The role of Artificial Intelligence in Marketing: A Bibliometric Exploration of its Evolution and Influence on Strategic Decision-Making

FRIOUI Samira[1], GRAA Amel[2,*]
[1] Laboratory of Innovation Management and Marketing, Djillali Liabes University (Algeria), samira.frioui@univ-sba.dz
[2] Business Sciences Department, Djillali Liabes University (Algeria), amel.graa@univ-sba.dz

Received date: 19/10/2024; **Revised date:** 04/11/2024 ; **Publication date:** 31/12/2024

Summary: The adoption of artificial intelligence (AI) in marketing strategies and decision-making is on the rise. However, there remains a notable lack of bibliometric analysis in this area. To address this, a thorough study spanning from 1984 to 2023 was conducted using a bibliometric approach, analyzing the research landscape, key developments, and emerging trends, based on data from the Scopus database. The study examined 358 journal articles, revealing that the predominant research areas are management, business, and accounting. The journal "Decision Support Systems" was identified as a particularly active source of publications, with the United States leading in publication output. This research fills a critical gap by providing essential bibliometric insights into the role of AI in marketing and decision-making, offering a clear overview of the field's evolution and current areas of focus.

Keywords: Artificial intelligence; Marketing strategies; Decision-making; Bibliometric approach; Emerging trends

Jel Classification Codes : M31 ; D83 ; L86

I- Introduction

The impact of artificial intelligence (AI) on marketing strategies and decision-making is a crucial and constantly evolving area of study. Firstly, according to (Cekuls, 2023), the growing importance of competitive intelligence in the business world is reinforced by the evolution of AI, becoming a key factor in the competition for market shares. This is closely related to the observation by (D'Arco. M, 2019), who highlight the crucial role of AI and Big Data in the various functional areas of marketing, simplifying marketing strategies and reducing the risks of poor decisions.

The impact of artificial intelligence (AI) on marketing strategies and decision-making is a crucial and constantly evolving area of study. Firstly, according to (Cekuls, 2023), the growing importance of competitive intelligence in the business world is reinforced by the evolution of AI, becoming a key factor in the competition for market shares. This is closely related to the observation by (D'Arco. M, 2019), who highlight the crucial role of AI and Big Data in the various functional areas of marketing, simplifying marketing strategies and reducing the risks of poor decisions.

Furthermore, (Miklošík, 2019) highlights how machine learning predicts future developments and supports decision-making by extracting insights from large amounts of data, thus influencing the strategic decision-making processes of organizations. Moreover, (Fan, 2022) discovered that the algorithmic decision-making autonomy of AI affects consumer purchasing decisions, with an inverted U-shaped impact on these decisions.

On the other hand, (Al-Blooshi, 2020) demonstrated the applications of AI in financial decision-making, highlighting the increasing use of AI for anomaly detection and the establishment of optimal investment strategies. Concurrently, (Mühlroth, 2020) discusses AI as an accelerator of innovation, influencing the creation of innovations in various sectors, including marketing.

Additionally, (Eriksson, 2020) explains how AI contributes to the formulation of marketing strategies, offering new perspectives for the use of AI not only for rational purposes but also for creative ones. In the same vein, (Davenport, 2020) suggests that AI will change the future of marketing by altering marketing strategies and consumer behaviors, while raising important questions about privacy, bias, and ethics.

Moreover, (Saura, 2021) shows the increasing use of AI in AI-based CRMs for B2B marketing, highlighting the importance of these systems in customer relationship management and marketing decision-making. Finally, (Abrokwah-Larbi, 2023) conclude that the impact of AI on the performance of commercial organizations is significant, emphasizing the importance of the AIM approach to improve business performance.

This interconnected bibliometric analysis illustrates how AI is transforming the marketing and decision-making landscape, offering new and dynamic perspectives for businesses and researchers in the field.

Considering the rapid developments in the field of artificial intelligence and its growing impact on marketing strategies and decision-making processes, a central question arises:

What has been the evolution of the impact of artificial intelligence on marketing strategies and decision-making, and how is this evolution reflected in the scientific literature?

II– Theoretical Foundations

II.1. Overview of Artificial Intelligence in Modern Marketing

Artificial intelligence (AI) is pivotal in digital marketing, offering extensive benefits in numerous areas. It aids businesses in value creation and enhancing customer engagement via electronic services and enables an interactive customer experience and digital insight into procedures and sales, as pointed out by (Theodoridis, 2019) . Moreover, AI in digital marketing deepens customer understanding and relationship building, enhancing personal information access and the shopping experience, as per (Tiautrakul, 2019).

(Hassan, 2021) notes AI's application in market forecasting, process automation, and decision-making, increasing human task efficiency. This tech progression has led marketing to a juncture where adapting to digital trends is crucial, simplifying traditional targeting and personalization, as (Dumitriu, 2020) states. (Suleiman, 2021) argues that incorporating AI capabilities into digital marketing firms' operations could markedly boost performance. Similarly, (Esch, 2021) shows AI's transformation of content creation for campaigns, lead generation, customer experience management, and self-marketing on social media.

Conclusively, AI is transforming digital marketing by improving customer understanding, engagement, and marketing process optimization. Hence, embedding AI in marketing strategies is vital to stay competitive in today's digital age.

II.2. Brief History and Evolution of Artificial Intelligence

The evolution of artificial intelligence (AI) is a captivating tale of discoveries, innovations, and technological advancements. The application of evolution in the digital realm to create AI and artificial life dates back to the inception of the digital computer itself. The early theoretical work of John von Neumann and the pioneering experiments of Nils Aall Barricelli laid the groundwork for this evolution (Taylor, 2015).

