

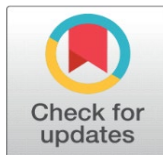
ROLE OF AI IN SOCIAL MEDIA MARKETING

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DOI

[10.29121/shodhkosh.v5.i6.2024.5093](https://doi.org/10.29121/shodhkosh.v5.i6.2024.5093)

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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ABSTRACT

This study investigates the significant role of artificial intelligence (AI) in social media marketing and examines the associated challenges faced by marketing professionals. Utilizing a quantitative research methodology, a structured questionnaire was distributed to 243 social media marketing professionals across various industries. The analysis reveals a strong consensus on the positive impact of AI in enhancing marketing campaign effectiveness, accuracy in audience targeting, engagement rates, and overall efficiency through AI-driven analytics and automation. However, the study also identifies substantial challenges, including high financial investment requirements, a lack of skilled personnel, data privacy concerns, biases in AI algorithms, and the difficulty of ensuring the accuracy and reliability of AI-driven insights. These findings underscore the need for strategic investment, robust data privacy frameworks, and continuous refinement of AI models. Future research should focus on developing cost-effective AI implementation methods, training programs for AI professionals, and exploring the ethical implications of AI in marketing.

Keywords: Artificial Intelligence, Social Media Marketing, AI-Driven Analytics, Audience Targeting, Consumer Behavior, Marketing Automation, Data Privacy, Algorithmic Bias, Marketing Effectiveness, Quantitative Research



1. INTRODUCTION

The emergence of artificial intelligence (AI) has brought about a new period of creativity and effectiveness in several sectors, with social media marketing being one of the fields that has been greatly affected. Social media platforms, which are now essential for modern communication and marketing strategies, are rapidly using AI to improve user experience, optimise content distribution, and boost marketing results. The capacity of AI to efficiently handle and evaluate large quantities of data in real-time presents unparalleled prospects for firms to interact with their target consumers in more significant and tailored manners. This article investigates the profound impact of artificial intelligence (AI) on social media marketing, analysing its various uses, advantages, and the obstacles it presents. Social media marketing is leveraging social channels like Facebook, Twitter, Instagram, and LinkedIn to advertise products and services, interact with customers, and cultivate brand recognition. Historically, these tasks necessitated significant human labour to oversee the production of material, interaction with the audience, and analysis of data. Nevertheless, the use of AI has transformed these procedures by automating jobs, offering more profound understandings into consumer behaviour, and facilitating more efficient targeting of audiences. Artificial intelligence (AI) technologies, including machine learning, natural language processing (NLP), and computer vision, have become essential components of the social media marketing toolset. Machine learning algorithms play a central role in several AI applications within the field of social media marketing. These algorithms have the capability to analyse user data in order to detect trends and make

predictions about future behaviour. This enables marketers to customise their content and strategies accordingly. AI can assist in identifying the most favourable moments to publish content, the post formats that elicit the highest level of audience involvement, and the most effective approaches to engage with distinct audience segments. The previous inability to achieve this degree of precision has made AI a revolutionary tool for social media marketing.

Natural language processing (NLP) is an essential artificial intelligence (AI) technology that has revolutionised the field of social media marketing. Natural Language Processing (NLP) empowers robots to comprehend, analyse, and produce human language, a crucial capability for analysing social media discussions and extracting relevant observations. AI can assess public mood and offer immediate feedback on brand perception by monitoring and analysing user-generated information, including comments, reviews, and tweets. This enables organisations to promptly handle consumer requirements, resolve issues, and take advantage of favourable trends. Computer vision, a component of artificial intelligence, is employed to examine and comprehend visual material on social media sites. This technology has the capability to identify and distinguish objects, people, and situations in both photos and videos. As a result, it allows for more advanced content filtering and precise targeting of advertisements. For example, artificial intelligence (AI) has the capability to recognise objects in images created by users, enabling the creation of advertisements that are more tailored and pertinent to individuals. This feature boosts the efficacy of visual marketing initiatives and enriches the overall user experience. Although there are many advantages, the use of AI in social media marketing is not devoid of difficulties. Data privacy and algorithmic bias are important ethical problems that require attention and resolution. Prudent management of user data is necessary when utilising AI to guarantee privacy and adherence to rules. Moreover, AI algorithms provide a potential danger of prejudice, resulting in the unjust treatment of specific user demographics. Businesses should adopt strong efforts to reduce these dangers and guarantee responsible usage of AI.

AI has revolutionised social media marketing by facilitating more accurate targeting, streamlined content management, and enhanced audience interaction. AI technologies will likely boost the capabilities of social media marketing, making it more dynamic and impactful as they continue to advance. Nevertheless, it is imperative for businesses to confront the ethical dilemmas linked to AI in order to guarantee its conscientious and equitable use. This article will extensively examine the several uses of artificial intelligence (AI) in the field of social media marketing, investigating how firms may effectively utilise its capabilities to attain superior marketing results.

