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BIBLIOMETRIC ANALYSIS OF RESEARCH ON ARTIFICIAL INTELLIGENCE IN ACCOUNTING

This article presents a bibliometric analysis methodology focused on the application of artificial intelligence (AI) in accounting, conducted using international scientific databases such as Scopus, Web of Science, and Google Scholar, along with the VOSviewer analytical tool. The originality of the research lies in the systematization of approaches to the use of AI in automating accounting processes, enhancing the accuracy of financial control, and improving the efficiency of managerial decision-making.

A total of 603 scientific publications were reviewed, with 269 highly cited articles selected from the Scopus database. The results demonstrate a steady increase in interest toward digital technologies in accounting, particularly in the automation of routine operations, digitization of financial reporting, internal auditing, tax accounting, and financial risk forecasting.

Special attention is given to recent trends reflecting the expanding scope of AI in accounting and control. The study concludes by highlighting the potential for further research into the application of AI across various segments of accounting, including a comparative analysis of its impact on accounting efficiency in small and large businesses, as well as the assessment of risks associated with AI implementation in financial systems. Given the limited exploration of accounting digitalization in Kazakhstan, this area offers a promising direction for future academic inquiry.

Keywords: artificial Intelligence, accounting, accounting automation, bibliometric analysis.

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Бухгалтерлік есептегі жасанды интеллектті зерттеулердің библиометрлік талдауы

Бұл мақалада бухгалтерлік есепте жасанды интеллектіні (ЖИ) қолдануға арналған библиометриялық талдау әдістемесі ұсынылады. Зерттеу Scopus, Web of Science және Google Scholar халықаралық ғылыми дерекқорларының негізінде және VOSviewer аналитикалық құралы арқылы жүргізілді. Зерттеудің бірегейлігі – есептік процестерді автоматтандыруда, қаржылық бақылау дәлдігін арттыруда және басқарушылық шешім қабылдау тиімділігін жақсартуда ЖИ-ді қолдану тәсілдерін жүйелеуде болып табылады.

Барлығы 603 ғылыми жарияланым қарастырылып, олардың ішінен Scopus дерекқорындағы дәйексөзі жоғары 269 мақала іріктеліп алынды. Зерттеу нәтижелері бухгалтерлік есеп саласында цифрлық технологияларға деген қызығушылықтың тұрақты түрде артып келе жатқанын көрсетеді. Әсіресе, күнделікті операцияларды автоматтандыру, есептілікті цифрландыру, ішкі аудит, салық есебі және қаржылық тәуекелдерді болжау салалары ерекше назарда.

Соңғы жылдардағы үрдістерге, яғни ЖИ-дің есеп және бақылау жүйелеріндегі қолдану аясының кеңеюіне ерекше көңіл бөлінеді. Қорытынды бөлімде ЖИ-дің бухгалтерлік есептің әртүрлі сегменттеріндегі қолданылуын, оның ішінде шағын және ірі бизнеске әсерін салыстырмалы талдау, сондай-ақ қаржылық жүйелерге енгізуден туындайтын тәуекелдерді бағалау бойынша болашақ зерттеулердің өзектілігі атап өтіледі. Қазақстанда бухгалтерлік есепті цифрландыру деңгейінің жеткіліксіз зерттелуін ескере отырып, бұл бағыт келешегі зор ғылыми бағыт ретінде ұсынылады.

Түйін сөздер: жасанды интеллект, бухгалтерлік есеп, бухгалтерлік есепті автоматтандыру, библиометриялық талдау.

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Библиометрический анализ исследований: искусственный интеллект в бухгалтерском учете

В статье представлена методология библиометрического анализа применения искусственного интеллекта в бухгалтерском учете, выполненного с использованием международных научных баз данных Scopus, Web of Science и Google Scholar, а также аналитического инструмента VOSviewer. Оригинальность исследования заключается в систематизации подходов к использованию ИИ в автоматизации учетных процессов, повышении точности финансового контроля и эффективности управленческого принятия решений.

В рамках анализа было изучено 603 научных публикации, из которых 269 статей с наибольшей цитируемостью были отобраны из базы данных Scopus. Результаты демонстрируют устойчивый рост интереса к цифровым технологиям в бухгалтерии, особенно в сфере автоматизации рутинных операций, цифровизации отчетности, внутреннего аудита, налогового учета и прогнозирования финансовых рисков.

Особое внимание уделяется трендам последних лет, свидетельствующим о расширении тематики ИИ в учете и контроле. В заключении подчеркивается перспективность дальнейших исследований в области применения ИИ в различных сегментах бухгалтерского учета, включая сравнительный анализ эффективности внедрения ИИ в организациях малого и крупного бизнеса, а также изучение рисков цифровизации финансовых систем. Учитывая недостаточный уровень разработанности темы в Республике Казахстан, данное направление представляет собой актуальный научный вектор.

Ключевые слова: искусственный интеллект, бухгалтерский учет, автоматизация бухгалтерского учета, библиометрический анализ.

Introduction

In recent decades, accounting and financial control have undergone significant changes under the influence of digital technologies and artificial intelligence (AI). The development of automated systems, machine learning, and analytical algorithms has led to a significant transformation of traditional accounting processes. The COVID-19 pandemic served as the main catalyst for the industry-wide shift to online platforms. Modern accounting systems are increasingly integrating artificial intelligence (AI) technologies, driven by the desire to automate processes, minimize human errors, and enhance overall work efficiency. According to research findings, this process facilitates the rapid digital transformation of the industry and supports its effective adaptation to emerging technological conditions and innovations. (Altawalbeh & Al Frijat, 2025).

