

Artificial Intelligence in Marketing

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Abstract

This review paper explores the evolving role of artificial intelligence (AI) in marketing, examining both its potential and its limitations. AI technologies are increasingly being leveraged to enhance marketing practices through automation, data analysis, and personalized customer experiences. The paper highlights the significant advantages of AI, including its ability to process vast amounts of data in real-time, optimize marketing strategies, and improve efficiency and scalability. However, the paper also addresses critical challenges, such as the lack of "common sense" in AI systems, the ethical concerns surrounding data privacy, and the potential stifling of human creativity. By examining these pros and cons, the paper provides a comprehensive overview of AI's current and future impact on marketing, emphasizing the need for a balanced approach that integrates human expertise with AI-driven insights for sustainable success.

Introduction

Artificial Intelligence (AI) is poised to become an integral component of every commercial entity worldwide in the long term. The latest trends in AI-driven automation highlight significant shifts in the AI landscape, as evidenced by the reconfiguration of ideas, interests, and investments in AI adoption by enterprises. This technology has advanced to the point where it can recognize faces and objects, which has far-reaching implications for various business applications. In security, facial recognition technology can accurately identify individuals, while object detection can be employed to distinguish and analyze images. AI processes human images similarly to how it treats cookies, enabling businesses to offer more personalized services based on customer preferences.

Artificial Intelligence (AI) primarily focuses on user retention and lead conversion in digital marketing. It can guide users in directions that align with a business's goals by utilizing intuitive AI chatbots, intelligent email marketing, interactive web design, and other digital marketing services. Several factors influence the impact of AI on digital marketing. Machine Learning (ML), a subset of AI, involves computer programs that access data and learn independently. ML compiles data from various sources, including social media accounts, menus, online reviews, and websites. AI then leverages this information to create and deliver content that is relevant to the audience. Additionally, AI software enables in-depth online analysis of restaurants and their customers.

Digital marketing, enhanced by AI, provides clients with a visually engaging experience across social media and digital platforms such as Facebook and Instagram. These platforms thoroughly analyze user data before presenting them with offers tailored to their specific needs. AI also aids marketers in identifying and forecasting trends, helping companies avoid overspending on digital advertising and ensuring that their budget is efficiently utilized. The ability of a computer to recognize objects, scenes, and activities in images is known as computer vision. This technology has applications in areas such as medical imaging analysis, facial recognition, public security, and security monitoring. When combined

When a firm hires a communication agency to design a publicity stunt, both parties implicitly understand that the marketing campaign should neither endanger human lives nor break the law. In AI, however, nothing is assumed to "go without saying." In traditional statistics, the analyst's domain knowledge and expertise are crucial for infusing common sense into the model (for example, by selecting relevant independent variables or establishing a causal graph). This is much less the case in AI applications, where data is often input in raw form (albeit in large quantities), and the analyst partially outsources higher-level learning to the model. The absence of this "common sense" makes the specification of objective functions, which is discussed next, a particularly complex and frequently underrated task.

Literature Review

Marcello et al. (2021). The study is the first to present an integrated view of the body of knowledge on artificial intelligence (AI) as published in marketing, consumer research, and psychology literature. By employing a systematic literature review with a data-driven approach and quantitative methodology (including bibliographic coupling), the study offers an overview of the emerging intellectual structure of AI research within these three areas of literature. The researchers identified eight topical clusters: (1) memory and computational logic; (2) decision-making and cognitive processes; (3) neural networks; (4) machine learning and linguistic analysis; (5) social media and text mining; (6) social media content analytics; (7) technology acceptance and adoption; and (8) big data and robots. Additionally, a total of 412 theoretical lenses used in these studies were identified, with the most frequently used being: (1) the unified theory of acceptance and use of technology; (2) game theory; (3) theory of mind; (4) theory of planned behavior; (5) computational theories; (6) behavioral reasoning theory; (7) decision theories; and (8) evolutionary theory. Finally, the study proposes a research agenda aimed at advancing scholarly debate on AI within the three literatures, emphasizing the cross-fertilization of theories across fields and addressing neglected research topics [1].

