

Generative AI in E-commerce: a literature review of current applications, gaps and future directions

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Abstract

Purpose – This study systematically investigates the integration of Generative Artificial Intelligence (GenAI) in the e-commerce sector to enhance customer interactions, optimize business operations and support decision-making processes across online platforms.

Design/methodology/approach – A comprehensive search of the Web of Science, Scopus and Google Scholar identified 52 empirical research articles published between 2022 and 2025 that met the predefined inclusion criteria.

Findings – The review categorizes the selected studies according to their research methodologies and data collection techniques. Major areas of GenAI application include: (1) enhancing customer purchase intention and experience; (2) implementing GenAI-driven optimization strategies; (3) supporting business decision-making; (4) improving information retrieval; (5) enabling GenAI-driven advertising; and (6) developing GenAI implementation strategies. Findings also highlight theoretical models and their predictive factors, which play a significant role in explaining the effectiveness of GenAI applications in e-commerce. In addition, challenges and future research directions related to GenAI integration are identified.

Practical implications – The study offers actionable insights for e-commerce practitioners by guiding the effective integration of GenAI into business strategies. By understanding the current trends, theoretical models and key predictive factors, organizations can enhance operational efficiency and decision-making.

Originality/value – This study offers a novel synthesis of GenAI applications in e-commerce, focusing on empirical research published between 2022 and 2025. By systematically categorizing prior studies, it offers a structured overview of GenAI's impact across various e-commerce functions. The inclusion of theoretical models and their predictive factors further enriches the understanding of GenAI's effectiveness in real-world e-commerce contexts. This study enriches the literature and delivers actionable guidance for practitioners to apply GenAI in boosting customer engagement and operational efficiency.

Keywords Generative artificial intelligence (GenAI), E-commerce, Literature review

Paper type Literature review

1. Introduction

Since its introduction in November 2022, generative artificial intelligence (GenAI) has emerged as a leading advancement in artificial intelligence, demonstrating the capacity to emulate aspects of human cognition, learning and decision-making to deliver intelligent solutions across a wide range of industries. E-commerce has experienced one of the most profound transformations, with GenAI playing a pivotal role in reshaping business operations, customer interactions and the management of digital commerce activities (Gupta *et al.*, 2024;



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Wallace and DeVries, 2025). As GenAI technologies continue to evolve rapidly, their influence on digital commerce has become increasingly pronounced (Chang and Park, 2024). Global retail e-commerce sales are estimated to reach USD 6.3tn in 2024 and are projected to exceed USD 8tn by 2027, while social commerce alone is expected to contribute more than USD 1.3tn (Veenam, 2024). These figures reflect the extent to which AI-powered technologies, particularly GenAI, are transforming customer engagement, personalization, logistics, marketing strategies and decision-making in the e-commerce world. GenAI enhances customer experiences by generating personalized product recommendations and marketing content tailored to individual preferences and browsing behaviors (Chen *et al.*, 2023b).

Furthermore, GenAI-enabled chatbots and virtual assistants facilitate customer service interactions by providing rapid, continuous and scalable support (Arman and Lamiya, 2023; Chakraborty *et al.*, 2024). The integration of these capabilities enables highly personalized marketing experiences, dynamic pricing mechanisms and automated content generation, ultimately strengthening customer satisfaction, operational efficiency and competitive advantage (Huang, 2023; Sirithumgul, 2023; Dhoni, 2024). Despite these benefits, the widespread adoption of GenAI-based shopping tools and platforms raises critical concerns related to privacy, data protection and algorithmic bias. Addressing these issues requires stakeholders to systematically assess associated risks and to develop robust governance frameworks that ensure the responsible and ethical deployment of GenAI technologies (Chakraborty *et al.*, 2025).

Despite this rapid evolution, the current literature shows a limited understanding of GenAI's full potential and the challenges it poses for e-commerce (Ooi *et al.*, 2023; Mariani and Dwivedi, 2024). Prior studies have primarily focused on traditional AI adoption, with minimal consideration of GenAI-specific factors such as content generation, human-AI collaboration and organizational adaptation (Mariani and Dwivedi, 2024). Although a growing body of research highlights both the benefits and challenges of integrating GenAI into e-commerce, a comprehensive synthesis of these findings remains lacking (Gude, 2023; Sadiq *et al.*, 2024). For example, Ooi *et al.* (2025) conducted a review on cross-disciplinary GenAI applications and provided multi-disciplinary insights on the opportunities, challenges and research agendas of GenAI across major industries. Conducting bibliometric and text mining of industry sources like tweets and blogs, Wang and Wang (2023) integrated industry perspectives to map GenAI themes, opportunities and emerging challenges across business domains. Veluru (2024) highlighted that predictive and GenAI models enhance operational efficiency, customer experience, demand forecasting, logistics optimization and data-driven decision-making. The study by Chen *et al.* (2023a) reviewed the achievements of AI in the e-commerce sector, with a particular focus on evaluating ChatGPT. This study examined the potential benefits of ChatGPT across different stages of e-commerce business processes, including customer service, product recommendations, content generation and decision-making support. It also highlighted key ethical risks and technical challenges, such as data privacy, security concerns and algorithmic bias.

Although existing reviews have begun to explore GenAI in business and e-commerce (Table 1), they remain fragmented and leave several important gaps that motivate this study. Current works either adopt a broad, cross-industry lens (e.g. Ooi *et al.*, 2025), focus mainly on industry perspectives via bibliometric or text-mining approaches (Wang and Wang, 2023) or discuss GenAI and AI in general terms without systematically synthesizing empirical evidence specific to e-commerce (Chen *et al.*, 2023b; Veluru, 2024). Meanwhile, the theoretical models and predictive factors that underpin GenAI adoption and use are largely overlooked in existing reviews. As a result, there is a lack of a systematic overview of empirical GenAI applications in e-commerce, a structured mapping of trends in this rapidly evolving research area and an integrated synthesis of the theoretical models and key predictive factors underpinning GenAI adoption and use, alongside a consolidated view of current challenges and future research

Table 1. Existing review studies in e-commerce and GenAI

Author(s) and year	Focus area	Theoretical contribution	Key findings
Ooi et al. (2025)	Cross-disciplinary GenAI applications	Provides multi-disciplinary insights into opportunities, challenges and research agendas for GenAI across major industries	Highlights GenAI's broad potential and risks across marketing, banking, retail, workplace and manufacturing, etc.
Veluru (2024)	GenAI and AI in e-commerce and supply chain operations	Highlights the role of AI and GenAI in enhancing efficiency, forecasting, logistics and customer interaction across e-commerce and supply chains	Shows improvements in demand forecasting, inventory management, logistics optimization, personalization and decision-making; identifies challenges such as data privacy, high costs and skill gaps
Chen et al. (2023a)	Impact of ChatGPT on e-commerce business models	Analyses ChatGPT prompt engineering for e-commerce, identification of potential benefits across business processes, critical discussion of negative impacts and risks	Presents benefits such as customer service, product recommendations, content generation and decision-making support, as well as challenges such as data privacy and security concerns
Wang and Wang (2023)	GenAI in business and management	Integrates industry perspectives to map GenAI themes, opportunities and emerging challenges across business domains	Maps trends, industry-research gaps

Source(s): Authors' own work

directions. To address these gaps, this study investigates the following research questions (RQs):

- RQ1. What are the trends in research in the application of GenAI in e-commerce?
- RQ2. What are the theoretical models and their prominent predictive factors influencing GenAI applications in e-commerce?
- RQ3. What are the current research challenges and future directions for GenAI in e-commerce?

This systematic review of research trends, theoretical models and emerging challenges offers a coherent and integrated understanding of GenAI applications in the e-commerce context. Examining research trends (RQ1) reveals the dominant areas of focus, evolving themes, research methods and significant gaps that shape current scholarly and industry interest in GenAI. Investigating the theoretical models and prominent predictive factors (RQ2) clarifies how prior studies frame GenAI adoption, the key constructs that influence its implementation and the theoretical limitations that constrain deeper explanatory insights. Finally, by integrating findings on current challenges and emerging opportunities (RQ3), the review offers practical insights on where future work is needed to strengthen conceptual, methodological and practical understanding of GenAI in e-commerce.

The structure of the study is as follows: [Section 2](#) details the research methodology, including article selection and inclusion criteria. [Section 3](#) presents and discusses the findings for each research question. [Section 4](#) concludes the study and outlines its implications and limitations.

2. Research method

The “Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)” guidelines were first established by [Moher et al. \(2009\)](#) to enhance the quality of reporting in systematic reviews and meta-analyses. This method provides a comprehensive checklist to ensure transparency and completeness in reporting, helping readers assess the validity and reliability of the reviews. PRISMA-ScR is an extension of the PRISMA guidelines proposed by [Tricco et al. \(2018\)](#), specifically designed to improve the reporting of reviews. Unlike the traditional PRISMA framework, which is designed for systematic reviews and meta-analyses, PRISMA-ScR addresses reviews with broader research questions and more flexible inclusion criteria. PRISMA-ScR is an appropriate tool for a literature review on GenAI in e-commerce due to its transparent reporting and ability to identify research gaps in the rapidly changing nature of technologies ([Tricco et al., 2018](#)). Meanwhile, this choice aligns with recent scoping and systematic reviews in e-commerce and electronic services that explicitly applied PRISMA-ScR or PRISMA to report their findings. For instance, [Kathriarachchi et al. \(2024\)](#) conducted a scoping review of risks in e-commerce recommender systems, and [Yaakoubi et al. \(2025\)](#) performed a scoping review of quality in electronic services, both employing PRISMA standards. The PRISMA-ScR mostly focuses on the different phases of the process. It encompasses the stages of identification, screening, eligibility assessment and inclusion ([Peters et al., 2020](#)). The identification phase captures all potential sources of information, while screening narrows the list based on relevance. Eligibility assesses the full-text articles that meet the inclusion criterion, while inclusion finalizes the records that will be included in the final analysis. These stages have been important in developing transparency and clarity in reporting so that the process is well-conducted and time-saving. Using these reporting standards strengthens transparency and ensures the review captures the breadth and heterogeneity of GenAI in e-commerce.