Artificial intelligence (AI) is a rapidly evolving technology with the potential to significantly transform various industries, including the field of accounting. In accounting, AI is being used to improve the efficiency of financial data processing, enhance the accuracy of calculations, automate audit procedures, and detect fraudulent activities. Empirical studies show that the leading global firms – KPMG, PwC, EY, and Deloitte – are actively investing in technological innovation and integrating AI into different aspects of their accounting and auditing operations. (Tandiono, 2023).

To effectively integrate artificial intelligence (AI) into accounting, it is important not only to develop new technologies, but also to assess their impact on the efficiency of accounting processes, the accuracy of financial calculations, and the automation of routine tasks. Currently, in order to increase the efficiency of accounting of economic entities, many of them are actively implementing artificial intelligence in order to reduce costs and reduce the risk of human error. At the same time, the digital transformation of accounting is accompanied by certain requirements. These include cybersecurity issues, as well as the need to train and retrain specialists in new digital tools. In the context of rapid digital progress, there is an increasing need to develop an integrated scientific approach to studying the impact of AI on accounting and control mechanisms of economic entities. The bibliometric analysis of scientific publications on this topic acquires special weight, allowing us to systematize existing research, identify key areas and assess the dynamics of scientific interest.

Despite these global developments, the level of AI adoption and research in Kazakhstan's accounting systems remains limited. According to the Concept for the Development of Artificial Intelligence in the Republic of Kazakhstan for 2024–2029, the government recognizes the importance of AI integration in finance, public services, and education, but practical implementation is still at an early stage (Ministry of Digital Development, 2024). This makes it particularly relevant to examine global research trends and assess Kazakhstan's position within them.

In recent years, the international scientific databases Scopus and Web of Science have recorded a visible increase in the number of publications devoted to the digitalization of accounting of economic entities. This growth shows the increasing attention of researchers to the issues of introducing digital technologies into accounting practice and underlines the relevance of this topic in the scientific community. In this regard, the aim of the present study is to conduct a bibliometric analysis of scientific works dedicated to AI in accounting, to identify key research directions, assess the dynamics of publication activity, and determine the most promising vectors for further development in this field.

Literature review

Alan Turing emerged as one of the pioneering scholars to undertake comprehensive investigations in the domain he termed "machine intelligence." (Turing, 1956). The phrase "artificial intelligence" was initially introduced during the Dartmouth Conference in the year 1956, thereby establishing "Artificial Intelligence Research" as a distinct academic discipline (Russell, 2021), a development attributable to the endeavors of scholars now regarded as the pioneers of this domain: John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon (Kaplan, 2022). Their work laid the foundation for further development of AI research, leading to its active implementation in various areas, including accounting.

Thus, the works of Amelia A. and Baldwin-Morgan emphasize the need for the integration of AI into educational programs in accounting. The authors emphasize that the training of future specialists should take into account the integration of technologies. It is considered how AI can be used for teaching accounting, including in the context of automated data analysis, financial forecasting, and fraud detection. The author notes that technologies such as natural language processing (NLP) and neural network models can help students better analyze financial statements (Baldwin-Morgan, 1995). Similar ideas resonate in the research of White Jr and Clinton E., who consider AI and expert systems as tools for automating logically complex tasks and supporting decision-making in the fields of finance and auditing. They emphasize the importance of using AI where traditional analytical methods prove insufficient (White, 1995). In turn, Duffy (2018) complements this vision by emphasizing the application of machine learning to automate routine tasks, improve reporting accuracy, and free up accountants' time for strategic tasks. Particular attention in the literature is also given to the practical context: in the study by Medyukha E.V. Kovaleva E.A. (2023), it is emphasized that despite the widespread use of software solutions such as 1C, many accounting processes are still carried out manually. The author advocates for the implementation of AI as a means to increase accuracy and reduce labor costs in everyday accounting practices. All the mentioned researchers agree that artificial intelligence is not just an auxiliary tool, but a key technology that transforms both the content and format of an accountant's work – from educational training to practical application in a corporate environment.

The originality of this study is grounded in the examination of scholarly literature pertaining to the utilization of artificial intelligence within the field of accounting. As part of the study, the most relevant and promising directions for the development of AI in this field have been identified, taking into account current trends in the digital transformation of accounting processes. The object of the study is scientific publications registered in the Scopus and Web of Science databases, dedicated to the automation of accounting with the use of AI.

Bibliometric indicators have become the basis for evaluating scientific publications, their impact, and citation rates. The foundations of bibliometrics were laid by Paul Otlet and Samuel Clement Bradford in the early 20th century. However, the key concepts of assessing scientific productivity and citation were developed by Eugene Garfield in the mid-20th century.

Bibliometric indicators serve as a representation of the degree of scientific engagement and efficacy of both theoretical and practical investigations within this domain. This emergent methodology of

quantitative analysis pertaining to the scientific discipline, employed in the exploration of artificial intelligence within the context of accounting, has theoretically elucidated the influence of the most pivotal scientific sources over the preceding quarter-century on the advancement of this field. The practical significance of bibliometric literature assessment lies in the formation of a structured bibliographic database of relevant studies, as well as in the targeted development of scientometric analysis of this topic. The abundance of relevant publications indexed in Scopus, Web of Science, and Google Scholar further validates the topicality and practical relevance of the present study.