The history of the emergence of the scientific and practical field of AI has seen a significant evolution of the very concept of AI, with the development of different intellectual abilities and methods in this field (Zakharov, 2021).

AI was first described in 1950, but its implementation in medicine was hindered by technical limitations until the advent of deep learning in the early 2000s, paving the way for clinical applications (Kaul, 2020).

The evolution of machine intelligence, from machine learning to deep learning, has played a key role in rational drug discovery, enabling the rapid and cost-effective identification of biologically active molecules among millions of candidate compounds (Zhang, 2017).

The history of AI has experienced ups and downs, with two periods of stagnation despite popular successes. Understanding this evolution is essential to anticipate the future and avoid another period of stagnation (Toosi, 2022) .

Analyzing the evolution of AI through examples like IBM's supercomputer Deep Blue and the Watson program illustrates the current limits and future challenges of AI, including the implications of Gödel's incompleteness theorem for its development (Silva, 2020).

Since the 1960s, the creation of artificial intelligence through simulated evolution has been explored, leading to a wide variety of approaches and advancements over the past 50 years (Jong, 2008).

The rapid evolution of AI in the 20th century, especially with technologies such as neural networks, machine learning, and deep learning, has had a significant impact on the fields of marketing, decision-making, Industry 4.0, and the digital transformation of businesses (Ruiz-Real, 2020).

AI systems, such as evolutionary engines, offer an alternative and elegant approach to building intelligent systems, in contrast to the traditional top-down design process (Hemker, 1994).

The need to define and recognize the limits of AI in relation to the psychobiological characteristics that underpin human intelligence is crucial to understanding why AI has not yet achieved the level of undifferentiated human intelligence as proposed by Alan Turing (Valencia.A.L, 2016).

II.3. Fundamentals of Bibliometric Analysis

Bibliometric analysis is an indispensable tool that uses mathematical and statistical methods to quantitatively assess scientific publications, allowing for the understanding of the evolution and structure of research fields. It finds a remarkable application in examining the use of artificial intelligence (AI) in marketing and decision-making, highlighting its significance. According to (Mora, 2019) , bibliometrics proves to be a powerful analytical tool for knowledge domains, revealing the cognitive and epistemological structure of research fields through the use of mathematical models and statistical techniques. (Romaní, 2011) explored the mathematical principles and methodological foundations of bibliometrics, emphasizing its crucial role in assessing scientific production at the level of researchers, institutions, and countries. (Thompson, 2015) added a historical dimension to this perspective, showing how bibliometrics has been applied in medical and health sciences, and discussed key aspects such as database coverage and data reliability. (Yu-jie, 2008) demonstrated the utility of bibliometrics in enhancing the quality of specialized journals through an analysis of articles, authors, and citations. Similarly, (Liu, 2022) illustrated the application of scientometrics and information visualization principles in studying the trends of general music courses in universities. (Xian, 2003) highlighted the trends and characteristics of publications in various scientific journals, providing a foundation for future development. (Li-she, 2009) 's study on the distribution of articles and authors and their professional titles in scientific journals underlines the importance of bibliometrics for understanding publication dynamics. (Yanping, 2013) used bibliometric methods to analyze publications in the life sciences field, highlighting the usefulness of this approach for capturing research trends in specific domains. Lastly, (Donthu, 2021) presented a methodological overview of bibliometrics, offering guidelines for conducting rigorous bibliometric analyses, emphasizing various techniques.

III- Methodology

III.1. Data Selection Criteria

In our study, data selection is based on a specific search formula and rigorously defined criteria. The search formula encompasses key terms in the title, abstract, and keywords of publications: "artificial intelligence", "AI", "artificial intelligence" in conjunction with "marketing", "marketing strategy", "marketing strategies", and "decision making", "decision", "decision making". This approach ensures that only documents relevant at the intersection of these three essential domains are selected.

The research fields are delimited to "BUSI" (Business), "DECI" (Decision Sciences), and "ECON" (Economics), ensuring that the analyses are anchored in contexts applicable to business strategies and decision-making. This boundary helps to exclude publications irrelevant to marketing and decision-making, focusing on the most significant contributions in these domains.

The search period extends from 1984 to 2023, thus covering a significant period where artificial intelligence has seen major advancements and increasing integration into the marketing field. This temporal window is essential for understanding the evolution and impact of AI in these sectors over time. It also allows for capturing the early uses of AI in marketing to the most modern applications, offering a comprehensive perspective on the subject.

The selection process also incorporates an evaluation of the quality and relevance of sources. Publications from peer-reviewed journals, recognized conferences, and reputable research institutions are preferred. This ensures that the compiled data are reliable, valid, and representative of current trends in the field of AI in marketing and decision-making. Additionally, particular attention is given to studies that present rigorous methodologies, in-depth analyses, and conclusions supported by solid data.

III.2. Bibliometric Analysis Tools and Techniques

Bibliometric analysis, a key area of scientific research, utilizes various tools and techniques to assess and interpret academic literature. One of the most essential tools for this task is Scopus, a renowned bibliographic database that provides extensive access to diverse academic publications. Scopus is particularly valued for its advanced search and analysis features, which facilitate a thorough evaluation of research trends and citation networks (Elsevier, 2024).

To conduct an effective bibliometric analysis, techniques such as citation mapping and co-citation analysis are commonly used. These methods allow for the exploration of interrelations between different publications and the identification of dominant trends and themes within a specific field (Van Eck, 2010). A tool often used in conjunction with Scopus for citation mapping is VOSviewer, software that aids in visualizing citation networks and academic collaborations (Van Eck, 2010).

