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Artificial Intelligence in Personalized Marketing: Strategies for Enhancing Consumer Engagement

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Abstract: This study examines the use of artificial intelligence (AI) in personalized marketing to boost consumer engagement. Using a systematic literature review from Scopus, DOAJ, and Google Scholar, it finds that AI helps predict consumer behavior, optimize communication, and deliver real-time adaptive content. These capabilities enhance customer satisfaction and loyalty. However, challenges such as data privacy, ethical concerns, and the need for human oversight remain. The study recommends investing in AI-driven analytics, automation, and dynamic content strategies to improve customer experience and interaction.

Keywords: AI-driven customer engagement, Predictive analytics in marketing, AI in consumer insights, AI-driven marketing ethics.

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1. Introduction

Artificial Intelligence (AI) is defined as a branch of computer science aimed at developing systems capable of performing tasks that typically require human intelligence, such as voice recognition, decision-making, and natural language processing. In the context of industrial transformation, AI plays

a crucial role in reshaping various sectors, including marketing [1]. In the marketing domain, AI enables more comprehensive data analysis, content personalization, and the automation of processes that previously required human intervention. The significant changes brought about by AI in how companies interact with customers include the ability to provide personalized product recommendations, enhance customer experiences through responsive chat-bots, and analyze consumer behavior to identify trends and preferences. For instance, Amazon has successfully implemented AI in its machine learning-based product recommendation system, significantly enhancing conversion rates and customer retention [2]. Similarly, Netflix leverages AI to personalize content recommendations based on user preferences, contributing to increased customer satisfaction and loyalty [3].

Personalization in marketing refers to a tailored approach that caters to the individual needs and preferences of consumers, in contrast to traditional marketing, which typically employs a mass and uniform approach. Personalization allows companies to offer products, services, or content that is relevant to each consumer based on collected data, such as purchase history, browsing behavior, and past interactions [4]. Utilizing AI technology enables personalization to be conducted more efficiently and accurately. The importance of personalization lies in its ability to foster stronger and more meaningful relationships with consumers [5]. Through personalization, consumers feel more valued and understood, leading to increased loyalty and customer satisfaction. This stands in contrast to traditional marketing, which often lacks effectiveness in reaching and retaining consumers due to its failure to consider individual needs and preferences [6].

The AI technologies utilized in personalized marketing include machine learning, deep learning, and natural language processing (NLP). Machine learning enables systems to learn from historical data and make predictions or decisions without explicit programming for each task. Deep learning, a subset of machine learning, involves complex neural networks to enhance these capabilities. NLP allows computers to understand, interpret, and respond to human language naturally [7]. Together, these technologies analyze consumer data, such as purchase history, browsing behavior, and social media interactions [8]. Through this analysis, AI can identify individual consumer preferences and needs, subsequently providing personalized product or service recommendations in real-time.

Implementing personalized marketing strategies using AI provides companies with numerous advantages, such as increased consumer engagement and sales conversions. In today's highly competitive market landscape, businesses must leverage advanced technologies to remain relevant and adapt to shifting consumer demands. AI plays a pivotal role in enhancing marketing accuracy, improving customer engagement, and fostering sustainable growth, making its integration an essential rather than optional strategy [9]. Companies can enhance engagement levels by leveraging AI algorithms to analyze consumer data and behaviors, allowing for the customization of marketing efforts to align with individual preferences. This statement highlights AI's role in personalizing marketing strategies, yet it assumes that higher engagement directly translates to increased customer satisfaction and loyalty. A critical consideration is whether such personalization risks ethical concerns, such as consumer data privacy and algorithmic bias [10]. This tailored approach not only boosts customer satisfaction but also cultivates loyalty and trust, ultimately driving sales conversions and revenue growth [11]. Furthermore, AI enables companies to deliver timely and relevant content, enhancing the overall customer experience and fortifying brand-consumer relationships [12]. The application of AI in personalizing marketing strategies aligns with the principles of Industry 4.0, which emphasizes sustainable consumption and production practices. A study demonstrated that AI implementation led to a 14.2% increase in total factor productivity for Chinese manufacturing companies listed on A-shares from 2010 to 2021, as indicated by data from the China Stock Market Accounting Research Database. This substantial productivity gain underscores the benefits of AI strategies, with a 1% increase in AI penetration corresponding to a 14.2% rise in productivity. AI enhances productivity through value-added effects, skill bias, and technology upgrades, reflecting its growing importance in the modern business landscape [13].

