

AI-Chatbot Service Quality and E-Brand Loyalty: A Mediated Model of Functional Benefit, User Experience, And Satisfaction

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Abstract

In today's digital era, artificial intelligence (AI) and chatbot technology have played a pivotal role in enhancing customer engagement, satisfaction, and brand relationships. Based on the Stimulus - Organism-Response (S-O-R) framework, this study proposes a conceptual model that explains how chatbot service quality influences e-brand loyalty. In this model, chatbot service quality is regarded as a stimulus (S) that elicits functional benefits perceived by users. These benefits serve as the organism (O), shaping positive experiences and satisfaction during interactions with AI. Consequently, these internal evaluations lead to responses (R) manifested as e-brand loyalty. Moreover, the model highlights the mediating role of satisfaction in linking functional benefits and positive experiences to loyalty, underscoring its significance in fostering long-term customer-brand relationships. Methodologically, this study adopts a conceptual modelling approach, synthesising the literature on service quality, customer experience, and digital branding to propose testable hypotheses. This study offers three major contributions to the theory and practice. First, it extends service quality theory by applying and advancing the S-O-R framework in the context of AI-driven interactions, thereby clarifying the combined role of functional benefits and experiential value in shaping digital-service experiences. Second, it integrates technological, experiential, and emotional dimensions into a comprehensive framework, clarifying how value co-creation occurs between chatbots and consumers. Third, it offers practical implications for managers to optimise chatbot design to enhance efficiency, enrich user experience, and foster stronger brand attachment. By advancing both theoretical understanding and managerial practice, this study underscores the strategic role of AI chatbots in cultivating sustainable E-brand loyalty.

Keywords: AI-Chatbot, Service Quality, User Experience, Satisfaction, E-Brand Loyalty

Introduction

In the current business environment, customer satisfaction plays an important role in driving organizational growth. When customers are satisfied, they are not only more likely to continue purchasing but also to maintain long-term relationships, thereby fostering brand loyalty, which is a key determinant of business sustainability. In the era of digital transformation, the advancement of artificial intelligence (AI) has introduced both opportunities and challenges in understanding and meeting customer expectations (Kunal et al., 2023). According to Mordor Intelligence (2023), the global chatbot market is projected to reach USD 7.01 billion in 2024 and USD 20.81 billion by 2029, with a compound annual growth rate (CAGR) of 24.32% during the forecast period (2024–2029). AI technology presents significant opportunities for enhancing customer engagement and delivering personalised services. Building on a systematic theoretical approach,

this study aims to identify the critical factors influencing customer satisfaction and brand attachment (Saputra 2024).

This study focuses on the relationship between AI chatbot service quality and e-brand loyalty within the digital brand context, emphasising the mediating roles of functional benefits and satisfaction. In particular, user experience is conceptualised as a moderating factor that shapes the link between AI chatbot service quality and functional benefits. By examining service quality through the lens of functional benefits, positive experiences, and user satisfaction, this study extends the current knowledge in the field. Previous empirical studies on chatbot reuse intentions and brand loyalty (Elkhwesky & Elkhwesky, 2023; Priya & Sharma, 2023; Ahmadi & Ataei, 2024; Zhang & Wang, 2023) have highlighted the importance of service quality in shaping customer behaviour, but the underlying mechanisms remain insufficiently addressed in the literature.

Based on the Stimulus–Organism–Response (S–O–R) framework, AI chatbot service quality is viewed as the stimulus (S) that influences users’ internal states (O), specifically functional benefits and satisfaction, which in turn drive behavioural outcomes (R), such as e-brand loyalty. By systematically exploring these relationships, this study contributes to the literature on information systems, consumer behaviour, digital marketing, and technology management. Simultaneously, it provides valuable managerial implications for brand managers seeking to optimise chatbot service quality, enhance user experience, and strengthen long-term e-brand loyalty in the digital marketplace.

Literature review

Theoretical background

The S–O–R (Stimulus–Organism–Response) model was originally developed by Mehrabian and Russell (1974). The authors argued that a shopping environment contains stimuli (S) that affect the organism (O) and ultimately leads to behavioural responses (R). First, stimuli (S) in the SOR model are considered external factors that influence an individual’s cognitive and affective reactions (Eroglu et al., 2001). In this study, AI chatbot service quality was conceptualised as an external stimulus (S). User experience is introduced as a key moderating factor between AI chatbot service quality and functional benefit. Specifically, when the user experience is positive, the relationship between service quality and functional benefits is strengthened. Conversely, when the user experience is low, the same level of AI chatbot service quality may generate fewer functional benefits.

