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SOCIO-ECONOMIC AND ENVIRONMENTAL ISSUES IN DEVELOPMENT

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THE IMPACT OF AI-POWERED SERVICE QUALITY ON PERCEIVED VALUE AND CUSTOMER SATISFACTION ON E-COMMERCE PLATFORMS IN VIETNAM

Le Van Chien

levanchien@humg.edu.vn

*Faculty of Economics and Business Administration,
Hanoi University of Mining and Geology, Hanoi, Vietnam*

Abstract

In the highly competitive e-commerce market, customer service has become a key factor in creating a competitive advantage for e-commerce businesses. The integration of artificial intelligence (AI) in delivering customer services has emerged as a significant turning point. This study examines the impact of AI-powered service quality on customer satisfaction on B2C e-commerce platforms in Vietnam. Additionally, it explores the mediating role of perceived value. The study surveyed 398 individuals who had experienced AI-powered services while shopping on major e-commerce platforms in Vietnam, including Shopee, Tiki, Lazada, and TikTok Shop. The findings provide new insights into the application of AI in e-commerce services, emphasizing the importance of AI adoption and customer experience optimization in enhancing customer satisfaction in e-commerce. Based on the analysis results, the study also offers recommendations for e-commerce businesses to improve AI-powered service quality and promote customer satisfaction.

Keywords: *AI-powered service quality, customer satisfaction, perceived value, e-commerce platforms*

1. Introduction

In an increasingly competitive market, service quality is key to customer satisfaction and loyalty (A. P. Parasuraman et al., 1985; Shi et al., 2014; Zeithaml et al., 1996). In e-commerce, where interactions occur digitally, electronic service quality significantly influences online purchasing behavior (A. Parasuraman et al., 2005; Rita et al., 2019; Wolfinbarger & Gilly, 2003; Zeithaml et al., 2002).

In Vietnam, the government has issued several important policies to promote the development and application of artificial intelligence, notably the "National strategy on research, development, and application of artificial intelligence by 2030" (Decision No. 127/QĐ-TTg, 2021). Additionally, the "Decision on guidelines for some principles on research and development of responsible AI systems" (Decision No. 950/QĐ-BKHCN, 2024) has introduced nine principles emphasizing requirements such as respecting human rights, ensuring safety, fairness, transparency, and protecting personal data. Moreover, Decree No. 13/2023/ND-CP on personal data protection also strictly regulates the collection and processing of user information, contributing to the creation of a safe and reliable AI application environment in e-commerce. These policies provide favorable conditions for e-commerce businesses to strengthen the application of AI to enhance service quality. However, compared to developed countries, the level of AI technology maturity in Vietnam is still in the process of improvement, requiring businesses to focus on investment and simultaneously optimize the customer experience through AI.

The rapid rise of artificial intelligence (AI) is transforming e-commerce, offering automated solutions for complex tasks (Crittenden et al., 2019). AI is widely applied in chatbots, recommendation systems, smart logistics, and dynamic pricing (Adam et al., 2021; Song et al., 2019).

In Vietnam, major e-commerce platforms now use AI for customer support, including chatbots, image search, automated recommendations, and augmented reality. Despite growing research on AI-powered service quality, a review of existing studies reveals three key gaps in the e-commerce sector:

First, while many studies highlight the importance of AI in customer service - such as AI-powered service quality positively impacting consumer experience and strengthening business-consumer relationships (T.-M. Nguyen et al., 2021), AI-driven services influencing consumer interactions directly or indirectly (Isaac Owusu Asante et al., 2023), and AI revolutionizing service operations to enhance customer experience and business value (Rahman et al., 2023) - there are also contrasting perspectives. Some argue that AI-driven services are less effective than human-provided services in enhancing operations and consumer experience, making AI less critical as a competitive differentiation strategy (Prentice et al., 2020). Additionally, perceived trade-offs when using AI-powered services can negatively impact consumer experience (Ameen et al., 2021). Positive AI interactions may enhance customer satisfaction, while negative interactions may not significantly affect it (Mariani & Borghi, 2024). These differing views suggest that further research is needed to clarify the role of AI in customer service.

