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Research paper



Artificial Intelligence and Marketing Strategies: Systematic Insights on Predictive Analytics, Segmentation, and Personalization

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Abstract

Although artificial intelligence (AI) has become a powerful driver of innovation in marketing, existing research often treats its applications in predictive analytics, customer segmentation, and personalization as fragmented domains. This lack of integration limits a comprehensive understanding of how AI can shape modern marketing strategies. To address this gap, this study conducted a systematic review of 20 peer-reviewed articles published between 2020 and 2025, following PRISMA guidelines. Bibliometric techniques and thematic content analysis were employed to identify intellectual structures, citation patterns, and emerging research themes. The analysis revealed four thematic clusters: (1) AI for personalization and customer relationship management (CRM), (2) predictive analytics and strategic marketing, (3) global and supply chain applications of AI, and (4) bibliometric and conceptual foundations. Keyword and trend mapping highlighted dominant themes such as machine learning and customer behavior, while new areas of interest—including emotion AI, federated learning, and AI ethics—are gaining prominence. This review not only synthesizes dispersed literature but also provides a roadmap for future research, emphasizing explainable AI, adaptive models, ethical governance, and interdisciplinary collaboration to support responsible and innovative AI adoption in marketing.

Keywords: *artificial intelligence, marketing, predictive analytics, customer segmentation, personalization, strategies*

1. Introduction

The digital economy underwent substantial transformation because of fast-moving disruptive technologies, which include artificial intelligence (AI), big data analytics, the Internet of Things (IoT), and blockchain [1-3]. The technologies have revolutionized conventional business operations through their ability to automate processes, handle real-time data analysis, and create interconnected systems [4,5]. AI emerges as the primary force behind marketing transformation among these innovative technologies [6,7]. Organizations use AI to extract valuable insights from large datasets of structured and unstructured information, which enables automated decision processes and personalized experiences at large scales. Businesses now use AI to enhance operational efficiency while gaining strategic advantages in customer engagement, brand loyalty, and revenue growth because of rising consumer expectations and competitive market environments.

The three main domains where AI demonstrates its marketing role include predictive analytics, together with customer segmentation and personalization strategies [8]. The application of machine learning algorithms to customer data through predictive analytics allows firms to make future trends and behavior predictions [9]. The AI-based customer segmentation system enables marketers to sort consumers through their behavioral patterns, real-time interactions, and personal preferences beyond basic demographic segmentation [10]. AI-powered personalization enables businesses to deliver customized content, offers, and messages that match each customer's specific requirements [11-14]. Research in these domains exists independently of each other because scientists have not developed enough integrative analysis to link strategic value from these applications into a unified AI-based marketing strategy.

While literature reviews [15-17] exist relating to the theoretical foundation and technological applications of AI in marketing, we did not find a comprehensive review integrating both theoretical and applied insights. The disconnected approach to research is leaving a gap when it comes to depicting how predictive analytics, segmentation, and personalization converge to develop an integrated, AI-enhanced strategy [18]. There is an urgent need for a systematic mapping of the intellectual landscape, identifying clusters of themes and methodological devices that characterize the field of research. Given such thematic fragmentation, a synthesized understanding of current knowledge is

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essential to inform scholarly research as well as practical application, particularly in a context where the practice of customer-tailored innovation has become critical to business success.
In order to fill this gap, the current paper performs a systematic literature review from peer-reviewed journal articles between between 2020 to 2025, as suggested by PRISMA guidelines. Using a combination of bibliometric and thematic content analysis, the paper assesses the development of AI technologies in marketing, key contributors, and the conceptual clusters that form the underpinning of current research. The paper gives a comprehensive overview of the field, emphasizing the overarching themes, as well as emerging topics, including explainable AI, federated learning, and ethical personalization. Finally, this review consolidates dispersed research to enrich knowledge about the potential of AI in marketing, providing strategic implications for practitioners and shaping future research that encourages the ethical and purposeful adoption of AI in contemporary marketing ecosystems.

2. Literature Survey

Although this review primarily focuses on literature published from 2020 to 2025 to capture the most recent and rapidly evolving developments in AI-driven marketing, it is important to recognize earlier foundational contributions that shaped the field's trajectory. Pioneering studies before 2020 (e.g., [19]; [20]; [21]) introduced the integration of analytics, automation, and algorithmic decision-making into marketing practice, establishing the conceptual and technological basis for the current wave of AI applications. These earlier insights provided the groundwork for today's advancements in predictive modeling, personalization, and ethical governance frameworks that characterize the post-2020 literature.
The recent acceleration in the adoption of Artificial Intelligence (AI) technologies has completely changed everything in the marketing game, with data-driven decision-making and real-time analysis taking place in ways never dreamt possible by big analytics [22]. For the past several years, both academics and the B2B practice community have been studying how AI-driven models, especially those built on machine learning (ML), natural language processing (NLP), and deep learning, can yield predictive insights that significantly improve marketing effectiveness. Other works [23,24] stressed the synergies of AI with predictive analytics to predict customer behavior and improve campaign results. These technologies enable marketers to go from reactive to proactive tactics by recognizing behavioral signals and identifying needs before the customer is even aware of them. Further, bibliometric analyses similar to some published papers [25,26] have more and more emphasized artificial applications in marketing, mainly predictive analytics and customer behavior modeling, both being essential for developing targeting and positioning strategies.
In addition to prediction, AI has also helped refine customer segmentations and personalizations. Unlike traditional segmentations in which demographic variables are static, AI can enable dynamic segmentation because it analyzes complex data sets that include behavioral and contextual [27]. These developments help facilitate the rise of hyper-personalized marketing strategies that are tailored to individuals' paths to purchase, as theorized by experts [28,29]. AI-based recommendation systems, chatbots, and custom content software are major factors that shape customer engagement and loyalty. But as highlighted [30], the growing dependence on AI for personalization also brings to the fore concerns about ethical use of data, transparency, and algorithmic bias. Consequently, although AI offers significant marketing opportunities, its use must strike a balance between creativity and responsible practices.