Companies encounter several challenges when implementing AI for personalized marketing, particularly concerning data privacy and implementation costs. To address these issues, the integration

of Differential Privacy and Generative Adversarial Networks (GANs) has emerged as a solution for maintaining privacy in digital marketing. Utilizing open marketing datasets and synthetic data generated by CTGAN enables effective synthesis of multi-modal non-Gaussian distributions [14]. While integrating Artificial Intelligence into personalized marketing has markedly enhanced customer satisfaction, sales, and marketing efficiency, it has also raised concerns about privacy in relation to data collection, profiling, and targeted advertising strategies. Furthermore, practical difficulties in AI implementation involve deficiencies in data infrastructure, a shortage of trained personnel, and a lack of clarity regarding the applications, which can impede the successful adoption and use of AI technologies in marketing [15]. Additionally, the evolving digital marketing landscape necessitates the effective management of consumer data while ensuring compliance with stringent data protection regulations. This highlights the critical need to balance the benefits of personalization with privacy considerations, fostering consumer trust and adhering to legal requirements. While personalization enhances user engagement and business performance, excessive data collection without transparency may erode consumer trust and invite regulatory scrutiny. Striking this balance is not merely a compliance issue but a strategic imperative for sustainable digital marketing practices [16].

Several case studies have illustrated the successful application of personalized marketing strategies using AI, demonstrating notable increases in performance metrics. For example, research by Gerlich et al. [17] revealed a strong positive correlation between the number of influencers and marketing profits, with correlation coefficients ranging from 0.86 to 0.99 in companies utilizing AI technologies. Additionally, Canhoto et al. [18] investigated the impact of AI-driven personalized offers on customer experiences in physical retail environments. Their study demonstrated how AI can enhance targeting effectiveness while emphasizing the critical challenge of balancing personalization with privacy concerns. This research underscores the dual-edged nature of AI-driven personalization: while it improves consumer engagement and sales optimization, it also raises ethical questions regarding data privacy and consent, necessitating stricter regulatory frameworks. Moreover, Wu and Monfort [19], which utilized data from 278 food firms and employed empirical modeling through structural equation modeling and the FsQCA approach, highlighted the beneficial impact of AI marketing strategies on firm performance. The research emphasized the crucial roles of marketing capabilities, customer value co-creation, and market orientation in the effectiveness and success of these strategies. Collectively, these studies demonstrate the effectiveness and significance of AI-driven personalized marketing in improving business outcomes and customer engagement.

A key gap in existing research is the lack of empirical studies examining how AI personalization influences long-term consumer trust and brand perception, particularly in different cultural and demographic contexts. Additionally, challenges related to data privacy and stringent regulations continue to be significant concerns, particularly regarding the collection, profiling, and use of data for targeted advertising. While solutions such as Differential Privacy and Generative Adversarial Networks (GANs) have been proposed to protect privacy, their implementation is still limited and requires further exploration. Moreover, little research has explored the potential unintended consequences of over-personalization, such as consumer fatigue or reduced brand trust due to excessive data tracking and targeted advertising. Therefore, this research aims to delve deeper into the optimal utilization of AI-driven personalized marketing strategies, with a specific focus on enhancing consumer engagement while addressing ethical and regulatory concerns. Additionally, it seeks to evaluate the best approaches for addressing privacy and regulatory challenges. This study will employ a systematic literature review to identify and synthesize previous findings, providing comprehensive and practical recommendations for companies looking to implement such strategies.

