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The Role of AI in Predicting Consumer Behaviour and Effective Marketing Strategies

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ABSTRACT

Artificial Intelligence (AI) has become an important tool in analysing and predicting consumer behaviour. With its big data processing capabilities, AI can assist companies in developing more effective and efficient marketing strategies. This research aims to analyse the role of AI in understanding consumer behaviour patterns and their implications for marketing strategies. The method used in this research is a literature study that includes various journals, industry reports, and case studies. The results show that AI provides significant advantages in increasing sales conversions, optimising marketing costs, and strengthening relationships between companies and customers. However, challenges such as data privacy and algorithm transparency remain major concerns in the application of this technology. Therefore, an ethical and sustainable strategy in adopting AI is required so that the benefits can be optimised without compromising customer trust. This research provides insights for academics and business practitioners in understanding the impact of AI on consumer behaviour and developing more innovative and data-driven marketing strategies.

Keywords : artificial intelligence, consumer behaviour, marketing strategy, personalisation, chatbot

INTRODUCTION

The development of Artificial Intelligence (AI) technology in the business world has progressed rapidly and is increasingly being applied in various sectors to improve efficiency and competitiveness (Dehkordi, 2024). AI is now used in data analysis to explore business insights more accurately and quickly, enabling companies to make more informed data-based decisions. In big data processing, AI plays a role in filtering, classifying, and analysing large amounts of data in real-time, helping companies identify market trends and consumer behaviour patterns (Maulani & Widoretno, 2024; Urva et al., 2023). In addition, AI is also being applied in service personalisation, such as product recommendations based on customer preferences in e-commerce platforms, chatbots to improve customer service, and virtual assistants that help automate various administrative tasks. With the widespread application of AI, the business world continues to transform towards higher efficiency and a more optimised customer experience (Mahendra et al., 2024; Oktaviani, Ayuni, Sembiring, Lie, & Yeo, 2024).

The digital era has significantly changed consumer behaviour, where easy access to the internet and technological developments have led to an increase in online shopping, reliance on social media, and the use of data-driven recommendations in decision-making. Consumers are now more likely to seek product information through online reviews, compare prices across multiple platforms, and rely on recommendation algorithms to find products that match their preferences (Haro, Kushariyadi, Widyawati,

Fauziyah, & Judijanto, 2024; Nazilah, 2025). In addition, the growing trend of customer-centric marketing requires businesses to understand customer needs and expectations more deeply. With data analytics and artificial intelligence, companies can create more personalised experiences, from customised marketing to responsive customer service (Chaidir & Irawan, 2024). This transformation confirms that the success of a business in the digital era is highly dependent on its ability to adapt to changing consumer behaviour and deliver relevant and value-added experiences (Razina, Yunita, & Sabilah, 2025; Yeni, Darmaputera, & Hildayanti, 2024).

Understanding and accurately predicting consumer behaviour is a key factor in business success, as it enables companies to develop more effective and targeted marketing strategies. By analysing data on customer behaviour, preferences and market trends, companies can create products and services that meet consumer needs, increase customer loyalty and maximise sales opportunities. Conversely, mistakes in predicting market trends can result in decreased profitability, such as overstocking of products that are not in demand, irrelevant marketing strategies, or loss of customers to competitors that are more responsive to change. Therefore, the use of technologies such as data analytics and Artificial Intelligence in understanding consumption patterns is becoming increasingly important for businesses to remain competitive and sustainable amidst evolving market dynamics (Setiawan et al., 2024; Sulistyawati, 2024).

Artificial Intelligence (AI) plays a role in consumer behaviour analysis and prediction with its ability to process large amounts of data quickly and accurately. Through technologies such as machine learning and deep learning, AI can identify consumption patterns and trends based on purchase history, digital interactions, and customer preferences. Natural language processing (NLP) also enables AI to understand and analyse consumer sentiment from reviews, social media, and customer feedback to provide deeper insights. With these capabilities, companies can personalise marketing strategies, optimise product recommendations, and design more effective promotional campaigns. In addition, more accurate consumer behaviour predictions help businesses anticipate changing market trends, reduce the risk of strategic mistakes, and improve customer satisfaction, creating a stronger competitive edge in the digital industry (Oktaviani et al., 2024).

