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Artificial Intelligence (AI) Revolution in Accounting and Auditing Field: A Bibliometric Analysis

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ABSTRACT

Artificial Intelligence (AI) integration in accounting and auditing is transforming these fields by enhancing efficiency, accuracy, and strategic decision-making. AI automates routine tasks, supports complex financial assessments, and improves fraud detection and audit processes. However, its implementation also raises ethical and regulatory concerns, such as data privacy and job displacement. Clear procedures and guidelines are essential to maintain internal stability and maximize AI's value. This study aims to analyze the publication trends and citation metrics on AI in accounting and auditing while identifying the common research keywords in this area. It also identifies the main countries contributing research on this topic. The study is based on a bibliometric analysis of 105 articles from the Scopus database using the TITLE-ABS-KEY approach. In addition, the VOS Viewer software is used to create bibliometric networks and Harzing's Publish or Perish software is used to assess the citation metrics of the articles. The analysis shows that the number of publications on AI in accounting and auditing is increasing, especially between 2020 and 2023. The articles were cited 1968 times, which corresponds to an average of 18.74 citations per article. The results show that the most common keywords discussed in this area are artificial intelligence, accounting, auditing, blockchain, and machine learning, which can be grouped into 7 clusters. The United States, China, the United Kingdom, and Saudi Arabia are among the countries that contribute to publications in this area. To summarize, this article provides

important insights and publication trends into artificial intelligence in the area of accounting and auditing.

Keywords: Artificial Intelligence, Accounting, Auditing, Bibliometric Analysis, Digitalization.

INTRODUCTION

The integration of artificial intelligence (AI) in the fields of accounting and auditing is transforming traditional practices, offering unprecedented opportunities for efficiency, accuracy, and strategic decision-making. As AI technologies continue to evolve, their applications within these domains are expanding, ranging from automating routine tasks to providing advanced analytical capabilities that support complex financial assessments. Traditionally, accounting and auditing functions relied heavily on manual processes and human expertise. However, with the advancement of information technology (IT), there has been a significant shift in how these functions are performed. Recognizing the importance of IT, organizations, accountants, auditors, professional bodies, academics, and regulators have increasingly focused on enhancing accounting and auditing processes through technology [1]. Technological, regulatory, and economic changes will persist in challenging the profession's traditional methods and mindsets, which is beneficial. Accountants and auditors must quickly adapt to changes in user demand and the development of new and emerging metrics of organizational performance beyond traditional financial statements [2].

Using AI including machine learning, deep learning, big data analytics, data mining, and cloud computing in accounting and auditing practices has leveraged the possibility of processing massive volumes of financial data, facilitating the identification of patterns, trends, and anomalies [3]. The adoption of AI in accounting and auditing has the potential to revolutionize these professions. For instance, AI-driven tools can enhance the accuracy of financial reporting, improve fraud detection mechanisms, and streamline audit processes. [4] concludes that digitization in accounting facilitates communication among economic actors, ensuring business continuity during crises, and real-time information access. The decision to digitize is influenced by internal factors like organizational culture and external factors like telecommunications infrastructure. It shifts accountants' roles from record-keepers to strategic partners, enhancing overall economic performance.

However, despite these benefits, the implementation of AI also raises ethical and regulatory concerns, particularly regarding data privacy, job displacement, and algorithmic bias. Managers should establish clear procedures for employees to follow, ensuring guidelines are well understood. Without this, time and resources could be wasted, affecting business value. It is crucial for maintaining internal stability, as unclear leadership might cause staff to lose trust, leave, or resist new technologies, undermining AI's value [5]. In the short run, automation seems beneficial, but long-term negative consequences emerge. Automation is a priority across industries, with AI leading it. Operational excellence and skill development are crucial, as lacking skills hinder progress. Sustainability is central to all initiatives [6].

This study employs bibliometric analysis to map the landscape of AI research within accounting and auditing. By identifying key trends, influential authors, and prominent research themes, it highlights the most cited works, prolific contributors, and collaborative networks. The findings

from this analysis elucidate the current state of research and suggest potential directions for future studies. These insights will enhance our understanding of how AI is reshaping these fields and inform practitioners, researchers, and policymakers about the current and future implications of AI technologies.

