International Journal of Contemporary Research In Multidisciplinary

Research Article

Impact of AI Powered Chatbots on Customer Relationship Management in E-commerce

Suhani Agarwal[1], Arya Singh[2], Arijit Mishra[3*], Mayank Chauhan[4]

[1]Assistant Professor, Vidya University, 247 Baghpat Road, NCR, Meerut, Uttar Pradesh, India
[2]Assistant Professor, Symbiosis Institute of Design, Pune, Maharashtra, India
[3]Assistant Controller of Examinations, Motherhood University, Roorkee, Uttarakhand, India
[4]FMS, Gurukula Kangri (Deemed to be University), Haridwar, Uttarakhand, India

Corresponding Author: Arijit Mishra*

Abstract

This paper examines how AI-driven chatbots have influenced Customer Relationship Management (CRM) in the e-commerce field. Amid the high demand of instant and personalized digital interaction, AI-powered chatbots are transforming customer-business communication ways and retention. The article explores the effect of major chatbot factors including the quality of interaction, personalization, perceived usefulness, anthropomorphism, and service quality on customer satisfaction, trust, engagement, and brand loyalty. These technologies are efficient in their operations and assist real-time support, yet their effectiveness is highly associated with the acceptance of user perception of authenticity, usefulness, and risk. This research applies a conceptual framework, in which the main question is how chatbot attributes and customer experience are connected to CRM outcomes, and the moderating factors are variations in ethical issues, privacy of the data, and perceived risk. The results indicate the role chatbots play on customer experiences both positively and negatively; in addition to improving the decision-making process and relieving stress, there may also emerge customer confusion and abandonment due to bad design. The study notes the existing gaps in the literature, including omission of the long-term impact, cultural crossings and incorporation in smaller e-commerce entrepreneurial ventures. Overall, the research concludes that there should be ethical design, transparency, and moderate automation to use AI chatbots as actionable in the CRM framework.

KEYWORDS: AI Chatbots, Customer Relationship Management, E-Commerce, Customer Engagement, Personalization, Ethical Concerns, Brand Loyalty, Customer Experience, Data Privacy.

1. INTRODUCTION

Chatbots powered by artificial intelligence (AI) are now reshaping the realm of customer relationship management (CRM) in e-commerce by bringing efficiency to operations, customer communication, and customer experience. Such smart systems reduce manual work and give a scale of 24/7 support, resulting in the reduction of response time, customer satisfaction, and an optimization of marketing returns on investments (Dutta *et al*., 2025) [5]. Interactive abilities, personalized communication, and efficient problem-solving are the main chatbot characteristics that can define a positive perception of customers and strengthen their emotional connection with brands (Xia & Shannon, 2025) [22]. Moreover, such factors as perceived pleasure and personalization also play a role in maintaining brand loyalty and retention. Nonetheless, user acceptance is critical to successful implementation of chatbots into CRM and is based on perceived authenticity, usefulness, and dangers (Marjerison *et al*., 2025) [12]. Interestingly, Perceived usefulness has been found out to be one of the most important mediators between the behavior intentions and other determinants. The fact that chatbots are designed in the form of people and are able to provide the end customer with a high quality of service also contribute to the improvement of the online flow experience of buyers and their feelings of emotional connection to a specific brand, thus building a stronger loyalty in the end (Alalwan *et al*., 2025) [1].

Although there are many benefits, the application of AI chatbots in e-commerce CRM has several issues, such as the ethics of chatbots, data security problems, or difficulty in preserving the human touch (Dutta *et al*., 2025) [5]. Although chatbots receive admiration because of their potential to generate greater task completion, trust, interaction, and perceived humanness that altogether result in increasing the intentions of the user to use chatbots (Ding & Najaf, 2024) [4], not all the effects that chatbots have on a customer are positive. Ranieri *et al*. (2024) [18] believe that chatbot communication may positively and negatively affect the customer experience. On the one hand, they are capable of supplying pleasing and effective experiences that decrease shopping related-stress and facilitate the information-gathering activities. Conversely, inefficiently built chatbots could lead to misunderstanding, task mis completion, and customer dissatisfaction, often culminating into customer shopping abortions. Hence, though chatbots developed using AI generate huge potential to reinvent CRM in e-commerce, AI in chatbots needs to be implemented with a strategic mind with the balance between technology and human values to increase the positive experience in customer care.

