

Exploring How Ai Chatbots Influence Customer Loyalty Among Generation Z on E-Commerce Platforms

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ABSTRACT

The rapid development of artificial intelligence (AI) and machine learning has profoundly reshaped various industries, particularly through the rise of conversational AI agents—commonly known as chatbots—which facilitate seamless human and machine interaction. This study examines the influence of AI chatbot attributes on customer satisfaction and its subsequent impact on customer loyalty among Generation Z users in e-commerce platforms. Drawing on a positivist paradigm and a causal research design, data were collected from 200 Gen Z consumers via an online survey using a 7-point Likert scale. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to analyze the data. The findings indicate that personalization and system quality have significant positive effects on customer satisfaction. Interestingly, information quality and usability showed unexpected negative associations with satisfaction, suggesting a divergence from traditional assumptions. In contrast, interactivity, experience, and psychological ownership did not exhibit significant impacts. Furthermore, customer satisfaction strongly predicts customer loyalty. These results underscore the importance for e-commerce platforms to enhance personalization and system quality, while carefully re-evaluating how information and usability features are tailored to meet Gen Z's sophisticated digital expectations. This study contributes to the growing body of knowledge on AI-enabled customer experiences by offering novel insights into the preferences of digital natives and addressing inconsistencies in existing literature.

Keywords: AI Chatbots, Customer Loyalty, Customer Satisfaction, Gen Z, E-commerce, PLS-SEM.

INTRODUCTION:

The emergence of artificial intelligence (AI) and advances in machine learning have transformed industries, especially through conversational AI agents or chatbots that enable user interaction via text or voice (Li et al., 2023). Chatbots have become indispensable in customer service across online businesses and public sectors (Pathak & Bansal, 2024), with the global chatbot market valued at USD 7.01 billion in 2024 and expected to grow at a compound annual growth rate (CAGR) of 24.32% through 2029 (Joshi, 2025). Retail sales influenced by chatbots were projected to reach \$112 billion by 2023, with overall market value surpassing \$15.5 billion by 2028 (Wang et al., 2022; Zhang et al., 2024). Their rapid adoption stems from capabilities like instant responses, 24/7 availability, and operational cost reductions (Joshi, 2025; Zhang et al., 2024).

In e-commerce, where competition is intense, maintaining customer loyalty is vital. AI chatbots enhance the consumer experience by providing seamless, personalized, and immediate support around the clock (Chakraborty et al., 2024; Pathak & Bansal, 2024; Sadiq et al., 2025). Their role in transaction handling and query response boosts engagement and satisfaction, making chatbot deployment a critical digital strategy for attracting and retaining customers

(Alsadoun & Alnasser, 2025; Salah & Ayyash, 2024). This study focuses on Generation Z (Gen Z), individuals born between 1997 and 2012, the first true digital natives raised with pervasive digital technology and smartphones (D'Acunto et al., 2025). Gen Z differs markedly from older groups in their consumer behaviors and attitudes shaped by technological immersion and historical contexts (Doan et al., 2025).

Despite the increasing prevalence and strategic importance of AI chatbots in e-commerce, a comprehensive understanding of their specific impact on customer loyalty, particularly among Gen Z consumers, remains limited (Alsadoun & Alnasser, 2025; Zhang et al., 2024). Prior research on AI chatbot adoption has often focused on organizational contexts or different consumer segments and industries, such as (Chotisarn & Phuthong, 2025; Li et al., 2023; B. H. T. Nguyen et al., 2023), food and beverage (B. H. T. Nguyen et al., 2023), or hospitality (Chotisarn & Phuthong, 2025), providing limited insights into the specific dynamics within e-commerce for Gen Z (T.-Q. Dang, Nguyen, et al., 2025; B. H. T. Nguyen et al., 2023; L. T. Nguyen et al., 2023). Furthermore, the impact of AI chatbot recommendations on consumer intention and the psychological processes triggering adoption decisions also require further empirical investigation (Zhang et al., 2024). Besides,

research gaps persist in clearly articulating which specific AI chatbot attributes (e.g., information quality, system quality, usability, experience, interactivity, personalization, psychological ownership) influence customer satisfaction and loyalty (Ashfaq et al., 2025; Magno & Dossena, 2023). Especially, this study is consistently divided AI chatbot attributes into two primary dimensions: utilitarian value and hedonic value (Evelina et al., 2020; Randheer, 2015), both positively influencing consumer satisfaction and loyalty (Magno & Dossena, 2023; B. H. T. Nguyen et al., 2023).

To clarify the issues and contribute to filling the research gaps mentioned above, this study has main objective as follows: examining the relationships between AI chatbot attributes and customer loyalty through customer satisfaction among Gen Z users in e-commerce platforms.

With a particular focus on Gen Z customers using e-commerce platforms, this study significantly adds to the scant body of knowledge on how AI chatbots affect client loyalty. The important chatbot characteristics that Gen Z users value—information quality, system quality, usability, experience, interactivity, personalization, and psychological ownership—are meticulously identified. The article presents and empirically confirms a strong research model that sheds light on the precursors of "smart experiences" in chatbot encounters, going beyond simple identification. By doing this, this study gives chatbot developers and e-commerce companies evidence-based advice on how to improve user experiences and boost consumer loyalty in a cutthroat digital environment.

LITERATURE REVIEWS

2.1 Review prior studies related AI Chatbot

AI chatbots are recognized as a significant technological trend in customer service support (B. H. T. Nguyen et al., 2023). These AI-driven tools facilitate user interaction primarily through text or voice, capable of simulating human conversations (Ashfaq et al., 2025; Davenport et al., 2020; Li et al., 2023; Xia & Shannon, 2025). Their integration into customer service has grown exponentially, enabling companies to offer 24/7 support, provide personalized content, and ensure efficient interactions (Alsadoun & Alnasser, 2025; Ashfaq et al., 2025; Davenport et al., 2020; Li et al., 2023; Xia & Shannon, 2025).