Keyword and co-citation analysis are crucial for uncovering emerging themes and developing research areas. They enable the mapping of the evolution of concepts and ideas within a specific scientific field (Cobo, 2011). The Hirsch index, or h-index, is also an important bibliometric tool, used to measure the productivity and impact of an author's or institution's research works (Hirsch, 2005). This index is particularly useful for assessing influence in a given research domain.

Furthermore, social network analysis (SNA) is applied in bibliometric studies to examine collaboration patterns among researchers and institutions. This technique helps to understand how social interactions influence the spread of knowledge and the conduct of scientific research (Borgatti, 2009).

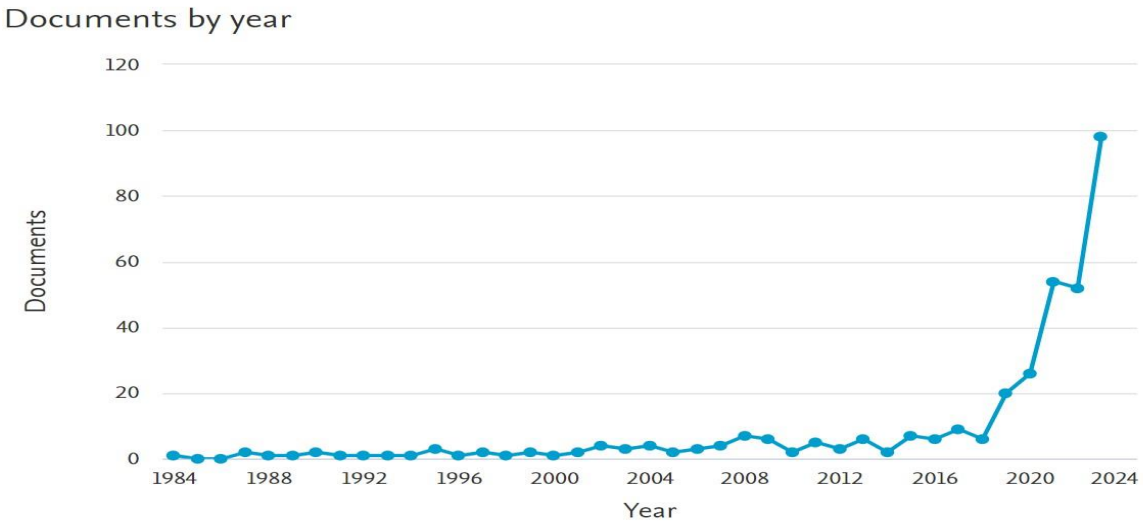
IV- RESULTS AND DISCUSSION

IV.1. Temporal Distribution of Documents

The importance of Temporal Distribution of Documents analysis in bibliometric studies is crucial for understanding the evolution and trends within a research domain. For instance, the study by (Yang, 2022) on tetrandrine research shows a thorough bibliometric analysis revealing temporal and geographical trends of publications and citations, emphasizing the importance of understanding temporal evolution in scientific research. Similarly, (Abdollahi, 2021) utilized bibliometric techniques to examine the application of wireless sensor networks in agriculture, highlighting the remarkable growth of research in this area over time. (Patel, 2022) Also emphasizes the importance of extracting temporal information for a comprehensive understanding of a document, which is crucial in bibliometric analysis to identify distinct phases and trends.

Identifying these phases allows for a better understanding of the evolution of research domains and the discovery of new study opportunities.

Figure (1): Exponential Growth of Publications by Year



The source: Analysis based on data extracted from Scopus, 2024

Five phases can be distinguished in the research on the impact of artificial intelligence on marketing strategies and decision-making (see figure 1)*:*

-Initial Growth Phase*(2009-1984)* : During this initial phase, there is a gradual but steady growth in the number of publications, indicating the emergence and maturation of the domain of artificial intelligence applied to marketing. This period marks the foundations of the domain, with the development of theoretical and practical bases, and a gradual accumulation of knowledge. The modest growth reflects a growing interest and gradual recognition of the importance of AI in marketing*.*

-Phase of Alternation between Growth and Decline*(2017-2010)* : This phase is characterized by annual variations in the number of publications, reflecting rapid changes in research themes and responsiveness to technological innovations and emerging challenges. These fluctuations suggest a period of uncertainty or transformation in the domain, where new sub-disciplines may emerge, and research interests may rapidly evolve*.*

-Decline Phase*(2018)* : In 2018, a noticeable decrease in the number of publications is observed, which could indicate a decreasing interest in certain topics, or a saturation of research in specific areas. This drop may also signal a shift in research focus or be a natural consequence after a period of stabilization*.*

-Stabilization Phase*(2020-2019)* : This phase is marked by stabilization in the number of publications. This period could reflect maturity reached in the domain, where approaches and methodologies are well-established. It might also indicate a temporary saturation of research themes, leading to a pause in significant innovation*.*