2. Method

This study employs a Systematic Literature Review (SLR) approach to explore the optimal utilization of AI-based personalized marketing strategies, with a specific focus on enhancing consumer engagement. A qualitative content analysis is conducted to systematically review, categorize, and synthesize existing research, providing a comprehensive understanding of AI's impact on personalized

marketing practices and consumer interactions. The literature search is conducted using three primary academic databases: Scopus, DOAJ, and Google Scholar, covering peer-reviewed publications from 2013 to 2024. The search strategy utilizes predefined keywords, including "Artificial Intelligence (AI)," "Personalized Marketing," and "Consumer Engagement." To ensure the reliability and relevance of the selected studies, specific inclusion and exclusion criteria are applied. Studies included in this review explicitly discuss AI applications in personalized marketing aimed at improving consumer engagement. Only empirical research and case studies published in academic journals or conference proceedings within the last decade are considered. Additionally, articles written in English are selected to maintain accessibility and consistency in data interpretation. Studies that do not directly address AI or personalization in marketing, as well as non-empirical content such as opinion pieces, editorials, or conceptual papers, are excluded. Furthermore, research published before 2013 is omitted unless deemed highly relevant and influential in shaping the field.

This review considers studies employing various AI models and techniques that contribute to personalized marketing strategies. Among these models are Machine Learning (ML) algorithms, including Decision Trees, Random Forest, and Neural Networks, which are frequently used for personalized recommendation systems. Additionally, Natural Language Processing (NLP) is examined in the context of sentiment analysis and chatbot interactions, while Deep Learning is analyzed for its applications in predictive analytics and behavioral pattern recognition. To evaluate the effectiveness of AI-driven personalization, the study also reviews statistical methodologies such as content analysis, regression models, and clustering techniques that are commonly used in marketing research.

The data selection process follows a structured approach, beginning with the removal of duplicate entries from the search results. Titles and abstracts are then screened to ensure alignment with the research objectives, after which full-text articles meeting the inclusion criteria undergo an in-depth review. Key information extracted includes author details, publication year, research methodology, AI models employed, key findings, and conclusions. This extracted data is systematically analyzed to identify trends, patterns, and research gaps in the implementation of AI-driven personalized marketing strategies. To address potential biases in AI-based data analysis, this study critically examines several aspects. First, the extent to which AI models used in reviewed studies are generalizable across different industries and consumer demographics is considered. Second, possible algorithmic biases in AI-driven personalization and their implications for consumer perceptions are analyzed. Finally, publication bias is acknowledged by ensuring a balanced evaluation of both positive and negative outcomes of AI implementation in marketing. By incorporating these refinements, this study aims to provide a structured, transparent, and reproducible assessment of AI's role in personalized marketing and consumer engagement.

3. Results And Discussion

Based on our research findings, we have identified several key studies that make substantial contributions to the focus and objectives of this investigation. The insights gained from these studies have greatly enhanced our comprehension of the subject matter. The results from these studies have been consolidated and presented in Table 1.

Table 1. Summary of Research Findings and Insights According to Eligibility Criteria

No	Focus	Author	Research Variables
1	Utilizing AI in Personalized Marketing Strategies	Kietzmann et al. (2018), Kishen et al. (2021), Abdelkader (2023), B. Gao et al. (2023), Mršić (2023), Huang et al. (2023), Kim et al. (2022), Lim et al. (2023)	AI in personalized marketing, consumer data analysis, targeted advertising, product recommendations, machine learning algorithms, dynamic pricing, predictive analytics, personalized content, technological advancements

2	The Impact of AI on Customer Satisfaction and Loyalty	Q. Chen et al. (2023), Yang et al. (2023), Gäthke (2020), Singh & Singh (2024), Prentice et al. (2020), Y. Gao & Liu (2023), Hsu & Lin (2023)	AI chatbot services, service recovery, self-deprecating humor, augmented reality (AR) applications, customer satisfaction, perceived value, cognitive and affective trust, service quality
3	How AI Helps Understand Consumer Preferences and Behavior	Krisprimandoyo (2023), Biswas & Patra (2023), Li et al. (2022), Vaid et al. (2023), Min et al. (2024), Leichtmann et al. (2023), Peltier et al. (2024), Stankevich (2015)	Consumer behavior analysis, image recognition, chatbots, customization, Explainable AI (XAI), self-regulated learning, user adherence, psychological responses, purchase intentions
4	Key Challenges in Implementing AI-Based Personalized Marketing	Qin (2024), Rafieian & Yoganarasimhan (2023), Kumar & Suthar (2024), Xu et al. (2021), Sanders et al. (2019), Batra & Keller (2016), Metcalf et al. (2019)	Ethical and legal issues, algorithmic bias, data privacy, scalability, generalizability, counterfactual validity, transparency, privacy-enhancing technologies, market segmentation, microtargeting
5	Comparison of Effectiveness Between Traditional Marketing and AI-Based Marketing	Song et al. (2024), Keegan et al. (2024), Sands et al. (2022), Verganti et al. (2020), Bove (2019), Sowa & Przegalinska (2020)	Advertising efficiency, AI-generated ads, B2B marketing paradoxes, AI influencers, word-of-mouth intentions, intelligent marketing decision-making systems, human-AI collaboration, productivity enhancement