Historically, research on chatbots has often focused on their adoption, user satisfaction, and loyalty, drawing on frameworks like the Technology Acceptance Model (TAM) and the Computers-Are-Social-Actors (CASA) paradigm (Li et al., 2023; Xia & Shannon, 2025). These studies commonly investigated the influence of information quality, service quality, ease of use, and enjoyment on user satisfaction and continuance

intention (Ashfaq et al., 2025; Magno & Dossena, 2023). Recent studies are exploring how specific chatbot affordances (such as interactivity, selectivity, information, association, and navigation) drive Consumers' Smart Experiences (CSEs) (emotional and cognitive responses) and, in turn, influence customer chatbot stickiness and chatbot affinity (perceived importance of chatbots) (Ashfaq et al., 2025). Previous studies have delved into its internal aspects behavioral and attitudinal loyalty—and their specific impact on value co-creation in the AI chatbot context (L. T. Nguyen et al., 2023).

In general, previous research on chatbots has explored various aspects, including their adoption or behavioral intention, their impact on satisfaction and loyalty, and their role in value co-creation between consumers and providers. Most studies have focused on organizational contexts or different consumer segments and industries (e.g., banking, F&B, hospitality). However, research focusing on their impact particularly on Generation Z consumers remains limited and fragmented. This study seeks to fill this gap by examining how AI chatbots influence the loyalty of Gen Z consumers within the context of e-commerce platforms.

2.2 Customer Loyalty

Customer loyalty is a crucial concept, defined as repeat purchase behavior, preference for a certain brand, and a willingness to engage in positive word-of-mouth (B. H. T. Nguyen et al., 2023). It is considered a significant competitive advantage for achieving long-term business success and profitability (B. H. T. Nguyen et al., 2023). Factors generally affecting customer loyalty include perceived value and website quality (B. H. T. Nguyen et al., 2023). In the context of AI chatbots, research indicates that effective implementation can positively influence customer satisfaction, engagement, and subsequently, loyalty (Alsadoun & Alnasser, 2025; Chotisarn & Phuthong, 2025). When consumers experience effective communication and assistance through AI chatbots, they are more likely to develop a lasting connection with the brand (Alsadoun & Alnasser, 2025; Li et al., 2023). Perceived value is broadly defined as the consumer's overall assessment of a product or service's utility based on perceived benefits versus perceived costs or risks (Evelina et al., 2020; Randheer, 2015). This assessment is consistently divided into two primary dimensions: utilitarian value and hedonic value (Evelina et al., 2020; Randheer, 2015), both positively influencing consumer satisfaction (Magno & Dossena, 2023; B. H. T. Nguyen et al., 2023).

2.3 Utilitarian value

Utilitarian value refers to the functional, instrumental, and practical benefits that users derive from a product or service (Esmaeilzadeh et al., 2025; B. H. T. Nguyen et al., 2023). It is associated with usefulness, wisdom, and

task-specific efficiency (Esmaeilzadeh et al., 2025). When users perceive that their functional needs are met, their satisfaction and intention to use are positively influenced (Esmaeilzadeh et al., 2025). The utilitarian elements you specified, supported by the sources, include:

Information Quality refers to users' perceptions of an AI chatbot's information in terms of accuracy, relevance, sufficiency, and utility in addressing shopping-related inquiries (Magno & Dossena, 2023; B. H. T. Nguyen et al., 2023; Ruan & Mezei, 2022). It significantly affects customer satisfaction and continued use (Ashfaq et al., 2025; Magno & Dossena, 2023; Ruan & Mezei, 2022). Accurate, complete, and timely information enhances trust and efficiency, while poor quality can damage brand perception (Tien et al., 2023). Users expect chatbot responses to match the reliability of human agents (Kwangsawad & Jattamart, 2022), influencing their willingness to reuse the service.

System Quality encompasses the technical features of AI chatbots—usability, reliability, speed, learnability, low cognitive load, availability, and timeliness (Magno & Dossena, 2023). These attributes contribute to a seamless user experience and typically enhance satisfaction (Kwangsawad & Jattamart, 2022), though their impact may diminish if users begin to take system performance for granted (Magno & Dossena, 2023).

Usability refers to how easily users interact with chatbots, involving intuitive design, clear navigation, and low effort (Alsadoun & Alnasser, 2025; Magno & Dossena, 2023; Xia & Shannon, 2025). High usability improves satisfaction and engagement, especially with advanced NLP reducing frustration and boosting adoption. It aligns with perceived ease of use, supporting positive attitudes, usefulness, and brand trust (Xia & Shannon, 2025).

Interactivity refers to real-time, two-way communication, user control, and instant information access between consumers and chatbots (Ashfaq et al., 2025; Li et al., 2023). It shapes users' perceived affordances and is key to satisfaction and engagement (Ahmad et al., 2025; Li et al., 2023; Xia & Shannon, 2025). Interactive chatbots support efficient, responsive communication anytime and anywhere, fostering positive experiences and enhancing perceived ease of use and usefulness (Ahmad et al., 2025; Xia & Shannon, 2025).

Personalization is the chatbot's ability to tailor responses and services to individual user needs (Li et al., 2023; Li & Zhang, 2023). It boosts satisfaction, loyalty, and usage by delivering custom experiences beyond generic assistance (Ameen et al., 2021; Li & Zhang, 2023). AI chatbots personalize interactions by analyzing user data,

adapting dialogues, and offering proactive support, thereby enhancing satisfaction, engagement, and trust (Calvaresi et al., 2023; Li & Zhang, 2023; Ruan & Mezei, 2022; Xia & Shannon, 2025).

