AI and Platform Quality in Building Trust.

The research results prove that AI Recommendation Quality (H2) and AI-enabled Platform Quality (H1) are important determinants in building Customer Trust among Lazada customers in Aceh. Interestingly, the quality of AI recommendations has a much greater influence weight (Beta = 0.472) than the general platform quality (Beta = 0.159) on trust. This indicates that accurate and relevant product personalization makes consumers feel the system is highly competent and understands their needs, which leads to the formation of trust.

2. Mechanisms Towards Loyalty: Full vs. Partial Mediation.

This study uncovered an interesting phenomenon related to customer loyalty. The quality of an AI platform has been shown to foster loyalty both directly and through trust (H3 and H6 were accepted). An error-free, fast, and intelligently navigated platform instantly entices customers to return. However, AI Recommendation Quality cannot directly create loyalty (H4 rejected). Intelligent recommendations do not automatically create loyalty among customers if they lack trust in the platform. Loyalty from AI recommendation features must fully navigate the psychological mechanism of Customer Trust (H7 accepted).

with full mediation). This proves the theoretical argument that no matter how well a machine learning algorithm reads consumer preferences, without the pillar of Trust, consumers will not stay on the platform for long.

3. Digital Literacy Is Not a Moderator, but a Direct Predictor.

The most unexpected finding was the rejection of Hypotheses 8 and 9. Digital literacy was shown to fail to perform its moderating function. This means that high and low levels of digital literacy do not differentiate how consumers respond to AI quality in shaping trust. However, if we look at the direct effect data, Digital Literacy actually has a significant direct positive effect on Customer Trust (Beta = 0.251; P = 0.000). A logical explanation for this finding is that in the modern e-commerce era (especially among respondents predominantly Gen Z and Millennials), digital literacy has become a basic skill (baseline skill), no longer a differentiating factor. Consumers in urban Aceh are already quite digitally literate; so digital literacy independently increases their trust in online transactions, but does not change how AI algorithms work in serving them.

Based on managerial findings, Lazada needs to prioritize security, transparency and recommendation accuracy to ensure trust is built, as it is only through trust that expensive AI features can be converted into profitable customer loyalty. .

V. CONCLUSION AND LIMITATIONS

5.1. Conclusion

Based on the data analysis, both AI-enabled Platform Quality and AI Recommendation Quality significantly build Customer Trust. Notably, the accuracy of AI recommendations has the most dominant impact on establishing this trust.

Regarding customer retention, general platform quality directly drives Customer Loyalty. However, sophisticated AI recommendation features do not automatically create loyalty without the user's complete trust. Therefore, Customer Trust plays a central mediating role, acting as a partial mediator for platform quality and a full mediator for AI recommendation quality.

Furthermore, this study found that Digital Literacy does not act as a moderator to strengthen or weaken the relationship between AI technology and trust. Instead, digital literacy serves as a direct predictor that increases trust. This indicates that for Lazada consumers in Aceh—who are predominantly Gen-Z and Millennials—digital literacy has become a baseline skill rather than a differentiating factor in how they respond to artificial intelligence systems.

5.2. Limitations of the Research

Despite providing important academic and managerial contributions, this study has several limitations. First, the sample exclusively focuses on Lazada users in Aceh Province, with a dominant demographic of urban youth. This restricts the generalizability of the findings to rural populations or a more heterogeneous national scale. Second, this study evaluates only a single e-commerce platform. As a result, it fails to capture direct comparative dynamics with major competitors that might utilize different AI architectures. Additionally, the cross-sectional research design only captures data at a single point in time. Because psychological constructs like trust and loyalty continuously evolve through repeated transactions, a longitudinal approach would be more ideal for future studies. Finally, the determination coefficients (R-Square) of 60.9% for Customer Loyalty and 63.5% for Customer Trust indicate that a substantial portion of the variance is influenced by variables outside this research model. Future research is highly recommended to integrate external factors such as price sensitivity, sales promotions, and human customer service quality.

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