2.1 Eligibility criteria

In line with PRISMA guidelines, this study employed transparent, pre-specified inclusion and exclusion criteria to guide the article selection process and ensure the quality and relevance of the review ([Whittemore and Kanfl, 2005](#); [Pranckute, 2021](#)). Studies were required to examine technological, managerial, commercial or customer aspects of GenAI to align with this study’s RQs: trends and contexts (RQ1), theoretical models and predictive factors (RQ2) and challenges and future directions (RQ3). [Table 2](#) depicts the inclusion and exclusion criteria for articles used in this study. The studies to be included in this review had to be identified based on the presence of the specified search terms in their titles, abstracts or keywords. Studies that did not contain relevant keywords in the titles, subject or keywords were excluded. This is important as only relevant studies will be included. The basis of this review was research articles since they remain the major type of works published in journals. Original research

Table 2. Inclusion and exclusion criteria

Inclusion	Exclusion
Relevant search terms are found in the titles, abstracts or keywords sections	Research papers that do not contain relevant search words in the abstracts, titles or keywords section
Peer-reviewed journal and conference articles were included	Review papers, non-research material and other types (books, book chapters, reports and workshops) were excluded
Research papers published in English from November 2022 to mid-July 2025	Research articles released beyond this timeframe or those not available in English
Research articles focused on GenAI in e-commerce	Articles not specifically focusing on GenAI are excluded
Source(s): Authors’ own work	

articles are those that usually present findings of original research that have direct implications in their respective fields of study. Review papers were excluded to avoid duplication of evidence and book chapters, as well as other non-peer-reviewed materials (e.g. reports, workshop papers), were excluded because they do not consistently meet peer-review standards. The timeframe of 2022–2025 was purposefully selected to capture the rapid rise of research on GenAI following the release of ChatGPT in late 2022. This approach aligns with [Sedkaoui and Benaichouba \(2024\)](#), who identified the post-2022 period as the most relevant phase for substantial academic interest in the capabilities and applications of GenAI and for reviewing its developments. Meanwhile, the searches included all English-language articles published between November 2022 and mid-July 2025. This review provides an overview of recent trends regarding the use of GenAI in the e-commerce field. Thus, only works that focus specifically on GenAI in e-commerce will be relevant for this review.

2.2 Search and selection of sources

The search was carried out within the “Web of Science (WoS), Scopus, and Google Scholar databases”. WoS and Scopus were chosen because they are prominent academic databases that index high-quality, peer-reviewed journals relevant ([Pranckute, 2021](#); [Sedkaoui and Benaichouba, 2024](#)). Moreover, their broad coverage allows for comprehensive retrieval of studies, supporting a systematic and reliable analysis of the literature ([Necula and Păvăloaia, 2023](#)). Google Scholar was added to ensure coverage of emerging GenAI studies that may not yet appear in those databases, especially given the rapid pace of GenAI research after 2022 ([Haddaway et al., 2015](#)). The keywords were utilized using Boolean operators: (“generative artificial intelligence” OR “generative AI” OR “GenAI”) AND (“e-commerce” OR “electronic commerce” OR “retail” OR “shopping” OR “online shopping” OR “purchase”). The keywords were selected based on a preliminary scan of early GenAI e-commerce literature and the terminology consistently used by scholars in top databases. Boolean combinations were applied to ensure comprehensive coverage of both (a) GenAI terminology and (b) e-commerce contexts, thereby maximizing retrieval accuracy and minimizing irrelevant results. The processes of selecting sources for this review involved identification, screening eligibility and inclusion as shown in [Figure 1](#). Initially, 286 records were retrieved from selected databases in the identification phase. Next, a reference mining process was conducted by reviewing the reference lists of the downloaded articles to identify any additional relevant studies that may have been overlooked during the initial searches. However, no additional references were found. All paper records were entered and organized in EndNote, which helped eliminate duplicates, leaving 96 articles. Screening these articles resulted in only 66 records, with 10 being excluded for not being article types and 20 for not being in English. Additionally, 14 papers were excluded because they focused on e-commerce rather than GenAI. In the end, 52 studies met the selection criteria and are included in this review.

3. Findings

All 52 included articles have been thoroughly read and analyzed, and the findings are discussed based on three formulated RQs.

3.1 RQ1: What are the trends in research in the application of GenAI in e-commerce?

To address this RQ, publication year, publication type and geographical location of selected studies have been extracted and analyzed. According to [Figure 2](#), there has been an increase in research output over the past two years. Since GenAI emerged in late 2022, there have been no recorded publications for that year. In 2023, there were 11 articles, representing 21.15% of the total publications. In 2024, the number of publications reached 24, accounting for 46.15%, indicating the rapid development of GenAI research in e-commerce. As of July 2025, a total of 17 articles had been published, representing 32.69% of the overall publications. This reflects

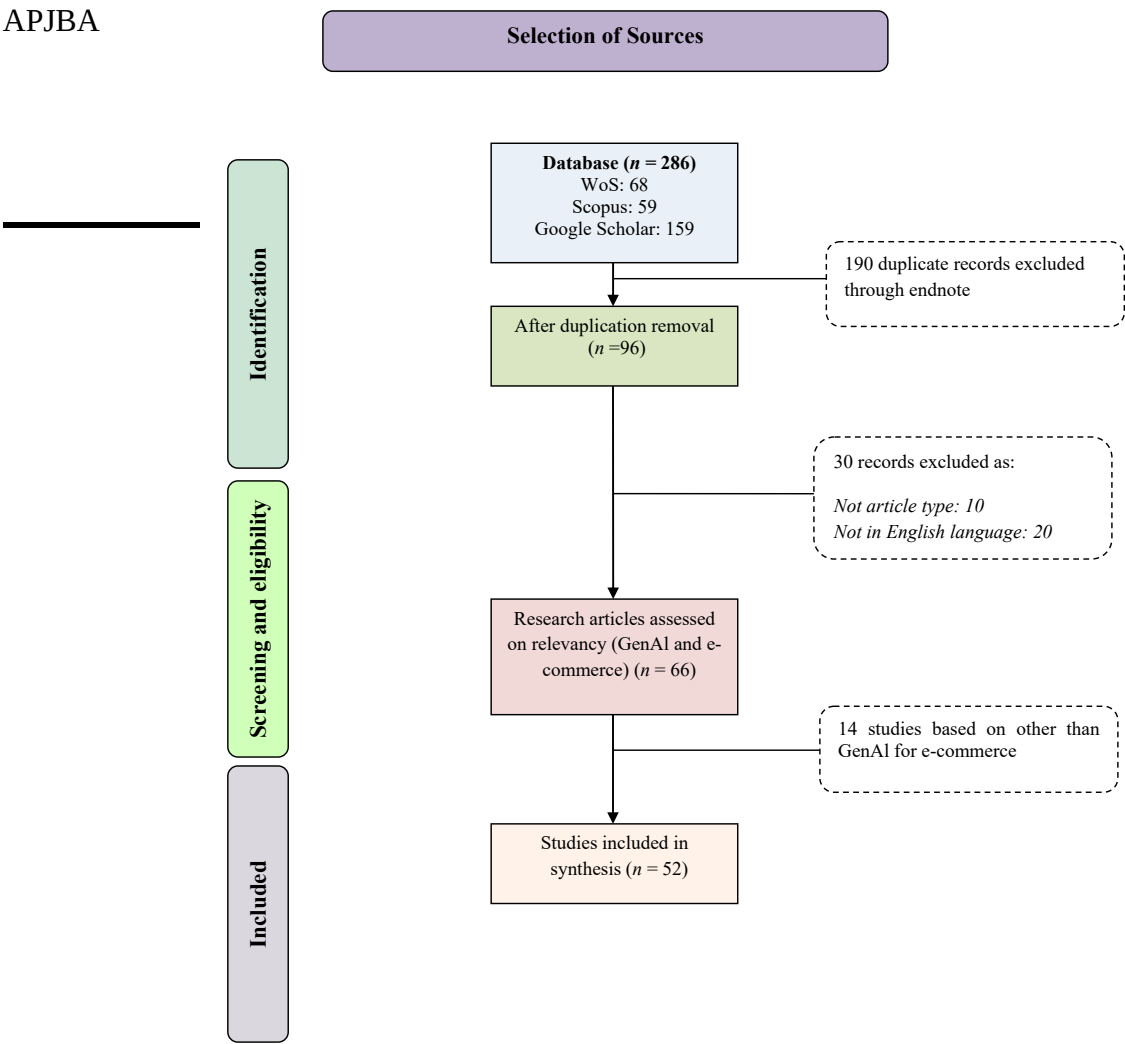


Figure 1. Selection of sources flow diagram. Source: Authors' own work

substantial progress in the first half of 2025 and indicates the potential for a record number of publications by the end of the year.

