A Bibliometric Analysis of Artificial Intelligence Adoption in Business Research for the Period 2015–2025

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Article Info	ABSTRACT
	Artificial Intelligence (AI) has become a transformative technology that significantly influences modern business practices, decision-making processes, and organizational innovation. As the adoption of AI continues to expand across industries, scholarly interest in this topic has increased substantially. This study aims to map the development of research on Artificial Intelligence adoption in business using a bibliometric approach. Data were collected from the Scopus database covering publications from 2015 to 2025. The analysis was conducted using VOSviewer to visualize scientific networks, including co-authorship, institutional collaboration, country collaboration, keyword co-occurrence, overlay visualization, and density mapping. The results indicate a significant growth in publications related to AI adoption in business, particularly in recent years. The United States, India, China, Germany, and Italy emerge as the most influential countries contributing to this research area, while several collaborative networks among authors and institutions highlight the global nature of this field. The keyword analysis reveals that major research themes revolve around artificial intelligence, digital transformation, technology adoption, machine learning, and decision-making processes. Additionally, emerging topics such as sustainability, ethical technology, generative artificial intelligence, and Industry 4.0 are gaining increasing attention in recent studies. This study provides a comprehensive overview of the intellectual structure and research trends in AI adoption within business research, offering insights into key contributors, major thematic clusters, and potential future research directions.

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1. INTRODUCTION

In recent years, Artificial Intelligence (AI) has transformed from a niche technology to a pervasive force reshaping business landscapes globally. Initially rooted in computational theory and data processing, AI's evolution accelerated significantly in the early 2010s, driven by exponential increases in data availability, improvements in processing power, and advancements in machine learning algorithms [1]. These developments have facilitated the integration of AI systems into core business functions, including operations, marketing, finance, human resources, and strategic planning. As a result, organizations across diverse sectors increasingly recognize AI not merely as a

technical tool, but as a strategic enabler for innovation and competitive advantage [2].

The adoption of AI in business research reflects this broader transformation, as scholars seek to understand not only the technical capabilities of AI systems but also their organizational, economic, and ethical implications. From predictive analytics for consumer behavior to automated decision-making systems in supply chain management, AI technologies have become central to the generation of knowledge in business disciplines [3]. This academic inquiry is evidenced by a substantial increase in scholarly publications addressing AI applications, frameworks, challenges, and impacts within business contexts. The proliferation of AI-related business research underscores its relevance as a critical area of scholarly interest and practical importance.

Despite the rapid growth of AI research, the landscape of knowledge production remains fragmented across disciplines and industries. Some studies focus on the operational efficiencies enabled by AI, such as cost reduction and process automation, while others emphasize strategic implications, including business model innovation and market disruption [4], [5]. Additionally, ethical concerns—such as algorithmic bias, job displacement, and data privacy—have emerged as significant points of debate among researchers and practitioners alike [6]. These diverse research trajectories highlight the complexity of AI adoption in business and underscore the importance of systematic reviews that can map trends, identify gaps, and establish future research directions.

Bibliometric analysis has emerged as a powerful tool for organizing and interpreting large volumes of academic literature. By quantifying publication patterns, citation networks, and thematic clusters, bibliometrics enables researchers to identify influential works, leading scholars, and evolving trends within a research domain

[7]. Such analyses are particularly valuable in fast-moving fields like AI, where the volume of literature can be overwhelming and multidisciplinary intersections add layers of complexity. Through bibliometric techniques, researchers can trace the development of topics, assess research performance, and reveal structural patterns that might otherwise remain obscured in traditional narrative reviews.

The period between 2015 and 2025 represents a pivotal decade for AI adoption in business research. Beginning with the widespread deployment of deep learning and natural language processing techniques, and extending into the era of generative AI and autonomous systems, this timeframe encapsulates significant technological breakthroughs and shifts in scholarly focus. Moreover, the global business environment during this decade has been characterized by rapid digital transformation, heightened competition, and increased demand for data-driven decision making—all of which have influenced the direction and intensity of AI-related research. Therefore, a bibliometric analysis covering this period provides a comprehensive perspective on how academic inquiry into AI adoption in business has evolved and where it is headed.

While numerous literature reviews have explored specific aspects of AI in business—such as AI in marketing analytics, human–machine collaboration in organizations, or the ethical implications of machine learning applications—there is a lack of holistic bibliometric studies that systematically quantify the evolution of AI adoption across the entire business research landscape over an extended period. Existing reviews often focus on fragmented topics, limited databases, or narrow timeframes, making it difficult to understand overarching patterns, leading contributors, and emerging trends within the broader field (Almeida & Ferreira, 2022). Consequently, scholars and practitioners lack a consolidated view that

integrates publication volume trends, citation impact, thematic evolution, and network structures of knowledge production with respect to AI in business. This gap hinders the ability to benchmark progress, identify underexplored areas, and direct future research toward the most impactful and relevant questions. The objective of this study is to conduct a comprehensive bibliometric analysis of research on AI adoption in business published between 2015 and 2025. Specifically, the study aims to map publication trends, identify influential authors, journals, and institutions, uncover thematic clusters and research fronts, and examine the evolution of topics over time.