E-commerce Customer relationship management is going through transformation with the use of AI-powered Chatbots which provide a more personalized, scalable and super speedy customer response. Their capability of automating monotonous processes, capturing customers in a more interactive way and developing emotional connection to a brand made them strong tools in the digital market. Nonetheless, they can only be effective when well designed and implemented with consideration of user perceptions of authenticity, usefulness and

risk. On the one hand, these tools are efficient in ensuring great customer experience; they also come with their challenges, which include privacy difficulties, ethical issues, and relating to interference of a human like conversation. Thus, companies have to balance between the use of the technological superiority of chatbots and the maintenance of the usage of the elements that promote trust and loyalty. Further deployment and improvement will likely turn AI-driven chatbots into a valuable part of CRM practice in the e-commerce industry as it will allow brands to achieve a high level and maintain it as the digital environment grows competitive.

2. RESEARCH OBJECTIVES

1. To investigate how AI-powered chatbots can impact important aspects of customer relationship management (CRM) in e-commerce, namely customer satisfaction, engagement and customer loyalty.
2. To examine how the chatbot characteristics--interactivity, personalization, and problem-solving--influence the attitude of people towards them and help improve the CRM performance.
3. To examination the issues impacting user understanding and acceptance of AI chatbots such as a perceived authenticity, usefulness, and perceived risk in acceptance and adoption of the chatbots.
4. To determine the positive and negative effects of chatbot engagement into the customer experience including the quality of interaction, tasks completed and the feeling of attachment to the brand.
5. To recognize issues and constraints related with chatbot uses in CRM, like, ethical aspects, proprietary data, and request to communicate similar to man.

3. RESEARCH QUESTIONS

RQ1: What is the role of chatbots based on AI in the effectiveness of the customer relationship management in online shops?

RQ2: Which of the chatbot features is most relevant in improving the customer satisfaction, trust, and brand loyalty?

RQ3: What are some of the factors that influence the user acceptance and behavior intention to adopt AI chatbots in e-commerce?

RQ4: How do chatbot dialogues affect customer experience (e.g. reduce stress, engagement better, cause confusion, failure in tasks)?

RQ5: What are the essential issues and ethical concerns about implementing AI chatbots to CRM in e-commerce systems?

4. LITERATURE REVIEW

Chatbots powered by AI have turned out to be groundbreaking mechanisms in the field of customer relationship management on the e-commerce scene. Due to the change in digital customer

expectations, the use of chatbots in businesses has augmented continuously as a means of providing efficient, customized, and 24-hour customer service. Such smart systems act as the gateway to numerous online customers and ease the processes of interactions and worthwhile service experiences. Chatbots help to achieve the stated improvement through automation of monotonous tasks and the possibility of real-time communication, thus, letting achieve stronger relations with customers. The present section addresses the literature that has already been published concerning how chatbots will affect the different aspects of CRM in e-commerce in terms of operation efficiency, customer engagement, the user experience, and behavioral acceptance.

4.1 AI-Powered Chatbots in E-Commerce

The use of AI-driven chatbots has turned the e-commerce industry into an area of significant automation of customer service and enrichment of interaction and minimisation of operational expenses. Such smart devices enormously boost the response and consumer happiness levels and marketing ROI (Dutta *et al.*, 2025) [5]. The fact that they have been incorporated to user-friendly sites such as Facebook and Instagram attests to their expandability and efficacy in instant contact. Perceived authenticity, usefulness, and risk contribute a great deal to the user acceptance of the following systems, and usefulness mediates between both of the indicators of behavior intentions (Marjerison *et al.*, 2025) [12]. Indicatively, the EcoptiAI framework is an excellent example of how agentic AI can achieve up to 52.7% of reduction in procedural costs in optimization process compared to conventional AI without compromising high operational tooling and standards (Alecsoiu *et al.*, 2025) [2]. In terms of demographics, performance expectancy, effort expectancy, and facilitating conditions encourage the application of e-commerce technology with the help of AI technologies on the Chinese Generation Z consumer base positively, and social influence does it negatively (Pu *et al.*, 2025) [17]. All these insights contribute to the increased role of AI-chatbots in e-commerce and the fact that user-centered approaches should be developed to increase trust, usability, and long-term engagement.

