

Design of an Artificial Intelligence Based Recommendation System to Improve User Experience On E-Commerce Platforms

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ARTICLE INFO

Article history:

Received June 28, 2024

Revised July 15, 2024

Accepted July 16, 2024

Keywords:

Systems, Artificial Intelligence, E-commerce

ABSTRACT

The objective of this research is to explore the design and development of an artificial intelligence-based recommendation system to enhance user experience on e-commerce platforms. The research methodology employed is qualitative research, a method used to gain in-depth understanding of social phenomena. The chosen type of research is a literature review, where in the researcher collects, studies, and analyzes written references or sources such as books, journals, articles, documents, and other significant sources of information related to the researched topic or title. Subsequently, the researcher analyzes and draws conclusions to find answers to the research questions. The research findings indicate that the development of an artificial intelligence-based recommendation system for improving user experience on e-commerce platforms is a relevant and pressing step. By comprehending various aspects discussed in the literature, the researcher can design a system that is not only accurate and efficient but also ethical, secure, and aligned with user needs. For future researchers, further studies are needed, and practical implementation steps will be crucial to translate literature findings into tangible solutions that can enhance the e-commerce landscape in the future.

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1. INTRODUCTION

E-commerce platforms are currently very much needed by various parties and groups, including business people, the world of education, and other worlds of work. Its existence has had a significant positive impact in increasing accessibility, efficiency and ease of transactions. For business people, e-commerce platforms provide the opportunity to expand their market reach globally without geographic limitations. This allows them to reach consumers in various locations more easily, opening up wider sales opportunities and increasing business growth potential.

Wali et al., (2023) explained that in the world of education, e-commerce platforms also make an important contribution. Many educational and training institutions utilize this platform to provide online courses, learning materials and other educational resources. This not only provides wider access to education to students from various parts of the world, but also provides flexibility in time and place in the learning process. Meanwhile, in the world of work, e-commerce platforms play an important role in increasing the efficiency of business processes. Online transactions allow companies to sell, purchase and exchange information more quickly and efficiently. Apart from that, this platform is also an effective channel for marketing and promoting products or services (Cabrera-Sánchez et al., 2020). The growth and development

of e-commerce platforms is bringing positive changes in the way businesses, education and work interact. Increasingly close global connectivity and the ability to access a variety of services and information online have created a more open and connected environment for all parties involved.

According to Michael Aldrich, e-commerce is a concept that utilizes electronic and communication technology to support business processes, especially in terms of buying and selling transactions (Wang et al., 2021). Furthermore, in Aldrich's view, e-commerce includes the use of computers and communications networks to facilitate the exchange of information and transactions between businesses and consumers or between businesses. Aldrich sees e-commerce as an evolution in the way businesses interact with customers and business partners, removing geographic limitations in the transaction process. By using electronic technology, e-commerce allows business people to create more efficient distribution channels, increase the accessibility of products or services, and make transactions easier. Aldrich's views provided the conceptual basis for the development of e-commerce, and his innovative ideas paved the way for major transformations in the world of commerce. E-commerce not only allows the exchange of goods and services electronically but also creates a business environment that is more open, efficient, and accessible to various parties in various locations (Bok, 2023).

Meanwhile, according to existing data, the growth of e-commerce in Indonesia in 2023. The gross transaction value (GMV) of Indonesian e-commerce is estimated to reach US\$ 62 billion in 2023. This figure grows 20.2% from the GMV of Indonesian e-commerce in 2022 which is US\$ \$51.6 billion.

The number of Indonesian e-commerce users is estimated to reach 196.47 million people in 2023. This figure will grow 10.3% from the number of Indonesian e-commerce users in 2022 which was 178.94 million people.

This data shows that the development of E-Commerce users continues to increase from year to year, for this reason currently we certainly need a system to provide recommendations for the use of e-commerce based on an artificial intelligence system.

Fitriani, (2022) explains the artificial intelligence (AI) system to provide more personal and relevant recommendations to users. Artificial intelligence systems are able to analyze user data, shopping patterns and preferences in greater depth, enabling a more personalized shopping experience.

By utilizing AI technology, e-commerce platforms can provide product recommendations that suit users' individual tastes and needs. The system can learn a user's shopping behavior from previous transaction, browsing and interaction history, providing smarter and more accurate suggestions over time. Apart from that, artificial intelligence systems can also be used to improve e-commerce operational efficiency. For example, in supply chain management, demand prediction, and automatic price adjustments based on dynamic market data. This helps e-commerce companies to respond to market changes more quickly and effectively (Mykhalchuk et al., 2021; Peng et al., 2023).

The use of artificial intelligence systems in e-commerce can also help improve transaction security by detecting potential suspicious activity or fraud. This provides an additional layer of protection for users and businesses in the e-commerce ecosystem. By incorporating artificial intelligence in the e-commerce ecosystem, we can improve the overall shopping experience, increase customer satisfaction, and support continued growth in e-commerce.

