

THE APPLICATION OF ARTIFICIAL INTELLIGENCE (AI) IN THE FIELDS OF ACCOUNTING AND AUDITING: A BIBLIOMETRIC ANALYSIS

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Abstract :

In recent years, artificial intelligence (AI) has expanded rapidly and become increasingly significant in the fields of accounting and auditing. To map publishing activity, prevalent topics, and thematic advancements, this study uses a bibliometric technique to examine the scientific output on the application of AI in these disciplines. A total of 962 publications, published between 2019 and 2024, were obtained from the Scopus database, which is regarded as one of the most trustworthy academic sources, after applying the appropriate filters. Furthermore, Biblioshiny (R program) and Vosviewer were used to build bibliometric networks and analyse research patterns. The results show that publications on AI in accounting and auditing have been steadily rising, especially between 2022 and 2024. The findings of the thematic analysis show that machine learning and artificial intelligence are the primary research areas, with a focus on risk management, accounting, and auditing as key application fields. Additionally, new fields like deep learning and risk assessment have emerged.

Keywords: AI, Accounting, Auditing, bibliometric analysis, Scopus database, Vosviewer, Biblioshiny (R)

Introduction:

Recent years have witnessed a rapid surge in global investment in artificial intelligence (AI) systems, highlighting their transformative role across industries. According to market projections, AI system spending is expected to rise sharply from 174.16 billion USD in 2024 to 255.59 billion USD in 2025, reflecting a compound annual growth rate (CAGR) of 46.8%. This exponential growth is driven by advances in computing power, the expansion of cloud technologies, increased awareness and education, evolving regulatory and compliance requirements, and the growing adoption of industry-specific applications. Moreover, spending is forecasted to continue its upward trajectory, reaching as much as 1,212.13 billion USD by 2029. Such figures underscore the strategic importance of AI as a cornerstone of digital transformation and economic development worldwide. (The Business Research Company, 2025).

The term artificial intelligence was first used in 1955 in preparatory document to the summer Dartmouth Conference in 1956 whose authors were McCarthy, Marvin Minsky, Nathaniel Rochester and Claude Shannon. The meeting's aim was to examine "the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it (Cordeschi, 2007). Although the origins of AI date back several decades, there is a unanimous agreement on the critical significance of intelligent systems equipped with learning, reasoning, and adaptive capacities today. These features enable AI approaches to attain unparalleled performance in learning to address increasingly intricate computational tasks, rendering them essential for the future advancement of human society (Barredo Arrieta et al., 2020).

Artificial Intelligence is characterised by the capacity of machines to demonstrate human-like intelligence in executing activities including decision-making, problem-solving, and language processing (Morandin-Ahuerma, 2022) (Zhang et al., 2021). It encompasses technologies such as Machine Learning, Natural Language Processing, and Computer Vision, which enable software to learn independently and make decisions. These technologies are revolutionising various fields, such as healthcare, transportation, and education, by enhancing capabilities like image identification and language processing. Current trends in AI include deep learning and quantum computing, with real-world applications seen in self-driving vehicles and advanced diagnostics (Shah & Raghavendra, 2024) (Shrivastava, 2024).

Artificial Intelligence (AI) is revolutionising the accounting profession through the automation of mundane operations, the enhancement of data analysis, and the provision of profound insights. Technologies such as machine learning and generative AI enhance productivity and precision in diverse domains, including auditing, tax accounting, management accounting, and financial accounting (Greenman et al., 2024). It automates repetitive procedures and offers predictive insights, hence transforming the functions of accounting professionals. This transition requires new competencies centred on AI integration and data analysis, as conventional methods adapt to include newer technologies (Biswas & Tarafder, 2025). Allowing accountants to focus on strategic decision-making and advisory roles (Thanasas & Kapiotis, 2024). The advantages of applying AI in accounting are well-documented and widely acknowledged in recent research. A key benefit lies in its ability to

enhance accuracy while minimising human errors. By automating processes such as data entry, receipt reconciliation, invoice preparation and distribution, expense management, and monitoring price variations, AI ensures greater reliability in financial data analysis (Tlili, 2025).

In the audit field, artificial intelligence (AI) significantly enhances auditing by automating repetitive tasks, improving data analysis, and detecting anomalies. Tools such as machine learning, natural language processing, and predictive analytics contribute to more accurate and timely audits. AI also enables better risk detection and compliance monitoring, ultimately improving audit quality and reducing operational costs (Ghafar et al., 2024). Beyond these advantages, it reduces human error and allows auditors to focus on high-risk areas and conduct more in-depth evaluations (Vidya, 2024). Furthermore, the technology supports continuous auditing through real-time monitoring, enabling the timely detection of anomalies and fraud (Fidyah et al., 2024) (Lidiana, 2024).

Recent academic research has consistently emphasised the transformative role of Artificial Intelligence (AI) in accounting and auditing. (Mohd Sallem et al., 2024) highlight, through a bibliometric analysis, that research on AI in these fields has grown rapidly since 2020, with recurring themes including blockchain, machine learning, and fraud detection. Similarly, (Melo et al., 2024) underscore the intersection of AI with big data and digital transformation, suggesting that technological innovation is redefining both professional practices and education in accounting. Complementing these findings, (Luthfiani, 2024) adopts a conceptual perspective, stressing the need for interdisciplinary collaboration and preparing future professionals to face the challenges of job displacement and paradigm shifts. Other studies focus on specific applications: (Barna & Hurducaci, 2024) explore the integration of AI with ERP systems, revealing its potential to optimise workflows, improve compliance, and enhance strategic decision-making. Meanwhile, (Ghassani et al., 2024) and (Agustí & Orta-Pérez, 2022) contribute bibliometric insights that map publication trends, identify leading publishers, and outline emerging and declining research fronts in AI for accounting and finance. Finally, (Abu Huson et al., 2024) offer a broader perspective, demonstrating how AI, blockchain, and IT collectively influence auditing research, particularly in areas such as audit quality, data analytics, and auditor performance. Collectively, these studies reveal a dynamic and evolving field where AI not only augments efficiency and accuracy but also raises profound challenges related to ethics, education, and the future role of accounting professionals.

This paper aims to answer the following questions:

Research Questions:

We aimed to address the following questions:

- 1- What is the distribution of artificial Intelligence (AI) in Accounting and Auditing publications by years between 2019 and 2024?