2.1 AI as predictive analytics in marketing

Artificial intelligence (AI) has become a key player in producing predictive analytics within contemporary marketing plans. Machine learning (ML), natural language processing (NLP), and deep learning algorithms-related predictive analytics allow companies to predict customer responses and market trends more precisely. One of the most thorough reviews of the use of AI technologies (sentiment analysis, recommender systems) within digital marketing concerning the prediction of consumers' preferences and behavior scores has been given by some experts [23]. Similarly, another report [24] highlighted the use of predictive analytics in AI to turn raw data into foresight since it allows for behavioral cues to be detected from digital footprints, which includes forecasting decision-making and ROI in digital marketing campaigns.
Moreover, several studies [31,32] have also shown how AI-based data analytics and strategic marketing planning, such as forecasting for demand and pricing. These predictive models are built on big data obtained from social media, e-commerce, and CRM systems. Meanwhile, some authors [33] affirmed that the combination of AI and real-time analytics has given marketers the ability to conduct simulations of future occurrences retrospectively and dynamically modify their strategies by responding to market movements. Yet several works [29,30] sounded cautious about the excess reliance on algorithmic outputs without human-in-the-loop oversight, pointing to the contextual intricacies and ethical challenges in consumer prediction.

2.2 AI for customer segmentation in marketing

Where AI is transforming consumer understanding & segmentation, AI has changed how marketers think about and group customers. Customer segmentation, which used to be based on demographic and psychographic variables, can now be more dynamic, data-driven, and behavioral with AI. Other works [25,27] showed that machine learning techniques could segment customers not only based on preferences but also based on real-time actions, value contribution, as well as lifetime value. These analytics enable hyper-targeted marketing campaigns that go beyond traditional segmentation.
A specific study [26] has done bibliometric analyses to demonstrate the increasing application of AI-based segmentation in CRM systems, more specifically, with people's usage of the algorithmic segmentation, using clustering algorithms, neural networks, and collaborative filtering technology. Likewise, a study [28] shows how AI facilitates the unveiling of hidden customer segments and subsequently revises the groupings based on changing behavior. Other works [25,34] have also discussed more complex modeling of segmentation, such as micro-segmentation and persona generation, ensuring that the customer journey can be rendered in a more flexible and more accurate manner. Despite these improvements, some papers raised concerns with respect to model interpretability and biases in training images, both of which could negatively impact the segmentation accuracy.

2.3 AI for personalization strategy in marketing

One of the greatest benefits of AI for marketing is the ability to deliver in real-time, relevant experiences—often described as personalization at scale. The surveyed literature is in general agreement on personalization being the leading enabler of customer engagement and

retention, supported by AI methods such as recommender systems, chatbots, dynamic content rendering, and AI-driven CRM. Previous reports [23,24] have presented compelling evidence that personalization via AI facilitates increases in conversion rates and customer satisfaction by delivering context-aware messages, offers, and services.
Composite models had been developed (e.g., the 8-T model) [28,33] that connect personalization with branding, emotional intelligence, and automation tools. A study by Herrmann & Masawi (2022) [29] further pointed out the fact that personalized content (in omnichannel touchpoints) is important for the perception and loyalty of the brand. Additionally, several studies [30,35] investigated the AI′s role in personalizing international customer interaction by adjusting messaging and product recommendations in terms of different cultures. However, with these improvements, authors such as Ciampi et al. (2020) [31] emphasized that due to the personalized nature of AI, data privacy challenges become an issue, where ethical AI governance should be in place.

3. Methodology

Building upon the procedures outlined in prior studies [36,37], this research adopted the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure methodological rigor, transparency, and reproducibility in conducting a systematic literature review.