Methodology

Within the framework of this research work, a bibliometric analysis of scientific publications related to the use of artificial intelligence in the field of accounting was carried out. The research is aimed at identifying key scientific areas, identifying the most influential authors and publications, as well as analyzing current trends and existing problems in this field. The inquiry included the following stages:

In the context of this research endeavor, a bibliometric examination of scholarly articles focused on the utilization of artificial intelligence within the domain of accounting was performed. The collection of relevant scientific articles was carried out in the international database Scopus, Web of Science, and Google Scholar where the following English keywords were used: “Artificial Intelligence in Accounting,” “Machine Learning in Finance,” “Automation in Accounting,” “AI-based Financial Auditing.” The investigation encompassed a comprehensive examination of scholarly contributions by the foremost experts in the discipline, peer-reviewed journals, and empirical research scrutinizing the effects of artificial intelligence technologies on accounting practices, auditing methodologies, financial data management, and the automation of accounting operations. An examination of article citations from 2000 to 2025 revealed the most significant publications and research trends. During the investigation, 603 papers out of 340 publications were located; 269 of these highly referenced articles were chosen based on subject similarity for further analysis.

At the second stage, for visualizing the obtained data, databases analytics were used, and for keyword analysis, identifying thematic clusters, and constructing bibliometric maps, the software tool VOSviewer was applied. Using this program, a selection of scientific sources was conducted taking into account their authority, significance, and relevance. Special attention was paid to the citation level of the publications and their impact on further research (Bejker, 2014)

The next step was to identify the primary methodological methods and topic directions in the field of AI in accounting by conducting a citation analysis, which is a crucial component of bibliometric research, as well as a content analysis of publications. This methodology demonstrated that it was possible to obtain a comprehensive understanding of the current state of research and form scientifically sound conclusions.

Results and discussion

To ensure methodological transparency, the article selection process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. Initially, a total of 659,438 documents were retrieved from Scopus, Web of Science, and Google Scholar based on the term “artificial intelligence” in the title, abstract, and keywords. The search was refined to focus on “artificial intelligence in accounting,” resulting in 2,873 articles. The selection process is illustrated in Figure 1, adapted in accordance with PRISMA guidelines.

Although the initially recognized corpus of academic publications appeared to be relevant to the designated topic, a considerable proportion of these works merely engaged with the research question in a constrained manner. In this framework, an exhaustive selection of scholarly literature was conducted, concentrating on those investigations that most comprehensively and directly interact with the research subject, thereby enabling the construction of a literature foundation that aligns precisely with the aims and objectives of the inquiry. As a result, a total of 269 indexed articles were selected, which serve as the foundational basis for the bibliometric analysis and are regarded as the most pertinent to the research theme.

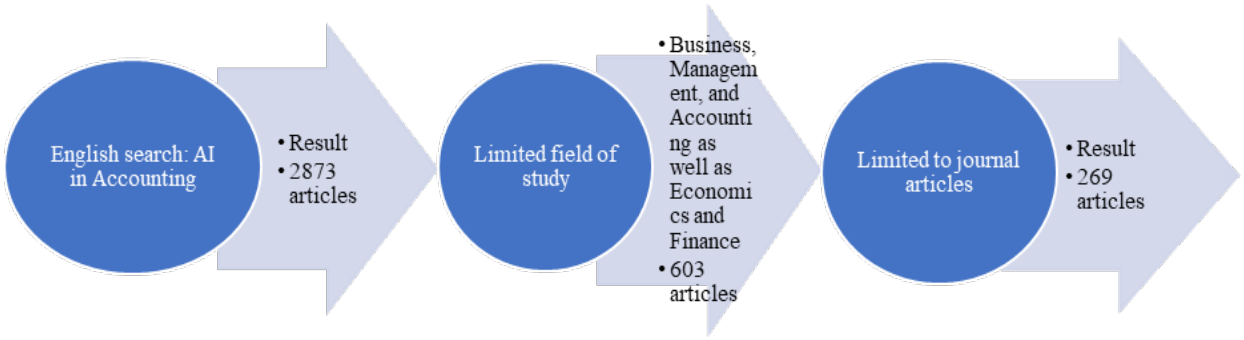

Figure 1 – The process of selecting publications for analysis
Note – compiled by the author based on the source (Scopus, 2025) (electronic resource)

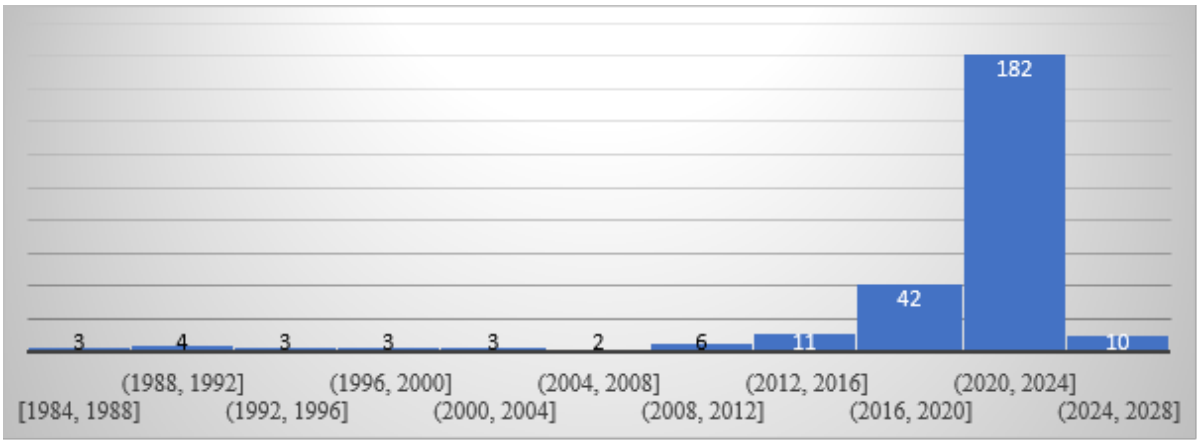

Figure 2 – The quantity of scholarly works pertaining to the domain of artificial intelligence within the field of accounting, spanning the years from 1984 to 2025.
Note – compiled by the author based on the source (Scopus, 2025) (electronic resource)

