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A systematic literature review on AI chatbots in automating customer support for e-commerce

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Abstract

The rapid advancement of artificial intelligence (AI) has significantly transformed the e-commerce sector, particularly through the integration of AI-powered chatbots. This study conducts a systematic literature review to examine how chatbots align with the eight foundational features of e-commerce technology: ubiquity, global reach, universal standards, interactivity, information richness, information density, personalization/customization, and social technology. Guided by the PRISMA framework, the review addresses two primary research questions: (1) How do AI-driven chatbots support the unique features of e-commerce technology? and (2) What technological advancements enhance their functionality in this context? Relevant literature was retrieved from five major academic databases: ACM Digital Library, ABI/INFORM Collection, Elsevier ScienceDirect, IEEE/IET Electronic Library, and Web of Science. The findings indicate that chatbots predominantly enhance interactivity, information richness, and personalization by employing advanced technologies such as natural language processing (NLP), transfer learning, knowledge graphs, domain ontologies, and prompting strategies. This study highlights gaps in existing research and provides recommendations for future investigations. Linking theoretical frameworks with emerging technological capabilities offers valuable insights for scholars and industry practitioners aiming to optimize chatbot deployment in digital commerce environments.

Keywords: customer support, E-Commerce, AI, chatbots, AI agents.

Introduction

Chatbots, also known as virtual assistants or conversational agents, are designed to simulate human interaction through text or voice. In the context of e-commerce, Manychat chatbot plays a vital role in enhancing customer service by automating repetitive tasks such as query handling, order tracking, and delivery updates on social media websites like Facebook and WhatsApp, and also integrates with Shopify for the purpose of managing abandoned cart messages (Oskar Mortensen, 2025). By reducing waiting times and improving service responsiveness, chatbots contribute significantly to operational efficiency. Chatbots like Intercom, Lindy, Zendesk AI, Tidio AI (Lyro) perform, however, depend on several factors, including natural language understanding, seamless integration with e-commerce platforms, and real-time interaction capabilities, content-aware workflow automation across the journey of the customer, and human-like assistance with an entry-level pricing (Akdemir & Bulut, 2024; Oskar Mortensen, 2025; Sanghvi, 2025; Sofia Gomez, 2025; Sundjaja et al., 2025).

As artificial intelligence continues to reshape e-commerce, the shift extends beyond traditional customer segmentation toward real-time, personalized interactions. Chatbots exemplify this transformation by analyzing vast customer data to deliver tailored support and recommendations. Unlike conventional customer personas based on broad demographics, AI chatbots employ machine learning to interpret individual preferences and behavioral patterns, offering context-aware suggestions and responses in real-time. (Coppola, 2024). This shift improves customer satisfaction, streamlines operations, and reduces manual intervention.

Businesses increasingly rely on AI-powered chatbots to deliver a seamless and personalized shopping experience. While many bots handle routine queries such as order status or return requests, advanced AI-driven virtual assistants are capable of managing complex interactions, thereby expanding the scope of automation in customer support (Coppola, 2024; Wang et al., 2023).

Current market trends reinforce this shift. E-commerce sales in 2024 are projected to reach $1,192.6 billion, an 8.1% growth from the previous year (U.S. Census Bureau, 2025). As AI continues to disrupt traditional business models and consumer behavior, particularly in the post-COVID era, understanding the role of chatbots within this evolving landscape becomes increasingly important. Laudon and Traver (2023) Outline eight foundational features of e-commerce technology: ubiquity, global reach, universal standards, interactivity, information richness, information density, personalization/customization, and social technology. Despite the rapid adoption of AI, there is a noticeable gap in systematically analyzing how chatbot functionalities align with these technological pillars (Laudon & Traver, 2023). This disconnect highlights the need for a deeper theoretical understanding and practical alignment.

To address this gap, this systematic literature review (SLR) (Kitchenham & Charters, 2007) investigates the role of AI-driven chatbots in supporting the unique technological characteristics of e-commerce. It identifies the technological advancements that enhance their functionality. The following research questions guide the study:

- **RQ1:** *How do AI-driven chatbot capabilities support the unique features of e-commerce technology?*
- **RQ2**: *What are the technological advancements of AI chatbots that support e-commerce?*

This review aims to contribute to both academic literature and real-world applications by comprehensively analyzing chatbot capabilities in the context of e-commerce technologies. It will summarize existing findings, identify knowledge gaps, and suggest directions for future innovation. Moreover, the study bridges the gap between theoretical frameworks and business practices, offering insights into how AI chatbots can serve as strategic tools for gaining a competitive advantage in digital commerce. The remainder of this review is organized as follows: methodology, results, discussion addressing the proposed research questions, limitations, future research directions, and conclusions.