2. REVIEW OF LITERATURE

Basri (2020) did a thorough investigation to assess the influence of artificial intelligence (AI)-assisted social media marketing (AISMM) on the performance of small and medium firms (SMEs) in Saudi Arabia. The study highlights the potential of AISMM to bring about significant changes in successful company management. The study employed a survey methodology, gathering primary and secondary data from entrepreneurs and workers of startups and small and medium-sized enterprises (SMEs) in the Saudi Arabian setting. The research findings indicate that the use of partial least square structural equation modelling (PLS-SEM) has shown a growing adoption of AISMM practices by startups and SMEs. These practices have been found to have a substantial impact on the expansion of client bases and profitability. The correlation highlights the importance of AISMM in boosting overall business performance through the enhancement of management effectiveness. The study is unique because it specifically examines how good business management plays a role in using AISMM to enhance the performance of small and medium-sized enterprises (SMEs). Practitioners may get practical knowledge from this research, as it emphasises how AISMM can effectively tackle different marketing obstacles, therefore promoting corporate expansion and long-term viability. This literature review emphasises the crucial role of artificial intelligence (AI) in social media marketing, demonstrating its ability to completely transform conventional marketing approaches and provide significant enhancements in the performance of small and medium-sized enterprises (SMEs). Through the integration of artificial intelligence (AI) technology, organisations may streamline their marketing tactics, improve client interaction, and attain a more advantageous market position. Basri's discoveries are especially pertinent in the current era of digital technology, as AI-powered tools and methods are becoming crucial for gaining a competitive edge. This study adds to the increasing amount of literature that highlights the strategic significance of AI in contemporary marketing. It provides significant insights for both researchers and practitioners who seek to fully utilise the potential of AI in social media marketing.

Micu, Capatina, and Micu (2018) investigated the suitability of artificial intelligence (AI) methods in social media marketing (SMM), emphasising the growing fascination with AI's capacity to transform marketing tactics. Their research examines the connections between marketers' expertise in social media marketing (SMM), their understanding of

machine learning (ML) applications, and the frequency of ML algorithm deployment in SMM campaigns. In addition, the study examines the opinions of potential users about an AI-powered programme that utilises deep learning algorithms and convolutional neural networks to recognise company logos in social media posts. The capabilities of the AI Media programme were classified into three main clusters: audience analysis, picture analysis, and sentiment analysis. The evaluation of these clusters was conducted using a three-point scale to ascertain the essential functionality as opposed to the anticipated ones, from the viewpoint of digital agencies and freelancers. The results demonstrate a notable level of interest and confidence among potential customers in the software's value proposition, highlighting its ability to improve competitive advantage in social media marketing. This study highlights the crucial significance of artificial intelligence (AI) in contemporary marketing, specifically in utilising robust technologies to enhance the efficacy and efficiency of campaigns. By using AI into social media marketing (SMM), organisations may enhance their ability to target specific audiences, analyse images in depth, and accurately measure sentiment. This, in turn, facilitates more informed decision-making and enhances marketing results. The research conducted by Micu et al. demonstrates the practical uses of AI in social media marketing (SMM). This research offers essential knowledge for marketers and software developers, urging them to embrace sophisticated AI approaches in order to maintain competitiveness in the digital marketing industry. This literature study emphasises the significant influence of artificial intelligence (AI) in social media marketing (SMM), affirming the idea that AI-powered advancements are crucial for attaining exceptional marketing outcomes and maintaining a competitive edge.

Capatina et al. (2020) investigated the prospective functionalities of AI-driven software for social media marketing (SMM) and their alignment with the expectations of potential users. The growing use of AI in social media marketing (SMM) has required a more profound comprehension of user anticipations, especially among digital agencies and independent workers in France, Italy, and Romania. The study sought to distinguish a future AI-driven SMM programme by examining the perceptions and intents of potential users to utilise the software. This was accomplished by employing integer-valued regression models within a causal framework. Information was gathered from individuals who operate or work for digital businesses and freelancers that had specialised knowledge in social media marketing (SMM). The study utilised R software and employed a fuzzy-set qualitative comparative analysis (fsQCA) technique to identify different causal configurations of the programme's expected capabilities. These capabilities were classified into three categories: audience analysis, picture analysis, and sentiment analysis. These parameters were discovered to have an impact on users' intents to evaluate and embrace the product. The results indicate that prospective users are especially interested in features that improve the accuracy and efficiency of social media marketing techniques. Businesses may enhance their ability to target and segment audiences more precisely by utilising audience analysis skills. Additionally, image analysis provides the means to recognise and optimise material at an advanced level. Sentiment research offers a more profound understanding of client sentiments and preferences, enabling more prompt and tailored marketing strategies. This study emphasises the crucial significance of artificial intelligence (AI) in the progress of social media marketing (SMM), providing a competitive advantage by means of advanced analytical instruments. Developers may enhance the relevance and effectiveness of SMM solutions by matching software capabilities with user expectations. This study adds to the existing body of research on artificial intelligence (AI) in marketing by highlighting the significance of user-centered design and the potential of AI to revolutionise social media marketing (SMM) practices. The work of Capatina et al. emphasises the importance of ongoing innovation in AI applications to address the changing requirements of marketers and sustain a competitive edge in the digital environment.

