

FROM E-COMMERCE HABITS TO CHATBOT ACCEPTANCE: EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL TO AI CONVERSATIONAL AGENTS

Abstract

This study explores how consumers' familiarity with e-commerce, as well as their perceived benefits and barriers related to it, influence the acceptance of AI-powered chatbots in online shopping contexts. Drawing on the Technology Acceptance Model (TAM), the research integrates external variables such as frequency of e-commerce use and perceived convenience, risk, and lack of physical interaction with chatbot adoption. A survey was conducted on 220 participants, and data were analyzed using ANOVA and Structural Equation Modeling (SEM). Results show that e-commerce usage frequency significantly shapes how users perceive the benefits and barriers of online shopping. However, it does not directly influence their perception of chatbot usefulness or ease of use. Among the factors considered, only perceived convenience was found to positively affect both TAM constructs. The model confirms that perceived usefulness and, to a lesser extent, ease of use predict attitude toward chatbots, which strongly influences behavioral intention. These findings extend the TAM framework to the domain of conversational AI, offering theoretical insights and practical guidelines for improving chatbot adoption strategies in e-commerce environments.

Keywords: AI, chatbot, e-commerce, consumer perception, TAM

Introduction

E-commerce has emerged as a fundamental pillar of the global economy, redefining interactions between businesses and customers and driving profound socio-economic transformation (Hendricks & Mwapwele, 2024). The continuous evolution of e-commerce is evidenced by the increasing growth in online sales. In 2024, global retail e-commerce sales reached an estimated 6 trillion U.S. dollars and forecasts suggest a 31% increase over the next few years, approaching nearly 8 trillion dollars by 2028 (Statista, 2025).

In recent years, the adoption of AI-powered chatbots in e-commerce has grown exponentially, progressively transforming the way in which communication takes place between retailers and consumers (Tran et al., 2021). Thanks to the advancement of large language models (LLMs), chatbots have become more intelligent, enhancing the quality of customer interactions. Additionally, the widespread use of tools like ChatGPT, Gemini, and Claude have familiarized users with conversational AI, thereby accelerating the growth of the chatbot market in e-commerce.

Since more and more companies are investing in this technology (e.g. Amazon, Zalando...) due to its benefits, such as reduced operating costs and service efficiency, it is essential to understand how consumers experience the interaction with chatbots (Li & Wang, 2023). Gaining such insights can help to prevent user resistance and ensure that the implementation of chatbots yields a positive return on investment.

Despite its importance existing research on this topic remains scarce (Jiang et al., 2022; Li & Wang, 2023), highlighting the need for further studies to better understand this phenomenon.

Therefore, this study aims to explore the consumers' perception of, and willingness to use, chatbots during online shopping experiences specifically considering how familiarity with e-commerce, along with its perceived benefits and barriers, influence such perceptions and usage intentions. In detail, the study seeks to answer two research questions: (1) *What are the main benefits and barriers associated with e-commerce, and how do they vary based on consumers' level of e-commerce usage?* (2) *How are chatbots perceived in online shopping experiences, and to what extent can e-commerce usage, perceived benefits and barriers shape such perception of and intention towards chatbots?*

To address these questions, a quantitative study based on 220 participants was carried out. Findings revealed that consumers with higher levels of e-commerce usage perceive different benefits and barriers compared to those who use it less frequently. In particular, those who perceive e-commerce as convenient are more likely to find chatbots both useful and easy to use, which in turn positively influences their attitude towards and intention to use chatbots.

Theoretical Background

E-commerce: benefits and barriers. E-commerce adoption is influenced by a combination of perceived benefits and barriers, which vary depending on the individual and organizational context. Among the main benefits, there is the ability to shop online 24/7 year-round, the convenience of ordering products from anywhere, including via mobile devices, the ease of comparing prices and reading reviews, and the significant time savings by avoiding in-store visits (Taher, 2021). By contrast, common barriers such as data security, financial loss, and risk of receiving counterfeit or low-quality products, have been often identified as important challenges affecting e-commerce adoption (Handoyo, 2024).

Previous studies on technology acceptance have shown that experience with a given technology alters users' perceptions of it (Burton-Jones & Hubona, 2006; Venkatesh *et al.*, 2003). In the context of e-commerce, this implies that the more individuals become familiar with online shopping, the more they recognize its benefits and tend to perceive fewer barriers (Lian & Yen, 2014; Nirmala & Devi, 2011). Extending this perspective, the first hypothesis of the study aims to validate these findings by confirming their robustness in the current context and sample:

H1: Consumers' frequency of e-commerce usage shapes the benefits and barriers they perceive.