Conceptual Framework

Figure 1 depicts a conceptual framework that maps the technological advancements and AI-powered chatbot capabilities onto the unique features of e-commerce technology. To begin with, the dimensions of the conceptual framework reveal that e-commerce platforms possess eight unique technological characteristics that differ from those of traditional retail environments. Laudon and Traver (2023) identified characteristics listed below:

- Ubiquity – E-commerce AI-powered chatbot technology is available anywhere, irrespective of place and time.
- Global Reach – AI-chatbot technology reaches across different countries around the globe
- Universal Standards – A set of technology standards.
- Interactivity – Interactivity refers to real-time two-way communication between organizations and consumers.
- Personalization/Customization - By letting companies build the purchasing experience according to consumer preferences
- Information Density – Information density represents the capability of storing, analyzing, and delivering large amounts of data related to products, customers, and transactions.
- Richness – The complexity and content of a message and the ability of a medium to convey information. Interactivity refers to real-time two-way communication between organizations and consumers.
- Social Technology - Social interactions and collaboration between business merchants and customers, mainly through integrating social media platforms.

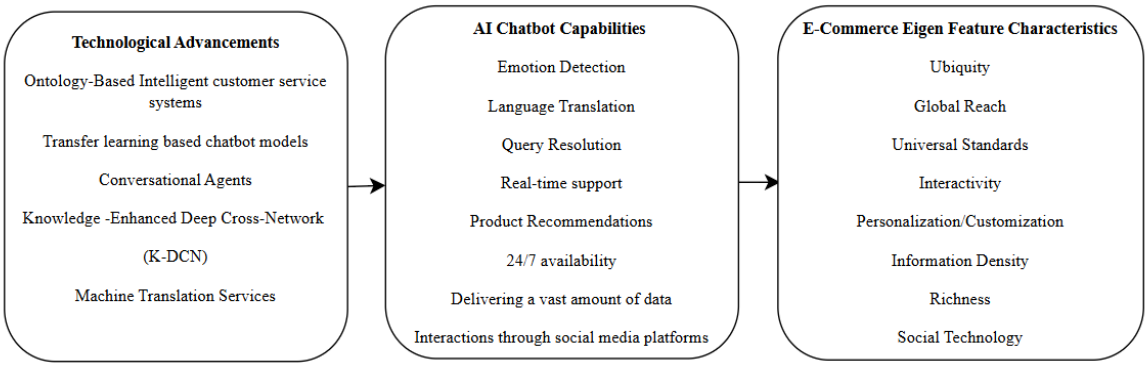

Figure 1. Conceptual Framework

AI chatbots play a vital role in increasing the above-mentioned e-commerce characteristics by leveraging a wide range of technological advancements such as ontology-based intelligent customer service systems, transfer learning based chatbot models, knowledge enhanced deep cross network (K-DCN), machine translational services, conversational agents like ChatGPT, which include natural language processing (NLP), machine learning (ML) (Bird & Lotfi, 2024; Jia et al., 2025; Orzol & Szopik-Depczynska, 2023; Wei, 2021; Wong et al., 2024; Xiang et al., 2021). Each of these technologies represents various aspects of AI's role in improving chatbot capabilities, such as emotion detection, language translation, query resolution, product recommendations, availability, collection of a large amount of data, and social interactions through social media platforms.

Methodology

The literature followed the Preferred Reporting Items for Systematic Literature Review and Meta-Analysis (PRISMA) guidelines, Page et al. (2021). The Title/Abstract searched articles selected for this research were performed using the needed combination of ("customer support" OR "customer service" OR "technical support") AND ("E-commerce" OR "Online shopping" OR "Electronic Commerce") AND ("AI agents" OR

"chatbots" OR "virtual assistants") and articles such as books, and surveys are excluded at the beginning of our search. The study focuses on articles published between January 2020 and March 2025.

We searched for full-text articles published in peer-reviewed journals and works written in English in the databases ACM Digital Library, ABI/INFORM Collection, Elsevier ScienceDirect, IEEE/IET Electronic Library, and Web of Science. Every article was screened to ensure its relevance to customer support, e-commerce, and AI agents or chatbots. It included full-text, peer-reviewed articles with finished research that were available in English and were considered for inclusion. The articles are unavailable in English; conference proceedings, off-topic articles, and literature reviews have been excluded.

