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(REVIEW ARTICLE)

The role of Artificial Intelligence in marketing: A thematic review of AI applications and consumer engagement

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Abstract

Long before the worldwide epidemic struck, technological advancements were transforming consumer behavior and marketing strategies. The potential of AI to positively impact marketing practices and research is also promising. However, marketers must understand AI and how it profoundly affects consumer behavior. Consequently, the purpose of this paper is to review the applications of AI in marketing and examine its contribution to the facilitation of marketing processes. This review of AI applications in marketing is based on existing literature up to 2021. This study only included research papers based on AI technologies. Using thematic analysis, articles sourced from the Google Scholar and Scopus databases were analyzed. The analysis of selected studies shows that AI adoption in marketing is in the initial stage. Findings – The analysis revealed the following main themes (a) predictive analytics, (b) AI integration, (c) customer relationship management, (d) strategic marketing with AI, (e) AI in services, (f) conversational commerce, (g) advertising AI, and (h) customer brand engagement.

Keywords: Artificial Intelligence; Big Data; Marketing; Machine Learning

1. Introduction

AI in marketing has emerged as a prominent subject within the technology sector, capturing the interest of both marketers and academics due to its exciting possibilities for the future. Over recent years, advancements in AI technology have profoundly impacted the marketing industry. It is now being applied across various domains in today's business landscape. According to recent data, 72% of marketers view AI as a beneficial asset to their operations (Riesland & Stillings, 1987; Huang & Rust, 2018; Rangan et al., 2021; Russell & Norvig, 2021).

Both marketers and consumers leverage AI at different touchpoints, ranging from retail sales and strategic decision-making to personalized marketing efforts and customer satisfaction analysis (Huang & Rust, 2021; Kumar et al.). Consumers are reaping the benefits of AI applications, including reduced costs, access to multiple service channels, and opportunities for creative expression (Henlin & Kaplan, 2019; PwC, 2017; Smart Insights, 2018). The global embrace of AI tools has been remarkable; the international AI market, valued at approximately $5 billion in 2015, is projected to soar to nearly $125 billion by 2025 (Statista, 2020).

Despite this rapid market penetration, the actual implementation of AI technologies in marketing remains somewhat unclear. There is a lack of comprehensive overviews detailing how marketers have investigated various aspects of AI, its applications, and human-AI interactions. To address this, our study offers a review that elucidates the significant

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areas of AI-enabled research in marketing of interest to both marketers and scholars. We identify key topics within AI marketing literature and present eight areas of marketing relevance.

Our focus extends over the previous 21 years (2000–2021), during which there was a substantial rise in AI adoption among both marketers and consumers. The role of AI in nurturing consumer relationships and enhancing brand engagement has been a significant topic of investigation. Additionally, recent studies have shed light on how anthropomorphism and interpersonal appeal can influence users' relationships with AI tools, underscoring the growing importance of these techniques in AI marketing research. As reliance on AI grows, a deeper understanding of AI, its tools, and consumer behavior becomes increasingly vital.

The structure of our study includes an introduction in the first section, followed by a literature review and methodology in the second. The third section delves into methods and data analysis, while the fourth offers an overview of prominent research topics related to AI in marketing. The fifth section outlines upcoming research opportunities, and the sixth concludes by discussing the study's conclusions and limitations. Marketing has emerged as a prominent subject within the technology sector, capturing the interest of both marketers and academics due to its exciting possibilities for the future. Over recent years, advancements in AI technology have profoundly impacted the marketing industry. It is now being applied across various domains in today's business landscape. According to recent data, 72% of marketers view AI as a beneficial asset to their operations (Riesland & Stillings, 1987; Huang & Rust, 2018; Rangan et al., 2021; Russell & Norvig, 2021).

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2. Literature Review

Artificial Intelligence (AI) was first proposed by Alan Turing in the 1950s, in which he marked the Turing Test as a way of defining machine intelligence (Turing, 1950). This unprecedented period became a watershed for computer science, many industries, and society. The expression "artificial intelligence" was introduced by a scientist named John McCarthy in the 1950s at the Dartmouth Conference to define the computer science section that seeks to simulate human learning. According to McCarthy, AI can be defined as "the science and engineering of making intelligent machines" (Tech Nation, 2019). AI is a collection of complex hardware, software, and vast data repositories that mimic human functions such as deciding, solving problems, and thinking logically. 1961: The first robot was introduced by General Motors, an achievement in AI development (Murray et al., 2017). During this time, significant theoretical progress and the development of machine learning (ML) (Lu, 2019) were made. A landmark event occurred in 1997 when a specialized computer, Deep Blue, defeated the world chess champion Garry Kasparov (Hsu, 1999). It has been well over 20 years since AI has considerably changed industries such as education and health, so why not marketing, too? (Huang & Rust, 2018).

The dawn of the 21st century saw the digital revolution's rapid acceleration with the internet's exponential growth (Lu, 2019). This resulted in vast amounts of data being created, called big data, which conventional data processing techniques were incapable of processing effectively (Dimitrieska et al., 2018). The challenges of big data presented opportunities for AI applications in marketing (de Bellis & Venkataramani Johar, 2020; Grewal et al., 2020). Therefore, marketers heavily invest in AI and machine learning to improve capabilities and outperform (Ma & Sun, 2020). Yet, in these early days of AI adoption in marketing, only a few large technology companies, namely Google and Amazon, showed widespread enthusiasm for AI. At the same time, many marketers were still skeptical (Casillas & Lopez, 2010). Soon, AI became trusted by marketers and indispensable to brands (Karimova & Goby, 2021). As early as 2017, numerous companies began implementing AI-powered algorithms into their decision-making (Aflalo, 2020). Recently, it has been reported that AI adoption in marketing has increased by 270% in the past four years (Lin, 2022). With the

widespread adoption of AI across various industries, it went from emerging technology to an essential tool in making informed decisions and running the business (Mallik, S. K., & Rahman, M. A. (2024).