2- What are the most pertinent journals, authors and publications about the application of artificial Intelligence (AI) in the fields of accounting and auditing?

3- How is scientific production in AI for accounting and auditing distributed across countries, and which institutions act as the main drivers of research influence?

4- What are the main research hotspots and recurring keywords in studies of artificial Intelligence (AI) in the accounting and auditing fields?

The document is organised into five sections. Section 2 outlines the methodology and materials employed in the analysis, while Section 3 presents the results and commentary. Section 4 is dedicated to the conclusion, while Section 5 discusses the study's limitations.

II- Materials and Methods:

This research aims to reveal the profile of the studies conducted for the use of ML in the accounting and auditing field for the period between 2020 and 2024. To achieve this aim, the bibliometric analysis method was used. Bibliometric analysis is a systematic examination of scientific literature aimed at identifying patterns, trends, and influence within a specific domain. (Ioannis, 2024). Multiple databases enable the collection of bibliographic data, such as Scopus, Web of Science (WoS), Dimensions, Cochrane Library, Lens, and PubMed. Each database possesses unique characteristics and functionalities. Web of Science and Scopus are the most commonly utilised databases for literature searches across diverse academic fields. (AIRyalat et al., 2019)

For this study, Scopus was selected as the primary source for retrieving relevant literature due to its extensive coverage of publications and citation-rich data, which makes it one of the most reliable databases for bibliometric analysis. (Mahanta et al., 2025). A set of keywords was entered in the search string for this study, with a concentration on two interdisciplinary elements: "Machine learning" and "Accounting & Auditing" and the Boolean operators "AND" and "OR" were employed. TITLE-ABS-KEY:

((" Artificial Intelligence " OR " Machine Learning " OR "Deep Learning" OR "Predictive Analytics" OR "Data Mining") AND ("Auditing" OR "Audit Automation" OR "Audit Risk Assessment" OR "Audit Sampling" OR "Full Population Auditing" OR "Internal Control Audits" OR "Accounting" OR "Financial Accounting" OR "Management Accounting" OR "Corporate Reporting" OR "Financial Forecasting" OR "Fraud Detection" OR "Risk Management"))).

The preliminary search produced a total of 26,510 publications. We employed many criteria to improve the search results. The initial filter imposed a temporal range restriction, including items published between 2019 and 2024. The second filter concentrated on subject domains, encompassing solely publications in the fields of Business, Management, and Accounting. The third filter pertained to document classification, specifically encompassing journal articles. The final filter focused on the language of publications, preserving solely papers authored in English. The ultimate sample comprised 962 articles.

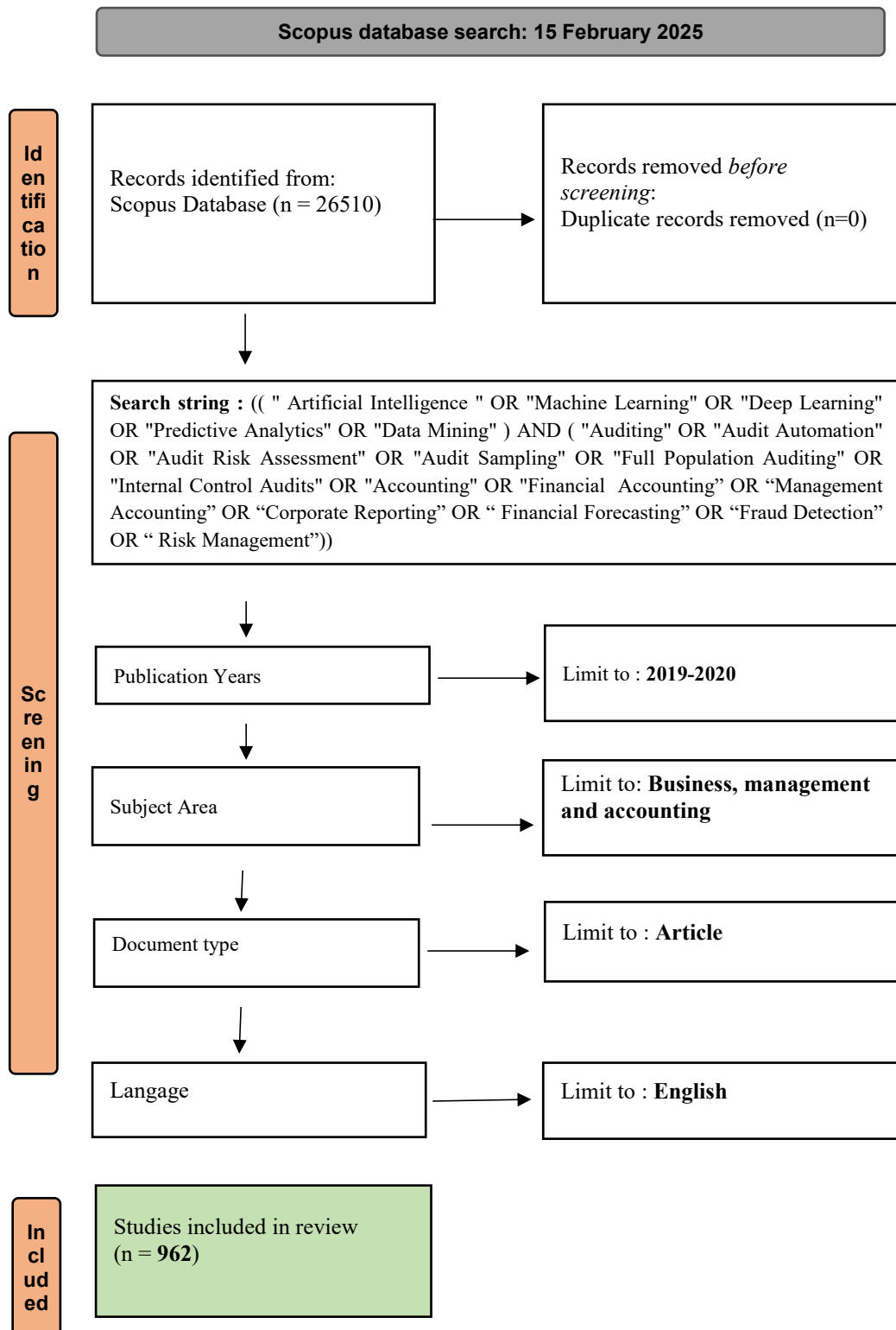


Figure (1) : Prisma framework of the study

To conduct the analysis, we employed both VOSviewer and Biblioshiny (R) software. VOSviewer was selected because of its ability to provide efficient bibliometric analysis, visualization, and research mapping (Siwi et al., 2026). It enables the generation of

publication, author, and journal maps derived from co-citation networks, as well as the construction of keyword maps based on co-occurrence relationships (Hudha et al., 2020). In contrast, Biblioshiny (R) was chosen for its capacity to facilitate the processing, exploration, and visualization of bibliometric data, thereby supporting the identification of trends and thematic structures in scientific production within a specific field (Sunarya & Al Qital, 2022).