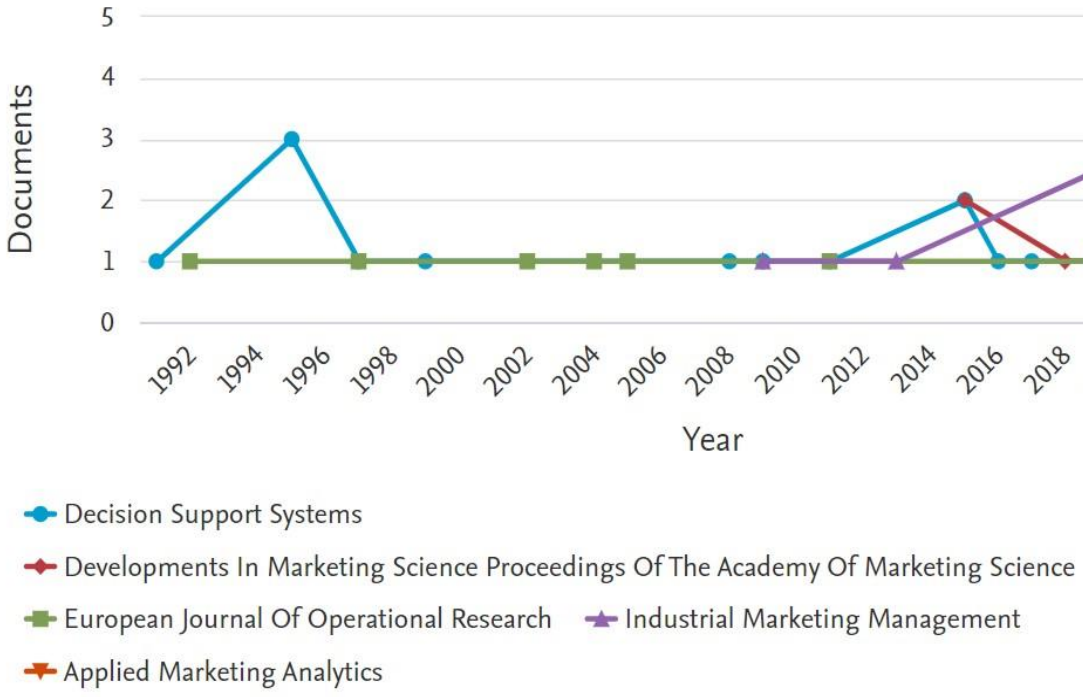
-Growth Phase*(2023-2021)* : This recent period witnesses a rapid and significant increase in publications, suggesting a major resurgence of interest and significant advancements in the domain. This growth can be attributed to technological innovations, increased investments, and a growing demand for AI tools for personalized marketing and strategic decision-making.

IV.2. Document Distribution by Source

This analysis can reveal the main channels through which research is disseminated and highlight the sources considered most prestigious or relevant to the field of artificial intelligence, marketing strategies, and decision-making. Furthermore, this distribution may offer insights into the trends and areas of interest within the scientific community related to this topic. The bibliometric analysis of document distribution by source (figure 2) shows that the distribution of publications in the studied field highlights a diversity of influential sources, each playing a key role in the dissemination of knowledge. Among them, "Decision Support Systems" stands out particularly with 14 publications, thereby emphasizing its importance as a major dissemination channel for research. On the other hand, "Developments in Marketing Science: Proceedings of the Academy of Marketing Science," with 9 publications, also reflects significant influence, being associated with a major conference in the field.

Moreover, the journals "European Journal Of Operational Research" and "Industrial Marketing Management," with 7 publications each, also establish themselves as important channels for publishing work, indicating their relevance and impact in the sector. Similarly, "Applied Marketing Analytics" and "IFIP Advances in Information and Communication Technology," with 6 publications each, show a significant contribution, reflecting the diversity of publishing platforms available to researchers.

Figure (2): Annual Distribution of Publications by Scientific Journal



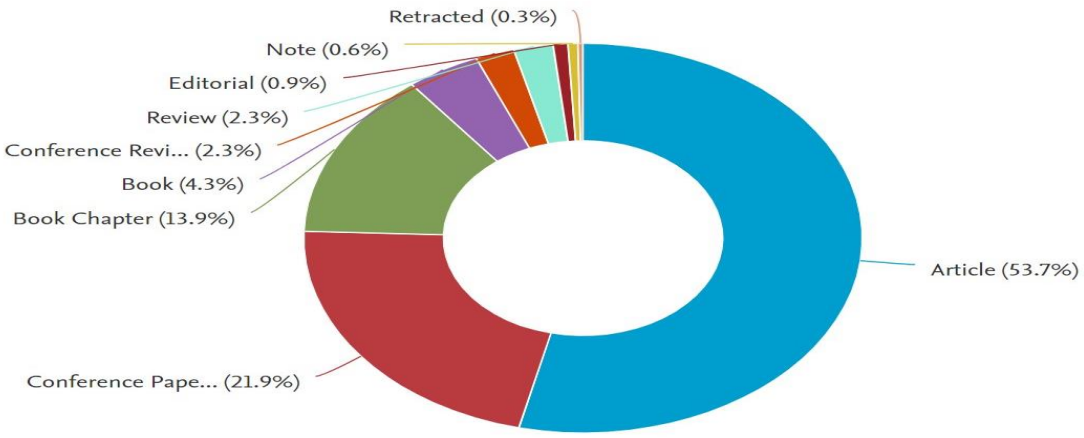
The source: Analysis based on data extracted from Scopus, 2024

Finally, a series of sources such as "Information Processing And Management," "Journal Of The Academy Of Marketing Science," "Smart Innovation Systems And Technologies," and "Springer Proceedings In Business And Economics," each with 5 publications, demonstrate that research in this field is widely distributed across a variety of academic and professional channels. This varied distribution underscores the breadth and multidisciplinarity of the conducted research, illustrating the richness and complexity of the studied field.

IV.3. Variety of Document Types

In bibliometric analysis, considering different types of documents is essential for a thorough understanding of a study area. (Donthu, 2021) And (Yu, 2020) highlight the importance of this diversity for a comprehensive and rigorous analysis of trends and developments in a specific field.