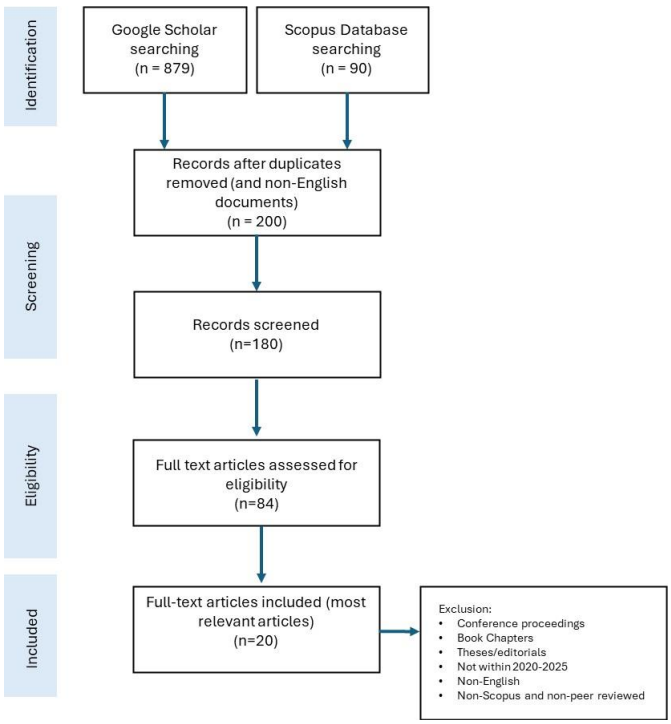


Fig. 1: PRISMA flow for the selection of the most relevant literature.

The review sought to identify, examine, and integrate scholarly evidence on the applications of artificial intelligence in contemporary marketing, with particular emphasis on predictive analytics, customer segmentation, and personalization strategies (Figure 1). While the PRISMA protocol provided a structured pathway, the review acknowledges inherent constraints, including possible selection bias arising from the exclusive use of Scopus and Google Scholar databases, as well as the omission of non-English publications, which may have constrained the inclusivity of global perspectives.

3.1 Selection of databases

Two widely used sources were chosen to get complete coverage of the scholarly literature:

- Scopus – selected for its comprehensive coverage of peer-reviewed papers in business, computer science, and social sciences.
- Google Scholar – consulted to complement and cross-validate results with more extensive academic coverage, among others, grey literature.

These databases were chosen as a data source to analyze information because of their stable metadata format and export features appropriate to perform a bibliometric assessment.

3.2 Defining keywords and search strategy

A comprehensive keyword strategy was developed to capture relevant studies. The primary concepts included Artificial Intelligence (AI) and Marketing, with subtopics such as predictive analytics, customer segmentation, and personalization. Synonyms and variations of AI (e.g., "machine learning", "deep learning", "AI-powered", "AI-driven") and marketing-related terms were included.
Boolean operators were applied as follows:
("artificial intelligence" OR "AI" OR "AI-driven" OR "machine learning" OR "deep learning") AND
("marketing" OR "digital marketing" OR "marketing analytics") AND
("predictive analytics" OR "consumer behavior prediction") AND
("customer segmentation" OR "market segmentation") AND
("personalized marketing" OR "marketing personalization")

Searches were conducted using the TITLE-ABS-KEY field restriction in Scopus to enhance relevance.

3.3 Refining the initial results

Initial search results yielded a large corpus of documents. To ensure focus and quality, the following inclusion and exclusion criteria were applied:

- Inclusion Criteria
  - Articles published between 2020 and 2025
  - Articles written in English
  - Peer-reviewed journal articles
  - Articles published in Scopus-indexed journals
- Exclusion Criteria
  - Conference proceedings, book chapters, theses, editorials, and non-peer-reviewed materials
  - Articles not indexed in Scopus
  - Articles lacking relevance to AI-based marketing applications

The PRISMA flow diagram was used to document the filtering process, which included screening by title and abstract, followed by full-text eligibility review.

3.4 Data analysis plan

Following selection, data from eligible articles were extracted using a structured coding template covering:

- Author(s) and publication year
- Country/region
- Keywords
- Citations
- Study type/design
- AI techniques applied
- Marketing application focus (predictive analytics, segmentation, personalization)
- Key findings and limitations

Two complementary analysis methods were employed:

- Bibliometric Analysis: Conducted using VOSviewer to evaluate citation patterns, keyword co-occurrence, and thematic clusters.
- Thematic Content Analysis: Used to qualitatively synthesize insights around the three focus areas of the review. Coding was performed iteratively, and themes were validated through peer debriefing.

3.5 Identification of research gaps and future research directions

The articles related to the application of artificial intelligence in marketing were manually reviewed to explore the underlying theoretical concepts and facilitate thematic coding. This in-depth review provided insights into existing research gaps and guided the formulation of future research directions.

4. Results and Discussion

4.1. Descriptive statistics of the bibliographic collection

As shown in Table 1, summary statistics based on the 20 most cited articles published from 2020 to 2025 offer some illustrative insights into the recent scholarly discussion of AI in marketing. All 20 papers were retrieved from different journals indexed in Scopus, confirming the wide and high-quality dispersion of the scientific production. Combining these publications, 73 individual keywords were extracted, reflecting the thematic diversity and cross-disciplinary character of AI in marketing—encompassing themes related to machine learning, personalization, customer segmentation, and predictive modeling.

