

EVALUATION OF THE EFFECTIVENESS OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN IMPROVING DIGITAL SHOPPING PERSONALIZATION

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ABSTRACT

This study aims to evaluate the effectiveness of Artificial Intelligence (AI) technology in personalizing digital shopping experiences. Using a mixed-method approach that combines qualitative and quantitative methods, the research examines how AI algorithms such as machine learning, data-driven product recommendations, and intelligent chatbots contribute to enhancing customer satisfaction and loyalty on e-commerce platforms. Data were collected through surveys of active e-commerce users and in-depth interviews with platform developers. The findings reveal that AI significantly improves the relevance of product recommendations, the efficiency of customer service, and overall user engagement. The study concludes that AI plays a pivotal role in shaping digital marketing strategies and supporting customer retention efforts in the contemporary digital economy.

INTRODUCTION

Digital transformation has become a key catalyst in reshaping the global business landscape, particularly in the electronic commerce (e-commerce) sector. Rapid technological advancements have not only changed the way consumers interact with products and services but have also revolutionized the business strategies companies use to reach and retain customers. One of the most significant technological innovations currently playing a vital role in digital business strategies is Artificial Intelligence (AI).

According to Davenport et al. (2020), AI enables systems to learn from data, recognize patterns, and make decisions with a level of intelligence that mimics human behavior. In the context of e-commerce, AI is utilized for a wide range of functions,

including product recommendation systems, customer service chatbots, predictive analytics, and digital marketing automation. The growing adoption of AI is driven by the need for operational efficiency and enhanced user experience through personalized approaches.

Personalization has emerged as one of the key strategies for fostering customer loyalty in the digital era. Modern consumers tend to value customized shopping experiences tailored to their preferences, search history, and behavioral patterns. As McClure and Seock (2020) state, AI technology is capable of analyzing large volumes of user data in real time, generating relevant and targeted recommendations, and enhancing the overall convenience of the shopping process. Thus, AI holds significant potential in creating shopping experiences that are not only efficient but also more meaningful for customers.

However, despite numerous studies and widespread industry practices demonstrating the effectiveness of AI in personalizing online shopping experiences, Givi (2021) notes that there remains a gap in systematic academic evaluation of AI's actual contribution to enhancing digital shopping experiences. Many companies adopt AI technologies without conducting precise assessments of their impact on customer satisfaction, loyalty, and conversion. Therefore, it is essential to conduct a comprehensive academic study to evaluate the effectiveness of AI implementation in the context of digital shopping personalization.

AI integrates machine learning algorithms, natural language processing, and advanced data analytics to replicate human cognitive processes. In the e-commerce sector, this technology is applied in various forms, such as personalized product recommendation systems, customer service chatbots, and predictive analytics to anticipate consumer needs. According to Davenport et al. (2020), the use of AI in marketing can accelerate decision-making and improve the accuracy of market targeting, allowing companies to deliver content and offers that are truly relevant to each individual customer.

Although many companies have implemented AI technologies and claimed improvements in personalization, there is still a lack of systematic research that measures the actual contribution of AI to conversion rates, customer loyalty, and service efficiency. Much of the existing literature focuses on technical implementation aspects or macroeconomic benefits. For instance, research by Kumar (2020) reported a 30% increase in sales conversion through the use of AI, while Zhang (2021) highlighted the importance of real-time data in enhancing the accuracy of recommendation systems. However, there is a notable gap in integrated studies that combine both technical and empirical approaches, specifically those that link AI implementation directly to user experience in the context of personalization.

While the adoption of AI has shown great potential in improving customer satisfaction, the question of how effective this technology is in building long-term customer loyalty remains a central concern in both academic and business practice. Therefore, this research focuses on evaluating the effectiveness of AI in enhancing digital shopping personalization and its impact on consumer behavior.

Problem Formulation

1. What is the impact of AI utilization on the relevance of product recommendations and user interactions on e-commerce platforms?
2. What are the challenges and opportunities in implementing AI to support a more personalized and responsive digital marketing strategy?

Research Objectives

1. To empirically evaluate the impact of AI usage on the relevance of product recommendations and user interactions on e-commerce platforms.
2. To identify the challenges and opportunities in AI implementation for supporting a more personalized and responsive digital marketing strategy.

Literature Review

The Concept of Artificial Intelligence in E-Commerce

Artificial Intelligence (AI) in the context of e-commerce refers to the use of computing systems capable of performing tasks that traditionally require human intelligence, such as big data analysis, pattern recognition, and automated decision-making. According to Huang and Rust (2021), AI consists of several core components, including machine learning, deep learning, natural language processing (NLP), and computer vision—all of which can be leveraged to enhance the quality of services in the digital retail sector.