Nair and Gupta (2021) examined the use of artificial intelligence (AI) in contemporary digital marketing settings, with a specific emphasis on how AI might improve the efficiency and ingenuity of social media and digital advertising experts. The research sought to emphasise the capacity of AI to enhance investment returns by facilitating enhanced specialisation and promoting collaboration among marketing teams. The researchers observed a substantial disparity in the level of knowledge and utilisation of AI among digital marketers, with a considerable number of professionals either lacking understanding of AI's significance or being unsure of how to properly harness its potential. The report conducted an extensive literature analysis to identify a range of AI applications that have the potential to significantly impact digital media marketing. Important uses of AI include predictive analytics, which enables marketers to forecast consumer behaviour and customise their plans appropriately, and natural language processing (NLP), which improves content development and customer interactions by comprehending and creating human language. Machine learning algorithms allow the automatic placement and optimisation of ads, guaranteeing that ads are delivered to the most pertinent audiences at the most advantageous moments. In addition, AI-powered solutions for sentiment analysis assist marketers in assessing public opinion and adapting their efforts to more effectively coincide with audience attitudes. The report

highlights the transformative impact of AI on the digital marketing industry, emphasising its ability to optimise workflows, boost customisation, and enhance overall marketing results. Marketers may attain enhanced accuracy in targeting, more efficiency in campaign management, and more profound understanding of customer behaviour by incorporating AI into their tactics. Nair and Gupta's research offers significant guidance to social media marketers, offering practical insights on how to effectively incorporate AI technologies to strengthen digital marketing tactics. This analysis emphasises the profound influence of artificial intelligence (AI) on digital marketing and promotes its implementation as a means to sustain a competitive advantage in the swiftly changing marketing landscape.

In their study, Liu, Gupta, and Patel (2023) examined the use of responsible AI principles in digital health social media marketing. They emphasised the significant impact it may have on transforming the field while also addressing ethical issues. Social media platforms such as Twitter and Facebook have become essential tools for medical practitioners and authorities to distribute and handle health-related information, with artificial intelligence (AI) playing a pivotal role in improving these digital capabilities. Artificial intelligence (AI) integrated into social media platforms allows organisations to effectively identify, evaluate, identify, and anticipate health-related problems, providing advantages to both patients and healthcare professionals by enhancing data management and problem-solving capabilities. Nevertheless, the incorporation of AI in this particular situation gives rise to noteworthy ethical apprehensions, including encroachment upon privacy and the necessity for confidence, which must be resolved in order to guarantee conscientious and ethical utilisation of AI. The study did an exploratory analysis using 25 in-depth interviews with healthcare experts. The findings revealed that following responsible AI principles improves the success of social media marketing activities. The concepts of openness, accountability, fairness, and privacy protection are essential for organisations to establish trust with consumers and manage ethical risks effectively. Healthcare firms may use the power of AI to enhance user engagement, deliver tailored health information, and attain superior health results by adopting responsible AI practices that adhere to ethical norms. The results emphasise the significance of responsible artificial intelligence (AI) in guaranteeing the ethical and effective use of AI-powered social media marketing tactics in the healthcare industry. The paper presents research ideas and practical recommendations for incorporating responsible AI concepts into social media marketing strategies. It emphasises the importance of continuous examination and involvement of stakeholders to address ethical concerns. Liu et al. provide a valuable contribution to the ongoing discussion on AI ethics in digital marketing. They highlight the crucial need of responsible AI in promoting trust and sustainability in AI-enabled healthcare marketing. This study offers significant insights for healthcare organisations and marketers, promoting the implementation of responsible AI practices to improve the ethical and efficient utilisation of AI in social media marketing.

George et al. (2024) explore the crucial impact of artificial intelligence (AI) in revolutionising marketing methods and improving performance. The use of AI into contemporary marketing is transforming the way firms approach consumer involvement and market analysis. By employing sophisticated data analytics, artificial intelligence efficiently analyses large volumes of data at an impressive pace, resulting in important insights into customer behaviour and industry trends. This feature enables a significant level of customisation, since artificial intelligence may customise content and adverts based on individual tastes, hence enhancing consumer engagement and pleasure. An important use of artificial intelligence in the field of marketing is the utilisation of chatbots and virtual assistants, which offer immediate and automated client service. These tools not only improve customer service, but also have a vital function in generating and converting leads, guaranteeing that potential consumers receive timely and pertinent information. AI-powered content generation enhances the optimisation of marketing materials, guaranteeing that the content is both captivating and tailored to specific audiences. In addition, AI algorithms provide more efficient targeted advertising, enabling advertisers to accurately contact specified consumers. AI-driven automation simplifies repetitive chores like email marketing and social media posting, allowing marketers to dedicate their attention to strategic planning and creative endeavours. Predictive analytics, an additional artificial intelligence (AI) application, enables firms to forecast market trends and changes, facilitating proactive decision-making and strategic adaptations. This ability to anticipate future events or trends is extremely useful in preserving a competitive advantage in the swiftly changing digital environment. The report emphasises that AI's strengths in data-driven decision-making, efficiency improvement, and personalisation greatly boost marketing effectiveness and return on investment. Through the utilisation of AI solutions, marketers may get enhanced efficiency, heightened personalisation in client interactions, and better-informed strategic planning. The research conducted by George et al. emphasises the significant and influential role of artificial intelligence (AI) in marketing. They strongly advocate for the widespread use of AI in order to stimulate innovation and enhance

competition within the marketing industry. This literature analysis confirms that AI is not only a tool, but rather a strategic asset that is essential for achieving success in modern marketing.

