



A SYSTEMATIC STUDY OF AI ADOPTION IN ACCOUNTING: AUTOMATING PROCESSES, REDUCING ERRORS, AND ENHANCING DISCLOSURE QUALITY

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Article history:	Abstract:
Received: 6 th July 2024 Accepted: 4 th August 2024	This paper tries to focus on AI in the accounting sector, its applications (current and prospective), advantages, difficulties and impacts. It is structured as follows: Literature Review: In the first stage many related works considered to ensure the state, potential applications and challenges of Artificial Intelligence in Accounting Systematic Review: Second stage, Impact of AI implementation towards the accounting processes, monitoring changes and trends. Comparative Review: Multiple researches are compared at third stage in order to assess the variety of views on the effects of AI and the areas of investigation remain uncovered. The implementation of AI evidently has a lot of advantages like bringing in more transparency, accuracy and efficiency as well as much more complex analytic abilities. For a more in-depth analysis of the underlying topics, e.g. semi-tracking studies and mediators/moderators, sociotechnical impacts, cultural factors as well as preparedness for digital transformation, and ethical dilemmas related to use of intelligent transportation systems are all presented or brought forth. Future research should focus on the application of AI in early-adopting nations especially those lagging behind, along with efforts to develop accounting systems to attain a global balance in AI research.

Keywords: financial accounting, Accounting, disclosure quality, artificial intelligence.

INTRODUCTION:

Today, artificial intelligence (AI) is used for things such as medical diagnosis to speech and picture recognition to work automation just to name a few of the use cases (Goodfellow et al., 2016). Many businesses are being increasingly serious about fully leveraging the potential of AI services (Huang and Rust 2021). Demand hence, in recent years, there has been a move towards including AI particularly Machine Learning (ML) in the audit and accounting processes (Bao et al., 2020). According to Gomber et al. Due to digitalization of many organizations, they can easily employ such kinds of solutions that enable them to manage their business processes as well as their business model (Hanelt et al. 2018). Incorporation of AI has slowly but steadily infiltrated corporate practice such as incorporation into marketing and selling of products. Currently, technological advancement particularly artificial intelligence is being implemented in accounting recording, tracking and posting. Modern accounting can also learn much from utilization of artificial intelligence since it has the potential of revolutionizing performance as well as accuracy in the profession (Horn, 2021).

Therefore, one should note the fact that the accounting profession has gone through tremendous change in its response to changes in the environment. Academic study has been exploring and identifying these progressions up to the present as accounting techniques go on evolving over new technologies. Still lacking, nevertheless, are any empirical research (Kroon et al, 2021). It turns out that it will be easier to prepare and create the budget, monitor expenditures, create invoices and statements of financial position and more, with the help of various software packages such as Excel, specific accounting software, and cloud's accounting software. (Ghatrif, AI, 2022:2). Artificial Intelligence is anticipated to have the most impact on accounting out of all digital technologies. This gives a way of analyzing vast volumes of accounting data to assist the stakeholder and business entities in their decision making and also in the conduct of financial analyses (Lehner et al., 2022). Utilizing AI also helps businesses acquire and retain enormous volumes of a variety of data kinds because it has greatly improved data collecting and considerably decreased storage costs (Dai and Vasarhelyi, 2020).



Focusing on the ways to enhance the investors' performance and efficiency of the market, the utilization of the AI algorithms that operate with text analysis for predicting a certain value is identified as one of the most significant practices (Ren et al., 2013). Adopting AI also offers management accountants, who are already adept at deriving insights from data and analyzing them, a special advantage.

The last two groups of professionals can improve the evaluation of firm performance by using the modern AI supporting analytical tools (Appelbaum et al., 2017). From the paper, use of artificial intelligence in the assessment of the financial reports enables the stakeholders and investors to make the right financial decision regarding the management and existence of their investment (Mushtaq et al 2022). Therefore, various AI technologies are being employed across different fields in the current society and thus, it is high time that the function and role of AI in accounting was assessed. It could also be argued that accounting is one of the several that is reaping the fruits of the enhanced technologies in artificial intelligence. These changes with the help of AI can lead to a significant transformation of responsibilities of auditors and accountants meaning simpler tasks like automations of routine process and deep data analysis opportunities. It has become indispensable in the present digitized economy for business to implement AI solutions to reduce time with higher efficiency, reduce the mistakes in the decision-making process, and extract meaningful information from the financial data for better decision-making. Accounting industry is also likely to experience these innovations in order to continue supporting financial reporting accuracy. Due to significance of AI in accounting, the therefore, aim of this study will be to establish the level of interest in the technology in the discipline. To achieve this, a number of scholarly articles will be reviewed to explain the current state of advancement in AI as well as how it has impacted accounting.