Davenport et al. (2020) emphasize that the integration of AI into digital marketing accelerates task automation, enhances predictive capabilities, and optimizes the customer experience with greater precision. These technologies enable businesses to process vast amounts of data and respond to consumer behavior in increasingly personalized and scalable ways.

Personalization in the Digital Shopping Experience

Personalization in e-commerce refers to the delivery of content, products, or services tailored to the unique profile of each user. This profile is typically built using shopping history, search activity, and social interactions. McClure and Seock (2020) argue that personalization enhances consumer perception and creates more meaningful shopping experiences, ultimately leading to increased customer retention. The tailored

approach addresses individual needs and preferences, which contributes to stronger emotional connections between consumers and platforms.

Challenges in the Implementation of AI in E-Commerce

Kumar (2020) shows that the implementation of AI in digital marketing can increase sales conversions by up to 30%. The study emphasizes how machine learning algorithms are capable of processing customer data and generating targeted recommendations. The method combines historical data analysis with predictive modeling of future behavior to enhance marketing effectiveness.

Zhang (2021) highlights the importance of using real-time data to create a more personalized and responsive shopping experience. Their findings suggest that access to up-to-date customer data enables personalization systems to quickly adapt product offerings to meet the evolving needs of users. This reinforces the notion that response speed is a critical factor in the success of e-commerce personalization strategies.

Additional studies by Huang and Rust (2021) and van der Borgh et al. (2020) support the argument that AI plays a crucial role in creating emotionally resonant and holistic digital experiences. They introduce the concept of the “feeling economy,” in which consumer interactions are not merely transactional but also emotional. These findings suggest that personalization rooted in emotional understanding has a significant impact on customer loyalty.

Although AI adoption has shown great potential to enhance customer satisfaction, questions remain regarding the extent to which this technology effectively fosters long-term consumer loyalty. As a result, this research is focused on evaluating the effectiveness of AI in improving personalized digital shopping experiences and its impact on consumer behavior.

RESEARCH METHOD

This study employed a qualitative approach as outlined by Sugiyono (2017), aiming to explore in depth the role of Artificial Intelligence (AI) technology in enhancing customer experience in e-commerce. This approach was chosen to gain a comprehensive understanding of how AI is implemented and its impact on consumer behavior. Data collection was conducted using two primary methods: in depth interviews and participatory observation. In depth interviews were carried out with ten informants, consisting of e-commerce business actors particularly marketing managers and active customers from various e-commerce platforms. The interview questions focused on customer experiences, AI based personalization, and the challenges involved in implementing AI technologies. In addition to interviews, participatory observation was conducted to observe the use of AI on e-commerce platforms, including features such as product recommendation systems, chatbots, and personalization interfaces tailored to user preferences.

The data collected from interviews and observations were analyzed using thematic analysis, in line with Sugiyono (2017). The analysis process began with the transcription of interview recordings, followed by the identification of key emerging themes. These themes included the impact of AI on personalization, challenges related to data privacy, and the effectiveness of AI in enhancing customer experience. Through this approach, the study aimed to provide a rich and comprehensive portrayal of how AI is utilized in the e-commerce context, from the perspectives of both service providers and users.

RESEARCH RESULTS AND DISCUSSION

General Description of Findings Study:

Based on results interview deep with 10 respondents who are user active e-commerce platforms such as Tokopedia, Shopee, and Lazada which have apply technology intelligence artificial intelligence (AI) in experience shopping they were found that majority Respondent feel very helped with presence Features intelligent AI-based. As many as 8 out of 10 respondents in a way explicit state that system recommendation emerging products moment they open very accurate and relevant application with need as well as preference personal they. They to mention that feature This shorten time search Because products displayed on the page main direct in accordance with frequently used categories they search or buy.

Not only that, as many as 7 out of 10 respondents others also expressed that experience shop they become more comfortable, efficient and enjoyable blessing existence feature personalization. Some most appreciated features is offer customized discount with history purchase, notification of appropriate product promotions interest, and recommendation goods complement from transaction previously. One of the Respondent even to mention that He feel as "understood" by the system, because application in a way automatic display current product needed without must typed in the column search.

Following Table of results from results interview namely :

Table 1

No	Question	Percentage (%)
1	Experience shop become more comfortable , efficient and enjoyable blessing feature personalization	70
2	System recommendation product considered very accurate and relevant with need as well as preference personal	80

Most of the respondents also indicated that AI gives a plus point in building emotional attachment with the platform they use. Features like “congratulations on your anniversary”, which are accompanied by discount vouchers, product suggestions based on seasonal changes or trends, and restock reminders for favorite products, make the shopping experience feel more personal and interactive, as if each user is served individually.