Table 1. Summarizes all the inclusion and exclusion criteria.

Inclusion Criteria	Exclusion Criteria
• Published between 1/1/2020 and 03/17/2025 • Peer-reviewed • Full-text availability • Focus is on e-commerce, chatbots	• Not Published in English • Conference proceedings • Off-topic • Literature Reviews

Results

Figure 2 illustrates the PRISMA flowchart, which outlines the various steps in completing this literature review. The first step consists of the collection of journal articles (n =115) from five different databases such as ACM Digital Library (n= 21), ABI/INFORM Collection (n= 5), Elsevier Science Direct Journals (n= 11), IEEE/IET Electronic Library (n= 46), Web of Science (n= 32) with Title/Abstract search criteria, and the second step involves the removal of duplicates (n= 12). The next step involves screening the records for full-text content and excluding conference proceedings (n = 70), off-topic articles (n = 7), and literature reviews (n = 10). The final step involves the articles that are part of the study (n = 16). The articles before the screening process are loaded into Zotero to record the references for citations, and all the articles are then exported into Excel for further evaluation.

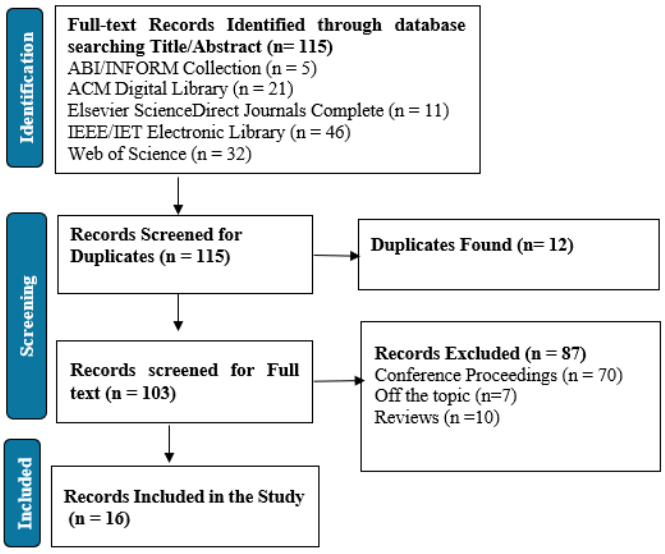

Figure 2. PRISMA Flowchart

Table 2. Comparative Analysis of E-Commerce Features With the Chatbot's Capabilities

Authors [Ref.,]	E-Commerce Features	Chatbot Capabilities
(Akdemir & Bulut, 2024)	Personalization/Customization	Tailoring chatbot responses, using historical data, and purchase data.
	Interactivity	Chatbot conversations with customers.
	Richness	Chatbot response generation uses natural language processing.
	Information Density	Ability to collect data from customers and resolve problematic queries.
(Bird & Lotfi, 2024)	Information Density	Knowledge transfer to improve autonomous customer support.
	Interactivity	Chatbot responds to the customers.
	Richness	The skill of communicating more than just facts.
	Global Reach	Across various domains, transfer learning allows adoption.
	Personalization/Customization	The user knows the replies and adopts different tones.
(Chang & Hsiao, 2024)	Personalization	A chatbot that prevents users' negative feelings.
	Interactivity	Real-time exchanges between businesses and customers.
(Han, 2021)	Interactivity	Customers feel like they are interacting with a human.
	Richness	Anthropomorphism is more enjoyable for consumers.
(Jia et al., 2025)	Personalization	Satisfaction of both cognitive and emotional impulses influences consumers' desire to use chatbots.
	Richness	Consumer satisfaction influences the usage intention of chatbots.
	Interactivity	Real-time conversation makes it more interactive.
	Information Density	Chatbots act as data centers mainly in e-health services.
(Li et al., 2023)	Personalization/Customization	Supports making chatbots' personalities and messages more personal.
	Interactivity	Focuses on talks between chatbots and customers, understanding, and response.
	Richness	Suggests a lot of information, direction, and emotional cues.
(Martin et al., 2021)	Interactivity	The foot-in-the-door technique for engaging users represents interactivity.
	Richness	Anthropomorphic design cues contribute to information richness.