By employing AI-powered marketing strategies, you can now use AI in organizations across all functions, from product development to marketing and customer support ((Mallik, S. K., & Rahman, M. A. (2024). In that case, companies ultimately utilize consumer preferences and behavior to enhance the efficacy of marketing campaigns (Kumar et al., 2019b). Moreover, AI improves demand forecasting (Carbonneau et al., 2008), optimizes supply chains (Min, 2010), and manages inventories, leading to enhanced efficiency, minutes/hours, and/or cost savings. Likewise, AI-enabled chatbots transform customer service through their instant, personalized response-generating feature, leading to customer satisfaction (Hoyer et al., 2020; Pelau et al., 2021).

For example, AI-based recommendation systems play a vital role in analyzing user preferences to recommend the most relevant products in e-commerce (Marchand & Marx, 2020). Furthermore, AI has become integral to consumers' day-to-day lives, whether through virtual assistants, chatbots, smart home devices, or intelligent products. Voice assistants that leverage AIdesign, seperti Siri, Alexa, and Google Assistant have been developed to understand and answer user questions, perform tasks like booking appointments, and keep track of reminders (Hoy, 2018). Artificial intelligence smartphones can determine faces, act as intelligent assistants, and take enriched images using smart algorithms (Kumar et al., 2019a). In addition to this, since October 2023, e-commerce platforms, streaming services, and social networks, such as Amazon, Instagram, and Netflix, have used recommendation systems powered by AI to recommend content and products tailored to the customers' preferences (Chung et al., 2016; Martínez-López et al., 2015). Such amplification is necessary to increase user experience and satisfaction, and it is achieved through customized recommendations according to user interests (Shen, 2014)

3. Methodology

This study synthesized AI-related articles in marketing using a systematic review approach based on the PRISMA guideline. A multi-staged filtering method was applied to identify papers within the stated time period.

3.1. Selection

Keywords Extraction Relevant to Artificial Intelligence First, we searched for "Artificial Intelligence in Marketing" in Google Scholar to find all relevant terms and concepts. We have downloaded ten research papers whose titles and abstracts included keywords such as "AI in Marketing." Next, a comprehensive examination of the mentioned papers was performed to capture any further keywords directly linked to AI. During this process, we identified four key search terms to perform more detailed searches within two of the most established and advocated databases and search engines, Google Scholar and Scopus (Buhalis & Law, 2008). Table 1 describes the specific keywords that were selected.

The chosen period of article collection was between 2000 and 2021 because AI technology developed a lot during this period, and marketers tend to include AI in their marketing plans. Articles were eligible for inclusion by the following criteria:

- Their focus was explicitly on AI technologies.
- They were always relevant in the context of marketing.

3.2. Data Collection

During the data collection phase, an initial search yielded **580 articles**. Several articles were excluded due to duplication, classification as conference proceedings, review papers, or book chapters.

Table 1 Identified and Utilized Keywords

Concepts	**Keywords**
1. Artificial Intelligence	"Artificial intelligence" OR "Big data" OR "Machine learning" OR "Data mining"
2. Marketing	"Marketing" OR "Marketer" OR "Market"
Search Strategy	1 IN/AND 2

The scoping list included papers with any one of the predefined key terms in either their title or abstract. The selected articles were screened to assess whether their content related to the use of artificial intelligence in marketing (Mallik, S. K., Islam, M. R., Uddin, I., Ali, M. A., & Trisha, S. M. (2025). We retained only those articles which specifically mentioned AI and its application in marketing. After executing the filtering process, 75 papers were filtered for analysis. Figure 1 provides a pictorial representation of this selection process. The identified articles were thoroughly reviewed and analyzed using thematic analysis to determine the themes of AI in marketing.