2. METHOD

This study employs a bibliometric research design to systematically analyze scholarly publications related to Artificial Intelligence (AI) adoption in business research for the period 2015–2025. Bibliometric analysis is a quantitative method used to evaluate academic literature through statistical and mathematical techniques, enabling the identification of publication trends, citation structures, and intellectual development within a research field [7]. The study focuses exclusively on peer-reviewed journal articles and review papers to ensure academic rigor and reliability. Publications were retrieved from Scopus. A structured keyword search strategy was applied using combinations of terms such as "artificial intelligence," "AI adoption," "machine learning," "business," "management," "marketing," "finance," and "operations," ensuring relevance to the research objectives.

Following data retrieval, a systematic screening process was conducted to refine the dataset. Duplicate records were removed, and inclusion criteria were applied based on publication year (2015–2025), subject area relevance (business, management, and related fields), and document type (articles and reviews). Studies that focused solely on technical AI development without clear business application were excluded to maintain alignment with the study's scope. The finalized dataset was then exported in bibliographic formats compatible with bibliometric software tools such as VOSviewer [8]. This tool was used to generate descriptive statistics, co-authorship networks, co-citation analyses, keyword co-occurrence maps, and thematic evolution diagrams. Such techniques allow for visualization of relationships among authors, institutions, countries, and research themes, thereby revealing the structural configuration of knowledge production within the domain.