4.2 Chatbots as CRM Tools: Enhancing Operational Efficiency

Artificial intelligence based chatbots are quickly changing customer relationship management (CRM) because it has greatly enhanced operational efficiency and customer service provision in many industries (Khneyzer *et al.*, 2024; Sofiyah *et al.*, 2024) [9, 19]. Such smart systems simplify the customer care operations by automating basic group communications, minimizing responsiveness and efficiently supporting the common customer questions leaving the human representatives to solely focus on the tricky customer requirements (Sofiyah *et al.*, 2024) [19]. The capacity of CRM systems to include AI features has also been instrumental in boosting features like predictive analytics, sentimental analysis, and customized recommendations that singularly, or jointly, facilitate more

customer-centered and proactive interactions (Khneyzer *et al.*, 2024) [9]. However, the use of AI chatbots does bring continuous challenges, such as those regarding interoperability of systems, data safety, and the risks of algorithmic prejudice (Urbani *et al.*, 2024) [21]. With the aim of overcoming these obstacles, Urbani *et al.* (2024) [21] develop a format of investigating the organizational readiness in respect of the chatbot implementation paying the attention to the constructs of compatibility, trust, and subjective norms. With additional developments that AI will go through, strategic use of chatbots is showing to be core to the effectiveness and scaling adoption of CRM in the digital marketplace (Ozay *et al.*, 2024) [15].

4.3 Customer Engagement and Experience

Customer engagement (CE) and experience have emerged as important areas of concern in the business of e-commerce and transformed both on theoretical and practical levels. Environmental sustainability, in particular, is known to contribute to CE and customer experience considerably, especially in the up-and-coming markets where the ecological and social understanding has been increasing over the past few years (Tsetse *et al.*, 2024) [20]. E-tailing, the use of a gameful and interactive experience, in digital retail settings has guided greater importance on the positive implications on CE, promoting brand advocacy and revisitation. Such results are also influenced by psychological characteristics of the individual, including fear of missing out and internet self-efficacy (Malik & Pradhan, 2025) [11]. A bibliometric review by Marvi *et al.* (2024) [13] has been conducted, covering the historical development in the domain of both CE and research within the scope of the international business. The review traces the evolution of the conceptual basis of the studies and how the research became focused on changing areas over the years. Nonetheless, the current body of literature is biased toward stressing on hedonic consumption scenarios at the expense of utilitarian services. Barrett *et al.* (2024) [3] believe that CE occurs largely different in hedonic and utilitarian territories and has different forces, ramifications, and connections. The difference breaks current generalizations and emphasizes the necessity of expanding the research in respect to the diversity of service settings to plan the complexity of CE.

4.4 User Acceptance and Behavioral Intention

One of the most salient elements of effective AI-powered chatbots adoption in e-commerce activity, in general, and behavioral intention and user acceptance in application to this situation, in particular, can be identified as an imperative to refer to the models that can help understand properly- Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) in this specific case. Perceived authenticity and usefulness, on the one hand, and perceived risk on the other have an effect on the user readiness to adopt the chatbots in e-commerce environment (Marjerison *et al.*, 2025) [12]. The relevance of those factors is additionally offered by comparative analysis between a variety of fields. An example is that in mobile health-related

applications, ease of use with usefulness contributes to the behavioral intention by raising user satisfaction (Park *et al*., 2025) [16]. Among the current COVID-19 context, the importance of habit as a predictor of behavioral intention surpassed that of hedonic motivation and price value in case of the e-learning (Zheng *et al*., 2025) [23]. Moreover, within the academic context, the determination of AI use is affected by such factors as facilitating conditions and the expectancy of effort, whereas personal innovativeness and individual readiness mediate this relationship (Fang *et al*., 2025) [6-7].

4.5 Positive and Negative Effects on Customer Journey

Incorporation of new technologies in e-commerce has impacted good and bad on the customer path. Although such innovations as scan-and-go applications make shopping more efficient, they might also present the so-called negaffordance, or elements of design that prevent the achievement of the customer goals due to their undesigned but nonetheless negative effects (Naeem, 2025) [14]. In the same manner, on the other hand, personalized advertisement powered by AI elevates customization, as it can undermine consumer agency, which may lead to altering brand consumer relationships (Hardcastle *et al*., 2025) [8]. New technologies like augmented reality (AR) and virtual reality (VR) have demonstrated to enhance customer experience, attitude, and loyalty, but their issue depends on specific types of technology and product category (Fan *et al*., 2025) [6-7]. Moreover, an AI model that operates on transformers will provide more accurate interpretability of involved interactions between customers, therefore, allowing more accurate targeting and interaction (Lu & Kannan, 2025) [10]. Together, these works emphasize the necessity of technological innovation process and customer expectations or ethical issues alignment, aligning of which may result in the friction and customer satisfaction decline in the customer experience path.