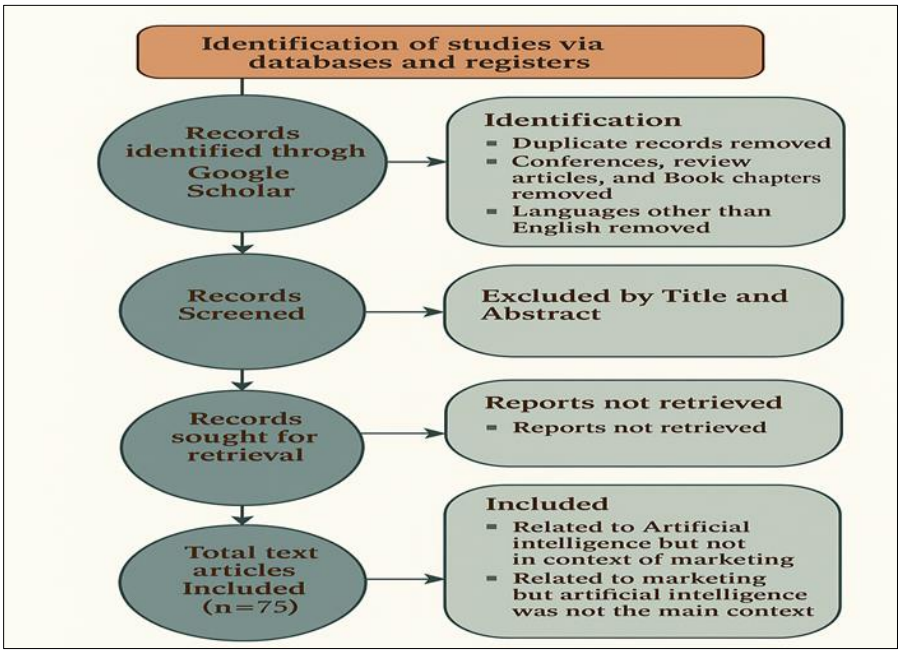

Figure 1 PRISMA Flowchart

3.3. Data Analysis

After identifying the articles, we performed a thematic analysis based on Braun and Clarke's (2006) methodology over the contents of 75 papers to identify significant themes. Thematic analysis is a qualitative analytical approach used in systematic reviews. It is generally understood as "a method for identifying, analyzing and reporting patterns (themes) within data" (Braun and Clarke, 2006). The first and arguably most important step was to understand the data. All selected papers were read, re-read, and summarized using a standard framework to capture the essence of insights extracted in the first-round stage. After this, a detailed screening of the papers was performed. Similar findings were collated into articles, and manual coding was used to indicate each article's contribution to a particular theme. They were codes for important concepts outlining major research areas. The articles were then classified according to the marketing-related AI applications discussed in the literature. The codes were then combined into possible themes. This process ultimately led to identifying, defining, and naming eight core themes, which reflect the specific research domains in AI-driven marketing literature.

3.4. Findings and Themes Discussed

The study is a review of AI applications in marketing. Using 75 research papers, the authors conducted a thematic analysis and uncovered common themes in the data from the existing literature.

3.4.1. Theme 1 – Predictive Analytics

This theme represents research that uses AI to study consumer sentiments and predict consumer attitudes toward products, price, place, and promotion. Big data and artificial neural networks (ANNs) have been used for significant research on online feedback, perceptions, and consumer attitudes (Chong et al., 2017). It has been found in many studies that ANNs and fuzzy logic can efficiently solve problems related to market prediction, market segmentation, and sales forecasting (Tiwari et al., 2020). Marketers have access not only to structured data but also to unstructured formats such as audio, video, images, and text, which traditional analytical techniques have been known not to be able to analyze well. While marketers can cover generating sales trends, market activity control, pattern recognition, and new product and service design based on customer-centered approaches, AI allows AI (KHL, 2019). AI-Assisted

Conversational commerce: AI-driven voice assistants enable to converse with the consumer, helping marketers to identify consumer mood based on voice commands (Halbauer & Klarman, 2022)

Demand forecasting can be augmented with social media predictive analytics. They identified different AI-powered intelligence abilities that offer marketers a competitive edge (Huang & Moricha, 2021). These include:

- Mechanical AI: Gather data on market, firms, environment, consumer, competition
- AI Cognition: Built for market research.
- AI-intuition: Asks (or tells) the consumer what they need, hope, or how much they are willing to pay.

Other studies have explored using AI-powered sentiment analysis to understand consumer behavior.

3.4.2. Theme 2 -AI and the Human-AI Relationship

Indeed, research under this theme shows an echoing of human form in interactions between users and AI-driven tools like voice assistants and chatbots due to the web of interconnected global villages compared to natural human-computer interaction. These interactions mimic interpersonal ones, where AI tools help users' complete tasks, continue conversations, and answer questions (human-human interaction). (2019) Investigated the relationships formed with these anthropomorphized devices (servants, friends, authority figures) and the implications they hold for the future use of AI. It wasn't until 2017 that academic interest appeared in examining this topic. Although research in this area is nascent, scholars are looking into what leads to human-AI relationships. According to existing literature, some key factors are enjoyment, anthropomorphism, social presence, and interpersonal attraction (Han & Yang, 2018; Noor et al., 2021). Human-AI relationships benefit both companies and consumers. These interactions shape consumer attitudes toward AI tools and the brands tied to them. In addition, they enhance perceived well-being, encouraging users to adopt and use AI-based personal assistants and chatbots (Skojov et al., 2021; Han & Yang, 2018; Ki et al., 2020).

3.4.3. Theme 3 – Customer Relationship Management (CRM) and AI.

This theme covers how AI technologies transform CRM for organizations by allowing them to analyze customer data on a large scale (Mishra & Mukherjee, 2019). Today, modern consumers are more aware of AI-driven services and how they improve user experiences. With the integration of other data sources and building a structured data infrastructure, AI-based CRM systems have revolutionized how marketers evaluate consumer data. With the existence of big data, it is believed that marketers can implement data centric frameworks that support real time customer analytics that create long lasting relationships over time (Kitchens et al., 2018). Chatterjee et al. Organizational agility, which involves quickly responding to vision and technology challenges while integrating AI-driven customer service solutions, is one important aspect that plays a crucial role in helping organizations to the successful adoption of AI solutions, leading to better customer engagement and satisfaction (Tsiotsou and Wirtz, 2021).Moreover, how IoT is improving CRM and as a result contributes to better business efficiency and more effective communication with consumers (Luo & Campos, 2018).