1.1 Research Objectives and Questions

The purpose of this study is to investigate the use of AI in accounting procedures by looking at its advantages, difficulties, and general effects on the industry. The following main questions serve as a guide for the research:

1. How far along is the adoption of AI in accounting?
2. What are the main advantages and difficulties of implementing AI in accounting?
3. What regional and functional differences exist in the adoption of AI in accounting?
4. What are the projections for AI use in accounting, together with the research gaps?

1.2 Stages of the Study

The study is organized into three stages, each of which is intended to fully address the research objectives, in order to provide answers to these issues, as seen in the figure below:

Stage 1: Thorough literature analysis with an emphasis on artificial intelligence in accounting to learn about the technology's condition, uses, advantages, and disadvantages.

Stage 2: Systematic Literature Review to gauge AI uptake and accounting practice impact.

Stage 3: Comparative literature review: In order to comprehend varied viewpoints on AI's influence in accounting and to discover research gaps, several works are compared and examined.

The operation of the methodology is explained in the following figure:

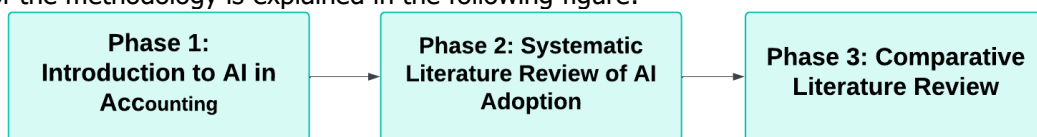


Figure 1. Stages of the Research Methodology for AI in Accounting Study

2. The Model

As previously shown in Figure 1, the study is divided into three stages in order to accomplish the goals of examining the advantages and difficulties of implementing AI in accounting and assessing the degree of its advancement and influence on the industry. To provide a thorough analysis, a mixed-methods approach combining quantitative and qualitative research techniques will be used.

-The first phase of review of the literature will assess artificial intelligence accounting and its scholarship. A basic frame of reference of the newest developments and discoveries made in the field will however be set throughout this stage.

-This will be followed by stage two, which will be the study of the literature in relation to the application of AI in accounting. Baselines knowledges of the newest ideas and innovative developments in the field will be set at this stage. The second step will be an analysis of the literature on the application of AI in accounting. This stage will focus the search for information from scholarly journals particularly from Scopus to assess today's AI technology including its applications,



benefits and challenges to the accounting profession. Thus, to provide readers with the extensive understanding of AI's progress and even more, in the area of accounting, the review will systematize, compare and analyze the relevant papers. -The third stage of the research work will entail comparative analysis of the literature, specifically in accounting studies where use of AI has been made. This stage aims at identifying the areas that may still be unclear in regard to the impact of AI since it approaches the concept from four different perspectives. Each stage of this progression guarantees a complete and thorough study of AI in accounting starting from the theoretical conceptualization to the current practice and comparative studies.

Stage 1: AI in accounting:

AI has undergone development over the years, and therefore there have been different definitions of this term in different years as pointed out by Haenlein and Kaplan(2019). A science different from the applied mathematics and computer science but encompassing a field of study as well as being grounded. taulli2019 'It has borrowed significantly from such fields as economics, neuroscience, and psychology' There are a number of definitions of Artificial Intelligence given in literature; loosely, AI is the capacity of Information technology to undertake tasks independently with minimal reference to humans (Hu et al., 2021). AI in accounting is defined as the deployment, consolidation, and synchronization of business decision-making activities at different levels with the help of SMART automation including A., BPM and RPA (Gosh, 2022). AI has brought accuracy to the work done, automated the work and come up with other aspects of the work besides the routine typing.AI has multiple applications in Figure (2) source: (Vasarhelyi & Kogan, 2009).

