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ANALYSIS OF MACHINE LEARNING AND AI TO ENHANCE MARKETING NEEDS AND CUSTOMER SATISFACTION

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ABSTRACT

The development of Machine Learning (ML) and Artificial Intelligence (AI) technologies has revolutionized various industries, including marketing and customer satisfaction. In the modern competitive business era, companies are increasingly relying on this technology to improve operational efficiency and effectiveness, especially in answering marketing needs and customer satisfaction. This study aims to analyze the role of ML and AI in strengthening aspects of marketing and customer satisfaction in the business sector. The research method uses a qualitative approach with data collection techniques through literature studies. After the data is collected, it is then analyzed by the stages of filtering relevant data, presenting key information, and answering the research objectives in the conclusion. The results of the study show that the application of ML and AI can significantly improve the marketing effectiveness of companies through personalization of products and services, conducting more accurate customer segmentation, predicting consumer behavior, and optimizing various aspects of marketing. On the other hand, the application of ML and AI also plays an important role in improving customer satisfaction. For example, with the use of intelligent chatbots and customer feedback analysis, companies can understand the shortcomings that need to be fixed, then improve the quality of customer service. So, by utilizing this technology, companies can increase efficiency in marketing, drive increased sales, and build more solid relationships with customers, which ultimately contributes to increased customer satisfaction.

INTRODUCTION

In recent decades, consumer expectations for the shopping experience and interaction with brands have changed significantly. Consumers now want more experiences that are fast, responsive, and relevant. This change encourages companies to continue to innovate to understand and meet customer needs more effectively (Razak, 2023). However, companies face major challenges in terms of the increasing volume and complexity of data. This data comes not only from sales transactions, but also from other sources such as customer reviews, interactions on social media, geographic data, and online search patterns. This diverse data is growing at a high speed, and its volume continues to grow every day, making it difficult to process manually (Wulandari, 2023).

In the midst of these challenges, technological developments have opened up new opportunities in various aspects of business, including marketing and customer satisfaction. Technologies such as Machine Learning (ML) and Artificial Intelligence (AI) have the potential to help companies change the way they interact with customers and analyze consumer behavior and needs. These technologies facilitate companies to process data at scale more effectively, generate valuable insights to improve marketing strategies, and maintain and improve customer satisfaction. Innovations in AI and ML help

companies to extract value from available data more easily, making data an asset that supports business decisions and strengthens relationships with customers (Razak, 2023).

Artificial Intelligence (AI) is a term that refers to computer technology that mimics human intelligence, so that it is able to carry out various complex tasks in an efficient way. AI aims to make computer systems able to think, understand, and make decisions that would normally require human thinking. Meanwhile, Machine Learning (ML) is one of the methods in AI, namely computers to "learn" independently based on the data they receive, without the need for explicit instructions from humans (Soori et al., 2023). ML is a subset of AI, which means that every ML application also falls under the category of AI. However, not all AI applications or solutions use ML methods.

Both technologies are able to offer significant solutions to the challenges companies face today, especially in the need for effective marketing and increased consumer satisfaction. These advancements in technology facilitate systems to accurately recognize faces and objects, which opens up great opportunities for a wide range of business applications. On the other hand, AI also helps companies to understand customer preferences more deeply; for example, this technology can analyze facial expressions to identify customer moods, so that businesses can provide product recommendations that are more in line with the customer's feelings or desires at that time (Olson & Levy, 2017; Yang et al., 2021).

In marketing, AI and ML are capable of collecting and analyzing data from various sources such as social media, websites, and mobile apps. This data is then processed to understand consumer trends, individual preferences, and opportunities to improve product or service offerings. AI's ability to provide a more personalized and relevant marketing approach makes the customer experience richer and increases their satisfaction (Saura et al., 2021). Additionally, AI-driven personalization of services provides added value in the relationship between the company and the customer. When customers feel valued and understood, customer satisfaction levels increase. Furthermore, the application of ML and AI in managing customer satisfaction also allows for a quick and appropriate response to changes in consumer behavior. This strengthens customer loyalty by improving the quality of interactions and providing a more positive customer experience, which is crucial for maintaining long-term relationships (Gkikas & Theodoridis, 2019; Stalidis et al., 2015).