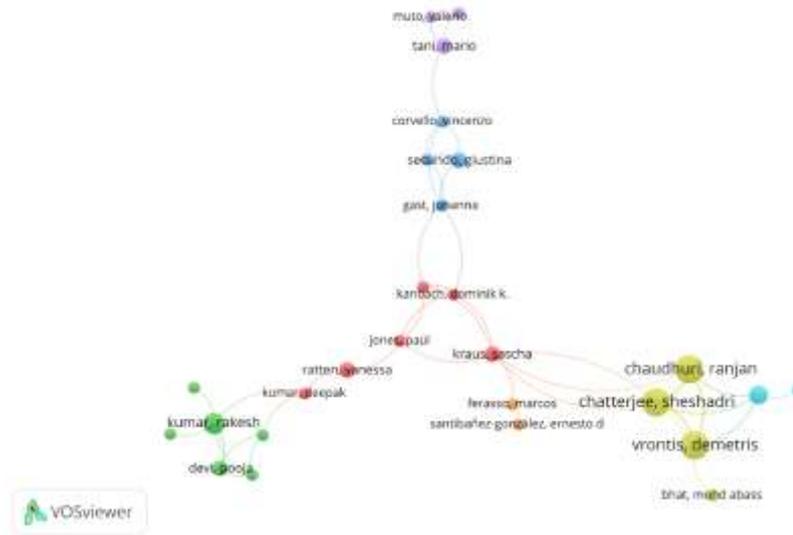## 3. RESULTS AND DISCUSSION

Figure 1. Author Visualization
Source: Data Analysis

Figure 1 reveals the collaborative structure among researchers studying Artificial Intelligence adoption in business. The network is divided into several clusters representing groups of authors who frequently collaborate within the same research communities. One prominent cluster includes Ranjan Chaudhuri, Sheshadri Chatterjee, and Demetris Vrontis, indicating strong collaboration and significant influence in this research area. Another cluster centered around Sascha Kraus connects several authors such as Paul Jones and Dominik K. Kanbach, suggesting an active European research collaboration network focusing on AI and digital transformation in business. A smaller cluster involving Rakesh Kumar, Pooja Devi, and Deepak Kumar indicates regional collaborations, likely reflecting emerging contributions from developing research communities. Additionally, authors such as Mario Tani, Valerio Muto, and Vincenzo Corvello form another connected group, highlighting academic partnerships in related management and innovation studies.
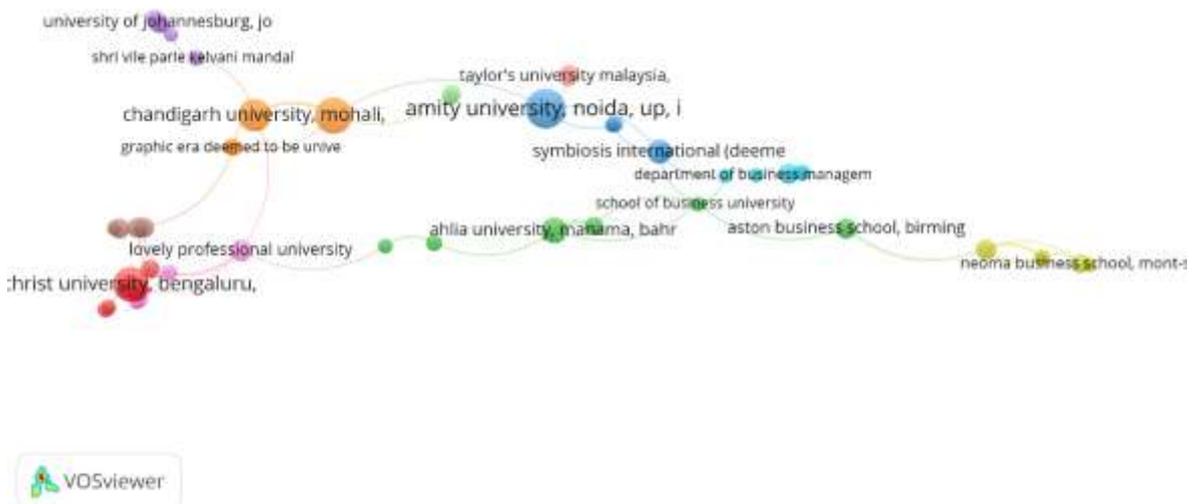

Figure 2. Institution Visualization
Source: Data Analysis

Figure 2 illustrates how universities and academic institutions collaborate in research related to Artificial Intelligence adoption in business. The map shows several clusters of institutions connected through co-authorship relationships, indicating active international collaboration. Institutions such as Amity University Noida, Symbiosis International University, and Taylor's University Malaysia appear as central nodes within one cluster, suggesting their significant contribution to the research field and their role in fostering collaboration among institutions in Asia. Another visible cluster includes Christ University Bengaluru, which is strongly connected with several nearby institutions, reflecting an active research network within Indian academic institutions. Additionally, Chandigarh University Mohali serves as an important connecting node that links multiple institutions across clusters, indicating its role in facilitating broader academic collaboration. On the right side of the network, institutions such as Ahlia University (Bahrain), Aston Business School, and NEOMA Business School represent collaborations extending toward Middle Eastern and European institutions.
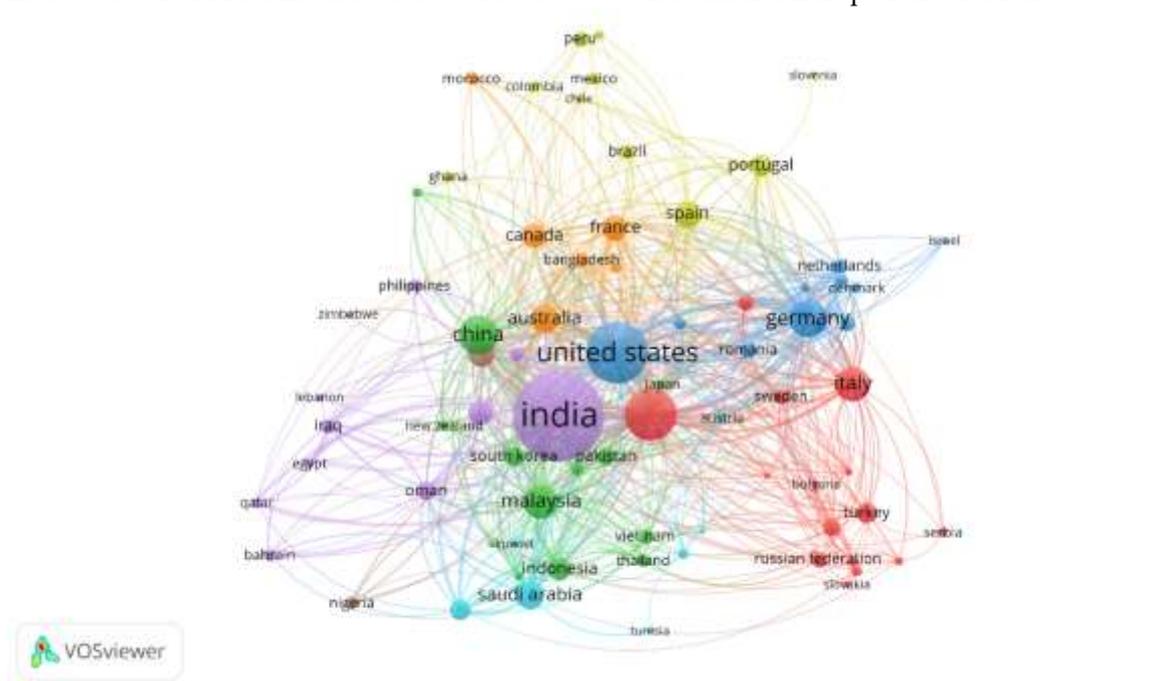