Authors [Ref.,]	E-Commerce Features	Chatbot Capabilities
(Moriuchi et al., 2021)	Richness	Chatbots provide direct responses, and augmented reality increases shopping intention.
	Interactivity	Augmented Reality and chatbots both support two-way communication.
	Ubiquity	Augmented Reality (AR) stimulates the in-store experiences at home.
(Orzol & Szopik-Depczynska, 2023)	Ubiquity	ChatGPT is accessible online, from anywhere, and at any time.
	Richness	ChatGPT-4 provides high-quality responses to customers.
	Interactivity	ChatGPT is straightforward in handling positive and negative comments from customers and can be used in any part of the company.
	Personalization/Customization	Effective utilization of prompting techniques.
(Puertas et al., 2024)	Interactivity	Social presence is leveraged as a chatbot skill for Spanish beginner users.
	Personalization/Customization	Customization of voice contributes to the entertainment of using a chatbot.
	Richness	Entertainment and media appeal contribute to information richness.
	Social Technology	Social presence and sense of closeness.
	Information Density	Providing concise information for experienced users and detailed explanations for new users, aligned with information density.
(Song et al., 2022)	Interactivity	Chatbots save human agents time and energy by performing repetitive tasks.
	Personalization	Pre-purchase recommendations with chatbots are higher.
(Sundjaja et al., 2025)	Interactivity	The chatbot encourages regular use by supporting user interaction.
	Richness	Chatbot disclosure and coaching quality improve the user's impression and emotional confidence.
	Information Density	The quality of chatbot output and perceived utility indicate that rich, helpful content is sent to users.
(Wang et al., 2023)	Interactivity	While both chatbots and people interact with consumers, their efficacy varies with the kind of activity (objective vs. subjective).
	Information Density	By answering actual questions, such as product searches, chatbots help to lower the cognitive burden.
	Richness	Emotional involvement, empathy, and task appropriateness, all aspects of rich communication, are the main subjects of the paper.
(Wei, 2021)	Information Density	Use of domain ontologies, fuzzy control, and sentence vector encoding contributes to dense and structured knowledge delivery.
	Interactivity	Supports communication in real-time.

Authors [Ref.,]	E-Commerce Features	Chatbot Capabilities
	Universal Standards	Developing an ontology library implies a consistent representation of domain knowledge, allowing reusability and interoperability.
	Richness	Chatbot uses domain knowledge and natural language processing techniques to support richer chatbot communication.
(Wong et al., 2024)	Information Density	Chatbot supports rich, data-driven decision-making by including large-scale knowledge and deep feature extraction.
	Richness	The model enhances prediction context using knowledge graphs and dense and sparse features.
	Interactivity	Development of a conversational chatbot (Alime) that can interact with users.
	Personalization/Customization	Click-through rate prediction aims to personalize the content and responses based on consumer behavior.
(Xiang et al., 2021)	Global Reach	Supports global access through cross-lingual dialogues.
	Universal Standards	Robustness of the framework toward a cross-lingual scenario.

Table 2 answers RQ1: How do AI-driven chatbot capabilities support the unique features of e-commerce technology? And we also examined each dimension of the unique eigen features of e-commerce technology with AI adoption.

Ubiquity

Ubiquity is a fundamental dimension of e-commerce technology accessible to consumers regardless of time, place, and device, making it straightforward. The availability of products in online stores, regardless of location, and at any time (Laudon & Traver, 2023), aligns with the integration of AI chatbots in e-commerce. Although chatbots are readily available, they have a limited impact on people's overall perception of a company. (Moriuchi et al., 2021). Thus, instead of primarily being engagement-enhancing technologies, chatbots should be viewed as practical communication tools that offer quick and straightforward assistance. For example, while ChatGPT indirectly helps consumers by providing immediate access to information and support, matching the general ubiquity aspect of e-commerce technology, ChatGPT's ubiquitous availability mostly helps merchants control scalable communication.

Global Reach

E-commerce technology enables organizations to reach consumers worldwide, expanding their customer base and allowing them to market their goods and services globally. Organizations can avoid the constraints of physical stores and target customers worldwide by utilizing e-commerce technology. (Laudon & Traver, 2023) which is well-aligned with transfer learning (Bird & Lotfi, 2024) and cross-lingual capabilities (Xiang et al., 2021). By enabling scalability, language-independent customer service, and rapid implementation across various sectors, these capabilities expand the global reach of AI in e-commerce.

Universal Standards

The fundamental aspect of e-commerce technology depends on global standards to facilitate smooth transactions and guarantee interoperability across platforms. Regardless of the systems, locations, or devices involved, these standards are essential for developing a consistent and efficient experience for both

companies and customers (Laudon & Traver, 2023). These criteria are demonstrated in attempts to create reusable and interoperable systems, particularly with AI-powered chatbots. Creating an ontology library, for example, offers a uniform representation of domain information, enabling organized communication and integration across applications (Wei, 2021). The strength of chatbot frameworks in cross-lingual situations also demonstrates how uniform methods enable worldwide functionality, allowing AI systems to run efficiently in multiple languages and cultural settings (Xiang et al., 2021). These developments highlight the importance of universal standards in maximizing and extending AI integration into e-commerce systems.