Previous research conducted by Haleem et al. (2022) highlighted that AI, especially through techniques such as ML, plays an important role in improving the effectiveness of digital marketing. AI provides marketers with a key advantage by collecting and analyzing large amounts of data to generate concrete and actionable insights, which ultimately strengthens customer engagement and loyalty.

Meanwhile, research by Madhuri et al. (2024) that discusses the use of ML and AI in improving customer satisfaction shows that through sentiment analysis and predictions, businesses can anticipate customer needs, personalize marketing strategies, and offer more relevant products, ultimately having a positive impact on customer satisfaction. The existence of automation of various routine tasks and answering customer questions, allows companies to use resources more efficiently, provide faster responses, and increase customer satisfaction.

This research is novel in its approach that provides practical guidance for companies to adopt ML and AI, specifically to strengthen marketing strategies and improve customer satisfaction. The study not only shows how ML and AI can improve marketing efficiency and relevance, but also highlights the importance of decision-making based on real-time data and consumer behavior analysis. This data-driven approach presents a new method to understand and meet customer needs more accurately and responsively in the digital era.

The results of the research are expected to contribute to providing applicable implementation guidelines, which can be used by companies to be more effective in managing technology-based marketing and customer service. Through the insights obtained from this research, the company is expected to improve the accuracy in designing marketing strategies, based on constantly updated data and customer behavior information generated directly. The results of this study also enrich the literature discussing the application of AI and ML in marketing and customer satisfaction, providing a solid foundation for further research in this area. Thus, the main objective of the study is to analyze the contribution of ML and AI in meeting marketing needs and improving customer satisfaction.

METHODS

This study employed a qualitative approach for its research method. The focus was on creating a comprehensive picture of the phenomenon under investigation, emphasizing the detailed perspectives

of informants. The research was conducted in a natural environment to authentically capture social aspects or phenomena, making it suitable for in-depth understanding rather than numerical analysis.

Data collection was conducted through library research techniques, which involved gathering and analyzing literature relevant to the research topic. This included reviewing existing theories and findings from various sources such as books, journals, and previous studies. Each source was critically assessed and analyzed to strengthen the research argument.

The analysis process followed several steps: first, data was filtered through reduction to retain only relevant information. The remaining data was then presented descriptively, forming a rich narrative for discussion. Finally, conclusions were drawn from this analysis to address the research questions and achieve the study's objectives.

RESULTS

The development of technology today has produced various innovations that are able to significantly support human life. In today's era, humans live in a dynamic and changing global society. The great current in globalization and technological advances is driving the emergence of new market forces. Innovations are created to have a broad scope of purpose, which is to realize a smarter future where people can enjoy the best quality of life (Lee & Trimi, 2018). One of the latest technological innovations is the emergence of machine learning (ML) and artificial intelligence (AI). The use of this technology is driven by human cognitive limitations in absorbing and processing information, especially in the midst of an increasingly rapid flow of information and a high speed of information production. This cognitive limitation is increasingly visible with an increase in the volume and complexity of available information. Therefore, it is important to consider the potential for AI interaction and adoption in innovation management, so that it can support the decision-making process and the use of information more effectively (Purnomo, 2023).

Artificial Intelligence (AI) has become a hot topic of discussion lately. Not only in the scope of Information Technology (IT), discussions about AI are now also expanding into the business realm, showing its increasingly widespread influence in various fields (Rismayadi, 2024). Essentially, AI is a simulation of human intelligence implemented in machines, allowing computers to think and behave like humans. With the help of this technology, intelligent machines are capable of performing a variety of activities that require human intelligence, such as robotics, speech and image recognition, natural language processing, and problem-solving. In the business field, AI also brings efficiency benefits, both in terms of time and cost, by helping to perform tasks that require intelligent human-like understanding and response (Chintalapati & Pandey, 2022; Marinchak et al., 2017; Toorajipour et al., 2021).

