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AI AND CHATBOTS IN DIGITAL MARKETING: A BIBLIOMETRIC STUDY

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ABSTRACT
The accelerated progress of digital marketing has been propelled by artificial intelligence (AI) and chatbots, transforming customer engagement, data analysis, and personalized marketing strategies. By employing the PRISMA framework, this study conducts a comprehensive bibliometric analysis aimed at examining AI and chatbots in digital marketing by reviewing 203 scholarly articles published between 2019 and 2024. Using the Dimensions.ai database and bibliometric tools such as Biblioshiny, Scimago Graphica, and VOSviewer, this study identifies key publication and citation trends, highly cited publications, influential contributors, collaborative networks, and dominant thematic areas.

KEYWORDS: AI, Chatbots, Digital marketing, Visualization, Analysis, Publications.

1. INTRODUCTION
From traditional marketing strategies to data-driven, more dynamic ones, digital transformation has profoundly transformed marketing strategies (Singh et al., 2023). This transformation is largely fueled by digitization and technology, particularly in digital marketing, where new technologies such as AI (Artificial Intelligence) are projected to have boundless possibilities (Enshassi et al., 2024; Ziakis & Vlachopoulou, 2023). Leveraging AI for digital marketing marks the beginning of a new phase of more intelligent marketing wherein analytics forecasting, customer categorization, and individualized marketing are no longer pipe dreams, but attainable goals. Technology advancement in internet usage coupled with the increased use of gadgets have placed digital marketing as one of the most essential tools in the business world (Shanmugam et al., 2023).
Digital marketing is defined as using the internet and other technologies To interact with consumers in their everyday digital environments. This is consistent with the consumer trends that are now observed to lean heavily on online research, price comparisons, and e-shopping (Kharis et al., 2024). AI comes into play in this landscape as a tool that has unmatched capacities in handling and processing big data to provide insights that can enable better marketing decisions (Theodoridis & Gkikas, 2019). One of the most apparent fields to adopt AI technologies is the use of chatbots in providing solutions to customers (Statista, 2023; Statista, 2024). These artificial intelligence chatbots help to boost the functionality of e-businesses by responding to the customers' questions instantly at any time and day, which, in turn, optimizes the customer satisfaction level And the overall efficiency of the service (Misischia et al., 2022).

Moreover, the function of AI in modern digital marketing extends beyond customer service. Driving marketing intelligence with predictive analytics ensures that marketing efforts are not merely reactive but proactive as well (Enshassi et al., 2024). Besides, AI enables one to create personalized targeting messages that can capture the attention of the consumer and strengthen the efficiency of marketing communication (Ziakis & Vlachopoulou, 2023). The application of AI and chatbots in digital marketing are the perfect examples of the efficiency of such technologies. Wang et al. (2024) shed light on their increasing significance as marketing tools in the future. The combination of AI and chatbots is likely to offer great solutions to different contingencies experienced in conventional marketing.

Bibliometric analysis is a useful systematic method to assess the development and current state of research on AI and chatbots in digital marketing. In addition to providing insights into the development of the field, bibliometric studies identify influential works and authors and highlight emerging research areas based on publication patterns, citation networks, and thematic trends (Zhang et al., 2019; Caviggioli & Ughetto, 2019). We conducted a search on Web of Science and Scopus to identify earlier bibliometric studies on the topic. However, we found that only one such study is available, a bibliometric analysis performed using VOSviewer focusing on the evolution of AI in digital marketing (Nalbant & Aydin, 2025). In contrast, our study expands this scope by including not only AI but also chatbots, which have seen widespread adoption in recent years. Given the increasing prevalence of chatbots in various industries, it is essential to explore their role alongside AI in digital marketing, offering a more comprehensive view of the current landscape.

This study provides a novel and comprehensive bibliometric analysis of AI and chatbots in digital marketing, fulfilling the identified research gaps in the existing literature.

1. Unlike previous studies, such as those by Mogaji et al. (2020) and Kharis et al. (2024), which have focused primarily on individual domains like financial services and education respectively, this study extends the analysis to include cross-industry applications, comparing the use of AI and chatbots across industries like e-commerce, banking, and tourism. This broadens the scope of understanding AI's role in digital marketing across diverse sectors.
2. Additionally, we have selected a specific timeframe from 2019 to 2024, which captures the pivotal period during which the surge in AI and chatbot adoption occurred, particularly due to the COVID-19 pandemic. The pandemic accelerated the digital transformation of businesses, driving the widespread integration of AI tools, including chatbots, into marketing strategies to ensure customer engagement during lockdowns and beyond (Shanmugam et al., 2023; Enshassi et al., 2024). This period marks a critical phase in the development and application of AI in digital marketing, and our study provides a comprehensive examination of these trends during this transformative time.
3. Previous bibliometric studies have predominantly used tools like VOSviewer or Bibliometrix for their analyses. This study distinguishes itself by employing multiple bibliometric tools, including Biblioshiny, Scimago Graphica, and VosViewer. This diverse toolset enables a more comprehensive visualization of the emerging research trends, collaborative networks, and intellectual foundations in the field, ensuring a deeper understanding of the field’s evolution.

1.1. Research Questions

The study intends to examine the existing foundational knowledge and the latest trends in research concerning AI and chatbots in digital marketing from 2019 to 2024. It explores influential authors, influential journals, geographic contributions, collaboration networks, bibliographic coupling, keyword trends, and thematic trends. To do so, some research questions (RQ) and the corresponding analysis procedures are formulated (see **Table 1**).

Table 1. Research Questions and Corresponding Analyses

RQ No.	Research Question (RQ)	Analysis
RQ1	What is the publication and citation trend of research relating to AI and chatbots in digital marketing?	Temporal analysis of publications and citations
RQ2	What are the most productive journals, authors, institutions, and countries in the field?	Most prolific journals, authors, institutions, and countries
RQ3	What are the most influential publications in the field?	Most global cited publications
RQ4	What are the key collaborative networks in the field?	Collaborative network map of journals, authors, institutions, and countries
RQ5	Which documents constitute the intellectual foundation of the field?	Bibliographic coupling of documents
RQ6	What are the thematic trends, trend topics, most occurring keywords, and research gaps in the field?	Word Cloud, Trend topics, Conceptual structure map, Thematic map of keywords, and Thematic evolution of keywords

2. METHODOLOGY

This study is devoted to carrying out a bibliometric analysis of the relationship between AI, chatbots, and digital marketing, a field that has been rapidly developing and attracting increasing research and practical attention. The chosen approach aims to rigorously enable the identification, synthesis, and analysis of the literature. The approach was inspired by the systematic quantitative method used in prior studies that investigated related but different fields of study, such as climate change and sustainable development (Menon et al., 2022; Chen et al., 2022).