Richness

According to Laudon and Traver (2023) Information richness is defined as the complexity and content of a message, as well as the ability of a medium to convey information, thereby reducing uncertainty and enhancing knowledge. Many aspects of this richness are found in the framework of AI-enhanced e-commerce and chatbot interactions. Chatbots respond using natural language processing for context-aware and nuanced interactions (Akdemir & Bulut, 2024; Wei, 2021). Domain knowledge and knowledge graphs enhance the prediction context by linking dense and sparse data features (Wong et al., 2024). The capability to communicate more than just the facts, (Bird & Lotfi, 2024) including emotional cues, direction (Li et al., 2023), and coaching quality, (Sundjaja et al., 2025) improves the user's impression and emotional confidence. Anthropomorphism is a new design approach where a chatbot exhibits human-like qualities, making interactions more enjoyable, and helping to fulfill cognitive and emotional user needs, which drives user intention (Jia et al., 2025). Some of the features, such as entertainment, media appeal (Puertas et al., 2024), and augmented reality (AR) (Moriuchi et al., 2021), directly increase customer engagement, contributing further to richness (Martin et al., 2021). Furthermore, emotional involvement, empathy, and task appropriateness are the key functions of rich communication, ensuring a personalized and effective user experience (Wang et al., 2023). These elements, taken together, demonstrate how chatbots, particularly advanced designs like ChatGPT (Orzol & Szopik-Depczynska, 2023) support and represent information-rich communication, complementing Laudon's definition by providing advanced, context-driven, and emotionally charged messages that enhance consumer satisfaction and decision-making in e-commerce settings.

Interactivity

Another essential function of e-commerce technology is interactivity, which refers to real-time two-way communication between organizations and consumers. Direct communication between consumers and chatbots, faster communication, and continuous exchange of information that mimics human-like interaction, where AI-driven chatbots become a fundamental component of this relationship. These real-time interactions with chatbots increase the perception of engagement, making consumers feel as though they are communicating with human agents, which in turn enhances customer trust and satisfaction of customers (Akdemir & Bulut, 2024; Bird & Lotfi, 2024; Chang & Hsiao, 2024; Jia et al., 2025; Li et al., 2023; Sundjaja et al., 2025; Wang et al., 2023; Wei, 2021).

Chabot supports various forms of dialogue, from product queries to emotional feedback, by successfully handling both positive and negative comments across multiple touchpoints, including websites and mobile applications. Various strategies, such as the foot-in-the-door (Martin et al., 2021), social presence (Puertas et al., 2024) for language learners, and how chatbots encourage deeper user engagement. Additionally, augmented reality (AR) (Moriuchi et al., 2021) increases interaction through engagement. Chatbots automatically reduce routine tasks, lighten the burden on human agents (Moriuchi et al., 2021), and encourage regular use by maintaining dynamic and responsive communication. By emphasizing user knowledge, prompt replies, and context-aware interaction, chatbots significantly increase the interactivity

of e-commerce sites, whether via simple service questions or sophisticated conversational artificial intelligence systems like Alime (Wong et al., 2024).

Information density

It is a core functionality of e-commerce technology, representing the capability of storing, analyzing, and delivering large amounts of data related to products, customers, and transactions, thereby enhancing decision-making and targeting (Laudon & Traver, 2023). Chatbots controlled by AI are a key part of this plan because they function like intelligent data centers and share structured information (Bird & Lotfi, 2024). This is especially true in e-health (Jia et al., 2025). The people using these tools give them helpful information and answer questions quickly, making customers happy and improving the service *(Akdemir & Bulut, 2024)*. Bots that converse with humans maximize information delivery by providing brief responses to those who have used them and thorough explanations to those who have not (Puertas et al., 2024). Fuzzy control, sentence vector encoding, and domain ontologies are more sophisticated techniques that facilitate orderly, dense information dissemination (Wei, 2021; Bird & Lotfi, 2024). Chatbots also help people make decisions based on data by extracting large amounts of information and analyzing deep features (Wong et al., 2024). This helps people make better decisions while reducing the cognitive load (Wang et al., 2023). Even though there are problems like too much information and emotion, the quality, relevance, and usefulness of chatbot answers show that they are good at making e-commerce platforms more information-rich (Sundjaja et al., 2025).