The diagram shows the number of scientific publications indexed in the database from 1984 to 2028. According to observations, low activity is evident until 2012. During the period from 1984 to 2012, the number of publications remained minimal, ranging from 2 to 6 articles per interval. This indicates a weak interest in the application of AI in accounting during the early stages of digitalization. Starting from 2016-2020, the number of publications significantly increased (42 articles), indicating a rise in the popularity of machine learning and accounting automation technologies. The peak of publication activity falls between 2020 and 2024. Since this period sees a sharp increase in the number of publications, reaching 182 articles, which accounts for more than 50% of all works over the entire analyzed period. This is due to the widespread implementation of AI in accounting systems, the intensification of business digitalization, and the increase in scientific research in this field. Especially the year 2021 became a record year, which may be related to the accelerated digital transformation following the COVID-19 pandemic. During the interval spanning from 2024 to 2028, a notable decline in publication output (10 articles) was observed, which could suggest a transition in scholarly pursuits towards a more pragmatic phase of artificial intelligence integration within accounting methodologies.

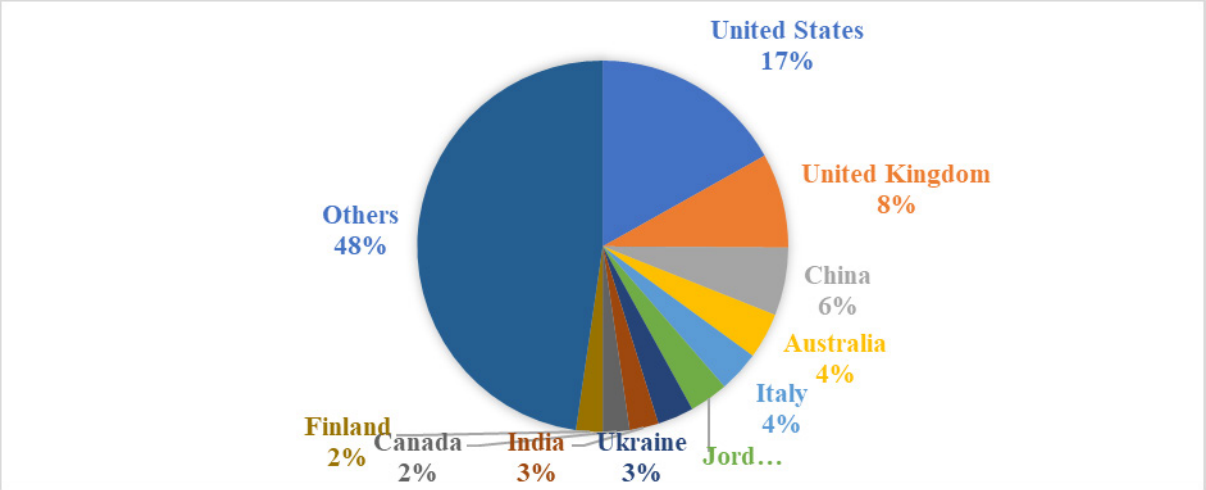

Figure 3 – Proportional representation of scholarly publications by nation for the years 1984 to 2025.
Note – compiled by the author based on the source (Scopus, 2025) (electronic resource)

The highest number of scientific publications is registered in the USA – 17% (80 publications), the leader in the number of studies, which is due to the developed academic environment and the implementation of advanced technologies in accounting systems. Next is the United Kingdom with 8% (39 publications) – one of the leading centers for accounting innovations and financial technologies. China – 6% (28 publications) – a country with active development of AI and its application in various fields of the economy. In contrast, the Republic of Kazakhstan is represented by only three scientific publications indexed in the Scopus database within the scope of this bibliometric analysis. This indicates a relatively low level of scientific output in the field of artificial intelligence in accounting compared to leading countries. However, it also signals the emergence of research interest in this domain:

- Amanova G.D., Akimova B.Zh., Saparbaeva S.S., Moldashbayeva L.P., Zholayeva M.A. (2023). *Problems and prospects in development of digital technologies in accounting and auditing at social enterprises of the Republic of Kazakhstan*. The article analyzes the current state and perspectives of implementing digital tools (AI, Big Data, blockchain, etc.) in Kazakhstan's accounting practices.

- Amirgaliyeva A., Kaliyeva Y., Kadyrova K., Nurpeisova N., Bolshekbaeva K., Beisekova P. (2025). *Identifying areas for improving management accounting tools in the food industry*. This study examines the digital transformation of management accounting in the food sector through ERP systems, AI, and advanced analytical tools.

- Kupalova H., Honcharenko N., Andrusiv U., Jakupova D., Oleshko E., Demchenko K. (2024). *Organizational and financial aspects of distribution management of digital content*. The article explores innovative technologies in digital trade, including artificial intelligence, with co-authorship linked to Kazakhstan. Although not directly focused on accounting, the study reinforces Kazakhstan's contribution to digital and AI-related research.