2.1. Data Source

For this investigation, the Dimensions.ai database was selected because of its vast coverage areas of academic sources, citation data, and well-articulated reasons in earlier literature (Hook et al., 2021; Petersen, 2022; Herzog et al., 2020; Banshal et al., 2022). The Dimensions.ai database is well-recognized for its vast list, containing various papers belonging to different disciplines, which perfectly fits the requirements of this bibliometric study.

2.2. Search Strategy

In line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, a clear set of inclusion and exclusion criteria were used to screen the articles in a structured manner, which is particularly suitable in bibliometric reviews, as identified by Page et al. (2021). The inclusion and exclusion criteria for the papers considered in the analysis using

PRISMA are provided in **Figure 1**. The search was conducted with the following terms within the title of the document: "AI and Chatbots in Digital marketing", "AI in Digital Marketing", "Artificial Intelligence in Digital Marketing", "Chatbots in Digital Marketing", "Artificial Intelligence", "Chatbots", and "Digital Marketing" for publications between the years 2019 to 2024. This approach to selecting strategic keywords and the temporal restriction was aimed at identifying the most relevant and recent studies in this dynamically growing area of research. The initial search retrieved 2500 articles, which were further refined to 203 articles following selective inclusion and exclusion based on predetermined criteria for bibliometric analysis.

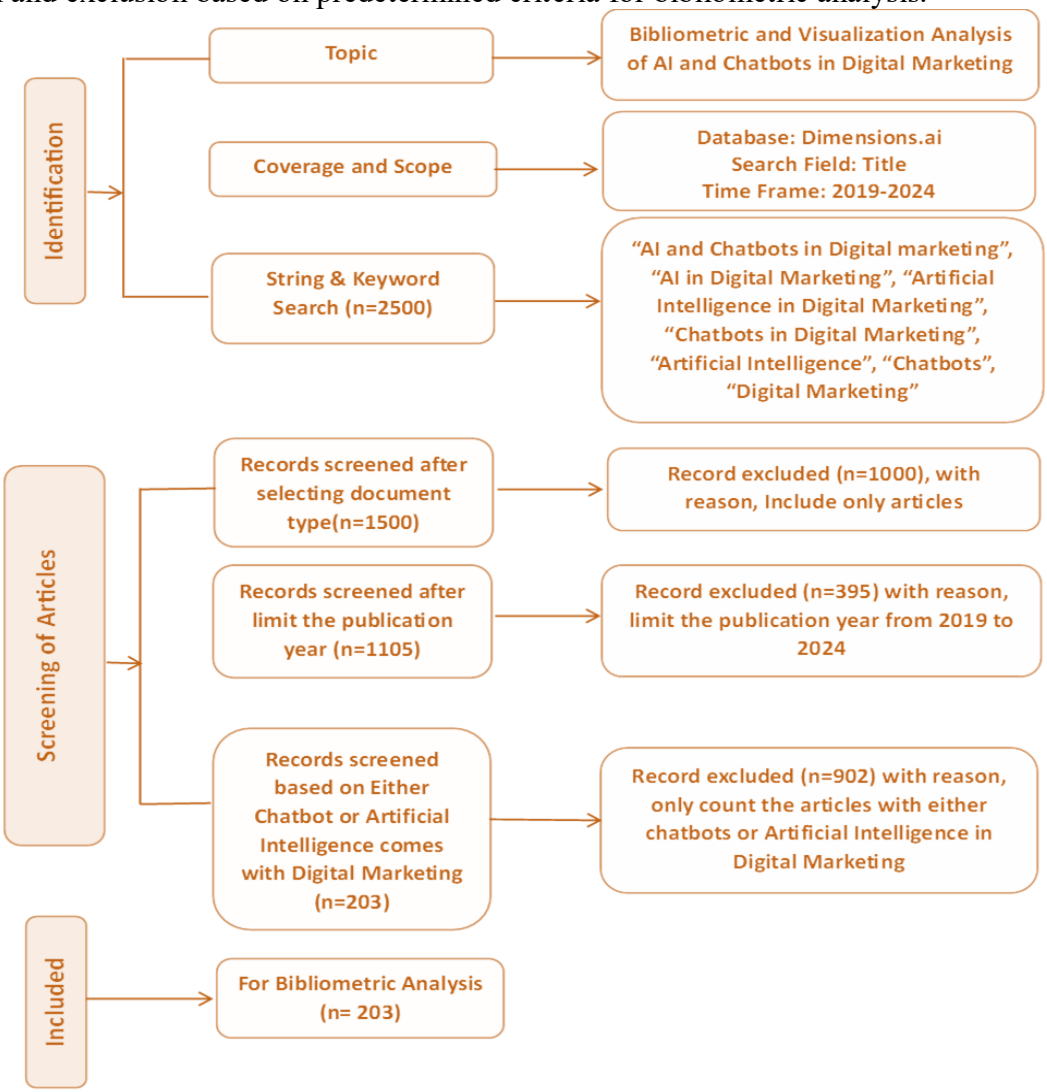


Figure 1. Literature search criteria adhering to PRISMA

2.3. Data analysis and Visualization

A dual approach combining performance analysis and science mapping is applied to examine the research trends and the intellectual structure of studies relating to AI and chatbots in digital marketing (**Figure 2**). Publication trends, citation impact, and authorship patterns are quantified by performance analysis, whereas science mapping is associated with collaboration networks,

thematic evolution, and knowledge structure in the field (Donthu et al., 2021). Integrating these techniques ensures a comprehensive assessment of scholarly contributions and emerging research directions. To perform the bibliometric analysis and visualize the generated data, numerous tools, including Biblioshiny, Scimago Graphica, and VOSviewer, were used to facilitate the structured analysis of publication trends, citation relationships, research collaboration, and thematic research clusters.