Table 1 provides a summary of research findings and insights based on specific eligibility criteria. The table covers several key areas, including the use of AI in personalized marketing strategies, the impact of AI on customer satisfaction and loyalty, and how AI aids in understanding consumer preferences and behavior. It also highlights major challenges in implementing AI-based personalized marketing and compares the effectiveness of traditional versus AI-based marketing methods. Each research focus is represented by notable authors, with variables including consumer data analysis, chatbot technologies, ethical and privacy concerns, and advertising efficiency. This table offers a comprehensive overview of how various studies contribute to the research topic and reflects recent advancements and challenges in AI applications in marketing and customer experience.

3.1. How to Utilize AI in Personalized Marketing Strategies?

Artificial Intelligence (AI) is integral to personalized marketing strategies as it utilizes consumer data to craft tailored experiences. By analyzing extensive datasets, AI predicts individual preferences and behaviors, facilitating targeted advertisements, product recommendations, and personalized content [20]. Through machine learning algorithms, AI identifies consumer behavior patterns, which support dynamic pricing, predictive analytics, and personalized suggestions, thereby enhancing customer satisfaction and loyalty [21]. The incorporation of AI in marketing not only boosts operational efficiency but also enriches customer experiences, leading to increased engagement and loyalty, as demonstrated in case studies of prominent companies [22]. Nonetheless, it is crucial to balance the advantages of AI-driven personalized marketing with privacy concerns to foster consumer trust and ensure compliance with relevant regulations [23]. Ethical concerns, including algorithmic bias and the potential exploitation of consumer data, must be carefully addressed to ensure the responsible implementation of AI. Research has demonstrated that biased algorithms can reinforce discriminatory patterns, resulting in the inequitable treatment of specific consumer groups [24]. AI's roles in analyzing user behavior, developing

recommendation systems, and predicting market trends are pivotal in shaping the future of digital advertising, enabling precise and targeted marketing efforts [25].

Recent research has investigated the application of AI in personalized marketing and educational strategies. AI-powered personalized recommendations have been found to significantly enhance learning performance and engagement, especially among students with moderate levels of motivation [26]. In the context of tutoring services, AI assistance can help instructors better meet students' needs, thereby improving academic outcomes, although the potential for technology overload may mitigate these benefits [27]. Furthermore, AI-facilitated analytics-based personalized scaffolds in self-regulated learning can promote more self-directed learning activities, although the specific impact on learning outcomes remains to be fully understood [28]. These studies collectively illustrate the potential of AI to create personalized experiences across diverse sectors, underscoring its capacity to enhance engagement, adherence, and performance when implemented effectively.

The application of AI in marketing enables companies to gain a deeper understanding of consumer preferences and deliver services that are more closely aligned with their needs. AI provides consumers with relevant recommendations and suggestions, thereby enhancing their satisfaction and engagement with the products or services offered. This can lead to increased customer loyalty and higher engagement levels, ultimately contributing positively to business growth. The primary benefits of implementing AI in personalized marketing include improved operational efficiency and enhanced customer experience. AI assists companies in reducing marketing costs by efficiently targeting advertisements and offers to the appropriate consumer segments. Furthermore, AI allows for real-time customization of services based on up-to-date data analysis. However, there are associated privacy risks that need to be carefully managed. It is crucial for companies to balance the use of data for personalization with the protection of consumer privacy to avoid fostering distrust.