3.4.4. Theme 4 - AI in strategic marketing

This type of research focuses on how AI helps formulate marketing strategies. AI is changing the way we make decisions in organizations, and as such, it is already starting to alter corporate structures to accommodate AI-driven strategic marketing strategies (Mallik, Shuvo Kumar, et al.,2025). For instance, AI can leverage user-generated content, such as social media or reviews, and convert it into valuable insights that allow businesses to formulate competitive strategies (Lin & Kunnathur, 2019; Netzer et al., 2012). Moreover, AI can assist, complement, or substitute human decision-making in developing marketing strategies (Jarrahi, 2018). Nonetheless, the existing research on AI adoption in the context of strategic marketing decision-making remains limited. However, more studies have focused on big data analytics, tracking customer sentiment towards products, brands, and services and integrating those into marketing strategic decisions (Fan et al., 2015).

3.4.5. Theme 5 – The Role of AI in Services and Customer Experience

Research within this theme explores how AI can improve service delivery and the drivers of consumer adoption of AI-based service technologies. Most research papers center on service robots, chatbots and voice assistants.For example, recent research examined public sentiment toward robot employees as frontline service providers by analyzing YouTube comments (Yu, 2020). Exploring other forms of AI service tools (Garsøy et al., 2019; Van Pinxteren et al., 2019) implies that a human-like social presence contributes significantly to a customer's trust and engagement in service adoption. However, consumers also prefer human customer service representatives in specific scenarios, such as complex problems. Technological constraints, data inaccuracy, and a lack of internal capabilities are key barriers to

adoption (West et al., 2018; Zhu et al., 2020). With AI transforming service contexts, marketing theories and frameworks need adjustment to enable hyper-personalized customer encounters (Buck et al., 2020).

3.4.6. Theme 6 -AI for Retail and E-Commerce

This theme focuses on AI and its effect on retail operations, such as consumer purchase decisions and retail value chain activities across the retail landscape. Guhar et al. (2021) mentioned that Artificial Intelligence is Changing the Retail Game, improving online and in-store experiences and streamlining supply chain workflows. Research by Oosthuizen et al. (2021): AI for stock management, knowledge integration, and operational optimization. Similarly, the rise of voice shopping and conversational commerce have also been pressurized by AI, changing how consumers make their decisions. The primary motivators behind AI adoption in retail are still under exploration (Araújo & Casais, 2020). Research indicates that internal (habit and emotion) and external (time constraint and convenience) factors affect younger consumers' adoption of AI tools for shopping (Chopra, 2019). In addition, anthropomorphism and perceived intelligence of voice assistants positively influence consumer purchasing intentions (Balakrishnan & Dwivedi, 2021).

3.4.7. Theme 7 - AI in Advertising

This category refers to studies related to AI use in advertisements. E-commerce is rapidly advancing, and traditional advertising models are failing to keep up with actual market demands. As a result, marketers and advertisers are using AI technologies to improve the effectiveness and efficiency of advertising (Kin & Jiang, 2019). Recent studies have explored how voice assistants and smart speakers can be integrated as new channels, communication tools, and consumer touchpoints to deliver effective marketing messages (Smith, 2018).

4. Discussion

This systematic literature review shows that AI significantly influences many aspects of marketing. AI in marketing is an emerging area at the moment (Mallik, S. K., Uddin, I., Trisha, S. M., Hasan, M. M., & Rahman, M. A. 2025). Research shows that AI is implemented in various activities, including the following: consumer relationship management, brand engagement, customer experience management, retailer sales, voice commerce or voice-assisted e-commerce, social media marketing, predictive analytics, strategic marketing planning, B2B marketing, and e-WOM-based insights. According to recent research, AI has enormous potential to become an increasingly important influencer in marketing applications.

The identified themes reflect the increasing impact of AI in marketing to support strategic marketing decision-making and player in molding consumer behavior and engagement. From predicting market trends, sales patterns, and customer preferences, AI algorithms for predictive analytics are becoming increasingly critical for organizations. This analytical ability improves strategic marketing strategies like segmentation, targeting, and product positioning. Also, AI helps build customer relationships via personalized recommendations, conversational interfaces (bots), and brand experiences (Mallik, S. K. (2024). The review also highlights unique applications of AI, including conversational commerce, and shows how customers can chat with AI assistants based on their needs during the purchase. Soon, AI will have more and more power as more advertising campaigns allow targeting, multimodal content creation, and real-time bid optimization (Mallik, S. K. 2024).

4.1. Future Research Directions

Research on AI usage in marketing is still growing. The literature review provides insights into several directions that merit future research to further understand AI's implications and challenges and prepare consumers and industries for inevitable disruptions. Several significant areas could be of great assistance. First and foremost, we need to find the right mix between AI-based automation vs. what marketers need to do. Understanding how best to have AI and marketers work together can improve resource allocation and the marketing process. The focus on customer experience and efficiency should be considered when pursuing AI-driven marketing initiatives. To guarantee that marketing AI applications are correctly executed, researchers should study them. As AI continues to shape the future of marketing, it is increasingly essential that these tools be harnessed to benefit consumers. AI technologies have their place in marketing, but the consumer must come first. Another emerging area of critical research is how AI can create consumer models based on neuroscience and neuroscientific principles. At the same time, if marketers know more about consumer behavior, they can create marketing strategies that are truly suited to consumers, maximizing the satisfaction of their target audiences and their involvement.