Thus, it can be concluded that AI technology in e-commerce is not only functioning as a tool to assist transactions, but has developed into a strategic component that directly influences user perception, preferences, and comfort. This becomes strong evidence that the integration of data technology and consumer behavior is capable of creating a more responsive and customer satisfaction-oriented digital shopping ecosystem.

Effectiveness System Recommendation AI Based:

When asked specifically about the AI-based product recommendation system, the majority of respondents gave very positive responses. The following is Table 2, which presents the results of the respondent interviews:

Table 2

No	Question	Percentage (%)
1	Recommendation features product rated efficient and helpful find product with fast	90
2	Recommendation in accordance with preferences and habits shopping personal	80

As many as 9 out of 10 respondents stated that this feature is very efficient and helpful in finding the right products in a short amount of time. They felt that the recommendations displayed were always relevant to their shopping preferences and habits, so they no longer needed to manually browse through many categories. Some respondents also acknowledged that this system indirectly encouraged them to make impulsive purchases, as the products shown were very appealing and matched needs they had not yet realized themselves.

On average, respondents observed that the more frequently they used e-commerce applications such as Shopee, Tokopedia, or Lazada, the more accurate and personalized the recommendation system became. They noticed an improvement in the quality of product suggestions over time, indicating that the AI system works with an adaptive algorithm model that continuously learns from user behavior patterns and adjusts its output accordingly. This aligns with the opinions of Malodia et al. (2021) and

Brynjolfsson (2014), who state that AI-based recommendation systems supported by machine learning become increasingly effective as user interaction increases, since the algorithm gathers more historical data to analyze.

Furthermore, Yaghi (2020) confirms that AI systems in e-commerce have evolved into strategic tools for increasing engagement and conversion rates. He demonstrates that AI-based personalization can increase the likelihood of purchase by up to 30–50%, as the recommended products align more closely with the current interests of the user. This strengthens the interview findings in this study, where respondents reported being encouraged to make purchases because the recommended products felt like they were "speaking directly" to them.

In addition, research by McKittrick et al. (2024) found that AI-driven product recommendation systems are capable of creating a more intuitive shopping experience, where users feel that the application understands their needs even before they explicitly search for them. This finding is consistent with the respondents' experiences in this study, where they stated that the system seemed to "understand" what they wanted to buy based on their previous history and behavior.

Thus, AI-based recommendation systems not only function as search assistance tools but also play a significant role in shaping consumer behavior, increasing time efficiency, and creating a sense of connection between users and e-commerce platforms. In this context, AI acts as a strategic element in building adaptive and responsive personalization that encourages sustainable digital shopping satisfaction.

The Impact of AI on Customer Loyalty and Retention:

When discussing the impact of AI on customer loyalty and the desire to continue using a particular platform, the interview results show that seven respondents felt that the personalization provided by e-commerce platforms significantly influenced their loyalty. They stated that their shopping experience became more enjoyable and emotionally engaging because the application greeted them by name, remembered their anniversaries, and provided special offers based on their previous purchase history.

This created a stronger emotional attachment to the platform, which in turn reinforced their intention to continue shopping there. This level of personalization demonstrates **AI's capability to create a more personal and emotionally valuable experience**, commonly referred to as a customer-centric approach.

Table 3

No	Question	Percentage (%)
1	Personalization increase loyalty customer	70
2	Experience shop become more fun and emotional	70

This finding is supported by research from Givi (2021), which shows that personalized customer experiences including more personal interactions and relevant offers can increase customer loyalty to a platform. Givi suggests that features such as anniversary reminders or exclusive offers can strengthen emotional bonds and foster the desire to continue using the platform. This research reinforces the findings of this study, indicating that a more personal experience can create a sense of appreciation and enhance customer retention.

However, the findings also reveal a more complex perspective on the factors influencing purchasing decisions. Three other respondents stated that although personalization is very helpful, they still consider other factors such as price and shipping costs as the main determinants in their purchasing decisions. This reflects a more realistic view of the impact of AI on consumer decisions, where personalization plays an important role, but practical and economic factors remain primary considerations for many consumers.

Research by Sreepada and Patra (2021) also supports these findings, showing that customer loyalty is not solely influenced by personalized experiences but also by functional factors such as pricing and delivery costs. In this case, they emphasize a value-based approach, which includes cost-related considerations, as still being dominant in purchase decisions, even though personalization continues to enhance customer satisfaction. In addition, research by Nuryanti (2021) proposes that customer loyalty in e-commerce is closely linked to personalization experiences driven by user data, but this must be accompanied by competitive offers and attractive pricing. As a result, although AI-based personalization has a significant impact on engagement, practical aspects of online shopping such as pricing and delivery fees continue to play an important role.