In this study, Babatunde et al. (2024) extensively examine the theoretical aspects of how artificial intelligence (AI) might revolutionise marketing techniques by tailoring them to individual consumers and improving their level of involvement. This research explores the theoretical foundations of customer engagement and investigates the efficient use of AI to generate marketing experiences that are tailored and pertinent. AI may utilise consumer behaviour and demographics analysis to create tailored communications that maximise engagement and impact decision-making processes. The study emphasises the utilisation of game mechanics, in which AI customises gamified marketing experiences by adapting rewards and challenges to individual preferences, hence fostering more customer involvement. AI's capacity to analyse extensive datasets enables accurate anticipation of customer preferences and behaviours, hence aiding targeted advertising, personalised product suggestions, and the creation of resonant content for specific consumer categories. AI-driven Natural Language Processing (NLP) solutions have the capability to analyse customer reviews, social media interactions, and other unstructured data formats in order to comprehend consumer sentiment. This allows marketers to customise their communication strategies for maximum engagement. In addition, chatbots and virtual assistants driven by artificial intelligence offer immediate, customised customer help and suggestions for products, creating a more engaged and captivating brand encounter. The report highlights several advantages of utilising AI for personalised marketing. Personalised marketing messages and experiences may enhance client happiness and loyalty by catering to individual requirements and preferences. Customised content and products assist companies in cultivating a more pertinent and relatable image, therefore strengthening their bond with customers. In addition, implementing highly focused and efficient personalised marketing strategies may greatly enhance conversion rates and boost revenues. Moreover, the report also tackles crucial factors in AI-driven marketing personalisation. Ensuring a balance between personalisation and data privacy concerns is crucial, necessitating openness and granting users control over data gathering processes. Furthermore, AI algorithms have the potential to perpetuate biases that already exist in the training data. Therefore, it is of utmost importance to prioritise fairness and inclusion in AI-driven marketing. Babatunde et al. assert that AI is transforming marketing personalisation through the utilisation of its analytical powers and theoretical understanding of customer involvement. This allows firms to create focused and pertinent marketing strategies that cultivate stronger consumer relationships and stimulate business expansion. The study offers a thorough comprehension of how AI may be utilised to improve marketing personalisation, highlighting the importance of ethical issues and the substantial potential for AI to profoundly influence marketing practices.

Albinali and Hamdan (2021) investigated the utilisation of artificial intelligence (AI) in social media marketing and its influence on customer behaviour, supported by empirical data from Bahrain. Their study, which appears in a publication focused on examining the impact of new technologies and entrepreneurship on company growth in developing nations, emphasises how companies and brands utilise social media to broaden their market presence. Artificial intelligence (AI) plays a crucial part in this process by examining and condensing the most often discussed subjects on social media, therefore offering businesses a distinct comprehension of customer behaviour and preferences. The research sought to investigate the use of AI in social media marketing and its potential for businesses to successfully promote their products. The researchers utilised a questionnaire-based survey approach to investigate the impact of AI on consumer behaviour. The results validated that AI has a substantial influence on customer behaviour, allowing firms to customise their marketing campaigns with more accuracy. The capacity of AI to analyse extensive volumes of social media data enables firms to uncover popular subjects and customer preferences, hence enabling the development of focused marketing efforts. These observations enable organisations to predict consumer wants and preferences, resulting in more tailored and efficient marketing campaigns. Furthermore, solutions powered by artificial intelligence may augment interaction by delivering instantaneous replies and tailored content, therefore enhancing consumer happiness and loyalty. The report highlights the significant impact that AI may have on social media marketing, especially in developing nations such as Bahrain. Through the utilisation of artificial intelligence, firms may enhance their competitive advantage by making better informed decisions and engaging in strategic planning. The report emphasises that AI not only improves the effectiveness of marketing endeavours but also profoundly influences customer behaviour by delivering customised and pertinent material. Albinali and Hamdan's research demonstrates the vital significance of AI in contemporary marketing strategies, highlighting its influence on comprehending and shaping customer behaviour. Their research indicates that organisations that successfully use AI into their social media marketing strategies may get more market penetration, enhanced client interaction, and superior overall performance. This literature review

enhances the existing information on the utilisation of AI in marketing, providing significant insights for academics and practitioners who want to fully exploit AI's capabilities in social media marketing.