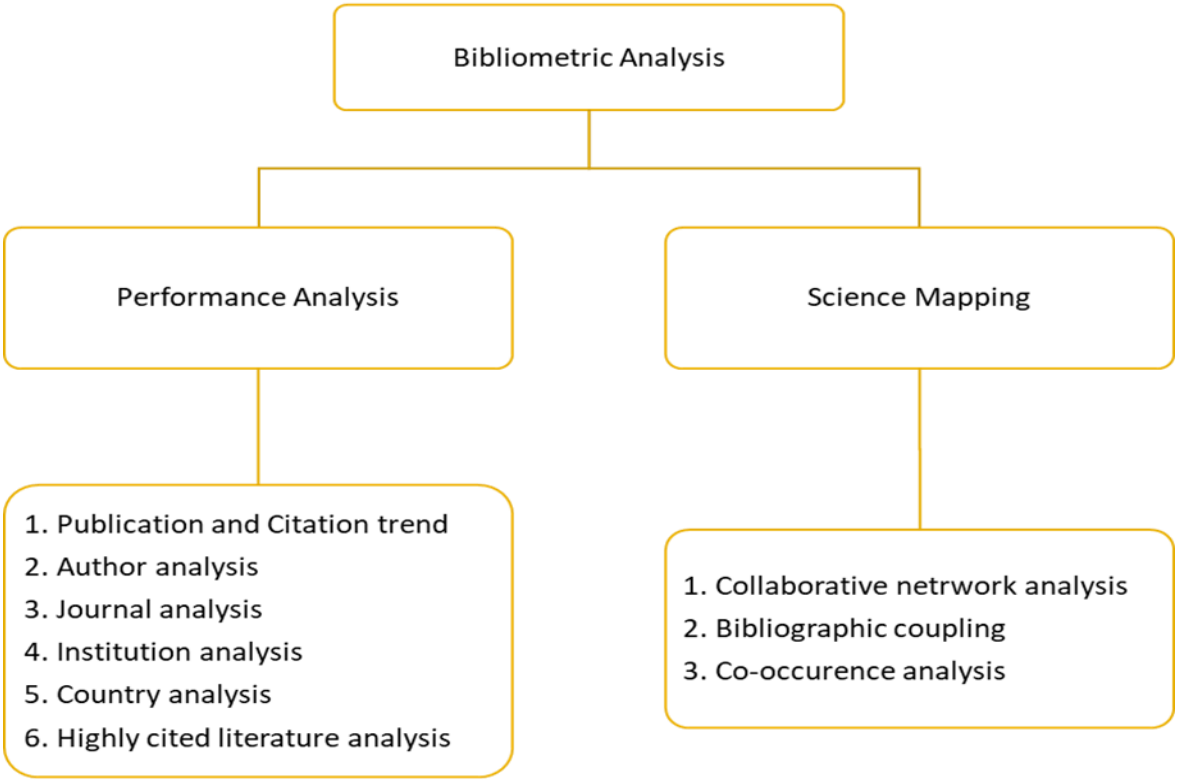


Figure 2. Bibliometric Analysis Overview

3. RESULTS

3.1. Performance Analysis

3.1.1. Descriptive Statistics of Data

The basic information of our bibliometric analysis is given in **Table 2**. Over the past 6 years, 203 documents have been published relating to AI and chatbots in digital marketing in 131 sources, with an average citation per doc of 16.82 and 9,370 references. The annual growth rate of 32.55% indicates increasing academic interest.

In terms of authorship, 618 authors contributed to the dataset, with only 22 authors producing single-authored documents. This suggests a strong tendency toward collaborative research. The total number of single-authored documents is 24, whereas the overall collaboration rate is high, with an average of 3.33 co-authors per document. Additionally, 30.54% of the documents involve international co-authorship, reflecting significant cross-border collaboration and knowledge exchange. Regarding document types, all 203 analyzed documents are categorized as articles, suggesting that journal publications dominate the research output in this domain.

Table 2. Descriptive Statistics of data for bibliometric analysis.

Description	*Results*
MAIN INFORMATION ABOUT DATA	
Timespan	**2019:2024**
Sources (Journals, Books, etc)	**131**
Documents	**203**
Annual Growth Rate %	**32.55**
Average citations per doc	**16.82**
References	**9370**
AUTHORS	
Authors	**618**
Authors of single-authored docs	**22**
AUTHORS COLLABORATION	
Single-authored docs	**24**
Co-Authors per Doc	**3.33**
International co-authorships %	**30.54**
DOCUMENT TYPES	
article	**203**

3.1.2. Dominant Subject Areas

Figure 3 presents the distribution of research publications or scholarly contributions across various disciplines. The data highlights that the major contribution (65%) is concentrated in Commerce, Management, Tourism, and Services, demonstrating a significant research focus in business and economic-related fields. The Information and Computing Sciences domain follows with 21%, indicating a substantial academic interest in technology and digital advancements. Other disciplines, such as Language, Communication and Culture (2%), Engineering (2%), and Psychology (2%), exhibit a relatively smaller but notable research presence. The remaining categories, including Creative Arts and Writing, Health Sciences, Philosophy and Religious Studies, Economics, Human Society, and Law and Legal Studies, each contribute around 1%, reflecting their lower representation in the analyzed scholarly output.