III- Results and Discussion:

This section presents the key findings of the bibliometric analysis on AI in accounting and auditing. It covers overall statistics, annual production progression, leading journals and authors, geographical distribution, and thematic analysis to highlight main and emerging research directions.

III-1- General Overview of bibliometric statistics:



Figure (2): Summary of main data

Figure (2) shows that the bibliometric analysis covers 962 documents published between 2019 and 2024, distributed across 360 sources. This indicates that artificial intelligence in the field of accounting and auditing is undergoing rapid expansion. The area demonstrates strong dynamism, with an annual growth rate of 35.37%, reflecting increasing scientific interest. The research community is extensive (3059 authors) and highly collaborative: only 113 papers were single-authored (3.7%), with an average of 3.58 authors per document, 30% of which involve international co-authorship.

In terms of content, the articles cite an average of 56 references each (54138 in total), indicating a solid grounding in the literature. The average document age is 2.62 years, underscoring the novelty of the corpus. Despite this recency, the impact is notable, with an average of 23.16 citations per article. Finally, the presence of 3030 author keywords reflects wide thematic diversity and the emergence of numerous subfields.

III-2-Annual Scientific Production :

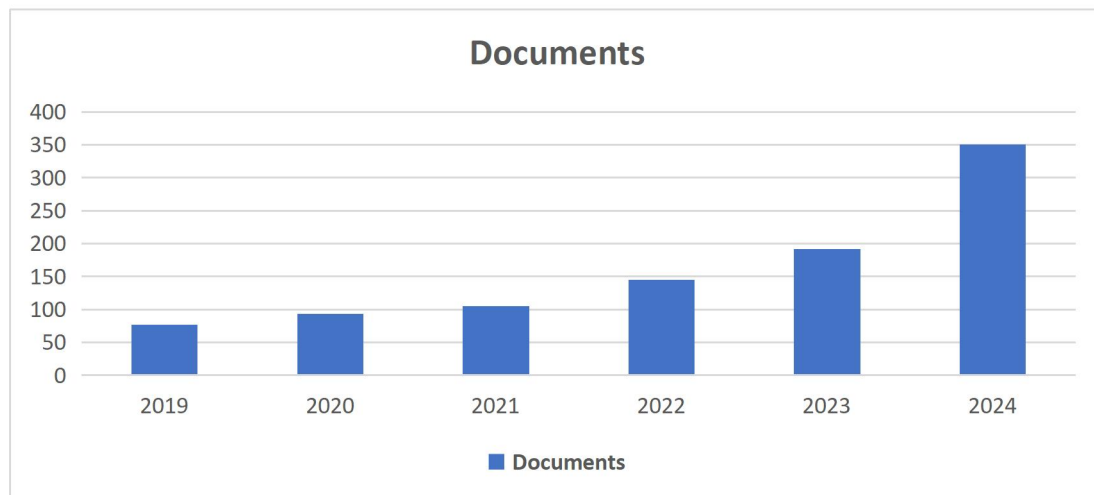


Figure (3) : The annual progression of literature on Artificial Intelligence in accounting and auditing (2019-2024)

Figure (3) reveals a clear upward trajectory in publications from 2019 to 2024, rising from 77 in 2019 to 350 in 2024. The early years indicate moderate growth, followed by a sharper increase starting in 2022, with 145 publications. The most notable rise occurs in 2024, where the number of documents nearly doubles compared to the previous year, reaching around 350. Overall, the data highlights the rapid expansion of research activity in the field of AI in accounting and auditing.

III-3- The most relevant journals, authors and articles in artificial intelligence (AI) applied to Accounting and Auditing:

In this part, we present the most relevant journals, authors, and articles on artificial intelligence (AI) in the fields of accounting and auditing. This analysis highlights the main publication outlets and leading contributions that structure the field, while also providing a better understanding of the intellectual framework and the key drivers shaping this research domain.

1) Analysis by Journals:

Drawing on data from Scopus, this table presents the ten most influential journals on the application of artificial intelligence in accounting and auditing. It reports key bibliometric indicators (TP, TC, CiteScore, and TSc), identifies the most cited article in each journal, and specifies the corresponding publisher, thereby providing a comprehensive view of their scientific impact.

Table (1): Top 10 productive journals in Artificial intelligence for accounting and auditing

Journal	TP	TP*	TC	Cite Score (2024)	The most cited article	TsC	Publisher
Journal of Cleaner Production	18950	28	393.051	20.7	Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry 4.0: Challenges, opportunities, and ethical dimensions	339	Elsevier
Journal of Risk and Financial Management	2312	26	11.671	5	Financial Inclusion and Its Ripple Effects on Socio-Economic Development: A Comprehensive Review	45	MDPI
Technological Forecasting and Social Change	2927	22	76.934	26.3	The effects of artificial intelligence applications in educational settings: Challenges and strategies	125	Elsevier
International Journal of Accounting Information Systems	98	20	1043	10.6	Enablers, barriers and strategies for adopting new technology in accounting	36	Elsevier
Risks	876	20	4399	5.0	The Role of Artificial Intelligence Technology in Predictive Risk Assessment for Business Continuity: A Case Study of Greece	25	MDPI

Decision Support Systems	491	18	6646	13.5	Explainable artificial intelligence and agile decision-making in supply chain cyber resilience	58	Elsevier
Journal of Emerging Technologies in Accounting	106	16	491	4.6	Using Artificial Intelligence in ESG Assurance	7	American Accounting Association
Knowledge-Based Systems	4394	15	65757	15.0	Crested Porcupine Optimizer: A new nature-inspired metaheuristic	263	Elsevier
IEEE Transactions on Engineering Management	1792	13	17420	9.7	Digital Supply Chain Management and Technology to Enhance Resilience by Building and Using End-to-End Visibility During the COVID-19 Pandemic	198	IEEE
Journal of Organizational and End User Computing	245	13	1447	5.9	Innovating Sustainability: VQA-Based AI for Carbon Neutrality Challenges		