These publications indicate a nascent but expanding academic presence of Kazakhstan in the global discourse on the digitalization of accounting. The limited number of Scopus-indexed contributions underscores the need to enhance national research capacity and academic visibility in this domain. Overall, the international academic landscape is shaped by contributions published in high-impact journals that focus on financial reporting, auditing practices, and the digital transformation of accounting methodologies (Table 1).

Table 1 – The most significant works published in scientific editions

Journal name	Research areas	Number of publications
Journal of Emerging Technologies in Accounting	The main focus of the publication is the adoption of new technologies in accounting**,** including therole of blockchain and AI in auditing and digital financial services	14
International Journal of Accounting Information Systems	a publication dedicated to the study of information technology in accounting, including the application of artificial intelligence and automated data processing systems	12
Cogent Business And Management	The journal covers a wider range of topics, including the impact of AI on accounting processes, innovative technologies in financial management and digital accounting, as well as the ethical and regulatory aspects of implementing AI in financial and accounting systems.	11
Financial And Credit Activity Problems Of Theory And Practice	This journal focuses on research in finance, credit and accounting.	10
Journal of Risk and Financial Management	an international journal that publishes papers on financial risk management, including research on risk forecasting using AI.	10
Journal Of Accounting And Organizational Change	This journal is dedicated to exploring changes in accounting and organisational processes, Transforming Accounting and Auditing – the impact of digital technology on traditional accounting processes	7
Accounting Research Journal	An authoritative source of accounting research covering digitalisation, auditing and regulatory issues.	2
Journal of Applied Accounting Research	A scholarly, peer-reviewed periodical that disseminates empirical research pertaining to the field of accounting, encompassing the application of artificial intelligence and machine learning in the domain of financial oversight.	4
Meditari Accountancy Research	the dissemination of scholarly work within the domains of accounting, financial oversight, and associated fields, as well as the implications of emergent technologies such as artificial intelligence, machine learning, extensive data analytics, and the mechanization of accounting procedures.	6
Note – compiled by the author based on the source (Scopus, 2025) (electronic resource)		

For the purpose of the analysis, data pertaining to publications cataloged within the Scopus and Web of Science databases were employed. Specifically, the following variables were examined: the annual number of publications spanning from 1984 to 2025, the h-index of 44, the total of 7688 highly cited articles, prominent journals, and prevailing research trajectories.

The examination of the acquired data facilitated a comprehensive evaluation of the progression of scholarly interest in this subject, the recognition of principal research trajectories, and the ascertainment of the influence of artificial intelligence technologies on the advancement of accounting and auditing.

Analysis of publications has shown a steady increase in interest in the topic of AI in accounting since 2020. Prior to this, publications were sporadic; however, since 2021, there has been a sharp increase in the number of works. The highest publication activity is observed in 2023–2024, confirming the relevance of the topic and its demand in the scientific community. The main factors contributing to the growth of interest are:

The number of publications and their citation rates have sharply increased over the past five years, confirming the significance of research in the field of AI and accounting.

Table 3 presents the most significant contributions to the development of scientific research in the application of artificial intelligence in accounting, distinguished by a high level of citation and scientific significance.

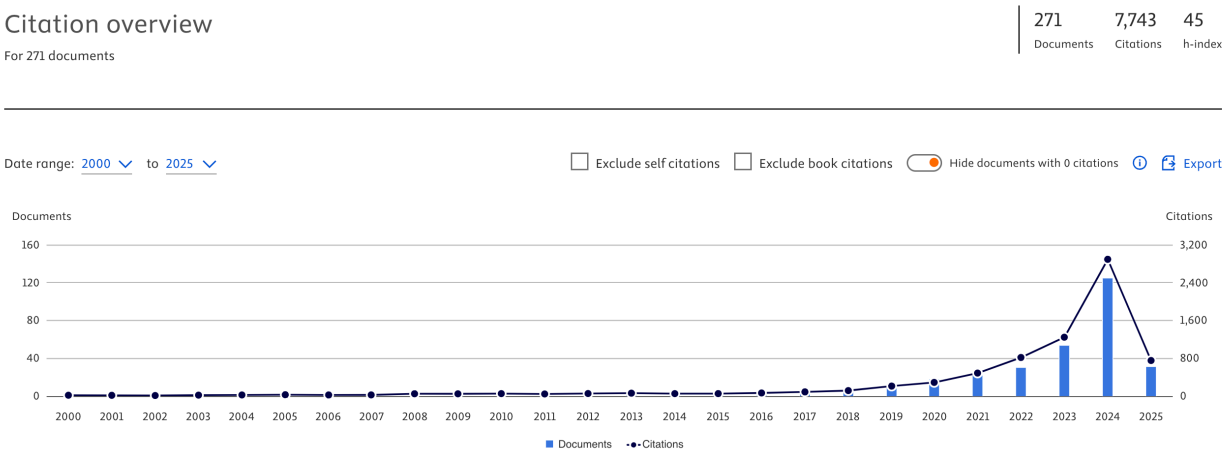

Figure 4 – Dynamics of scholarly publication and citation trends concerning the subject of artificial intelligence within the field of accounting from the years 2000 to 2025
Note – compiled by the author based on the source (Scopus, 2025) (electronic resource)