Figure (3): Distribution of Scientific Document Types



The source: Analysis based on data extracted from Scopus, 2024

The bibliometric analysis of the distribution of document types in the field of artificial intelligence, marketing strategies, and decision-making reveals several interesting trends, shedding light on preferred modes of communication and publication preferences, as shown in Figure **1**. Firstly, articles, which account for 53.69% of the documents, suggest that research is primarily disseminated through academic journals. This dominance indicates a marked preference for journal publications, often viewed as high-value scientific contributions. Next, conference proceedings, representing 21.88%, reflect the importance of conferences as platforms for idea exchange and presenting the latest research.

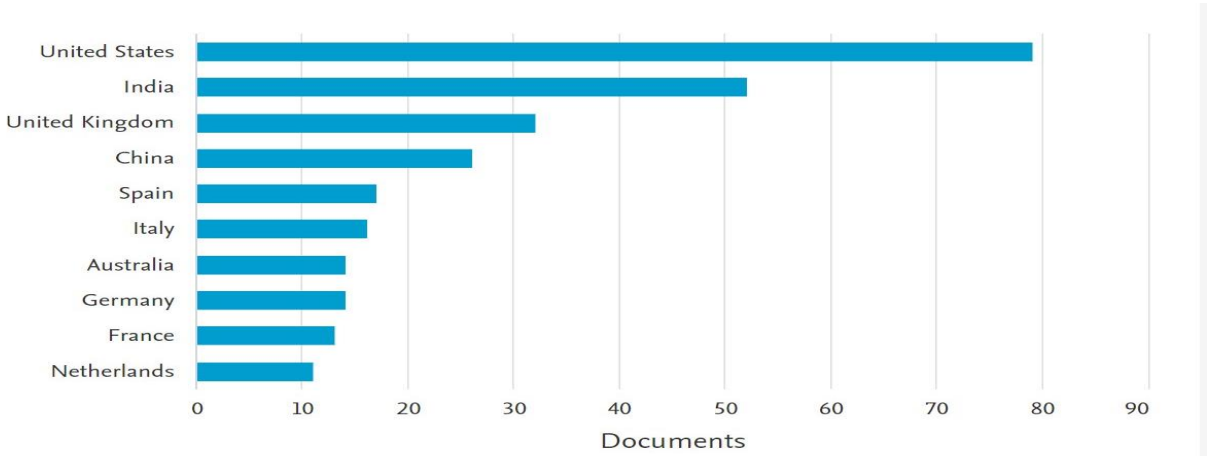
Furthermore, book chapters, at 13.92%, show an interest in more detailed and thematic contributions, allowing for an in-depth exploration of topics. While less frequent at 4.26%, books still indicate a substantial contribution to the literature, often in the form of monographs or edited volumes. Reviews and conference reviews, making up 4.54% of the documents, play a crucial role in synthesizing and assessing existing knowledge. Finally, editorials, notes, and retracted articles, although less common at 1.70%, significantly contribute to scientific discussion and academic discourse.

This distribution thus highlights a predominance of journal articles and conference communications in knowledge dissemination, while acknowledging the importance of books and book chapters for more in-depth contributions. In summary, this analysis helps to understand publication trends and preferred communication formats in the field.

IV.4. Geographic Distribution of Publications

Figure **2** shows a concentration of research in certain countries, while others emerge as significant players in this field. The geographical diversity of contributions reflects the global reach and importance of this research area.

Figure (4): Contribution of Countries to Scientific Literature



The source: Analysis based on data extracted from Scopus, 2024

This dominance indicates a strong research activity in this country. India: With 52 publications, India contributes 10.83%. This suggests a significant interest and research capacity in this field. United Kingdom: With 32 publications, or 6.67% of the total, the UK is also a major contributor, reflecting a strong research tradition. China: Contributing with 26 publications (5.42%), China demonstrates its growing role in international scientific research. Spain: With 17 publications, Spain accounts for 3.54% of the publications, indicating a notable presence in this research area. Italy, Australia, and Germany: Each of these countries makes a significant contribution, with respectively 16, 14, and 14 publications, each representing about 3% of the total. France: With 13 publications (2.71%), France also shows notable research activity. Other countries: Other countries also contribute but to a lesser extent, indicating geographical diversity in research on the subject.

IV.5. Analysis of Author Contributions

The analysis of authors' contributions highlights key authors in the field and suggests potential collaboration networks. The presence of authors with multiple publications may indicate active research areas and influential research groups. Furthermore, the diversity of contributions demonstrates a range of expertise and approaches in this research field. This analysis provides a valuable perspective for identifying opinion leaders and understanding the dynamics of scientific production in this domain.