Table 1: Descriptive statistics

Main information	Description	Results
Articles	Number of most relevant articles	20
Sources	Scopus database	20
Keywords	Number of unique keywords	73
Average citations	Average citations per document	29.45
Authors	Total number of authors	62
Author appearances	Total author appearance	62
Multi-authored	Authors of multi-authored documents	19
Single-authored documents	Total number of single-authored documents	1
Documents per author	Documents per author	0.32
Authors per document	Number of authors per document	3.1
Co-authors	Number of co-authors per document	3.05
Collaboration Index	Collaboration Index number	0.95
Quartile Distribution (number of articles)	Q1	9
	Q2	3
	Q3	1
	Q4	7

In the actual academic publication evaluation, there were 62 distinct contributors and 62 authorship entries, meaning, on average, each author contributed to only one article. Out of the 20 articles, 19 were multi-authored, and 1 was mono-authored, underscoring a strong

pattern of co-authorship in this area of research. The mean number of authors per article was 3.1, and the mean rate of co-authorship was 3.05 authors per article, which confirmed the predominance of work on interdisciplinary. The collaboration index, which is the ratio of multi-authored papers to all papers, was recorded as 0.95, indicative of an intense collaboration relative to the output of scholarly papers. From a productivity perspective, the number of documents per author ratio was only 0.32, meaning that most authors authored only 1 paper. Regarding the academic level of where articles were published, the distribution of articles in quality quartiles of the journal was as follows: 9 at level Q1, 3 at level Q2, 1 at level Q3, and 7 at level Q4. This distribution indicates that almost half of the chosen articles were published in prestigious journals, which confirms the scientific quality and visibility of AI in marketing research. Results indicate a rich, interconnected, and thematically diverse research field, but with a growing emphasis on the strategic importance of AI for marketing practice and theory.

4.2 Word Cloud Mapping

The word cloud visualization (Fig. 2) provides a semantic overview of the most frequent keywords in AI-driven marketing research, revealing how the field has evolved toward data-intensive and decision-intelligent paradigms. Dominant keywords such as "*marketing*," "*artificial intelligence*," "*analytics*," "*machine learning*," "*learning*," and "*big data science*" illustrate the centrality of computational intelligence in redefining marketing theory and practice. These terms collectively underscore how predictive algorithms, analytical modeling, and real-time data integration have become indispensable in optimizing market segmentation, demand forecasting, and consumer insight generation Meanwhile, the prominence of "predictive," "personalization," "customer," and "relationship" reflects the growing sophistication of AI applications in customer relationship management (CRM) and experience design, where adaptive systems enable individualized engagement at scale. Likewise, the inclusion of "digital," "technology," and "automation" further reflects the reinvention of traditional marketing processes through smart systems. Equally notable are emergent keywords such as "ethics," "privacy," "sustainability," and "trust," which reveal increasing scholarly concern for responsible AI adoption. Their presence in the visualization marks a paradigm shift from purely performance-driven automation to value-driven, responsible marketing practices that safeguard fairness and transparency in AI deployment. Methodological terms, including "bibliometric," "systematic," "mapping," and "cluster," underscore the reliance on structured reviews in tracing the field's development, suggesting that scholars increasingly employ structured, data-driven reviews to trace intellectual evolution and thematic convergence. Finally, the inclusion of "ecosystem," "fintech," "chatbots," and "engagement" points towards cross-sectoral diffusion, where AI integrates with financial technologies, conversational interfaces, and platform-based ecosystems to deliver more immersive and context-aware consumer experiences. Together, these patterns provide a comprehensive linguistic fingerprint of how AI is transforming marketing from a transactional discipline into a predictive, adaptive, and ethically anchored ecosystem.



Fig. 2: Word cloud visualization from the frequently occurring keywords

4.3 Co-citation Network

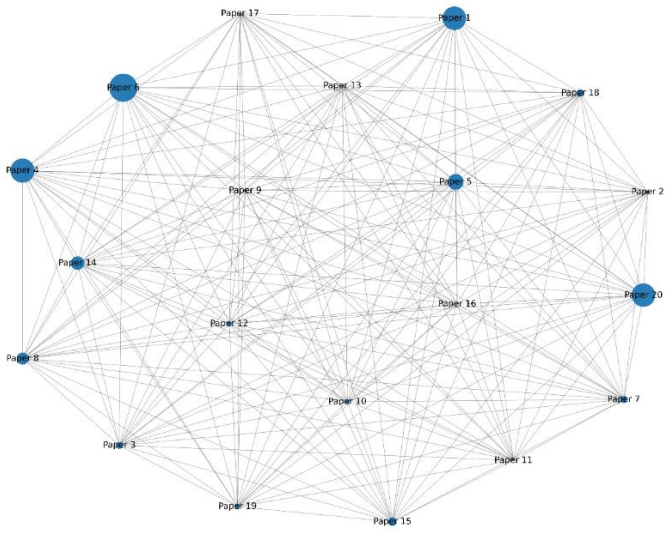


Fig. 3: Co-Citation network mapping

The co-citation network (Figure 3) further complements the word cloud visualization by mapping the intellectual architecture of the 20 reviewed articles within the domain of AI-driven marketing. Each node represents a published work (e.g., Paper 1 to Paper 20 as listed in Table 2), with node size proportional to its citation influence. – The prominence of studies such as Paper 1 [25], Paper 4 [31], Paper 6 [32], and Paper 20 [45] indicates their foundational role in establishing core constructs related to predictive analytics, customer segmentation, and personalization, the domains that collectively define the operational backbone of AI-enabled marketing. These highly cited papers serve as intellectual anchors that are consistently referenced alongside others, pointing to their foundational contributions in the areas of predictive analytics, customer segmentation, and personalization. The edges connecting nodes reflect the frequency of co-citation, representing thematic or methodological alignment. A dense pattern of connections indicates a well-integrated and thematically cohesive body of literature, where interrelated studies reinforce one another's findings and frameworks. In contrast, smaller nodes with fewer links signify niche or emerging contributions that are less frequently co-cited but may introduce novel approaches or underexplored research directions. This network highlights both the influential core studies shaping the field and the distinctive outliers that expand its boundaries. This co-citation structure thus reveals both the established intellectual anchors and the exploratory peripheries that continue to expand the scope of AI in marketing toward more explainable, secure, and human-aligned systems.