Dwivedi et al. (2021) conduct a thorough analysis of the changing digital and social media marketing environment, emphasising the significant influence of the internet and social media on consumer behaviour and corporate strategies. The essay compiles thoughts from prominent professionals to examine the potential advantages and obstacles that digital and social media marketing pose for organisations. Some of the main advantages are lower marketing expenses, improved brand recognition, and higher sales. Nevertheless, the authors also acknowledge substantial obstacles, such as the adverse effects of electronic word-of-mouth (eWOM) and the invasive characteristics of certain online brand representations. The article encompasses a broad spectrum of subjects, providing thorough accounts of crucial facets of digital and social media marketing. This text delves into the use of artificial intelligence (AI) in tailoring marketing tactics, the possibilities presented by augmented reality (AR) in crafting captivating marketing experiences, and the significance of proficient digital content management. The discussion focuses on the increasing impact of mobile marketing and advertising, as well as the particular factors relevant to B2B marketing. The study also explores the phenomena of electronic word-of-mouth (eWOM) and its dual nature as both a challenge and an opportunity for companies. Furthermore, the authors emphasise the ethical concerns that are inherent in digital marketing tactics, underscoring the importance of employing responsible and transparent strategies to uphold customer confidence. This encompasses the resolution of privacy problems and the establishment of justice in AI systems. The study finds deficiencies in the existing body of knowledge and suggests potential areas for future research to enhance comprehension in the discipline. These encompass the investigation of the incorporation of artificial intelligence (AI) and augmented reality (AR) in marketing, the impact of mobile advertising on customer behaviour, and the ethical consequences of evolving digital marketing strategies. The study of Dwivedi et al. is a noteworthy addition to both scholarly research and practical implementations in the field of digital and social media marketing. The statement emphasises the importance of ongoing innovation and ethical deliberation in response to the changing nature of digital marketing. The paper offers a roadmap for future studies by identifying the shortcomings in present research and suggesting new directions for investigation. This will assist marketers in navigating the intricate and ever-changing digital marketing landscape.

Angelen and Siddik (2023) examine the revolutionary capacity of artificial intelligence (AI) in marketing, presenting it as a crucial disruptor alongside technologies like the Internet of Things (IoT), big data analytics, and blockchain. The role of AI in marketing is highly crucial since it has the potential to completely transform existing procedures, providing unparalleled prospects for improving marketing tactics and increasing customer involvement. The authors do a methodical examination of existing literature to highlight the significance of artificial intelligence (AI) in the field of marketing and to outline potential areas for future study. The research emphasises the integration of AI into several marketing functions to enhance efficiency and effectiveness. AI-powered data analytics enables marketers to efficiently analyse large volumes of data, providing valuable insights into customer behaviour and market trends. This facilitates more accurate targeting and customisation, which are crucial for captivating contemporary customers. The utilisation of artificial intelligence (AI) in marketing include the implementation of algorithms for precise advertising, predictive analytics for predicting changes in the market, and natural language processing (NLP) for analysing consumer sentiment and producing content. A substantial portion of the study entails doing co-citation and co-occurrence analysis, which aids in the visualisation of the conceptual and intellectual terrain of artificial intelligence in the field of marketing. The authors employ the Louvain method to perform data clustering and discover significant research sub-themes and potential future research directions. These encompass the incorporation of artificial intelligence with other groundbreaking technologies, the advancement of more intricate artificial intelligence algorithms for marketing purposes, and the investigation of ethical ramifications associated with the use of artificial intelligence in marketing. The results indicate that AI's proficiency in data analysis, automation, and personalisation is transforming marketing tactics, empowering organisations to develop more efficient and customer-focused campaigns. Nevertheless, the study highlights the difficulties linked to the adoption of AI, including issues related to data privacy, the requirement for openness in AI processes, and the possibility of algorithmic biases. Angelen and Siddik's research highlights the crucial significance of AI in the future of marketing, emphasising the need for ongoing discovery and incorporation of AI technologies to maintain competitiveness. The study offers a roadmap for marketers and academics to fully use the potential of AI by identifying current trends and future directions. This will help ensure that marketing strategies keep up with technical improvements. This literature study provides useful insights into the strategic utilisation of artificial intelligence (AI) in marketing, highlighting its capacity to stimulate innovation and facilitate growth in the digital world.

2.1. OBJECTIVES OF THE STUDY

- To understand the role of AI in Social Media Marketing
- To understand the challenges of implementing AI in social media marketing.

2.2. HYPOTHESIS

H1: AI plays a significant role in social media marketing.

H2: There are several challenges in implementing AI in social media marketing.

3. RESEARCH METHODOLOGY

The research methodology employed in this study utilized a quantitative approach to examine the impact of artificial intelligence (AI) on social media marketing effectiveness. A structured questionnaire was designed and distributed online to a sample of 243 marketing professionals from various industries, ensuring a diverse and representative population. Data collection was conducted over a period of three months, and the responses were analysed using statistical techniques, including descriptive statistics.

4. DATA ANALYSIS

Table 1. Role of AI in social media marketing.

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
AI significantly improves the effectiveness of social media marketing campaigns.	12	4.9%	12	4.9%	9	3.7%	35	14.4%	175	72.0%
AI tools enhance the accuracy of audience targeting on social media platforms.	18	7.4%	15	6.2%	5	2.1%	34	14.0%	171	70.4%
AI-driven analytics provide deeper insights into consumer behavior on social media.	15	6.2%	16	6.6%	3	1.2%	26	10.7%	183	75.3%
AI increases engagement rates of social media content.	16	6.6%	9	3.7%	6	2.5%	40	16.5%	172	70.8%
AI automates routine social media marketing tasks, boosting efficiency.	12	4.9%	13	5.3%	8	3.3%	23	9.5%	187	77.0%

The first statement, "AI significantly improves the effectiveness of social media marketing campaigns," is supported by 86.4% of respondents who either agree or strongly agree. This overwhelming majority indicates that marketing professionals recognize the substantial impact AI has on enhancing campaign outcomes. AI's ability to analyze large datasets, optimize content delivery, and provide actionable insights likely contributes to this perception. The small percentage of respondents (9.8%) who disagree or strongly disagree suggests that while AI is generally seen as beneficial, a minority might be facing implementation challenges or are skeptical of its effectiveness. For the statement "AI tools enhance the accuracy of audience targeting on social media platforms," 84.4% of respondents agree or strongly agree, highlighting the significant role AI plays in precise audience targeting. Accurate targeting is crucial for maximizing engagement and conversion rates, and AI's ability to analyze user data and behavior patterns allows marketers to reach the right audience more effectively. However, the 13.6% who disagree or strongly disagree point to potential obstacles, such as data quality issues or the complexity of integrating AI tools into existing marketing strategies.