TP: Total Publications, **TP*** :Total publications in AI for accounting and auditing **TC:** Total Citations, **TsC** : Times Cited

The examination of Table (1) shows that the most productive journals span both multidisciplinary and specialised domains. The Journal of Cleaner Production dominates in overall volume, with 18,950 publications, of which 28 are explicitly related to AI in accounting and auditing. It accumulates 393,051 citations (CiteScore 20.7), reflecting its very high international visibility. The Journal of Risk and Financial Management has a total of 2,312 publications, including 26 on AI in accounting and auditing, with a relatively modest impact (11,671 citations, CiteScore 5). Similarly, Technological Forecasting and Social Change publishes a total of 2,927 articles, of which 22 are related to the field, garnering strong academic recognition (76,934 citations, CiteScore 26.3). Among specialised outlets,

the International Journal of Accounting Information Systems has 98 total publications, with 20 on AI in accounting, and 1,043 citations (CiteScore 10.6), confirming its disciplinary relevance but more limited visibility. The Journal of Emerging Technologies in Accounting (106 articles, 16 on AI) and the Journal of Organisational and End-User Computing (245 articles, 13 on AI) also exhibit a targeted orientation, albeit with a lower impact. In the area of decision-making and risk management, Risks (876 total, 20 on AI; 4,399 citations), Decision Support Systems (491 total, 18 on AI; 6,646 citations), and IEEE Transactions on Engineering Management (1,792 total, 13 on AI; 17,420 citations) highlight the role of AI in supporting decision-making, resilience, and risk governance. Finally, Knowledge-Based Systems stands out as a methodological powerhouse with 4,394 total publications, including 15 in the studied field, and an exceptional citation volume (65,757).

2) Analysis by Authors:

Finding the most prolific writers who have made the most contributions to the subject of artificial intelligence in accounting and auditing is crucial to understanding the key actors in this field. The top 10 writers are shown in Table (2).

Table 2: Top 10 prolific authors in AI for Accounting and Auditing

Author	Nbr of Arts/ Author	Citations	TP	TC	h- Index	Current affiliation	Country
Vasarhelyi, M.A.	5	189	166	3805	40	Rutgers University-Newark	United States
Lehner, O.M.	4	277	71	1489	20	University of Jyväskylä	Finland
Mangla, S.K.	4	98	265	13349	76	O.P. Jindal Global University	India
Mansouri, M.	4	17	42	321	7	Hassan 1 University	Morocco
Rezki, N.	4	17	7	17	2	Berrechid Hassan First University	Morocco
Chen, H.	3	85	627	23134	80	The University of Arizona	United States
Chowdhury, S.	3	317	63	5778	23	TBS Business School	France
Delen, D.	3	69	247	11959	56	İstinye Üniversitesi	Turkey
Duan, H.K.	3	121	9	147	4	Sacred Heart University Fairfield	United States
Fang, W.	3	38	77	2625	28	Huazhong University of Science and Technology	

TP : Total publications, TC : Total Citations

The table (2) distinguishes between two types of indicators: the first two columns (“Nbr of Arts/Author” and “Citations”) reflect each author’s contribution to the specific corpus studied (The number of articles on AI in accounting/auditing and the citations received within the analysed period). By contrast, the TP, TC, and h-index values correspond to the author’s overall publications and citations in Scopus, covering their entire scientific output. This distinction is crucial for evaluating both the targeted influence of a researcher in the selected field and their broader academic impact.

From a broader academic perspective, the table highlights the significant impact of leading researchers such as H. Chen from the University of Arizona, who stands out with 627 publications, 23,134 citations, and the highest h-index (80). Other influential researchers include S.K. Mangla from India with 265 publications and 13,243 citations, and D. Delen from Turkey with 247 publications and 11,273 citations. M.A. Vasarhelyi from Rutgers University in the United States, although with a smaller total output of 166 publications, remains a key figure in accounting and auditing research, illustrating the balance between quantity, quality, and a solid h-index of 40.

When narrowing the analysis to the corpus explicitly dedicated to artificial intelligence in accounting and auditing, the distribution of contributions reveals a more concentrated set of outputs. M.A. Vasarhelyi once again emerges as the most productive author, with five articles. He is followed by O.M. Lehner, S.K. Mangla, M. Mansouri, and N. Rezki, each of whom contributed four articles indexed in Scopus. A second group of researchers, including H. Chen, S. Chowdhury, D. Delen, H.K. Duan, and W. Fang, produced three articles each during the studied period.

In terms of impact, S. Chowdhury stands out, despite having only three publications, with the highest citation count of 317 citations, corresponding to an average of 105.7 citations per article. This indicates an exceptional influence compared to his peers. O.M. Lehner follows with 277 citations across four articles, averaging 69.25 citations per article, while H.K. Duan records 271 citations for three articles, averaging 90.3 citations per article. These figures underscore that while productivity (number of articles) is an important indicator, the citation-per-article ratio highlights the significant academic influence of certain researchers

3) Analysis by documents (Highly cited Papers):

In bibliometric analysis, highly cited articles highlight the most impactful studies in a field. They showcase influential ideas and methods, helping researchers identify the key contributions that have shaped the discipline’s development. Moreover, highly cited publications are frequently employed as indicators of scientific excellence and as benchmarks for comparing research performance across countries, institutions, and research groups. As

such, they represent valuable tools for recognising and monitoring genuinely “world-class” research (Aksnes, 2003).