All 52 selected articles were published in journals, demonstrating a growing academic commitment to producing credible and impactful research in the field. Geographically, China accounted for the highest number of studies with eight publications (e.g. [Shahzad et al., 2025](#); [Huang et al., 2025](#); [Yuan et al., 2025](#); [Xie and Desouza, 2025](#); [Wang and Zhang, 2025](#); [Cheng et al., 2025](#); [Shi et al., 2025](#); [Dai et al., 2024](#)). Being leading position in GenAI-related e-commerce research can be attributed to China's status as one of the world's largest online markets for nearly a decade ([Liu et al., 2024](#)). China's e-commerce transactions contribute a significant share to the national gross domestic product (GDP). Additionally, the government has initiated development plans to expand the role of e-commerce in national economic development ([Jiang et al., 2024](#)). India followed with five studies (e.g. [Kumar et al., 2024](#);

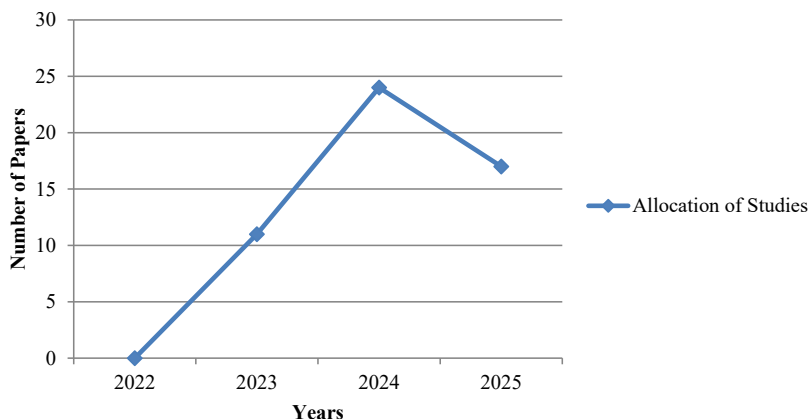


Figure 2. Trend of published articles. Source: Authors' own work

Chakraborty *et al.*, 2025; Vhatkar *et al.*, 2024; Kamoopuri and Sengar, 2025; Gupta and Mukherjee, 2025). Three studies were conducted in the United States (Gude, 2023; Park and Ahn, 2024; Chang *et al.*, 2024). Two studies were conducted in Malaysia (Abumalloh *et al.*, 2024; Iranmanesh *et al.*, 2024). Other countries contributed one study each, including Indonesia (Andarsari and Suryadi, 2024), Korea (Hee-Young *et al.*, 2023), Bangladesh (Arman and Lamiya, 2023), Australia (Steiner *et al.*, 2024) and Sweden (Chuma and De Oliveira, 2023), Taiwan (Foroughi *et al.*, 2025) (Table 3). Most of the studies (28, 54.90%) did not specify geographical location.

3.1.1 Study contexts. The 52 selected articles have been grouped into six categories, each reflecting common objectives and contexts. As outlined in Table 4, the category of customer purchase intention and experience comprises 19 studies. Research by Arman and Lamiya (2023) and Kumar *et al.* (2024) shows that personalized GenAI recommendations positively influence purchase intentions by aligning with individual customer preferences. Further, Kshetri (2024) and Dhoni (2024) demonstrated interactive content generated by GenAI to boost user engagement and satisfaction. Chang *et al.* (2024), Misra *et al.* (2024) and Park and Ahn (2024) explore consumer behavior to forecast purchasing decisions, offering valuable insights that assist retailers in improving their marketing strategies. In contrast, Andarsari and Suryadi (2024) and Steiner *et al.* (2024) examined GenAI-driven personalized marketing

Table 3. Geographical locations

Countries	Number of studies
China	8
India	5
United States	3
Malaysia	2
Indonesia	1
Korea	1
Bangladesh	1
Australia	1
Sweden	1
Taiwan	1
Not specified	28
Source(s): Authors' own work	

Table 4. Context of research in the application of GenAI in e-commerce

Context or category	References	Number of studies
Customer purchase intention and experience	Arman and Lamiya (2023) , Andarsari and Suryadi (2024) , Chang and Park (2024) , Misra et al. (2024) , Park and Ahn (2024) , Steiner et al. (2024) , Kshetri (2024) , Dhoni (2024) , Kumar et al. (2024) , Kim and Choi (2024) , Chang et al. (2024) , Shi et al. (2025) , Cheng et al. (2025) , Stamkou et al. (2025) , Kamoonpuri and Sengar (2025) , Shahzad et al. (2025) , Huang et al. (2025) , Foroughi et al. (2025) , Xie and Desouza (2025)	19
GenAI-driven optimization strategies	Amit et al. (2023) , Chen et al. (2023a) , Kathiriya et al. (2023) , Ooi et al. (2023) , Huang (2023) , Zhang (2023) , Chakraborty et al. (2024) , Roumeliotis et al. (2024) , Zhao et al. (2024) , Vedula et al. (2024) , Jabade et al. (2024) , Dai et al. (2024) , Xu et al. (2024) , Alti and Lakehal (2025) , Chakraborty et al. (2025) , Wang and Zhang (2025)	16
Business decision-making	Chuma and De Oliveira (2023) , Hee-Young et al. (2023) , Sadiq et al. (2024) , Abumalloh et al. (2024) , Oluwagbenro (2024) , Li et al. (2024) , Mora-López et al. (2025) , Wasilewski (2025)	8
Information retrieval	Gude (2023) , Iranmanesh et al. (2024) , Gupta and Mukherjee (2025)	3
Advertising with GenAI	Dimitrieska (2024) , Islam et al. (2024) , Vhatkar et al. (2024) , Desai and Desai (2025)	4
GenAI implementation strategies	Rane (2023) , Yuan et al. (2025)	2
Source(s): Authors' own work		

impacts consumer engagement. In this context, [Kim and Choi \(2024\)](#) noted that enhanced customer experiences arising from personalized interactions can reinforce brand loyalty and ultimately drive repeat purchasing behavior. [Chang et al. \(2024\)](#) examined the influence of different chatbot models and user personality traits on customer purchase intention and shopping experience in both virtual and physical retail environments. [Shi et al. \(2025\)](#) revealed that user purchase intention for AI-generated cultural products was driven by perceived value, price, hedonic motivation and cultural experience. [Cheng et al. \(2025\)](#) found that customer purchase intention and experience were influenced by perceptions of GenAI-generated reviews, with ethical concerns and personal innovativeness playing key roles. [Stamkou et al. \(2025\)](#) showed that AI-generated e-commerce content enhanced the purchase experience by positively influencing perceptions of service quality, security and design aesthetics. [Kamoonpuri and Sengar \(2025\)](#) highlighted that customer purchase intention and experience with GenAI chatbots were shaped by shopping enjoyment, optimism and perceived control during retail interactions. [Shahzad et al. \(2025\)](#) revealed that trust in GenAI chatbots enhanced customer purchase intention and experience, whereas distrust driven by privacy concerns and emotional detachment acted as a barrier. [Huang et al. \(2025\)](#) found that customer purchase intention and experience with AI-generated fashion content were influenced by perceived brand design effort, price value and aesthetic appeal, particularly in online settings. Finally, [Foroughi et al. \(2025\)](#) described sustained use of GenAI in shopping, and [Xie and Desouza \(2025\)](#) demonstrated that virtual influencers in AI-driven live commerce enhanced customer purchase intention and experience by fostering emotional connection and interactive engagement.

Together, these findings stress the truly transformative role of GenAI in enriching customer purchase intentions within the highly competitive e-commerce space. The category of GenAI-driven optimization strategies comprises 16 studies that collectively illustrate the

transformative potential of GenAI in enhancing various aspects of e-commerce. [Amit et al. \(2023\)](#) discussed how ChatGPT influences the development of e-commerce by increasing customer engagement and optimizing internal processes. [Chen et al. \(2023a\)](#) covered the potential of applying ChatGPT and pointed out the positive and negative impacts on the industry. [Kathiriya et al. \(2023\)](#) focused on the application of GenAI technologies to prevent retail theft; in this respect, they substantiate several practical resonances within the context of enhanced applications of security measures. [Ooi et al. \(2023\)](#) performed a thorough analysis of the interdisciplinary uses of GenAI, recommending future directions for its application in e-commerce. [Huang \(2023\)](#) looked into the relationship between online shopping and digital marketing, stressing how these tools allow businesses to create personalized and engaging experiences for their customers. [Zhang \(2023\)](#) discussed the impact of ChatGPT on the development of the e-commerce economy and discussed the potential of such technology to stimulate growth. [Chakraborty et al. \(2024\)](#) explored how to use AI chatbots to build trust and confidence in online shopping customers. [Rumeliotis et al. \(2024\)](#) examined how various language models analyze product reviews to better interpret consumer sentiment, while [Zhao et al. \(2024\)](#) discussed the use of customized ChatGPT models to enhance the online shopping experience. Together, these studies indicate that strategically applied GenAI can significantly benefit e-commerce by improving speed, customer service and overall business success.

[Vedula et al. \(2024\)](#) demonstrated that GenAI optimized the shopping process by generating contextual product questions to streamline customer interaction. [Jabade et al. \(2024\)](#) showed that GenAI enabled personalized fashion design and visualization, enhancing customer engagement and purchase intent. [Dai et al. \(2024\)](#) found that GenAI-driven strategies supported agile, data-informed product design and marketing, thereby boosting cross-border e-commerce outcomes. [Xu et al. \(2024\)](#) reported that GenAI enhanced the recommendation system (Recsys) performance through personalized, explainable and interactive recommendation strategies. [Alti and Lakehal \(2025\)](#) revealed that GenAI-driven model-driven design (MDD) strategies dynamically optimized e-commerce UI/UX, improving personalization and user engagement. [Chakraborty et al. \(2025\)](#) observed that GenAI enhanced platform efficiency and long-term user engagement through task-social fit and personalized AI features. Finally, [Wang and Zhang \(2025\)](#) found that GenAI capabilities drove sustainable innovation and supply chain performance in cross-border e-commerce SMEs.