LITERATURE REVIEW

Bibliometric Analysis

This technique originated in the early 20th century and has seen significant advancements over the decades. Bibliometric analysis is a powerful tool for assessing and understanding academic research. It provides valuable insights into publication trends, research impact, and collaboration patterns. Bibliometric analysis is a methodological approach used to quantitatively analyze academic literature and research output. This method can reveal trends in specific fields, identify influential works and authors, and map the development of research areas over time [7 -9]. Bibliometric analysis is gaining popularity in various disciplines including accounting and auditing fields. It has become a valuable tool for evaluating the development and influence of research within these disciplines.

[10] conducted a bibliometric and coding analysis to investigate the relationship between technology and disruption in accounting literature, with a specific focus on blockchain's impact on business processes and digital interactions. Similarly, [11] examined the scalability and business applications of blockchain within accounting and auditing, highlighting its potential to enhance transparency and efficiency. A study by [12] utilized bibliometric and content analysis to analyze the scholarly discussion on blockchain technology in accounting and auditing. They employed tools like the Bibliometrix R-package and VOSviewer for network visualization of keywords and bibliographic coupling. This study also identified research gaps, such as the need for comprehensive studies on blockchain's regulatory and governance aspects in accounting and the exploration of risks and challenges associated with new technologies in auditing (MDPI).

Bibliometric analysis offers a comprehensive and quantitative approach to understanding and evaluating the academic literature. Its helps researchers gain a deeper understanding of their fields, track the evolution of research topics, and assess the impact of their work. As scholarly databases and bibliometric tools continue to evolve, the use of bibliometric analysis in academic research is likely to expand, providing even greater insights into the complexities of scientific communication.

Artificial Intelligence (AI) in Accounting

The integration of artificial intelligence (AI) technologies has significantly transformed traditional accounting practices, introducing a range of efficiencies and capabilities that were previously unattainable. The adoption of AI in accounting has led to a significant reduction in manual tasks, allowing accountants to focus on more strategic activities and has increased productivity and accuracy in accounting practices [13-14].

AI has revolutionized accounting through the automation of repetitive and time-consuming tasks. Technologies such as robotic process automation (RPA) can handle functions like data entry, invoice processing, and payroll, which frees up accountants to focus on more strategic activities. For example, AI-powered systems can automatically categorize transactions,

reconcile accounts, and generate financial statements, significantly reducing the manual effort required in these processes [15]. AI technologies enhance data analysis capabilities by enabling the processing of vast amounts of data at unprecedented speeds. Machine learning algorithms can identify patterns and trends within financial data that might be missed by human analysis. This allows for more accurate forecasting, risk assessment, and decision-making. Predictive analytics, a subset of AI, can provide insights into future financial performance and help organizations make informed strategic decisions [16].

AI is also instrumental in improving the accuracy of financial reporting and ensuring compliance with regulatory standards. By minimizing human error and providing real-time data validation, AI helps ensure that financial records are accurate and up-to-date. Moreover, AI can assist in compliance by continuously monitoring transactions for anomalies and flagging potential issues for further investigation. This proactive approach to compliance helps organizations stay ahead of regulatory requirements and reduces the risk of costly errors and penalties [17]. The integration of AI in accounting supports strategic decision-making by providing deeper insights and more comprehensive analysis. For instance, AI can analyze market conditions, customer behavior, and operational data to inform budgeting and financial planning processes. This enables accountants and financial managers to make more informed decisions that align with the organization's strategic goals [18].

Real-world applications of AI in accounting include the use of chatbots for customer service, AI-driven financial advisory services, and the deployment of blockchain for secure and transparent transaction recording. Major accounting firms such as Deloitte, PwC, KPMG, and EY have invested heavily in AI technologies to enhance their service offerings and improve operational efficiency. These firms leverage AI to automate audit processes, perform complex financial analysis, and provide real-time insights to their clients [19].