Several previous studies have examined the role of Artificial Intelligence (AI) in understanding and predicting consumer behaviour and its influence on the effectiveness of marketing strategies. The study conducted by Alam et al., (2025) shows that the application of AI can increase customer loyalty and give companies a competitive advantage in an increasingly complex and dynamic marketing world. Another study by Bharadwaj (2023) discusses how natural language processing (NLP) helps businesses in analysing customer sentiment from social media and product reviews, so that companies can adjust their marketing campaigns more responsively. Additionally, research by Singh & Singh (2024) and Patil (2024) highlighted the application of AI-based chatbots in improving customer experience and brand loyalty through faster and more efficient interactions. The results of these studies show that the integration of AI in marketing

strategies not only improves the understanding of consumer behaviour but also helps companies in optimising data-driven marketing decisions.

This research has high relevance in modern business development, especially for companies that want to improve the effectiveness of their marketing strategies in the digital era. With the rapid development of Artificial Intelligence (AI) technology, a deeper understanding of the role of AI in predicting consumer behaviour is crucial for creating marketing strategies that are more targeted, personalised, and responsive to market changes. For business practitioners, this research can provide insights into how AI applications, such as big data analytics, machine learning, and chatbots, can improve customer experience and drive brand loyalty. Meanwhile, for academics, this research contributes to enriching the study of the interaction between AI and consumer behaviour, while opening up opportunities for further research in the field of technology-based marketing. Thus, this research not only has practical benefits for the business world, but also makes an academic contribution in understanding the impact of AI on marketing strategies and the dynamics of modern consumer behaviour.

The purpose of this research is to analyse the role of Artificial Intelligence (AI) in predicting consumer behaviour and developing more effective and targeted marketing strategies. This research aims to identify how AI technologies, such as machine learning, deep learning, and natural language processing (NLP), are used in processing consumer data to understand patterns, preferences, and market trends. It also seeks to explore the impact of AI implementation on the efficiency of marketing strategies, including ad personalisation, customer service improvement through chatbots, and optimisation of product recommendations. Thus, the results of this study are expected to provide insights for companies in adopting AI technology to improve business competitiveness and provide academic contributions in the development of studies on technology-based marketing.

RESEARCH METHOD

This research uses a literature study approach by analysing various secondary sources, such as scientific journals, industry research reports, and case studies of companies that have implemented AI in their marketing strategies (Wujarso et al., 2023). This approach aims to gain an in-depth understanding of how AI is used to analyse consumer behaviour and improve marketing effectiveness. The analysis is conducted by identifying patterns, trends, and the impact of AI implementation on modern marketing strategies, including personalisation of services, optimisation of advertising campaigns, and improvement of customer experience through technologies such as machine learning, deep learning, and natural language processing (NLP). Data obtained from various sources will be systematically reviewed to reveal the link between the utilisation of AI and the success of more efficient, responsive, and data-driven marketing strategies. With this method, the research is expected to make a significant contribution to academics in the development of technology-based marketing studies, as well as to business practitioners in designing more innovative and competitive marketing strategies in the digital era.

RESULT AND DISCUSSION

AI in Predicting Consumer Behaviour

Artificial Intelligence (AI) plays an important role in predicting consumer behaviour by leveraging machine learning algorithms that can analyse historical data to identify behavioural patterns. By processing transaction data, search history, and customer interactions, AI can recognise buying tendencies, product preferences, and the optimal time to market. For example, recommendation algorithms used by e-commerce platforms can learn customers' shopping patterns and offer products that match their interests, increasing the chances of conversion and customer loyalty. These data-driven analyses allow companies to make more strategic, efficient, and accurate predictive-based marketing decisions.

In addition, natural language processing (NLP) techniques play a role in understanding customer sentiments and preferences from product reviews, social media comments, and customer service conversations. With NLP, AI can recognise language patterns, classify customer opinions as positive, negative or neutral, and identify aspects of the product that consumers like or complain about the most. For example, companies can use sentiment analysis to assess people's perceptions of a marketing campaign or new product launch, allowing them to adjust marketing strategies more responsively. By understanding customer sentiment, businesses can promote more personalised interactions and build closer relationships with their customers.