Table 2: Details of articles considered in this review

Paper	Year Published	Authors	Title of the Paper	Journal	Quartile	Citations	Keywords
1 [25]	2020	Cai Mitsu Feng, Andrew Park, Leyland Pitt, Jan Kietzmann, Gavin Northey	Artificial Intelligence in Marketing: A Bibliographic Perspective	Australasian Marketing Journal	Q1	99	artificial intelligence, natural language processing, sentiment analysis, machine learning, bibliographic data
2 [28]	2025	Maria D'Souza Deryl, Sanjeev Verma, Vartika Srivastava	8-T Framework for Artificial Intelligence-Driven Branding: A Strategic Typology	International Journal of Consumer Studies	Q1	2	artificial intelligence, branding, marketing, relationship, strategy, technology, trust.
3 [29]	2022	Heinz Herrmann, Becksndale Masawi	Three and a Half Decades of Artificial Intelligence in Banking, Financial Services and Insurance: A Systematic Evolutionary Review	Strategic Change	Q1	7	artificial intelligence, banking, financial services, fintech, insurance, systematic science mapping.
4 [31]	2020	Francesco Ciampi, Giacomo Marzi, Stefano Demi, Marco Faraoni	The Big Data–Business Strategy Interconnection: A Grand Challenge for Knowledge Management. A Review and Future Perspectives	Journal of Knowledge Management	Q1	104	bibliometric, strategy, big data, research agenda, systematization of literature
5 [34]	2024	Dervis Ozay, Mohammad Jahanbakht, Atefeh Shoomal, Shouyi Wang	Artificial Intelligence (AI)-based Customer Relationship Management (CRM): A Comprehensive Bibliometric and Systematic Literature Review with Outlook on Future Research	Enterprise Information Systems	Q1	44	Enterprise information system, artificial intelligence, customer relationship management, customer experience, bibliometric analysis
6 [32]	2022	In Lee, George Mangalaraj	Big Data Analytics in Supply Chain Management: A Systematic Literature Review and Research Directions	Big Data and Cognitive Computing	Q1	142	big data analytics, data analytics, supply chain management, sustainability, performance, SCOR model, predictive analytics
7 [30]	2024	Rakibul Hasan, Arto Ojala	Managing Artificial Intelligence in International Business: Toward a Research Agenda on Sustainable Production and Consumption	Thunderbird International Business Review	Q1	8	artificial intelligence, global sustainable development, international business, international expansion, sociotechnical theory
8 [38]	2024	Giovanna Culot, Matteo Podrecca, Guido Nassimbeni	Artificial Intelligence in Supply Chain Management: A Systematic Literature Review of Empirical Studies and Research Directions	Computers in Industry	Q1	24	artificial intelligence, machine learning, supply chain management, operations management, systematic literature review, empirical studies
9 [39]	2025	Guanqun Wang	Customer Segmentation in Digital Marketing Using a Q-Learning-Based Differential Evolution Algorithm Integrated	PLOS One	Q1	1	algorithms, artificial intelligence, cluster analysis, consumer behavior, humans, marketing, principal component analysis