Table (3): Top 20 Highly cited articles

No	Authors	Title	Source	TC	Cites per Year
1	(Moll & Yigitbasioglu, 2019)	The role of internet-related technologies in shaping the work of accountants: New directions for accounting research.	The British Accounting Review	378	54
2	(Munoko et al., 2020)	The Ethical Implications of Using Artificial Intelligence in Auditing.	Journal of Business Ethics	303	50.50
3	(Leo et al., 2019)	Machine Learning in Banking Risk Management: A Literature Review	Risks	294	42
4	(Han et al., 2023)	Accounting and auditing with blockchain technology and artificial intelligence: A literature review	International Journal of Accounting Information Systems	286	95.33
5	(Manita et al., 2020)	The digital transformation of external audit and its impact on corporate governance	Technological Forecasting and Social Change	285	47.50
6	(Bao et al., 2019)	Detecting Accounting Fraud in Publicly Traded U.S. Firms Using a Machine Learning Approach	Journal of Accounting Research	247	41.17
7	(Ashta & Herrmann, 2021)	Artificial intelligence and fintech: An overview of opportunities and risks for banking, investments, and microfinance	Strategic Change	213	42.60
8	(Rodríguez-Espíndola et al., 2022)	Analysis of the adoption of emergent technologies for risk management in the era of digital manufacturing	Technological Forecasting and Social Change	177	44.25
9	(Damerji & Salimi, 2021)	Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting	Accounting Education	166	33.20
10	(Craja et al., 2020)	Deep learning for detecting financial statement fraud	Decision Support Systems	159	26.50
11	(Tiwari & Khan, 2020)	Sustainability accounting and reporting in the industry 4.0	Journal of Cleaner Production	151	25.17
12	(Albitar et al.,	Auditing in times of social	International	149	29.80

	2020)	distancing: the effect of COVID-19 on auditing quality	Journal of Accounting and Information Management		
13	(Fedyk et al., 2022)	Is artificial intelligence improving the audit process?	Review of Accounting Studies	147	36.75
14	(Brown et al., 2019)	What Are You Saying? Using topic to Detect Financial Misreporting	Journal of Accounting Research	145	24.17
15	(Qasim & Kharbat, 2020)	Blockchain Technology, Business Data Analytics, and Artificial Intelligence: Use in the Accounting Profession and Ideas for Inclusion into the Accounting Curriculum	Journal of Emerging Technologies in Accounting	143	23.83
16	(Bertomeu et al., 2020)	Using machine learning to detect misstatements.	Review of Accounting Studies	140	28
17	(Leitner-Hanetseder et al., 2021)	A profession in transition: actors, tasks and roles in AI-based accounting	Journal of Applied Accounting Research	125	25
18	(Gotthardt et al., 2020)	Current State and Challenges in the Implementation of Smart Robotic Process Automation in Accounting and Auditing	ACRN Journal of Finance and Risk Perspectives	117	19.50
19	(Tiberius & Hirth, 2019)	Impacts of digitization on auditing: A Delphi study for Germany	Journal of International Accounting, Auditing and Taxation	113	16.14
20	(Baesens et al., 2021)	Data engineering for fraud detection	Decision Support Systems	112	

Table (3) shows that the most cited article is by (Moll & Yigitbasioglu, 2019), with 378 citations (54 per year), focusing on internet-related technologies (cloud, big data, blockchain, and AI) shaping accounting work. Close behind is (Munoko et al., 2020), with 303 citations (50.5 per year), addressing the ethical implications of AI in auditing, and (Leo et al., 2019), with 294 citations (42 per year), on machine learning for banking risk management. The standout is (Han et al., 2023), with 286 citations but the highest yearly rate (95.33), indicating extraordinary influence in a very short time. This article examines the potential of blockchain technology to enhance transparency and trust in accounting operations, as well as to support professionals' informed decision-making processes. Overall, all papers received between 112 and 402 citations, reflecting both foundational and emerging contributions.

The 20 highly cited articles, as shown in the table above, reveal that research on AI in accounting and auditing is concentrated in the areas of fraud detection, audit transformation, governance, blockchain integration, risk management, and ethical adoption. While earlier work (2019–2020) established the conceptual and methodological foundations, more recent publications (2021–2023) emphasise the practical adoption, interdisciplinarity, and rapid growth in influence. The swift accumulation of citations by (Han et al., 2023) further suggests that the convergence of AI and blockchain is likely to dominate future research.

III-4- Geographical Analysis :

The geographical dimension of the bibliometric analysis highlights how different regions contribute to and interact within the development of literature in a specific academic field. (Durmuş Şenyapar, 2023). This is what we will attempt to demonstrate through Table 04, which presents the top 10 countries and research institutions in the field of artificial intelligence in accounting and auditing, and Figure 03, which illustrates the map of international collaboration among countries.

Table (4) : top 10 countries and institutional education in AI for Accounting and Auditing

Rank	Country	TP	1st Inst (Highest Cited)
1	United States	206	Vanderbilt University
2	China	155	Dalian University of Technology
3	United Kingdom	100	University of Manchester
4	India	88	IIT Guwahati
5	Australia	60	Queensland University of Technology
6	Germany	51	Humboldt University of Berlin
7	France	40	NEOMA Business School
8	Canada	32	McMaster University
9	Italy	31	University of Salerno
10	Taiwan	24	Chang Jung Christian University

Rank	Institutional Education	Country	TP
1	Hefei University of Technology	China	10
2	The Hong Kong Polytechnic University	Hong Kong	9
3	Rutgers University-Newark	United States	8
4	Ministry of Education of the People's Republic of China	China	8
5	Southwestern University of Finance and Economics	China	8
6	Rutgers Business School—Newark and New Brunswick	United States	8
7	Université Hassan 1er	Morocco	7
8	Curtin University	Australia	7
9	The University of Manchester	United Kingdom	6

10	Arizona State University	United States	6
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TP: Total publications

Table (4) highlights the dominance of the United States and China in both publication output and institutional contributions. The United States leads with 206 publications, with Vanderbilt University as the most cited institution, underscoring its academic influence. China follows with 155 publications, where the Dalian University of Technology emerges as the most influential, reflecting the country's rapid research growth. Other nations such as the United Kingdom, India, Australia, and Germany also show notable activity, with leading institutions like the University of Manchester and IIT Guwahati. Chinese universities, including Hefei University of Technology and the Ministry of Education, occupy several top positions, confirming the country's strategic investment in scientific research. American institutions such as Rutgers University further illustrate the strength of U.S. academia. Meanwhile, universities from regions like Morocco (Université Hassan 1er) and Australia (Curtin University) contribute to the global landscape, though with fewer publications. Overall, the data reveal a concentration of excellence in select countries and institutions, reflecting both competition and collaboration in global research.

For additional analysis of country contributions to AI research applied to accounting and auditing, we conducted a bibliometric map using VOSviewer. to illustrate the scientific output of the leading countries in this domain and to explore international collaborations, as shown in Figure (4) below. Only countries with more than six publications are included, representing 49 out of a total of 109 countries.