Figure 3. Country Visualization
Source: Data Analysis

Figure 3 illustrates the global structure of research collaboration on Artificial Intelligence adoption in business. The map highlights several countries as central nodes, particularly the United States, India, China, Germany, and Italy, which appear with larger nodes, indicating a higher number of publications and stronger collaborative ties. Among these, the United States and India act as major hubs that connect multiple countries across different regions, demonstrating their influential role in advancing AI-related business research. European countries such as Germany, Italy, Spain, France, and Portugal also form a dense collaboration cluster, reflecting strong research partnerships within Europe. Meanwhile, Asian countries including China, Malaysia, Indonesia, South Korea, and Pakistan show active participation and growing contributions to the field. The network also reveals emerging collaboration from countries in the Middle East, Africa, and Latin America, such as Saudi Arabia, Egypt, Brazil, and Mexico, indicating the expanding global interest in AI adoption in business.

Citation Analysis

Table 1. Top Cited Literature

Citations	Authors and Year	Title
1,059	[9]	A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda
744	[10]	Understanding the adoption of Industry 4.0 technologies in improving environmental sustainability
684	[11]	Artificial Intelligence and Business Value: a Literature Review
671	[12]	Unlocking the value of artificial intelligence in human resource management through AI capability framework
582	[13]	Digital Transformation in Healthcare: Technology Acceptance and Its Applications
498	[14]	Service robots, customers and service employees: what can we learn from the academic literature and where are the gaps?
487	[15]	Artificial intelligence—challenges and opportunities for international HRM: a review and research agenda
472	[16]	The dark side of generative artificial intelligence: A critical analysis of controversies and risks of ChatGPT
422	[17]	Leveraging ChatGPT and other generative artificial intelligence (AI)-based applications in the hospitality and tourism industry: practices, challenges and research agenda
414	[18]	Ready or Not, AI Comes—An Interview Study of Organizational AI Readiness Factors

Source: Scopus

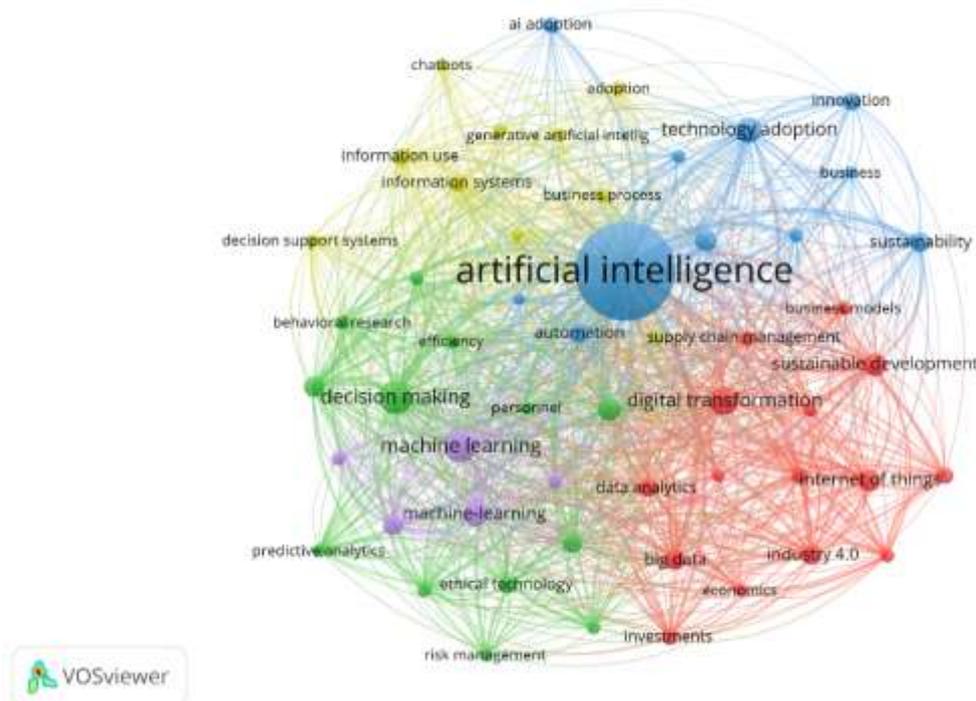**Keyword Co-Occurrence Analysis**

Figure 4. Network Visualization

Source: Data Analysis

Figure 4 illustrates the conceptual structure of research on Artificial Intelligence adoption in business. The term "artificial intelligence" appears as the most prominent and central keyword, indicating that it functions as the primary focus of the research

field. The large node size suggests that this concept is the most frequently used keyword across the publications analyzed. The central position of artificial intelligence also indicates that it is strongly connected to multiple related themes, demonstrating that AI research in business contexts is highly interdisciplinary and intersects with several technological and managerial domains. One important cluster highlighted in the visualization is associated with technology adoption and innovation, which includes keywords such as technology adoption, innovation, sustainability, and business. These keywords reflect research that examines how organizations integrate AI technologies into their operations and strategic processes. Studies within this cluster often explore factors influencing AI implementation, including organizational readiness, technological infrastructure, and strategic innovation capabilities. The presence of sustainability-related terms also indicates a growing interest in examining how AI contributes to sustainable business practices and long-term organizational performance.