Liye Ma (2020). Artificial intelligence (AI) agents powered by machine learning algorithms are rapidly transforming the business landscape, sparking significant interest among researchers. In this paper, the authors review and advocate for the use of machine learning methods in marketing research. They provide an overview of common machine learning tasks and methods, comparing them with the statistical and econometric methods traditionally employed by marketing researchers. The authors argue that machine learning methods are capable of processing large-scale and unstructured data and have flexible model structures that deliver strong predictive performance. However, they also acknowledge that these methods may lack model transparency and interpretability. The paper discusses notable AI-driven industry trends and practices and reviews the emerging academic marketing literature that utilizes machine learning methods. More importantly, it presents a unified conceptual framework and a multi-faceted research agenda. From five key aspects of empirical marketing research—method, data, usage, issue, and theory—the authors propose several research priorities. These include extending machine learning methods and integrating them as core components in marketing research, using these methods to extract insights from large-scale unstructured, tracking, and network data, employing them transparently for descriptive, causal, and prescriptive analyses, using them to map customer purchase journeys and develop decision-support capabilities, and connecting these methods to human insights and marketing theories. The authors emphasize that opportunities abound for machine learning methods in marketing, and they hope that their multi-faceted research agenda will inspire further work in this exciting field [2].

Abid Haleem et al. (2022). Artificial Intelligence (AI) holds immense potential in the field of marketing. It enhances the proliferation of information and data sources, improves software's data management capabilities, and enables the design of complex and advanced algorithms. AI is transforming the way brands and consumers interact. The application of AI technology varies significantly depending on the nature of the website and the type of business involved. Marketers can now focus more effectively on customers and address their needs in real time. By leveraging AI, marketers can swiftly identify the content to target specific customers and determine the optimal channels and timing for engagement, utilizing data collected and generated by AI algorithms. When AI is employed to personalize user experiences, consumers feel more comfortable and are more likely to purchase the offered products or services. Additionally, AI tools can be used to analyze the performance of competitors' campaigns and uncover insights into their customers' expectations. Machine Learning (ML), a subset of AI, allows computers to analyze and interpret data without explicit programming. ML aids in problem-solving by improving the performance and accuracy of algorithms as they are fed more data. For this research, relevant articles on AI in marketing were sourced from Scopus, Google Scholar, ResearchGate, and other platforms. These articles were thoroughly reviewed, leading to the development of the paper's theme. This paper seeks to review the role of AI in marketing, exploring its specific applications across various marketing segments and their impact on the transformation of the marketing sector. Finally, the paper identifies and analyzes critical applications of AI in marketing [3].

Sanjeev Verma et al. (2021). Disruptive technologies such as the Internet of Things, big data analytics, blockchain, and artificial intelligence have revolutionized the way businesses operate. Among these, artificial intelligence (AI) stands out as the latest technological disruptor with significant potential to transform marketing. Practitioners around the world are seeking the most suitable AI solutions for their marketing functions. However, a systematic literature review can underscore the importance of AI in marketing and outline future research directions. The present study aims to provide a comprehensive review of AI in marketing through bibliometric, conceptual, and intellectual network analysis of existing literature published between 1982 and 2020. An extensive review of 1,580 papers helped identify the performance of key scientific contributors, such as the most relevant authors and sources. Additionally, co-citation and co-occurrence analyses were used to map the conceptual and intellectual network in the field. Data clustering with the Louvain algorithm further identified research sub-themes and suggested future research directions to advance AI in marketing [4].

Ming Hui (2020). The authors propose a three-stage framework for strategic marketing planning that incorporates the various benefits of artificial intelligence (AI): mechanical AI for automating repetitive marketing tasks, thinking AI for processing data and making decisions, and feeling AI for analyzing interactions and human emotions. This framework outlines how AI can be utilized across different stages of marketing, including research, strategy (segmentation, targeting, and positioning, or STP), and actions. At the marketing research stage, mechanical AI is employed for data collection, thinking AI for market analysis, and feeling AI for gaining customer insights. During the marketing strategy (STP) stage, mechanical AI assists in segmentation (identifying segments), thinking AI in targeting (recommending segments), and feeling AI in positioning (aligning with segment preferences). In the marketing action stage, mechanical AI is used for standardization, thinking AI for personalization, and feeling AI for building relational connections. The authors apply this framework to various areas of marketing, organized by the marketing 4Ps/4Cs, to demonstrate the strategic use of AI [5].

Nalini et al. (2021). AI marketing leverages artificial intelligence technologies to make automated decisions based on data collection, analysis, and additional observations of audience behavior or economic trends that may influence marketing strategies. AI is particularly valuable in marketing scenarios where speed is critical. By utilizing data and customer profiles, AI tools learn how to effectively communicate with customers, delivering personalized messages at the optimal time without the need for direct intervention from marketing team members, thereby ensuring maximum efficiency. For many modern marketers, AI is used to augment marketing teams or handle more tactical tasks that require less human interpretation. Artificial intelligence refers to the creation of intelligent machines capable of thinking and reacting like humans. Often regarded as the next industrial revolution, AI is seen as a potential solution to many of the current and future challenges facing the world. Additionally, AI has the potential to create entirely new industries, technologies, and environments [6].

