

UTILIZATION OF ARTIFICIAL INTELLIGENCE SYSTEMS TO PREDICT CONSUMER BEHAVIOR

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ABSTRACT

The development of Artificial Intelligence (AI) System technology has opened up new opportunities in understanding consumer behavior. With abundant data availability, companies have the potential to improve marketing and customer service strategies through predicting consumer behavior. This study aims to explore the implications of utilizing Artificial Intelligence Systems in predicting consumer behavior and its impact on business strategies. The purpose of this study is to identify the benefits of utilizing Artificial Intelligence Systems in predicting consumer behavior, analyze challenges that may arise, and detail strategies that companies can adopt to optimize the utilization of this technology. The research method used is a combination of literature analysis and case studies. Literature analysis was conducted to detail the theoretical basis regarding the utilization of Artificial Intelligence Systems in the prediction of consumer behavior. Case studies were conducted on a number of companies that have successfully implemented this technology to understand the context of their implementation and the benefits they derived. The results showed that the utilization of Artificial Intelligence Systems in predicting consumer behavior can improve service personalization, optimize marketing strategies, and provide deep insights into consumer preferences. However, challenges related to data privacy, ethics, and technology integration are still obstacles that need to be overcome. Strategies that focus on data security, transparency, and an ethical approach can help companies address these challenges.

Keywords: artificial intelligence system, consumer behavior prediction, service personalization.

INTRODUCTION

The use of Artificial Intelligence (AI) Systems has brought profound transformations in various areas of life, including the business world. One important aspect of applying AI in a business context is its ability to predict consumer behavior. Consumer behavior is complex and often difficult to understand thoroughly. In this context, AI is becoming a highly effective tool for analyzing big data, identifying hidden patterns, and making accurate predictions regarding future consumer decisions (Onile et al., 2021).

In the ever-evolving digital age, companies in various sectors are increasingly relying on data to make strategic decisions. A deep understanding of consumer behavior is the key to success for companies in developing marketing strategies, better product offerings, and increasing customer satisfaction. However, the increasing complexity of consumer data and the need to respond quickly to changing trends make the use of conventional methods less effective (Guo et al., 2019). The use of Artificial Intelligence Systems as a solution to predict consumer behavior is becoming increasingly relevant. AI is able to process and analyze data with speed and accuracy far beyond human capacity. Machine learning algorithms in AI can learn from historical patterns and identify complex relationships, allowing companies to make smarter predictions regarding future consumer decisions (Huang & Rust, 2021).

AI's advantage in predicting consumer behavior lies not only in its ability to analyze large and complex data, but also in its ability to adapt to change. By constantly learning from new data, artificial intelligence systems can keep up with changing consumer trends and provide deeper insights (Praful Bharadiya, 2023). The application of AI in predicting consumer behavior is not only an analytical tool, but also a strategic foundation for better business decision making. With a better understanding of consumer needs and preferences, companies can optimize product offerings, improve operational efficiency, and build stronger relationships with customers (Dash et al., 2019). In this context, this research will explore in depth how the utilization of artificial intelligence systems can change the paradigm of marketing and business strategy by providing more accurate and measurable predictions of consumer behavior. Thus, it is expected that the results of this study can make a significant contribution to the development of business strategies that are more adaptive and responsive to market dynamics.

RESEARCH METHODS

The research method used in this study is descriptive qualitative to understand in depth the use of Artificial Intelligence (AI) Systems in predicting consumer behavior. The first step in the research is data collection through in-depth interviews with experts in the field of artificial intelligence and business practitioners who have implemented AI for consumer behavior analysis. In addition, this research will involve literature analysis to understand the latest trends, technological developments, and best practices in the application of AI for this purpose (Sugiyono, 2017). The collected data will be analyzed qualitatively, focusing on identifying patterns, barriers, and benefits of utilizing AI in the context of predicting consumer behavior. The research will involve in-depth case studies related to companies that have successfully implemented Artificial Intelligence Systems in their marketing strategies. This case analysis will cover implementation steps, challenges faced, and their impact on business decisions. Through this descriptive qualitative approach, the research is expected to provide a comprehensive picture of how companies can optimize the use of AI to predict consumer behavior, as well as the factors that influence the success or failure of the implementation (Sugiyono, 2018). The results of this study will provide practical guidance for companies looking to adopt artificial intelligence technology in an effort to understand and respond more effectively to consumer needs.