One of the most popular branches of AI is Machine Learning (ML). ML is a computer science discipline that makes computers learn from data without the need to be explicitly programmed for a specific task. As a subfield of AI, ML is attracting great attention in research because of its potential to automate the process of learning from experience. Tom Mitchell, one of the most widely referenced figures in the ML literature, defines machine learning as an effort to build a computer program that can improve its performance along with experience. According to him, "a computer program is said to learn from the experience of E in relation to some type of task T and a measure of performance P, if its performance in task T, measured by P, increases along with experience E" (Yazici et al., 2023).

While ML and AI are often considered similar, they have different scopes. ML is a subset of AI that focuses on learning from data and automated refinement, while AI covers broader areas such as natural language understanding, decision-making, and complex problem-solving. Thus, AI is not only about learning from data, but also about creating systems that are able to think and act intelligently, supporting its role in improving efficiency and productivity in various applications (Ma & Sun, 2020). The use of AI and ML in business offers a variety of benefits for the sustainability of the company. Studies show that AI has great potential to reinvent business models, change the future job landscape, improve performance, and expand human capabilities (Duan et al., 2019; Wilson & Daugherty, 2018). In this case, there is potential for how AI and ML play a role in meeting marketing needs and increasing customer satisfaction.

One of the key aspects of applying AI and ML in marketing is personalization. Through business analytics, artificial intelligence, and machine learning, companies can understand and predict customer behavior based on available transaction and demographic data. For example, relevant product recommendations can be generated by analyzing purchase history, browsing behavior, and customer preferences. Predictive analytics helps marketers to identify consumption patterns, forecast consumer

interest, and provide personalized marketing through customized product messages and offers. Through this approach, AI and ML support the creation of more personalized marketing experiences, which can improve customer satisfaction and sales (Kim & Hwang, 2024).

In addition, the application of AI in marketing is increasingly important because companies must be able to recognize and understand customer needs and expectations for products and services. The insights generated by AI help marketers more easily identify target audiences, strengthen customer engagement, and create more personalized experiences. As a result, there has been an increase in the four essential elements of marketing: customer targeting, lifetime value, customer engagement, customer experience, and customer loyalty. So AI can help marketers better understand customer behavior and add value to customer interactions with brands (Maihani et al., 2023). Even AI facilitates the provision of customized content to improve marketing effectiveness. In the sales industry, AI algorithms are often used to recommend content that is relevant to the audience, which has a positive impact on revenue generation. Artificial neural networks, as a form of machine learning, process information through coordinated neurons, which help tailor content based on individual interests. As a result, AI can increase customer engagement by automatically generating relevant content. From website views to special offers, AI provides a customized experience on every customer interaction, helping businesses to leverage available data and reach potential customers more effectively and in a timely manner (Haleem et al., 2022). Furthermore, the use of machine learning (ML) in marketing also helps businesses to segment customers in a more effective and data-driven way. The use of ML encourages companies to be able to identify different customer segments based on their characteristics and behaviors. This technology helps analyze potential customers who unsubscribe or leave the service. AI can detect common features or patterns among unsubscribed customers, so marketers can plan better retention strategies to keep customers loyal (Haleem et al., 2022).

In addition, ML supports the development of more focused and targeted marketing strategies. Through data analysis, companies can explore correlations and patterns that are useful for building predictive models, which are useful in segmentation-based marketing applications. One example is a recommendation system that uses ML to learn about user behavior and preferences as they interact with a website or app. The system automatically selects relevant ads to display, tailored to user interests, thereby increasing marketing effectiveness. Because the system learns from growing data, its performance can improve independently without the need for manual algorithm updates (De Mauro et al., 2022; Ma & Sun, 2020). So by implementing this segmentation strategy, each customer segment can be given different messages and offers, which are more relevant to their needs and preferences. As a result, the effectiveness of marketing campaigns is higher because the communication conveyed feels more personal and in accordance with the unique characteristics of each customer segment.

Furthermore, the use of ML algorithms can predict customer lifetime value, that is, companies can gain deeper insights into the value that each customer can provide at all times. Through the use of large amounts of structured and unstructured data, ML supports more efficient business operations and facilitates more informed decision-making. These insights help companies in allocating corporate resources effectively, optimizing the profits that can be generated from each customer (Agrawal et al., 2020).