Second, while numerous studies have examined electronic service quality in e-commerce, most focus on human-operated factors, with limited attention to AI-powered automated services. Existing research on AI-driven service quality is fragmented, often exploring individual technologies rather than providing a comprehensive analysis. For instance, prior studies have investigated chatbot service quality (Adam et al., 2021), image-based search functions (Sudarsan et al., 2022), automated recommendation systems (Chinchanachokchai et al., 2021), post-sale support services (Daqar & Smoudy, 2019), and augmented reality (Saleem et al., 2022). Noor et al. (2022) examined AI-powered service quality but mainly focused on chatbots and augmented reality (Noor et al., 2022). Given the rapid growth and intense competition in Vietnam's e-commerce market - led by platforms like Shopee, TikTok Shop, Lazada, and Tiki - further research is needed to understand consumer responses to AI-powered services comprehensively.

Third, while existing studies have developed comprehensive AI-powered service quality scales, two perspectives remain. The first evaluates AI's technical performance, based on the IS success model (DeLone & McLean, 1992), measuring reliability, empathy, and assurance (T.-M. Nguyen et al., 2021; Prentice et al., 2020). The second focuses on user experience and service utility, using the SERVQUAL model (A. P. Parasuraman et al., 1988), covering efficiency, security, availability, enjoyment, human contact, and personalization (Noor et al., 2022). In Vietnam, the first approach was validated in hospitality services (T.-M. Nguyen et al., 2021) but may not fully capture AI service quality in e-commerce. E-commerce platforms integrate diverse AI applications (chatbots, image search, AR, recommendation systems, automated post-sales services), requiring both accuracy and engaging shopping experiences.

Addressing these gaps, this study empirically examines the impact of AI-powered service quality on perceived value and customer satisfaction, focusing on Vietnam's e-commerce platforms.

2. Literature Review and Hypothesis Development

2.1. AI technology and the application of AI technology on e-commerce platforms in Vietnam

AI is an advanced technology that simulates human intelligence, including learning, communication, and collaboration. Unlike natural intelligence, AI operates through computer systems and automation, utilizing big data and machine learning algorithms. This allows AI to perform complex tasks with minimal human intervention, optimizing performance in various fields, particularly business (Kaplan & Haenlein, 2019; Russell & Norvig, 2016).

In business, AI not only supports operations but also provides value to both customers and suppliers (Wirtz et al., 2012). AI is widely used in areas like inventory management, content automation, and customer service (Bolton et al., 2018; Chung et al., 2020), playing a crucial role in enhancing service quality and business efficiency.

E-commerce in Vietnam has grown rapidly, with a market size of over 20 billion USD in 2023, making it one of the fastest-growing e-commerce markets in Southeast Asia (E-commerce and Digital Economy Agency, Ministry of Industry and Trade, 2023; Momentum Works, 2024). Major platforms like Shopee, Lazada, and TikTok Shop have adopted AI to improve customer experience, with applications like chatbots, augmented reality, image search, and smart after-sales services.

AI in academic research is often explored from two angles: (1) its adoption across industries (Gursoy et al., 2019; Sohn & Kwon, 2020), and (2) the quality of AI services in business (Prentice & Nguyen, 2020). This study focuses on the latter, evaluating the impact of AI on service quality and consumer behavior on Vietnamese e-commerce platforms.

2.2. AI-powered service quality

The rapid growth of technology has enhanced its role in service delivery (Bitner et al., 2010). Service providers use technology in two main ways: first, to support employees in interacting with customers, improving performance and personalizing services (Salomann et al., 2007; Verhagen et al., 2014), and second, to replace employees with self-service platforms like e-commerce websites and ATMs, increasing efficiency and convenience (Bitner et al., 2000).

With AI, a "high-tech - human-like" model has emerged, allowing AI to automate processes and simulate human interactions, improving service quality while minimizing human bias or errors (Paschen et al., 2020; Russell & Norvig, 2016). This enables more personalized and efficient customer experience.

Service quality is traditionally defined as the gap between expected and perceived service, based on customer perceptions (A. Parasuraman et al., 1994). While much research has focused on human-provided services (Prentice & Kadan, 2019; Scheidt & Chung, 2019; Suhartanto et al., 2019), there is limited study on customer responses to AI-powered services (Prentice et al., 2020). AI-driven services, built around self-service technologies, may have distinct service quality characteristics compared to traditional human interactions.