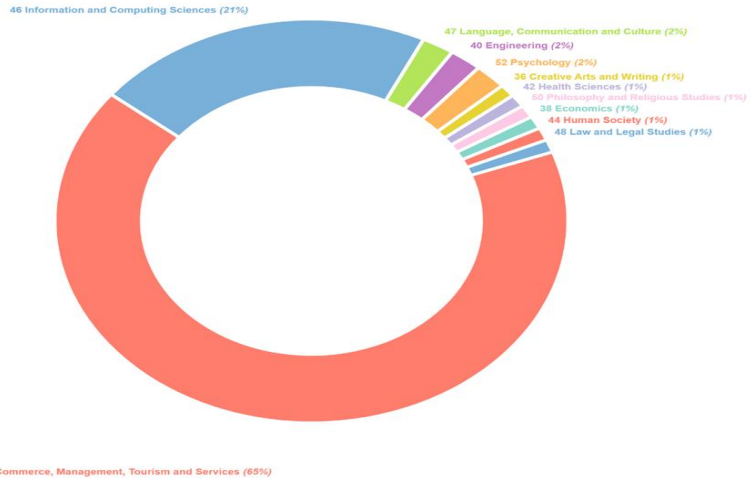


Figure 3. Donut chart representing dominant subject areas

3.1.3. Publication and Citation trend

Figure 4 illustrates the publication and citation trends in AI and chatbots in digital marketing from 2019 to 2024. The solid blue line represents the number of publications per year, while the red dashed line denotes the total citations received in each respective year. The publication trend shows a significant increase in research output, particularly from 2021 onward, peaking in 2023 before a slight decline in 2024. However, total citations peaked in 2021 and have since declined, suggesting that earlier studies had a stronger academic impact while newer publications have yet to accumulate citations.

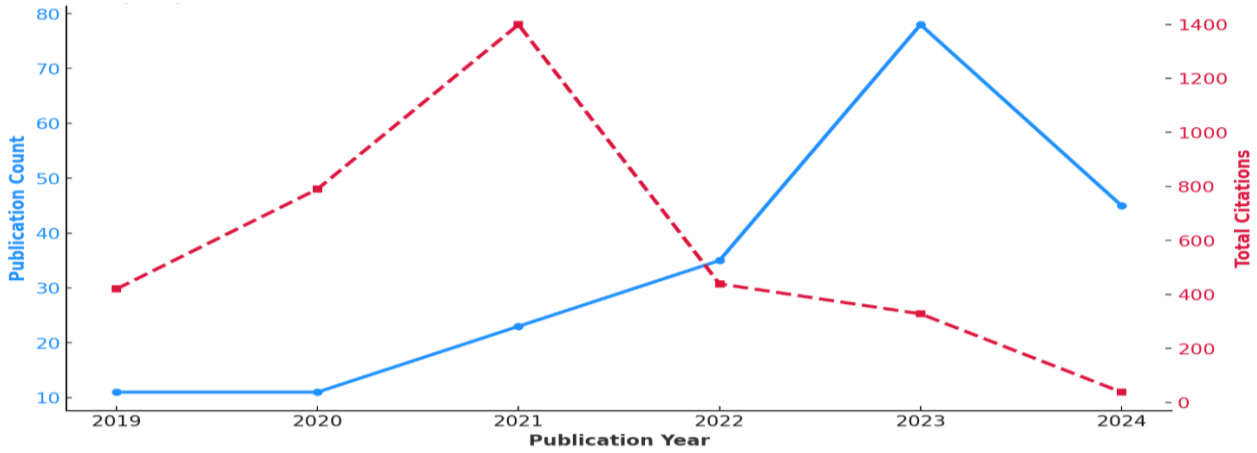


Figure 4. Annual trend of publications and citations for 2019-2024

3.1.4. Prolific Journals, Authors, Institutions and Countries

There are 131 sources, 618 authors, 380 institutions, and 56 countries contributing to the literature in our dataset. **Table 3** presents the top 10 most productive journals, authors, institutions, and countries based on publication count (i.e., TP- Total Publications). Journal of Retailing and Consumer Services occupies the top position among the leading journals with 10 publications (TP), followed by Journal of Business Research (9 TP) and Technological Forecasting and Social Change (7 TP). Yogesh K. Dwivedi is the most prolific author with 5 publications, followed by Varsha Jain and Nripendra P. Rana with 4 TP each. In terms of institutional contribution, Swansea University and Symbiosis International University represent the top two places with 6 publications each, followed by Qatar University with 5 TP and Audencia Business School with 4 TP. Among the countries, United States dominates with 30 TP, United Kingdom (27 TP) second, and India third with 26 TP.

Table 3. Top 10 Journals, Authors, Institutions and Countries based on publication count

Rank	Journal	TP	Author	TP	Institution	TP	Country	TP
1	Journal of Retailing and Consumer Services	10	Dwivedi, Yogesh K.	5	Swansea University	6	United States	30
2	Journal of Business Research	9	Jain, Varsha	4	Symbiosis International University	6	United Kingdom	27
3	Technological Forecasting and Social Change	7	Rana, Nripendra P.	4	Qatar University	5	India	26

4	International Journal of Bank Marketing	5	Mero, Joel	3	Audencia Business School	4	China	22
5	Journal of Financial Services Marketing	4	Andrzejak, Edyta	3	University of Jyväskylä	3	France	10
6	Journal of Research in Interactive Marketing	4	Mogaji, Emmanuel	3	Gdańsk University of Technology	3	Australia	10
7	Information Systems Frontiers	4	Saad, Sihem Ben	3	Chandigarh University	2	Romania	8
8	Australasian Makreting Journal (AMJ)	3	Micu A	3	Indian Institute of Technology Delhi	2	Poland	7
9	Industrial Marketing Management	3	Ahmad H	2	King's College London	2	Finland	7
10	International Journal of Consumer Studies	3	Capatina A	2	Manchester Metropolitan University	2	Canada	6

3.1.5. Most Global Cited Publications

Table 4 presents the top 10 most global cited papers provided by Biblioshiny. The data indicates that the top-ranked paper is "Setting the future of digital and social media marketing research: Perspectives and research propositions," published by Dwivedi et al. (2021) in the International Journal of Information Management. The paper has received a total of 820 citations and 164 citations per year, making it the most influential document in the dataset. Following this, Chung et al. (2020) in the Journal of Business Research ranks second with 421 total citations and 70.17 citations per year, highlighting the growing interest in AI-driven customer satisfaction, particularly with chatbots in luxury brand services. Other notable contributions include Mogaji et al. (2020) in the Australasian Marketing Journal, which explores the implications of AI in financial services marketing with 132 citations, and Toader (2019) in Sustainability, analyzing chatbot errors and trust with 103 citations. The research themes across these top-cited papers primarily focus on artificial intelligence, chatbots, digital marketing strategies, and e-commerce engagement, reflecting the increasing integration of AI-driven tools in consumer interactions.