In addition to behavioural prediction and sentiment analysis, AI also enables more accurate customer segmentation based on their habits and preferences. With this technique, companies can group customers into different categories, such as loyal customers, seasonal buyers, or potential customers, so that marketing strategies can be tailored to the needs of each segment. For example, companies can send special promotions to customers who frequently purchase certain products or offer discounts to new customers to increase conversion rates. With more precise segmentation, AI helps companies create more personalised customer experiences, increase the effectiveness of marketing campaigns, and ultimately, drive sustainable business growth.

Several previous studies have proven the effectiveness of Artificial Intelligence in predicting consumer behaviour and improving marketing strategies. Research conducted by Singgalen (2023) shows how AI-based data processing, such as TF-IDF and SVM, can assist businesses in understanding customer preferences. With the CRISP-DM method, businesses can optimise data-driven marketing strategies to improve customer experience and marketing campaign effectiveness. Another study by Sinjanka et al., (2023) shows that the utilisation of Natural Language Processing (NLP) in social media sentiment analysis helps companies understand public opinion towards a brand, so they can quickly adjust communication and marketing strategies. In addition, research from Alam et al., (2025) revealed that AI-based customer segmentation not only improves service personalisation but also contributes to increased customer loyalty and long-term retention.

Based on the various findings and research that have been described, it can be concluded that Artificial Intelligence has an increasingly crucial role in modern marketing strategies. AI's ability to analyse data in depth, understand customer sentiment, and perform more accurate segmentation gives companies a competitive advantage in the face of evolving market dynamics. By leveraging AI, businesses can not only improve the effectiveness of marketing campaigns, but also create more personalised and relevant customer experiences. However, the application of AI in marketing must also be balanced with ethical use of data and transparency in interactions with customers to build sustainable trust. Therefore, companies that want to remain relevant and competitive in the digital era need to continue to innovate in adopting AI and optimise their utilisation strategies to achieve sustainable business growth.

AI-Based Marketing Strategy

One of the key advantages of AI in marketing strategy is its ability to deliver more targeted content personalisation. By analysing historical customer data, such as search history, product preferences, and purchase patterns, AI can provide recommendations that match each individual's needs and interests. For example, e-commerce platforms such as Amazon and Netflix use machine learning algorithms to offer users the most relevant products or shows based on their previous activities. This approach not only improves customer engagement, but also encourages loyalty and increases sales conversions, as customers feel they are getting an experience tailored to their preferences.

In addition, AI also plays a role in optimising data-driven marketing strategies in real-time. With technologies such as machine learning and Natural Language Processing (NLP), companies can analyse customer behaviour across multiple digital channels, including social media, email and mobile apps. This allows marketers to customise their campaigns based on emerging trends and real-time customer responses. For example, AI can identify the best time to send promotional emails or customise digital ads to appeal more to specific market segments. With predictive analytics, businesses can be more proactive in designing responsive and dynamic marketing strategies, thereby increasing the effectiveness of their campaigns.

Furthermore, AI also helps in marketing automation that can save companies time and resources. Technologies such as AI-powered chatbots are able to provide fast and efficient customer service by answering queries in real-time and providing relevant product recommendations. In addition, AI systems in digital marketing can automate the ad bidding process, optimise marketing budgets, and target more potential audiences through analysis of their online behaviour. With the utilisation of AI, companies can improve operational efficiency while providing a better customer experience, thus creating a smarter, adaptive and market-oriented marketing strategy.

Research by Zikry et al., (2024) examined the effectiveness of AI-based recommendation systems in improving customer experience on e-commerce platforms. The results show that machine learning algorithms personalising user experience have a greater influence than product recommendations in improving user satisfaction. Meanwhile, a study by Vashishth et al., (2025) showed that AI-supported content personalisation significantly improved customer experience in e-commerce marketing. In addition, research conducted by Haleem et al., (2022) highlighted how the use of AI can help quickly determine what content to target to customers and which channels to use at what moment, thanks to the data collected and generated by its algorithms. AI can also be used to analyse the performance of competitors' campaigns and reveal their customer expectations.