2.3. AI-powered service quality and customer satisfaction

According to the expectation/disconfirmation model, when actual performance exceeds expectations, customers experience higher satisfaction (Oliver, 1989; Yi, 1990). Customer satisfaction is an emotional response from comparing perceived performance with prior expectations (Day, 1984; Gary Kotler & Armstrong, 2012).

Service quality and customer satisfaction are distinct but related concepts. Service quality is an assessment of service excellence (Cronin et al., 2000), while satisfaction combines cognitive and emotional responses (Rust & Oliver, 1994). Studies confirm that higher service quality leads to increased satisfaction (Yi, 1990).

In AI-powered services, quality becomes especially important. Sectors like banking, hospitality, and retail use AI to enhance operations and customer experience, though research on how AI-powered service quality affects customer satisfaction is limited. Previous studies show that self-service systems can provide both positive and negative experiences (Bitner et al., 2000). Benefits such as convenience and time savings can increase satisfaction, while system errors or poor design can cause frustration. Similarly, the quality of SST services affects perceived value and customer satisfaction (H. Q. Nguyen et al., 2023). Similarly, AI technologies can personalize services, improving customer loyalty (Mithas et al., 2005).

AI-powered services extend previous service technologies, emphasizing factors like accuracy, automation, and personalization (Prentice & Nguyen, 2020). If AI services meet customer expectations, satisfaction increases. If not, it decreases. This study argues that AI-powered service quality directly affects customer satisfaction. Therefore, the following hypothesis is proposed:

H1: AI-powered service quality positively impacts customer satisfaction

2.4. AI-powered service quality and customer perceived value

Perceived value is an important concept as it influences customer satisfaction (Heskett et al., 1997) and post-purchase behavior (Cronin et al., 1997). Zeithaml (1988) defines perceived value as the overall customer evaluation of a product/service, comparing the benefits received with the costs incurred to obtain it (Zeithaml, 1988). Patterson & Spreng (1997) emphasize this by defining perceived value as the ratio of benefits to the sacrifice required to gain those benefits (Patterson & Spreng, 1997). Lovelock et al (2007) further argue that strategies to increase perceived benefits or reduce sacrifices enhance customer perceived value (Lovelock et al., 2007).

Previous studies have shown that service quality positively impacts customer perceived value (Cronin et al., 2000; A. Parasuraman & Grewal, 2000; Ryu et al., 2012; Teas & Agarwal, 2000; Wu, 2013). When service quality improves, customers perceive greater benefits relative to the costs (money, time, effort), thus increasing perceived value. In online retail, Parasuraman (2005) developed the E-S-QUAL model to assess the impact of e-service quality on customer perceived value (A. Parasuraman et al., 2005). Subsequent studies have reinforced this view, noting that service quality plays a key role in enhancing perceived value in digital environments (Brady & Cronin Jr., 2001; Jiang et al., 2018).

Research on self-service technologies also suggests that integrating technology into services can enhance customer experiences, improving perceived value (Boon-itt, 2015; Kim & Park, 2019; H. Q. Nguyen et al., 2023; Pooya et al., 2020)

In AI-powered services, the relationship between AI service quality and perceived value becomes even more significant. AI can create personalized experiences, increasing speed and accuracy, allowing customers to perceive more benefits compared to traditional services. However, if AI services are not user-friendly or reliable, customers may perceive lower value.

Based on the above arguments, this study proposes the following hypothesis:

H2: AI-powered service quality positively impacts customer perceived value.

2.5. Customer perceived value and customer satisfaction

According to Hallowell (1996), customer satisfaction results from comparing the perceived value of a transaction with the expected value from other providers (Hallowell, 1996). Rust & Oliver (1994) also emphasize that perceived value significantly impacts customer satisfaction, aligning with Fornell et al. (1996), who argue that perceived value is a precursor to satisfaction (Fornell et al., 1996; Rust & Oliver, 1994). Therefore, perceived value plays a crucial role in determining customer satisfaction. When customers perceive higher service quality relative to the costs, they evaluate the service as more valuable, leading to increased satisfaction.