RESULTS AND DISCUSSION

A. Research Results

The results of this study show that the use of Artificial Intelligence (AI) Systems in predicting consumer behavior has a significant positive impact on companies. Analysis of historical consumer data using machine learning algorithms is able to produce more accurate and measurable behavioral predictions. One of the key findings is AI's ability to identify patterns that are difficult to detect by conventional methods, providing deeper insights into consumer preferences and factors influencing purchasing decisions (Dash et al., 2019).

In addition, this research shows that the implementation of Artificial Intelligence Systems allows companies to be more responsive to changing consumer trends. By constantly learning from new data, predictive models can be updated in real-time, allowing companies to respond more quickly and precisely to changing consumer needs (Saura et al., 2021). This gives companies a competitive advantage in optimizing marketing strategies, product inventory, and customer service. However, the results also identified several challenges that need to be overcome in utilizing AI to predict consumer behavior. Among them is the need for high-quality data, data security, and a better understanding of the interpretation of AI prediction results. Therefore, companies need to develop strong data infrastructure, strict security policies, and improve AI literacy within their organizations (Rathore, 2023).

The importance of transparency in AI decision-making is also emerging as an important finding, as consumers and other stakeholders increasingly demand to understand how artificial intelligence systems make predictions. Therefore, companies need to develop mechanisms that can transparently explain how AI makes decisions, thus building consumer trust. Overall, the results of this study make an important contribution to the understanding of how the utilization of Artificial Intelligence Systems can improve the prediction of consumer behavior, by providing a comprehensive picture of the benefits, challenges, and strategic implications. The implications of this research can guide companies in taking better decisions in adopting and integrating artificial intelligence technology in their business strategies (Perez-Vega et al., 2021).

B. Discussion

1. Benefits of Utilizing Artificial Intelligence Systems in Predicting Consumer Behavior

The utilization of Artificial Intelligence (AI) Systems in predicting consumer behavior has become an important milestone in the modern business world. With AI's ability to crunch big data and analyze complex patterns, companies can reap significant benefits in crafting marketing strategies, improving service personalization, and responding quickly to changing consumer trends. In this discussion, an in-depth analysis will be analyzed about the benefits of utilizing Artificial Intelligence Systems in predicting consumer behavior, including increasing prediction accuracy, optimizing marketing strategies, and improving customer service quality (Himeur et al., 2021).

One of the main benefits of utilizing Artificial Intelligence Systems in predicting consumer behavior is the increased accuracy of predictions. AI is able to process and analyze data at a scale that cannot be achieved manually, so it can identify hidden patterns and complex relationships in consumer data. This means companies

can make consumer behavior predictions with a higher degree of accuracy, providing deep insight into consumer needs and preferences (Eriksson et al., 2020). Using machine learning algorithms, the Artificial Intelligence System can continuously learn from new data and improve its ability to forecast future consumer behavior. This gives companies an edge in anticipating changing consumer trends and adjusting their strategies proactively. For example, companies can more effectively respond to shifting consumer preferences or emerging market trends, allowing them to remain relevant and competitive in a dynamic marketplace (Society, 2023).

Another benefit that can be obtained from the utilization of Artificial Intelligence Systems is the optimization of marketing strategies. With a better understanding of consumer behavior, companies can devise marketing strategies that are more effective and in accordance with market needs. AI can help identify market segmentation more accurately, allowing companies to target their marketing campaigns more precisely. In addition, Artificial Intelligence Systems can be used to personalize marketing content, ensuring that the messages conveyed to consumers are relevant and engaging. Through consumer data analysis, AI can determine individual preferences, purchase history, and interaction patterns, so that companies can present product offerings that are more suitable and attractive to each consumer.

This marketing strategy optimization not only has an impact on the effectiveness of the campaign, but also on the efficiency of marketing spending. By targeting consumers who are more likely to respond with product or service offerings, companies can allocate their marketing budgets more wisely, increasing overall ROI (Return on Investment).

The use of Artificial Intelligence Systems also has a positive impact on the quality of customer service. AI can be used to deeply understand consumers' individual preferences and needs, enabling companies to present more personalized and relevant customer experiences. For example, AI chatbots can be used to provide fast and responsive customer service, with the ability to understand consumer queries, provide product information, and respond to complaints more efficiently. Thus, the company can increase customer satisfaction and build stronger relationships with its consumer base.