Second, the organism (O) represents the internal processes and structures that intervene between external stimuli and individuals’ final actions, responses, or behaviours (Bagozzi 1986). This reflects the mechanism by which consumers transform external stimuli into meaningful information and use it to interpret their environment before making decisions or judgments (Loureiro & Sarmiento, 2018). In this study, internal responses (O) are represented by the functional benefits derived from chatbot interactions. Positive chatbot experiences stem from

ease of use, personalisation, and emotional satisfaction during the interaction. These functional benefits reflect the value that users perceive in a chatbot service. Subsequently, customer satisfaction emerges as the next outcome, resulting from perceived functional benefits.

Finally, response (R) represents the consumer's ultimate decision, which can be expressed as either approach or avoidance behaviour (Mehrabian & Russell, 1974). In this study, the behavioural response (R) is defined as user e-brand loyalty, which is reflected in brand attachment, repurchase behaviour, recommendations, and advocacy in the online context. According to the S–O–R framework, high-quality AI chatbot services foster positive experiences and deliver greater functional benefits, which in turn enhance satisfaction and strengthen brand loyalty. Conversely, poor service quality may result in negative experiences, limited functional benefits, and a decline in brand loyalty.

Definitions

AI-Chatbot service quality

AI-powered chatbots are not only a new service delivery method but also represent an innovative approach to customer interactions. Unlike traditional self-service systems based on information technology platforms, AI chatbots are designed to simulate human conversations and provide users with information and assistance. However, in certain aspects, such as emotional intelligence, they still fall short compared to human agents (Gray et al., 2007). Their role in customer service involves answering enquiries, solving problems, and offering 24/7 support (Li et al., 2024). Similar to other service industries, today's customers highly value efficiency and convenience in their interactions with business. AI chatbots can provide quick responses and assist with essential tasks, such as delivering information, guiding processes, and resolving issues. Moreover, they can collect and analyse customer data to generate personalised product recommendations and tailored content, thereby enhancing the user experience and increasing the functional value customers derive from the service (Li & Wang, 2023).

E-brand loyalty

Customer loyalty has long been conceptualised in business communication research as a stable, non-random behavioural response that reflects a long-term commitment to repurchase or continue supporting a preferred brand, even when confronted with competitive marketing efforts (Oliver, 1997). E-brand loyalty builds upon this traditional understanding but incorporates the unique characteristics of the digital environment, particularly in the context of Internet-based marketing and consumer behaviour. Schultz and Peltier (2013) emphasize that e-loyalty has shifted away from the traditional product-centered model controlled by marketers toward a consumer-driven model shaped by digital technologies and distribution systems. Online brand loyalty refers to the degree of attachment and commitment that customers demonstrate toward a brand or company in digital contexts. It extends beyond simple satisfaction, reflecting a willingness to repurchase from the brand and recommend it to others (Yang et al., 2023).

Functional benefit

Functional benefits are the external advantages of a product or service, typically related to the tangible attributes that influence consumer choice (Ku, 2020). Prior research has confirmed that functional benefits significantly affect customer and organizational performance and are strongly linked to long-term business and financial performance (Foroudi et al., 2020). In the case of AI chatbots, personalisation and cross-platform integration are key functional benefits that enhance the user experience. Personalised responses aligned with individual characteristics make users feel better understood and supported, thereby improving their satisfaction with the interaction (Chaudhry & Debi, 2024). As Kehat et al. (2024) highlight, these functional benefits not only reflect the technical capacity of chatbots but also play a vital role in fostering long-term relationships between customers and businesses through digital service channels.

Online customer experience

Petre et al. (2006) suggest that online customer experience is not limited to interactions with websites but also shapes perceptions of value and service quality. The importance of online experience in the growth of e-commerce has been widely recognised (Rose et al. 2012). Online customer experience is viewed as a psychological state manifested as subjective responses or overall perceptions associated with service delivery (Zhang et al., 2017). In this context, the introduction of AI chatbots serves as a critical enabler that enriches the online customer experience through rapid responses, personalisation, and convenience.