The implementation of AI-based chatbots has become one of the key innovations in modern customer service. Chatbots allow companies to provide fast, accurate, and available responses 24/7 without the need for direct human intervention. By utilising Natural Language Processing (NLP) technology, chatbots can understand and respond to customer queries with more natural language and provide appropriate solutions. For example, e-commerce platforms and banking services use chatbots to assist customers in tracking orders, checking balances or completing transactions automatically. This not only increases customer satisfaction but also reduces the workload of human customer service teams, allowing them to focus on more complex issues.

In addition, AI-based chatbots are also capable of improving service personalisation by remembering interaction history and customer preferences. A chatbot can provide product recommendations, offer special promotions, or provide related information based on previous purchase patterns. For example, in the retail industry, a chatbot can suggest clothing or accessories based on the customer's taste, while in banking services, a chatbot can provide information on investment products that match the user's financial profile. With these capabilities, chatbots are not only a tool to answer questions but also part of a more effective and customer-centric marketing strategy.

Furthermore, the use of chatbots in customer service also helps companies improve operational efficiency. By automating repetitive tasks such as answering FAQs or handling refund requests, companies can reduce operational costs while speeding up the service process. In addition, more sophisticated chatbots can be combined with real-time data analysis to identify trends in customer complaints and provide useful insights for companies in improving the quality of their products or services. With the widespread adoption of chatbots, companies from various industries can create faster, more efficient and interactive customer experiences, thereby strengthening customer loyalty and increasing competitiveness in the ever-evolving digital marketplace.

Research by Soetiyono et al., (2024) examined the effect of using chatbots and virtual assistants in customer management on customer satisfaction and purchasing decisions. The results show that these technologies significantly have a positive impact on customer satisfaction and influence consumer purchasing behaviour. In addition, research by Nugraha & Nasution (2024) examined the impact of AI chatbots on reducing

customer service workload at Grab, specifically in the context of transportation and delivery services in Medan City. The results showed that 75% of agents experienced a decrease in workload, with an increase in average response time by 30%. Another study by Rosanti et al., (2025) explored how the use of chatbots and virtual assistants on the Lazada app affects customer satisfaction and purchase decisions. The study concluded that the implementation of AI-based automated customer service can significantly improve customer experience towards customer satisfaction and purchasing decisions on the Lazada app.

In the digital era, targeted advertising has become one of the most effective marketing strategies, with Artificial Intelligence (AI) playing a key role in its optimization. By leveraging machine learning and big data analytics, AI can identify consumer behavior patterns based on search history, social media interactions, and purchasing habits. This technology enables advertisers to deliver more relevant and personalized ads, increasing the likelihood of conversion compared to conventional marketing methods. For instance, platforms like Google Ads and Facebook Ads use AI to tailor ad content to user preferences, ensuring that the displayed advertisements align with their needs and interests.

Moreover, AI helps optimize marketing strategies by adjusting ads in real time. Through techniques such as programmatic advertising, AI can automatically purchase, place, and manage digital ads based on data collected from the target audience. This allows companies to maximize their marketing budgets by displaying ads only to users with a higher potential for making a purchase. For example, a user who frequently searches for information about a specific gadget is more likely to see ads for similar products across various digital platforms. As a result, AI enhances advertising campaign efficiency, reduces budget waste, and improves the return on investment (ROI) of digital marketing.

Furthermore, AI enables automated A/B testing and predictive analytics to refine advertising campaign effectiveness. By collecting data on how users respond to different ad versions, AI can determine the most engaging format, design, and message for the target market. Additionally, AI can predict the best time to display ads, increasing the likelihood of user engagement. With the ability to continuously learn and adapt, AI makes digital advertising more precise, adaptive, and data-driven, allowing businesses to reach the right audience in a more effective and efficient manner.

The study from Saefudin et al., (2023) discusses the use of AI in social media analysis to enhance marketing effectiveness. AI assists in data analysis, content personalization, decision-making, operational efficiency, and cost savings, all of which contribute to improved marketing performance and customer experience. Another study by Girfita et al., (2024) highlights how AI can help Micro, Small, and Medium Enterprises (MSMEs) target more specific audiences, customize ad content, and optimize ad performance based on real-time data, thereby increasing marketing campaign effectiveness. Meanwhile, research by Ramadhani & Salisah (2024) examines the role of AI in digital advertising personalization through a case study on the Spotify application.

