

Artificial Intelligence in Digital Marketing: A Bibliometric Analysis and Systematic Literature Review using the TCCM Framework

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ABSTRACT

The present study provides an extensive review of the literature on artificial intelligence in the digital marketing domain. This paper helps reveal recent trends in AI in the digital marketing landscape and identifies research gaps. The theory development, characteristics, context and methodology (TCCM) framework has been applied for theory development and to identify gaps in existing research and future research directions. A total of 67 articles were used in the present study for the TCCM framework. Articles were identified and screened using the PRISMA framework from the Scopus and WoS databases. Along with TCCM, bibliometric analysis is also used to identify connections between different uses of AI in digital marketing. The findings reveal that anthropomorphism, chatbots, data privacy, digital communication, marketing technology, marketing strategy, credibility and human-AI interactions are the main research themes. Future research can focus on modern theoretical bases of human-AI interaction, addressing the human-AI divide in affective customer experiences and developing frameworks for discovering and mitigating bias when using AI tools in marketing.

Keywords: Artificial Intelligence, Digital Marketing, Machine Learning, Bibliometric Analysis, Systematic Literature Review, TCCM Framework.

Introduction

Digital marketing is the activity of promoting goods and services through various digital channels and electronic devices. SEO, e-mail marketing, social media marketing, mobile marketing, and affiliate/influencer marketing are key tools in digital marketing. This form of marketing is gaining prominence nowadays due to its ability to reach a wide audience, at the least cost, offering higher returns. Digital marketing practices, such as analysing customer profiles, target customers, and consumer behaviour, strengthen customer relationships with the brand and deliver higher-quality services, increased revenue, and greater customer satisfaction (Theodoridis & Gkikas, 2019). With advances in technology, the potential of digital marketing has further increased (Rabby et al., 2021).

The implementation of Artificial Intelligence (AI) technology in digital marketing has been a fast-developing trend in recent years. AI technology can be used to analyse vast amounts of customer data and derive useful insights (Jain et al., 2023). AI algorithms can be used to identify and target prospective customers, customise marketing content, and fine-tune marketing channels (Makki, 2023). AI takes as input data from websites, sales, analytical reports, and social media insights, and processes them to produce optimised, precise, highly foresighted results (Pereira et al., 2023). This improved forecasting of consumer behaviour has helped firms enhance their earnings and gain a competitive advantage (Raisch

& Krakowski, 2021). AI technology helps marketers automate many tasks, including customer segmentation, which results in time and cost savings (Davenport et al., 2020).

Despite the increased interest, the integration of AI applications in digital marketing remains fragmented. This research fills this gap by conducting a Systematic Literature Review using the Theory, Context, Characteristics, and Methodology framework, combined with Bibliometric analysis. This review is important for expanding our understanding of how AI is shaping digital marketing, revealing its current state, emerging trends, and theoretical foundations. Finally, it identifies key future research directions to deepen researchers' understanding of the interconnectedness between AI and digital marketing.

Research Questions

- How has the AI Digital Marketing literature developed?
- What are the theories, contexts, characteristics and methodology concerning the field of AI and digital marketing?
- What are the current research themes and topics for AI and digital marketing research?

Methodology

Research Method

This paper uses a hybrid approach to review articles in the AI–digital marketing literature, employing bibliometric methods and the TCCM framework. Bibliometric processes help understand and demonstrate publication trends, execute network, co-occurrence, and keyword analyses, and identify social and intellectual networks in the area (Donthu et al., 2021). We use these processes to illustrate and recognise the extensive work in AI–digital marketing to generate insights, offer research directions for future studies, and expand the area and domain (Tomar et al., 2021). Bibliometric analysis is supplemented by framework-based analysis to enhance the completeness, precision, and contribution of the study. Bibliometric analysis helps impartially and quantitatively analyse the research dataset, while the framework-based approach highlights the qualitative dimension (Sureka et al., 2022).

The literature pertinent to the area was searched in the Scopus and Web of Science (WoS) databases and the search process was guided by the PRISMA framework (Moher et al., 2010), which helps increase transparency in the review process. It is shown in Figure 1.