Personalization/customization

E-commerce technology enables personalization/customization by letting companies build the purchasing experience according to consumer preferences (Laudon & Traver, 2023) modern chatbots exhibit this ability, such as customizing the replies, using the previous purchase data, and providing accurate answers promptly (Akdemir & Bulut, 2024), user-expected replies, and customization of different tone changes (Bird & Lotfi, 2024). The chatbot's ability to identify and respond to customers' negative comments achieves personalization, ensuring that conversations stay supportive and welcoming (Chang & Hsiao, 2024). Pre-purchasing recommendations (Song et al., 2022 and click-through rate predictions (Wong et al., 2024) allow content delivery aligned with consumer behavior. Customizable voice (Puertas et al., 2024)and tailored messaging (Bird & Lotfi, 2024) Style helps to provide a more personable (Li et al., 2023) and an entertaining experience. Effective use of prompting strategies where chatbots dynamically steer discussions depending on user replies and preferences, improving the relevance and fluency of interactions, is one key component of this personalization (Orzol & Szopik-Depczynska, 2023). These features show how chatbots meet emotional and cognitive demands (Jia et al., 2025), complementing the e-commerce personalization and customization aspect described by (2023).

Social Technology

E-commerce technology facilitates social interactions and collaboration between businesses and customers, primarily through integrating social media platforms. The integration of social technology allows companies to build relationships, promote their products, and market their brand visibility through user-centric communication (Laudon & Traver, 2023). Chatbot design demonstrates a straightforward application of these aspects; "Entertainment" and "Social Presence" are operationalized both visually (e.g., avatar appearance, design alignment with the website) and textually (e.g., tone of voice, expressions tailored to the target audience). These qualities mimic human-like interaction, providing a sense of closeness and interpersonal connection with the user (Puertas et al., 2024).

For further explanation of how these unique features support e-commerce technology from the authors' perspective, Figure 3 visually maps the alignment between the scholarly sources and the features of e-

commerce technology with rows and columns. The representation of "1" in Figure 3 represents that the respective study supports these features in the context of chatbots' supportive role.