2.4 Hedonic value

Hedonic value pertains to the experiential, emotional, and pleasure-oriented aspects of using a product or service (Esmaeilzadeh et al., 2025; B. H. T. Nguyen et al., 2023; Randheer, 2015). It focuses on the enjoyment, fun, and entertainment derived from the interaction, rather than solely on instrumental benefits (Esmaeilzadeh et al., 2025). A higher perception of hedonic value leads to increased customer shopping intentions and continued use of AI chatbots (AVCILAR & OZSOY, 2015; Joshi, 2025). The hedonic elements you specified, supported by the sources, include:

Experience reflects users' emotional and cognitive responses during chatbot use, including engagement, enjoyment, and memorability (Ameen et al., 2021). Positive experiences enhance retention and are shaped by the chatbot's ability to deliver timely, accurate, and personalized information (Ameen et al., 2021; Ashfaq et al., 2025; Calvaresi et al., 2023). Enjoyment and other hedonic elements drive satisfaction and loyalty (Chotisarn & Phuthong, 2025; Magno & Dossena, 2023).

Psychological ownership reflects users' sense of personal connection and control over the chatbot as a shopping tool (Li et al., 2023). When users view it as a "personal assistant," they feel responsible for its performance, leading to positive behaviors (Li et al., 2023). This feeling is strengthened by value-in-use and supports voluntary efforts to enhance chatbot use, playing a key role in continued usage intention (Li et al., 2023).

2.5 Hypotheses development

2.5.1 The relationship between Information Quality and Customer Satisfaction

Information Quality in this study refers to the attributes of information provided by AI chatbots that make it useful and valuable to users. Academically, it is defined as the "semantic success of the technology" (Magno & Dossena, 2023), encompassing both intrinsic and extrinsic factors such as accuracy, currency, completeness, relevance, credibility, and usefulness (Magno & Dossena, 2023). High perceived information quality positively influences consumers' perceptions of chatbot interactions and enhances the overall customer experience (Kwangsawad & Jattamart, 2022). Delivering high-quality information saves consumers time and effort, thereby boosting customer satisfaction (B. H. T. Nguyen et al., 2023). The importance of information quality for customer satisfaction is well-established: relevant, accurate, and credible information

fosters positive quality perceptions (Magno & Dossena, 2023) and improves brand satisfaction (B. H. T. Nguyen et al., 2023). Empirical evidence consistently shows a strong positive relationship between perceived information quality and customer satisfaction in both traditional and AI-driven service contexts (Kwangsawad & Jattamart, 2022; Ruan & Mezei, 2022). Conversely, poor information quality can damage perceptions of the entire business (N.-T. T. Nguyen et al., 2024). AI chatbots' ability to provide complete, current, and detailed product information is particularly valued and enhances perceived information quality (Ruan & Mezei, 2022). Therefore, it is hypothesized that:

H1: Information Quality (IQ) of AI chatbots positively influences Customer Satisfaction (CS) among Gen Z users in e-commerce platforms.

2.5.2 The relationship between System Quality and Customer Satisfaction

System Quality refers to the technical performance and characteristics of the AI chatbot system itself, encompassing usability, reliability, availability, adaptability, and timeliness (Magno & Dossena, 2023). For Gen Z—a demographic accustomed to seamless, instantaneous digital interactions robust system quality is critical. A chatbot that is easy to use and minimizes mental effort reduces user frustration and cognitive load, enabling smooth interactions. Ease of use, a core aspect of usability, strongly influences customer satisfaction, as difficult interfaces can deter users (Magno & Dossena, 2023). Additionally, prompt responsiveness prevents delays, fostering efficient and fluid conversations, which are key drivers of satisfaction in online shopping and service contexts (Alsadoun & Alnasser, 2025; Chotisarn & Phuthong, 2025). Service efficiency combining speed and accuracy has been shown to positively impact satisfaction (Chotisarn & Phuthong, 2025). Reliability, ensuring consistent and dependable chatbot performance without glitches or complex navigation, builds trust and confidence, further enhancing user experience (Ashfaq et al., 2025; Kwangsawad & Jattamart, 2022). However, some studies offer more nuanced views (Magno & Dossena, 2023) report that system quality did not significantly affect customer satisfaction, possibly due to a “ceiling effect” where users take good system quality as a given, so improvements beyond a certain threshold yield diminishing returns (Chotisarn & Phuthong, 2025; Magno & Dossena, 2023). Despite this, the positive link between system quality attributes such as efficiency and ease of use and customer satisfaction remains well supported theoretically. For Gen Z, high system quality translates into satisfaction with their interactions, pre-purchase support, and overall experience. Therefore, it is hypothesized that:

H2: System Quality (SQ) of AI chatbots positively influences Customer Satisfaction (CS) among Gen Z users in e-commerce platforms.

2.5.3 The relationship between Usability and Customer Satisfaction

Usability measures how effectively an AI chatbot assists users and enhances their e-commerce experience. It is closely tied to Perceived Ease of Use (PEOU) and Perceived Usefulness (PU), key concepts of the Technology Acceptance Model (TAM) (Kwangsawad & Jattamart, 2022; Xia & Shannon, 2025). PEOU means the technology is easy to use with minimal effort (Xia & Shannon, 2025), while PU reflects its ability to improve user performance (Kwangsawad & Jattamart, 2022). Gen Z prioritizes efficiency, convenience, and personalized support, which a usable chatbot delivers by streamlining shopping.

Chatbots enable effortless navigation and save time, acting as a “24/7 concierge” offering instant support (Calvaresi et al., 2023), a direct driver of satisfaction (Evelina et al., 2020). Ease of use and usefulness shape positive attitudes, satisfaction, and continued use intentions Kwangsawad & Jattamart, 2022; Xia & Shannon, 2025). A simple, intuitive interface reduces learning effort, boosting adoption and experience (Xia & Shannon, 2025). Chatbots that proactively engage users and understand context serve as intelligent assistants, making shopping smoother and more enjoyable—key factors in customer satisfaction and recommendation. Therefore, we hypothesize:

H3: Usability (US) of AI chatbots positively influences Customer Satisfaction (CS) among Gen Z users in e-commerce platforms.