Researchers also need to focus on using AI in pricing strategies. Insights gained from machine learning algorithms can be applied to real-world scenarios to deliver innovative pricing strategies that harness competitive advantages while

also being good for the customer and increasing profit. We must understand this transformation as AI impacts the consumer decision journey. We need further research to identify which consumer decisions we can allow AI to make for us and which should be done by people. With this knowledge, marketers can better harness AI and understand how AI mutually influences human behavior.

More research is also needed on the emotional and cognitive aspects of AI. Research on how humans react cognitively and emotionally to AI can help develop more empathetic, human-centered AI tools. Another aspect to explore is the differences between interactions with voice assistants (VAs) and social relationships. Exploring how people engage with virtual agents compared to interpersonal relationships provides valuable insight into the merits and weaknesses of AI-driven interactions. As previous research indicates that emotional connections or relationships between users and VAs or chatbots are, at a minimum, positive for marketers, researchers can grab this opportunity and investigate other motives in influencing users' tendency to develop an emotional connection or relationship with these AI tools. Lastly, and most importantly, we need to determine the factors that influence why consumers decide to buy products through voice assistants. People's perceptions of whether using chatbots and VAs (voice assistants) is more convenient, credible, or valuable than traditional methods for making a purchase will all influence their willingness to shop via conversational commerce. Understanding consumer best practices in this area followed by marketers will translate into creating compelling voice-enabled experiences.

5. Conclusion

This article mainly aims to address artificial intelligence issues in marketing. This paper offers a thematic analysis that systematically and comprehensively reviews AI research in marketing and consumer behavior. From 75 articles published from the year 2000 to 2021, we derived eight significant themes. It is worth noting that the total number of papers on AI in marketing has increased substantially since 2017. A new study suggests that AI has a lot of potential to be integral to improving customer relationship management and consumer brand engagement. A significant limitation of this study is the dependence on Google Scholar and the Scopus database in data collection (i.e., papers). Although Scopus is based on journals and covers a wide range of journals, all marketing journals do not fall under the scope of Google Scholar and Scopus, and articles published in journals not indexed by Scopus are not covered in our sample. Thus, the results of this research may not reflect the totality of the work in the context of AI in marketing so far. Moreover, the possibility of analysis was dependent on the choice of keywords. Therefore, future studies that engage data from further databases can offer more insight into the area. Despite these limitations, this study contributes to describing AI research's applications and evolution in marketing, uncovering implications for new research.

Compliance with ethical standards

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Authors' Contributions

All authors made substantial contributions to the study from its conception and design to this stage of submission and have all approved the submission.

Disclosure of conflict of interests

The authors declare that they have not known any competing financial interest or personal relationship that could have affected the reporting of this work

References

[1] Aflalo, B. (2020). How AI has evolved in the marketing industry— And where it's headed next. https://www.clickz.com/howai-has-evolved-in-the-marketing-industry-and-where-itsheaded-next/263703/

[2] Araújo, T., & Casais, B. (2020). Customer acceptance of shopping assistant chatbots. *Smart Innovation, Systems and Technologies*, *167*. https://doi.org/10.1007/978-981-15-1564-4_26

[3] Balakrishnan, J., & Dwivedi, Y. K. (2021). Conversational commerce: Entering the next stage of AI-powered digital assistants. In *Annals of Operations Research* (Issue 0123456789). Springer. https://doi.org/10.1007/s10479-021-04049-5

[4] Bock, D. E., Wolter, J. S., & Ferrell, O. C. (2020). Artificial intelligence: Disrupting what we know about services. *Journal of Services Marketing*, *34*(3), 317–334. https://doi.org/10.1108/ JSM-01-2019-0047

[5] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

[6] Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of tourism research. *Tourism Management*, *29*(4), 609–623. https://doi.org/10.1016/j.tourman.2008.01.005

[7] Carbonneau, R., Laframboise, K., & Vahidov, R. (2008). Application of machine learning techniques for supply chain demand forecasting. *European Journal of Operational Research*, *184*(3), 1140–1154. https://doi.org/10.1016/j.ejor.2006.12.004

[8] Casillas, J., & Lopez, F. J. (2010). Marketing intelligent system using soft computing: Managerial and research applications. Springer.

[9] Chatterjee, S., Chaudhuri, R., Vrontis, D., Thrassou, A., & Ghosh, S. K. (2021). Adoption of artificial intelligence-integrated CRM systems in agile organizations in India. *Technological Fo recasting and Social Change*, *168*(March), 120783. https:// doi.org/10.1016/j.techfore.2021.120783

[10] Chong, A. Y. L., Li, B., Ngai, E. W. T., Ch'ng, E., & Lee, F. (2016). Predicting online product sales via online reviews, sentiments, and promotion strategies. *International Journal of Operations and Production Management*, *36*(4), 358–383. https://doi.org/10.1108/IJOPM-03-2015-0151

[11] Chopra, K. (2019). Indian shopper motivation to use artificial intelligence: Generating Vroom's expectancy theory of motivation using grounded theory approach. *International*

[12] *Journal of Retail and Distribution Management*, *47*(3), 331– 347. https://doi.org/10.1108/IJRDM-11-2018-0251

[13] Mallik, S. K. (2024). Financial Institutions in Bangladesh: Assessing Performance, Risk, and Sectoral Contributions in 2023.