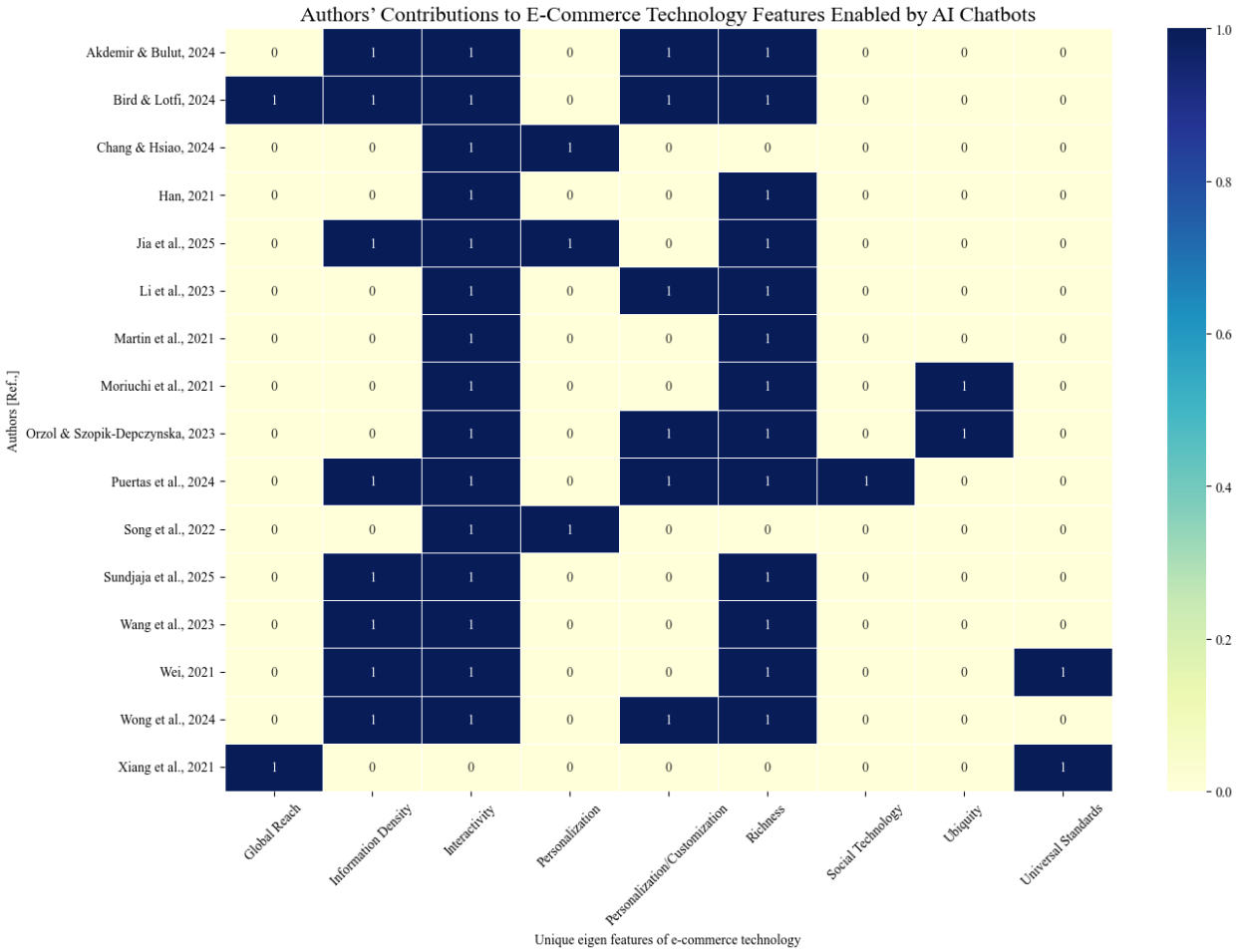

Figure 3. Authors' Contributions to E-Commerce Technology Features Enabled by AI Chatbots

The above visualization shows that Interactivity, Information Richness, and Personalization/Customization are the most frequently supported features across the literature, as discussed in some articles, representing personalization as depicted in the figure. This reinforces that chatbots are primarily viewed as tools for enhancing customer engagement, tailored communication, and rich information exchange. In contrast, features like Global Reach, Social Technology, Ubiquity, and Universal Standards are less commonly discussed.

RQ2 examines how chatbots operate in e-commerce, specifically the technological advancements that enable chatbot capabilities to enhance the quality of services across e-commerce technology dimensions, from developing the e-commerce online intelligent customer service system built on an ontology library (which is based on fuzzy control) to retrieve the data for online customer service product recommendations (Wei, 2021) to the growing use of artificial intelligence in customer service by integrating various AI technologies, such as a machine learning technique called transfer learning-based chatbot models, which are first learned from one domain with a random weight distribution. Then, knowledge learned in previous domains is transferred to the other domains. It also tested this model with 19 different companies. The results yielded are language transfer and knowledge transfer from prominent-level domains and models that

were deployed on physical robot platforms, including "Pepper" and "Temi" (Bird & Lotfi, 2024), representing how virtual chatbots are evolving into physical robots.

The increased use of conversational agents like ChatGPT has revolutionized e-commerce by enhancing customer experience, communication, and sales by providing high-quality responses, increased availability, and accessibility. This is achieved by utilizing prompting techniques, handling both positive and negative customer feedback, and recommending products (Orzol & Szopik-Depczynska, 2023). AI-driven further enhances the capability of the recommendations through a knowledge-enhanced deep cross-network (K-DCN), which incorporates knowledge graphs to predict click-through rates and rank products based on customer profiles and behavior. It was tested with a real-world application in Alime, a chatbot that ranks items in recommendations, resolves customer issues, and offers promotions to customers, thereby decreasing the cost of customer service and improving customer satisfaction. These technological advancements strengthen the platform's personalization features and information density. However, e-commerce must support multilingual users in globalization. To address this, it is proposed that machine translation (MT) services are often employed before and after chatbot interactions to facilitate multilingual communication (Xiang et al., 2021). On the other hand, translation introduces noise and errors that reduce system robustness and impact service quality.

Beyond technological advancements, the trust and perception of users play a crucial role in adopting chatbots, which vary at different stages of the shopping journey. For instance, consumers tend to trust chatbots more during the pre-purchase stage due to their personalized recommendations. However, they refer to human agents disclosing privacy information and risk-related issues during purchase (Song et al., 2022). Increasing customer experience, anthropomorphism to appear more like a human, and feel enjoyable has emerged as a psychological design technique mainly for young customers (18-34 years old) (Han, 2021)and staying constant irrespective of age with the foot-in-the-door technique, asking consumers to agree to a small and easy request, and following up with more significant questions. The idea of agreeing to the small request will likely lead to saying yes to the more critical questions, as they want to remain consistent with their earlier behavior during conversations (Martin et al., 2021)

These designs contribute to social technology and the interactive features of the chatbot's functionality. Anthropomorphized chatbots are highly recommended for development in retail e-commerce, as they aim to foster customer trust and alleviate the technology burden on customers using chatbots, ultimately leading to improved service evaluation. Even though anthropomorphized chatbots make customers believe that they are interacting with human agents, the frequent messaging would increase the difficulty of data processing and result in a negative evaluation.