A key focus of GenAI applications in e-commerce is business decision-making, examined in eight studies. [Chuma and De Oliveira \(2023\)](#) highlighted the importance of data-driven insights for navigating the complexities of e-commerce markets. Additionally, studies by [Sadiq et al. \(2024\)](#), [Abumalloh et al. \(2024\)](#), [Oluwagbenro \(2024\)](#), [Li et al. \(2024\)](#) and [Hee-Young et al. \(2023\)](#) highlighted that GenAI's data analytics capabilities support strategic decision-making and enhance marketing efforts. [Mora-López et al. \(2025\)](#) provided objective indicators to guide business decisions on GenAI adoption amid shifting market expectations. [Wasilewski \(2025\)](#) showed that GenAI supported data-driven decision-making by enabling personalized content strategies tailored to customer segments.

Another essential area is information retrieval, as explored by [Gude \(2023\)](#) and [Iranmanesh et al. \(2024\)](#), who underscored the importance of improved search functions and product discoverability in enhancing user experience. [Gupta and Mukherjee \(2025\)](#) found that GenAI enhanced information retrieval by reducing overload through synthesized, customized product search results, although adoption depended on trust and perceived reliability.

Advertising with GenAI, as explored by [Dimitrieska \(2024\)](#) and [Islam et al. \(2024\)](#), introduces innovative approaches such as personalized ad targeting and dynamic content creation, which enhance consumer engagement. [Vhatkar et al. \(2024\)](#) showed that GenAI enhanced retail advertising through personalized experiences, chatbots and visual search within omnichannel strategies. [Desai and Desai \(2025\)](#) found that GenAI supported advertising effectiveness by streamlining data access and enabling real-time, data-driven campaign decisions.

Rane (2023) contributed insights into collaborative GenAI strategies, emphasizing the role of interdepartmental teamwork in aligning goals and maximizing GenAI’s e-commerce benefits. Yuan *et al.* (2025) emphasized that GenAI implementation strategies in financial services needed to address technological, organizational and environmental factors to drive adoption and optimize outcomes. Collectively, these studies illustrate GenAI’s broad impact on e-commerce, fostering innovation and strengthening consumer engagement.

Analyzing the research methods used to assess the impact of GenAI in e-commerce is crucial for evaluating the credibility and robustness of existing findings. Such insights are crucial to supporting evidence-based implementation and informing policy-making. Following Creswell’s (2014) research design framework, the selected publications were categorized into qualitative, quantitative and mixed-method approaches (Table 5). To deepen the analysis, this classification was further extended to discuss extracted data based on data analysis techniques (Table 6) and underlying theoretical frameworks and constructs (Table 7).

Table 5. Research methods and data collection tools

Research method	References	Data collection tools
Quantitative (n = 21)	Hee-Young <i>et al.</i> (2023), Gude (2023), Abumalloh <i>et al.</i> (2024), Sadiq <i>et al.</i> (2024), Kim and Choi (2024), Chang <i>et al.</i> (2024), Andarsari and Suryadi (2024), Iranmanesh <i>et al.</i> (2024), Park and Ahn (2024), Vhatkar <i>et al.</i> (2024), Shahzad <i>et al.</i> (2025), Huang <i>et al.</i> (2025), Chakraborty <i>et al.</i> (2025), Yuan <i>et al.</i> (2025), Cheng <i>et al.</i> (2025), Shi <i>et al.</i> (2025), Stamkou <i>et al.</i> (2025), Kamoopuri and Sengar (2025), Foroughi <i>et al.</i> (2025) Kathiriya <i>et al.</i> (2023)	Survey (n = 19) Sales transaction and inventory review (n = 1) Electronic transactional records (ETL Processes) (n = 1) Product reviews from online platforms (n = 5)
Qualitative (n = 14)	Li <i>et al.</i> (2024), Roumeliotis <i>et al.</i> (2024), Vedula <i>et al.</i> (2024), Dai <i>et al.</i> (2024), Mora-López <i>et al.</i> (2025) Chen <i>et al.</i> (2023a), Chuma and De Oliveira (2023), Wasilewski (2025) Desai and Desai (2025), Xie and Desouza (2025), Gupta and Mukherjee (2025) Kumar <i>et al.</i> (2024), Islam <i>et al.</i> (2024) Misra <i>et al.</i> (2024)	Text extraction and ChatGPT’s responses (n = 3) Semi-structured interviews (n = 3) Case study and industry analysis (n = 2) Primary (“interviews, discussions, observations, etc.”) and secondary (newspapers, reports, statistical data, journals, books, etc.”) data sources (n = 1) Survey and interview (n = 4)
Mix-method (n = 5)	Huang (2023), Chakraborty <i>et al.</i> (2024), Chakraborty <i>et al.</i> (2025), Wang and Zhang (2025) Arman and Lamiya (2023)	Open-ended questionnaire and percentage/frequency analysis (n = 1) Not specified
Not applicable (n = 12)	Kathiriya <i>et al.</i> (2023), Ooi <i>et al.</i> (2023), Rane (2023), Dimitrieska (2024), Oluwagbenro (2024), Amit <i>et al.</i> (2023), Zhang (2023), Zhao <i>et al.</i> (2024), Roumeliotis <i>et al.</i> (2024), Kshetri (2024), Xu <i>et al.</i> (2024), Alti and Lakehal (2025)	
Source(s): Authors’ own work		

Table 6. Data analysis methods

Data analysis	Methods	References	No of studies
Advanced SEM techniques	PLS- SEM	Hee-Young <i>et al.</i> (2023), Chang <i>et al.</i> (2024), Iranmanesh <i>et al.</i> (2024), Andarsari and Suryadi (2024), Kim and Choi (2024), Sadiq <i>et al.</i> (2024), Vhatkar <i>et al.</i> (2024), Shahzad <i>et al.</i> (2025), Huang <i>et al.</i> (2025), Chakraborty <i>et al.</i> (2025), Yuan <i>et al.</i> (2025), Wang and Zhang (2025), Kamoopuri and Sengar (2025)	13
Statistical techniques	SEM- SWOT	Abumalloh <i>et al.</i> (2024)	1
	SEM- fsQCA	Chakraborty <i>et al.</i> (2024)	1
	SEM-ANN	Foroughi <i>et al.</i> (2025), Shi <i>et al.</i> (2025)	2
	ANOVAs	Steiner <i>et al.</i> (2024), Misra <i>et al.</i> (2024), Stamkou <i>et al.</i> (2025)	3
	Comparative and correlation analysis	Zhao <i>et al.</i> (2024)	1
	Regression analysis	Park and Ahn (2024)	1
	Chi-square tests and logistic regression	Gude (2023)	1
Natural Language Processing	Descriptive statics analysis	Dai <i>et al.</i> (2024), Mora-López <i>et al.</i> (2025), Wasilewski (2025)	3
	Sentiment analysis	Roumeliotis <i>et al.</i> (2024)	1
	Cosine similarity, cluster analysis	Wasilewski (2025)	1
Textual qualitative analysis	Hybrid CNN-SVM Model	Li <i>et al.</i> (2024)	1
	Content analysis	Vedula <i>et al.</i> (2024)	1
	Thematic analysis, gioia method and inductive coding	Desai and Desai (2025), Gupta and Mukherjee (2025), Xie and Desouza (2025)	3
	Narrative/conceptual synthesis	Kumar <i>et al.</i> (2024)	1

Source(s): Authors' own work

This comprehensive methodological mapping provides a solid foundation for interpreting current research and identifying opportunities for future inquiry.

3.1.2 Research methods and data collection tools. As shown in Table 5, the majority of publications (21 of the 52 studies) implemented quantitative research designs. The most common data collection method across quantitative studies was the survey, used in 19 papers. In these studies, researchers gathered data from various stakeholders, particularly customers, to assess perceptions, behaviors and experiences related to GenAI in e-commerce. For example, Shi *et al.* (2025) employed a quantitative approach to identify consumer purchase intention of artificial intelligence creative products by collecting data via a survey. One study by Dhoni (2024) analyzed electronic transactional records, offering deep insights into consumer behavior and purchasing trends that can inform targeted marketing strategies. Similarly, Kathiriya *et al.* (2023) reviewed sales transactions and inventory records to assess operational patterns in demand and supply, enabling businesses to refine their inventory management and sales execution strategies.

Qualitative approaches were employed in 14 studies, often involving interviews, qualitative case studies, industry analyses and product reviews from online platforms. The most frequently used data collection method within this approach was the analysis of product reviews from online platforms, employed in five studies (Li *et al.*, 2024; Roumeliotis *et al.*, 2024; Vedula *et al.*, 2024; Dai *et al.*, 2024; Mora-López *et al.*, 2025). For example, Roumeliotis *et al.* (2024) analyzed user online review content from prominent e-commerce

Table 7. Theories and constructs

Single vs multiple theories	Theories and constructs	References
Multiple theories	Theories: “Task-Technology Fit (TTF) and Social-Technology Fit (STF) frameworks”	(Chakraborty <i>et al.</i> , 2025)
	Predictive factors: - ‘<u>Technological</u>—task characteristics, technology characteristics, TTF, perceived usefulness’ - ‘<u>Social</u>—social-technology fit’ - ‘<u>Human</u>: satisfaction, intention to continue’ - ‘<u>Demographic moderator</u>: gender (male vs female)’	(Huang <i>et al.</i> , 2025)
	Theories: “Theory of Planned Behavior (TPB) with Customer Perceived Value (CPV)”	
	Predictive factors: - ‘<u>Technology</u> – perceived aesthetic value, perceived effort of brand design, perceived variety value’ - ‘<u>Human</u> – perceived price value, attitude, purchase intention’ - ‘<u>Social</u> – subjective norm’	(Shi <i>et al.</i> , 2025)
	Theories: “Stimulus-organism-response theory, the theory of planned behavior, the value adoption model, the innovation diffusion theory, and the unified theory of acceptance and use of technology 2”	
	Predictive factors: - Human – perceived value, perceived price, perceived behavioral control, attitude, purchase intention, hedonic motivations, cultural experience - Social – subjective norms, social influence - Technological – facilitating conditions, generative quality - Moderator – self-innovation	
	Theories: “Elaboration Likelihood Model (ELM) and the Technology Acceptance Model (TAM)”	(Iranmanesh <i>et al.</i> , 2024)
	Predictive factors: - ‘<u>Information quality</u> – information accuracy, information completeness, information relevance, information understandability, information value-added, information diagnosticity. - <u>Technology</u> – perceived usefulness, perceived ease of use, - <u>Human</u> – attitude, intention to use, perceived enjoyment. - <u>Control variables</u> – age, gender’	
	Theories: “Elaboration Likelihood Model (ELM) and Status Quo Bias (SQB) theory”	(Chakraborty <i>et al.</i> , 2024)
	Predictive factors: - ‘Information quality – perceived credibility’ - ‘Human – perceived inertia, perceived threat, perceived regret avoidance, perceived attitude toward using GenAI, perceived trust toward using GenAI’ - ‘<u>Technology</u> – perceived interaction quality’ - ‘Moderator – perceived anthropomorphism	