Artificial Intelligence (AI) in Auditing

The development of artificial intelligence (AI) technologies has revolutionized auditing practices which offer numerous enhancements in efficiency, accuracy, and overall audit quality. These technologies, including machine learning (ML) and natural language processing (NLP), enable auditors to handle large volumes of data swiftly and accurately, improving their ability to detect anomalies and potential fraud. AI can automate routine audit tasks such as data entry, transaction testing, and compliance checks. This automation allows auditors to focus on higher-value activities that require professional judgment and insight. By reducing the time spent on manual processes, AI tools enhance the overall efficiency of the audit process. According to [20], AI technologies enable auditors to perform real-time monitoring and continuous auditing, allowing for the prompt identification of risks and preventive measures. AI's ability to analyze vast amounts of data with high precision helps in identifying patterns and anomalies that might go unnoticed by human auditors. This capability is crucial for detecting errors, irregularities, and fraudulent activities. AI-powered tools improve the accuracy of audits by providing deeper insights into financial data, thus enhancing the reliability of audit outcomes [20]. The use of AI in auditing has been shown to improve audit quality by enhancing the effectiveness of fraud detection processes [21]. The adoption of AI in auditing can lead to cost reductions by enabling firms to operate with fewer employees while maintaining high audit quality. [22] indicates that the integration of AI allows audit firms to improve processes, resulting in lower audit fees and a decrease in the junior workforce, as routine tasks become automated. AI has the potential to

significantly enhance audit quality by enabling more comprehensive data analysis and improving the accuracy of risk assessments. AI can also help audit firms leverage data analytics to provide better insights into an entity's operations and associated risks, leading to improved audit effectiveness and communication [22].

METHODOLOGY

Using Scopus as the database, this research utilized the search query (TITLE-ABS-KEY (AI OR ARTIFICIAL INTELLIGENCE AND ACCOUNTING AND AUDITING) AND PUBYEAR > 2000 AND PUBYEAR < 2024), resulting in the acquisition of 105 documents. Scopus database is selected due to its reputable and reliable source for scholarly research, and it provides a comprehensive index of numerous scientific publications. The search was conducted in July 2024 and a detailed summary of all queries is depicted in the flow chart shown in Figure 1.