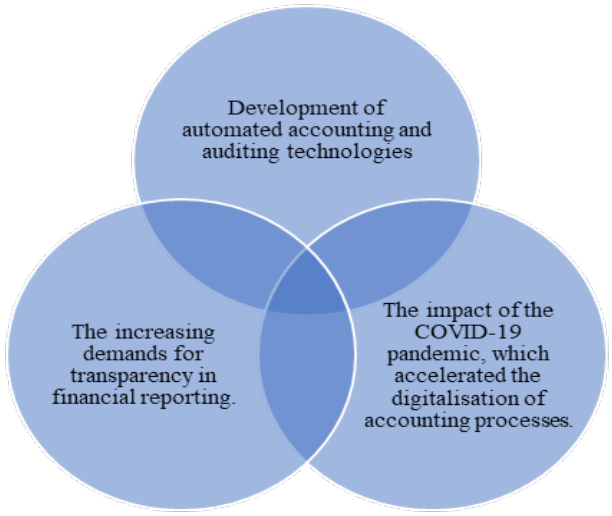

Figure 5 – Factors contributing to the growing interest in artificial intelligence in accounting
Note – compiled by the author based on (Altawalbeh & Al Frijat, 2025).

Table 2 – Key areas of research in AI and accounting

Research area	Key aspects
AI in accounting and reporting	Automated data processing, implications for financial reporting standards.
AI in auditing and regulatory oversight	Audit automation, detection of financial malfeasance
Artificial Intelligence and the Prognostication of Financial Risk	The utilization of data analytics, alongside the advancement of predictive modeling techniques.
Ethical and Regulatory Aspects of AI	Regulation of AI in accounting, explainability of algorithms
AI and automation of accounting processes	Impact of RPA (robotic process automation), digitalisation of accounting, reducing human error
Note – compiled by the author based on the source (Tandiono, 2023)	

Table 3 – A compilation of scholarly articles exhibiting a significant citation rate within the domain of accounting, particularly focusing on the integration of artificial intelligence

Year of publication of the article	Name of article	Journal name	Number of citations
1994	Bankruptcy prediction using neural networks	Decision Support Systems	488
2019	The role of internet-related technologies in shaping the work of accountants: New directions for accounting research	British Accounting Review	328
2017	«The emergence of artificial intelligence: How automation is changing auditing»	Journal of Emerging Technologies in Accounting	303
2017	Revisiting the risk of automation»	Economics Letters	300
2020	«The Ethical Implications of Using Artificial Intelligence in Auditing»	Journal of Business Ethics	245
2023	«Accounting and auditing with blockchain technology and artificial Intelligence: A literature review»	International Journal of Accounting Information Systems	213
2020	«Digital systems and new challenges of financial management – fintech, XBRL, blockchain and cryptocurrencies»	Quality – Access to Success	156
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	147
1990	Can software influence creativity?	Information Systems Research	142
2019	A human-centric perspective exploring the readiness towards smart warehousing: The case of a large retail distribution warehouse	International Journal of Information Management	139
2016	"The reports of my death are greatly exaggerated"—Artificial intelligence research in accounting	International Journal of Accounting Information Systems	138
2020	Sustainability accounting and reporting in the industry 4.0	Journal of Cleaner Production	130
2021	Mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting	Accounting Education	127
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	123
2023	An artificial intelligence algorithmic approach to ethical decision-making in human resource management processes	Human Resource Management Review	119
Note – compiled by the author based on the source (Scopus, 2025) (electronic resource)			

In the course of conducting an analysis of bibliometric data, the preeminent scientific articles that have garnered the highest citation counts and are published in prestigious academic journals focusing on the implementation of artificial intelligence (AI) within the realm of accounting were discerned. To ensure the academic quality of the analyzed corpus, we introduced a citation threshold criterion. Based on the distribution of citation counts among the selected 269 articles, we established that the 90th percentile equals 428 citations. Therefore, publications cited ≥ 428 times were considered highly influential. One prominent example is the article "Bankruptcy prediction using neural networks", which had 488 citations at the time of the analysis, placing it among the top 10% of the most cited studies in the field.

Through the process of citation analysis, a total of 15 publications of considerable significance that have exerted a profound influence on the advancement of this scholarly domain were identified. However, in addition to these works, the study also considered other articles covering related topics. Among the first 15 works included in the review, the following key research directions stand out – Bankruptcy prediction using neural networks – a 1994 paper (488 citations) represents an early study demonstrating the application of machine learning methods in financial forecasting (Wilson, 1994).

«The role of internet-related technologies in shaping the work of accountants: New directions for accounting research», (2019, 328 citations) – the article analyzes the impact of digital technologies on the accounting profession (Moll, 2019).

«The impact of automation and AI on auditing (The emergence of artificial intelligence: How automation is changing auditing», (2017, 303 citations) – the work examines how automation affects auditing (Kokina, 2017).

«Risks of Automation and Impact on the Labor Market (Revisiting the risk of automation, 2017, 300 citations) – the study examines the economic consequences of implementing automated technologies in accounting (Arntz, 2017).

«Ethical Implications of Using Artificial Intelligence in Auditing» (2020, 245 citations) – the focus is on the ethical challenges associated with the automation of auditing processes (Munoko, 2020).

«The use of blockchain and AI in accounting and auditing» (Accounting and auditing with blockchain technology and artificial intelligence: A literature review, 2023, 213 citations) – the study systematizes the main directions of integrating blockchain and AI into the accounting field (Han, 2023).