The use of AI in predicting consumer behavior also allows companies to anticipate future customer needs. This can be realized through personalized product offerings, smarter recommendations, and improved after-sales service. For example, an e-commerce platform that uses an AI recommendation system can provide more relevant product suggestions based on purchase history and consumer browsing behavior. Although the utilization of Artificial Intelligence Systems offers significant benefits, it cannot be overlooked that there are ethical challenges and concerns to be overcome. One of the key challenges is the need for high-quality data and sustainability in AI model updates. Without accurate and relevant data, AI models might produce biased or inaccurate predictions.

Data security is also a critical issue, especially as Artificial Intelligence Systems process and store large amounts of data. Consumer privacy protection must come first, and companies need to implement strong security measures to protect consumers' personal information. In addition, ethical concerns also arise along with the use of AI in predicting consumer behavior. It is important to ensure that the use of these technologies does not violate individual privacy and does not give rise to discrimination. Transparency in AI decision-making is key to building consumer trust and ensuring that consumers understand how decisions are made by algorithms.

The use of Artificial Intelligence Systems in predicting consumer behavior brings significant benefits to companies in various aspects of their business. Improving the accuracy of predictions, optimizing marketing strategies, and improving the quality of customer service are concrete results that can be obtained. However, it is important to remember that the use of AI also presents ethical challenges and considerations that must be managed wisely. Along with technological developments, companies are expected to continuously adapt and integrate Artificial Intelligence Systems into their business strategies in a sustainable and ethical manner. Thus, companies can maximize the potential of these technologies to improve the consumer experience, improve operational efficiency, and remain relevant in an ever-changing market.

2. Challenges and Obstacles in the Use of Artificial Intelligence Systems

The utilization of Artificial Intelligence (AI) Systems has brought revolutionary impacts in various sectors, including business, healthcare, education, and more. Although it provides many benefits, the implementation of AI technology is also faced with a number of challenges and obstacles that need to be overcome so that its utilization can be optimal. In this discussion, we will explore in depth some of the main challenges faced in the utilization of Artificial Intelligence Systems, including dependence on data, security and privacy, ethics, uncertainty in decision making, and challenges in integration and adoption (Verma et al., 2021).

- i. **Dependence on Data**
One of the main challenges in utilizing Artificial Intelligence Systems is the reliance on high-quality data. AI models require large, representative training data in order to learn well and produce accurate predictions. However, not all data can be considered equal, and the success of AI models depends largely on the diversity, relevance, and quality of the data used. These challenges can become even more complex when the data required to train an AI model is unavailable or difficult to obtain. Some industries may face barriers in collecting sufficient data, and sometimes existing data may not reflect the diversity of real-world circumstances. High reliance on data can also create bias in AI models if the data used does not cover the entire spectrum of the population or if there is an imbalance in the data used for training.
- ii. **Security and Privacy**
Security and privacy are significant challenges in the utilization of Artificial Intelligence Systems. In the context of big data collection, storage, and processing, the risk of data leakage or misuse of consumers' personal information becomes greater. Companies must maintain data integrity and confidentiality, implement strict security protocols, and ensure that the AI systems used cannot be manipulated by unauthorized parties. In addition, ethical issues also arise along with the growth of AI utilization. The use of these technologies to make predictions of consumer behavior may raise concerns about individual privacy and excessive surveillance. Companies must transparently explain to consumers how their data is used and ensure that data collection and use practices are in line with applicable regulations and ethical norms.
- iii. **Ethics in Decision-Making**
Ethical challenges are becoming increasingly complex along with the ability of Artificial Intelligence Systems to make complex decisions. AI models tend to learn patterns from training data, which can reflect existing inequalities or biases in the data. In the context of predictive consumer behavior, decisions taken by systems can have a significant impact on individuals and society. Ethical questions arise related to fairness, accountability, and the social impact of decisions made by AI systems. How do companies ensure that AI models are impartial or discriminatory against specific groups? Are there mechanisms to correct inequities that may arise in AI decisions? These questions require deep reflection and the application of strong ethical guidelines in the development and implementation of these technologies.

Although Artificial Intelligence Systems can provide predictions with a high degree of accuracy, the level of uncertainty remains a challenge. AI models cannot always predict outcomes with absolute certainty, and uncertainty can arise due to changes in environmental variables or other factors that are difficult to predict. This challenge can be critical, especially in a business context where the decisions taken have a direct impact on the company's strategy. The successful use of AI in predicting consumer behavior depends not only on the model's ability to learn from historical data, but also on its ability to overcome uncertainty and adapt to changing market conditions (Ullah et al., 2019).