Search Strategy

• Identification

For identifying the literature, the authors selected the keywords “Artificial Intelligence” and “Digital Marketing”. Both WoS and Scopus databases were used. A total of 1116 articles published between 2018 and 2026 were identified from the database.

• Screening

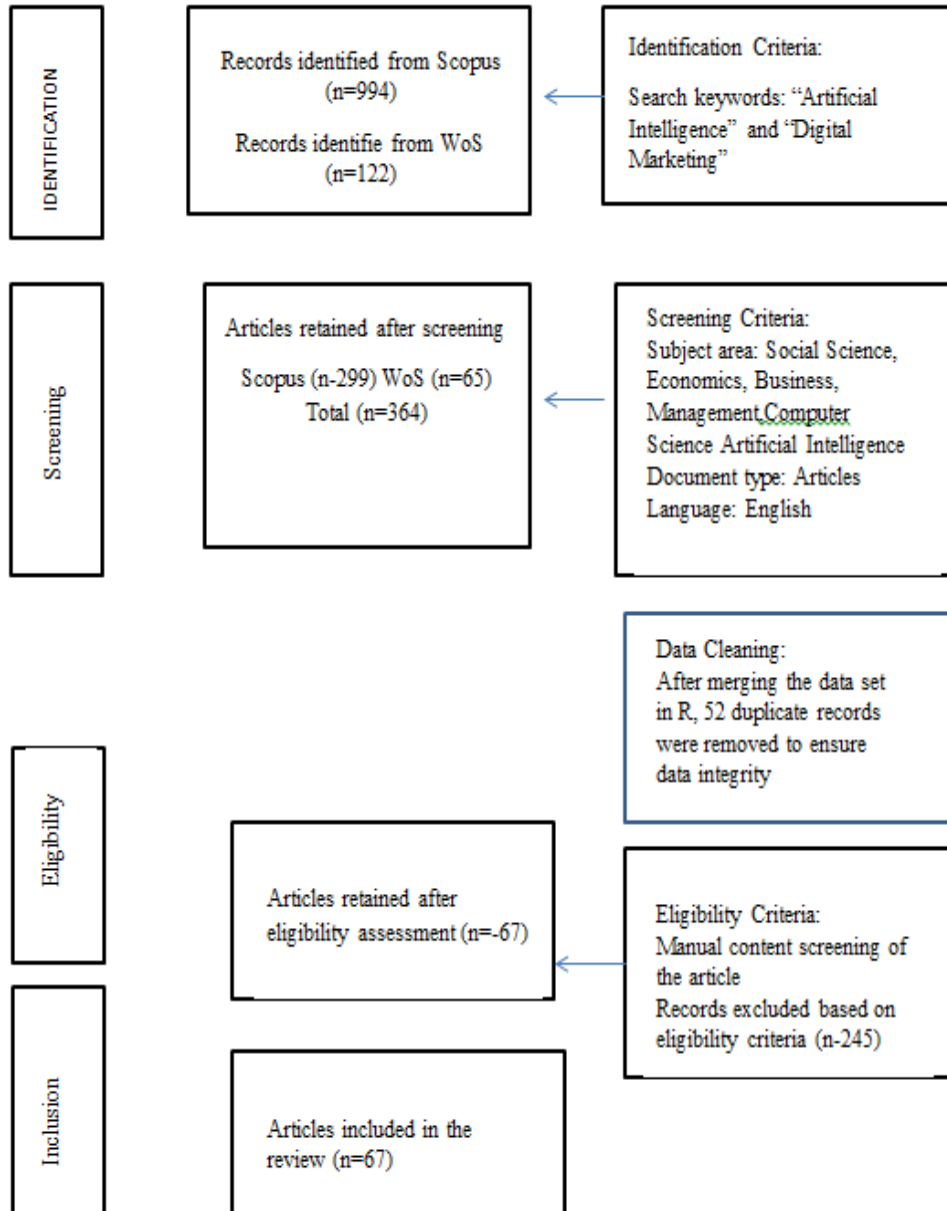
As part of the screening procedure, we reserved only English-language journal articles. Other publications, such as books, chapters, book reviews, working papers, and conference proceedings, were excluded. Subject area filters were also used. After the entire screening process, the number of articles was reduced to 364, of which 52 duplicates were removed after merging the documents in RStudio. Thus, the final number of articles came to 312, which were manually evaluated against the eligibility criteria. Bibliometric analysis was performed using these 312 articles.