Empirical studies have shown that perceived value positively impacts customer satisfaction in both traditional retail (Cronin et al., 2000; Eggert & Ulaga, 2002) and e-commerce environments (Hsu, 2006; Z. Yang & Peterson, 2004). Additionally, research in self-service technology contexts supports this relationship (Boon-itt, 2015; Kim & Park, 2019; H. Q. Nguyen et al., 2023; Pooya et al., 2020).

These findings indicate that in a digital environment, perceived value continues to play a critical role in customer satisfaction, especially as advanced technologies like AI are increasingly

applied to services on e-commerce platforms. Based on this, the study proposes the following hypothesis:

H3: Customer perceived value positively impacts customer satisfaction with AI-powered services.

Based on the above research hypotheses, the research model includes the proposed factors shown in Figure 1.

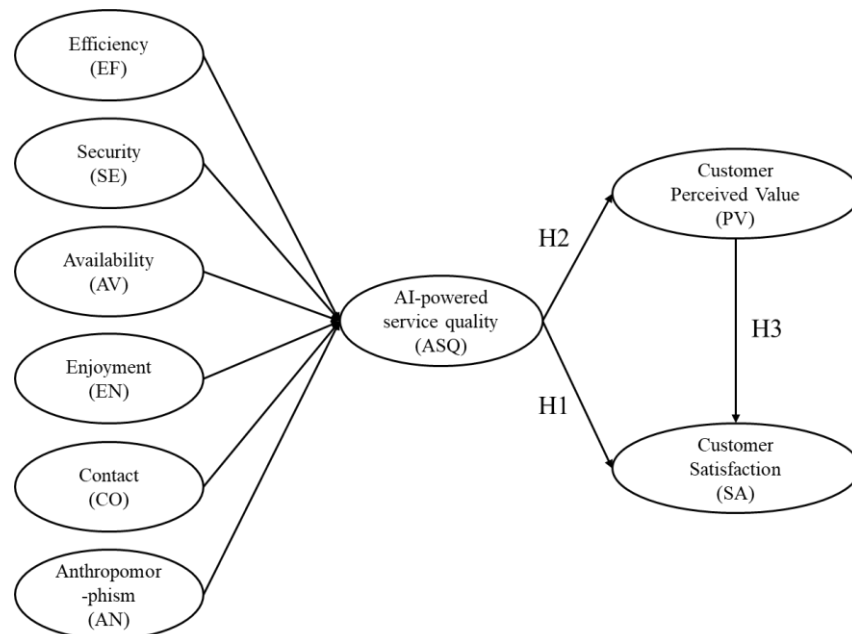


Figure 1. Proposed research model

Source: Author's proposed research

3. Method

3.1. Sample and data collection

The target group for this study consists of individuals who have experienced AI-powered services while shopping on major e-commerce platforms in Vietnam, such as Shopee, Tiki, Lazada, and TikTokShop. An online survey was conducted using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Data was collected from October 2024 to December 2024.

Based on the non-probability convenience sampling method, online questionnaires created on Microsoft Forms were sent to customers to collect their feedback. Participation in the survey was voluntary. After excluding responses with errors or missing data, a total of 398 valid responses were collected for data analysis. Demographic information is presented in Table 1.

Table 1. Demographic information

Characteristics	Frequency	%
<i>Gender</i>		
Male	162	40.7
Female	236	59.3
<i>Age</i>		

18 to 23	187	47.0
24 to 30	106	26.6
31 to 40	69	17.3
Over 40	36	9.0
<i>Occupation</i>		
Student	154	38.7
Specialized Professions (Doctor, Teacher, Police)	52	13.1
Office Worker	118	29.6
Engineer/Scientist	36	9.0
Manual Labor	26	6.5
Other	12	3.0
<i>The e-commerce platform is selected for evaluation</i>		
Shopee	196	49.2
Lazada	64	16.1
Tiki	26	6.5
Tiktok Shop	112	28.1
<i>The AI-enabled services on e-commerce platforms that have been used or accessed</i>		
Chatbots	307	77.1
Image-based search	342	85.9
Automatic recommendation systems	298	74.9
Automated after-sales services	259	65.1
Augmented reality technology	184	46.2

Source: Analysis results from i

The data was analyzed using SmartPLS 4.0 software (Cudeck, 1989). The use of Likert scales and structural equation modeling (SEM) aligns with current research on service quality that incorporates linear modeling approaches. The Partial Least Squares (PLS) method was chosen for model testing due to its effectiveness in handling second-order constructs and its suitability for exploratory research aimed at testing new models and assessing out-of-sample predictive relevance (Hair et al., 2017).