(continued)

Table 7. Continued

Single vs multiple theories	Theories and constructs	References
Single- Theory	Theories: “Stimulus–Organism–Response (SOR) and Hierarchy of Effects (HOE) model”	(Andarsari <i>et al.</i> , 2024)
	- Predictive factors:	
	- ‘Information quality – user-generated content’	
	- ‘Human – brand attitude, brand trust, purchase intention’	
	Theories: “Service-Dominant Logic and Social Exchange Theory”	(Misra <i>et al.</i> , 2024)
	- Predictive factors:	
	- ‘Technology – algorithmic decision autonomy, power distance’	
	- ‘Human – self-efficacy, purchase decisions’	
	Theories: “Theory of Reasoned Action (TRA) with Innovation Diffusion Theory (IDT)”	(Hee-Young <i>et al.</i> , 2023)
	- Predictive factors:	
Single- Theory	- ‘Technology – usability, innovativeness’	
	- ‘Information quality – credibility’	
	- ‘Social – subjective norm’	
	- ‘Human – attitude, switching intention’	
	Theories: “Dual Factor Theory”	(Shahzad <i>et al.</i> , 2025)
	- Predictive factors:	
	- ‘Technological – anthropomorphism, transparency, efficiency’	
	- ‘Human – trust, distrust, consumer satisfaction, continued intention, emotional detachment, risk perception, privacy concern’	
	- ‘Moderator – IT knowledge’	
	Theories: “Theory of Planned Behavior (TPB)”	(Kamoonpuri & Sengar, 2025)
Single- Theory	- Predictive factors:	
	- ‘Human – playfulness with AI, shopping enjoyment, optimism, discomfort, perceived control, need for touch, and negative attitude toward social influence, attitude towards shopping through AI chatbot, intention of shopping through AI chatbot’	
	Theories: “Resource-Based View (RBV)”	(Wang & Zhang, 2025)
	- Predictive factors:	
	- ‘Technological – GenAI capability’	
	- ‘Organizational – internationalization green innovation performance, supply chain exploratory innovation, supply chain exploitative innovation’	
	- ‘Control variables – enterprise size, enterprise age’	
	- ‘Moderator- AI regulation’	
	Theories: “Unified Theory of Acceptance and Use of Technology (UTAUT)”	(Gupta & Mukherjee, 2025)
	- Predictive factors:	
Single- Theory	- ‘Technological – technology characteristics, facilitating conditions, performance expectancy, effort expectancy,	
	- ‘Human – individual readiness, trust, attitude toward GenAI technology, adoption, and usage of GenAI technology’	
	- ‘Social – social influence’	
	- ‘Information quality – information characteristics’	

(continued)

Table 7. Continued

Single vs multiple theories	Theories and constructs	References
	Theories: “Unified Theory of Acceptance and Use of Technology (UTAUT)” - Predictive factors: - ‘Technology – perceived performance’ - ‘Human – trust in recommendations and products, intention to adopt GenAI, brand awareness’	(Chang <i>et al.</i> , 2024)
	Theories: “Unified Theory of Acceptance and Use of Technology (UTAUT)” - Predictive factors: - ‘Environmental – ChatGPT as a green evangelist, green purchase intention’ - ‘Human – consumer equilibrium’ - ‘Moderator/mediator- Brand credibility’	(Sadiq <i>et al.</i> , 2024)
	Theories: “Self-verification theory” - Predictive factors: - ‘Information quality and governance – traditional brand personality traits (excitement, sincerity, sophistication, professionalism, attractiveness, materialism), AI-generated brand personality traits’ - ‘Human – self-brand connection, purchase intention’	(Park <i>et al.</i> , 2024)

platforms, including Amazon and eBay, to examine customer satisfaction and emotional responses. Text extraction and ChatGPT’s responses were the next most commonly used method, employed in three studies (Chen *et al.*, 2023a; Chuma and De Oliveira, 2023; Wasilewski, 2025). For instance, Wasilewski (2025) proposed a framework to explore the potential of using AI-generated product descriptions to create personalized, differentiated content tailored to specific e-commerce customer segments. Three studies followed semi-structured interviews (Desai and Desai, 2025; Xie and Desouza, 2025; Gupta and Mukherjee, 2025) to gain in-depth insights into user experiences and perceptions. For instance, Gupta and Mukherjee (2025) conducted semi-structured interviews with lead GenAI users to explore psychological drivers influencing their adoption of GenAI platforms for retail information search. Two studies conducted case studies and industry analyses (Kumar *et al.*, 2024; Islam *et al.*, 2024), contributing valuable insights into market trends and best practices within the e-commerce sector. These studies enable businesses to better understand industry dynamics and identify strategic opportunities. One study, Misra *et al.* (2024), used both primary and secondary data to examine market behavior. Primary sources included interviews and observations, while secondary sources involved reports, statistics and literature.

Five studies adopted a mixed-methods approach, integrating both qualitative and quantitative data within a single study to provide a more comprehensive understanding of the research problem. Among these, the most common combination was surveys paired with interviews ($n = 4$). For example, Chakraborty *et al.* (2024) employed an exploratory qualitative phase followed by a quantitative survey to validate factors influencing continued use of GenAI-based shopping platforms.

As shown in Table 6, a diverse set of data analysis methods has been employed to examine the application of GenAI across e-commerce, marketing and retail, broadly grouped into four main categories: advanced structural equation modeling (SEM), statistical analysis, natural language processing (NLP) and textual techniques. Among these, PLS-SEM has been the

dominant method, utilized in thirteen studies (e.g. [Hee-Young et al., 2023](#); [Yuan et al., 2025](#)), indicating its strength in modeling complex relationships and validating constructs related to GenAI adoption and user behavior. In addition to standard SEM applications, studies have integrated SEM with fsQCA ([Chakraborty et al., 2024](#)), SWOT analysis ([Abumalloh et al., 2024](#)) and ANN ([Foroughi et al., 2025](#); [Shi et al., 2025](#)), highlighting hybrid modeling efforts to capture both causal and nonlinear dynamics in GenAI use.

Statistical techniques were also prominent, with ANOVA used in three studies (e.g. [Steiner et al., 2024](#)) to compare group means and other methods such as regression analysis ([Park and Ahn, 2024](#)), chi-square and logistic regression ([Gude, 2023](#)) and descriptive statistics ([Dai et al., 2024](#); [Wasilewski, 2025](#)) applied to support data-driven decisions and trend evaluation. [Zhao et al. \(2024\)](#) employed comparative and correlation analysis to assess market competitiveness.

NLP techniques have supported AI-driven content and user interaction analysis. [Roumeliotis et al. \(2024\)](#) applied sentiment analysis to measure consumer attitudes toward GenAI-generated content, while [Wasilewski \(2025\)](#) utilized cosine similarity and cluster analysis to evaluate content variation across customer segments. [Li et al. \(2024\)](#) further enhanced product categorization using a hybrid CNN-SVM model. Textual methods were applied in several studies using content and thematic analysis. Thematic approaches, particularly those guided by grounded theory and the Gioia methodology ([Desai and Desai, 2025](#); [Gupta and Mukherjee, 2025](#)), enabled researchers to derive inductive insights into user perceptions, motivations and trust in GenAI platforms. [Kumar et al. \(2024\)](#) contributed a conceptual synthesis, integrating literature to highlight key strategic challenges and directions.

3.2 *RQ2: What are the theoretical models or frameworks and their prominent predictive factors influencing GenAI applications in e-commerce?*

3.2.1 *Theoretical models or frameworks.* According to [Creswell \(2014\)](#), theories serve different roles across different research approaches. In quantitative research, they offer a proposed explanation for the relationships between variables, guiding hypothesis formulation and statistical testing. In qualitative research, theories often function as interpretive lenses that shape the inquiry or may emerge inductively from the data itself. In mixed-methods studies, theories are employed in adaptable ways, either as frameworks guiding the integration of quantitative and qualitative components or as tools for interpreting findings through both empirical and conceptual perspectives. As shown in [Table 7](#), 15 of the 52 studies employed theoretical models or frameworks to investigate the application of Gen AI in e-commerce. Eight studies have integrated two or more theories/frameworks to provide a more comprehensive understanding of the phenomenon under investigation. These studies have incorporated a range of constructs affecting e-commerce customers' intentions in different ways. For example, [Chakraborty et al. \(2025\)](#) explored the significance of "Task-Technology Fit (TTF)" ([Goodhue and Thompson, 1995](#)), in addressing functional and "Social-Technology Fit (STF)" ([Dwyer, 2007](#)), to cover social aspects of the user experience, which in turn reinforces overall user satisfaction and the likelihood of repeat usage in GenAI based shopping platforms. [Iranmanesh et al. \(2024\)](#) combined the "Elaboration Likelihood Model (ELM)" ([Petty and Cacioppo, 1986](#)) with the "Technology Acceptance Model (TAM)" ([Davis, 1989](#)) to investigate how ChatGPT performs in providing shopping-related information within e-commerce contexts. ELM explains how individuals process and respond to persuasive messages, with a focus on informational cues that play a critical role in shaping technology acceptance, as reflected through TAM factors. "Service-Dominant Logic" and "Social Exchange Theory" [Croppanzano and Mitchell \(2005\)](#), [Vargo and Lusch \(2017\)](#) were used by [Misra et al. \(2024\)](#) to demonstrate the importance of consumer engagement and algorithmic decision autonomy in enhancing personalization and satisfaction in e-commerce.