Satisfaction According to Godlewski and Perse (2010), the degree to which customer values are fulfilled determines the level of satisfaction derived from using a medium for communication. In business contexts, satisfaction is typically defined as the extent to which a product or service meets or exceeds customer expectation (Chung et al., 2018). It is a foundational concept in marketing and management and is widely acknowledged as a key driver of loyalty, repurchase behaviour, and positive word-of-mouth advocacy (Meria, 2023).

Research methodology

This study adopts a qualitative research approach, focusing on the systematisation of theoretical foundations drawn from prior studies and the application of the S–O–R framework. Specifically, this study analyzes key constructs, including AI chatbot service quality, functional benefits, user experience, customer satisfaction, and e-loyalty, to clarify how these factors influence and mediate one another. These constructs were identified through an extensive synthesis of the academic literature, industry reports, and empirical studies related to digital service quality, online user behaviour, and brand engagement. By consolidating theoretical insights, this study develops a conceptual research model that contributes to understanding the role of AI chatbots in enhancing customer experience and fostering long-term brand loyalty in a digital environment.

Hypotheses development

Currently, AI chatbots are widely implemented in e-commerce, often serving as the first “employee” that consumers encounter when interacting with an organisation. In many cases, customers must engage with AI chatbots before completing a purchase. Customers are redirected to human agents only when the chatbot is unable to resolve an issue. Therefore, the quality of AI

chatbots significantly influences customers' initial impressions of an organisation (Chen et al., 2022). High-quality AI chatbots deliver clear functional benefits by providing timely, accurate responses that are personalised. These benefits help customers save time, reduce the effort required to find information, and solve problems more efficiently. Moreover, the consistency and reliability of chatbot responses ensure that customers experience a stable level of service quality, minimizing risks and fostering a sense of trust during transactions (Shahzad et al., 2024). These factors suggest that AI chatbot service quality enhances the overall customer experience and generates practical functional benefits for users. Therefore, the author proposes the following hypothesis:

H1: The quality of AI chatbot services positively influences functional benefits.

In the context of AI-enabled services, prior studies have highlighted that AI provides both product-related advantages and user-centred experiences (Yoon et al., 2020), while also creating functional and emotional value (Elkhwesky & Elkhwesky, 2023). A positive user experience can be understood as favourable impressions and memories shaped by actual interactions, which manifest through functional benefits, outcomes, and satisfaction with acquired knowledge (Priya & Sharma, 2023). When users report a positive experience, they tend to evaluate AI chatbot service quality more clearly, thereby perceiving stronger functional benefits during interactions. Conversely, when the user experience is less favourable, even improvements in service quality may not translate into enhanced functional benefits for the user. This implies that user experience moderates the relationship between AI chatbot service quality and functional benefits, amplifying or diminishing its impact. Importantly, the value derived by users extends beyond product or functional gains to encompass the emotional benefits tied to the brand (Ahmadi & Ataei, 2024). Accordingly, the author proposes the following hypothesis:

H2: Positive user experience moderates the relationship between AI chatbot service quality and functional benefits.

Customer satisfaction is defined as an overall subjective evaluation of a service or transaction and is considered an emotional state that emerges progressively (Oliver 1981). Chung et al. (2018) found that AI chatbot use can significantly improve customer satisfaction with brands. When customers perceive high service quality, they believe that the AI chatbot has adequately met or even exceeded their expectations, leading to satisfaction with the firm (Maklan et al., 2017). Functional benefits, in this context, stem from the perceived balance between the rewards and costs associated with a service (Yang & Peterson, 2004). Specifically, if customers feel that the time and effort spent in exchange for high-quality chatbot services are worthwhile, they are more likely to appreciate the value provided by the service (Chen et al., 2022). Thus, the author proposes the following hypothesis:

H3: Functional benefits positively influence satisfaction.

Consumers who develop emotional bonds with a brand tend to rate its products and services more favourably and are less susceptible to competitor's appeals (Davis & Dacin, 2022). Zhang and Wang (2023) demonstrate that functional benefits positively affect e-brand loyalty. When customers perceive advantages from chatbot use, such as accurate information delivery, effective

assistance, and time savings, they are more likely to feel satisfied and maintain their relationship with the brand. In other words, the functional benefits generated by AI chatbots not only address practical needs but also reinforce online brand loyalty (Tran and Chang, 2024). Accordingly, the author suggests the hypothesis:

H4: Functional benefits positively influence user e-brand loyalty.