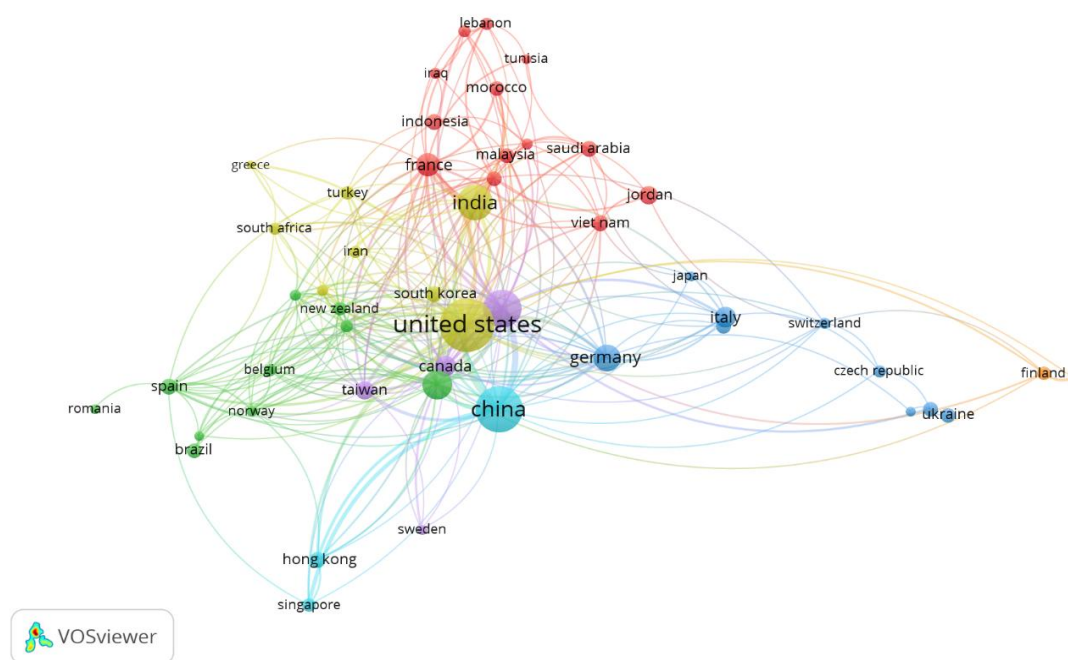


Figure (4): Map of international collaboration between countries

The co-authorship network in figure (4) reveals a clear and dominant landscape in AI research for accounting and auditing, heavily influenced by a few key nations. The United States stands as the uncontested leader, not only producing the highest volume of research with 206 documents but also generating the most significant impact, as evidenced by its 5,893 citations. Furthermore, its total link strength of 139 indicates it is the central hub in the global collaboration network, engaging with a wide array of international partners. Following the US, the United Kingdom solidifies its position as a core contributor. Despite having fewer publications (100 documents) than China, its research demonstrates remarkable influence, accruing 4,159 citations—the second-highest globally. Its very high link strength of 124 underscores its role as a critical nexus, facilitating research connections across the world. China emerges as a powerhouse in terms of output, ranking second with 155 documents, and third in citations (3,954). However, its slightly lower collaboration strength (105) compared to the Anglo-Saxon leaders suggests a more concentrated domestic effort or different collaborative patterns.

Other nations play significant, albeit smaller, roles. Australia demonstrates highly impactful research, translating 60 documents into 2,668 citations, indicating a strong influence per publication. European nations like France (40 documents, 1,728 citations, 57 links) and Germany (51 documents, 1,468 citations, 37 links) are established players with robust international ties. Notably, India shows a substantial output (88 documents), ranking fourth in volume, though its citation count (2,210) suggests a growing influence that is still maturing.

The collaboration map, while partially illustrative, confirms the global reach of this research field. It shows that the central network comprising the US, UK, China, and Australia

III-5- Thematic Analysis:

1) Co-occurrence Network :

To map the co-occurrence of the most significant author keywords, VOSviewer was employed, as it integrates a clustering function that automatically groups related terms. For robustness, only keywords with more than five occurrences were included in the analysis, resulting in a network of 106 keywords out of a total of 3,031.