4.6 Challenges and Ethical Considerations

Although the use of AI-driven chatbots in e-commerce is increasingly popular, there are some issues and ethical concerns connected to their use. Privacy of data is one of the main problems because chatbots usually store sensitive information about its customers and there is also the possibility of data leakage or failure to respect privacy laws. Secondly, the secrecy around chatbot algorithm may cause concern, particularly where the intended users do not know about what is being done with their data. Excessive use of automatization can also contribute to a lack of human factor in the customer service, which can result in emotionless communication with the company and it might lose its emotional connection to customers. The other ethical issue is the possibility of biased reaction or incorrect information, particularly when chatbots are used to learn with incomplete or obsolete data. Companies should also take into account psychological impact of anthropomorphized chatbots, whereby it should not manipulate with emotions of the users in the wrong way. The solution to these problems is to consider it carefully in design, clear policies and moderate level of human intervention in chats with chatbots.

4.7 Gaps in Literature and Research Opportunities

Although significant studies have been done regarding the utility advantages of AI chatbots within e-commerce, there are still a number of gaps, which should be filled. The vast majority of the available literature is limited in its scope to the short-term result (direct customer satisfaction, response time, and simple engagement measures). There exist deficiencies in extensive studies that examine how a chat bot interaction can long-term affect the loyalty of the customers, the trust that they maintain, and the brand advocacy. Also, most of the literature at hand focuses on the giant worldwide e-commerce stores creating a gap in knowledge about how chatbot could be useful in small-scale or region-specific enterprises. The understanding of cultural, as well as demographic differences in accepting and behavior towards chatbots is also unexplored. Furthermore, little consideration has been paid to how incorporated and combined chatbots are into multichannel CRM courses and interact with other customer services channels. Another up-and-coming area that holds a lot of research potential is the role of emotional intelligence and adaptive learning in the behavior of the chatbots. These aspects should be investigated to offer further knowledge of the change in the role of AI chatbots in customer relationship management, which is personalized, ethical, and efficient.

The given literature proves the revolutionary effect of AI-based chatbots to boost CRM in e-commerce. Nevertheless, some issues and gaps present a great opportunity to future investigations and elaboration of more efficient, responsible, and inclusive chatbot approach.
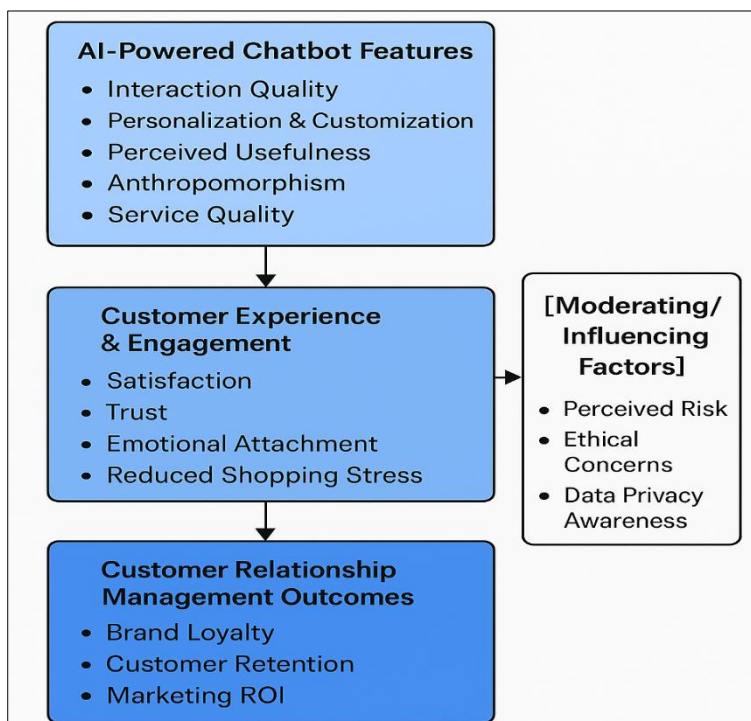
5. METHODOLOGY
5.1 Conceptual Framework

Fig 1: AI-Powered Chatbot Features

The conceptual framework of this research study aims to learn how the multitude of characteristics of AI-enhanced chatbots affect the customer relationship management (CRM) in e-commerce industries. The main chatbot characteristics (attributed to the central part of the model) are interaction quality, personalization, perceived usefulness, anthropomorphism, and service quality. These characteristics have a direct influence on customer experiences, as they increase satisfaction, trust, eliminate shopping anxiety, and make them emotionally defined to the brand.