• Eligibility

A broad evaluation based on titles and abstracts was conducted to eliminate articles that were absolutely irrelevant to the main research theme. The remaining articles were manually screened against strict inclusion criteria. Articles were reserved only if they provided enough empirical or theoretical support to be categorised under the four foundations of the TCCM framework. Based on the eligibility criteria, 245 records were removed.

Inclusion

A final set of 67 articles was retained and employed in the TCCM review process.



Source:-Adapted from Moher et al., 2009

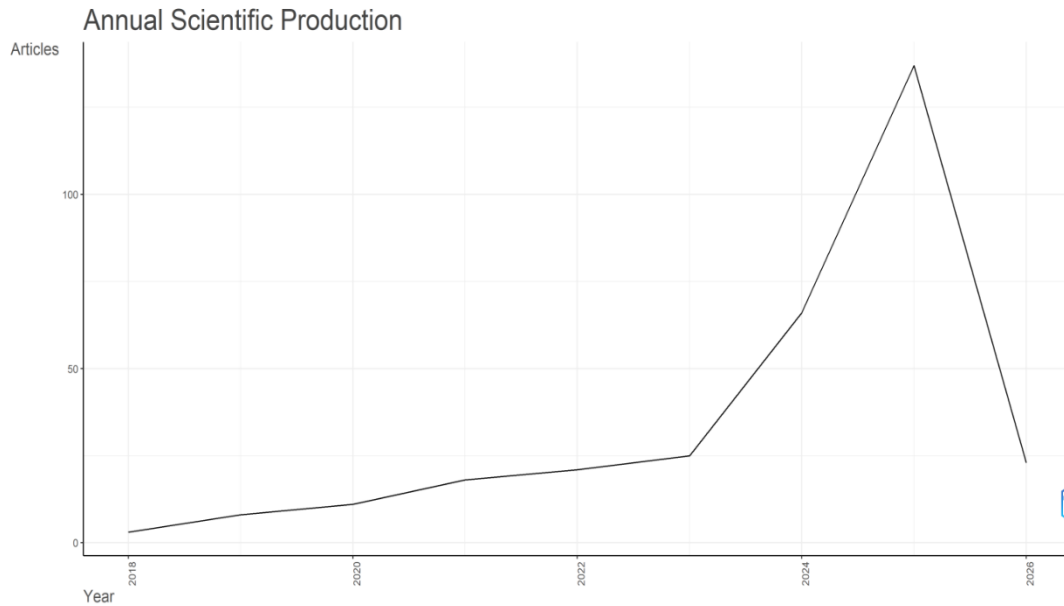
Figure 1: PRISMA Framework

Bibliometric Characteristics

Figure 2 represents the annual scientific production of the articles. During 2018-2022, the field was in its early stages of development. Beginning in 2023, the line shows a near-vertical rise due to the widespread adoption and development of Generative AI and Large Language Models. This explosive growth in research interest indicates that the field is in an accelerated phase of growth. Figure 3 shows the country's scientific production. China, USA, and India are the top three countries contributing to AI

and digital marketing research. Figure 4 shows the thematic map concerning the research domain. Themes such as anthropomorphism, chatbots, data privacy, digital communication, marketing technology, marketing strategy, credibility, and human-AI interactions are the motor themes that drive the current research. Themes like LLMs, Generative AI, virtual influencers, etc., are still demanding deeper development. SEO, market intelligence, decision support systems, etc., are niche themes, whereas digital marketing strategies, brand loyalty, supply chain management, etc., are emerging or declining themes within the research domain.