Table 4. Top 10 most global cited publications

Rank	Corresponding Author, Year, Source	Publication Title	Total Citations (TC)	TC per Year	Normalized TC
1	Dwivedi Y K, 2021, International Journal Of Information Management	Setting the future of digital and social media marketing research: Perspectives and research propositions	820	164.00	13.48
2	Chung M, 2020, Journal Of Business Research	Chatbot e-service and customer satisfaction regarding luxury brands	421	70.17	5.86
3	Mogaji E, 2020, Australasian Marketing Journal (Amj)	The implications of artificial intelligence on the digital marketing of financial services to vulnerable customers	132	22.00	1.84
4	Toader D, 2019, Sustainability	The Effect of Social Presence and Chatbot Errors on Trust	103	14.71	2.70
5	Moriuchi E, 2020, Journal Of Strategic Marketing	Engagement with chatbots versus augmented reality interactive technology in e-commerce	97	16.17	1.35
6	Miklosik A, 2019, Ieee Access	Towards the Adoption of Machine Learning-Based Analytical Tools in Digital Marketing	77	11.00	2.02
7	Mogaji E, 2021, International Journal Of Bank Marketing	Managers' understanding of artificial intelligence in relation to marketing financial services: insights from a cross-country study	71	14.20	1.17
8	Chintalapati S, 2021, International Journal Of Market Research	Artificial intelligence in marketing: A systematic literature review	67	13.40	1.10
9	Ingaldi M, 2019, Sustainability	How to Make E-Commerce More Successful by Use of Kano's Model to Assess Customer Satisfaction in Terms of Sustainable Development	59	8.43	1.55
10	Lies J, 2019, International Journal Of Interactive Multimedia And Artificial Intelligence	Marketing Intelligence and Big Data: Digital Marketing Techniques on their Way to Becoming Social Engineering Techniques in Marketing	53	7.57	1.39

3.2. Science Mapping

3.2.1. Collaborative Network Analysis

The network visualization of journals, authors, institutions, and countries created using different tools is displayed in **Figure 5**. The collaborative network map of the top 25 journals reveals six distinct clusters, each representing thematic research areas in the field (**Figure 5A**). The nodes represent journals and the edges indicate a collaborative link between two journals. The color code of clusters emphasizes unique groups of journals that have strong thematic linkages among them. The largest cluster (red) includes high-impact journals such as the Journal of Retailing and Consumer Services, Information Systems Frontiers, and International Journal of Consumer Studies, signifying their dominant role in shaping AI-driven marketing and business strategies. The smallest cluster (orange) includes only one journal, i.e., Technology in Society.

The collaborative network map of authors reveals several distinct clusters of collaboration among researchers in the field (**Figure 5B**). The network is primarily divided into four clusters, with prominent authors in each group forming strong intra-cluster connections while also maintaining inter-cluster linkages. The red cluster, featuring authors like Jain, Varsha, Karjaluoto, and Heikki, exhibits dense interconnections, suggesting a high level of collaboration among these authors. The green cluster, which includes Dwivedi, Yogesh K., Raman, Ramakrishnan, and Chakraborty, Amrita, signifies another strong group with moderate links to other clusters. The blue cluster, featuring Rana, Nripendra P., has connections with authors such as Ali Alalwan, Abdullah M., and Metri, Bhimaraya, indicating their involvement in interdisciplinary collaborations. Lastly, the yellow cluster, led by Mogaji, Emmanuel, suggests a relatively smaller but focused research collaboration. The link strength among these authors indicates that certain key figures, such as Dwivedi, Yogesh K., act as bridges between different research groups, facilitating knowledge exchange and interdisciplinary research. The network highlights the pivotal role of influential authors in shaping research trajectories within the domain.

The collaborative network map of institutions shows various clusters including 32 institutions (**Figure 5C**). The map illustrates the research partnerships among various universities and business schools. Each node represents an institution, and the connections (edges) indicate co-authorships or institutional collaborations in academic research. The size of the nodes suggests the prominence or centrality of an institution in the network, while the colors denote different collaboration clusters. Swansea University, Qatar University, Audencia Business School, and Toronto Metropolitan University form the central red cluster, indicating a strong hub of research collaborations. Swansea University appears as the most central and influential institution in this cluster, signifying its strong research collaborations with multiple institutions. The presence of multiple clusters suggests regional or thematic groupings, where institutions collaborate more frequently within their networks.

Figure 5 (D) illustrates the collaboration network map of countries representing the global research network formation and the strength of partnerships between countries. The network reveals a highly interconnected global research network, with four major clusters driving international co-authorship. Cluster 1, the largest, includes India, the United Kingdom, the United States, and Australia, highlighting their dominant role in cross-border academic partnerships. Cluster 2, a smaller but influential group, includes Qatar and France, showing regional collaborations with selective international linkages. Clusters 3 and 4 represent more localized or specialized research groups with limited global reach. The United Kingdom emerges as the most influential collaborator, followed by India, the United States, and France, indicating their central

roles in global knowledge exchange. The extensive intercontinental linkages, particularly between Europe, North America, and Asia, suggest that research collaboration is not limited by geographical proximity but is driven by institutional partnerships and funding. This analysis underscores the significance of key research hubs in fostering academic advancements across borders.