AI chatbots can consistently deliver high-quality services without the fatigue, stress, or errors that may affect human employees. This consistency ensures that customers receive the same service standard in every interaction, thereby reinforcing their trust and brand loyalty (Ruan & Mezei, 2022). Customer satisfaction with AI chatbot services is a critical driver of future consumer behavior and long-term brand engagement. When customers perceive that chatbots provide accurate information, prompt responses, and effective assistance, they tend to value the service more highly, which, in turn, strengthens satisfaction and encourages ongoing loyalty to the brand (Schuhbert et al., 2023). Additionally, AI chatbots can collect and analyse customer data through conversation (Chang et al., 2023). These insights allow firms to optimise their marketing strategies, refine their product offerings, and identify emerging consumer trends. Understanding customer preferences and behaviours enables businesses to design targeted marketing efforts, thereby deepening engagement and consolidating e-brand loyalty (Niu and Mvondo, 2024). Therefore, the author proposes the hypothesis:

H5: Satisfaction positively influences e-brand loyalty.

Proposed research model

The preceding discussion highlights the interconnections among AI chatbot service quality, functional benefits, user experience, satisfaction, and e-brand loyalty. Drawing on prior evidence that AI chatbot quality delivers timely, accurate, and consistent support (Chen et al., 2022; Shahzad et al., 2024), this study positions functional benefit as a central mechanism through which such quality generates value for consumers. Simultaneously, research emphasises that users' subjective experiences can strengthen or weaken the extent to which these benefits are realised (Priya & Sharma, 2023; Ahmadi & Ataei, 2024). Building on these insights, the model incorporates positive user experience as a moderator that shapes the relationship between service quality and functional benefits. Furthermore, functional benefits are theorised to enhance both satisfaction and e-brand loyalty (Zhang & Wang, 2023; Tran & Chang, 2024), while satisfaction serves as a pivotal antecedent of loyalty (Schuhbert et al., 2023; Niu & Mvondo, 2024). Taken together, the proposed model integrates these relationships into a coherent framework that advances our understanding of how AI-enabled services drive customer loyalty in digital contexts.

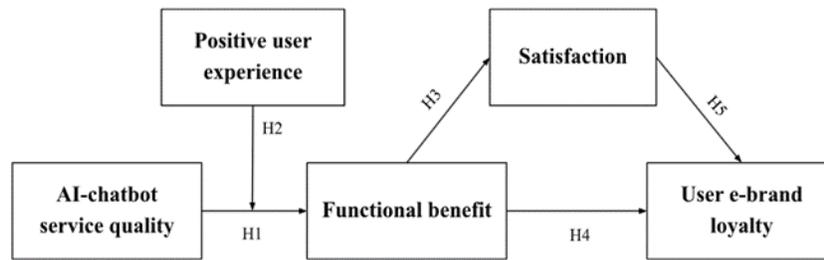


Figure: AI-chatbot service quality and e-brand loyalty: A mediated model of functional benefit, user experience, and satisfaction

Source: Proposed by the author

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This study proposes a conceptual model that explains the relationship between AI chatbot service quality and online brand loyalty, mediated by functional benefits and customer satisfaction, while also accounting for the moderating role of user experience. The proposed model asserts that when chatbot service quality—measured in terms of responsiveness, accuracy, and support capability—is assured, customers are more likely to perceive substantial functional benefits in return. These benefits can enhance satisfaction and strengthen brand loyalty in the online context. Importantly, user experience is a critical factor that may either amplify or diminish the impact of chatbot service quality on functional benefits.

The primary contribution of this research lies in applying the S–O–R framework to explain the formation of online brand loyalty in the rapidly expanding e-commerce sector. Beyond advancing theoretical perspectives on consumer behaviour in digital environments, the model provides a novel approach for future studies on digital marketing and service technologies.

Nonetheless, this study is limited to the conceptual stage and does not empirically validate the proposed model. Future studies should conduct surveys or experiments to assess the reliability and generalisability of the framework and empirically test the proposed hypotheses. Moreover, additional constructs, such as trust in AI technology, electronic word-of-mouth (eWOM), and service personalisation, could be incorporated to capture more nuanced mechanisms. Cross-market and cross-industry comparisons may also provide valuable theoretical and practical insights.

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