Seven studies were founded on a single theory, with three of them based on the "Unified Theory of Acceptance and Use of Technology (UTAUT)" proposed by [Venkatesh et al. \(2003\)](#)

(Gupta and Mukherjee, 2025; Chang *et al.*, 2024; Sadiq *et al.*, 2024). Chang *et al.* (2024) offered insights into how perceived performance and trust in recommendations affect the intention to adopt new technologies, highlighting the significance of credible information in building consumer confidence in the GenAI era. Sadiq *et al.* (2024) highlighted the environmental aspects of ChatGPT-powered chatbots as green evangelists, presenting an innovative path toward sustainable consumerism in e-commerce. “Dual Factor Theory” (Cenfetelli, 2004) used a study of Shahzad *et al.* (2025) to examine the role of trust in GenAI chatbot adoption. “Self-Verification Theory” (Swann, 2012) was employed by Park and Ahn (2024) to understand the traditional brand personality traits in e-commerce.

3.2.2 Predictive factors. Following Hendricks and Mwapwele (2024), several factors influencing the application of GenAI in e-commerce were classified under the technological, environmental and organizational dimensions. However, due to the distinctive characteristics of GenAI, the remaining factors are grouped into three additional categories: human, information quality and governance and social factors (Figure 3).

3.2.2.1 Technological factors. Technological factors refer to the inherent capabilities and functional attributes of GenAI systems that influence their adoption and use in e-commerce contexts. A prominent construct is usability, which includes ease of use and seamless interactions. Several studies highlight that when users find GenAI tools user-friendly and efficient, they are more likely to adopt them (Iranmanesh *et al.*, 2024; Chakraborty *et al.*, 2024; Gupta and Mukherjee, 2025). Generative capability is another critical factor, capturing the system’s ability to autonomously produce high-quality, personalized and contextually relevant outputs. This is especially valuable in tasks such as generating marketing content or answering customer queries (Shi *et al.*, 2025; Chakraborty *et al.*, 2025). Closely related is interaction quality, which refers to the perceived naturalness, coherence and responsiveness of GenAI in conversational exchanges (Shi *et al.*, 2025; Chakraborty *et al.*, 2025). In addition, perceived innovativeness reflects the degree to which users view GenAI as novel and forward-thinking. A higher perception of innovativeness often correlates with stronger intention to adopt and explore the technology (Hee-Young *et al.*, 2023; Iranmanesh *et al.*, 2024). Another important factor is algorithmic decision autonomy, which refers to the system’s capacity to make independent recommendations or decisions without human intervention. This construct is especially pertinent to personalized shopping experiences and automated content curation (Misra *et al.*, 2024).

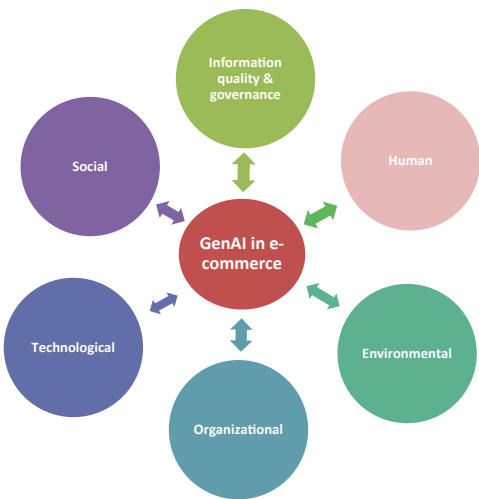


Figure 3. Conceptual map of key constructs influencing GenAI in e-commerce. Source: Authors’ own work

3.2.2.2 Organizational factors. Organizational factors refer to the internal structures, innovation capacity and performance goals of firms that influence GenAI adoption in e-commerce. The key factors emerging in the literature are the contribution of GenAI to green innovation performance and internationalization performance. For instance, [Wang and Zhang \(2025\)](#) demonstrated that GenAI capabilities support environmentally sustainable innovation and global market expansion when supported by a proactive strategic posture. Additionally, the study emphasized the importance of “supply chain exploratory innovation”, the pursuit of new knowledge and practices and “supply chain exploitative innovation the optimization of existing capabilities”. Both forms of innovation were identified as critical for integrating GenAI into supply chain operations and achieving broader strategic goals.

3.2.2.3 Environmental factors. Environmental factors refer to the sustainability-related cues and ecological positioning of GenAI tools that influence consumer behavior in e-commerce contexts. Specifically, [Sadiq et al. \(2024\)](#) explored the framing of ChatGPT as a green evangelist, where the chatbot was presented as embodying pro-environmental values. This positioning significantly enhanced consumers’ intention to make environmentally friendly purchases, suggesting that GenAI applications perceived as ecologically responsible can promote sustainable consumption. In this way, GenAI tools in e-commerce are not only facilitating transactions or customer support but are also enhancing environmental attitudes by signaling ecological responsibility.

3.2.2.4 Social factors. Social factors refer to the influence of interpersonal expectations and societal norms on the adoption and use of GenAI in e-commerce. A dominant factor across studies is subjective norm, which captures users’ perceptions of whether important others think they should use GenAI. This was consistently highlighted as a key determinant of intention in multiple studies ([Huang et al., 2025](#); [Hee-Young et al., 2023](#); [Shi et al., 2025](#)). In addition, social influence, which extends this idea to broader peer and societal pressures, was also shown to outline consumer acceptance and behavioral intentions ([Shi et al., 2025](#); [Gupta and Mukherjee, 2025](#)). Beyond these traditional constructs, social-technology fit ([Chakraborty et al., 2025](#)) offers a novel view, highlighting that users also consider how GenAI aligns with their social identity and group norms.

3.2.2.5 Human factors. Human factors were the most frequently cited across GenAI e-commerce studies, highlighting the centrality of individual-level psychological and emotional responses in adoption and usage behaviors. Trust, attitude, satisfaction, purchase intention, risk perception, privacy concern and continued usage intention were the most commonly used constructs, particularly in examining decision confidence, loyalty and platform engagement ([Shahzad et al., 2025](#); [Kamoonpuri and Sengar, 2025](#); [Gupta and Mukherjee, 2025](#)). Perceived value across hedonic, price and aesthetic dimensions, along with behavioral control, was also consistently employed to predict shopping intention and user evaluations ([Shi et al., 2025](#); [Huang et al., 2025](#)). Several studies introduced emotional side constructs such as emotional detachment, consumer equilibrium and perceived regret, which captured deeper psychological mechanisms driving avoidance or detachment ([Sadiq et al., 2024](#); [Chakraborty et al., 2024](#)). Identity-driven responses, including self-brand connection and brand attitude, contributed to personalized engagement and brand alignment ([Park and Ahn, 2024](#); [Andarsari and Suryadi, 2024](#)). Moderators such as gender, IT knowledge and self-efficacy further enhanced individual differences in evaluation and usage outcomes ([Misra et al., 2024](#); [Hee-Young et al., 2023](#)).

3.2.2.6 Information quality and governance. Information quality refers to the perceived usefulness, credibility and clarity of content generated or delivered by GenAI tools in digital commerce environments. In the e-commerce context, it significantly influences consumer’s evaluation, trust and acting upon GenAI-driven recommendations and interactions. The most frequently cited constructs across studies include information accuracy, completeness, relevance, understandability, diagnosticity and value-added content ([Iranmanesh et al., 2024](#)), all of which are foundational to effective consumer decision-making. Perceived credibility emerged as a key determinant in reducing resistance and perceived risk during online

shopping, especially under uncertainty (Chakraborty *et al.*, 2024; Hee-Young *et al.*, 2023). Broader informational aspects, including user-generated content (Andarsari and Suryadi, 2024) and information characteristics (Gupta and Mukherjee, 2025), further enhance positive evaluations of GenAI interactions. Moreover, information governance elements like brand-related personality traits (e.g. sincerity, sophistication or professionalism), whether traditional or AI-generated acted as trust-enhancing cues (Park and Ahn, 2024). These features not only improved informational quality but also reinforced self-brand connection, influencing consumer purchase intentions and brand loyalty.

3.3 RQ3 What are the current research challenges and future directions for GenAI in e-commerce?

Despite rapid growth in research on GenAI in e-commerce, several challenges persist, reflecting gaps in context, methodology, theoretical coverage and construct representation. First, the geographical distribution of studies is heavily skewed toward China, India and the USA, with limited representation from other regions, particularly low- and middle-income countries. This concentration restricts understanding of GenAI's adoption and impact in diverse economic, cultural and regulatory contexts. Future research can expand cross-country investigations, including multi-country comparative studies, to reveal context-specific enablers, barriers and consumer perceptions, which could guide more inclusive and equitable GenAI deployment strategies.

While studies on consumer-facing GenAI highlight benefits for purchase intention, engagement and trust, research on backend applications, operational optimization, supply chain integration and strategic decision-making remains relatively limited (Table 4). Future studies could examine GenAI-driven optimization strategies, organizational adoption and efficiency gains in real-world e-commerce operations, incorporating organizational performance metrics, process automation impacts and environmental sustainability outcomes. The methodological landscape shows a dominance of quantitative surveys ($n = 19$), while qualitative approaches such as interviews, case studies and textual analysis, as well as mixed-method designs, are less frequent (Tables 5 and 6). While surveys offer generalizable insights, they may overlook nuanced user experiences, algorithmic transparency issues and operational challenges in applying GenAI. Future studies should adopt more diverse methodologies, including longitudinal, experimental and field-based research, to capture dynamic adoption patterns, the influence of real-time interactions and organizational implementation practices.