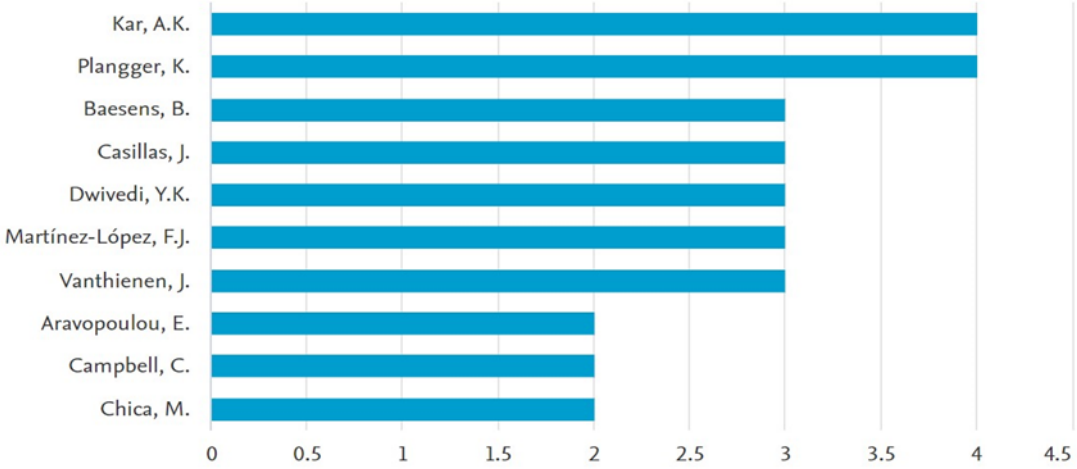
The bibliometric analysis of authors' contributions, as shown in figure 5, reveals the following trends:

Kar, A.K. and Plangger, K. are the most prolific authors with 4 publications each, accounting for approximately 1.94% of the total publications each. This high productivity indicates significant influence in this research domain.

Baesens, B., Casillas, J., Dwivedi, Y.K., Martínez-López, F.J., and Vanthienen, J. each contributed with 3 publications, making up 1.46% each of the total publications. These authors also play an important role in research on this topic.

Other authors, such as Pinarbasi, F., Machtynger, L., and Martens, D., have each 2 publications, which represent about 0.97% of the total each. Although their number of publications is lower, their contribution remains notable.

Figure (5): Scientific Productivity by Author



The source: Analysis based on data extracted from Scopus, 2024

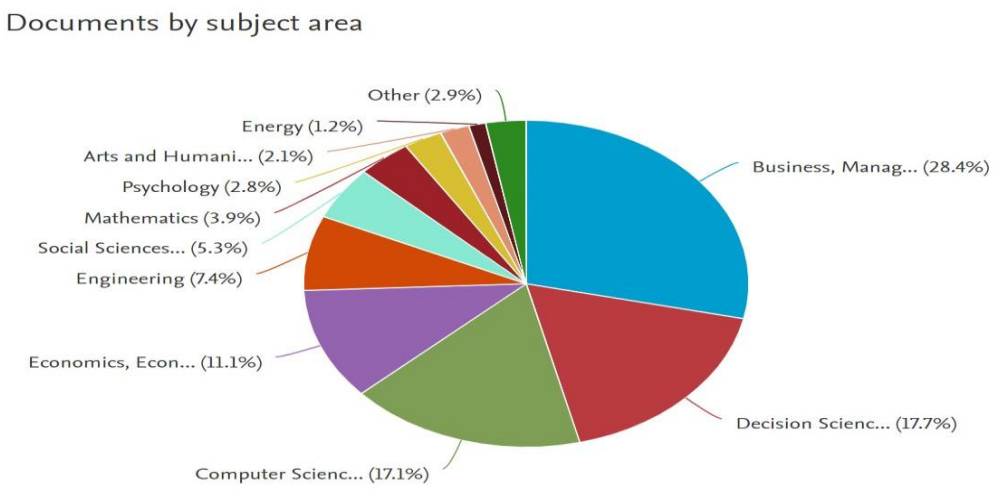
IV.6. Sector Analysis of Documents

The presented data unveil a sector analysis of scientific documents that highlights the predominant role of artificial intelligence (AI) in shaping various research domains, as illustrated in Figure 6. Dominated by the Business, Management, and Accounting sector with 254 documents, the landscape reflects a concentration of research in these areas, underlining the significance and dominance of management and accounting topics in the context of AI. The Decision Sciences field follows with 158 documents, indicating a keen interest in AI-assisted decision making, essential for strategic business applications.

Computer Science, with 153 documents, shows a strong convergence between AI technical advancements and their practical applications while the fields of Economics, Econometrics, and Finance, represented by 99 documents, demonstrate the integration of AI in economic and financial analysis for refined forecasting and modeling. With 66 documents, the Engineering sector reveals AI's contribution to engineering challenges, notably in optimization and automation. Social Sciences, through 47 documents, focus on the impact of AI on society and social behaviors, while the 35 documents in Mathematics suggest using AI to solve complex problems or develop new algorithms.

Psychology, with 25 contributions, likely explores the interface between AI and understanding human cognition or consumer behavior. Arts and Humanities, although less represented with 19 documents, might probe into the cultural impact of AI or its creative applications. The Energy and Medicine sectors, with 11 and 10 documents respectively, reflect the growing importance of AI in energy management and medical applications.

Figure (6): Distribution of Scientific Documents by Field of Study



The source: Analysis based on data extracted from Scopus, 2024

Environmental Sciences, Agricultural and Biological Sciences, and Physics and Astronomy, even though they only account for 6 and 4 documents, suggest using AI for environmental issues and in fundamental research. Finally, Chemistry and Nursing, with only one document each, may represent emerging niches or specific application areas of AI.

This sectorial distribution of documents illustrates the multidisciplinary of artificial intelligence applications and its integration into various research fields. It also shows the areas where AI is most influential and those where it is beginning to make its mark, offering valuable insights for researchers and strategists on key areas to invest and develop further.