[14] Mallik, S. K., & Rahman, M. A. (2024). An analysis of business students learning styles to improve the effectiveness of teaching methods.

[15] Chung, T. S., Wedel, M., & Rust, R. T. (2016). Adaptive personalization using social networks. *Journal of the Academy of Marketing Science*, *44*(1), 66–87. https://doi.org/10.1007/ s11747-015-0441-x

[16] de Bellis, E., & Venkataramani Johar, G. (2020). Autonomous shopping systems: Identifying and overcoming barriers to consumer adoption. *Journal of Retailing*, *96*(1), 74–87. https://doi.org/10.1016/j.jretai.2019.12.004

[17] Dimitrieska, S., Stankovska, A., & Efremova, T. (2018). Artificial intelligence and marketing. *Entrepreneurship*, *7*(2), 298–304.

[18] Fan, S., Lau, R. Y. K., & Zhao, J. L. (2015). Demystifying big data analytics for business intelligence through the lens of marketing mix. *Big Data Research*, *2*(1), 28–32. https://doi.org/10.1016/j.bdr.2015.02.006

[19] Grewal, D., Hulland, J., Kopalle, P. K., & Karahanna, E. (2020). *The future of technology and marketing: A multidisciplinary perspective* (Vol. 48, pp. 1–8). Springer.

[20] Guha, A., Grewal, D., Kopalle, P. K., Haenlein, M., Schneider, M. J., Jung, H., Moustafa, R., Hegde, D. R., & Hawkins, G. (2021). How artificial intelligence will affect the future of retailing. *Journal of Retailing*, *97*(1), 28–41. https://doi.org/10.1016/j.jretai.2021.01.005

[21] Gursoy, D., Chi, O. H., Lu, L., & Nunkoo, R. (2019). Consumers acceptance of artificially intelligent (AI) device use in service delivery. *International Journal of Information Management*, *49*(March), 157–169. https://doi.org/10.1016/j. ijinfomgt.2019.03.008

[22] Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California Management Review*, *61*(4), 5–14. https:// doi.org/10.1177/0008125619864925

[23] Mallik, S. K., & Rahman, M. A. (2024). An analysis of business students learning styles to improve the effectiveness of teaching methods.

[24] Mallik, S. K., Islam, M. R., Uddin, I., Ali, M. A., & Trisha, S. M. (2025). Leveraging artificial intelligence to mitigate money laundering risks through the detection of cyberbullying patterns in financial transactions. *Global Journal of Engineering and Technology Advances*, *22*(01), 094-115.

[25] Halbauer, I., & Klarmann, M. (2022). How voice retailers can predict customer mood and how they can use that information. *International Journal of Research in Marketing*, *39*(1), 77–95. https://doi.org/10.1016/J.IJRESMAR.2021.09.008

[26] Han, S., & Yang, H. (2018). Understanding adoption of intelligent personal assistants: A parasocial relationship perspective. *Industrial Management and Data Systems*, *118*(3), 618–636. https://doi.org/10.1108/IMDS-05-2017-0214

[27] Hollebeek, L. D., & Belk, R. (2021). Consumers' technology facilitated brand engagement and wellbeing: Positivist TAM/PERMA- vs. consumer Culture Theory perspectives. In *International Journal of Research in Marketing*, *38*(2), 387–401. https://doi.org/10.1016/j.ijresmar.2021.03.001

[28] Hoy, M. B. (2018). Alexa, Siri, Cortana, and more: An introduction to voice assistants. *Medical Reference Services Quarterly*, *37*(1), 81–88. https://doi.org/10.1080/02763869.2018.1404391

[29] Hoyer, W. D., Kroschke, M., Schmitt, B., Kraume, K., & Shankar, V. (2020). Transforming the customer experience through new technologies. *Journal of Interactive Marketing*, *51*, 57–71. https://doi.org/10.1016/j.intmar.2020.04.001 Hsu, F. H. (1999). IBM's Deep Blue chess grandmaster chips.

[30] Mallik, Shuvo Kumar, et al. "Leveraging artificial intelligence to mitigate money laundering risks through the detection of cyberbullying patterns in financial transactions." *Global Journal of Engineering and Technology Advances* 22.01 (2025): 094-115.

[31] Mallik, S. K. (2024). Microcredit's effects on household's Bangladeshi perspective on fish producers' earnings and expenses.

[32] *IEEE Micro*, *19*(2), 70–81. https://doi.org/10.1109/40.755469 Huang, M.-H., & Rust, R. T. (2018). Artificial intelligence in service. *Journal of Service Research*, *21*(2), 155–172. https://doi.org/10.1177/1094670517752459

[33] Huang, M.-H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*, *49*(1), 30–50. https://doi.org/10.1007/s11747-020-00749-9

[34] Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business Horizons*, *61*(4), 577–586. https://doi. org/10.1016/j.bushor.2018.03.007

[35] Karimova, G. Z., & Goby, V. P. (2021). The adaptation of anthropomorphism and archetypes for marketing artificial intelligence. *Journal of Consumer Marketing*, *38*(2), 229–238. https://doi.org/10.1108/JCM-04-2020-3785

[36] Ki, C. W. (Chloe), Cho, E., & Lee, J. E. (2020). Can an intelligent personal assistant (IPA) be your friend? Para-friendship development mechanism between IPAs and their users. *Computers in Human Behavior*, *111*, 106412. https://doi.org/ 10.1016/j.chb.2020.106412

[37] Kitchens, B., Dobolyi, D., Li, J., & Abbasi, A. (2018). Advanced customer analytics: Strategic value through integration of relationship-oriented big data. *Journal of Management Information Systems*, *35*(2), 540–574. https://doi.org/10.1080/ 07421222.2018.1451957

[38] Mallik, S. K., Uddin, I., Trisha, S. M., Hasan, M. M., & Rahman, M. A. (2025). Econometric advances in causal inference: The machine learning revolution.