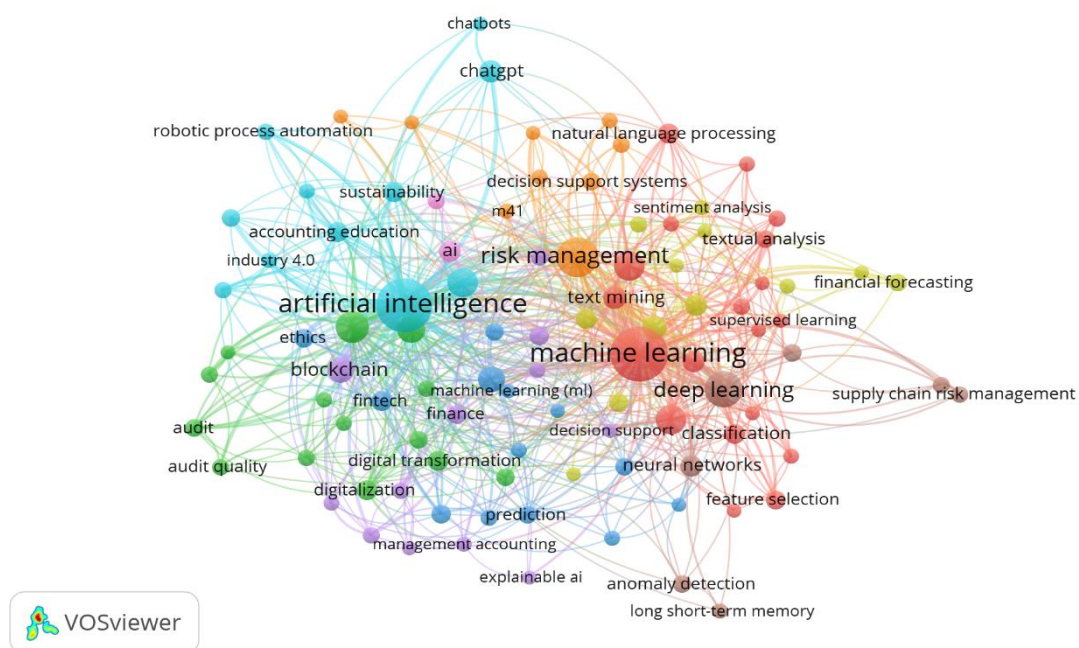


Figure (5): Co-occurrence of most significant author keywords

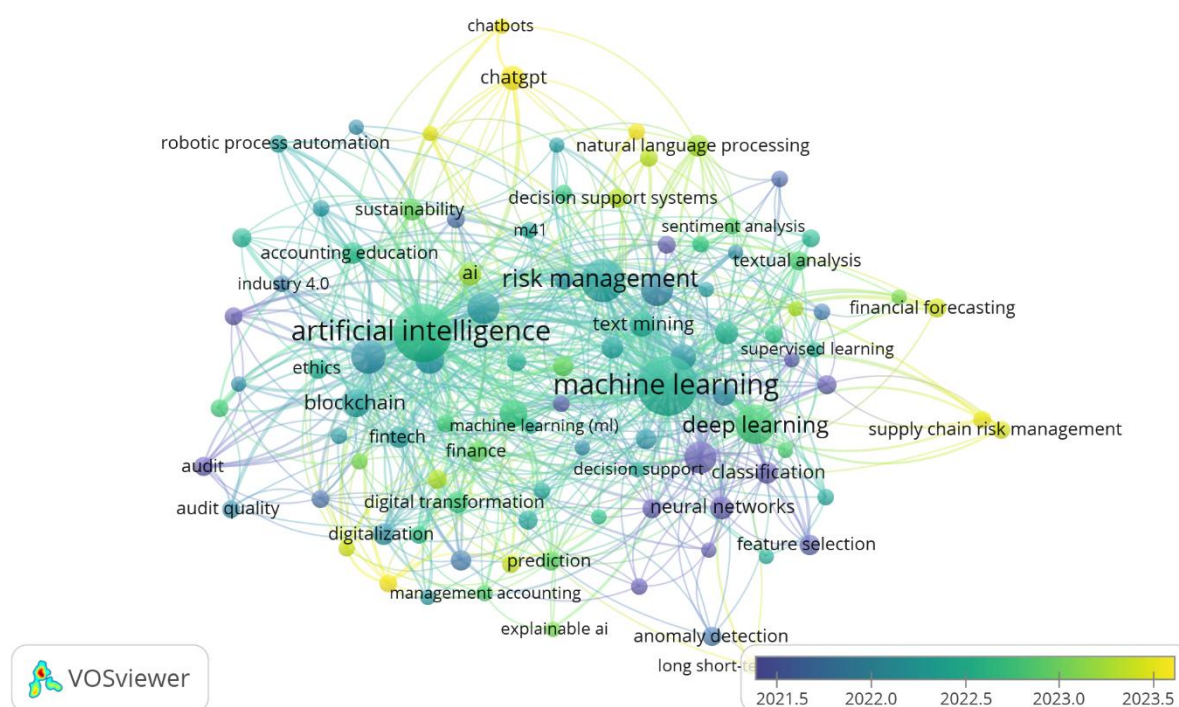


Figure (6): Co-occurrence of author keywords based on average appearing year

Figure (5) illustrates the co-occurrence of author keywords. The network is segmented into nine groups according on keyword co-occurrence. The red cluster comprises 19 keywords, including machine learning (total link strength = 300; occurrences = 226), data mining, and classification. The green cluster consists of 14 terms, concentrating on accounting, auditing, and financial reporting. The blue cluster has 13 elements, including automation, fintech, credit scoring, and fraud. The yellow cluster, with 12 terms, signifies themes associated with business intelligence and financial forecasting. The purple cluster focuses on blockchain, managerial accounting, and decision-making. The sixth cluster, depicted in sky blue, includes artificial intelligence (total link strength = 338; occurrences = 214), accounting profession, accounting education, and blockchain technology. Clusters seven, eight, and nine—depicted in orange, brown, and light purple—comprise 9, 7, and 2 terms, respectively, focused on risk management, deep learning, and big data analytics.

The analysis of keyword co-occurrence by average publication year highlights the temporal evolution of research themes. The blue nodes correspond to the earliest topics (around 2021), dominated by themes such as audit, accounting, audit quality, and neural networks, which laid the methodological and disciplinary foundations of the field. Gradually, around 2022 in green nodes, the research consolidated around central themes such as artificial intelligence, machine learning, blockchain, fintech, and risk management, which occupy a structural position in the network due to their strong co-occurrence with other terms. Finally,

the light green to yellow nodes, representing the most recent publications (2023), reveal the emergence of new research orientations, including deep learning ChatGPT, chatbots, decision support systems, and financial forecasting. These emerging themes reflect a shift towards more recent applications of artificial intelligence and automation in accounting and auditing, marking a new stage in the development of the field.

2) Keywords cloud:

Keywords play a crucial role in academic publications since they enhance the visibility and accessibility of research outputs within their disciplines, which in turn can improve citation rates. Recently, several studies have employed author keyword analysis to identify prevailing trends and emerging directions across different areas of research. (Agyekum & Ali, 2025).



Figure (7) : Word cloud

The word cloud highlights the most frequently occurring keywords in the dataset, with the size of each term reflecting its frequency in the reviewed documents. Machine learning, with 328 occurrences, emerges as the dominant theme, confirming its pivotal role in advancing the application of artificial intelligence in accounting and auditing. Artificial intelligence appears 259 times, and risk management 216 times, both standing out as major focal areas that illustrate how AI-driven approaches are increasingly leveraged to strengthen financial oversight and risk mitigation practices. Accounting, recorded 182 times, and auditing, with 120 mentions, further emphasise the disciplinary orientation of this research field, showing that AI methods are being directly integrated into core professional domains. Deep learning also appears as an emerging subfield within the broader AI and ML landscape, while keywords such as risk assessment, which appears 92 times, forecasting with 66

mentions, and decision making with 65, highlight the growing tendency to use AI not only as a technical tool but also as a driver of predictive analytics and strategic decision support in financial contexts.

3) Thematic map :

A thematic map, derived from author keywords, visually represents and organises the most pertinent research themes in a field by examining the co-occurrence and frequency of keywords used by authors in their publications. This map generally organises themes into quadrants according to their centrality (significance and interaction with other subjects) and density (development and internal coherence), including motor themes (well-developed and significant), niche themes (specialised and less central), emerging/declining themes (underdeveloped or diminishing), and basic themes (important but underdeveloped) (Alkhamash, 2023).