IV.7. Citation Overview

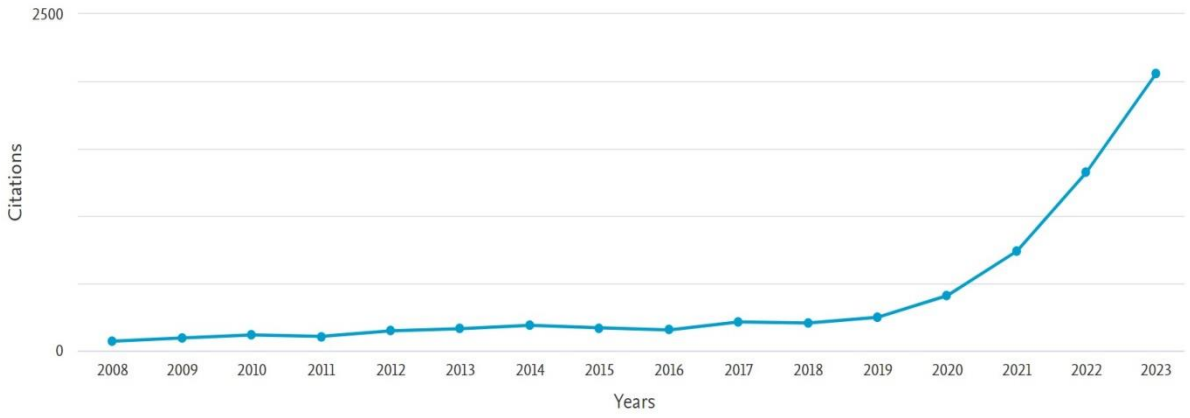
The analysis of citation trends can be divided into the following phases, as illustrated in Figure 7*:*

Phase 1 (Before 2020): The total citations in this phase are 2,267. This phase represents the citation landscape before the COVID-19 pandemic. The relatively lower number of citations could be due to a combination of factors, including the ongoing development of the field and the absence of research surges related to the pandemic.

Phase 2 (2020-2021): The total citations in this phase are 5,191. This significant increase in citations during the early years of the COVID-19 pandemic could be attributed to increased research activity in response to global challenges, an increase in publications, and possibly a greater focus on accessible and online resources.

Phase 3 (2022-2023): The total citations in this phase are 7,470. This phase, representing the most recent years, shows the highest number of citations. This could be due to the maturation of the field, the ongoing impact of pandemic-era research, and the consolidation of new research directions that emerged during the pandemic.

Figure (7): Evolution of Scientific Publications' Citations by Year



The source: Analysis based on data extracted from Scopus, 2024

The evolution of citation numbers across these phases suggests a dynamic research landscape, heavily influenced by global events such as the COVID-19 pandemic, and possibly by the increasing digitization and accessibility of research publications. The significant jump in citations in the later phases might also reflect a growing interest and development in the field, leading to more publications and citations.

This phased approach to analyzing citation trends provides insights into how external factors and the natural progression of research fields can impact citation patterns over time.

V- CONCLUSION

In conclusion, this detailed bibliometric analysis offers a comprehensive view of the growing impact of artificial intelligence on marketing strategies and decision-making. The temporal distribution of documents, analyzed in five distinct phases, reveals a marked evolutionary trajectory. From the initial growth phase between 1984 and 2009, characterized by a gradual increase in publications, to the notable growth phase from 2021 to 2023, there is a trend towards an acceleration of research and publications. This dynamic reflects the importance and increasing integration of AI in marketing practices.

The distribution of documents by source highlights key dissemination channels such as "Decision Support Systems," "European Journal of Operational Research," and "Industrial Marketing Management," underscoring the diversity of publication platforms. This diversity indicates a multidisciplinary approach in research and recognition from various academic and professional sectors.

The analysis of the variety of document types, dominated by review articles, conference proceedings, and book chapters, demonstrates a preference for publication formats that facilitate detailed discussion and rapid dissemination of knowledge. Additionally, the geographical distribution of publications shows strong research activity in the United States, India, the United Kingdom, China, and Spain, thus reflecting a global and varied contribution.

The review of authors' contributions, with personalities such as Kar, A.K., and Plangger, K., highlights opinion leaders and active research areas, suggesting the presence of influential collaboration networks. This diversity of expertise and approaches enriches the study field of AI in marketing and decision-making.

Overall, these results highlight an expanding field, characterized by a growing adoption of

AI technologies and recognition of their transformative potential in marketing strategies and decision-making. The observed trends suggest that the field will continue to evolve rapidly, driven by new technological and theoretical innovations, paving the way for promising future research.

Bibliography List

Abdollahi, A. R. (2021). Wireless Sensor Networks in Agriculture: Insights from Bibliometric Analysis. *Sustainability*.

Abrokwah-Larbi, K. &.-L. (2023). The impact of artificial intelligence in marketing on the performance of business organizations: evidence from SMEs in an emerging economy. *Journal of Entrepreneurship in Emerging Economies.*

Al-Blooshi, L. &. (2020, 2 18). Applications of Artificial Intelligence in Financial Management Decisions: A Mini-Review. *Consumer Financial Fraud eJournal*.

Borgatti, S. P. (2009). Network analysis in the social sciences. *Science, 323*(5916), 892-895.

Cekuls, A. (2023). AI-Driven Competitive Intelligence: Enhancing Business Strategy and Decision Making. *Journal of Intelligence Studies in Business, 12*(3), 4-5.

Cobo, M. J.-H.-V. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology, 62*(7), 1382-1402.

D'Arco. M, L. P. (2019). Embracing AI and Big Data in customer journey mapping: from literature review to a theoretical framework. *Innovative Marketing, 15*(4).

Davenport, T. G. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science, 48*, 24-42.

Donthu, N. K. (2021, 9 1). How to conduct a bibliometric analysis: An overview and guidelines. *ournal of Business Research, 133*, 285-296.