			with K-Means Clustering				
10 [26]	2024	Hasna Koubaa El Euch and Foued Ben Said	Marketing Strategy and Artificial Intelligence: State of the Art and Research Agenda	Journal of Telecommunications and the Digital Economy	Q2	2	artificial intelligence, marketing strategy, bibliometric analysis, strategic marketing, AI tools in marketing
11 [33]	2025	Noptanit Chotisarn, Thadathibesra Phuthong	Mapping the Landscape of Marketing Technology: Trends, Theories, and Trajectories in Ecosystem Research	Cogent Business & Management	Q2	0	marketing technology ecosystem, digital transformation, artificial intelligence marketing, service-dominant logic, bibliometric analysis
12 [40]	2025	Rabah Seddaoui, Shahmir Sivaraj Abdullah, Shuhymee Ahmad, Abdullahi Hassan Gorundutse	Influence of Marketing Innovation and Advanced Technologies on Firm Performance: The Case of Algeria	Journal of Advanced Research in Applied Sciences and Engineering Technology	Q2	3	artificial intelligence, big data analytics, marketing innovation
13 [27]	2024	Rajumesh Sivarajah	Nexus between artificial intelligence and marketing: a systematic review and bibliometric analysis	International Journal of Electronic Marketing and Retailing	Q3	O	marketing, artificial intelligence, machine learning, deep learning, bibliometric
14 [23]	2023	Ziakis, Christos & Vlachopoulou	Artificial Intelligence in Digital Marketing: Insights from a Comprehensive Review	Information	Q4	31	artificial intelligence; digital marketing; AI-driven marketing
15 [24]	2024	Md Ahadul Islam, Shafiqul Islam Fakir, S. B. Masud, Md Deluar Hossen, Md Tariqul Islam, Md Rafiuddin Siddiky	Artificial Intelligence in Digital Marketing Automation: Enhancing Personalization, Predictive Analytics, and Ethical Integration	Edelweiss Applied Science and Technology	Q4	12	artificial intelligence, chatbots and NLP, customer personalization, digital marketing automation, ethical AI practices, marketing innovation, PRISMA, predictive analytics
16 [41]	2025	Simerjeet Singh Bawa, Kishore Kunal, Kismat Kaur, Jyotsna Sharma, Vishal Srivastava, Puneet Tikku	An Analysis of Artificial Intelligence Implications and Its Impact on Marketing. A Systematic Review	Communications on Applied Nonlinear Analysis	Q4	O	artificial intelligence, big data, consumer behavior, machines, marketers, solutions
17 [42]	2025	Himani Devi, Amit Kumar Uniyal	The Impact of AI-Driven Social Media Advertising on Consumer Purchasing Decisions	Journal of Information Systems Engineering and Management	Q4	0	artificial intelligence, consumer behavior, digital marketing, purchase intention
18 [43]	2024	Maciej Potwora, Olha Vdovichena, Dmytrii Semchuk, Liubov Lipych, Volodymyr Saienko	The Use of Artificial Intelligence in Marketing Strategies: Automation, Personalization, and Forecasting	Journal of Management World	Q4	9	AI-driven market personalization, customer engagement techniques, data ethics, machine learning applications, predictive analytics, and privacy management
19 [44]	2024	Daegeon Kim, Gi Hyun Hwang	Machine Learning and Artificial Intelligence Use in Marketing	International Journal of Intelligent Systems and Applications in Engineering	Q4	3	artificial intelligence, machine learning, marketing, process
20 [45]	2022	Andrea De Mauro, Andrea Sestino, Andrea Bacconi	Machine learning and artificial intelligence use in marketing: a general taxonomy	Italian Journal of Marketing	Q4	98	artificial intelligence, analytics, big data, machine learning, marketing, marketing analytics

4.3.1 Dense connectivity and Thematic Integration

A high density in the network was observed, where most papers are connected, and this indicates a tight network among them. This indicates a solid foundational alignment with key topics such as AI-driven personalization, segmentation, CRM, marketing strategy, and predictive analytics. The high density of interconnections here suggests that the studies are commonly co-cited or cited in the context of their ideas (i.e., they are often mentioned together), and this reflects their collective authority in the shaping of this literature.

1. Prominent Thematic Clusters

- Cluster 1: AI for Personalization and CRM

Comprises papers like “Artificial Intelligence (AI)-based Customer Relationship Management” [34] and “Artificial Intelligence in Digital Marketing Automation” [24]. These papers stress the use of AI for improving customer experience, automating touchpoints, and creating personalized marketing actions.

- Cluster 2: Predictive Analytics and Strategic Marketing

Led by articles such as “Artificial Intelligence in Marketing: A Bibliographic Perspective” [25] as well as "8-T Framework for AI-Driven Branding" [28], this collection investigates predictive models, sentiment analysis, and machine learning in marketing strategy, targeting, and prediction.

- Cluster 3: AI in Supply Chain and Global Expansion

Articles like “Artificial Intelligence in Supply Chain Management” [32] coverage in supply & demand chain executives, and “Managing AI in International Business” [30] indicate AI’s operational and strategic uses beyond just customer-facing functions, consistent with larger business transformation themes.

- Cluster 4: Foundations and Bibliometric Overviews

This set of articles includes systematic or conceptual taxonomizing reviews, for example, "Three and a Half Decades of AI in Marketing" [29]; and "Machine Learning and AI Use in Marketing: A General Taxonomy" [45], and thereby provide frameworks, classifications, and historiographic insights.

2. Central and Influential Nodes

Some nodes are highly connected and positioned centrally, such as:

- “Artificial Intelligence in Marketing: A Bibliographic Perspective” [25]
- “8-T Framework for AI-Driven Branding” [28]
- “AI-based CRM” [34]

These serve as conceptual anchors, cited across multiple clusters, indicating their broad applicability and influence across different subfields of AI in marketing.

3. Collaboration for Research and Practice

The weighted inter-cluster edges denote studies connecting different clusters; they illustrate the extent to which certain topics bridge conceptual sections, e.g., customer segmentation algorithms Q-Learning and K-means [39], connect both technically modeling and strategically applying clusters. This supports the interdisciplinary relation of AI for marketing, with its basis in computer science methods that underlie marketing theory.