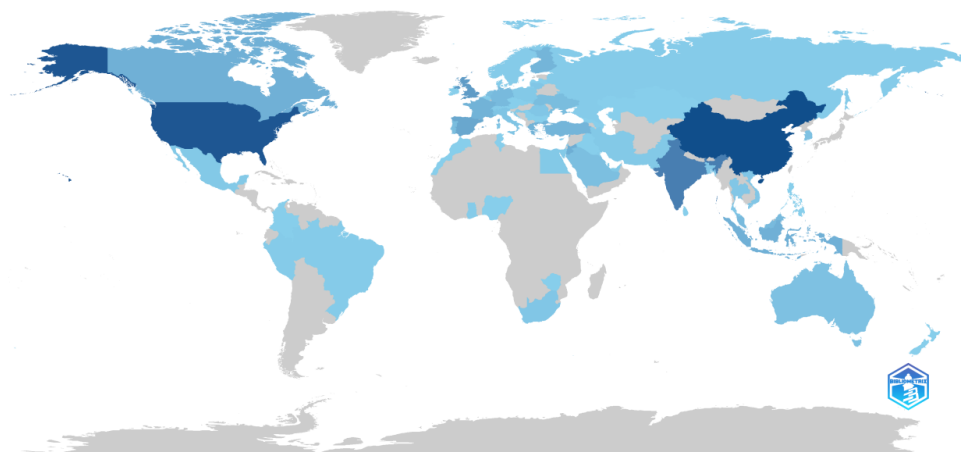
Figure 2: Annual Scientific Production



Source: Generated by the authors using Biblioshiny based on data retrieved from then Scopus and Web of Science

Figure 3: Country Scientific Production

Country Scientific Production



Source: Generated by the authors using Biblioshiny based on data retrieved from then Scopus and Web of Science

Figure 4: Thematic Map



Source: Generated by the authors using Biblioshiny based on data retrieved from then Scopus and Web of Science

TCCM Framework

In this paper, the TCCM Framework by Paul & Rosado-Serrano (2019) is employed to show an in-depth description of the selected papers for systematic literature review which is available in Table 1.. With the TCCM framework, it is feasible to evaluate the research gaps that are evident in the literature to guide further research.

Table 1: TCCM Framework Summary

SI No.		Theory	Context	Characteristics	Methodology
1	Li, et al., 2023	Affordance theory and service-dominant logic	Banking industry	The influence of chatbot affordances on consumers' value- in-use	PLS SEM
2	Rodgers& Nguyen, 2022	Throughput Model, ethical egoism, deontology	Application of AI in advertising	The study identifies six dominant ethical pathways affecting consumer purchase decision making	Conceptual review
3	Biswas et al., 2023	Statistical learning theory	Numerical rating given to Redmi smart phone brand within one month period in Amazon& Snapdeal	With the help of ANN predicting sales volume	ANN predictive modeling
4	Song&Bonnai, 2024	Business Model Innovation theory	The study focus on Chinese luxury brand customers	the moderating role of AI augmented Marketing Activities on the relation between Luxury Shopping Experience and Customer Satisfaction	Video- based-experimental design, PCA and Pearson's correlation
5	Nair&Gupta, 2021	Computational Intelligence theories	Practical application of digital marketing journey	Content creation, voice search, programmatic media buying, propensity modeling, predictive analytics	Conceptual review