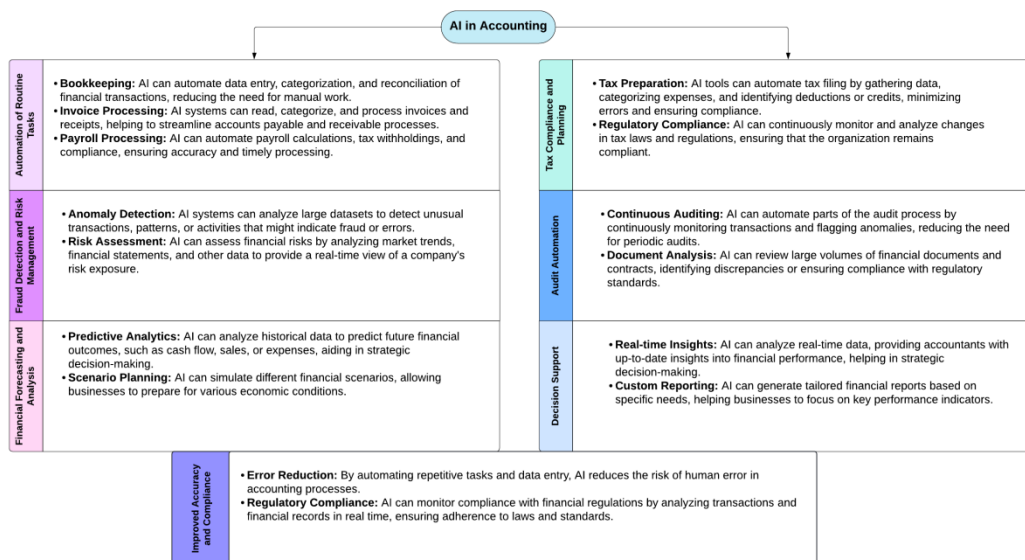


Figure 2 Applications of AI in accounting: key areas of impact and functionality

As highlighted in figure 2 below the accounting profession has adopted AI technology in many ways. The presence of AI interpretations can be subdivided into as under: · Decision making aid · Greater precision and adherence · Fraud identifying · Forecasting of finances · Tax compliance · Automation of different operations of audits. AI tools and technologies and how they enhance accuracy, fast-track procedures, and help decision-making are underlined at various sections throughout the paper. The illustration points out to how AI has the potential of revolutionising modern day accounting processes.

Consequently, the accounting AI refers to the application of AI technology in automating the accounting processes. This apply to areas of work including data entry, accounting, certification, accounting and quantitative analysis. Accounting chores are already time-taking exercises and the use of AI in accounting tasks may well cut out the amount of time needed to complete these chores on one hand, while it also may well do a better job or cut out errors on the other hand. Besides, it could be used to provide conclusions to large quantities of information that would be rather difficult to discern even basic patterns. This can help in the decision-making and thus improve on organisation's decision-making by helping them make quicker and improved decisions in the future. AI can also assist in automating report generation; the implication of this will be that the time taken to generate the report will be reduced while at the same time creating space for other important activities that need human intervention. Finally yet importantly, AI can be used in checking the transaction for the mavericks or wrong doing in order to recommend the fraud. From the previous statement, it is very clear that in the subsequent years, accounting is going to change its mode of operation as there will be increased technology riding wave.



As rightly pointed out by Demirkan et al., (2020) there are many opportunities that are available within the profession no matter the risks that come with such innovations. They also mentioned that, forecasting is one of the application domains where AI and ML could be applied (Kureljusic & Karger, 2023). The other advantage that can be associated with the use of artificial intelligence is the aspect of reducing cost. Those activities that are repetitive in nature do not require a lot of time and energy as compels labor.

Efficiency: AI reduces tasks to core level allowing accountants to focus on important tasks.
Scalability: There is flexibility as it reaches the proportions of large corporations but do not necessarily need to hire more accounting professionals as AI techniques can handle large volumes of data and operations. AI can improve productivity, reduce errors and enhance general and strategic decision-making of businesses apart from helping organisations adapt to progressively complex regulations through integration in accounting processes (Vasarhelyi & Kogan, 2009). In our study, we focus on the benefits of using AI in accounting; however, it is necessary to identify the challenges to the change which have been highlighted in the literature. Not surprisingly, the literature on the current methods of accounting and auditing identifies several difficulties. Accounting processes for instance are still predominantly paper based and most are conducted manually often involving data keying into accounting spreadsheets. (Han and others, 2023). The literature revealed that even little research has been done on the AI implementation stage. Empirical research of the business value of AI is limited and little attempt has been made to understand how this tool could impact sustainability and high level business performance. To the companies that are interested in applying AI the lack of information becomes a serious threat factor that drives them ignorantly into the process of adopting this technology. This may not be in the best interest of industrial decision-makers and policy authorities who are charged with the responsibility of steering social processes aimed at addressing the corporate digital divide and long-term sustainable adoption of advanced technologies such as artificial intelligence as proposed in Ghobakhloo, et al., (2023).