2.5.4 The relationship between Experience and Customer Satisfaction

Experience in this study refers to users' overall cognitive and emotional engagement with AI chatbots, described as “empathetic and affectional” interactions that can be enjoyable and memorable (Li et al., 2023). These experiences combine hedonic elements like enjoyment and novelty with cognitive functions such as problem-solving (Ashfaq et al., 2025), driven by tailored services and accurate, timely information (Ameen et al., 2021; Ashfaq et al., 2025). Positive chatbot experiences are vital for customer satisfaction (Calvaresi et al., 2023; Magno & Dossena, 2023). Enjoyable, comforting, or novel interactions increase user pleasure and satisfaction (Ameen et al., 2021). Elements such as entertainment and feelings of respect enhance time efficiency, enjoyment, and personalization (Ameen et al., 2021). Research confirms that brand experience and emotional engagement with chatbots strongly affect satisfaction (Magno & Dossena, 2023; Şahin et al., 2011). Research confirms that brand experience and emotional

engagement with chatbots strongly affect satisfaction (Magno & Dossena, 2023; Şahin et al., 2011). Enjoyment is a key predictor of satisfaction with AI services (Chotisarn & Phuthong, 2025) Engaging chatbots boost motivation and positive attitudes, fostering attachment and continued use (Ahmad et al., 2025; Ashfaq et al., 2025; Xia & Shannon, 2025). Seamless, effective experiences help users make informed decisions and resolve shopping needs, driving overall satisfaction. Therefore, we hypothesize:

H4: Experience (EX) with AI chatbots positively influences Customer Satisfaction (CS) among Gen Z users in e-commerce platforms.

2.5.5 The relationship between Interactivity and Customer Satisfaction

Interactivity refers to dynamic communication and user control in AI chatbot interactions, defined as the “subjective perception of quality interaction between a buyer and seller” (Li et al., 2023). It involves two-way communication, active control, and quick responses (Ashfaq et al., 2025), enabling real-time engagement and instant answers (Ahmad et al., 2025; Xia & Shannon, 2025). Responsive interactivity strongly influences customer satisfaction. Efficient, real-time exchanges help users engage meaningfully and access information quickly, fostering positive cognitive and emotional “smart experiences” that boost satisfaction (Ashfaq et al., 2025; Magno & Dossena, 2023). Studies show that highly interactive chatbots build strong relationships and enhance satisfaction (Ashfaq et al., 2025). For Gen Z, who expect seamless digital interactions, interactivity is a key driver. Context-aware, personalized conversations improve satisfaction and convenience (Xia & Shannon, 2025). Interactivity is a critical factor in perceived chatbot value (Ashfaq et al., 2025; Li et al., 2023) and, combined with emotional satisfaction, creates positive experiences that meet Gen Z’s expectations for efficient pre-purchase support, enhancing overall satisfaction. Therefore, it is hypothesized that:

H5: Interactivity (IN) of AI chatbots positively influences Customer Satisfaction (CS) among Gen Z users in e-commerce platforms.

2.5.6 The relationship between Personalization and Customer Satisfaction

In AI chatbots, Personalization refers to tailoring information, product recommendations, or solutions to an individual’s needs and preferences, often based on user behavior like past purchases and browsing history (Ameen et al., 2021; Li et al., 2023; Sadiq et al., 2025). It can be viewed as both a firm’s strategy and a customer’s perception of customized service (Li et al., 2023). Personalization is a key driver of customer satisfaction; chatbots delivering personalized messages increase user satisfaction and effectively resolve specific problems, maximizing satisfaction in recommendation

systems (Li & Zhang, 2023) . Beyond providing information, personalized chatbots proactively initiate relevant conversations and respond contextually, helping users find products and make informed decisions, enhancing overall satisfaction. Research shows personalization improves resolution time and customer satisfaction (Ameen et al., 2021; L. T. Nguyen et al., 2023) and boosts engagement, shopping experience, and sales (Radha, 2025; Sadiq et al., 2025). By adapting to individual preferences and specific needs, AI chatbots create more relevant, satisfying experiences that increase customer contentment and willingness to recommend (Xia & Shannon, 2025). Therefore, we hypothesize:

H6: Personalization (PE) of AI chatbots positively influences Customer Satisfaction (CS) among Gen Z users in e-commerce platforms.

2.5.7 The relationship between Psychological Ownership and Customer Satisfaction

Psychological Ownership refers to the emotional bond and sense of personal possession a user feels toward a chatbot or its service, distinct from legal ownership and reflecting the belief that the chatbot is “partly theirs” (Li et al., 2023). This sense of ownership can be triggered by personalization, where the chatbot adapts to individual needs, enhancing user fit and feelings of possession (Calvaresi et al., 2023; Li et al., 2023). Such ownership fosters positive motivation and behaviors, including a heightened sense of responsibility (Calvaresi et al., 2023; Li et al., 2023). Research shows that hedonic digital services like chatbots enable users to form attachments or ownership feelings, strengthening consumer-firm relationships (Calvaresi et al., 2023; Li et al., 2023). These positive relationships correlate with greater satisfaction. When consumers feel ownership, they tend to engage more and have improved experiences, leading to higher satisfaction. Therefore, we hypothesize:

H7: Customer Satisfaction (CS) with AI chatbots positively influences Psychological Ownership (PO) among Gen Z users in e-commerce platforms.