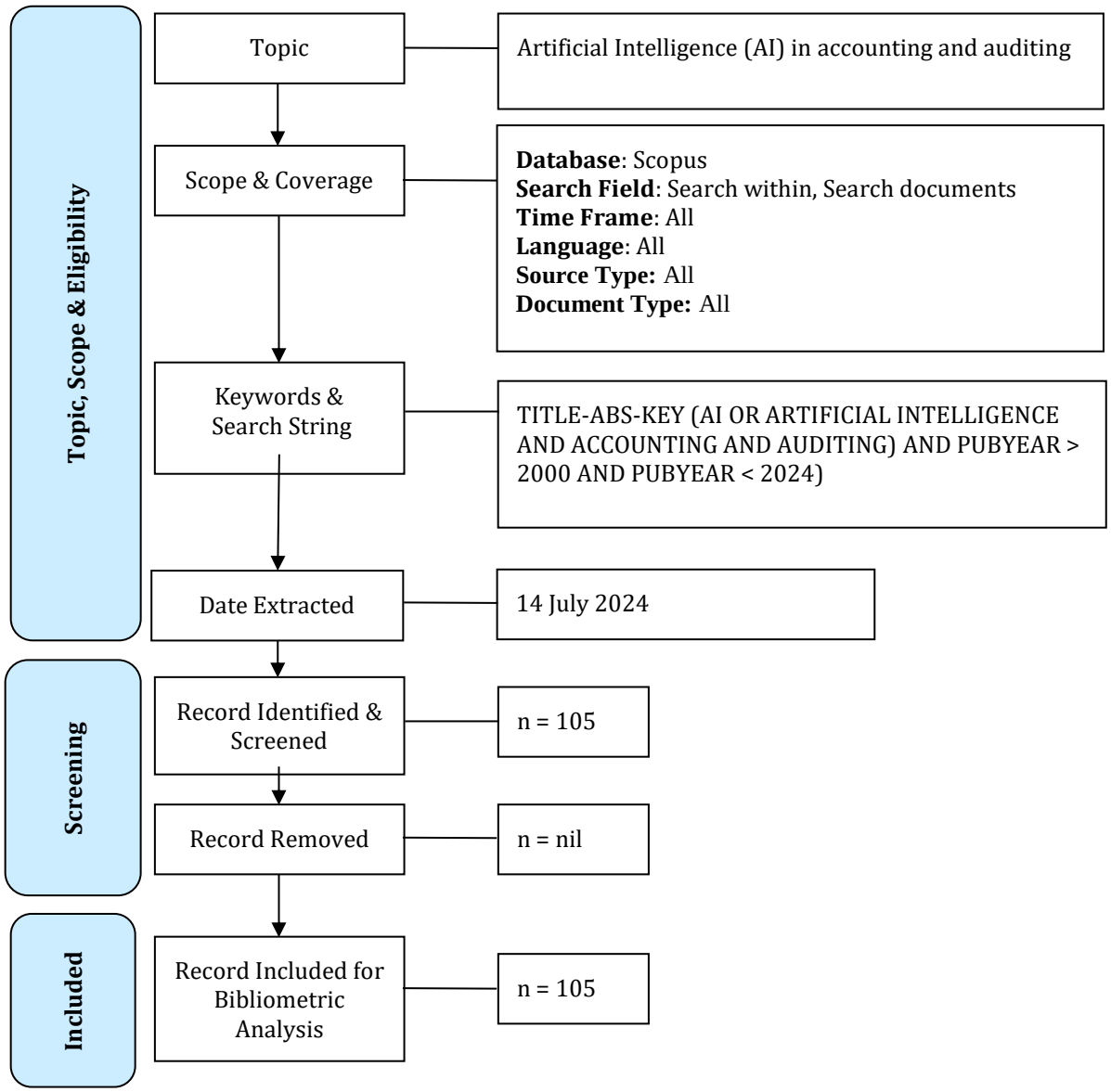

Figure 1: Flow diagram of the search strategy
Source: [23-24]

The retrieved data was analyzed using an Excel template for basic analysis or document profiling. The data were then summarized based on document type, source language, and publication patterns. A citation analysis was conducted to determine the total number of citations, average citations per publication, and average citations per cited publication, aiming to identify highly cited publications and influential authors in the field. Additionally, VOSviewer was employed for network visualization. It is utilized to create charts and diagrams reflecting the frequency of published materials, analysed using Microsoft Excel. An analysis of frequently occurring keywords was performed to identify clusters of themes and emerging areas of study in artificial intelligence in accounting and auditing. Based on the bibliometric data, this study offers valuable insights into the research area's subject matter, helps identify potential research questions, and tracks the evolution of research topics over time. Meanwhile, Harzing's Publish or Perish software was used to identify the most highly cited article.

RESULTS AND DISCUSSION

Documents Profiles

This study analyzed the types of documents, languages, and subject areas of the publications to offer meaningful insights into the scope and extent of research in AI within the fields of Accounting and Auditing.

Table 1 displays the categories of sources published by different researchers. The types of sources produced by these scholars are detailed in Table 1. The findings indicate that the majority of publications are in the form of articles (44.76%), conference paper (34.29%), and book chapter (12.38%). Other documents contributed to less than 5% were in the form of book, editorial, note and review with 1.90% and conference review with 0.95%.

Table 1: Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	47	44.76
Conference Paper	36	34.29
Book Chapter	13	12.38
Book	2	1.90
Editorial	2	1.90
Note	2	1.90
Review	2	1.90
Conference Review	1	0.95
Total	**105**	**100.00**

Table 2 presents the number of publications sorted by language. According to data from Scopus, all 105 documents are in English. This corresponds with expectations, as English-language journals are the most common and vital for researchers in the global academic community.

Table 2: Languages

Language	Total Publications (TP)*	Percentage (%)
English	105	100.00
Total	**105**	**100.00**

Table 3 shows the number of documents published by subject area in the Scopus database. The search resulted in 49 papers in the field of Business, Management and Accounting, 47 papers in the Computer Science, and 32 papers in the Economics, Econometrics and Finance. Meanwhile, the subject areas of Social Sciences, Engineering, and Decision Sciences contributed 19, 16, 14 total publications, respectively. Other subject areas that contributed to less than ten total publications include Energy, Environmental Science, Arts and Humanities, Mathematics, Physics and Astronomy, Medicine, Materials Science, and Psychology. These results indicate that the topic of AI in Accounting and Auditing is highly pertinent in the realm of Business, Management and Accounting.