3.2. Evaluation of reliability, convergent validity, and discriminant validity of the scale

This study adopts and slightly modifies measurement scales for each construct based on prior research. The translation and language adaptation of questionnaire items from English to Vietnamese were conducted with support from a linguistics expert and two e-commerce specialists.

Based on a literature review, AI-powered service quality (ASQ) is conceptualized as a second-order construct consisting of six first-order dimensions: Efficiency (EF), Security (SE), Availability (AV), Enjoyment (EN), Contact (CO), and Anthropomorphism (AN). The measurement items were adapted from studies by Noor et al. (Noor et al., 2022). The customer perceived value scale includes 4 items inherited and developed from the scale of Parasuraman (A. Parasuraman và c.s., 2005). The customer satisfaction scale consists of 6 items inherited and developed from Bhattacharjee's scale (Bhattacharjee, 2001). All original scales demonstrated acceptable reliability and validity.

To model the second-order construct, a two-stage approach was used (Becker et al., 2012; Ringle et al., 2012; Wetzels et al., 2009). In Stage 1, a repeated indicators approach was applied to compute the latent scores of the first-order constructs, which were then saved as variables in the dataset. In Stage 2, these were treated as observed variables, and the second-order construct was modeled as a first-order latent variable.

Indicator reliability was assessed through factor loadings, all exceeding the 0.7 threshold, ensuring scale reliability. Table 2 presents the results for Cronbach's Alpha, rhoC, and rhoA, all of which met the reliability criteria (≥ 0.7). Specifically, Cronbach's Alpha values ranged from 0.780 to 0.879, indicating high reliability (Hair et al., 2019, 2022). The rhoC and rhoA coefficients also exceeded acceptable levels (T. Dijkstra & Henseler, 2015; T. K. Dijkstra, 2010, 2014; Henseler et al., 2015; Jöreskog, 1971). The average variance extracted (AVE) values for all constructs were above 0.50, confirming convergent validity (Fornell & Larcker, 1981).

Table 2. Validity and reliability results

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AN	0.863	0.866	0.898	0.595
AV	0.780	0.801	0.871	0.693
CO	0.873	0.874	0.908	0.664
EF	0.836	0.842	0.890	0.670
EN	0.854	0.858	0.901	0.695
PV	0.820	0.830	0.882	0.651
SA	0.879	0.881	0.909	0.624
SE	0.792	0.798	0.865	0.617

Source: Authors' own work

The HTMT criterion was employed to further assess the discriminant validity of the measurement scales. According to Henseler et al. (2015), discriminant validity is established when the HTMT value between two constructs is below 0.85 (Henseler et al., 2015). As shown in Table 3, all HTMT values between construct pairs are below this threshold, indicating that the constructs in this study are clearly distinct from one another.

Table 3. Discriminant validity analysis of scale using HTMT criterion

	AN	AV	CO	EF	EN	PV	SA	SE
AN								
AV	0.425							
CO	0.560	0.273						
EF	0.432	0.549	0.387					
EN	0.694	0.355	0.485	0.388				
PV	0.689	0.568	0.597	0.718	0.664			
SA	0.654	0.475	0.608	0.501	0.725	0.789		
SE	0.660	0.329	0.579	0.366	0.598	0.620	0.657	

Note: Discriminant validity is established at the HTMT

Source: Authors' own work

After transforming the ASQ construct into a first-order structure, a bootstrapping analysis was conducted to assess the quality of its first-order components. As shown in Figure 2, the p-values of the outer weights for all dimensions (EF, SE, AV, EN, CO, and AN) are below 0.05, indicating that all six first-order constructs are statistically significant contributors to the second-order ASQ construct (Hair et al., 2011).

4. Results

The Variance Inflation Factor (VIF) was used to test for multicollinearity. All variables had VIF values ranging from 1.000 to 2.394 (less than 3), indicating no multicollinearity in the model (Hair et al., 2019).