3.2. The Impact of AI on Customer Satisfaction and Loyalty

Artificial Intelligence (AI) plays a crucial role in influencing customer satisfaction and loyalty within service environments. Research indicates that the quality of AI chat-bot services positively impacts customer loyalty by enhancing perceived value, cognitive trust, affective trust, and overall satisfaction [29]. Furthermore, AI technology can support service recovery efforts by employing self-deprecating humor, which increases customers' tolerance for service failures, with perceived intelligence and sincerity serving as mediators of this effect [30]. Additionally, the deployment of AI-driven smart services, such as augmented reality (AR) applications, contributes to higher levels of service satisfaction by alleviating perceived complexity, thereby fostering greater customer loyalty [31]. Nevertheless, the integration of AI in sectors such as healthcare and finance presents distinct challenges, including regulatory constraints and the necessity for transparency in decision-making processes [32]. These insights underscore the complex effects of AI on customer satisfaction and loyalty, highlighting the necessity of effective AI technology utilization in service settings.

Artificial Intelligence (AI) is transforming customer service and significantly influencing customer satisfaction and loyalty. AI-based solutions enhance customer satisfaction and perceived efficiency, which subsequently boosts customer loyalty [33]. In the hospitality industry, AI applications have demonstrated positive effects on service quality, customer satisfaction, and loyalty, although the quality of human service remains critical [34]. In sales and marketing, AI facilitates personalized interactions, improves customer relationship management, and enhances the overall customer experience through real-time support and tailored recommendations [35]. Organizations are integrating AI into their operations to improve productivity and service quality, with the ultimate goal of increasing customer satisfaction and loyalty [36].

AI significantly contributes to enhancing consumer satisfaction and loyalty through various mechanisms. By providing high-quality chat-bot services, AI elevates perceived value and trust, which in turn boosts satisfaction and loyalty. The use of self-deprecating humor by AI in addressing service failures demonstrates that AI can increase consumer tolerance for service shortcomings, provided it is accompanied by perceived intelligence and sincerity. Additionally, smart services such as augmented

reality (AR) help to reduce complexity and improve the service experience, further contributing to increased satisfaction and loyalty. In the hospitality sector, while AI technology has a significant positive impact, the quality of human interaction remains crucial in shaping the overall customer experience.

The impact of AI on consumer satisfaction and loyalty is highly dependent on the quality of its implementation and consumer perceptions of the technology. AI can enhance efficiency and provide more personalized services, which are critical for boosting consumer satisfaction. However, AI also has limitations, particularly in replacing the human touch, which is sometimes essential for building emotional connections with consumers. The success of AI integration relies on how well the technology is incorporated into existing service operations and how effectively companies address potential privacy and ethical concerns.

3.3. How AI Helps Understand Consumer Preferences and Behavior

Artificial intelligence (AI) is crucial for comprehending consumer preferences and behaviors by analyzing extensive datasets to deliver tailored experiences and product suggestions [37]. Technologies such as image recognition and chat-bot allow marketers to scrutinize online consumer interactions, thereby refining marketing strategies and strengthening customer relationships [38]. Through the application of AI image recognition and deep neural networks (DNN), companies can evaluate consumer facial expressions, anticipate psychological responses, and provide customized product recommendations, which enhances consumer satisfaction and insights into consumer behavior within the e-commerce sector [39]. However, challenges such as data privacy concerns and the need for explainable AI (XAI) remain critical, as highlighted by recent studies in the Journal of Consumer Research. [40]. The integration of AI methods in consumer research is progressively growing, providing actionable insights and enabling a more precise exploration of consumer behavior than ever before [41].

Recent research underscores the profound impact of AI on understanding and influencing consumer behavior across different fields. Explainable AI (XAI) has been found to enhance user adherence to health management platforms and boost engagement in online lending, especially through the use of counterfactual explanations [42]. XAI methods can also improve user performance and trust calibration in high-risk decision-making tasks [43]. Additionally, AI support in tutoring contexts can enhance service outcomes, though factors such as AI aversion and technology overload may affect its effectiveness [44]. In the cosmetics sector, AI-driven customization of skincare products is gaining traction, with perceived usefulness and subjective norms playing a significant role in shaping purchase intentions [45]. These findings illustrate the potential of AI and XAI in various consumer-facing applications and underscore the need to tailor AI solutions to meet specific user needs and contexts.