Table 3: Subject Area

Subject Area	Total Publications (TP)	Percentage (%)
Business, Management and Accounting	49	46.67%
Computer Science	47	44.76%
Economics, Econometrics and Finance	32	30.48%
Social Sciences	19	18.10%
Engineering	16	15.24%
Decision Sciences	14	13.33%
Energy	10	9.52%
Environmental Science	9	8.57%
Arts and Humanities	6	5.71%
Mathematics	6	5.71%
Physics and Astronomy	5	4.76%
Earth and Planetary Sciences	3	2.86%
Medicine	2	1.90%
Materials Science	1	0.95%
Psychology	1	0.95%

Publication Trends

Table 4 demonstrates that interest in this area of expertise has grown over the past 22 years. The data shows a significant growth in publications from 2012 onward, indicating an increasing interest and research activity in the field. There was a substantial increase in the number of publications in 2012, with 43 publications, which accounts for 11.62% of the total cited publications. Furthermore, total citations in 2012 were also highest at 656. From 2002 to 2004 and in 2011, there was only 1 publication each year. Meanwhile, there were fluctuations in the number of publications from 2016 to 2019, with the number varying from 2 to 6 publications per year. Additionally, the recent years (2020-2023) reflect a steady increase in both the number of publications and overall citations, though the average citations per publication have become more consistent. The persistent growth in this trend highlights the ongoing significance of AI in accounting and auditing, emphasizing that various research areas require further investigation in the future.

Table 4: Year of Publication

Year	TP	NCP	TC	C/P	C/CP
2002	1	0.95%	1	0	0.00
2003	1	0.95%	1	48	48.00
2004	1	0.95%	1	46	46.00

2011	1	0.95%	1	0	0.00
2012	43	11.62	656	164	164
2016	2	1.90%	2	310	155.00
2017	1	0.95%	1	256	256.00
2018	2	1.90%	2	30	15.00
2019	6	5.71%	6	122	20.33
2020	17	16.19%	12	525	30.88
2021	20	19.05%	14	260	13.00
2022	22	20.95%	21	193	8.77
2023	31	29.52%	18	178	5.74

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication

Publications by Authors

Table 5 ranks the top 10 authors by the number of articles published in the field of AI in accounting and auditing. According to the data, Hamdan, A. from Bahrain is the leading author with four published articles, each of which has been cited. Meanwhile, Vasarhelyi, M.A., with three publications, has the highest average citation rate of 76.3 citations per paper among the listed authors. This exceptionally high citation rate underscores the substantial influence and impact of Vasarhelyi, M.A.'s research in the field. Figure 1 also illustrates the co-authorship among these authors and their network connections with others. This network map visually depicts the relationships between authors in AI in accounting and auditing based on their publication connections. The color shading on the map represents collaborative clusters, while the lines connecting authors denote their co-authorship.

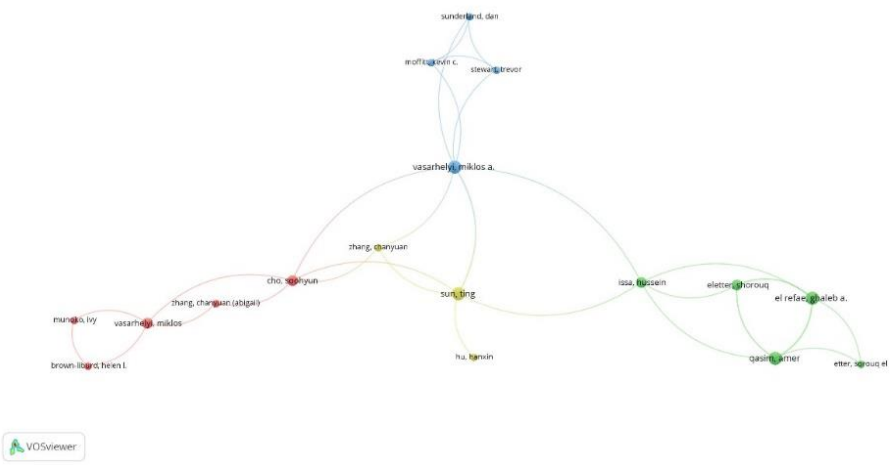

Figure 1: Network visualization map of the co-authorship by authors

Table 5: Most Productive Authors

Author's Name	Affiliation	Country	TP	NCP	TC	C/P	C/CP
Hamdan, A.	Ahlia University	Bahrain	4	4	5	1.25	1.25
El Refae, G.A.	Al Ain University	United Arab Emirates	3	2	5	1.67	2.50
Faccia, A.	University of Birmingham	United Kingdom	3	3	162	54.00	54.00
Qasim, A.	Al Ain University	United Arab Emirates	3	2	5	1.67	2.50
Sun, T.	The College of New Jersey	United States	3	3	226	75.33	75.33
Vasarhelyi, M.A.	Rutgers University-Newark	United States	3	3	229	76.33	76.33