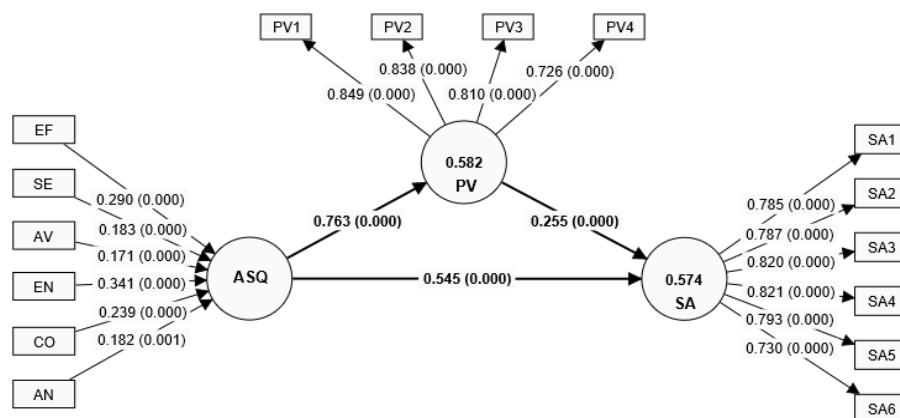


Figure 2. Estimated results of the research model using PLS-SEM

Source: Authors' own work

As illustrated in Figure 2, all standardized path coefficients are positive. Specifically, EF, SE, AV, EN, CO, and AN all have a positive effect on ASQ. Among them, EN shows the strongest influence on customers' perception of AI-powered service quality in e-commerce platforms ($\beta = 0.341$), while AV has the weakest ($\beta = 0.171$).

ASQ has a positive impact on customer satisfaction (SA) ($\beta = 0.545$), supporting Hypothesis H1. Similarly, the significant positive effect of ASQ on perceived value (PV) is confirmed ($\beta = 0.763$), supporting H2. PV also positively affects SA ($\beta = 0.255$), confirming H3. Thus, H1, H2, and H3 are all supported.

ASQ has a positive impact on customer satisfaction (SA) ($\beta = 0.545$), supporting Hypothesis H1. Similarly, the significant positive effect of ASQ on perceived value (PV) is confirmed ($\beta = 0.763$), supporting H2. PV also positively affects SA ($\beta = 0.255$), confirming H3. Thus, H1, H2, and H3 are all supported.

The adjusted R^2 for PV is 0.582, indicating that AI-powered service quality explains 58.2% of the variance in perceived value. The adjusted R^2 for SA is 0.574, meaning the model explains 57.4% of the variance in customer satisfaction. These results demonstrate that the model has good predictive power within the research context (Hair et al., 2019; Shmueli et al., 2019).

5. Discussion and conclusion

This study empirically examined the relationship between AI-powered service quality (ASQ) and customer satisfaction on e-commerce platforms in Vietnam. The findings not only reinforce the role of AI in enhancing the shopping experience but also make important academic contributions by addressing three key research gaps.

First, the study provides empirical evidence of the positive impact of ASQ on perceived value and customer satisfaction, confirming that AI can enhance the quality of automated services in e-commerce. This finding aligns with previous research in sectors such as tourism, hospitality, and banking (T.-M. Nguyen et al., 2021; Noor et al., 2022; Prentice et al., 2020; X. Yang, 2023), while extending the understanding to the e-commerce context, where AI plays a crucial role in optimizing the consumer journey.

Second, the study offers a comprehensive evaluation of customer responses to AI services on e-commerce platforms, rather than focusing on a single technology such as chatbots or recommendation systems. This helps clarify the interaction between AI and traditional electronic services (whether employee-provided or self-service), addressing a limitation in previous studies. In the context of Vietnam's rapidly growing e-commerce market, these findings offer a more practical view of how AI enhances customer experience.

Third, this study is the first to evaluate AI service quality in e-commerce in Vietnam from a user experience perspective, using a measurement model consisting of six components: efficiency (EF), security (SE), availability (AV), enjoyment (EN), contact with humans (CO), and personalization (AN). Notably, enjoyment (EN) is the most important factor for customers and has the strongest impact on their perception of AI-supported service quality. This is because enjoyment not only creates unique and engaging experiences but also stimulates curiosity and joy when interacting with AI services, making customers feel more connected to the platform. When the service experience is enjoyable, users tend to return to use the service more frequently, which is more effective than traditional factors like efficiency and security in retaining customers.