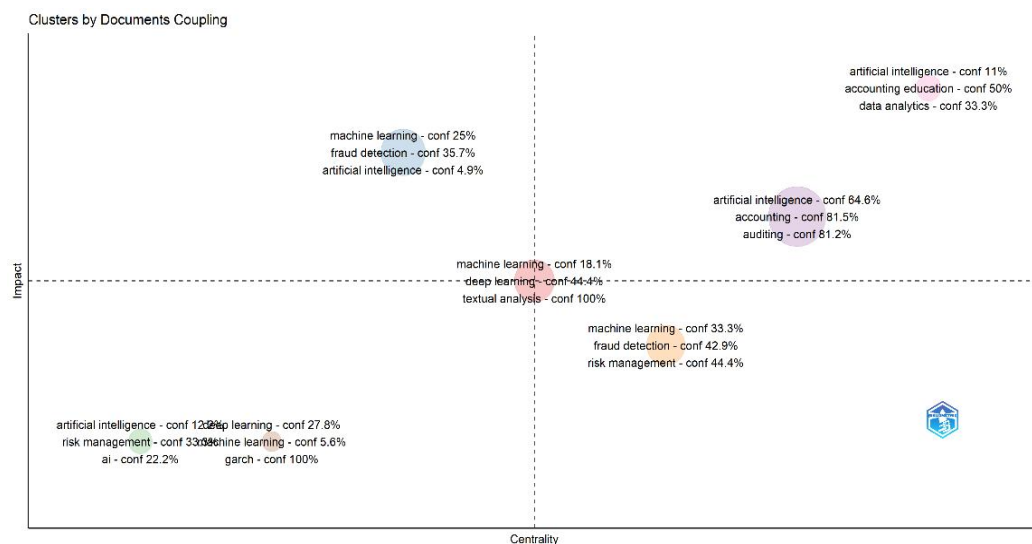


Figure (8): Author keywords thematic map

The thematic map reveals a structured research landscape with both consolidated and emerging areas. The dominant cluster, focused on artificial intelligence, accounting, and auditing, stands at the core of the field, as reflected by its high frequency (100), strong centrality (0.431), and significant impact (3.411). This centrality positions it as the backbone of scientific production, confirming that AI-driven approaches to auditing and accounting remain the primary concern of researchers. Alongside this, another highly promising cluster emerges: AI and data analytics in accounting education. Despite its smaller size (freq = 14), it shows the highest centrality (0.460) and the most substantial impact (4.039), suggesting that research on integrating AI into accounting curricula is gaining traction and shaping future directions in the discipline. Beyond these core and emergent themes, several specialised clusters illustrate how the field branches into applied domains and methodological supports. Fraud detection, appearing in two distinct clusters, plays a dual role: in Cluster 2 (machine learning–fraud detection–AI), it demonstrates high influence (impact = 3.636), while in Cluster 5 (machine learning–fraud detection–risk management), it takes on a transversal position with strong centrality (0.430) but lower impact (2.644). These results confirm that

fraud detection is both a specialised and a foundational application of AI in accounting research. At the methodological level, clusters dedicated to machine learning, deep learning, and textual analysis (Cluster 1) act as enabling technologies, with medium centrality and impact (3.063), supporting practical implementations. Conversely, more peripheral clusters, such as those connecting AI, deep learning, and advanced risk management models (e.g., GARCH), display low frequencies and negligible impact, indicating experimental yet not fully consolidated directions

VI-Conclusion:

From this study, we have concluded that The bibliometric analysis reveals a rapidly expanding field, with strong annual growth, high levels of collaboration, and diverse thematic orientations, confirming both the novelty of the research corpus and its significant scientific impact. We also identified several findings summarized as follows:

➤The annual scientific production shows a strong upward trajectory, with a marked acceleration from 2022 onwards, confirming the rapid and growing research interest in applying AI to accounting and auditing;

➤The scientific production on AI in accounting and auditing is disseminated across both multidisciplinary and specialised journals. Multidisciplinary outlets ensure broad visibility and impact, while specialised journals provide focused contributions that reinforce the disciplinary relevance of this research field;

➤The analysis of the most prolific authors reveals a contrast between their broad academic impact and specialised influence. H. Chen from the University of Arizona (United States) and S.K. Mangla from O.P. Jindal Global University (India) stand out for their overall impact, with an h-index of 80 and 76 respectively, while S. Chowdhury from TBS Business School (France) and H.K. Duan from Sacred Heart University (United States) lead in average citations per article (105.7 and 90.3) in the studied field;

➤The analysis of highly cited articles shows that research on AI in accounting and auditing is primarily focused on fraud detection, audit transformation, governance, blockchain integration, risk management, and ethical adoption. The exceptional impact of Han et al. (2023) suggesting that the convergence of AI and blockchain will shape future research directions;

➤The central insight drawn from the geographical analysis is that the United States leads the world in AI research in accounting and auditing, both in terms of volume and impact. China and the United Kingdom are both significant centers; the latter is notable for its robust production, while the former serves as a crucial worldwide connector. The network exhibits a genuinely global scientific discourse, with notable contributions from Australia, Europe, and Asia, despite the country's significant presence in the field;

➤The keyword co-occurrence analysis revealed a strong dominance of the keywords "artificial intelligence" and "machine learning," along with their strong linkage to domains related to accounting and auditing, such as financial accounting, classification, management accounting, audit quality, financial forecasting and fraud.

➤According to the word cloud analysis, the main themes in AI research for accounting and auditing include machine learning and artificial intelligence, with a particular focus on risk management, accounting, and auditing as key application domains. Predictive analytics and strategic decision support are gaining popularity in financial contexts, as evidenced by emerging fields such as deep learning, risk assessment, forecasting, and informed decision-making.

➤The thematic map reveals that AI in auditing and accounting is highly prevalent, influential, and fundamental to the discipline. In contrast, AI in accounting education is a rapidly growing area. The detection of fraud is an example of both core and specialised uses of artificial intelligence, manifesting in various clusters with distinct functions. Machine learning, deep learning, and textual analysis are important clusters of methods that provide crucial support. In contrast, advanced risk models on the periphery are still in the experimental stage and have limited impact.

V- Limitation:

This research has specific limitations. The data collection was solely dependent on the Scopus database, which does not encompass all academic periodicals. Consequently, pertinent contributions catalogued in alternative databases, such as WoS, may have been excluded. Furthermore, the latest publications from 2025 in Scopus were eliminated. The analysis has been restricted to journal papers in the domains of Business, Management, and Accounting, and limited to publications authored in English. This study utilised a bibliometric approach rather than content analysis.

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