4.4 Intellectual Structure Analysis

The co-citation analysis of the 20 most pertinent studies on artificial intelligence in marketing reveals a coherent intellectual architecture organized into interlinked but distinct clusters. Three principal clusters emerged through community detection and centrality measures. The first cluster is anchored by highly cited and conceptually influential works such as *Artificial Intelligence in Marketing: A Bibliographic Perspective* [25] and *AI-based CRM: A Comprehensive Review* [34], which provide the theoretical scaffolding of the field. These studies exhibit strong eigenvector centrality, signifying both frequent co-citation and their pivotal role within the scholarly network, with an emphasis on foundational aspects, bibliometric mapping, and strategic frameworks for integrating AI into marketing, branding, and customer relationship management. The second cluster comprises studies on customer segmentation, personalization, and algorithmic techniques like Q-learning and clustering [39], which hold moderate centrality and represent the applied, data-intensive strand of the literature, offering empirical demonstrations of how AI transforms market targeting and consumer engagement. The third cluster brings together research addressing ethical, cross-border, and operational dimensions of AI in marketing, including governance frameworks and international strategies. Although these works show lower intellectual centrality, they possess notable betweenness centrality, highlighting their role as conceptual bridges between core theoretical contributions and emerging interdisciplinary concerns. Collectively, this tripartite structure reflects a field that is both strategically grounded and progressively shaped by technical advances and ethical imperatives, pointing to an evolving discourse that extends beyond performance outcomes toward responsible and globally adaptive innovation.

4.5 Real-world Case Studies

Although much of the recent literature remains rooted in Western markets, an increasing body of work from Asia and other developing regions is illuminating alternative trajectories of innovation. For example, in China and India, marketing engines embedded within high-volume digital marketplaces are deploying real-time AI systems adapted to local behavioral patterns and infrastructure conditions [46]. At the same time, Southeast-Asian contexts such as Indonesia are illustrating how marketers are pairing advanced automation with emergent norms of ethical adaptation and localized data-governance frameworks [47]. A case in point: Singapore’s MERaLiON initiative—an AI model designed for culturally-attuned emotion and multilingual customer-support scenarios—serves as a plausible infrastructure platform upon which emotion-aware AI marketing campaigns might be built [48].

In practical terms, emotion-aware AI could be tested in live marketing campaigns by harvesting multimodal signals (facial expression, voice tonality, behavioral cues) to calibrate ad-creative, channel timing, and offer design in real time. For instance, a brand operating in Singapore or Thailand might deploy an AI system that detects mild frustration or engagement peaks via webcam or mobile sensors, and then dynamically deliver a supportive video message or tailored product suggestion—thus closing the loop between emotional state and marketing response. Such campaigns, when executed thoughtfully, underscore how regional contexts matter: what constitutes “positive emotion” in one culture may differ in another, and data-privacy norms may govern whether emotion-detection feeds into personalization or is truncated to aggregate-level insights [49].

These perspectives expand our understanding of AI-marketing beyond a one-size-fits-all paradigm, emphasizing the need for frameworks that are sensitive to cultural, regulatory, and infrastructural diversity when deploying emotion-aware and ethically grounded AI systems.

4.6 Trending Topics

Figure 4 illustrates the evolving landscape of research themes on the application of AI in marketing from 2020—2025 and beyond, based on the temporal emergence and relative frequency of keywords. In the early part of the decade (2020-2021), the discourse was dominated by topics such as conversational AI, explainable AI, AI marketing automation, and hyperpersonalization, reflecting a collective drive toward enhancing customer engagement and transparency in algorithmic decision-making. The rise and enthusiasm towards AI ethics signaled an awareness of the moral and societal stakes of deploying AI in consumer-facing environments. Ethical challenges, such as algorithmic bias in automated recommendation systems, became increasingly visible, reminding practitioners of the potential for unintentional discrimination and reputational harm when data-driven personalization lacks oversight.