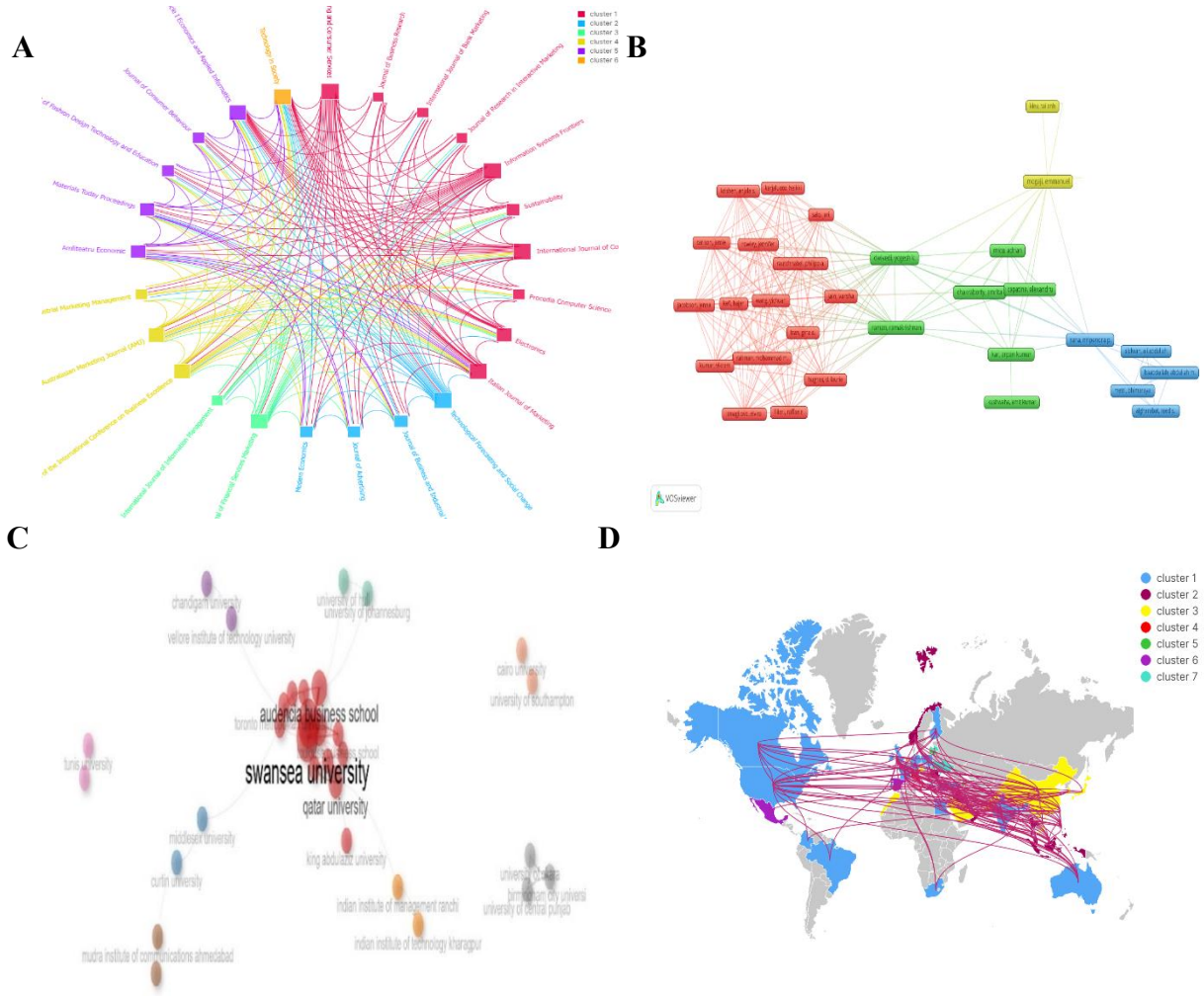


Figure 5. Collaborative network analysis. (A) Collaborative network map of journals. (Source: Scimago Graphica) (B) Collaborative network map of authors. (Source: VosViewer) (C) Collaborative network map of institutions. (Source: Biblioshiny) (D) Collaborative network map of countries. (Source: Scimago Graphica)

3.2.2. Bibliographic coupling

The interconnectedness of research papers in terms of shared references is reflected in the bibliographic coupling network of documents (**Figure 6**). The nodes are of different colors, and each color represents a specific research theme according to the shared references of documents. The color-coded clusters show groups of papers often referring to the same sources and marking strong intellectual connections within a certain area of research concerning AI and chatbots in digital marketing. Dwivedi et al. (2021), Chung et al. (2020), Moriuchi et al. (2020), Miklosik et al. (2019), and Chintalapati & Pandey (2021) are the most bibliographic coupled documents in

blue, green, yellow, lavender, and red clusters, respectively. Their central role in the research domain is shown by the large size of their representing nodes.

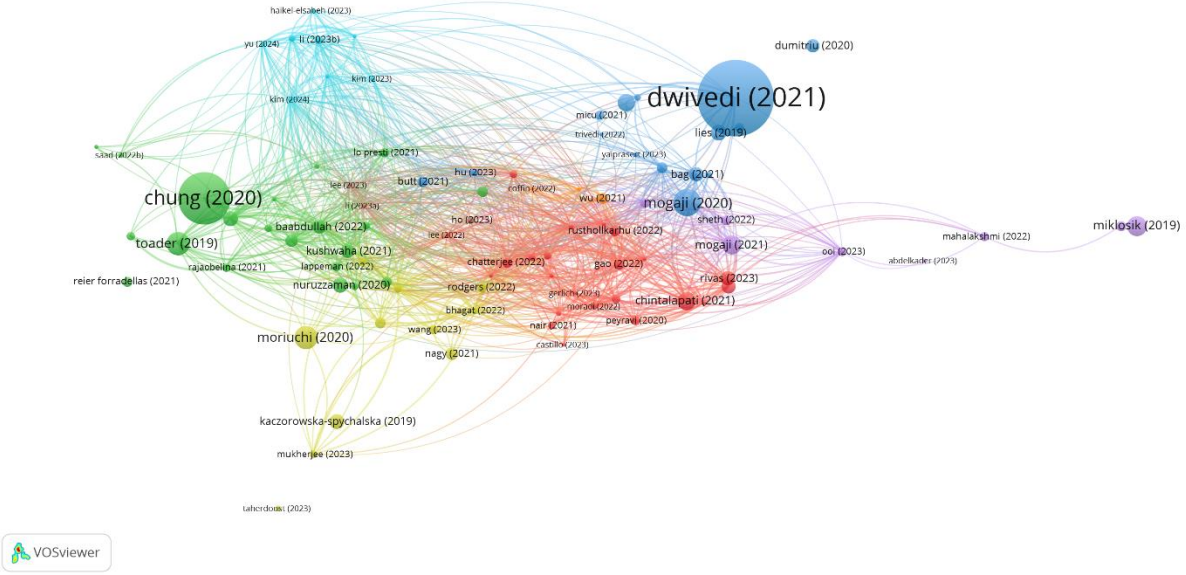


Figure 6. Bibliographic coupling of documents (Source: VosViewer)