[39] Mallik, S. K. (2024). Analyzing Banking Sector Risk and Capital Allocation: A Study on the Improvement of Risk-Weighted Assets and CRAR Compliance in 2023.

[40] Kühl, N. (2019). Supporting customer-oriented marketing with artificial intelligence: Automatically quantifying customer needs from social media. *Twitter 2016*.

[41] Kumar, P. M., Gandhi, U., Varatharajan, R., Manogaran, G., R., & Vadivel, T. (2019a). Intelligent face recognition and navigation system using neural learning for smart security in Internet of Things. *Cluster Computing*, *22*(S4), 7733–7744. https://doi.org/10.1007/s10586-017-1323-4

[42] Kumar, V., Rajan, B., Venkatesan, R., & Lecinski, J. (2019b). Understanding the role of artificial intelligence in personalized engagement marketing. *California Management Review*, 61(4), 135–155. https://doi.org/10.1177/0008125619859317

[43] Lee, H., & Cho, C.-H. (2020). Uses and gratifications of smart speakers: Modelling the effectiveness of smart speaker advertising. *International Journal of Advertising*, *39*(7), 1–22. https://doi.org/10.1080/02650487.2020.1765657

[44] Lin, C., & Kunnathur, A. (2019). Strategic orientations, developmental culture, and big data capability. *Journal of Business Research*, *105*, 49–60. https://doi.org/10.1016/j.jbusres.2019.07.016

[45] Lin, Y. (2022). 10 Artificial Intelligence statistics you need to know in 2022. *Oberlo*. https://www.oberlo.in/blog/artificial- intelligence-statistics

[46] Lo, F.-Y., & Campos, N. (2018). Blending Internet-of-Things (IoT) solutions into relationship marketing strategies. *Technological Forecasting and Social Change*, *137*(April), 10–18. https://doi.org/10.1016/j.techfore.2018.09.029

[47] Lu, Y. (2019). Artificial intelligence: A survey on evolution, models, applications and future trends. *Journal of Management Analytics*, *6*(1), 1–29. https://doi.org/10.1080/23270012.2019.1570365

[48] Lucini, F. R., Tonetto, L. M., Fogliatto, F. S., & Anzanello, M. J. (2020). Text mining approach to explore dimensions of airline customer satisfaction using online customer reviews. *Journal of Air Transport Management*, *83*, 101760. https:// doi.org/10.1016/j.jairtraman.2019.101760

[49] Ma, L., & Sun, B. (2020). Machine learning and AI in marketing – Connecting computing power to human insights. *International Journal of Research in Marketing*, *37*(3), 481–504. https://doi.org/10.1016/j.ijresmar.2020.04.005

[50] McLean, G., Osei-Frimpong, K., & Barhorst, J. (2021). Alexa, do voice assistants influence consumer brand engagement? – Examining the role of AI powered voice assistants in influencing consumer brand engagement. *Journal of Business Research*, *124,* 312–328. https://doi.org/10.1016/j.jbusres.2020.11.045

[51] Marchand, A., & Marx, P. (2020). Automated product recommendations with preference-based explanations. *Journal of Retailing*, *96*(3), 328–343. https://doi.org/10.1016/j.jretai.2020.01.001

[52] Martínez-López, F. J., Esteban-Millat, I., Argila, A., & RejónGuardia, F. (2015). Consumers' psychological outcomes linked to the use of an online store's recommendation system. *Internet Research*, *25*(4), 562–588. https://doi.org/10.1108/ IntR-01-2014-0033

[53] Min, H. (2010). Artificial intelligence in supply chain management: Theory and applications. *International Journal of Logistics Research and Applications*, *13*(1), 13–39. https:// doi.org/10.1080/13675560902736537

[54] Mishra, N., & Mukherjee, S. (2019). Effect of artificial intelligence on customer relationship management of Amazon in Bangalore. *International Journal of Management*, *10*(4). https://doi.org/10.34218/IJM.10.4.2019.016

[55] Murray, R. M., Li, Z., & Shankar Sastry, S. (2017). A mathematical introduction to robotic manipulation. In *A mathematical introduction to robotic manipulation*. https://doi.org/10.1201/9781315136370

[56] Netzer, O., Feldman, R., Goldenberg, J., & Fresko, M. (2012). Mine your own business: Market-structure surveillance through text mining. *Marketing Science*, *31*(3). https://doi. org/10.1287/mksc.1120.0713

[57] Noor, N., Hill, S. R., Troshani, I., Noor, N., Hill, S. R., & Troshani, I. (2021). Artificial intelligence service agents: Role of parasocial relationship artificial intelligence service agents: Role of parasocial relationship. *Journal of Computer Information Systems*, *00*(00), 1–15. https://doi.org/10.1080/ 08874417.2021.1962213