6	Makki, 2023	NA	AI in digital marketing	Content personalization, marketing automation	SLR
7	Chintalapati& Pandey, 2022	NA	Impact of AI in marketing	Integrated marketing, experiential marketing, content marketing, marketing operations and market research	SLR based on PRISMA framework
8	Alqudah et al., 2024	Dynamic Capabilities Theory and Customer Experience Theory	Workers of Jordanian e-marketing companies form the respondents	The study focuses on the impact of AI in e-marketing companies	Survey design, PLS
9	Reed et al.,2025	Martech Stack Framework	Primary data was collected from an international software vendor	The article explores the bias issues of AI in digital marketing and puts forward an analytical framework	SLR, mono-method qualitative case study and thematic Analysis
10	Adwan, 2024	RBV , Information Processing Theory	Application of AI in content creation	Importance of AI in content creation	Uses SLR based on PRISMA framework
11	Dellaert. et al.,2020	SOR theory	Influence of AI Voice Assistant in consumer decision making	autonomy- efficiency tradeoff, psychological comfort, and capacity to mentally represent the decision alternatives	Conceptual review
12	Hartmann et al., 2025	Computational Creativity Theory	Comparison of human vs AI made images	AI images surpass man made images in terms of quality, realism and aesthetics	creative briefing experiment and field study
13	Wirth, 2018	ML, Deep learning ,NLP	capability of AI to develop market related insights in digital marketing	Narrow AI, Strong AI, and Hybrid AI	Conceptual review
14	Pereira et al. 2023	Problem- solution framework, RBV	AI applications in digital marketing industry	SEO, communication and sales and content marketing are the problem areas.	RACE framework for review, survey method,match analysis
15	Oliveira& Chimenti, 2021	Theory of social comparison, para-social theory	The impact of non-human influencers in marketing communication	Anthropomorphism, attractiveness, authenticity, scalability, and controllability	SLR, netnography in conjunction with in- depth interviews
16	Dong, 2025	Consumer-Based-Brand-Equity Data/Technology Framework, Brand Equity Theory	Impact of AI on branding, trend, pros and pitfalls	6 clusters are identified:-AI; sales; ML; neural networks; consumer Behavior; social Media	SLR and Bibliometric analysis
17	Turlakova&Shumilo,2025	Control Theory	Meta Ads platform	Impact of AI features in Meta Ads on consumer behaviour	Experimental research design
18	Ma&Sun, 2020	Statistical learning theory	ML in marketing research	Benefits and limitations of ML in comparison to econometric models	Conceptual Review

19	Camacho, et al., 2025	Anthropomorphism theory, Hybrid AI-Human decision models	Evolution of AI and ML in digital marketing	Recommender systems, human- robot interaction , and social media marketing are the emerging themes	Bibliometric analysis using SciMat
20	Peyravi et al.,2020	RBV, Service-dominant logic	Application of AI in marketing	Identified main tools of AI applied in marketing and AI trends in marketing	SLR using SALSA method
21	Cunha et al., 2024	Information processing theory, Dynamic capabilities theory	Role of AI and ML in tourism and hospitality luxury sectors in Portugal and Spain	role of AI and ML in redesigning the tourism and hospitality sectors by offering customized consumer experience	Quantitative methodology
22	Saura et al., 2021	Resource- based view, Relationship marketing theory	Application of AI based CRMs in B2B digital marketing	The study discusses the main types of CRM ,main techniques and uses of AI based CRM in B2B digital marketing	SLR,MCA
23	Sabharwal et al., 2022	NA	Relationship between AI and digital advertising in marketing strategies of SMEs	There is a positive relation between AI and cost Leadership and differentiation strategy	Quantitative research design, PLS-SEM
24	Hibat, 2024	RBV	marketing managers of Jordanian manufacturing companies	AI has the power to influence digital marketing	Quantitative methodology, multiple and linear regression
25	Mogaji, et al.,2020	Consumer vulnerability theory, Nudge theory	Implications of AI on digital marketing of financial services to vulnerable consumers	How vulnerable consumers can be reached with suitable product offers.	Conceptual review
26	Cosmo et al. 2021	TRA, TP	Factors influencing intention to use chatbots	Attitude towards mobile advertising influences indirectly the intention to use chatbot	Quantitative study
27	Gündüzyeli, 2025	Predictive analytics, sentiment analysis, NLP	Role of social media and AI in digital marketing resilience	the importance of AI enabled social media marketing communication by brands with clients	Conceptual review
28	Ullal et al., 2021	NA	Role of ML in digital marketing	Consider attitude, behavior and choice of customers while building ML software	Interview method, survey method
29	Yu, 2025	NA	AI in tourism	The study discusses the impact of GenAI in tourism sector	Conceptual review
30	Saura et al., 2024	Privacy calculus theory, Trust theory	Privacy paradox in AI based digital marketing	Balanced approach which respects user privacy and ethical use of data in AI based marketing	SLR, MCA