2.5.8 The relationship between Customer Satisfaction and Customer Loyalty

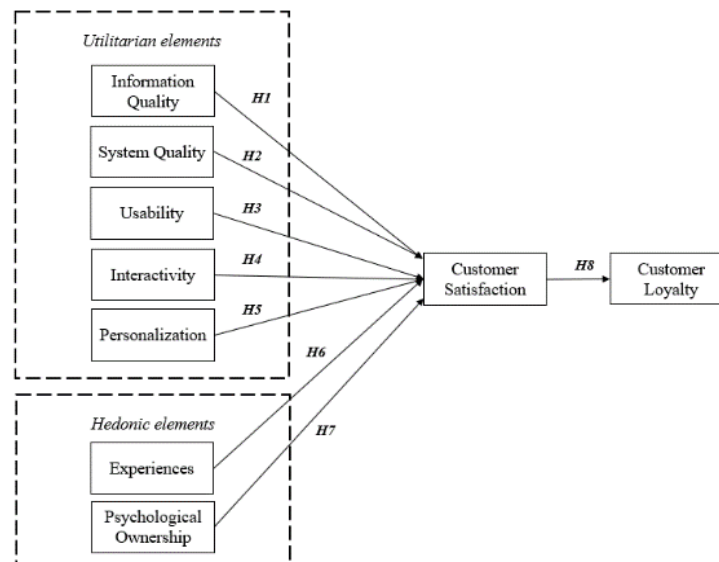
Customer Satisfaction is a user’s overall evaluation of a product or service based on how well it meets or exceeds expectations (Alsadoun & Alnasser, 2025; Evelina et al., 2020), arising from comparing experience with prior expectations (AVCILAR & OZSOY, 2015). In AI chatbot contexts, it reflects the effectiveness of support through accurate, timely, and relevant responses (Alsadoun & Alnasser, 2025). Customer Loyalty is a commitment to repurchase despite competitors or challenges (Kaur & Soch, 2012; Şahin et al., 2011). The link between satisfaction and loyalty is well-established

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(Alsadoun & Alnasser, 2025; Chotisarn & Phuthong, 2025). Studies confirm satisfaction as a key driver of loyalty (Calvaresi et al., 2023; Kaur & Soch, 2012). Satisfied consumers are more likely to return, reducing costs and boosting reputation (Alsadoun & Alnasser, 2025). Specifically, effective AI chatbot marketing increases satisfaction, which strongly influences loyalty

(Alsadoun & Alnasser, 2025; Chotisarn & Phuthong, 2025). Satisfaction also mediates the relationship between chatbot marketing, enjoyment, service efficiency, and loyalty, underscoring its central role in driving loyalty through AI chatbot interactions. Therefore, it is hypothesized that:

H8: Customer Satisfaction (CS) with AI chatbots positively influences Customer Loyalty (CL) among Gen Z users in e-commerce platforms.



Source: created by author

METHODOLOGY

3.1 Research Paradigm and design

The study is grounded in the Positivism research paradigm. It adheres to the principles of quantifiable observations, aiming to establish generalizable findings and causal relationships (Becker et al., 2023). The choice of positivism aligns with the study's objective of testing hypotheses regarding the impact of AI chatbot features on customer loyalty, allowing for a structured and quantifiable investigation of the stated research problem. Many studies in social sciences, particularly those employing quantitative methods like surveys and structural equation modeling (SEM), implicitly or explicitly adopt a positivist stance (B. H. T. Nguyen et al., 2023). A Causal research design is employed for this study. This approach moves beyond mere description to establish direct linkages and predict outcomes. Numerous prior studies examining the impact of technology on consumer behavior, satisfaction, and loyalty have utilized causal designs to investigate such relationships (Ahmad et al., 2025; Chotisarn & Phuthong, 2025; Zhang et al., 2024).

3.2 Sampling Method and sample size

Judgmental sampling will be utilized for participant recruitment. This non-probability sampling technique involves the researcher's deliberate selection of participants based on their judgment of who would be most relevant and representative of the target population for the study (T.-Q. Dang et al., 2023; Doan et al., 2025; L. T. Nguyen et al., 2023; N.-T. T. Nguyen et al., 2024b; Xia & Shannon, 2025). The research subjects are specifically Gen Z consumers (born from 1997 to 2012) who have used AI chatbots on current e-commerce platforms (such as Lazada, TikTok, Shopee) and use mobile devices with internet connectivity (Dang Quan et al., 2024; T. Q. Dang et al., 2025; T.-Q. Dang, Tran, et al., 2025). This method is chosen because it allows for focused data collection from individuals with direct experience with AI chatbots in e-commerce, which is crucial given the specificity of the research topic and the absence of a readily available sampling frame for this niche group (Xia & Shannon, 2025). Similar studies focusing on specific user segments or technology experiences have successfully employed judgmental or purposive sampling (Kwangsawad & Jattamart, 2022; B. H. T. Nguyen et al., 2023; Xia & Shannon, 2025).

The target sample size for this study is 200 people. Determining an adequate sample size is crucial for ensuring the statistical power, reliability, and generalizability of the research findings (Chotisarn & Phuthong, 2025). Based on established guidelines for Partial Least Squares Structural Equation Modeling (PLS-SEM), a minimum sample size is

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calculated using various parameters (Xia & Shannon, 2025). For this study, the number of latent variables is 9 and the number of observed variables is 37. With an anticipated effect size of 0.3, a desired statistical power level of 0.8, and a probability level (alpha) of 0.05, the calculated minimum sample size required for the model structure is 184 people (Chotisarn & Phuthong, 2025; Xia & Shannon, 2025). This satisfies recommendations for PLS-SEM studies, where a sample size between 100 and 200 respondents is often deemed adequate, particularly when considering effect size and statistical power (Chotisarn & Phuthong, 2025).