AI Chatbots in E-commerce. Artificial intelligence has revolutionized e-commerce, improving customer experience, optimizing operational efficiency, and enhancing data-driven decision making (Bawack et al., 2022). Its applications range from intelligent inventory management and demand forecasting to creating highly targeted and personalized marketing campaigns. AI is key in automating interactions with consumers through virtual assistants and chatbots, capable of handling a wide range of customer requests without the need for human intervention (Wang et al., 2023).

Chung et al. (2019) noted that chatbots help buyers save time and provide useful insights on product availability and performance. Moreover, Lee and Li (2023) found that chatbot features like 24/7 access, information integration, and interactivity positively influence customer perceptions and increase adoption. However, Luo et al. (2019) stated that when customers are aware of the chatbot's presence from the start, their purchase intention decreases, indicating a prejudice against these tools. Despite numerous studies on chatbot adoption in e-commerce, there is still little clarity about the factors that influence their perception and use (Zhang et al., 2024), likely because these systems are becoming increasingly intelligent and their perception evolves over time (Zehnle et al., 2025).

Hypotheses development. To investigate the determinants of chatbot acceptance in e-commerce, this study adopts the Technology Acceptance Model (TAM) (Davis, 1989), a widely used framework explaining how users come to accept and use new technologies. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are key predictors of Attitude (ATT) towards technology, which in turn affects Behavioural Intention (BI) to use it.

In this study, TAM is extended by incorporating consumers' level of e-commerce usage and their perceived benefits and barriers as external antecedents of PU and PEOU. Based on this framework, the following hypotheses are proposed:

H2: The level of usage of e-commerce positively influences both PU and PEOU

H3: Perceived benefits associated to e-commerce positively influence both PU and PEOU, while perceived barriers associated to e-commerce negatively influence them

H4: PU and PEOU of chatbots positively influence the attitude towards them

H5: The attitude towards chatbots positively influences the behavioural intention to use it

Methodology

Data for this study were collected through an online self-administered questionnaire distributed over a six-month period (January–June 2025). The survey investigated four main areas: (i) the frequency of e-commerce usage, (ii) perceived benefits and barriers related to online shopping, (iii) the core constructs of the Technology Acceptance Model (TAM) related to chatbots adoption in e-commerce, and (iv) respondents' socio-demographic characteristics.

All items were measured on a 7-point Likert scale (1= strong disagreement/very unlikely; 7= strong agreement/very likely). A total of 220 valid responses were obtained.

Data analysis was conducted using R software version 3.0, including both descriptive statistics and inferential analyses. In particular, ANOVA was performed to assess differences in perceived benefits and barriers (H1), as well as in chatbots' perceived PU and PEOU (H2), across groups with different levels of e-commerce usage, while Structural Equation Modeling (SEM) was employed to test the relationships among variables as hypothesized in this study (H3–H5).

Results

Respondents reported a moderate use of e-commerce, with a mean score of 4.33 (SD = 1.67). Based on their responses, participants were grouped into three usage categories: Low Users (n = 37, scores 1-2), Medium Users (n = 128, scores 3-5), and High Users (n = 55, scores 6-7). A one-way ANOVA was conducted to examine whether these groups perceive e-commerce benefits and barriers differently. Results revealed statistically significant differences in several dimensions. Practical benefits such as convenience, time saving, and 24/7 accessibility showed significant variation across groups ($p = 0.0107$), with High Users reporting greater appreciation for these aspects compared to Low Users. Information richness was also perceived differently ($p < 0.001$), with both Medium and High Users rating e-commerce as more informative than Low Users. Significant differences emerged for perceived risks, especially regarding data privacy and payment security ($p = 0.0049$) and delivery reliability ($p < 0.001$). Low Users tended to perceive these risks as higher. Finally, users diverged strongly on the disadvantage of lacking physical contact with products and sellers ($p < 0.001$), which was perceived as more problematic by Low Users. In contrast, no significant differences were found among the groups in their evaluation of enjoyment, advantageous prices, or the ability to find personalized products, suggesting that these aspects are perceived similarly regardless of usage intensity. These findings support H1, confirming that e-commerce usage significantly shapes users' perception of its benefits and barriers. Specifically, as usage intensity increases, the overall perception of benefits tends to rise, while the perception of barriers tends to decrease.