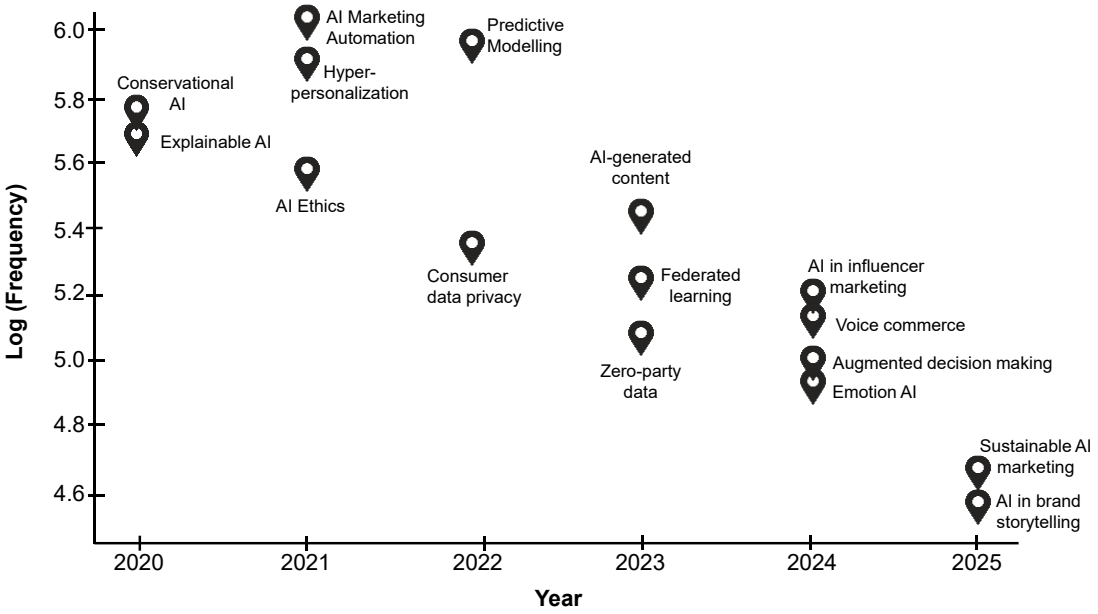


Fig. 4: Trending topics related to AI application in marketing from 2020-2025

As the decade progressed (2022 onward), the thematic focus expanded toward predictive modeling, AI-generated content, consumer data privacy, and federated learning, technologies that foreground both innovation and responsibility in data governance. The growing emphasis on privacy-preserving systems parallels real-world controversies, such as the misuse of behavioral data in the *Cambridge Analytica* case, which underscored the fragility of consumer trust in data-intensive marketing ecosystems. By 2024–2025, research trajectories began to explore emotionally intelligent and multisensory marketing interfaces, which include emotion-aware AI, influencer marketing analytics, and voice-commerce, raising new ethical questions about emotional manipulation, consent, and authenticity. Emerging discussions on sustainable AI marketing and AI-driven brand storytelling further reflect a shift toward value-based, socially conscious, and environmentally responsible marketing practices. Collectively, the figure encapsulates a transition from early personalization and automation toward ethically grounded, context-sensitive, and human-aware AI systems that redefine both marketing strategy and consumer trust in the algorithmic age.

5. Future Research Direction

Insights from the co-citation and intellectual structure analyses suggest that scholarship on AI and machine learning in marketing is entering a stage of methodological sophistication and cross-disciplinary expansion. The identified semantic clusters reveal solid foundations in predictive analytics, customer segmentation, and CRM-oriented personalization, indicating opportunities to develop integrative frameworks that unite these strands into adaptive, real-time marketing ecosystems. Future research can advance this direction through hybrid methodological designs, for instance, longitudinal studies to trace evolving consumer responses to AI-driven campaigns, or mixed-methods approaches combining behavioral data analytics with qualitative insights on user trust and perception.

On the technical front, emerging paradigms such as neuro-symbolic AI, reinforcement learning, and generative AI models (e.g., transformer-based architectures for creative content generation) offer new pathways for interpretability, contextual reasoning, and emotion-aware marketing automation. Investigating human-AI co-creation models, where algorithms generate, humans curate marketing narratives, can bridge efficiency with authenticity. Likewise, agile machine learning architectures that recalibrate campaigns in response to real-time feedback could be assessed through controlled field experiments to quantify precision gains across digital channels. Beyond the technological dimension, deeper connections with equally important interdisciplinary collaborations - linking data science, behavioral psychology, and consumer neuroscience are essential to ground personalization strategies in empirical understanding of cognitive and emotional processes. Techniques such as eye-tracking, neuroimaging, and psychophysiological measures could reveal how consumers cognitively engage with AI-generated messages, contributing to theory-building on attention, persuasion, and decision heuristics. Concurrently, growing thematic clusters on governance, privacy, and scalability emphasize the need for ethical design protocols, including bias detection frameworks, federated learning for privacy-preserving personalization, and transparent recommender systems enhance digital trust and brand integrity.

Finally, emerging avenues such as emotionally intelligent AI, culturally adaptive global marketing, and sustainability-oriented branding signal a broader paradigm shift, from optimizing for short-term performance toward cultivating long-term relationships grounded in human values, accountability, and societal well-being. This trajectory calls for an integrated research agenda that unites data science precision with psychological insight and managerial foresight to redefine marketing in the age of intelligent systems

6. Conclusion

Artificial intelligence, big data, and machine learning have reshaped marketing by shifting it from intuition-driven practices to data-intensive, predictive, and hyper-personalized strategies. Among these technologies, AI stands out as the primary catalyst, powering tools such as recommender systems, chatbots, predictive engines, and personalized content platforms that enable marketers to act with speed and precision in increasingly competitive environments. To capture and synthesize the evolving scholarly landscape, this review applied PRISMA guidelines, narrowing 969 initial records from Scopus and Google Scholar to 20 peer-reviewed studies published between 2020 and 2025. These articles collectively represent the core domains of predictive analytics, segmentation, and personalization, analyzed through bibliometric and thematic methods, including co-citation mapping with VOSviewer. Four major clusters were identified -personalization and CRM, predictive analytics for strategy, supply chain and global contexts, and foundational bibliometric studies -revealing a maturing field with strong anchors as well as emergent themes such as AI ethics, federated learning, emotion-aware systems, and sustainable branding. Despite rapid advances, unresolved issues remain around algorithmic opacity, interpretability, cultural generalization, and ethical use. Future work should therefore explore explainable and adaptive models, context-aware segmentation, and interdisciplinary approaches bridging computer science, behavioral psychology, and strategic management. By addressing these gaps, AI in marketing can advance toward frameworks that are both technologically rigorous and ethically grounded, supporting responsible innovation for scholars and practitioners alike.

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