2. RESEARCH METHOD

The research method used in this research is qualitative research. Qualitative research is a research method used to understand social phenomena in depth. Qualitative research does not just describe phenomena, but also seeks to understand the meaning and context of these phenomena (Yusanto, 2020). This type of research is library research which researchers carry out by collecting, studying and analyzing references or sources obtained in written form such as books, journals, articles, documents and other significant sources of information with the topic/title. researched. And then the researcher analyzes and draws conclusions to find answers to what the researcher is studying.

3. RESULTS AND DISCUSSIONS

Based on the results of the literature study analysis that researchers conducted by reading books and research journals related to the design of artificial intelligence-based recommendation systems to improve user

experience on e-commerce platforms, the researchers found that the development of artificial intelligence (AI)-based recommendation systems is an urgent need in facing the increasingly rapid dynamics of e-commerce development. E-commerce, as an electronic trading platform, has become an integral part of everyday life. According to Nursidik, (2023) In reality, the use of e-commerce not only provides easy access to shopping, but also provides new challenges in managing and presenting product information in accordance with user preferences.

According to Sekarwati et al., (2021) One of the crucial aspects in developing e-commerce is improving user experience. In this context, recommendation systems emerge as a potential solution to provide a more personalized and satisfying shopping experience. Previous research shows that recommendation systems can significantly increase user retention, sales, and customer satisfaction. In order to understand the potential of artificial intelligence-based recommendation systems to improve e-commerce user experience, previous studies provide valuable insights. In terms of algorithms, several studies have highlighted the advantages of machine learning algorithms in providing more accurate recommendations. Models such as collaborative filtering, content-based filtering, and hybrid methods have been successfully used to increase recommendation accuracy. However, challenges remain in overcoming the cold start issue, where the system has difficulty providing recommendations for new products or new users (Susanto & Purnomo, 2022) .

In addition, the processing and analysis of big data in optimizing the performance of recommendation systems cannot be ignored. In the context of e-commerce, large volumes of data are generated every day, and processing this data efficiently is the key to the success of recommendation systems. Previous research shows that big data technology can be used to improve the accuracy, scalability and responsiveness of recommendation systems (Triwidodo, 2023).

Image: example of the design of an artificial intelligence-based recommendation system Opinion of Valensia & Kurniabudi, (2023) Apart from accuracy, factors such as interpretability and user trust are also critical aspects that need to be considered in designing a recommendation system. Users must be able to understand the reasons behind the recommendations provided by the system so that they feel more confident and comfortable in following the suggestions provided. Therefore, in-depth research related to how to improve the interpretability of AI recommendations is a topic that is attracting increasing attention. The importance of involving users in the development of recommendation systems is also revealed in the literature. Users often have unique preferences and expectations, and therefore, involving them in the system design process can help ensure that the recommendations provided truly reflect their wants and needs. Participatory research and user-driven design are becoming relevant methodologies for gaining direct insights from users about their preferences.

Meanwhile, in the context of e-commerce, security and privacy aspects are a major concern. Users must be confident that their personal data is managed securely and that the recommendations provided do not pose a security risk (Musdalifah, 2023). Security and privacy research in the context of e-commerce recommendation systems is growing rapidly in response to societal concerns regarding the handling of personal data. Therefore social and contextual aspects also appear in the literature. Several studies highlight that factors such as social trends, seasonality, and geographic location can have a significant impact on user preferences. Integration of these factors in recommendation models can improve the relevance and sustainability of the system.

In developing artificial intelligence-based recommendation systems for e-commerce, the application of new technologies such as deep learning and neural networks is also a concern. The advantage in handling complex and in-depth data makes this technology an attractive choice in creating more sophisticated recommendation models (Chinchanachokchai et al., 2021). However, according to Fahrurrozi, (2023) as technology advances, research also shows that new challenges arise, including ethical issues and algorithmic bias. The importance of understanding the ethical implications of using artificial intelligence in providing recommendations cannot be overstated. The decisions made by algorithms can have a major impact on users' lives, and therefore, efforts need to be made to ensure that algorithms work fairly and transparently. Apart from that, economic factors also need to be considered. Implementing an artificial intelligence-based recommendation system can require significant investment, and therefore, it is necessary to conduct a cost-benefit analysis to ensure that the value generated by the system is commensurate with the costs incurred.

4. CONCLUSION

Based on the findings and discussion above as a whole, this research provides conclusions. The results of the literature study analysis show that developing an artificial intelligence-based recommendation system to improve user experience on e-commerce platforms is a relevant and urgent step. By understanding the various aspects that have been discussed in the literature, researchers can design systems that are not only accurate and efficient, but also ethical, safe, and in accordance with user needs. Further research and practical implementation will be the next steps to turn literature findings into real solutions that can improve the e-commerce landscape in the future.

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