Good customer experiences, in their turn, lead to such important CRM results as brand loyalty growth, customer retention, and the marketing return on investment. But this relation does not occur in a straightforward manner. Issues of perceived risk, ethical considerations, and privacy as it relates to data are some of the moderating variables that can affect customer perception and reaction to chatbots. As an example, a totally customized chatbot can fail to become trusted in case customers feel that it is intrusive or unsafe. Such a model allows examining the advantages and the constraints of the implementation of chatbots into CRM techniques in a structured form. It contributes to the comprehensive view of how the AI technology shapes the behavior of customers and the results of relations within the digital commerce settings, and acknowledges the value of responsible design and implementation principles.

6. RESULTS AND DISCUSSION

The results of the research demonstrate that AI-based chatbots have a profound effect on customer relationship management in e-commerce, making it more interactive and patient-experience oriented. Interaction quality, personalization, perceived usefulness of chatbots were direct factors contributing to increases in satisfaction, trust and an affective attachment to the brand. When interacting with smart chat interfaces, customers indicated the alleviation of stress when shopping, and better judgement in making decisions. These favorable experiences were converted to the measurable results of CRM in terms of greater brand loyalty, better customer retention, and better ROI in marketing. Nonetheless, the analysis also indicated that the perceived risk and the issue of data privacy was a moderating factor of these effects. There were also some users that showed reluctance when chatbots border on being too forward or lack open policies on data and elucidated the significance of ethical design interventions and clear information about data policy. The debate highlights that the businesses should prioritize efficiency and empathy, and they must focus on making AI solutions more than just functional because this area has to be reasonable and built to be trusted and fit consumer values and desires.

7. SUGGESTIONS AND POLICY IMPLICATIONS

- Encourage the usage of AI-powered chatbots in e-commerce business through their emphasis on personalization, interactivity, versatility, and user-friendliness to increase customer satisfaction.
- Create an ethical framework of chatbot implementation, encompassing issues of transparency, data utilization, and algorithmic responsibility.
- Order frequent audits and checks to guarantee that data privacy rules are implemented when dealing with chatbots.
- Customers service teams should be trained to collaborate with chatbots to create a balance between automated and personalized responses to sensitive and complicated requests.
- Encourage the use of adaptive learning capabilities on chatbots and make them self-optimize after user responses and patterns behavior.
- Promote cross-platform use of chat-bots in omnichannel CRM applications to achieve a smooth customer experience.

8. CONCLUSION

This study outlines the revolutionizing attribute of AI-enabled chatbots in reshaping Customer Relationship Management (CRM) in the e-commerce business. In streamlining communication, increasing service swiftness and making it possible to conduct customized exchanges, chatbots help increase customer fanaticism, credibility, emotional interest, and brand loyalty. They automate activities and provide uniform service, which makes them great to their marketing ROI and customer retention. Nonetheless, in order to carry it out successfully, it is necessary to handle crucial issues, such as ethics, data privacy, and stay down-to-earth in internet interactions. Moreover, user perception which depends on usefulness, authenticity and risk perceptions are critical when it comes to chatbot acceptance and the effectiveness of the CRM as a whole. On one hand, the benefits are huge, but, on the other, the research shows that the further chatbot development requires constant innovation and ethical considerations. Due to the increasing popularity of e-commerce, future research on the long-term effects, cross-cultural dynamics of user behaviors, and higher integrations between the omnichannel CRM systems to maximize customer experiences in a fast-changing landscape of the digital world should be conducted.

9. LIMITATIONS OF THE STUDY

- The study is mostly secondary based, and is based on other literature and may reduce the depth of empirical knowledge and may not enable it to be applied to different e-commerce.
- The fast development of AI technology presupposes that some of the conclusions might be out of date because of the new features of chatbots and actions by users.
- The paper fails to clear up cross-cultural differences in the customer attitude toward chatbots, which can shape the results of the CRM differently in diverse regions or demographics.
- The ethical, legal and privacy-related reasons are theoretical and not empirically examined, restricting the factuality of the identified reasons.
- The study is dedicated to e-commerce in particular and thus, its conclusion is unlikely to be applicable to other market sectors like healthcare, education, or financial services where chatbots are used differently.
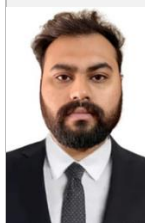
REFERENCES