[58] Oosthuizen, K., Botha, E., Robertson, J., & Montecchi, M. (2021). Artificial intelligence in retail: The AI-enabled value chain. *Australasian Marketing Journal*, *29*(3). https://doi. org/10.1016/j.ausmj.2020.07.007

[59] Pelau, C., Dabija, D. C., & Ene, I. (2021). What makes an AI device human-like? The role of interaction quality, empathy and perceived psychological anthropomorphic characteristics in the acceptance of artificial intelligence in the service industry. *Computers in Human Behavior*, *122*(February), 106855. https://doi.org/10.1016/j.chb.2021.106855

[60] Perez-Vega, R., Kaartemo, V., Lages, C. R., Borghei Razavi, N., & Männistö, J. (2021). Reshaping the contexts of online customer engagement behavior via artificial intelligence: A conceptual framework. *Journal of Business Research*, *129*, 902–910. https://doi.org/10.1016/j.jbusres.2020.11.002

[61] PwC. (2017). Bot.Me: A revolutionary partnership, How AI is pushing man and machine closer together. PricewaterhouseCoopers.

[62] Qin, X., & Jiang, Z. (2019). The impact of AI on the advertising process: The Chinese experience. *Journal of Advertising*, *48*(4). https://doi.org/10.1080/00913367.2019.1652122

[63] Rangaswamy, A., Moch, N., Felten, C., van Bruggen, G., Wieringa, J. E., & Wirtz, J. (2021). Corrigendum to "the role of marketing in digital business platforms". *Journal of Interactive Marketing*, 2020, *51*, 72–90. https://doi. org/10.1016/j.intmar.2020.04.006.

[64] Rissland, E. L., & Stillings, N. (1987). Artificial intelligence: Knowledge representation. In *Cognitive science: An introduction, second printing*. Massachusetts Institute of Technology.

[65] Russell, S., & Norvig, P. (2021). *Artificial Intelligence: A modern approach, global* (4th ed.), (Vol. 19, p. 1168). Pearson.

[66] Schweitzer, F., Belk, R., Jordan, W., Ortner, M., Schweitzer, F., Belk, R., Jordan, W., & Ortner, M. (2019). Servant, friend or master? The relationships users build with voice-controlled smart devices. *Journal of Marketing Management*, *00*(00), 1–23. https://doi.org/10.1080/0267257X.2019.1596970

[67] Shen, A. (2014). Recommendations as personalized marketing: Insights from customer experiences. *Journal of Services Marketing*, *28*(5), 414–427. https://doi.org/10.1108/JSM-04-2013-0083

[68] Skjuve, M., Inge, K., & Bae, P. (2021). *International Journal of Human—Computer Studies My Chatbot Companion—A Study of Human-Chatbot Relationships*, *149*. Retrieved March 2020, from https://doi.org/10.1016/j.ijhcs.2021.102601.

[69] Smith, K. T. (2018). Marketing via smart speakers: What should Alexa say? *Journal of Strategic Marketing*, *00*(00), 1–16. https://doi.org/10.1080/0965254X.2018.1541924

[70] Statista. (2020). Artificial Intelligence (AI) market size/revenue comparisons 2015–2025. https://www.statista.com/statistics/941835/artificial-intelligence-market-size-revenue comparisons.

[71] Sung, E. (Christine), Bae, S., Han, D. I. D., & Kwon, O. (2021). Consumer engagement via interactive artificial intelligence and mixed reality. *International Journal of Information Management*, *60*. https://doi.org/10.1016/j.ijinfomgt.2021.102382

[72] Tech Nation. (2019). *Artificial intelligence: Mapping global communities—Tech Nation*. https://technation.io/insights/ artificial-intelligence-mapping-global-communities.

[73] Tiwari, R., Srivastava, S., & Gera, R. (2020). Investigation of artificial intelligence techniques in finance and marketing. *Procedia Computer Science*, *173*. https://doi.org/10.1016/j.procs.2020.06.019

[74] Turing, A. M. (1950). Computing machinery and intelligence. In *Mind*, Vol. *LIX* (Issue 236, pp. 1–28). Oxford Academic. https://doi.org/10.1525/9780520318267-013

[75] van Pinxteren, M. M. E., Wetzels, R. W. H., Rüger, J., Pluymaekers, M., & Wetzels, M. (2019). Trust in humanoid robots: Implications for services marketing. *Journal of*

[76] *Services Marketing*, *33*(4), 507–518. https://doi.org/10.1108/ JSM-01-2018-0045

[77] Weber, F. D., & Schütte, R. (2019). State-of-the-art and adoption of artificial intelligence in retailing. *Digital Policy, Regulation and Governance*, *21*(3), 264–279. https://doi. org/10.1108/DPRG-09-2018-0050

[78] West, A., Clifford, J., & Atkinson, D. (2018). "Alexa, build me a brand"—An investigation into the impact of artificial intelligence on branding. *Journal of Business and Economics*, *9*(3), 9–10.

[79] Xu, Y., Shieh, C. H., van Esch, P., & Ling, I. L. (2020). AI customer service: Task complexity, problem-solving ability, and usage intention. *Australasian Marketing Journal*. *28*(4). https://doi.org/10.1016/j.ausmj.2020.03.005

[80] Yu, C. E. (2020). Humanlike robots as employees in the hotel industry: Thematic content analysis of online reviews. *Journal of Hospitality Marketing and Management*, *29*(1). https://doi.org/10.1080/19368623.2019.1592733