In practice, marketers and managers can leverage AI and ML to improve campaign effectiveness in these three strategic areas, namely Segmentation, Targeting, and Positioning, so that campaigns are more relevant to audiences and more optimal in the use of resources (De Mauro et al., 2022). ML provides the ability to automate the testing of different variations of marketing campaigns, so marketers can find the most effective version in marketing. AI algorithms can help allocate budgets optimally across various marketing channels, preventing overspending on digital advertising and ensuring more strategic and efficient investments. In addition, computer vision technology, which facilitates computers to recognize objects, scenes, and activities in images, further expands the application of AI in various sectors, such as medical imaging analysis, facial recognition, public safety, and security monitoring. When combined with AI, computer vision creates devices to predict future events and take appropriate actions, helping businesses and other sectors to adapt to potential changes and challenges (van Esch & Stewart Black, 2021).

Then, on the other hand, the application of AI and ML in the marketing field not only supports operational efficiency but also plays a big role in increasing customer satisfaction. Based on statistics, 84% of marketing companies have adopted AI and ML, with 75% of them reporting an increase in

customer satisfaction by up to 10% (Davenport et al., 2020). This technology delivers faster and more responsive customer service and offers a more personalized experience.

Such as the presence of AI-based chatbots is one important example in the application of this technology for customer satisfaction. Intelligent chatbots can provide efficient customer support, answer questions quickly, and help resolve issues. Chatbot programs that use machine learning are able to mimic human conversation patterns, even predicting user emotions. This offers a convenient experience for customers and can significantly increase business growth. In the field of marketing, the use of AI-based chatbots makes it easy for customers to interact with companies directly, without having to wait for a long time or limited by operational hours (Davenport et al., 2020; Kim & Hwang, 2024). Chatbots are available at any time and can directly direct important questions to human resources if they cannot be resolved automatically, thereby speeding up response times and improving customer satisfaction (Maihani et al., 2023).

In addition to chatbots, sentiment analysis is also an important part of efforts to improve customer satisfaction. Machine learning can process and analyze various forms of customer feedback from social media, reviews, and surveys to gauge satisfaction and identify areas for improvement. Sentiment analysis provides an in-depth understanding of a customer's views and preferences towards a product or service. That way, companies can automatically understand customer sentiment, whether it's from product reviews, social media comments, or other user feedback. As a result of these insights, companies can respond more quickly and appropriately, accelerating the taking of appropriate actions to maintain customer satisfaction (Maihani et al., 2023).

Real-life examples of the application of ML and AI in marketing have provided huge advantages for leading digital companies such as Google, Netflix, Spotify, Facebook, and Uber, which use these technologies to understand user demands and recommend content that matches customer preferences (Garusing-Arachchige, 2002). In all these cases, AI and ML technologies not only help improve the user experience but also improve efficiency in the marketing process. Based on the use of data to understand consumer patterns and preferences, it helps companies to be able to design more personalized experiences, improve marketing effectiveness, and strengthen relationships with customers.

These companies show how the application of AI and ML technologies has made companies more relevant in the market and helped businesses stay competitive and innovative. Therefore, by utilizing this technology, other companies can also gain an advantage in marketing efficiency, drive increased sales, and strengthen relationships with customers. The end result is increased customer satisfaction, which has a positive impact on the profitability and sustainability of the business. For this reason, the application of AI and ML, as shown by the success of these companies, is an important innovation that needs to be utilized and developed for business progress in the digital era.

CONCLUSION

This study highlights how Machine Learning (ML) and Artificial Intelligence (AI) have transformed marketing by enabling companies to gain deeper insights into customer behavior and deliver personalized experiences, thereby enhancing marketing effectiveness and customer satisfaction. The application of these technologies allows for improved product personalization, precise customer segmentation, behavior prediction, and optimization of marketing strategies. Additionally, tools like intelligent chatbots and feedback analysis contribute to better understanding customer needs, leading to improved service quality. The findings suggest that companies should integrate ML and AI into their marketing strategies; however, the study's qualitative approach and reliance on literature reviews indicate a need for further research using quantitative or mixed methods. Future studies could explore the effectiveness of ML and AI across various industries and company sizes, examining their long-term impacts on customer satisfaction and business performance.

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