1. Alalwan AA, Dwivedi YK, Rana NP, Williams MD. Anthropomorphism and service quality in AI chatbot interactions: Their role in customer flow experience and brand loyalty. Journal of Retailing and Consumer Services. 2025;76:10–34.
2. Alecsoiu M, Tan Y, Choudhury A. EcoptiAI: An agentic framework for optimizing e-commerce processes. Journal of Artificial Intelligence Research. 2025;78(2):345–369.
3. Barrett R, Lim J, Howard A. Reframing customer engagement: A comparative study of hedonic and utilitarian service contexts. Journal of Service Research. 2024;27(2):145–162.
4. Ding Y, Najaf K. Impact of trust and perceived humanness on adoption of AI chatbots in e-commerce. Electronic Commerce Research and Applications. 2024;58:11–21.
5. Dutta S, Ahmed A, Rahman M. The role of AI-powered chatbots in transforming CRM in e-commerce: Opportunities and challenges. Journal of Business Research. 2025;15(8):14–23.
6. Fan Y, Li H, Wang Z. Enhancing retail experiences with AR and VR: Effects on attitude, intention, and loyalty. Journal of Retailing and Consumer Services. 2025;75:10–28.
7. Fang Y, Liu Q, Han J. Factors influencing AI adoption among academic librarians: A UTAUT-based study. Library & Information Science Research. 2025;47(2):1–12.
8. Hardcastle L, Kumar A, Vyas P. AI personalization and consumer autonomy: Implications for brand relationships. Journal of Consumer Behaviour. 2025;34(1):45–62.
9. Khneyzer A, Lim WM, Lee JA. AI in CRM: Enhancing analytics and personalization in customer interactions. Journal of Business Research. 2024;15(8):1–14.
10. Lu Q, Kannan PK. Transformer-based models for analyzing e-commerce customer interactions. Journal of Marketing Research. 2025;62(2):178–196.
11. Malik A, Pradhan R. Gameful experiences and customer engagement in e-tailing: Moderating effects of FoMO and internet self-efficacy. Journal of Retailing and Consumer Services. 2025;76:1–13.
12. Marjerison R, Lee M, Koh J. Perceived usefulness and authenticity in chatbot adoption: A mediation analysis. Computers in Human Behavior. 2025;13(9):17–41.
13. Marvi R, De Luca LM, Valos MJ. Customer engagement in international business: A bibliometric analysis of evolving

conceptual structures. International Business Review. 2024;33(1):1–12.

14. Naeem M. Negaffordance in retail technology: A barrier to seamless customer experiences. Journal of Retail Technology. 2025;18(1):23–37.

15. Ozay B, Chen Y, Kwon J. AI-enabled customer engagement in e-commerce: CRM effectiveness through chatbot interaction. International Journal of Information Management. 2024;71:10–26.

16. Park S, Kim J, Lee H. Behavioral intention in mobile health applications: Role of satisfaction and ease of use. International Journal of Medical Informatics. 2025;17(9):1–15.

17. Pu X, Zhang L, Chen W. Adoption of AI-powered tools among Chinese Gen Z consumers: An extended UTAUT model. International Journal of Information Management. 2025;72:1–13.

18. Ranieri M, Ghezzi A, Giudici A. Chatbots and customer experience in digital commerce: A double-edged sword? Journal of Retailing and Consumer Services. 2024;74:1–26.

19. Sofiyah AR, Nugroho Y, Wijaya T. Improving CRM efficiency through AI chatbot deployment: A service operations perspective. Service Industries Journal. 2024;44(3):211–227.

20. Tsetse E, Kumar V, Amoako G. Environmental sustainability and customer engagement: Evidence from emerging markets. Journal of Business Research. 2024;15(8):1–14.

21. Urbani J, Singh A, Delgado M. Organizational readiness for AI chatbot integration in CRM: A strategic framework. Information Systems Frontiers. 2024;26(1):143–162.

22. Xia M, Shannon B. Customer perception of AI chatbots: Enjoyment, personalization, and problem-solving as engagement drivers. Journal of Interactive Marketing. 2025;62:88–101.

23. Zheng L, Li X, Wu Q. Determinants of behavioral intention in e-learning during the COVID-19 pandemic: An extended UTAUT approach. Computers & Education. 2025;190:11–23.