Another cluster focuses on digital transformation and emerging technologies, represented by keywords such as digital transformation, internet of things, big data, industry 4.0, and data analytics. This cluster highlights the role of AI as a key component of the broader digital transformation agenda within organizations. Researchers in this area commonly investigate how AI interacts with other digital technologies to optimize operational processes, enhance supply chain management, and support business model innovation. The strong link between AI and Industry 4.0 indicates that AI adoption is frequently studied within the context of smart manufacturing and digitally integrated business ecosystems. A third thematic cluster relates to decision-making and organizational processes, including keywords such as decision making, automation, efficiency, and decision support systems. This cluster emphasizes the managerial implications of AI adoption, particularly its ability to enhance analytical capabilities and support data-driven decision-making. Research within this domain often explores how AI tools improve managerial efficiency, assist in strategic planning, and reduce uncertainty in complex business environments. The inclusion of behavioral research and information systems suggests that scholars are also examining the human and organizational factors influencing AI adoption.

Another important cluster revolves around machine learning and predictive analytics, including keywords such as machine learning, predictive analytics, risk management, and ethical technology. This cluster reflects the technical foundation of AI applications in business contexts. Research within this domain often focuses on the development and application of machine learning models to forecast market trends, assess risks, and support intelligent decision systems. The presence of ethical technology highlights increasing academic concern regarding ethical considerations, transparency, and governance in AI implementation.
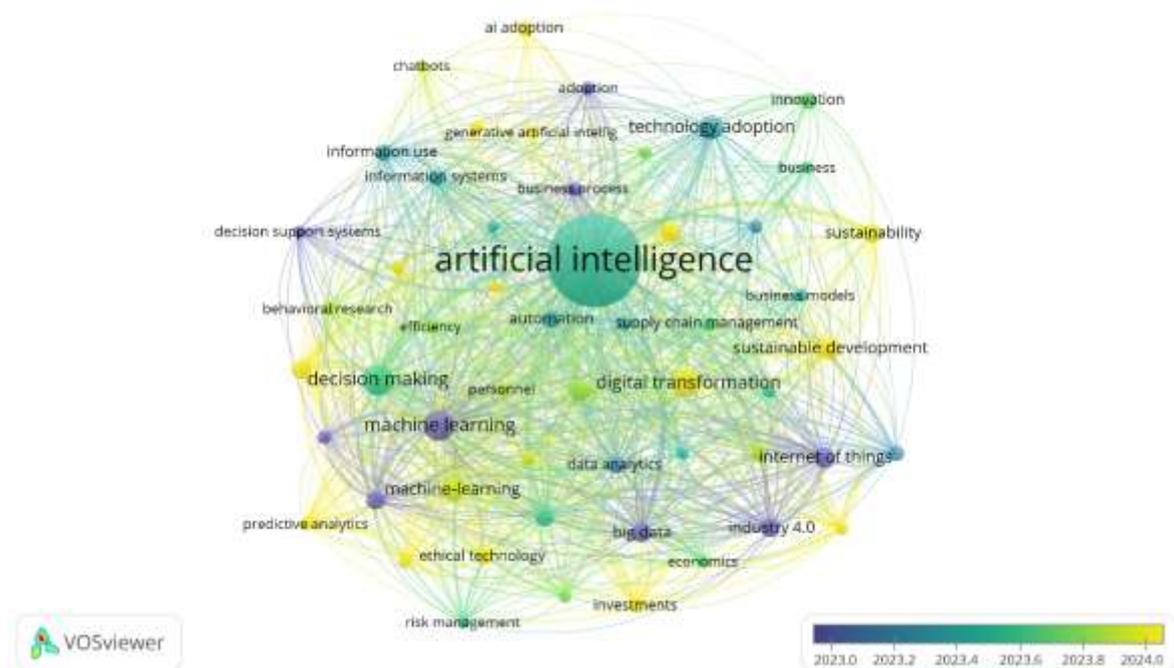
Figure 5. Overlay Visualization
Source: Data Analysis