3.3 Questionnaire Design

The survey instrument will utilize a 7-point Likert Scale for its measurement items. This scale ranges from "1=STRONGLY DISAGREE" to "7=STRONGLY AGREE," allowing respondents to express their perceptions, attitudes, and intentions with a higher degree of nuance and dispersion than a standard 5-point scale. The increased number of response options is expected to provide more accurate and discriminating data, thereby reducing neutral responses and enhancing the overall precision of the collected information (B. H. T. Nguyen et al., 2023). The 7-point Likert scale is a widely adopted measurement tool in similar consumer behavior and technology adoption studies, capturing detailed participant attitudes and perceptions (Alsadoun & Alnasser, 2025; Ameen et al., 2021; B. H. T. Nguyen et al., 2023; L. T. Nguyen et al., 2023; Zhang et al., 2024). Data will be collected through an online survey administered via Google Forms. This method is a widely recognized and efficient means of gathering primary quantitative data (Keengwe, 2007; Li & Zhang, 2023; Paramitha et al., 2022; Sadiq et al., 2025). The use of an online platform facilitates reaching a geographically dispersed population of Gen Z users who are digitally native (Doan et al., 2025).

4. Data analysis result

4.1 Respondents profile

According to the provided data from Table 4.1, the detailed demographic breakdown of the research participants showcases a nuanced profile. A total of 200 participants were included in the sample. Regarding Gender, the majority of respondents were male, accounting for 122 participants (61.00%), while 78 participants (39.00%) were female. The Age distribution of the Gen Z respondents indicates that the largest segment was 25-29 years old, comprising 90 participants (45.00%). This was followed by 15-18 years old with 56 participants (28.00%), and 19-24 years old with 54 participants (27.00%). In terms of Usage Duration of AI chatbots, the longest duration group was 3-4 years, with 96 respondents (48.00%). Respondents who had used AI chatbots for more than 4 years accounted for 72 participants (36.00%). Those with 1-2 years of usage constituted 28 participants (14.00%). For Usage Frequency, the data indicates that 112 respondents (56.00%) used AI chatbots daily. Weekly usage was reported by 50 participants (25.00%), and 38 respondents (19.00%) used AI chatbots monthly. This detailed breakdown provides a comprehensive understanding of the diverse demographic characteristics within the research sample.

Table 1: Respondents' profile (N=200)

Demographic characteristic	Frequency	Percentage
Gender		
Female	78	39.00%
Male	122	61.00%
Age		
15 - 18 years old	56	28.00%
19 - 24 years old	54	27.00%
25 - 29 years old	90	45.00%
Usage Duration		
< 1 year	4	2.00%
>4 years	72	36.00%
1 - 2 years	28	14.00%
3 - 4 years	96	48.00%
Usage Frequency		
Daily	112	56.00%
Monthly	38	19.00%
Weekly	50	25.00%

Source: created by author

4.2 Common Method Bias (CMB)

To mitigate the potential impact of CMB, several studies employed both procedural and statistical remedies (Alagarsamy & Mehroliia, 2023; Chau et al., 2025; Low et al., 2025). Efforts were undertaken to ensure the confidentiality of participants

about the procedure (N.-T. T. Nguyen et al., 2024c). Moreover, responses were assessed in an unbiased manner and were not classified as either true or deceptive (Alagarsamy & Mehroli, 2023; Low et al., 2025; N.-T. T. Nguyen et al., 2024). This methodology aims to encourage candid and transparent replies to every inquiry (Hair et al., 2019). By applying Harman's singular factor, an evaluation of CMB was conducted. A process of factorization was applied to the structures. In this study, the Variance Inflation Factor (VIF) was utilized to assess the potential for common method bias, as presented in Table 2, consistently demonstrate that all VIF values for the constructs were well within acceptable thresholds (L.-T. Nguyen et al., 2025; Phan et al., 2023; Thi Viet & Nguyen, 2025). The proportion of variance accounted for by a single component about the most significant variable fails to meet the minimum threshold of 50% (Alagarsamy & Mehroli, 2023). Consequently, it was unlikely that the current study would have common technique bias (Alagarsamy & Mehroli, 2023).

4.3 Measurement Model Assessment

Before conducting hypothesis testing in the inner model, it is imperative to validate the assessment of the outer model, also known as the measurement model (N.-T. T. Nguyen et al., 2024c; Pathak & Bansal, 2024). The results indicate Cronbach's Alpha values, the composite reliability (rho_A), the composite reliability (rho_C). The factor loading values in Table 4.2 satisfy the specified criteria, as each of these values exceeded the recommended threshold of 0.7 (Nguyen et al., 2024a).

The AVE values span a range of 0.688 to 0.737, all of which surpass the proposed threshold of 0.5 (Hair et al., 2019; N.-T. T. Nguyen et al., 2024a). Based on these findings, convergent validity is established. The discriminant validity is also confirmed by Fronell - Lacker criterion and Heterotrait-monotrait ratio (HTMT 0.85) in Table 3 and Table 4, respectively (Hair et al., 2019; N.-T. T. Nguyen et al., 2024c). To mitigate concerns related to collinearity in the model, an evaluation was conducted on the variance inflation factor (VIF) values. All VIF values were well below the conservative threshold of 3.3 (Hair et al., 2019). Specifically, VIF values ranged from 1.696 to 3.176 (Table 2). These results indicate that common method bias is not a significant concern in this dataset.