The analysis of the citation of scientific publications showed that the most significant influence on the development of the topic was exerted by works dedicated to audit automation, bankruptcy prediction, the use of blockchain, and machine learning in accounting. The publications that receive the highest frequency of citations are those disseminated in esteemed international academic journals, including the "Journal of Emerging Technologies in Accounting," the "International Journal of Accounting Information Systems," and the "British Accounting Review."

Keywords play an important role in representing research topics. This visualization is a bibliometric map reflecting the relationships between keywords used in scientific publications on the topic of artificial intelligence (AI) in accounting. The main clusters of keywords are marked in different colors, allowing for the identification of several interconnected research directions.

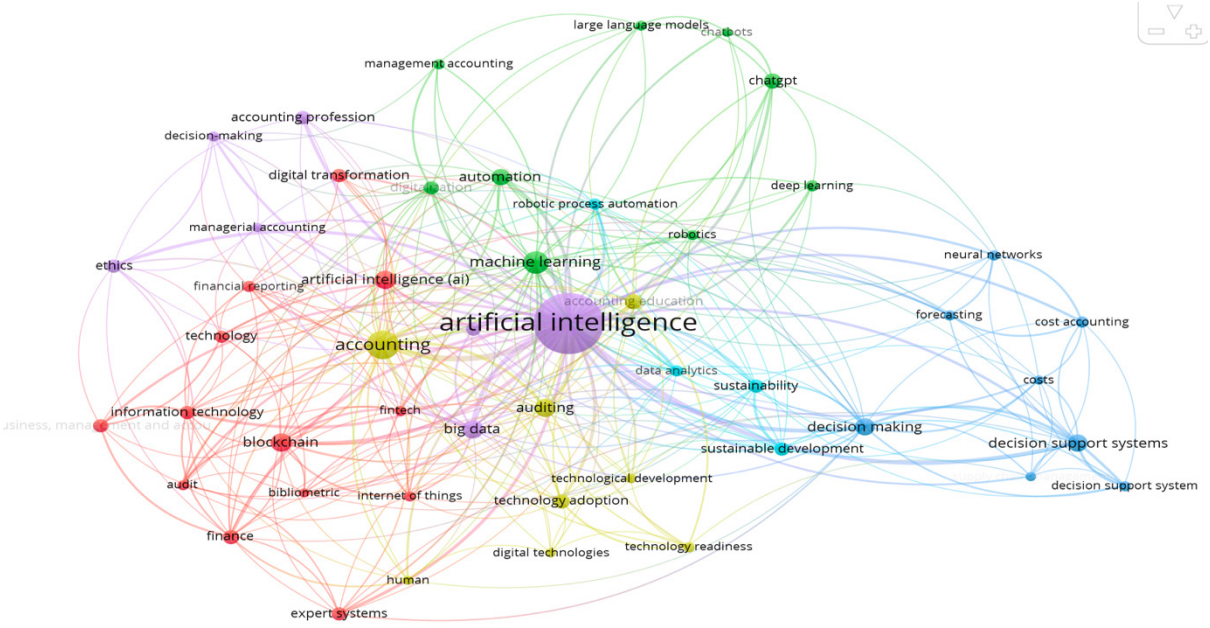

Figure 6 – Bibliometric map of key research areas on artificial intelligence in accounting.
Note – compiled by the author using VOSviewer 2025

The primary cluster (illustrated in purple) encompasses the domains of "Artificial Intelligence" and "Accounting." This section depicts a key aspect of the research discipline, which focuses on the use of artificial intelligence in the fields of accounting, auditing, and big data processing. It covers aspects such as financial reporting and the evolution of digital transformation.

Red cluster – "Blockchain, Fintech, and Information Technology". Research in this cluster focuses on the integration of blockchain technology, financial innovations (fintech), and artificial intelligence in the field of accounting. Blockchain is viewed as a tool that enhances transparency, strengthens data security, and supports the automation of accounting processes, thereby contributing to the modernization and reliability of financial reporting systems. Special emphasis is placed on digital financial technologies (FinTech) and their consequential applications within the accounting sector.

Blue cluster – "Problem Solving and Forecasting" Keywords: decision support systems, decision making, cost accounting, forecasting, neural networks. In this cluster, the research focuses on the application of decision support systems (DSS) and machine learning for data analysis and forecasting. Attention is given to network technologies (neural networks) and their impact on the automation of managerial decisions.

Green cluster – "Machine Learning and Automation" Keywords: machine learning, deep learning, chatbots, large language models, automation, robotic process automation. Monitoring in this part focuses on analyzing the possibilities of using deep learning technologies and automated accounting systems in order to increase the efficiency and optimize accounting processes of accounting systems. Special attention is paid to the implementation of ERP systems, which makes it possible to transform modern accounting and auditing practices, helping to reduce time costs, increase the accuracy of operations and reduce the risk of human error.

Yellow cluster – "Technological Transformation of Accounting" Keywords: technological development, technology adoption, technology readiness, sustainability, digital transformation

Purple block – "Ethics, management and professional accounting" Keywords: ethics, digital transformation, decision-making, accounting profession, managerial accounting. This block reflects the complexities associated with ethics, decision-making processes, and managerial accounting. The ramifications of artificial intelligence on the field of professional accounting, alongside the evolving responsibilities of accountants within the digital economic landscape, are currently under scholarly review.

Thus, AI in accounting is actively researched in the context of blockchain, fintech, forecasting, automation, and decision-making. Where the most popular areas are – the use of machine learning and automation for data processing. Blockchain and digital technologies for accounting transparency. Ethics and managerial decisions in the context of digital transformation. The interconnection of AI with Big Data, neural networks, chatbots, and financial technologies indicates a comprehensive approach to researching this topic.