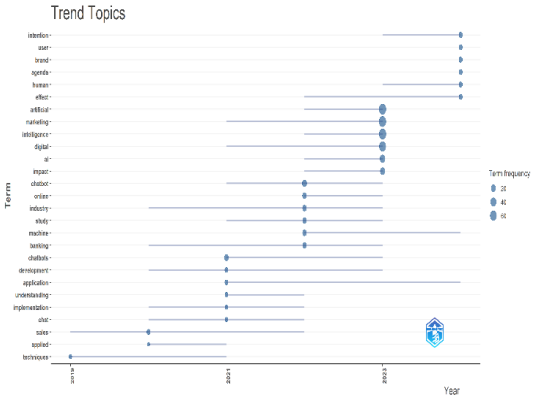
3.2.3. Co-occurrence Analysis

The word cloud (**Figure 7A**) represents the most frequently occurring terms in the analyzed literature, highlighting key themes and research trends in the field. The dominant terms, such as "artificial," "intelligence," "marketing," "digital," and "customer," suggest a strong research focus on the intersection of artificial intelligence and digital marketing strategies. The prominence of "online," "consumer," "social," and "technology" indicates that AI applications are being studied primarily in online business environments, emphasizing consumer engagement and social interactions. Additionally, terms like "chatbots," "e-commerce," "machine," "applications," "industry," "advertising," and "business" reflect the increasing role of AI-driven automation in various industries, particularly in customer service, advertising, and business operations. The presence of "future," "influence," "role," and "experience" suggests ongoing discussions about AI's evolving impact and its potential to transform digital interactions.

Figure 7 (B) shows the trend of topics where the beginning of the blue line represents the first time the keyword started appearing, and the circle represents the year when the keyword appeared more frequently. The circle size is positively linked to the keyword occurrence frequency. The most frequently used keywords are "artificial," "intelligence," "digital," and "marketing". The trend topics in recent years include "intention," "human," "effect," "user," "agenda," and "brand". In **Figure 7 (C)**, a conceptual mapping of keywords with Multiple Correspondence Analysis (MCA) is shown, providing a compressed representation of a huge dataset of keywords in a low-dimensional space. This two-dimensional visualization captures the variability and commonality between research keywords associated with AI and chatbots in digital marketing (Abdi & Valentin, 2007). Keywords in the same cluster indicate thematic similarity, and different clusters represent separate yet connected research focuses. The green cluster at the middle top, including "consumer," "industry," "online," and "services," represents research focused on AI applications in industry and consumer services, highlighting its practical relevance in business contexts. The

mustard cluster on the right, comprising "e-commerce," "chatbots," "AI," "virtual," and "influence," signifies a strong focus on AI-driven consumer interactions, particularly in online commerce and digital engagement. The red cluster in the center, featuring "marketing," "perspective," "advertising," "technology," "machine," and "digital," suggests an ongoing discourse around AI's role in reshaping marketing strategies and digital advertising. The cyan clusters in the middle and lower left, containing "artificial," "intelligence," and "research," indicate foundational studies on AI technologies, likely exploring theoretical and technical aspects. The thematic map in **Figure 7 (D)** provides insights into different research trends concerning AI and chatbots in digital marketing. Research topics in the map are grouped according to their development degree (density) and relevance degree (centrality). The basic themes that are well-established and widely studied are "artificial intelligence," "marketing," and "customer," forming the core foundation of research and underlining AI's impact on improving business and customer interactions. The Motor themes that are both developed and relevant include "chatbot," "consumer," "online," "virtual," "influencers," "social," and "sales," highlighting the growing impact of AI-driven interactions in digital marketing and sales. Niche Themes, although well-developed but less central than others involve "analytics," "data," and "hospitality," indicating focused but evolving applications of AI in industry-specific contexts. The Emerging or declining themes such as "ethical content optimization," "live users," and "automated autonomy" reflect areas of research that are either gaining traction in AI ethics and automation or gradually losing prominence in the broader discourse.

A **B**



C D

Figure 7. Co-occurrence analysis. (A) Word cloud. (Source: Scimago Graphica) (B) The Trend topics (2019-2024). (Source: Biblioshiny) (C) The conceptual structure map of keywords. (Source: Biblioshiny) (D) Thematic map of keywords. (Source: Biblioshiny)

3.2.4. Thematic evolution map

The thematic evolution map shows the focus of research in AI and chatbots in digital marketing over different periods (**Figure 8**). From 2019 to 2020, "advertising," "marketing," "chatbots," "AI," and "impact" were focused on exploring AI-driven marketing and digital interactions. From 2021 to 2021, the focus shifted to "marketing," "chatbot," "role," "online," and "AI," reflecting an increasing emphasis on digital transformation and the role of chatbots in online engagement. From 2022 to 2022, themes like "AI," "virtual," "challenges," "consumer," "advertising," "banking," "artificial," "customer," "impact," and "communication" emerged, signifying a broader application of AI in various industries and a growing focus on consumer interactions and technological challenges. From 2023 to 2024, research evolved toward structured implementation with themes such as "artificial," "customer," "consumer," "perspective," "chatbot," "online," "virtual," "application," and "framework," highlighting the transition from exploratory discussions to applied methodologies and theoretical advancements.