However, when examining whether e-commerce usage also influences the perception of chatbots, specifically their PEOU ($p = 0.961$) and PU ($p = 0.821$), no statistically significant differences were found among user groups. Therefore, H2 is not supported. Among the examined predictors, only perceived convenience significantly influenced PEOU ($p < 0.001$) and PU ($p = 0.020$), supporting H3 only partially.

Regarding H4, both perceptions constructs had a positive effect on users' attitude toward chatbots, with PU showing a strong and significant influence ($p < 0.001$), while the effect of PEOU was marginally significant ($p = 0.052$).

Finally, H5 was fully supported: ATT toward chatbots had a strong positive effect on BI ($p < 0.001$).

Discussions

This study explores how consumers' familiarity with e-commerce, and their perceptions of its benefits and barriers, affect their evaluation and acceptance of AI chatbots in online shopping. The findings offer several insights. First, the support for H1 confirms that e-commerce usage frequency significantly shapes consumers' perceptions. High-frequency users tend to recognize more of the practical benefits of e-commerce - such as convenience, information richness, and delivery efficiency - and perceive fewer barriers related to privacy, trust, or the lack of physical interaction. This is consistent with previous literature (Burton-Jones and Hubona, 2006; Venkatesh et al., 2003), which shows that repeated digital experiences increase familiarity and reduce perceived risks. Surprisingly, H2 was not supported. The expected relationship between e-commerce usage and chatbot-specific perceptions,

(i.e. PU and PEOU) did not emerge. This suggests that frequent exposure to online shopping alone is not sufficient to shape consumers' perceptions of chatbot quality. This finding diverges from what TAM extensions typically predict and it may indicate that chatbot evaluations rely more on direct interaction with the tool rather than general digital experience.

H3 was partially supported, as only one benefit (i.e. perceived convenience) significantly predicted PU and PEOU. Other expected predictors such as perceived risks, absence of physical contact, and product information did not show significant effects. This indicates that practical and time-saving advantages remain the most influential factors in shaping perceptions of chatbot usefulness and ease of use, confirming findings from Chung et al. (2019) and Lee & Li (2023), but not fully aligning with studies that emphasize trust and risk as dominant factors (Luo et al., 2019).

The results strongly support H4 and H5, in line with the original TAM framework (Davis, 1989). Both PU and, to a lesser extent, PEOU were positively associated with consumers' attitude toward chatbots, which in turn strongly influenced their intention to use. The dominant role of PU in shaping attitude aligns with prior research highlighting that PU is often the most critical driver of technology acceptance (Davis, 1989).

Implications and Conclusions

This study contributes to the literature by extending the TAM to AI-based chatbots in e-commerce, addressing the need to understand how users evaluate increasingly intelligent and adaptive technologies. By integrating perceived benefits/barriers and e-commerce usage as external variables, the study refines TAM's explanatory power, showing that only specific factors like perceived convenience influence chatbot perceptions. The findings confirm the central role of PU in shaping attitude and intention, while highlighting a weaker role for PEOU, suggesting that in AI contexts, outcome value may matter more than usability. Moreover, the lack of a direct link between usage frequency and chatbot perception suggests that general digital familiarity is not sufficient to drive chatbot acceptance, calling for new theoretical insights into human-AI interaction dynamics. From a managerial perspective, the findings highlight the importance of emphasizing convenience in chatbot design and communication strategies. Since perceived convenience significantly drives perceived usefulness and ease of use, companies should ensure that chatbot interactions clearly save users time, simplify tasks, and replicate the key advantages of e-commerce. Moreover, the fact that attitude strongly predicts usage intention suggests that businesses should focus on shaping positive first impressions through intuitive design, proactive support, and transparency about chatbot capabilities.

Despite these contributions, some limitations of the study must be acknowledged. First, the data are based on self-reported measures, which may be subject to social desirability bias. Second, while the study identifies perceived benefits and barriers, it does not directly assess actual chatbot interaction, a factor that could significantly influence perceptions, especially in AI contexts. Third, the cross-sectional design limits the ability to track how perceptions evolve over time as users gain more

experience with chatbots. Future research could address these limitations by employing longitudinal designs or experimental settings that involve real-time chatbot usage. Additionally, further studies could explore the impact of factors such as transparency, personalization, or anthropomorphism on trust and acceptance. Finally, given the growing role of generative AI, future work should also examine how AI identity disclosure and the perceived autonomy of chatbots influence user behavior across different cultural or generational segments.

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