Table 2: Measurement Model

Constructs	Items	Factor Loadings (FL)	Cronbach's Alpha (CA)	Dijkstra Henseler rho_A (pA)	Composite Reliability (CR)	Average Variance Extracted (AVE)	VIF
CL	CL1	0.818	0.856	0.857	0.903	0.699	1.844
	CL2	0.805					1.858
	CL3	0.856					2.292
	CL4	0.864					2.433
CS	CS1	0.872	0.880	0.883	0.917	0.735	2.379
	CS2	0.843					2.199
	CS3	0.817					1.933
	CS4	0.895					2.742
EX	EX1	0.875	0.911	0.917	0.933	0.737	3.077
	EX2	0.794					2.181
	EX3	0.883					3.176
	EX4	0.848					2.373
	EX5	0.89					2.978
IN	IN1	0.847	0.863	0.865	0.907	0.709	2.067
	IN2	0.815					1.842
	IN3	0.849					2.036
	IN4	0.858					2.248
IQ	IQ1	0.745	0.870	0.884	0.897	0.745	2.109
	IQ2	0.976					2.307
	IQ3	0.854					2.956
PE	PE1	0.902	0.870	0.872	0.911	0.720	2.967
	PE2	0.819					1.854
	PE3	0.84					2.265
	PE4	0.83					2.020
PO	PO1	0.837	0.849	0.851	0.898	0.688	1.956
	PO2	0.793					1.696

SQ	PO3	0.844					1.963
	PO4	0.843					2.060
	SQ1	0.853	0.906	0.906	0.930	0.727	2.679
	SQ2	0.835					2.352
	SQ3	0.86					2.721
	SQ4	0.848					2.689
US	SQ5	0.867					2.831
	US1	0.891	0.866	0.957	0.905	0.706	2.907
	US2	0.778					1.819
	US3	0.892					2.172
	US4	0.794					2.118

Source: created by authors

Table 3: Fronell-Lacker criterion

	CL	CS	EX	IN	IQ	PE	PO	SQ	US
CL	0.836								
CS	0.499	0.857							
EX	0.377	0.374	0.859						
IN	0.503	0.565	0.552	0.842					
IQ	0.137	0.148	0.282	0.382	0.863				
PE	0.337	0.700	0.412	0.653	0.205	0.848			
PO	0.469	0.540	0.544	0.632	0.367	0.511	0.830		
SQ	0.287	0.372	0.460	0.457	0.583	0.270	0.602	0.853	
US	-0.109	-0.179	-0.132	-0.102	-0.043	-0.058	-0.103	-0.106	0.840

Source: created by authors

Table 4: Heterotrait-monotrait ratio (HTMT 0.85)

	CL	CS	EX	IN	IQ	PE	PO	SQ	US
CL									
CS	0.572								
EX	0.426	0.412							
IN	0.586	0.645	0.621						
IQ	0.129	0.123	0.286	0.387					
PE	0.391	0.801	0.458	0.751	0.176				
PO	0.549	0.623	0.618	0.741	0.381	0.593			
SQ	0.326	0.413	0.504	0.517	0.651	0.303	0.686		
US	0.127	0.192	0.139	0.110	0.054	0.086	0.114	0.118	

Source: created by authors

4.4. Structural Model Assessment

The bootstrapping method was employed to evaluate the structural model, with 5,000 subsamples and 95% bias-corrected confidence intervals. The results presented in Table 5 indicate that IQ ($\beta = 0.161$, $p < 0.05$), SQ ($\beta = 0.189$, $p < 0.05$), US ($\beta = 0.114$, $p < 0.05$), and PE ($\beta = 0.552$, $p < 0.05$) have a significant relationship with CS. It verified the hypotheses H1, H2, H3, and H5. Additionally, the strong and significant impact of Customer Satisfaction on CL ($\beta = 0.499$, $p < 0.001$) has been found, thereby confirming H8. Nevertheless, the hypotheses H4 ($p > 0.05$), H6 ($p > 0.05$), and H7 ($p > 0.05$) were not confirmed, suggesting that IN, EX, and PO do not have significant beneficial impact on CS.

Table 5: Hypothesis Testing

Pathway		Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Remark
H1	IQ -> CS	0.161	0.066	2.456	0.014	Supported
H2	SQ -> CS	0.189	0.077	2.463	0.014	Supported
H3	US -> CS	0.114	0.045	2.519	0.012	Supported

H4	IN -> CS	0.095	0.125	0.762	0.446	Unsupported
H5	PE -> CS	0.552	0.171	3.227	0.001	Supported
H6	EX -> CS	-0.049	0.087	0.555	0.579	Unsupported
H7	PO -> CS	0.159	0.096	1.652	0.099	Unsupported
H8	CS -> CL	0.499	0.099	5.062	0.000	Supported

Source: created by authors

Next, when assessing the structural model, the R^2 value indicates the model's explanatory power for the endogenous variables. R^2 values between 0.33 and 0.67 indicate moderate predictive accuracy, while values above 0.67 are considered substantial (Hair et al., 2019). As shown in Table 6, the R^2 for Customer Satisfaction (CS) was 0.575, and for Customer Loyalty (CL) was 0.249. This suggests that the model explains 57.5% of the variance in CS, a substantial level, and 24.9% of the variance in CL, which is considered moderate.

The effect sizes (f^2) for each significant path were also assessed to determine the magnitude of each predictor's unique contribution. The f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively (Hair et al., 2019). While detailed f^2 values are not explicitly listed in the current output, the observed standardized path coefficients indicate that Personalization (PE) had a large effect on CS, while the effect sizes of System Quality (SQ), Usability (US), and Information Quality (IQ) were small to moderate. The Stone-Geisser Q^2 values for the endogenous constructs, as displayed in Table 6, further confirm the model's predictive capability. The Q^2 for CS was 0.518 and for CL was 0.164, both above zero, indicating satisfactory predictive relevance (Hair et al., 2019).