Overall, the keyword map demonstrates the interdisciplinary nature of the research and the active development of the field at the intersection of accounting, artificial intelligence, fintech, and digital transformation.

Discussion

The analysis of existing research on the application of artificial intelligence in accounting allows for agreement with the position of the majority of authors presented in the conducted bibliometric review. The bibliometric analysis confirms that artificial intelligence plays a fundamental and multifaceted role in the evolution of accounting. AI not only automates repetitive processes such as data entry, reconciliation, and report generation, but also enhances the analytical capacity of accountants through predictive modeling, real-time insights, and anomaly detection. It contributes to more informed decision-making, strengthens internal controls, and supports the strategic functions of financial management. Overall, AI emerges as a catalyst for the transition from traditional bookkeeping to data-driven, forward-looking accounting practices. In particular, the works of Baldwin-Morgan, White Jr., Duffy, Andyk, and other authoritative researchers confirm that AI is becoming an integral tool in the transformation of the accounting environment. Their works demonstrate a high degree of consensus regarding the benefits of AI implementation: from automating routine tasks and improving reporting accuracy to expanding accountants' analytical capabilities.

Although the bibliometric review covered a global sample of publications indexed in Scopus, only three scientific articles affiliated with Kazakhstan were identified within the scope of this analysis. This indicates a relatively low level of academic productivity in the field of artificial intelligence in

accounting from Kazakhstan compared to leading countries such as the United States, the United Kingdom, or China.

From a scholarly standpoint, this underrepresentation highlights a structural limitation in the regional research output and signals the need for enhanced academic support, research funding, and international collaboration in Kazakhstan. The identified publications, although few, demonstrate an emerging academic interest in the digitalization of accounting and the application of AI technologies. Future studies should aim to increase both the quantity and the depth of research to ensure broader participation in the global discourse on accounting innovation.

Nevertheless, it should be noted that a significant portion of publications is predominantly focused on the technical aspects of AI implementation or its applied capabilities in large corporations. Less attention is given to the specifics of accounting digitalization in developing countries, including Kazakhstan, where transformation processes are just gaining momentum. The lack of comprehensive cross-industry comparative studies, as well as works dedicated to assessing risks and regulatory-ethical barriers in local markets, limits the completeness of understanding the global impact of AI.

From a scientific perspective, this study fills a gap by incorporating bibliometric analysis with consideration of regional specifics and an emphasis on the need to adapt AI in the context of national accounting systems. It is proposed to further strengthen interdisciplinary research focused on combining AI with managerial accounting, environmental auditing, and corporate sustainability. Additionally, it is recommended to develop thematic studies in the field of education – for example, on the implementation of AI in accounting training programs, which will help form a new generation of specialists ready to work in a digital environment.

Thus, the novelty of the present study lies not only in the systematization of scientific publications but also in the formation of well-founded directions for future academic and practice-oriented research in the field of AI and accounting.

Conclusion

The current investigation has demonstrated a notable surge in interest surrounding the utilization of artificial intelligence within the domain of accounting, driven by advancements in digital technologies, the growing volume of financial data, and the need to automate accounting functions and improve the precision of financial reporting. The increasing competition in the accounting field requires the use of AI methods to enhance data analysis quality, minimize errors, and better meet the information needs of various stakeholders.

An analysis of a sample of 603 articles, from which 269 highly cited articles were selected from the Scopus database, showed a high evaluation of publication activity and scientific trends on the topic of artificial intelligence (AI) applications in accounting. The study is based on data from the international Scopus database and covers the period from 1984 to 2025. The analysis of publications showed that the active growth of interest in the application of AI in accounting began in 2016. The significant increase in scientific activity occurred in 2021, when the highest number of articles was published. In the period from 2020 to 2024, the number of publications sharply increased, indicating an intensified scientific interest in the digitalization of accounting. The largest number of studies was registered in the USA (17%), which can be attributed to the developed academic environment and the implementation of AI in accounting systems. The United Kingdom (8%) and China (6%) also hold leading positions in research on this topic. Kazakhstan is represented by 3 publications, which is still a relatively low figure, but indicates the beginning of the country's active involvement in the study of AI in accounting. The leading scientific journals in this field are: Journal of Emerging Technologies in Accounting, International Journal of Accounting Information Systems, British Accounting Review, Journal of Business Ethics. The results of the study confirm the growing significance of artificial intelligence technologies in accounting. The analysis of scientific publications identified the main research directions, key development vectors, and promising areas of AI application in this field. Consequently, the bibliometric examination of the literature substantiated that artificial intelligence assumes an ever more significant function within the field of accounting, and its implementation necessitates additional investigation from both technological and ethical standpoints.

Going forward, it is recommended to pursue more practice-oriented research, focusing on the integration of AI tools into corporate accounting frameworks and national financial systems. Special emphasis should also be placed on the modernization of accounting education, including AI-related content and collaboration with industry practitioners.

Importantly, the present study was limited to the global academic landscape. Future research will aim to conduct a deep content analysis of Kazakhstani scholarly journals indexed in the Committee for Quality Assurance in Science and Higher Education (ККСНВО), in order to map national scientific trends and assess the domestic potential for developing AI-driven accounting practices. This will allow for a more comprehensive understanding of Kazakhstan's academic capacity and help identify opportunities to align national research with global trends in accounting innovation.

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