Discussion Critical and Implications Practical:

In general, the findings of this study indicate that the implementation of Artificial Intelligence (AI) technology on e-commerce platforms has had a significant impact on customer experience and satisfaction. The use of intelligent recommendation systems is able to provide relevant product suggestions, responsive chatbot services, and emotionally resonant personalization all of which contribute to enhancing the effectiveness of digital shopping. Respondents reported feeling more valued and connected to e-commerce platforms, which in turn increases purchase frequency and customer retention. Data-driven personalization also creates a more comfortable shopping experience, minimizes the time spent searching for products, and even encourages impulsive buying. In addition, AI technology provides users with a sense of efficiency, enabling them to shop in smarter and more time-effective ways.

However, the study also identifies that although AI technology has enhanced the user experience, it has not yet fully replaced the role of humans in more complex

situations. Several respondents still feel more comfortable when there is human interaction, particularly in handling complicated issues or when faced with in-depth questions that cannot be adequately answered by chatbots. This finding highlights that despite rapid technological development, the human touch remains essential in delivering a holistic and comprehensive shopping experience.

The implications of these findings suggest that the development of AI in e-commerce cannot be separated from a human centered design approach. E-commerce businesses need to consider strategies that not only focus on technological efficiency but also on emotional comfort and customer trust. A balanced integration of AI's automation capabilities and human interpersonal engagement is essential to crafting a richer and more satisfying customer experience. Furthermore, the findings underscore the importance of ethics and transparency in the management of customer data. Without a foundation of trust in AI systems, personalization efforts could lead to user resistance or concern, rather than enhanced satisfaction.

As for recommendations for future research, this study opens several avenues for further exploration. First, future studies could broaden the sample by involving more respondents from diverse demographic and cultural backgrounds to examine potential differences in perception toward AI in e-commerce. Second, quantitative research could be conducted to statistically measure the influence of specific AI features on customer satisfaction and loyalty. Third, future studies are encouraged to investigate ethical considerations and data protection practices within AI-based personalization, as these issues are increasingly relevant in the digital age. Finally, research should also explore the effectiveness of hybrid interaction models combining AI and human service in delivering more adaptive and responsive customer support. In conclusion, it is hoped that future studies will enrich our understanding of how to optimize AI in the e-commerce sector, not only from a technical perspective but also by emphasizing a holistic and sustainable user experience.

CONCLUSION

Based on the results of a study involving 10 active users of e-commerce platforms that implement artificial intelligence (AI) technology, it can be concluded that AI plays an important role in enhancing the personalization of the digital shopping experience. Features such as product recommendation systems, NLP-based chatbots, and personalized interfaces have successfully created a more efficient, relevant, and enjoyable experience for users. The majority of respondents stated that they felt assisted in finding suitable products without having to spend time searching manually. In addition, AI technology has also been proven to improve customer loyalty and retention. Shopping experiences that feel more "personal," such as special notifications, exclusive offers based on transaction history, and more human-like interactions with chatbots, encourage users to return more frequently to e-commerce platforms. Although some

respondents still feel that chatbots are not yet fully optimized in handling complex problems, overall, the application of AI provides a significant added value to user comfort.

However, challenges such as personal data protection and the potential limitation of product exposure due to algorithmic filtering still require attention. The use of AI technology must be accompanied by policies that prioritize transparency and digital ethics. In this way, personalization becomes not only a strategy to drive transactions but also a foundation for building long-term connections between e-commerce platforms and their customers.

Suggestions

For E-Commerce Providers:

E-commerce platforms are advised to continue developing AI systems that focus not only on increasing sales but also on considering ethical aspects, data security, and product diversity. Recommendation features should not be overly narrow, so that customers still have a wide range of choices. In addition, improvements to chatbot systems are necessary to ensure they can handle complex problems in a more contextual and empathetic manner. Training algorithms using real-time data and user feedback is also an essential step to ensure that AI remains adaptive and relevant to evolving needs.

For Users or Customers:

Customers are encouraged to better understand how AI technology works in e-commerce platforms so that they can utilize it more effectively. For example, by setting account preferences, managing search history, and providing feedback on irrelevant recommendations. Users should also be aware of potential privacy risks and always review their personal data security settings. With a wise and informed approach, customers can enjoy the benefits of AI technology without compromising their comfort or control over their personal data.

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