Table 6: R-square; Q-square, f^2

	f^2	R-square	Q^2 predict	
CL		0.249	0.164	$Q^2 > 0$
CS	0.331	0.575	0.518	$Q^2 > 0$
EX	0.003			
IN	0.009			
IQ	0.039			
PE	0.391			
PO	0.026			
SQ	0.039			
US	0.030			

Source: created by authors

DISCUSSION AND IMPLICATION

5.1 Discussion

The findings offer valuable insights into how AI chatbot attributes influence Gen Z customer satisfaction and loyalty in e-commerce. Our findings showed a clear utilitarian–personalization profile behind Gen Z satisfaction with AI chatbots. Four attributes—Personalization, System Quality, Usability, and Information Quality—significantly increased Customer Satisfaction, while Interactivity, Experience, and Psychological Ownership did not. Collectively, predictors explained 57.5% of satisfaction and 24.9% of loyalty. This findings were consistency with prior researches, personalization emerged as a major driver, enhancing user satisfaction and loyalty. Similarly, information quality providing accurate, detailed, and timely product data was found to significantly improve satisfaction, especially in pre-purchase interactions with AI chatbots (Ruan & Mezei, 2022). These attributes support a positive user experience and reinforce trust in AI systems. In contrast, the impact of system quality on

satisfaction was minimal, supporting the notion of a “ceiling effect,” where consistently high system performance is now expected and no longer differentiates satisfaction levels (Magno & Dossena, 2023). However, ease of use remains essential, with intuitive interfaces reducing user frustration and encouraging continued use, aligning with findings on perceived ease of use (PEOU) influencing trust and behavioral intention (Alagarsamy & Mehroli, 2023). Interestingly, while “experience” is widely recognized as important in service contexts, this study found no direct effect on Gen Z satisfaction. Similarly, interactivity and psychological ownership did not show a significant link to satisfaction. For Gen Z, constant access and personalized responses may be viewed as standard features rather than value-adding elements. Moreover, the abstract nature of ownership in chatbot interactions may lack the immediacy and relevance needed to influence satisfaction meaningfully.

5.2 Implication

5.2.1 Theoretical implication

The current study adds to the knowledge of how AI chatbots influence Gen Z loyalty on e-commerce platforms in multiple ways. First, prior research on AI chatbot adoption has often concentrated on organizational contexts or different consumer segments (Chotisarn & Phuthong, 2025; B. H. T. Nguyen et al., 2023). This study specifically fills this gap by investigating the influence of AI chatbots on the loyalty of Gen Z customers in e-commerce, a crucial consumer segment defined as "digital native" individuals who demonstrate high engagement with technology. The study found counter-Intuitive Findings for Information Quality and Usability among Gen Z users in e-commerce platforms. These results contrast with traditional views where high information quality and ease of use are typically considered positive drivers of satisfaction (Magno & Dossena, 2023; B. H. T. Nguyen et al., 2023; Ruan & Mezei, 2022). Suggesting a unique dynamic within the Gen Z e-commerce context, warranting further investigation into why these attributes might inversely affect satisfaction. The study found that interactivity, experience and psychological ownership did not significantly influence customer satisfaction among Gen Z users in e-commerce platforms. This indicates that, for this specific demographic and context, these factors, while often studied, might not directly drive user contentment with AI chatbots as much as other attributes. This challenges some prior acknowledgments of the importance of interactivity and experience for customer satisfaction, thus resolving conflicting findings in previous literature

5.2.2 Practical implication

The study's findings have a number of managerial ramifications for businesses looking to increase their digital interaction with Generation Z. The need to switch from standardised chatbot scripts to adaptive, data-driven dialogue management is underscored by the prominent role that personalisation plays in improving customer happiness. In order to provide the perception of relevance and immediacy that Gen Z consumers desire, practitioners must invest in personalisation engines that can dynamically customise responses and recommendations to specific users. Furthermore, even though information and system quality showed reduced effect sizes, their importance highlights the fact that accuracy, timeliness, and dependability are still crucial baseline expectations. As a result, retailers should put system stability first and make sure chatbot material is clear, current, and focused on making decisions. Usability also increases customer satisfaction, arguing that rather than being distinguishing characteristics, smooth navigation, low cognitive load, and intuitive design can be viewed as fundamental components of high-quality services. However, since Gen Z prioritises functional efficiency over experiential embellishments, the non-significant impacts of interactivity, experience,

and psychological ownership imply that hedonic or novelty-based characteristics might not directly increase satisfaction. Lastly, managers should keep an eye on customer satisfaction indicators as key indications of the health of long-term relationships, as they are a major predictor of loyalty. Practically speaking, platforms are encouraged to carefully deploy resources, making significant investments in information dependability and personalisation, guaranteeing usability at scale, and cautiously experimenting with "wow" features only when backed by empirical proof of their additional value for Gen Z.

CONCLUSION, LIMITATION AND FUTURE RESEARCH

This study, while offering significant insights into the impact of AI chatbot attributes on customer satisfaction and loyalty among Gen Z users in e-commerce, is subject to several limitations. The unexpected negative relationships observed for Information Quality and Usability with Customer Satisfaction highlight a potential limitation in fully capturing the nuanced perceptions of these attributes among Gen Z. Similarly, the non-significant influence of Interactivity, Experience, and Psychological Ownership on Customer Satisfaction suggests that, as defined or measured in this study, these constructs might not universally or sufficiently drive satisfaction for this demographic in e-commerce contexts. Future research could employ qualitative analysis to delve deeper into Gen Z's specific expectations and interpretations of these chatbot attributes. The research utilized judgmental sampling for participant recruitment (Gen Z consumers who have used AI chatbots on e-commerce platforms), it inherently limits the broader generalizability of the findings. Future research could explore more diverse sampling strategies or replicate the study across different demographics to enhance the external validity of the conclusions.

In conclusion, this study makes a significant contribution to the limited body of knowledge by rigorously identifying critical chatbot attributes perceived by Gen Z users and empirically validating a robust research model that illuminates the antecedents of "smart experiences" in chatbot interactions. It provides evidence-based guidance for e-commerce businesses and chatbot developers, urging them to prioritize investments in System Quality and Personalization to enhance user contentment. Furthermore, it highlights the need to critically reassess how Information Quality and Usability are delivered to meet the sophisticated expectations of Gen Z, ultimately enabling businesses to enhance user experiences and strengthen customer loyalty in the competitive digital landscape.

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