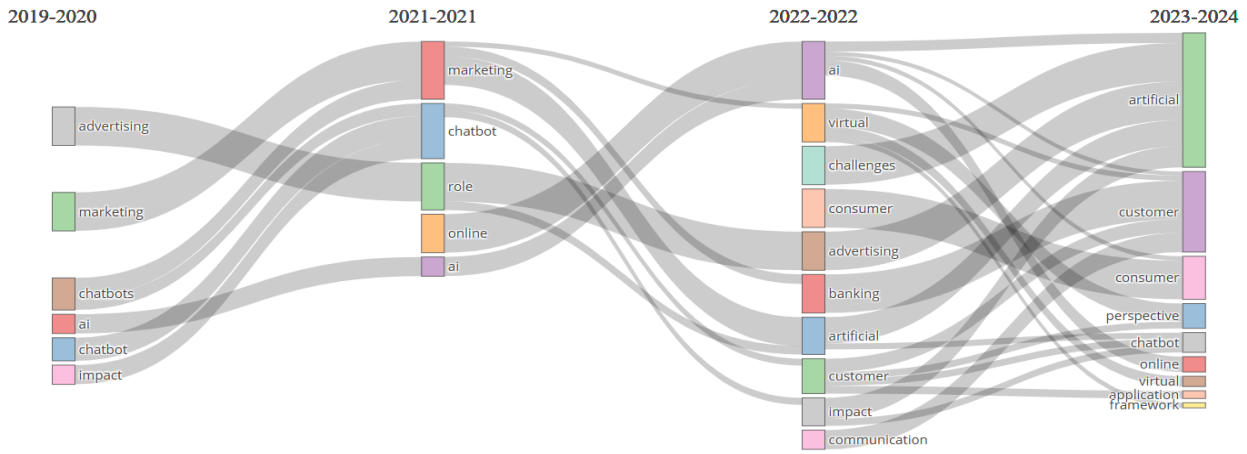


Figure 8. Evolution of research themes in the field from 2019 to 2024 (Source: Biblioshiny)

4. DISCUSSION

4.1. Theoretical Implications

This study makes a significant theoretical contribution by systematically mapping the evolutionary trends, research collaboration, and thematic development of studies on AI and chatbots in digital marketing through a comprehensive bibliometric analysis. Whereas the previous studies focused on isolated domain such as AI in education (Kharis et al., 2024), e-commerce (Theodoridis & Gkikas, 2019), tourism and hospitality (Menon et al., 2022), in this research, a cross domain perspective is taken involving different industries including e-commerce, financial services and tourism and others to have a holistic view of AI application in digital marketing. Using multiple bibliometric tools, Biblioshiny, Scimago Graphica, and VOSviewer, the study demonstrates a more comprehensive picture of knowledge diffusion and the influence of research in this field. Further, the findings help researchers to identify the most prominent authors, leading journals, important institutions, and the top contributing countries including the United States, the United Kingdom, and India, and allow them to find key contributors and assess the intellectual structure of AI and chatbot research in the field of digital marketing. Additionally, the study explores the country, institution, and author collaborative networks, thereby analysing the international collaborative networks and the geographic distribution of research activity. Moreover, it analyzes the evolving keyword trends, which exhibits the emergence of themes such as AI integration with other technologies as well as personalized marketing that will provide future researchers with information about the knowledge gaps and future academic opportunities in the field.

4.2. Practical Implications

From practical viewpoint, this study is vital to companies and corporations which are currently utilizing and also those which are planing to utilize AI and chatbots in their digital marketing. The findings clearly demonstrate the groundbreaking role of AI in marketing strategies by making customer interactions better and supporting informed, data-driven decisions. These insights can be used by businesses to adapt their digital marketing strategies in line with AI's capability of providing individualized customer experience and improving the marketing campaigns. The study helps the businesses to have a global view of the major contributors in the field which is useful for them to identify the key research hubs and potential collaborations that would assist them in accelerating the adoption of the innovative marketing solutions. On a societal level, this implies the ubiquitous use of AI and chatbots in various industries, and on a larger scale, that AI is increasingly making an appearance in service improvement and customer experience in different domains.

5. CONCLUSION AND FUTURE RESEARCH RECOMMENDATIONS

This study provides a comprehensive bibliometric analysis of studies on AI and chatbots in digital marketing from 2019 to 2024 based on the Dimensions.ai database. The analysis identifies key trends, emerging themes, and influential contributors in this field. The results uncover a substantial increase in publication volume, particularly from 2021 onward, driven by the digital transformation accelerated by the COVID-19 pandemic. Prominent countries contributing to this body of research include the United States, the United Kingdom, and India, which collectively lead the research field in terms of publication volume and citation impact. Key journals such as Journal of Retailing and Consumer Services and Journal of Business Research have been pivotal

in shaping the academic discussion, while leading authors like Yogesh K. Dwivedi, Varsha Jain, and Nripendra P. Rana have been key contributors to advancing knowledge in AI-driven marketing strategies. The analysis also shows a strong trend toward collaboration, with 30.54% of the documents featuring international co-authorship, indicating the global nature of this research. The study further highlights the multidisciplinary nature of AI and chatbot research in digital marketing, with major contributions from the fields of Commerce, Management, Tourism and Services, as well as Information and Computing Sciences. It also identifies emerging research areas such as AI's integration with blockchain and augmented reality. Leading institutions, including Swansea University and Symbiosis International University, foster global collaboration. Overall, this study provides a detailed map of the current state of AI and chatbot research in digital marketing, delivering key takeaways for academics, professionals, and policymakers. It underscores AI's revolutionary impact on the future of digital marketing, driving future advancements and opening new avenues for research in this dynamic field.

Despite making significant contributions, this study also has some limitations. First, the bibliometric analysis is restricted to the Dimensions.ai database. Future research should extend the bibliometric analysis to include other databases such as Scopus and Web of Science in order to have a better understanding of the global research on AI and chatbots in the domain of digital marketing. The use of the qualitative methods to complement bibliometric analysis could lead to deeper insights into the use of AI in the marketing world, for example, what sectors will AI be more or less effective in and how AI can lead to innovation. In addition, researchers should explore the emerging fields, including how AI can be integrated with other existing advanced technologies, for instance, blockchain, virtual reality, augmented reality, etc, to improve digital marketing potentials. Furthermore, studies could be conducted to measure the long-run impact of AI and chatbots on some of the key marketing metrics like customer satisfaction, business profitability, and brand loyalty that a business can use to evaluate the actual outputs of AI-driven marketing strategy. These recommendations will help in the further advancement of the field as well as in addressing gaps in our current understanding of the role of AI in digital marketing.

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