The statement "AI-driven analytics provide deeper insights into consumer behavior on social media" is affirmed by 86.0% of respondents agreeing or strongly agreeing. This high level of agreement underscores the value of AI in understanding consumer behavior, which is vital for creating relevant and personalized marketing content. The 12.8% who do not share this view may be encountering difficulties in harnessing AI analytics or may question the accuracy and reliability of the insights provided by AI. Regarding the statement "AI increases engagement rates of social media content," 87.3% of respondents agree or strongly agree, suggesting that AI's role in boosting engagement is widely recognized. AI's capabilities in content optimization and personalized recommendations likely contribute to higher engagement rates. The small group of 10.3% who disagree or strongly disagree might be experiencing challenges in effectively using AI to enhance engagement or may have differing views on its impact.

Finally, the statement "AI automates routine social media marketing tasks, boosting efficiency" sees the highest level of agreement, with 86.5% of respondents agreeing or strongly agreeing. This consensus highlights AI's efficiency in automating repetitive tasks, freeing up marketers to focus on strategic activities. The 10.2% who do not agree may face implementation barriers or have concerns about the reliability of AI automation. In summary, the data indicates strong support among marketing professionals for the positive impact of AI on various aspects of social media marketing. While a minority of respondents express concerns or face challenges, the overall sentiment is highly favorable, emphasizing AI's role in enhancing effectiveness, accuracy, insights, engagement, and efficiency in social media marketing.

Table 2 Challenges in implementing AI in social media marketing.

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Integrating AI into social media marketing requires significant financial investment.	18	7.4%	10	4.1%	12	4.9%	52	21.4%	151	62.1%
There is a lack of skilled personnel to manage AI tools in social media marketing.	22	9.1%	9	3.7%	7	2.9%	24	9.9%	181	74.5%
Data privacy concerns pose challenges to using AI in social media marketing.	10	4.1%	23	9.5%	12	4.9%	67	27.6%	131	53.9%
AI algorithms sometimes exhibit biases that can affect marketing outcomes.	16	6.6%	11	4.5%	9	3.7%	41	16.9%	166	68.3%
Ensuring the accuracy and reliability of AI-driven insights is challenging.	11	4.5%	15	6.2%	10	4.1%	20	8.2%	187	77.0%

The first statement, "Integrating AI into social media marketing requires significant financial investment," received agreement from 83.5% of respondents, with 62.1% strongly agreeing and 21.4% agreeing. This consensus underscores the perception that implementing AI involves considerable costs, which can be a barrier for many organizations. The financial burden includes the initial investment in AI technology, ongoing maintenance, and potential upgrades. The relatively small percentages of respondents who disagreed (7.4%) or strongly disagreed (4.1%) suggest that while financial concerns are prominent, some may have found cost-effective solutions or view the investment as justified by the returns. For the statement, "There is a lack of skilled personnel to manage AI tools in social media marketing," a significant 84.4% of respondents either agree (9.9%) or strongly agree (74.5%). This highlights a critical challenge in the adoption of AI: the shortage of skilled professionals who can effectively manage and utilize AI tools. This skills gap can hinder the successful implementation and optimization of AI-driven marketing strategies. Only a small fraction of respondents (9.1%) strongly disagreed, and 3.7% disagreed, indicating that some organizations may have adequate personnel or access to necessary training resources. The statement, "Data privacy concerns pose challenges to using AI in social media marketing," saw 81.5% of respondents agreeing (27.6%) or strongly agreeing (53.9%). This significant concern reflects the growing awareness and importance of data privacy issues in the digital age. AI's reliance on large datasets can raise questions about how data is collected, stored, and used, making compliance with privacy regulations a complex task. A minority of respondents (4.1% strongly disagree, 9.5% disagree) may be less impacted by these

concerns or have robust privacy measures in place. Regarding the statement, "AI algorithms sometimes exhibit biases that can affect marketing outcomes," 85.2% of respondents either strongly agreed (68.3%) or agreed (16.9%). This widespread agreement highlights the recognition that biases in AI algorithms can lead to unfair or ineffective marketing practices. Biases can stem from the data used to train AI models or from the models themselves, potentially impacting the accuracy and fairness of marketing decisions. The smaller percentages of those who strongly disagreed (6.6%) or disagreed (4.5%) suggest that some professionals may either not encounter these biases or have mechanisms to mitigate them. Finally, the statement, "Ensuring the accuracy and reliability of AI-driven insights is challenging," was strongly agreed upon by 77.0% and agreed upon by 8.2%, totaling 85.2%. This indicates a high level of concern regarding the dependability of AI-generated insights, which are crucial for making informed marketing decisions. The challenges in maintaining accuracy and reliability can stem from issues such as data quality, model performance, and the dynamic nature of social media environments. The minority of respondents who strongly disagreed (4.5%) or disagreed (6.2%) may have robust systems in place that ensure high accuracy and reliability. In summary, the data from Table 2 reveals significant challenges associated with implementing AI in social media marketing, including financial investment, the need for skilled personnel, data privacy concerns, algorithmic biases, and the accuracy and reliability of AI insights. Addressing these challenges is crucial for organizations to fully leverage the potential of AI in enhancing their social media marketing efforts.