Arnaud et al. (2020). This article explores the pitfalls and opportunities of AI in marketing through the perspectives of knowledge creation and knowledge transfer. First, it delves into the concept of "higher-order learning," which sets AI applications apart from traditional modeling approaches. The discussion centers on recent advancements in deep neural networks, covering key methodologies such as multilayer perceptron, convolutional, and recurrent neural networks, as well as various learning paradigms, including supervised, unsupervised, and reinforcement learning. Second, the article highlights the technological pitfalls and risks that marketing managers must consider when implementing AI in their organizations. These include issues like poorly defined objective functions, unsafe or unrealistic learning environments, biased AI, and the need for explainable and controllable AI. Third, while AI is expected to have a significant impact on automating predictive tasks that require minimal explainability, the article predicts that AI may fall short of its potential in many marketing domains if the challenges of tacit knowledge transfer between AI models and marketing organizations are not addressed [7].

Leonardo et al. (2021). A growing body of research on Intelligent Systems and Artificial Intelligence (AI) in marketing has demonstrated that AI can mimic human behavior and perform tasks in an "intelligent" manner. Given the increasing interest in AI among marketing researchers and practitioners, this review aims to provide an overview of the development of the marketing and AI research fields. By reviewing 164 articles published in Web of Science and Scopus indexed journals, the article establishes a context-specific research agenda. Through the application of Multiple Correspondence Analysis (MCA), the study identifies several research avenues, including the adoption, use, and acceptance of AI technology in marketing, the importance of data protection and ethics, the role of institutional support for AI in marketing, and the impact of AI on the labor market and marketers' skillsets [8].

Srikrishna et al. (2021). The digital transformation driven by the increasing use of artificial intelligence (AI) has been a key factor in triggering the next wave of enterprise business disruption. Marketing, in particular, is experiencing this transformation at an intense scale. Modern marketing is beginning to incorporate cutting-edge technologies like AI into mainstream operations to achieve accelerated success. This article examines the use of AI in marketing as an emerging research area. Drawing on insights from previous studies, the research categorizes marketing into five key functional themes: integrated digital marketing, content marketing, experiential marketing, marketing operations, and market research, along with 19 sub-functional themes (activity levers). Within these themes and sub-themes, the study identifies 170 use cases from existing literature where AI has been applied to deliver superior quality outcomes and experiences in marketing. Through a systematic literature review (SLR) of 57 relevant publications, the article evaluates and ranks these works based on their coverage, impact, relevance, and contributions. The

findings are analyzed across various sectors, research contexts, and scenarios. The study also discusses the implications for both practitioners and academic researchers and proposes a future research agenda to explore the ongoing transformation driven by the rapid adoption of AI in the marketing landscape [9].

Ming Hui et al. (2022). The article develops a conceptual framework for collaborative artificial intelligence (AI) in marketing, offering systematic guidance on how human marketers and consumers can effectively collaborate with AI. This framework has significant implications for retailing, which serves as the interface between marketers and consumers. Drawing from the multiple intelligences perspective, the framework distinguishes between mechanical, thinking, and feeling intelligence, based on the complexity of mimicking human intelligences. It posits that successful collaboration between AI and human intelligence (HI) can be achieved by: 1) recognizing the respective strengths of AI and HI, 2) having lower-level AI augment higher-level HI, and 3) advancing HI to a higher intelligence level as AI automates lower-level tasks. The article outlines implications for marketers, consumers, and researchers. Marketers are advised to optimize the mix and timing of AI-HI teams, consumers are encouraged to understand the complementarity between AI and HI strengths for informed consumption decisions, and researchers are invited to explore innovative approaches and boundary conditions of collaborative intelligence [10].

Conclusion

The implications of AI in marketing are profound, offering both significant advantages and notable challenges. On the positive side, AI can vastly enhance efficiency by automating tasks like data analysis, personalization, and customer service. It enables marketers to leverage vast amounts of data for highly targeted campaigns, improving customer experiences and optimizing marketing spend. AI's ability to process and analyze data faster than humans leads to better decision-making, real-time insights, and scalability.

However, the adoption of AI in marketing also comes with challenges. The absence of "common sense" in AI systems means that without careful oversight, campaigns may lack human empathy and cultural sensitivity, leading to tone-deaf messaging. Privacy concerns also arise as AI relies heavily on data collection, making it crucial for firms to navigate ethical and regulatory boundaries. Additionally, the risk of over-reliance on AI could lead to a loss of creative innovation, as models focus more on historical patterns than groundbreaking ideas. Therefore, while AI is a powerful tool, its success in marketing hinges on a careful balance between technological automation and human intuition.

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