31	Jin et al., 2024	T-EESST model, Decision tree model	AI in digital marketing	The study discovers that advanced big-data analytics and AI optimize sustainable digital marketing practices	Random Forest Model, Experimental design
32	Ku,2024	Social Response Theory	Restaurant sector	Perceived anthropomorphism, perceived warmth and customer- AI- Assisted Exchange impact digital innovation leading to customer satisfaction	Quantitative design using PLS SEM for analysis
33	Keegaan et al., 2024	Activity Theory	AI in B2B marketing	Discusses the contradictions that emerge when adopting AI in B2B sector	Expert interview method
34	Niros et al.,2025	Social response theory	The study conducted among chatbot users in Athens, and Greece	Individualism moderately influences the effects on customization and anthropomorphism on Relationship Equity, Brand Equity and Value Equity.	Intercept survey
35	Zong et al., 2025	RBV, Dynamic capability theory, KBV	SMEs in cultural and creative sectors in China	Big Data AI Analytics affordances can influence DMC of SMEs	SEM
36	Su, 2025	Social presence theory, Anthropomorphism, Social identity theory	Case studies of two virtual influencers:-Lil Miquela and Ayayi	VIs create an authentic relation with younger generations but also raise ethical concerns.	Conceptual research design, case study research, SLR
37	Jain et al., 2024	TPB, Behavioural Reasoning Theory, SOR, parasocial theory, TAM,	107 articles were reviewed. Both WoS and Scopus were considered focusing on AI based Consumer Behaviour	Themes identified:- impact of AI on consumer behaviour, consumer acceptance and trust, decision making, perception and responses	Bibliometric and Framework based methodology including TCM and ADO
38	Lee&Li, 2023	Affordance actualization theory, Social identification theory	Use of chatbots in banking industry	Chatbot and customer-brand identification leading to brand loyalty.	Online survey, SEM analysis
39	Oliveira et al.,2025	International marketing dynamic capabilities and collective absorptive capacity	Use of digital human avatars in international marketing efforts	Firms which use conversational AI in their international marketing efforts can improve their IDMCs	Interview and thematic analysis method
40	Gao et al., 2023	Computational advertising model	AI in advertising	Focuses on targeting, personalization, content creation and ad optimization.	SLR combined with bibliometric analysis
41	Madanchian, 2024	TAM,TPB, AIDA model, BRT, Value Adoption Model	AI on e-commerce sales	AI can enhance KPIs of e commerce	Critical review methodology

42	Charles et al., 2024	TAM, MarkBot framework, social presence theory	AI in marketing	Chatbots and AI voice assistants, AI/ML models, AI-integrated CRM	Conceptual review
43	Kopalle et al., 2021	NA	AI in marketing via global lenses	AI in marketing via global lens on three levels; country level, company level and consumer level	Conceptual review
44	Hossain et al., 2022	Resource-based view and Dynamic capabilities theory	Use of AI in readymade garments industry in B2B context	Export oriented firm's marketing analytics capability can improve its competitiveness in the presence of AI.	Multi-phase research design, SEM analysis
45	Sharma et al., 2022	UTAUT, AI based Hofstede's decision support cultural theory system	Theories have influence on adoption intention	covariance-based SEM	
46	Ledro et al., 2022	Information AI in CRM processing theory, knowledge-based view, RBV, social presence theory	Three main subfields:- Big Data and CRM, AI and ML, strategic management of AI-CRM integrations	Literature review combined with Bibliometric analysis	
47	Volkmar et al., 2022	NA	AI in marketing management	Three domains;- culture, strategy and implementation, decision making and ethics, and customer management	Delphi study, quantitative survey, and focus groups
48	Rustholkarhu, et al., 2022	Resource based view, Dynamic capability theory	AI in B2B sector customer journey management	The study identifies four key activities in B2B customer journey management	Conceptual review
49	Kietzman et al., 2018	Relationship marketing theory, social exchange theory	Use of AI along the customer journey	The use of AI in different stages of consumer journey	Conceptual review
50	Miklosik et al., 2019	Information processing theory, statistical decision theory	Use of big data and machine learning in marketing industry	Big data and ML influence digital transformation in marketing	Conceptual review
51	Herhausen et al., 2024	Resource-based view, theory of relationship marketing	Machine learning in marketing	Provide an overview of applications of ML in marketing	Conceptual review
52	Kasem et al., 2024	NA	AI in customer profiling in the context of digital start ups.	The study discloses three primary clusters	K-means clustering algorithm, Elbow method, Silhouette coefficient, and Gap Statistics method, RFM
53	Quin & Jiang, 2019	NA	Impact of AI in Chinese advertising market	Propose four steps in AI powered advertising	Conceptual review