Figure 5 illustrates the temporal evolution of research themes related to Artificial Intelligence adoption in business between 2015 and 2025. The color gradient indicates the average publication year of each keyword, where darker colors (blue and purple) represent earlier research topics, while lighter colors (green and yellow) represent more recent and emerging themes. The keyword "artificial intelligence" remains the central concept in the network, connecting a wide range of topics such as digital transformation, machine learning, technology adoption, and sustainability. Its central position demonstrates that AI acts as the core foundation around which various business-related technological and managerial research themes are developed. Earlier research topics, represented by darker colors, are primarily associated with foundational technological concepts such as machine learning, big data, predictive analytics, information systems, and decision support systems. These themes indicate that initial research in this field focused largely on the technological capabilities of AI and its analytical functions in supporting business decision-making and data-driven processes. Scholars in the earlier phase of the research period emphasized the development of computational models, data processing techniques, and the role of AI in improving organizational efficiency and decision support.

In contrast, the more recent research topics, represented by lighter yellow shades, highlight emerging themes such as AI adoption, sustainability, ethical technology, digital transformation, and generative artificial intelligence. These keywords indicate a shift in the research focus toward the broader organizational and societal implications of AI implementation in business. Recent studies increasingly examine how AI contributes to sustainable development, responsible technology use, and strategic innovation within organizations.
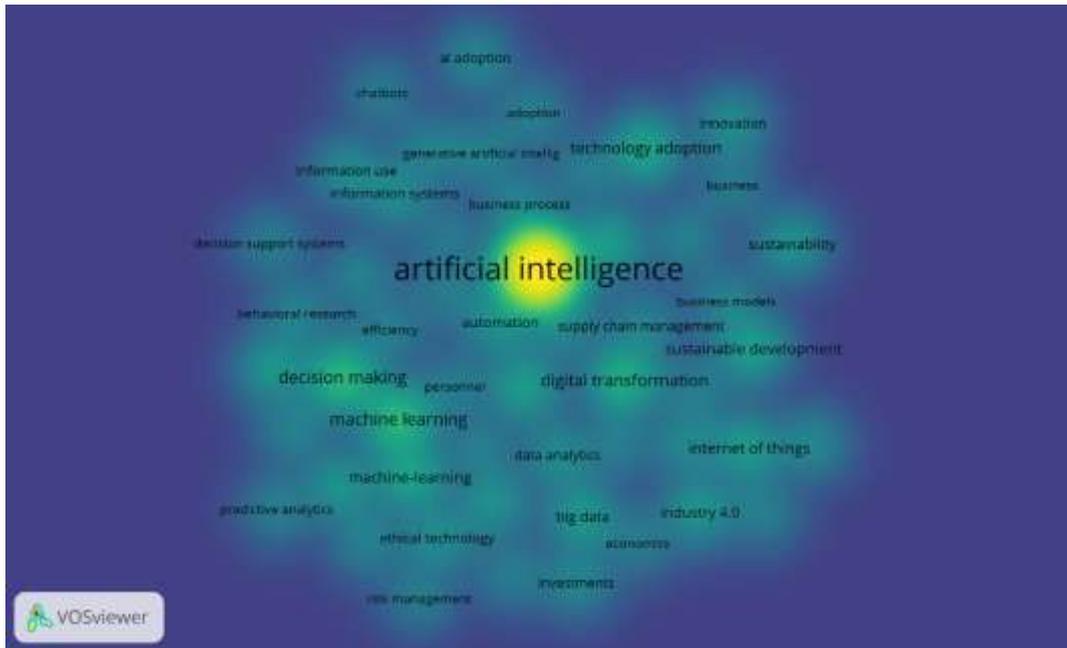
Figure 6. Density Visualization
Source: Data Analysis

Figure 6 highlights the concentration of research themes related to Artificial Intelligence adoption in business. In this visualization, areas with brighter yellow colors represent topics with higher frequency and stronger connections in the literature, while darker green and blue areas indicate less frequently discussed topics. The keyword "artificial intelligence" appears as the most prominent and brightest node in the center of the map, indicating that it is the most frequently occurring and highly connected concept within the research field. Surrounding this central theme are closely related topics such as digital transformation, technology adoption, machine learning, decision making, automation, and supply chain management, suggesting that these topics form the core research focus in studies examining the role of AI in business environments. In addition to these core themes, the visualization also reveals several emerging but slightly less dense research areas, including internet of things, big data, predictive analytics, ethical technology, sustainability, and industry 4.0. Although these topics appear with lower density compared to the central themes, they are still strongly connected to the main AI research cluster, indicating growing academic interest in integrating AI with broader digital technologies and responsible innovation practices.