URL: http://dx.doi.org/10.14738/assrj.119.2.17402

Borth, D.	University of St. Gallen	Switzerland	2	2	8	4.00	4.00
Cazazian, R.	Bucharest University of Economic Studies	Bucharest	2	2	11	5.50	5.50
Chi, D.J.	Chinese Culture University Taiwan	Taiwan	2	2	15	7.50	7.50
Cho, S.	Rutgers University-Newark	United States	2	2	69	34.50	34.50

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

Publications by Countries

Analysing publications by country in bibliometric studies provides useful insights into the global research panorama. It helps to identify the leading nations in terms of research productivity and provides information on international cooperation between countries. Table 6 shows the top 10 countries that contributed to the publications. The United States contributed the highest TP of 19 (18.10%), followed closely by China and United Kingdom with TP of 13 (12.38%) and 8 (7.62%) respectively. Saudi Arabia and United Arab Emirates contributed equal TP with 6 (5.71%), followed by Bahrain, India, Indonesia, Romania and Taiwan with TP of 5 (4.76%) each. The results show that artificial intelligence has been accepted worldwide as part of the accounting industries.

Additionally, Figure 2 shows a network map with five different colored clusters. These clusters represent countries that frequently collaborate on research, indicating strong cooperation between them. The size of the nodes suggests that some countries have published more papers than others. The map also shows which countries are the main contributors in each cluster, based on the size of the circles. The United States stands out as the strongest connection in this field.

Table 6: Top 20 Countries contributed to the publications

Country	TP	%
United States	19	18.10%
China	13	12.38%
United Kingdom	8	7.62%
Saudi Arabia	6	5.71%
United Arab Emirates	6	5.71%
Bahrain	5	4.76%
India	5	4.76%
Indonesia	5	4.76%
Romania	5	4.76%
Taiwan	5	4.76%

Notes: TP=total number of publications.



Figure 2: Worldwide scientific production indexed by Scopus

Citation Metrics

To demonstrate the impact and significance of the research field, citation metrics provide a quantitative measure of research impact, enhancing the visibility and perceived value of the reseach in the academic community [25]. According to citation metrics from the Scopus database (see Table 7), the 105 documents have been cited 1,962 times over 22 years. This results in an average of 815.76 citations per author, with 49.41 papers per author and 2.82 authors per paper.

Table 7: Citations metrics

Metrics	Data
Papers	105
Number of Citations	1968
Years	22
Citations per Year	89.45
Citations per Paper	18.74
Citations per Author	815.76
Papers per Author	49.41
Authors per Paper	2.82
h-index	22
g-index	43

Highly Cited Documents

Highly cited articles in bibliometric analysis are important because they show the most influential ideas, methods, and real-world applications in a particular research field. The results help researchers find key studies that have shaped the field and highlight significant historical contributions to knowledge. Further bibliometric analysis is summarized in Table 8 using Harzing's Publish or Perish software. The results show the top 20 highly cited articles, with the most cited article by Kokina and Davenport, titled "The emergence of artificial intelligence: How automation is changing auditing". The article was published in "Journal of Emerging Technologies in Accounting" in 2017. Another prominently cited article published in "Journal of Emerging Technologies in Accounting" by Issa, Sun and Vasarhelyi in 2016, titled "Research ideas for artificial intelligence in auditing: The formalization of audit and workforce supplementation". Besides, the articles published by other authors - Munoko, Brown-Liburd and Vasarhelyi in 2020; Fisher, Garnsey and Hughes in 2016; Mosteanu and Faccia in 2020; and, Han, Shiwakoti, Jarvis, Mordi and Botchie in 2023 received 169, 126, 116, and, 110 citations, respectively. Other articles received less than 100 citations, with the lowest citations of 28 for the article entitled "Explainable Artificial Intelligence (XAI) in auditing" published in "International Journal of Accounting Information Systems" by Zhang, Cho and Vasarhelyi in 2020.