54	Akter et al.,2023	Dynamic capabilities theory	Financial service industry in Australia	Algorithmic bias management capability consists of three primary dimensions	Literature review, thematic analysis, and surveys
55	Lu et al., 2023	NA	AI in retail industry	New retail should aim towards the fourth stage of AI development	Multi-case study , correlation analysis
56	Cherif et al., 2024	NA	Case studies of virtual influencers of retail industry in Brazil	The absence of human flaws,the role of storytelling, ability to appear more real than human influencers	mixed qualitative methodology (case studies and interview)
57	Liang et al., 2020	Technology Acceptance Model	AI adoption intention among customers in US fashion sector	All the variables of TAM model has an influence on AI adoption	SEM analysis
58	Mariani et al., 2022	UTAUT, game theory, theory of mind, TPB, computational theories, BRT	AI in marketing	Eight topical clusters were identified	Bibliographic method and SLR
59	Bruyn et al., 2020	NA	AI in marketing	The role of deep neural networks,the technological pitfalls of AI	Conceptual review
60	Abradi et al., 2022	NA	Economic impact of AI powerd with ML.	The implications of AI on firms and market competition.	Conceptual review
61	Yang et al., 2021	NA	AI for precision marketing	AI is effective in precision marketing.	Conceptual paper
62	Zulaikha et al. 2025	NA	AI in customer predictive analytics	AI can predict customers'behavior	Conceptual review
63	Vlačić et al. (2021)	CRM, KBV, network theory, and technology-related theoretical foundations	AI in marketing	AI in marketing, technological advancement, ethics, marketing channels and marketing strategy	Conceptual review
64	Tindaon ,2026	Dynamic Capability View	AI based CRM in B2B sector of four private and public organisations in Indonesia	AI based CRM system can increase business value and improve the quality of public services	Case study approach
65	Tajeddini et al.,2026	Dynamic capability view	Tourism and hospitality firms in Japan	Influence of dynamic capabilities on firm performance	PLS-SEM
66	Jansen et al., 2026	NA	Gen AI in advertising	Gen AI produced visual content can surpass conventionally produced content in performance metrics.	train an open-source gen AI model and the visual output is compared with conventional ad
67	Armutcu et al.,2026	SOR Theory	Mobile service users in Africa	The impact of AI mobile service marketing on mobile service users' repurchase intentions	PLS-SEM

Source: Author's analysis based on data extracted from Scopus and Web of Science.

- **Theory (T)**

The literature review shows that common theories used in AI and the digital marketing landscape include technology adoption theories, behavioural and ethical foundations and business and strategic foundations. Commonly applied technology adoption theories include the TAM and UTAUT. Behavioural and ethical foundations employed in the literature include the TPB, ethical egoism, deontology, and utilitarianism. Dynamic Capability View Service-Dominant Logic, RBV, and CRM theories are the business and strategic foundations commonly applied in the research papers. Many studies rely on traditional technology adoption models like TAM, while avoiding modern theories such as cognitive dissonance theory or asymmetric information theory that could better detail human-AI interaction, thereby creating a research gap for future research.