Discussion

The results of this bibliometric analysis provide a comprehensive overview of the development of research on Artificial Intelligence (AI) adoption in business during the period 2015–2025. The findings reveal a significant increase in scholarly interest in this field, particularly in recent years when organizations increasingly rely on AI technologies to enhance decision-making, operational efficiency, and competitive advantage. The growing number of publications reflects the expanding role of AI in business strategy and digital transformation initiatives across industries. This trend also indicates that AI adoption is no longer viewed solely as a technological issue but rather as a strategic and organizational phenomenon that influences multiple aspects of business operations.

The co-authorship analysis highlights the presence of several collaborative research groups that contribute to the advancement of AI adoption studies in business contexts.

Certain authors act as central connectors within the collaboration network, linking different research communities and facilitating the dissemination of knowledge across institutions and countries. These collaborative patterns indicate that research on AI adoption is increasingly interdisciplinary, integrating perspectives from information systems, management, innovation studies, and business analytics. Such collaboration is essential for understanding the complex implications of AI technologies in organizational environments, as the adoption process involves both technological capabilities and managerial decision-making.

Institutional collaboration analysis further demonstrates that universities from Asia, Europe, and the Middle East play an important role in advancing research on AI adoption in business. Institutions such as Amity University, Symbiosis International University, and Taylor's University Malaysia appear as active contributors in this research domain. The collaboration network suggests that academic partnerships across regions are strengthening, which facilitates knowledge exchange and contributes to the global development of AI research. The participation of institutions from developing countries also reflects the growing global relevance of AI adoption in business and indicates that emerging economies are increasingly engaged in studying the managerial and economic implications of AI technologies.

The country collaboration network reveals that research in this field is highly international. The United States, India, China, Germany, and Italy appear as major contributors with strong collaborative connections across multiple regions. The United States maintains a central role in shaping the research agenda due to its strong technological infrastructure and active research institutions. Meanwhile, countries such as India and China demonstrate rapidly growing contributions, reflecting their

increasing investment in AI research and digital innovation. European countries also show strong internal collaboration, indicating that regional research networks contribute significantly to the development of AI-related business studies.

The keyword co-occurrence analysis provides insights into the main thematic areas of research on AI adoption in business. The findings show that artificial intelligence, digital transformation, technology adoption, machine learning, and decision making represent the core concepts in the literature. These themes highlight the central role of AI technologies in supporting data-driven decision-making and organizational efficiency. The strong connection between AI and digital transformation indicates that many studies examine AI as a key component of broader technological transformation initiatives within organizations. In this context, AI adoption is often linked with other emerging technologies such as big data analytics, Internet of Things (IoT), and Industry 4.0.

The overlay visualization further reveals the temporal evolution of research themes in this field. Earlier studies focused primarily on technological foundations such as machine learning algorithms, data analytics, and decision support systems. These early studies aimed to explore the technical capabilities of AI and its potential to improve information processing and analytical decision-making in organizations. Over time, the focus of research has shifted toward broader organizational and strategic implications of AI adoption, including digital transformation, innovation, and sustainability. This shift indicates that researchers increasingly recognize AI as a strategic resource that can reshape business models and competitive strategies. Another important finding is the growing interest in sustainability and ethical considerations in AI adoption. Recent research themes such as sustainable development, ethical technology,

and responsible innovation suggest that scholars are paying increasing attention to the societal and environmental implications of AI technologies. Businesses are not only adopting AI to improve efficiency but also exploring how AI can contribute to sustainable practices, responsible decision-making, and long-term value creation. This emerging research direction reflects broader global discussions on ethical AI governance and the need to ensure that technological innovation aligns with sustainable development goals.

The density visualization confirms that artificial intelligence remains the most dominant concept in the research field, with strong connections to topics such as digital transformation, machine learning, and decision-making processes. However, several emerging topics with growing academic interest include Internet of Things, big data analytics, predictive analytics, and risk management. These topics demonstrate that AI adoption in business is closely connected to broader digital ecosystems in which multiple technologies interact to enhance organizational performance. As businesses continue to integrate AI with other digital tools, research in this field is expected to become even more interdisciplinary and technologically integrated.

4. CONCLUSION

This bibliometric study provides a comprehensive overview of the development of research on Artificial Intelligence (AI) adoption in business during the period 2015–2025. The findings indicate that scholarly interest in this field has grown significantly, reflecting the increasing role of AI technologies in supporting digital transformation, innovation, and data-driven decision-making in business organizations. The analysis reveals that research on AI adoption is characterized by strong international collaboration among authors, institutions, and countries, with major contributions from the United States, India, China, and several European nations. The thematic analysis further demonstrates that core research areas revolve around artificial intelligence, digital transformation, technology adoption, machine learning, and decision-making processes, while emerging topics such as sustainability, ethical technology, and generative AI are gaining increasing attention. The results suggest that the field is evolving toward a more interdisciplinary and strategic perspective, emphasizing not only technological development but also the organizational, ethical, and societal implications of AI implementation in modern business environments.