Theoretical and construct coverage in GenAI research in e-commerce is uneven. Multi-theory frameworks, such as TTF-STF, SOR-HOE, TPB-CPV and TRA-IDT, dominate, providing rich explanations of human, technological and social factors. However, organizational, environmental and information quality or governance dimensions are underexplored and moderators such as gender, IT knowledge and innovation capacity are applied inconsistently. Single-theory studies, including UTAUT, TPB, RBV, Dual Factor Theory and Self-Verification Theory, offer focused insights into specific technological, human, social or environmental predictors but often neglect interactions across domains and underutilize moderators. Future research can systematically integrate these underrepresented dimensions, test multi-theory and hybrid frameworks across diverse cultural, industrial and regional contexts and introduce moderators related to sustainability, regulatory compliance, digital literacy, AI ethics and brand credibility. Expanding construct coverage and applying robust methodological designs will strengthen explanatory power and enhance practical relevance for the adoption, usage and impact of GenAI in e-commerce.

Addressing these challenges by broadening geographical coverage, diversifying methods, expanding theoretical and construct representation and examining both consumer and organizational applications will enhance understanding of GenAI in e-commerce. This will support more robust, practical and contextually relevant recommendations for adoption, policy and sustainable implementation.

3.4 Macro-level vs micro-level insights on GenAI in e-commerce

This subsection synthesizes findings from RQ1 to RQ3 by distinguishing between macro-level and micro-level perspectives on GenAI in e-commerce. Macro-level insights provide a high-level, strategic overview of organization, such as economic, political or social shifts, to guide long-term decision-making and predict upcoming conditions (Van Wijk *et al.*, 2019). These insights focus on large-scale structures (e.g. global trade, industry-wide and national policies) rather than individual experiences. At the macro level, GenAI is primarily examined as a strategic and operational enabler within e-commerce platforms and organizations. Findings from RQ1 indicate that a substantial stream of research focuses on GenAI-driven optimization strategies, business decision-making, implementation strategies and advertizing reflecting system and firm-level value creation. These studies show that firms adopting robust GenAI governance, integration strategies and optimization frameworks achieve structural advantages in efficiency, content scalability and market responsiveness.

In contrast, micro-level insights focus on individual customer experiences and behavioral mechanisms, demonstrating that GenAI enhances purchase intention, perceived usefulness, trust and overall shopping satisfaction through personalized recommendations, conversational assistance, high-quality AI-generated content and improved information retrieval. These micro behaviors can provide fine-grained understandings about users (Zhou *et al.*, 2018). Collectively, these studies emphasize that individual factors such as trust, attitude, perceived value, privacy concern and continued usage intention emerge as the most frequently examined predictors of GenAI adoption. Social factors (e.g. subjective norm, social influence) and information quality and governance factors (e.g. credibility, accuracy, brand-related personality cues) further shape individual evaluations and interaction outcomes.

An integrated view shows that macro- and micro-level forces in GenAI-enabled e-commerce are tightly interconnected. At the macro level, industry-wide adoption of GenAI raises expectations for personalization and seamless digital experiences, while organizational choices in governance and model management directly shape the micro-level quality of customer interactions. Poor oversight can result in inconsistencies that undermine trust. In turn, micro-level customer behaviors aggregate to influence revenue performance, competitiveness and strategic positioning. These behavioral insights also inform optimization decisions in pricing, inventory and product planning. Overall, macro-level strategy shapes individual experiences, while micro-level customer responses feed back into organizational and market-level evolution, forming a continuous feedback loop within the e-commerce ecosystem.

The findings from RQ2 show that the theoretical landscape across the reviewed studies reveals clear distinctions between micro-level and macro-level theoretical usage in GenAI-enabled e-commerce research. Most studies employ micro-level, psychology- and behavior-oriented theories, such as TPB, TAM, TRA, UTAUT, ELM, SOR, HOE, SQB, self-verification theory and dual-factor theory, to explain how individuals perceive, evaluate and engage with GenAI technologies. These frameworks focus on constructs such as attitudes, trust, risk perception, perceived value, behavioral intentions, satisfaction and usage decisions, reflecting a strong emphasis on individual-level mechanisms shaping customer experience and purchase behavior. In contrast, only a small subset applies macro-level or organizational-level theories, such as RBV, which explores how organizational factors affect GenAI integration.

Despite the richness of micro-level insights, several important limitations can be highlighted for RQ3. The strong dominance of micro-level theories shows that literature remains heavily oriented toward understanding consumer psychology and interaction dynamics, while macro-level theoretical perspectives, essential for explaining organizational transformation and strategic alignment, remain under-utilized. This imbalance signals a clear theoretical gap and reinforces the need for future research that integrates both levels to better capture how organizational GenAI strategies are shaped by and reciprocally influence, individual customer behaviors. Methodologically, most studies rely on cross-sectional survey designs and focus predominantly on customers, with far less attention

devoted to managers' and employees' perspectives or to firm- and ecosystem-wide issues such as business model transformation, operational optimization, governance and regulation, privacy and data stewardship, market structure, competitive dynamics and implementation strategies in organizational settings. This narrow concentration limits understanding of how micro-level behaviors and interactions translate into sustained organizational- or ecosystem-level value. To advance the field, future research should incorporate macro-level methodological approaches that move beyond individual-level perceptions. These may include comparative organizational case studies, multi-stakeholder analyses, longitudinal organizational change studies, examinations of AI integration across supply chains and ecosystem-level investigations into how GenAI reshapes competitive dynamics, industry structures and inter-organizational relationships. Such multi-level and mixed method approaches would provide a more comprehensive understanding of how GenAI adoption unfolds within and across organizations and how micro-level user responses interact with broader strategic, structural and institutional forces.

4. Discussions

4.1 Discussion of RQs

This study reviews GenAI in e-commerce, mapping research trends, contexts, methods, key theories, predictors, limitations and current challenges. Inclusion and exclusion criteria were applied to extract relevant studies from WoS, Scopus and Google Scholar databases, resulting in the selection of 52 publications published between November 2022 and mid-July 2025.

4.1.1 Trends in GenAI research in e-commerce (RQ1). According to the findings, research trend on GenAI in e-commerce has accelerated sharply from 2023 onward, with the steepest rise occurring in 2024 and continuing into 2025. This growth reflects the rapid diffusion of GenAI models following their public release and the increasing urgency among scholars to understand their implications. The geographic distribution of studies demonstrates clear regional leadership, with China emerging as the dominant contributor, supported by substantial activity in India and the USA, along with expanding research interest in Malaysia, Indonesia, Taiwan and Korea. This global spread suggests that GenAI is being investigated in technologically advanced economies and in emerging markets where e-commerce expansion is rapid (Chang *et al.*, 2024; Andarsari and Suryadi, 2024).

In terms of research context, this study identified three dominant themes: customer purchase intention and experience, GenAI-driven optimization strategies and business decision-making. These findings indicate that GenAI in e-commerce is reshaping both consumer-facing and organizational processes by enhancing trust, engagement, purchase intention and perceived value through AI-generated content, personalized recommendations and conversational agents (Park and Ahn, 2024; Steiner *et al.*, 2024; Shahzad *et al.*, 2025). Beyond these benefits, it supports operational efficiency, inventory and demand prediction and data-driven decision-making, although these backend applications remain less explored (Huang, 2023; Zhao *et al.*, 2024). GenAI also strengthens managerial intelligence, strategic analysis and planning, enabling more informed market and operational decisions (Hee-Young *et al.*, 2023; Chuma and De Oliveira, 2023), while improving search relevance, content discovery and knowledge extraction for both consumers and firms (Gude, 2023; Gupta and Mukherjee, 2025). In advertising, AI-driven automation and personalized targeting enhance engagement and conversion, yet raise concerns about algorithmic bias, trust and content authenticity (Dimitrieska, 2024; Desai and Desai, 2025). Implementation research emphasizes adoption processes, strategic planning and organizational readiness as critical for realizing GenAI's transformative potential across e-commerce (Rane, 2023; Yuan *et al.*, 2025).

Methodologically, the field relies heavily on quantitative survey-based designs, particularly those analyzed using PLS-SEM, indicating a strong preference for theory-driven, model-testing approaches. Studies applying structural modeling reveal relationships among perceived usefulness, trust, personalization and behavioral responses toward GenAI-

enabled services (Hee-Young *et al.*, 2023; Sadiq *et al.*, 2024). At the same time, qualitative and data-centric methods continue to expand. Research using product reviews, interview data and text extraction provides deeper insight into user sentiment and practical deployment challenges (Roumeliotis *et al.*, 2024; Xie and Desouza, 2025). The adoption of natural language processing techniques, including sentiment analysis and hybrid machine learning models, reflects the integration of computational approaches in examining GenAI-generated or user-generated content (Li *et al.*, 2024).