AI assists marketers in gaining a deeper understanding of consumer preferences and behaviors through detailed and precise data analysis. This technology enables marketers to personalize interactions and offers based on data collected from online consumer interactions, such as image recognition that analyzes facial expressions to gauge emotional responses. The use of AI also facilitates a better understanding of individual needs and preferences, ultimately enhancing customer satisfaction by providing more relevant product recommendations. Explainable AI (XAI), with its capability to offer user-friendly explanations, contributes to increased trust and engagement, particularly in high-risk decision-making scenarios. The application of AI in understanding consumer preferences and behaviors provides significant benefits, including the ability to more effectively personalize consumer experiences and enhance user trust through transparency and clear explanations. Both AI and XAI add value by enabling companies to deliver more tailored and insightful services, which can boost customer loyalty and strengthen relationships with consumers.

3.4. Key Challenges in Implementing AI-Based Personalized Marketing

Implementing AI-based personalized marketing presents several key challenges. Ethical and legal concerns, including algorithmic bias, data privacy, and consumer protection, are critical issues that must be addressed to ensure the responsible application of AI in marketing [46]. Additionally, technical challenges such as scalability, generalizability, counterfactual validity, and the development of

advanced methods for dynamic settings must be overcome to implement personalized strategies effectively [47]. For instance, recent research indicates that a significant proportion of consumers express concerns regarding the use of their data in AI-driven marketing, highlighting the importance of transparency and ethical guidelines [48]. Furthermore, promoting transparency, establishing ethical guidelines, investing in bias detection tools, and utilizing privacy-enhancing technologies are essential measures to mitigate the risks associated with AI in marketing and to build consumer trust [48].

Implementing AI-based personalized marketing presents several significant challenges. Concerns regarding privacy and user resistance to behavioral advertising can affect purchase intentions, underscoring the importance of brand trust and website credibility [49]. Effective market segmentation is vital, as illustrated by a study on a physical activity app that identified four distinct user clusters based on demographics, behaviors, and psychographics [50]. Creating accurate user profiles requires a comprehensive approach that considers various dimensions, including fundamental attributes, interactions, feedback, and psychological factors [51]. To enhance marketing efficiency, strategies like micro-targeting and normative appeals have proven effective. For instance, a study involving riparian landowners showed that micro-targeting increased survey response rates by 66%, while normative messages led to a 23% increase in responses among those not targeted by micro-targeting [52].

The primary challenges in implementing AI-based personalized marketing encompass both ethical and technical aspects. Ethical and legal issues, such as algorithmic bias and data privacy, require careful consideration as they can impact consumer trust and acceptance of the technology. Technical challenges, including scalability and counterfactual validity, highlight that while AI can process large volumes of data, there are still difficulties in applying these results broadly and accurately across various scenarios. Privacy concerns and resistance to behavioral advertising suggest that consumers may not always be comfortable with the level of personalization provided by AI, which can negatively affect marketing effectiveness.

Addressing these challenges is crucial for the successful implementation of AI-based personalized marketing. Ethical and legal considerations are fundamental because they directly relate to consumer trust. If consumers perceive that their data is not secure or that data usage is not transparent, they may disengage from the brand. Technical challenges are also significant, as the ability of AI to generalize and scale determines how effectively the technology can be applied on a large scale. Additionally, accurate market segmentation and strategies such as micro-targeting can enhance consumer response, but they require precise data and in-depth analysis to be successful.

3.5. Comparison of Effectiveness Between Traditional Marketing and AI-Based Marketing

Traditional marketing and AI-based marketing exhibit varying levels of effectiveness. Studies indicate that AI provides digital tools that enhance advertising efficiency for tourist destinations, with AI-generated ads using rational appeals significantly increasing visit intentions [53]. In Business-to-Business (B2B) marketing, AI technologies present paradoxes that may lead to transformative changes, highlighting the necessity of addressing these tensions for successful AI integration into marketing strategies [54]. Industry analyses indicate that AI-driven marketing campaigns can yield a substantially higher return on investment than traditional approaches; however, achieving such outcomes necessitates considerable investment in advanced technology and skilled professionals [55]. Additionally, AI influencers affect consumer perceptions similarly to human influencers, albeit with AI influencers being perceived as having lower source trust but being more likely to generate word-of-mouth intentions, particularly among consumers with a high need for uniqueness [56]. Furthermore, the development of intelligent marketing decision-making systems utilizing AI algorithms like random forest and Apriori [57] has demonstrated superior results compared to traditional marketing methods. These systems have achieved up to 98.54% accuracy in predicting user purchases and have effectively contributed to the development of scientifically based marketing strategies.