Dumitriu, D. &. (2020). Artificial Intelligence Solutions for Digital Marketing. *Procedia Manufacturing, 46*, 630-636.

Elsevier. (2024, 1 28). *Scopus: The largest database of peer-reviewed literature*. Retrieved from Elsevier: https://www.elsevier-masson.fr

Eriksson, T. B. (2020). Think with me, or think for me? On the future role of artificial intelligence in marketing strategy formulation. *The Tqm Journal, 32*, 795-814.

Esch, P. &. (2021). Artificial Intelligence (AI): Revolutionizing Digital Marketing. *Australasian Marketing Journal, 29*, 199 - 203.

Fan, Y. &. (2022, 10 20). Exploring the role of AI algorithmic agents: The impact of algorithmic decision autonomy on consumer purchase decisions. *Frontiers in Psychology, 13*.

Hassan, A. (2021). The Usage of Artificial Intelligence in Digital Marketing: A Review. *Applications of Artificial Intelligence in Business, Education and Healthcare.*

Hemker, A. &. (1994, 2 1). Evolution Engines And Artificial Intelligence. *International Journal of Modern Physics C, 5*, 15-36.

Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National academy of Sciences, 102*, pp. 16569-16572.

Jong, K. (2008). Evolving intelligent agents: A 50 year quest. *IEEE Computational Intelligence Magazine, 3*.

Kaul, V. E. (2020, 6 18). The history of artificial intelligence in medicine. *Gastrointestinal endoscopy*.

Li-she, Y. (2009). Analysis of Papers and Writers' Information in the Jiangxi Library Journal (1998～2007). *Journal of Library and Information Sciences in Agriculture*.

Liu, Y. (2022, 9 29). Application Research of Computer Bibliometric Analysis Based on Cluster Analysis. *Proceedings of the 7th International Conference on Intelligent Information Processing*.

Miklošík, A. K. (2019, 6). Towards the Adoption of Machine Learning-Based Analytical Tools in Digital Marketing. *IEEE Access, 7*.

Mora, L. D. (2019, 5 1). Combining co-citation clustering and text-based analysis to reveal the main development paths of smart cities. *Technological Forecasting and Social Change*.

Mühlroth, C. (2020). Artificial Intelligence as Innovation Accelerator. *Proceedings of the 2020 on Computers and People Research Conference*, (pp. 6-7).

Patel, P. (2022, 2 28). A Recurrent Neural Model for Temporal Information Extraction. *Computer Science & Engineering: An International Journal*.

Romaní, F. H.-A. (2011). CIMEL: Ciencia e Investigación Médica Estudiantil Latinoamericana. *16*, 52-62.

Ruiz-Real, J. U.-T. (2020, 10 29). ARTIFICIAL INTELLIGENCE IN BUSINESS AND ECONOMICS RESEARCH: TRENDS AND FUTURE. *Journal of Business Economics and Management*, 1-20.

Saura, J. R.-S.-M. (2021). Setting B2B digital marketing in artificial intelligence-based CRMs: A review and directions for future research. *Industrial Marketing Management, 98*, 161-178.

Silva, E. (2020). Limits of Artificial Intelligence. *viXra*.

Suleiman, D. A. (2021). Enhancing digital marketing performance through usage intention of AI-powered websites. *IAES International Journal of Artificial Intelligence (IJ-AI).*

Taylor, T. D. (2015). Digital Genesis: Computers, Evolution and Artificial Life. *The 7th Munich-Sydney-Tilburg Philosophy of Science Conference: Evolutionary Thinking.* Sydney.

Theodoridis, P. &. (2019). How Artificial Intelligence Affects Digital Marketing. *Strategic Innovative Marketing and Tourism.*

Thompson, D. &. (2015, 6 1). A Descriptive and Historical Review of Bibliometrics with Applications to Medical Sciences. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy, 35*.

Tiautrakul, J. &. (2019). The Artificial Intelligence (AI) with the Future of Digital Marketing. *SSRN Electronic Journal*.

Toosi, A. B. (2022). A brief history of AI: how to prevent another winter (a critical review). *PET clinics*, *16*(4), 449-469.

Valencia.A.L. (2016, 12 12). Limits of Artificial Intelligence: a perspective from the psychobiological development. *Ventana Informática*(25).

Van Eck, N. J. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523-538.

Xian, R. (2003). Statistical Analysis of Library Journal. *Agriculture Network Information.*

Yang, G. X. (2022, 6 15). A Worldwide Bibliometric Analysis of Tetrandrine Research in Recent Two Decades. *Frontiers in Pharmacology, 13*.

Yanping, M. (2013). Bibliometric Analysis on Research Papers of Zhaoqing University in the Field of Life Sciences. *Journal of Zhaoqing University*.

Yu, D. &. (2020, 6 15). A bibliometric study for DEA applied to energy efficiency: Trends and future challenges. *Applied Energy, 268*.

Yu-jie, W. (2008). Bibliometric Analysis of Library Development in 2007. *Journal of Library and Information Sciences in Agriculture*.

Zakharov, V. (2021). About the Evolution of the Concept of "Artificial Intelligence". *2021 International Conference Engineering Technologies and Computer Science (EnT)*, (pp. 20-23).

Zhang, L. T. (2017, 11 1). From machine learning to deep learning: progress in machine intelligence for rational drug discovery. *Drug discovery today*, *22*(11), 1680-1685.

How to cite this article by the APA method:

FRIOUI Samira, GRAA Amel (2024), **The role of Artificial Intelligence in Marketing**, Economic Development Review, Volume 09 (Number 03), Algeria: University of Eloued, pp. 230-244