H1: AI plays a significant role in social media marketing.

Table 3. One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
AI significantly improves the effectiveness of social media marketing campaigns.	20.320	242	.000	1.43621	1.2970	1.5754
AI tools enhance the accuracy of audience targeting on social media platforms.	16.854	242	.000	1.33745	1.1811	1.4938
AI-driven analytics provide deeper insights into consumer behaviour on social media.	18.689	242	.000	1.42387	1.2738	1.5739
AI increases engagement rates of social media content.	19.230	242	.000	1.41152	1.2669	1.5561
AI automates routine social media marketing tasks, boosting efficiency.	20.788	242	.000	1.48148	1.3411	1.6219

The first statement, "AI significantly improves the effectiveness of social media marketing campaigns," shows a t-value of 20.320 with a significance level (p-value) of .000, indicating that the result is highly statistically significant. The mean difference is 1.43621, with a 95% confidence interval ranging from 1.2970 to 1.5754. This implies that respondents overwhelmingly believe that AI improves the effectiveness of social media marketing campaigns. The positive mean difference indicates that the average rating is significantly higher than the neutral value of 3, supporting the hypothesis that AI plays a crucial role in enhancing marketing campaign outcomes. For the statement "AI tools enhance the accuracy of audience targeting on social media platforms," the t-value is 16.854, and the significance level is .000, confirming the statistical significance of the findings. The mean difference of 1.33745, with a 95% confidence interval from 1.1811 to 1.4938, suggests that respondents perceive AI tools as significantly improving audience targeting accuracy. The strong positive mean difference reinforces the hypothesis by showing that AI's ability to analyze data and identify target audiences is highly valued by social media marketing professionals. The statement "AI-driven analytics provide deeper insights into consumer behavior on social media" has a t-value of 18.689 and a significance level of .000, indicating high statistical significance. The mean difference is 1.42387, with a 95% confidence interval ranging from 1.2738 to 1.5739. This demonstrates that respondents believe AI-driven analytics offer significantly deeper insights into consumer behavior, which is essential for developing effective marketing strategies. The positive mean difference supports the

hypothesis by highlighting AI's role in understanding and predicting consumer actions on social media. Regarding the statement "AI increases engagement rates of social media content," the t-value is 19.230, and the significance level is .000, signifying that the result is statistically significant. The mean difference of 1.41152, with a 95% confidence interval between 1.2669 and 1.5561, indicates a strong agreement among respondents that AI enhances engagement rates. This finding aligns with the hypothesis, emphasizing AI's capability to optimize content and interaction strategies, leading to higher engagement levels. Finally, for the statement "AI automates routine social media marketing tasks, boosting efficiency," the t-value is 20.788, with a significance level of .000, confirming the statistical significance of the results. The mean difference of 1.48148, with a 95% confidence interval from 1.3411 to 1.6219, reflects a strong consensus that AI significantly boosts efficiency by automating routine tasks. This supports the hypothesis by showing that AI's automation capabilities are crucial in enhancing the productivity and effectiveness of social media marketing efforts. In summary, the statistical analysis from Table 3 provides robust evidence supporting the hypothesis that AI plays a significant role in social media marketing. Each statement shows highly significant t-values and positive mean differences, indicating strong agreement among respondents on the beneficial impact of AI on various aspects of social media marketing, from campaign effectiveness and audience targeting to consumer insights, engagement, and efficiency.

H2: There are several challenges in implementing AI in social media marketing.

Table 4. One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Integrating AI into social media marketing requires significant financial investment.	16.486	242	.000	1.26749	1.1160	1.4189
There is a lack of skilled personnel to manage AI tools in social media marketing.	16.856	242	.000	1.37037	1.2102	1.5305
Data privacy concerns pose challenges to using AI in social media marketing.	16.020	242	.000	1.17695	1.0322	1.3217
AI algorithms sometimes exhibit biases that can affect marketing outcomes.	18.078	242	.000	1.35802	1.2101	1.5060
Ensuring the accuracy and reliability of AI-driven insights is challenging.	20.483	242	.000	1.46914	1.3279	1.6104