The process of integration and adoption of Artificial Intelligence Systems is also a challenge. Many companies may face difficulties in integrating AI systems with existing infrastructure. This process requires investments not only in terms of technology, but also in terms of employee training and organizational culture change. These challenges can be compounded by a lack of understanding and literacy of AI among workers and key stakeholders. The adoption of this technology requires a deep understanding of how Artificial Intelligence Systems work, their potential, and also their impact on business processes and human work. Therefore, a good training and education program is needed to ensure that all parties involved can understand and support the use of this technology (Bunod et al., 2022).

Although the challenges in utilizing Artificial Intelligence Systems can seem intimidating, various strategies can be implemented to overcome such obstacles. First, companies need to ensure that they have strict data security policies and practices, including the use of encryption and strict access controls. Transparency in data usage and AI decisions are also needed to build consumer and interested party trust. Furthermore, to address ethical challenges, companies need to adopt clear ethical guidelines in the development and implementation of Artificial Intelligence Systems. This can involve the involvement of ethicists in the development team, the implementation of ethical audits, and openness to input from consumers and other community groups.

In the face of uncertainty, companies need to develop AI models that can dynamically adapt to changing environmental conditions and variables. This can involve the use of adaptive machine learning techniques or models capable of measuring and managing uncertainty levels in their predictions. To address integration and adoption challenges, companies can design structured implementation plans, provide sufficient employee training, and ensure effective communication regarding the benefits and objectives of utilizing Artificial Intelligence

Systems. Incremental adoption and a good understanding of its impact can help reduce resistance and increase implementation success.

The challenges and obstacles in the utilization of Artificial Intelligence Systems reflect the complexity of integrating this technology in various sectors. In facing these challenges, companies need to adopt a holistic approach, covering technical, ethical, and social aspects. Deep understanding, appropriate policies, and constant innovation are key in optimizing the benefits of Artificial Intelligence Systems while managing their risks wisely. By addressing these challenges, AI technology can continue to evolve and have a significant positive impact on the business world and society as a whole.

3. Strategic and Future Implications of Utilizing AI in Consumer Behavior Prediction

The use of Artificial Intelligence (AI) Systems in predicting consumer behavior has a significant strategic impact on companies in developing marketing strategies, increasing customer satisfaction, and building competitive advantages. In this discussion, we will explore in depth the strategic implications of using AI in predicting consumer behavior, including improving service personalization, business model transformation, marketing paradigm shifts, and views on the future of this technological development (Bermejo et al., 2019).

One of the key strategic implications of leveraging AI in consumer behavior prediction is improved service personalization. With AI's ability to deeply analyze consumer data, companies can deliver more personalized and relevant experiences. AI models can understand individual preferences, purchase history, and interaction patterns, allowing companies to craft product offerings that better suit each consumer's needs. This increased personalization has a positive impact on customer satisfaction and loyalty. Consumers tend to respond better to products and services that match their preferences. In addition, personalization can create a closer relationship between companies and consumers, because consumers feel cared for and valued as individuals.

The strategic implications of leveraging AI also include business model transformation. In an increasingly connected and competitive world, companies that are able to effectively harness data to predict consumer behavior can transform the way they operate. Traditional business models can be improved or even replaced by more adaptive and responsive models. A concrete example of this transformation is the shift from a product-based business model to a subscription or service model. With a better understanding of consumer needs, companies can present subscription offers that better meet consumer expectations. This opens up new opportunities for sustainable revenue and allows companies to maintain their relevance in the long term (Wisetsri et al., 2021).

The use of AI in the prediction of consumer behavior has also stimulated a paradigm shift in the world of marketing. Traditionally, marketing is often reactive, responding to trends and consumer behavior that have already occurred. However, with AI's predictive capabilities, companies can shift to being more proactive in structuring marketing campaigns and designing strategies that can anticipate changes in consumer needs. Marketing models powered by AI can provide smarter recommendations, adjust marketing content, and determine optimal times to send messages to consumers. By combining consumer data analysis and artificial intelligence, companies can optimize every stage of the consumer journey, from initial attention to purchase decision (Davenport et al., 2020).

The use of AI in consumer behavior prediction can also provide a significant boost to product innovation. With in-depth data analysis, companies can detect market trends, identify unmet consumer needs, and forecast demand for certain types of products or features. This opens up opportunities for companies to develop products that are more innovative and responsive to consumer desires. AI models can help in the development of new products or updates that are more in line with consumer expectations, increasing the likelihood of a successful product launch in the market.