- **Context (C)**

Most research papers focus on the use of AI in industries such as banking, tourism/hospitality, luxury fashion, and the B2B sector. The number of research papers focusing on the application of AI across various functional areas, such as precision marketing, advertising, predictive analytics, and AI-powered customer interfaces, is also very high. But there is only very limited research on how to effectively reconcile the human-AI gap in affective customer experiences, especially regarding empathy and emotional intelligence and hence a research gap can be identified from here.

- **Characteristics (C)**

The extended literature mainly focuses on the role of AI in optimising marketing platforms, forecasting consumer behaviour, hyper-personalisation, and ethical decision-making. A striking factor is that most of the research is short-term focused. There is a lack of knowledge about the long-term impact of AI on customer loyalty, brand trust, and sustainable marketing models. In addition, most research papers explore patterns but fail to explain why they exist. These gaps certainly can be explored by future researchers.

- **Methodology (M)**

a mixed-methods approach is used, meaning most studies rely on both quantitative and qualitative methods for analysis. PLS-SEM, Principal Component Analysis and ANN Predictive Modelling are the most used quantitative techniques for analysis. SLR, conceptual reviews, bibliographic methods and case study approaches are the most commonly used qualitative techniques. But the research papers fail to provide an actionable framework to help marketers reveal and mitigate bias during the prompting and deployment stages of AI. Apart from this, the lack of sufficient data for marketing analysis is a major problem that most models have failed to address. Researchers can look into these important gaps.

Discussion and Implications

This review adds to theory and has implications for society and practice. The bibliometric analysis provides an advanced overview of the AI digital marketing literature by illustrating and analysing various publication trends. The TCCM framework enables highlighting the theoretical foundations and methodologies applied in this area.

- **Theoretical implications**

Previous studies concentrated heavily on the *Features*(accuracy, speed, predictive power)of AI tools. However, the emerging "Motor Themes" such as anthropomorphism and human-AI relationships suggest that theory must now account for the human appearances, behaviours and emotions of AI tools. There is a pointable need for more studies to understand how AI-driven personalization affects long-term brand loyalty rather than just short term benefits.

- **Strategic Implications for Management**

While "Machine Learning" and "Social Media Marketing" are now Basic Themes managers must move toward Motor Themes like AI Literacy and Chatbot Credibility to maintain a competitive advantage. "Market Intelligence" and "Decision Support Systems" currently reside in the Niche quadrant. This suggests that many firms are not exploiting AI for strategic level planning.

- **The Ethical implications**

The review suggests that ethical AI is not just a legal requirement but a competitive advantage. In an era of algorithmic bias, brands that proactively open up their AI usage and prioritize data privacy regulations will likely see higher levels of consumer trust.

Future Research Directions

By applying the TCCM review methodology, the study identifies several research gaps which the future researchers can exploit. Most of the literature reviewed depends on traditional theoretical foundations, suggesting that future researchers can explore modern theories such as cognitive dissonance and asymmetric information. Since research on reconciling the AI-human gap in affective customer experiences is very limited, researchers can focus on this context in their future work. The long-term impact of AI on customer loyalty, brand trust, and the sustainability of marketing strategies is often overlooked by researchers, highlighting a significant research gap. In the future, researchers can also develop robust frameworks to guide marketers in identifying and mitigating bias during the prompting and deployment stages of AI tools.

Conclusion

This study presents a systematic consolidation of articles published in the fields of artificial intelligence and digital marketing from 2018 to 2026. The TCCM framework, together with bibliometric analysis, provides an in-depth view of the literature published from 2018 to date on artificial intelligence. The research in the AI digital marketing domain focuses on themes such as anthropomorphism, chatbots, data privacy, digital communication, marketing technology, marketing strategy, credibility, and human-AI interactions. The review found that commonly applied theories in the literature include technology adoption and acceptance theories, behavioural and ethical foundations, and business and strategic foundations. Finally, the research also offers future research directions in some less-explored areas, such as cognitive dissonance theory, bridging the AI-human gap in affective customer experiences, and framework development for identifying and mitigating bias. Therefore, this analysis provides a view of the existing state of artificial intelligence in the digital marketing domain and gives future research directions.

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