Table 8: Top 20 highly cited articles

No.	Authors	Title	Source	Cites	Cites per Year
1	J. Kokina, T.H. Davenport (2017)	The emergence of artificial intelligence: How automation is changing auditing	Journal of Emerging Technologies in Accounting	256	36.57

2	H. Issa, T. Sun, M.A. Vasarhelyi (2016)	Research ideas for artificial intelligence in auditing: The formalization of audit and workforce supplementation	Journal of Emerging Technologies in Accounting	184	23
3	I. Munoko, H.L. Brown-Liburd, M. Vasarhelyi (2020)	The Ethical Implications of Using Artificial Intelligence in Auditing	Journal of Business Ethics	169	42.25
4	I.E. Fisher, M.R. Garnsey, M.E. Hughes (2016)	Natural Language Processing in Accounting, Auditing and Finance: A Synthesis of the Literature with a Roadmap for Future Research	Intelligent Systems in Accounting, Finance and Management	126	15.75
5	N.R. Mosteanu, A. Faccia (2020)	Digital systems and new challenges of financial management – fintech, XBRL, blockchain and cryptocurrencies	Quality - Access to Success	116	29
6	H. Han, R.K. Shiwakoti, R. Jarvis, C. Mordi, D. Botchie (2023)	Accounting and auditing with blockchain technology and artificial Intelligence: A literature review	International Journal of Accounting Information Systems	110	110
7	H. Damerji, A. Salimi (2021)	Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting	Accounting Education	81	27
8	M. Gotthardt, D. Koivulaakso, O. Paksoy, C. Saramo, M. Martikainen, O. Lehner (2020)	Current state and challenges in the implementation of smart robotic process automation in accounting and auditing	ACRN Journal of Finance and Risk Perspectives	71	17.75
9	M. Kend, L.A. Nguyen (2020)	Big Data Analytics and Other Emerging Technologies: The Impact on the Australian Audit and Assurance Profession	Australian Accounting Review	68	17
10	J. Mökander, L. Floridi (2021)	Ethics-Based Auditing to Develop Trustworthy AI	Minds and Machines	58	19.33
11	P. Roszkowska (2021)	Fintech in financial reporting and audit for fraud prevention and safeguarding equity investments	Journal of Accounting and Organizational Change	54	18
12	Y. Semet, E. Lutton, P. Collet (2003)	Ant colony optimisation for E-learning: Observing the emergence of pedagogic suggestions	2003 IEEE Swarm Intelligence Symposium, SIS 2003 - Proceedings	48	2.29
13	N. Zhao, D.C. Yen, I.-C. Chang (2004)	Auditing in the e-commerce era	Information Management and Computer Security	46	2.3
14	S. Cho, M.A. Vasarhelyi, T. Sun, C. Zhang (2020)	Learning from machine learning in accounting and assurance	Journal of Emerging Technologies in Accounting	41	10.25
15	A. Faccia, M.Y.K. Al Naqbi, S.A. Lootah (2019)	Integrated cloud financial accounting cycle. How artificial intelligence, blockchain, and XBRL will change the accounting, fiscal and auditing practices	ACM International Conference Proceeding Series	41	8.2
16	A. Fedyk, J. Hodson, N. Khimich, T. Fedyk (2022)	Is artificial intelligence improving the audit process?	Review of Accounting Studies	39	19.5
17	O.M. Lehner, K. Ittonen, H. Silvola, E.	Artificial intelligence-based decision-making in accounting and auditing: ethical challenges and normative thinking	Accounting, Auditing and Accountability Journal	34	17

	Ström, A. Wührleitner (2022)				
18	C.R.G. Popescu, V.C. Banţa (2019)	Performance evaluation of the implementation of the 2013/34/EU directive in Romania on the basis of corporate social responsibility reports	Sustainability (Switzerland)	33	6.6
19	A. Zemánková (2019)	Artificial intelligence and blockchain in audit and accounting: Literature review	WSEAS Transactions on Business and Economics	29	5.8
20	C.A. Zhang, S. Cho, M. Vasarhelyi (2022)	Explainable Artificial Intelligence (XAI) in auditing	International Journal of Accounting Information Systems	28	14

Top Keywords

The keyword analysis is important as it evaluates the frequency of various keywords. Based on table below, “Artificial Intelligence” is the most frequently used keyword with 70 occurrences, followed by "Auditing” and “Accounting" with 38 and 23 occurrences, respectively. “Blockchain” and “Machine Learning” have 14 and 11 occurrences, respectively. Keywords with fewer than 10 occurrences include “Big Data” and “Finance,” each with 9 occurrences, and “Financial Statements,” with 7 occurrences. The keywords analysis is reported in Table 9.