4.1.2 Theoretical models and predictive factors (RQ2). According to the findings, studies on GenAI in e-commerce employ both single- and multi-theory frameworks to explain adoption, usage and impact, reflecting the interplay between technology, human behavior, social influence and information quality. Multi-theory approaches are prominent, integrating complementary perspectives to capture complex adoption dynamics. The most commonly applied theories include UTAUT, TPB, SOR, ELM and TAM, which often appear in combinations such as TTF–STF (Chakraborty *et al.*, 2025), TPB–CPV (Huang *et al.*, 2025) and broader integrations like SOR–TPB–VAM–IDT–UTAUT2 (Shi *et al.*, 2025). Across these models, the most used predictors included perceived usefulness, information quality, trust, social influence, generative quality and perceived value, showing that users judge GenAI systems based on clarity, performance and social or experiential cues. Single-theory studies using Dual Factor Theory, TPB, RBV or UTAUT provide targeted insights but cannot fully capture cross-level interactions in GenAI-assisted commerce (Kamoonpuri and Sengar, 2025; Wang and Zhang, 2025; Gupta and Mukherjee, 2025). A persistent gap is the limited use of moderators and mediators, with only a few studies examining gender, IT knowledge, self-innovation, brand credibility or AI regulation, leaving contextual variability underexplored. This highlights the need for future work to test moderating conditions that shape GenAI adoption across diverse e-commerce environments.

4.1.3 Research challenges and future directions (RQ3). Despite rapid advances in GenAI research in e-commerce, several challenges remain that constrain understanding and practical implementation. Methodologically, studies are dominated by quantitative surveys, leaving nuanced user experiences, transparency and operational complexities underexplored (Andarsari and Suryadi, 2024; Misra *et al.*, 2024). While multi-theory frameworks capture human, technological and social dimensions effectively, they often under-represent organizational, environmental and information governance factors, and the use of moderators is inconsistent (Hee-Young *et al.*, 2023; Shi *et al.*, 2025). Single-theory studies provide focused insights but fail to fully address cross-level interactions and contextual variability (Gupta and Mukherjee, 2025; Kamoonpuri and Sengar, 2025; Wang and Zhang, 2025). Future research can prioritize broader methodological diversity, including qualitative, longitudinal, experimental and field-based designs, to capture richer behavioral and operational insights. Expanding theoretical coverage to systematically include organizational, environmental and information quality dimensions can improve explanatory power. Moreover, integrating moderators related to AI ethics, digital literacy, sustainability and brand credibility will help account for contextual differences across platforms and user populations. Addressing these gaps will strengthen both the practical relevance and theoretical robustness of GenAI applications in e-commerce, supporting more reliable, transparent and ethically responsible deployment. The summary of findings is presented in Figure 4.

4.2 Benefits and challenges of GenAI in e-commerce and social commerce

Based on the studies reviewed, a range of benefits and challenges associated with the use of GenAI in e-commerce and social commerce has been identified. The following points summarize the key opportunities these technologies offer, as well as the critical concerns and limitations highlighted across the literature.

Benefits:

- (1) Enhanced customer engagement, trust and purchase intention driven by GenAI content and personalized recommendations (Park and Ahn, 2024; Shahzad *et al.*, 2025).

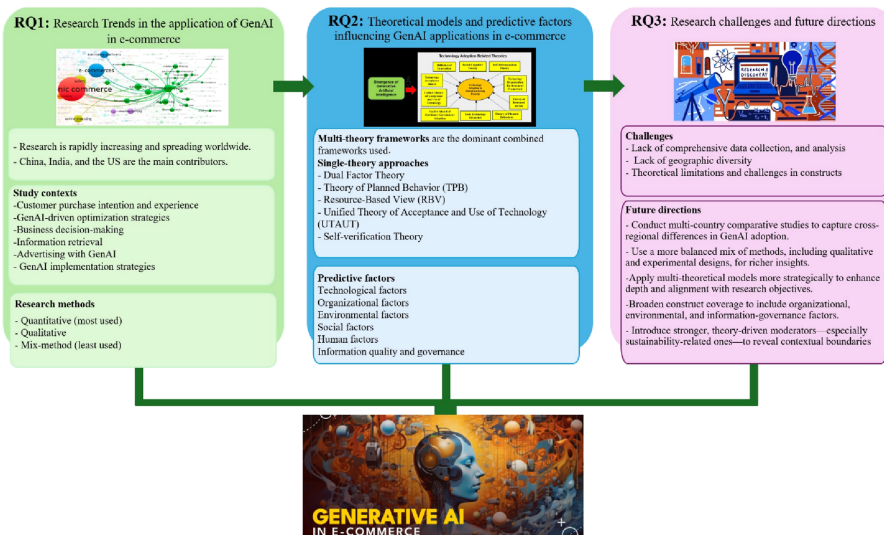


Figure 4. Summary of findings. Source: Authors' own work

- (2) Improved operational efficiency through automated inventory prediction, demand forecasting and targeting (Ooi *et al.*, 2023; Zhao *et al.*, 2024).
- (3) More accurate decision-making using GenAI-enabled analytical tools and strategic intelligence (Hee-Young *et al.*, 2023; Chuma and De Oliveira, 2023).
- (4) Better content discovery and information retrieval through GenAI-driven search relevance and knowledge extraction (Gude, 2023; Iranmanesh *et al.*, 2024).
- (5) More effective advertising and campaign personalization (Dimitrieska, 2024; Desai and Desai, 2025).

Challenges:

- (1) Limited transparency, credibility and explainability of GenAI content (Iranmanesh *et al.*, 2024; Shi *et al.*, 2025).
- (2) Algorithmic bias concerns influencing trust and user acceptance (Chakraborty *et al.*, 2024).
- (3) Ethical issues relating to privacy, data use and manipulation risks (Misra *et al.*, 2024).
- (4) Limited exploration of backend systems, including supply chain integration and operational deployment barriers (Veluru, 2024; Chakraborty *et al.*, 2025).
- (5) Uneven adoption across regions due to technological readiness and cultural differences (Chang *et al.*, 2024; Andarsari and Suryadi, 2024).

4.3 Recommendation for practices

The implications of GenAI research for e-commerce are significant for researchers, industry practitioners and policymakers. The rapid growth of GenAI research in e-commerce demonstrates the sector's fast-paced transformation and the practical opportunities it offers. Managers can use insights from developing countries such as China and the USA to enhance

customer engagement, provide personalized services, optimize operations and make more informed decisions based on data in other nations. They can also apply insights to improve branding and marketing strategies by delivering targeted campaigns and tailored customer experiences. Developers can use research findings to design GenAI applications that align with customer needs and market demands, ensuring usability, trust and relevance. For example, developers can design systems that prioritize usability in line with customer and market needs while refining algorithms based on practical feedback. These improvements can be further supported by research that examines organizations with advanced GenAI adoption, translating lessons into strategies adapted to local technological, cultural and infrastructural contexts. By combining managerial experience with such evidence, businesses can ensure that their GenAI initiatives align with both organizational goals and market realities. Additionally, upskilling employees, providing training on AI tools and establishing clear policies for ethical and responsible use can enhance adoption and effectiveness. Managers can draw actionable insights from the theoretical frameworks commonly applied in GenAI and e-commerce research. By understanding these theoretical foundations, managers can design GenAI strategies that align with user expectations, reduce adoption barriers and enhance customer satisfaction. Considering the research methods used, particularly the widespread reliance on quantitative surveys and PLS-SEM analyses also allows managers to assess the reliability, generalizability and predictive value of findings before applying them to business decisions. Developers can use these insights to inform system design, ensuring that GenAI applications incorporate factors proven to influence adoption, such as ease of use, perceived usefulness, cultural fit and compatibility with existing workflows. Policymakers can also benefit from understanding these frameworks and research methods. By recognizing drivers of user adoption and engagement, they can craft regulations and guidelines that promote fairness and transparency in the use of GenAI in e-commerce. Such informed policies can ensure that AI systems are deployed responsibly while supporting innovation and protecting consumer interests.

4.4 Technology-mediated customer communication (TMCC)

Technology-mediated customer communication (TMCC) appears consistently across recent GenAI studies. Research shows that AI-driven chatbots, recommendation tools and generated content shape customer evaluations by providing more relevant, adaptive and timely information (Park and Ahn, 2024; Steiner *et al.*, 2024; Shahzad *et al.*, 2025). These tools also strengthen trust and reduce uncertainty during product assessment. Other studies highlight improvements in the communication infrastructure, noting better targeting, higher message relevance and faster content production that support large-scale customer interactions (Dimitrieska, 2024; Desai and Desai, 2025). These study findings position TMCC as an important link between front-end engagement and back-end operational communication. However, gaps remain in areas such as transparency, bias control and organizational practices for governing AI-mediated messages, which receive limited attention in current work (Huang, 2023; Ooi *et al.*, 2023). These gaps indicate the need for deeper examination of communication safeguards, cultural differences and ethical boundaries in future GenAI research.

5. Research limitations and future directions

This study has some limitations that need to be documented. First, as the review included only studies published in English, research written in other languages was excluded from the analysis. Future studies may benefit from incorporating non-English publications to provide a more comprehensive international perspective, as relevant work in other languages may have been overlooked. Another problem is that due to limited time and resources, this study could only search in databases, namely, WoS, Scopus and Google Scholar. By expanding the search to include more databases, future studies can obtain a broader view of the literature. In

addition, the origins of most of the studies were from industrialized countries and developing countries were poorly represented. This is an important fact because the benefits and difficulties of using GenAI in e-commerce will vary depending on the location, considering regions with different structures, consumer habits, characteristics and economies. Perhaps for future research, it would be valuable to discuss the application of GenAI in different contexts worldwide, especially within developing countries. It focuses on peer-reviewed studies published in journals that provide useful information with practical examples. Reports, workshops and case studies that could talk about a comparative analysis of the impacts of GenAI in e-commerce may be part of further research. Finally, this study focuses on synthesizing current applications of GenAI in e-commerce and identifying the key gaps that limit its strategic and operational potential. While the review primarily examines GenAI as a content-creation and automation tool, future studies could extend this work by exploring the growing emergence of agentic AI, where systems demonstrate autonomous decision-making, multi-step reasoning and independent task execution. Future research could investigate these agentic capabilities along with consumer trust, personalization, service delivery and governance within e-commerce platforms.

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