Nevertheless, it is essential to remember that the impact of anthropomorphism may vary by sector; for example, pharmaceutical e-commerce does not significantly affect anthropomorphism. Still, the speed, ease of use (Jia et al., 2025), and customer satisfaction (Sundjaja et al., 2025) through the chatbot's communication quality (Akdemir & Bulut, 2024), are key factors. The moderating effect of customers' experience on using chatbots (Puertas et al., 2024) also impacts consumers' intention to use chatbots.

Discussion

The study's findings include how AI-powered chatbots enable them to support the unique technological features of e-commerce platforms. Through a systematic literature review, it has been demonstrated that chatbots primarily enhance interactivity, information richness, and personalization and customization features, which are crucial for customer engagement, satisfaction, and informed decision-making. Chatbots resemble ubiquity by providing support 24/7, which is a device-independent service, but (Moriuchi et al.,

2021) their impact on the overall brand impression is still somewhat limited. Similarly, transfer learning's multilingual and cross-lingual capabilities offer a global reach (Bird & Lotfi, 2024) (Xiang et al., 2021). These technologies are vulnerable to system weaknesses, concerns, and translation errors. Ontology libraries handle universal standards, thereby ensuring consistent interaction across platforms (Wei, 2021). The capacity of chatbots to deliver information richness, which depends not only on communicating truthful information but also on emotional and nuanced responses, has been emphasized by developments in knowledge graphs and NLP (Jia et al., 2025; Wong et al., 2024). Structured data transmission supports information density, enabling users to make quicker, better decisions and reducing the burden on logical thinking (Puertas et al., 2024; Wang et al., 2023). Moreover, social technology is increasingly being incorporated into chatbot design, utilizing entertainment elements and social presence to foster emotional connections with the user (Puertas et al., 2024).

Regarding the technological advancements (RQ2), the study revealed that NLP, transfer learning, prompting strategies, ontology-based library systems, and knowledge graph integration are key technologies for enhancing chatbot capabilities. Hence, these chatbots help provide real-time, personalized services across user groups by examining their potential to transform customer service into e-commerce. However, issues such as information overload, loss of perceived authenticity, and sector-specific differences in customer trust were mentioned, indicating that careful design, technological strength, and suitable domain application will determine how effectively chatbots work.

Conclusion

This systematic literature review examined how AI-driven chatbot capabilities align with the characteristic features of e-commerce technology driven by technological advancements, thereby filling the gap. The technological advancements of these chatbots are due to natural language processing, knowledge graphs, and prompting strategies. Chatbots have proven their ability to increase interactivity, information richness, and personalization in digital commerce. Although chatbots offer 24/7 availability, multilingual services, and customized interactions that significantly improve the user experience, problems remain in guaranteeing truthfulness, managing information overload, and integrating technologies into various cultural and industrial sectors. By combining the conceptual and technological components of chatbot integration, this study provides new insights into the strategic usage of artificial intelligence chatbots in e-commerce platforms.

This study has some limitations. First, the study used a title/abstract search; the full-text search might include more references for the unique features and technological advancements. Second, our analysis focuses on the limited timeframe from 2020 to 2025 and considers academic journals where this can be considered as a blind spot, as there are a lot of core AI technologies being adopted in real-world AI chatbots for customer support. The chatbot functionalities may vary across different sectors; however, this study is limited to the retail e-commerce sector.

Future research should focus on measuring customer satisfaction, loyalty, and behavior of their purchasing products, and measuring the impact of chatbot-supported features, looking into chatbot efficacy in a variety of industries, for example, healthcare, education, finance, where customers' expectations and emotions matter, measuring the chatbot's performance and multilingual settings to increase the global reach and social technology design, Examining hybrid customer care models where human agents and artificial intelligence chatbots co-exist, evaluating how this influences consumer confidence and perceived service quality, evaluating the long-term emotional consequences of anthropomorphized chatbots on users, especially about over-attachment, privacy, and trust manipulation. Future research, including empirical

validation and industry-specific adaptation, will determine if AI chatbots live up to their promise as transformational agents in the evolving landscape of global e-commerce.

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