The first statement, "Integrating AI into social media marketing requires significant financial investment," has a t-value of 16.486 and a significance level (p-value) of .000, indicating that the result is highly statistically significant. The mean difference is 1.26749, with a 95% confidence interval ranging from 1.1160 to 1.4189. This suggests that respondents widely acknowledge the substantial financial costs associated with implementing AI in social media marketing. The positive mean difference shows that the average rating is significantly higher than the neutral value of 3, supporting the hypothesis that financial investment is a significant challenge in adopting AI technologies. For the statement "There is a lack of skilled personnel to manage AI tools in social media marketing," the t-value is 16.856, with a significance level of .000, confirming the statistical significance of the findings. The mean difference of 1.37037, with a 95% confidence interval from 1.2102 to 1.5305, indicates that respondents perceive a notable shortage of skilled professionals capable of managing AI tools effectively. This strong positive mean difference reinforces the hypothesis by highlighting the human resource challenges in successfully implementing AI-driven marketing strategies. The statement "Data privacy concerns pose challenges to using AI in social media marketing" shows a t-value of 16.020 and a significance level of .000, indicating high statistical significance. The mean difference is 1.17695, with a 95% confidence interval ranging from 1.0322 to 1.3217. This demonstrates that respondents recognize data privacy as a significant challenge when using AI in social media marketing. The positive mean difference supports the hypothesis by

underscoring the importance of addressing privacy concerns to ensure ethical and compliant AI usage. Regarding the statement "AI algorithms sometimes exhibit biases that can affect marketing outcomes," the t-value is 18.078, with a significance level of .000, signifying that the result is statistically significant. The mean difference of 1.35802, with a 95% confidence interval between 1.2101 and 1.5060, suggests a strong agreement among respondents that AI algorithms can be biased, which can adversely impact marketing outcomes. This finding aligns with the hypothesis by emphasizing the need to address algorithmic biases to ensure fair and effective marketing practices. Finally, for the statement "Ensuring the accuracy and reliability of AI-driven insights is challenging," the t-value is 20.483, with a significance level of .000, confirming the statistical significance of the results. The mean difference of 1.46914, with a 95% confidence interval from 1.3279 to 1.6104, reflects a strong consensus that maintaining the accuracy and reliability of AI-driven insights poses a significant challenge. This supports the hypothesis by showing that ensuring the dependability of AI-generated data is crucial for making informed marketing decisions. In summary, the statistical analysis from Table 4 provides robust evidence supporting the hypothesis that there are several challenges in implementing AI in social media marketing. Each statement shows highly significant t-values and positive mean differences, indicating strong agreement among respondents on the various challenges, including financial investment, lack of skilled personnel, data privacy concerns, algorithmic biases, and the accuracy and reliability of AI insights.

5. FINDINGS

The findings of this study underscore the significant role that artificial intelligence (AI) plays in social media marketing, as well as the various challenges associated with its implementation. Analysis of the responses indicates a strong consensus among social media marketing professionals regarding the positive impact of AI on marketing effectiveness, audience targeting, consumer behavior insights, engagement rates, and efficiency. The statistical significance of the responses, with high t-values and positive mean differences for each statement, confirms that AI is perceived as a powerful tool that enhances various facets of social media marketing. These results validate the hypothesis that AI plays a significant role in social media marketing, with the majority of respondents acknowledging the transformative potential of AI technologies in optimizing marketing strategies and outcomes.

However, the study also reveals several critical challenges that hinder the effective implementation of AI in social media marketing. Respondents highlighted significant financial investment requirements, a shortage of skilled personnel, data privacy concerns, biases in AI algorithms, and the difficulty of ensuring the accuracy and reliability of AI-driven insights. These challenges are statistically significant, as evidenced by the high t-values and substantial mean differences, indicating a strong agreement among professionals about the obstacles they face. These findings support the second hypothesis, emphasizing the need for organizations to address these issues to fully leverage AI's benefits. By acknowledging and overcoming these barriers, businesses can better integrate AI into their marketing strategies, ensuring more effective and ethical use of AI technologies in social media marketing.

6. CONCLUSION

This study conclusively demonstrates the significant role of artificial intelligence (AI) in enhancing social media marketing strategies. The results indicate that AI substantially improves the effectiveness of marketing campaigns, accuracy in audience targeting, and engagement rates. Furthermore, AI-driven analytics provide deeper insights into consumer behavior, while automation of routine tasks boosts overall efficiency. These findings corroborate the hypothesis that AI is a critical enabler in the field of social media marketing, offering transformative potential that marketers are increasingly recognizing and leveraging.

The implications of these findings are profound for marketing professionals and organizations. First, the clear benefits of AI in optimizing marketing efforts underscore the need for businesses to invest in AI technologies. Companies that effectively integrate AI into their social media marketing strategies can expect improved campaign outcomes, more precise targeting, and higher engagement rates, which collectively contribute to better return on investment (ROI). However, the study also highlights significant challenges, such as the high financial costs, the need for skilled personnel, data privacy issues, and potential biases in AI algorithms. Addressing these challenges requires strategic investment in training and development, robust data privacy frameworks, and ongoing refinement of AI models to ensure fairness and accuracy.

Future research should focus on exploring solutions to the challenges identified in this study. Investigating cost-effective methods for AI implementation and training programs to develop skilled AI professionals in marketing are critical areas of interest. Additionally, further research is needed to enhance AI algorithms to minimize biases and improve the accuracy and reliability of AI-driven insights. Longitudinal studies could provide deeper insights into the long-term impact of AI on social media marketing effectiveness and consumer behavior. Moreover, examining the ethical implications of AI in marketing, particularly in relation to data privacy and algorithmic fairness, will be crucial in developing sustainable and responsible AI practices. This comprehensive approach will help in maximizing the benefits of AI while mitigating its challenges, ensuring a balanced and effective integration of AI in social media marketing.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

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