The examination of the co-occurrence of the author's keywords listed in the publications identifies key research topics within related fields. As illustrated in Figure 3, the network visualization map presents a co-occurrence network of author keywords pertinent to AI in accounting and auditing. The map shows groups of keywords represented by circles in different colours. The visualisation of the network is consistent with the analysis of the frequency of keywords in Table 9, with the largest circle representing the top three keywords: Artificial Intelligence, Auditing and Accounting.

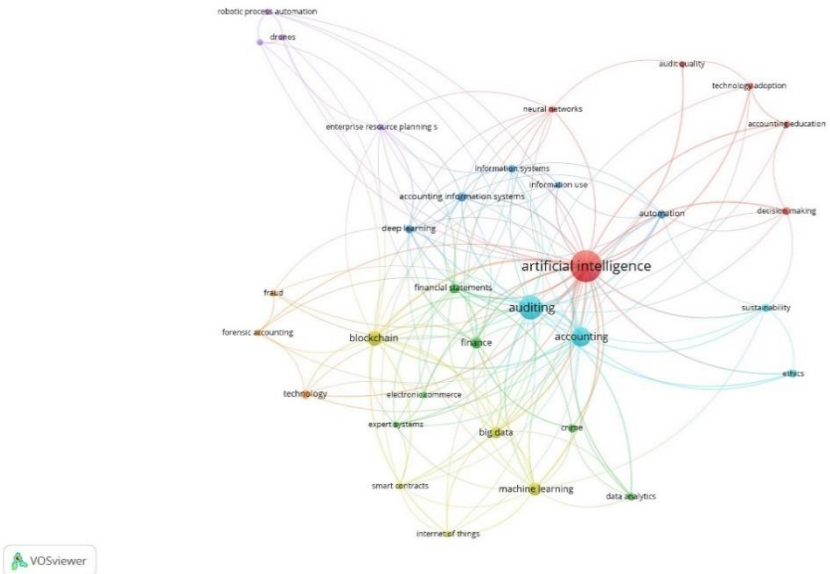

Figure 3: Network Visualization Map of The Co-Occurrence by Author’s Keywords

Table 9: Top author's keywords

Author Keywords	Total Publications (TP)	Percentage (%)
Artificial Intelligence	70	66.67%
Auditing	38	36.19%
Accounting	23	21.90%
Blockchain	14	13.33%
Machine Learning	11	10.48%
Big Data	9	8.57%
Finance	9	8.57%
Financial Statements	7	6.67%
Accounting Information Systems	6	5.71%
Automation	5	4.76%

In addition, the clusters generated by VOSviewer during the co-occurrence analysis provide useful insights to gain a deeper understanding by identifying keywords that are related to each other and to plan the direction of future research activities. The detailed analysis of the clusters identifies seven clusters of 33 items based on the analysis of the co-occurrence of the author's keywords, as shown in Table 10. Each cluster highlights important topics and points to a specific area of research.

Table 10: Cluster of the co-occurrence analysis of author's keywords

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7
Accounting Education	Crime	Accounting Information System	Big Data	Drones	Accounting	Forensic Accounting
Artificial Intelligence	Data Analytics	Automation	Blockchain	Enterprise Resource Planning	Auditing	Fraud
Audit Quality	Electronic Commerce	Deep Learning	Internet of Things	Real-Estate Accounting	Ethics	Technology
Decision Making	Expert Systems	Information Systems	Machine Learning	Robotic Process Automation	Sustainability	
Neural Networks	Finance	Information Use	Smart Contacts			
Technology Adoption	Financial Statements					

CONCLUSION

In conclusion, the integration of artificial intelligence (AI) in accounting and auditing is profoundly transforming these fields, offering significant improvements in efficiency, accuracy, and strategic decision-making. This bibliometric analysis reveals a growing body of literature that highlights the increasing importance and application of AI technologies from 2000 to 2023. The analysis, which included 105 articles cited 1968 times, identified key themes such as artificial intelligence, blockchain, and machine learning, grouped into seven clusters. The study also points out the leading countries in AI research, including the United States, China, the United Kingdom, and Saudi Arabia.

This study provides valuable insights into the current state of AI research in accounting and auditing and highlights potential future research directions. As AI continues to evolve, it will be essential for researchers, practitioners, and policymakers to address these emerging challenges and leverage AI's potential to enhance the accounting and auditing professions further. By mapping the landscape of AI research in these fields, this bibliometric analysis not only underscores the transformative impact of AI but also sets the stage for future studies to explore the nuanced implications and applications of AI technologies in accounting and auditing.

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