Recent research has investigated the effectiveness of AI-based marketing compared to traditional methods. AI assistance can notably enhance service outcomes in tutoring services by enabling employees to better adapt to customer needs, although challenges such as technology overload may

moderate its impact [58]. In a simulated marketing task, 20 participants took part in the study. A significant difference in performance was observed between the two groups, $n = 20$, $t(18) = 5.25$, $p < 0.001$. Participants who collaborated with a virtual assistant achieved a 57% increase in productivity, as measured by the number of tasks completed, compared to those who worked independently. This finding underscores the potential of human-AI collaboration in marketing [59].

The comparison between traditional and AI-based marketing effectiveness reveals that AI can significantly enhance marketing efficiency and outcomes. AI's use in advertising can boost consumer intent to take specific actions, such as visiting tourist destinations, by delivering more relevant and persuasive content. In the B2B sector, AI implementation can lead to transformative changes but also presents challenges that need careful management, such as the tension between innovation and traditional practices. In the context of influencers, although AI influencers may not be trusted as much as human influencers, they can still stimulate information-sharing intentions, particularly among consumers seeking uniqueness.

AI in marketing offers several advantages over traditional methods, particularly in terms of personalization, efficiency, and predictive accuracy. Intelligent marketing systems employing advanced algorithms can provide deeper insights into consumer behavior and enhance marketing strategies with greater precision. However, there are challenges to address, such as the potential for technology overload which could limit the positive impact of AI, and the need to build consumer trust, especially when utilizing AI influencers.

Figure 1. Framework of Thought Variables Contained in This Study

The mind-map chart presented in Figure 1 illustrates the evolution of research variables related to the application of artificial intelligence (AI) in marketing and customer experience from 2015 to 2024. During the 2015-2016 period, research concentrated on AI applications in advertising, including the impact of AI influencers on consumer perceptions. From 2017 to 2018, the focus shifted to machine learning algorithms, recommendation systems, and AI chat-bots, which enhance service interactions and personalization. This period underscores AI's role in improving user experience and operational efficiency.

In the 2019-2020 timeframe, research explored the use of Explainable AI (XAI), which improves transparency and user trust, and the deployment of advanced services such as augmented reality (AR) for service recovery. Research conducted between 2021 and 2022 addressed emerging issues such as privacy concerns, technology overload, market segmentation, and AI-powered tutoring applications. Finally, from 2023 to 2024, research focused on AI's role in consumer research, ethical and legal challenges, AI-driven personalization, and human-AI collaboration. This chart offers a detailed

overview of the evolving research variables and their impact on understanding and applying AI in marketing and customer service.

4. Conclusions and Suggestions

Based on the evaluation of the research findings, it can be concluded that the application of AI in personalized marketing strategies significantly enhances customer engagement and loyalty by providing more relevant and customized experiences. The use of AI in educational contexts also shows considerable potential for improving learning performance and student engagement, although issues related to technology overload must be addressed. AI plays a crucial role in increasing customer satisfaction by improving service quality through effective chat-bots, humor, and AI-based applications such as augmented reality (AR) that reduce service complexity. Additionally, AI offers deep insights into consumer preferences and behaviors through advanced analytics and image recognition technologies, which enhance service quality and consumer engagement.

Future research should focus on developing AI methodologies and technologies that can effectively address ethical and privacy issues, particularly regarding algorithmic bias and consumer data protection. In addition, industry-specific studies through case studies and longitudinal analysis are needed to evaluate the long-term impact of AI-based marketing strategies on consumer behavior. From a managerial perspective, marketing practitioners are advised to adopt AI with a transparent and ethical approach, ensuring that personalization systems not only increase consumer engagement, but also build trust and loyalty. The implementation of AI technology in marketing should be accompanied by continuous monitoring and evaluation mechanisms to maintain a balance between automation and authentic customer experience.

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