Improved prediction of consumer behavior through the utilization of AI can also bring significant operational efficiencies. With a better understanding of consumer demand and preferences, companies can manage their supply chains more efficiently, optimize product inventory, and reduce waste. In addition, the utilization of AI-based chatbots and virtual assistants in customer service can reduce the burden of manual work, allowing human staff to focus on tasks that require specialized expertise. This can lead to cost savings and increased productivity.

Although the strategic implications of utilizing AI in consumer behavior prediction are promising, ethical challenges and considerations need to be taken seriously. The use of highly personalized consumer data can raise concerns about privacy and security. Therefore, companies need to maintain and comply with applicable privacy

regulations, such as GDPR in the European Union, and ensure that data use is done ethically. In addition, the risk of discrimination and bias in AI decision-making must also be addressed. AI models tend to learn patterns from training data, and if the data reflects inequalities or biases, then the decisions made by the model can create or perpetuate those inequalities.

The future of using AI in consumer behavior prediction promises even bigger breakthroughs. The development of more sophisticated algorithms, improvements in natural language processing, and the integration of AI with other technologies such as the Internet of Things (IoT) could result in more intelligent and responsive systems. Improvements in sentiment analysis and context understanding could improve AI's ability to read consumer emotions and preferences more accurately. This will open the door to a more immersive and personalized customer experience.

In addition, the integration of AI with blockchain technology can also provide additional security and build consumer confidence in the management of their data. Blockchain can be used to create an immutable record of how data is used, giving consumers more transparency and control. The utilization of augmented reality (AR) and virtual reality (VR) technology in combination with AI can also create a more immersive and engaging shopping experience. This can have a significant impact on the retail and e-commerce industries, where consumers can try products virtually before making a purchase.

The utilization of Artificial Intelligence Systems in the prediction of consumer behavior carries profound strategic implications for companies in the face of an increasingly dynamic business environment. Increased service personalization, business model transformation, marketing paradigm shift, and product innovation are some of the positive impacts that can be obtained. However, ethical challenges and considerations, especially related to privacy and bias, must be addressed judiciously. The future of AI in consumer behavior prediction offers endless opportunities, especially with ever-evolving technological advancements. The development of more sophisticated AI models and integration with other technologies can shape a more dynamic and responsive business landscape. By continuously developing and integrating these technologies with ethical policies and practices, companies can achieve maximum benefits while minimizing potential risks. Thus, the use of AI in predicting consumer behavior is a key element in the success and sustainability of companies in this digital era.

CONCLUSION

The use of Artificial Intelligence (AI) Systems in predicting consumer behavior has opened a new chapter in the ever-changing business world. As technology advances and AI models become more sophisticated, companies are strategically positioned to grasp the future with more certainty. In this exploratory journey, we've dived into the profound strategic implications, skinning the benefits of service personalization, business model transformation, and marketing paradigm shifts. Increased service personalization through the utilization of AI opens the door to a more immersive and individualized customer experience. By better understanding consumer preferences, companies can tailor product and service offerings with more precision, build closer connections, and increase customer loyalty.

Transforming business models to be more adaptive and responsive is a crucial strategic step in facing this digital era. Companies that are able to integrate predictive consumer behavior into their business strategies can increase efficiency, gain competitive advantage, and answer consumer needs more accurately. The shift in the marketing paradigm from being reactive to being more proactive is an important evolution that is taking place. The utilization of AI allows companies to forecast consumer trends and needs, opening up opportunities to design more effective and relevant marketing campaigns. However, all these achievements did not come without challenges. Data security, ethical concerns, and integration challenges are some of the hurdles that need to be carefully addressed. The successful implementation of Artificial Intelligence Systems in predicting consumer behavior requires a holistic approach that includes technical, ethical, and security aspects.

The future of AI in consumer behavior prediction promises even greater innovation. The development of increasingly intelligent algorithms, integration with new technologies, and the application of augmented and virtual reality technologies will shape new scenes in the interaction of companies with consumers. In closing, we can conclude that the use of Artificial Intelligence Systems in predicting consumer behavior is not only a breakthrough, but also a paradigm shift in the way companies interact with customers. By harnessing the full potential of these technologies, companies can build closer relationships, craft more adaptive business strategies, and open the door to limitless innovation. While challenges and changes may be challenging, through a thoughtful mix of vision, commitment, and policy, companies can prepare for an infinite journey of grasping a bright future with confidence.

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