The results show that AI usage can enhance the relevance and effectiveness of ads presented to users.

Overall, AI-driven marketing strategies have significantly transformed how companies reach and interact with customers. Content personalization enables more relevant experiences and fosters customer loyalty, while chatbots and automated customer service accelerate response times and enhance communication efficiency. Additionally, targeted advertising ensures that marketing campaigns are more effective by displaying ads to the most potential audience. With the continuous advancement of AI implementation, companies can optimize their marketing strategies in a smarter, more efficient, and data-driven manner, thereby increasing competitiveness in an increasingly dynamic market.

In the rapidly evolving digital era, the adoption of Artificial Intelligence (AI) in marketing strategies is no longer just an option but has become a necessity for companies aiming to stay competitive. AI provides deep data analysis capabilities, allowing businesses to understand consumer behavior more accurately and develop more effective and efficient marketing strategies. Through content personalization, responsive chatbots, and intelligently targeted advertising, AI helps businesses create more relevant and interactive customer experiences.

From the author's perspective, integrating AI into marketing not only enhances efficiency but also fosters stronger relationships between brands and their consumers. AI's ability to process data in real time enables businesses to quickly adapt to changing trends and market demands, ultimately improving conversion rates and customer loyalty. However, it is crucial for companies to consider ethical aspects in AI utilization, particularly concerning data protection and consumer privacy.

Therefore, AI must be leveraged with a balanced approach, ensuring that technology enhances customer experiences without compromising transparency and trust. Moving forward, with continuous innovation, AI will play an even greater role in shaping the digital marketing landscape, offering new opportunities for businesses to grow and thrive amidst increasing competition.

Implications and Challenges

The implementation of Artificial Intelligence (AI) in marketing strategies provides significant benefits for companies. One of the primary advantages is improved operational efficiency, as AI can automate various tasks such as customer segmentation, content personalization, and real-time ad campaign management. With these capabilities, companies can reduce reliance on human labor for routine and administrative tasks, thereby lowering operational costs. Additionally, AI enables the optimization of marketing expenditures by targeting the most relevant audiences, increasing conversion rates, and maximizing Return on Investment (ROI). Through a data-driven approach, businesses can make more accurate marketing decisions, enhance customer experiences, and ultimately drive sales growth.

However, despite the numerous benefits AI offers, there are also challenges that must be addressed, particularly concerning data privacy and algorithm transparency. AI relies on vast amounts of customer data to analyze consumer behavior and preferences, raising concerns about personal information protection. Regulations such as the General Data Protection Regulation (GDPR) in Europe and Indonesia's Personal Data Protection Law (PDP) require companies to manage customer data carefully to avoid privacy violations. Additionally, algorithm transparency remains a major concern, as many businesses do not fully understand how AI makes decisions, potentially leading to biases or unfairness in marketing strategies. Therefore, to ensure AI is implemented ethically and effectively, companies need to adopt transparency policies, comply with regulatory requirements, and build consumer trust.

CONCLUSION

The conclusion of this study confirms that Artificial Intelligence (AI) plays a crucial role in predicting consumer behavior and enhancing the effectiveness of marketing strategies. With advanced data analysis capabilities, AI enables companies to understand consumption patterns, customer preferences, and target markets more accurately. Through techniques such as machine learning and natural language processing (NLP), AI can process transaction data, customer reviews, and social media interactions to provide deeper insights. Additionally, AI supports more effective market segmentation, allowing marketing strategies to be tailored to the specific needs of each customer.

In the implementation of AI-based marketing strategies, innovations such as content personalization, automated customer service chatbots, and targeted advertising have been proven to increase customer engagement and sales conversions. While AI offers various benefits, including operational efficiency and marketing cost optimization, challenges such as data privacy and algorithm transparency remain critical concerns. Therefore, companies must adopt AI with an ethical and responsible approach to maintain customer trust. With the right strategy, AI can continue to be a valuable tool in supporting sustainable business growth while creating more personalized and innovative customer experiences.

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