REFERENCES

[1]   W. Dhewanto, A. N. Umbara, and R. Hanifan, "Towards Policy Development of Entrepreneurial Ecosystem: A Review in Indonesia Financial Technology Sector," in *Proceedings of the 8th International Conference on Industrial and Business Engineering*, in ICIBE '22. New York, NY, USA: Association for Computing Machinery, 2023, pp. 282–290. doi: 10.1145/3568834.3568841.

[2]   P. S. Sutar, G. Kolte, S. Yamini, and K. Mathiyazhagan, "Food supply chain resilience in the digital era: a bibliometric analysis and development of conceptual framework," *J. Bus. Ind. Mark.*, vol. 39, no. 9, pp. 1863–1893, 2024, doi: 10.1108/JBIM-10-2023-0587.

[3]   N. Soni, E. K. Sharma, N. Singh, and A. Kapoor, "Artificial intelligence in business: from research and innovation to market deployment," *Procedia Comput. Sci.*, vol. 167, pp. 2200–2210, 2020.

[4]   J. P. Bharadiya, "Driving business growth with artificial intelligence and business intelligence," *Int. J. Comput. Sci. Technol.*, vol. 6, no. 4, pp. 28–44, 2022.

[5]   W. Wang, "Artificial Intelligence in Strategic Business Decisions: Enhancing Market Competitiveness," *Adv. Econ. Manag. Polit. Sci.*, vol. 117, pp. 87–93, 2024.

[6]   A. Y. Areiqat, A. Hamdan, A. F. Alheet, and B. Alareeni, "Impact of artificial intelligence on E-commerce development," in *The Importance of New Technologies and Entrepreneurship in Business Development: In The Context of Economic Diversity in Developing Countries: The Impact of New Technologies and Entrepreneurship on Business Development*, Springer, 2021, pp. 571–578.

[7]   N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: An overview and guidelines," *J. Bus. Res.*, vol. 133, pp. 285–296, 2021.

[8]   M. Aria and C. Cuccurullo, "A brief introduction to bibliometrix," *J. Informetr.*, vol. 11, no. 4, pp. 959–975, 2017.

[9]   L. Klerkx, E. Jakku, and P. Labarthe, "A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda," *NJAS-Wageningen J. life Sci.*, vol. 90, p. 100315, 2019.

[10]   M. Javaid, A. Haleem, R. P. Singh, R. Suman, and E. S. Gonzalez, "Understanding the adoption of Industry 4.0 technologies in improving environmental sustainability," *Sustain. Oper. Comput.*, vol. 3, pp. 203–217, 2022.

[11]   I. M. Enholm, E. Papagiannidis, P. Mikalef, and J. Krogstie, "Artificial intelligence and business value: A literature review," *Inf. Syst. Front.*, vol. 24, no. 5, pp. 1709–1734, 2022.

[12]   S. Chowdhury *et al.*, "Unlocking the value of artificial intelligence in human resource management through AI capability framework," *Hum. Resour. Manag. Rev.*, vol. 33, no. 1, p. 100899, 2023.

[13]   A. I. Stoumpos, F. Kitsios, and M. A. Talias, "Digital transformation in healthcare: technology acceptance and its applications," *Int. J. Environ. Res. Public Health*, vol. 20, no. 4, p. 3407, 2023.

[14]   V. N. Lu *et al.*, "Service robots, customers and service employees: what can we learn from the academic literature and where are the gaps?," *J. Serv. Theory Pract.*, vol. 30, no. 3, pp. 361–391, 2020.

[15]   P. Budhwar, A. Malik, M. T. T. De Silva, and P. Thevisuthan, "Artificial intelligence–challenges and opportunities for international HRM: a review and research agenda," *Int. J. Hum. Resour. Manag.*, vol. 33, no. 6, pp. 1065–1097, 2022.

[16]   K. Wach *et al.*, "The dark side of generative artificial intelligence: A critical analysis of controversies and risks of ChatGPT," *Entrep. Bus. Econ. Rev.*, vol. 11, no. 2, pp. 7–30, 2023.

[17]   Y. K. Dwivedi, N. Pandey, W. Currie, and A. Micu, "Leveraging ChatGPT and other generative artificial intelligence (AI)-based applications in the hospitality and tourism industry: practices, challenges and research agenda," *Int. J. Contemp. Hosp. Manag.*, vol. 36, no. 1, pp. 1–12, 2024.

[18]   B. Howieson, "Accounting practice in the new millennium: is accounting education ready to meet the challenge?," *Br. Account. Rev.*, vol. 35, no. 2, pp. 69–103, 2003.