Research implications

Theoretical implications: This study enriches the academic literature on AI-supported service quality (ASQ) and customer experience in e-commerce. It extends electronic service quality theory by integrating AI technology as a key component in evaluating service quality. While prior studies have primarily focused on human-delivered or traditional electronic services, this research offers a more comprehensive theoretical framework for ASQ in e-commerce. It emphasizes that customer experience is influenced not only by reliability and technical performance, but also by factors such as enjoyment, anthropomorphism, and human-like interaction. Moreover, this study contributes to Customer Experience Theory (CET) and the Stimulus-Organism-Response (SOR) model by clarifying the role of AI service quality as a stimulus that affects customer perception and behavior. Specifically, the findings show that positive experiences with AI services can enhance perceived value and customer satisfaction, which in turn may drive purchasing behavior. This helps to refine and expand the SOR model in the context of e-commerce, where AI is increasingly central to shaping consumer experiences.

Managerial implications: This study provides a foundation for e-commerce businesses in Vietnam, such as Shopee, Tiki, Lazada, and TikTok Shop, to improve the quality of their AI services in order to enhance customer perceived value and satisfaction - two critical factors in building sustainable customer relationships (Gary Kotler & Armstrong, 2012). Specifically, the findings help prioritize AI service quality components in the following order: enjoyment, efficiency, contact, security, anthropomorphism, and availability. This supports strategic resource allocation to maximize ROI in AI service development. Enjoyment (EN) is the most important factor in the perception of AI service quality, as customers seek dynamic interactions rather than mechanical responses. Therefore, e-commerce businesses should develop AI with a user-friendly interface, flexible responses, and integrate gamification or virtual assistants to enhance engagement. Efficiency (FE) reflects AI's ability to quickly and accurately process customer requests, saving time and improving shopping experience. E-commerce businesses need to invest in AI's speed and accuracy

to increase satisfaction and trust. Contact (CO) refers to AI simulating emotions, responding contextually, and connecting with human agents when necessary, creating emotional connections and flexible support in situations that require in-depth consultation. Customers appreciate AI systems that assist them without completely replacing human interaction. However, over-reliance on AI can create risks for e-commerce platforms, such as AI struggling to handle complex situations or unforeseen requests, leading to poor customer experience. Additionally, AI lacks the ability to recognize and respond to customers' emotional needs, something humans can easily do, which may make customers feel neglected. Excessive dependence on AI can also reduce human interaction, weakening customer connection and loyalty. Moreover, AI carries technical and security risks, such as software malfunctions or data breaches, which can damage the platform's reputation and security. Therefore, e-commerce platforms need to maintain a balance between AI technology and human support to ensure service quality.

Limitations and future research directions

This study has five main limitations:

Firstly, the scope of the research is limited to the e-commerce context in Vietnam and does not consider the differences between markets with varying levels of AI technology development. Future studies could expand this model to other countries to compare the impact of ASQ in different e-commerce business environments.

Secondly, the study employs a non-probability online convenience sampling method, which may affect the data quality and does not represent the entire customer base. Therefore, future studies should apply stratified sampling methods to segment customers based on criteria such as age, gender, location, preferred e-commerce platform, commonly used AI services, and technology usage levels.

Thirdly, the study focuses on customer experiences with AI services on e-commerce platforms in general, but does not delve into the differences between specific types of AI services, such as chatbots, augmented reality technology, recommendation systems, or image search. Therefore, future studies could examine the impact of each AI service type on customer experience quality.

Fourthly, the study does not analyze the differences between groups such as gender, occupation, age, and e-commerce platform, which could lead to gaps in understanding how these factors affect the perception and evaluation of service quality. Therefore, adding multi-group analysis would provide more accurate and tailored recommendations.

Fifthly, the study focuses on customer satisfaction and perceived value but does not consider the long-term impact of ASQ on customer loyalty and repeat purchase behavior. Therefore, future research could expand the model to assess the influence of AI service quality on customer loyalty.

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