The expense of the implemented system, a lack of capabilities and skills, transitional and compliance difficulties, and illegal access to firm data are additional issues (Budnik et al., 2017). Grosu et al. (2023) asserted that "Intangibles, which should be recognized in financial statements to give shareholders and investors an accurate picture of company value, are the main obstacles to the digital transformation of organizations." However, as of right now, accounting systems can only capitalize expenses related to R&D, trademarks, and patent application fees. To put it another way, businesses should take into consideration intangible assets when automating accounting processes and should not restrict disclosure to capitalization specific accounts exclusively.

One major issue that needs to be addressed in the usage of artificial intelligence is protecting data privacy, as Villarongaa et al. (2022) pointed out. Stated differently, businesses must make sure that confidential information is shielded from prying eyes and that only authorized individuals have access to vital data. The opaque nature of algorithmic processing may conceal biased inputs and outputs, therefore explainable AI is necessary for predictions, classifications, and recommendations.

Ethical concerns present another barrier to the application of AI (Rodgers et al 2023). When adopting and employing AI, varying ethical perspectives might give rise to concerns and obstacles. Every stakeholder could have a different ethical viewpoint. For example, managers are more inclined to base their decisions on utilitarian principles, seeking to promote general happiness and well-being, whereas accountants are more prone to prioritize their own interests (egoism).

The study proceeds to the second stage, where a Systematic Literature Review of AI Adoption is carried out, in order to demonstrate the advancement of AI approaches in accounting. This stage entails a thorough analysis of scholarly publications, especially those included in the Scopus index, to evaluate the state of AI technology today and its potential uses, advantages, and difficulties for the accounting industry.

Stage 2: Comprehensive Review of the Literature on AI Adoption in Accounting
 The systematic background stated in this stage, as adopted in Figure 3, starts with describing the selecting suitable keywords and research topic.

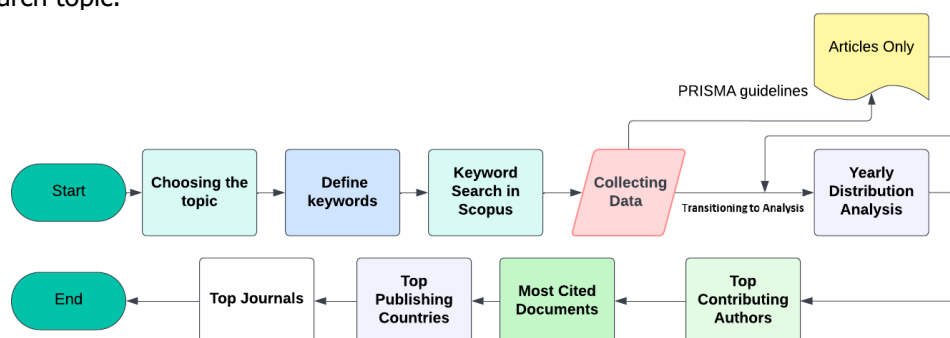


Figure 3: "A flowchart utilizing Scopus data for a comprehensive literature review on the implementation of AI in accounting"

Two essential keywords for this study were found to be "artificial intelligence" and "accounting." These search terms were selected to bring up pertinent articles about the use of AI in accounting. The Scopus database was searched thoroughly using sophisticated search methods. To guarantee the retrieval of pertinent publications that examine the nexus between AI and accounting, the search structure was designed to incorporate permutations of the primary keywords. This was the advanced search query that was used: "TITLE-ABS-KEY (("Accounting" OR "Financial Accounting" OR "Managerial Accounting" OR "Auditing" OR "Financial Reporting" OR "Bookkeeping" OR "Corporate Finance" OR "Accounting Information Systems" OR "Cost Accounting" OR "Tax Accounting" OR "Forensic Accounting") AND ("Artificial Intelligence" OR "Artificial Intelligent" OR "AI" OR "AI Techniques" OR "Artificial Intelligent Techniques" OR "Machine Learning" OR " "AI Tools" OR "Intelligent Automation" OR "Intelligent Systems")) AND SUBJAREA (BUSI)". The SUBJAREA(BUSI) The application of a filter ensures that the search is restricted to papers that fall under the topic area of "Business, Management, and Accounting," thereby concentrating on research that is directly related to the accounting industry.

3. Outcomes and Analysis

The above flowchart shows that data collecting from the Scopus database comes first, followed by analysis. The PRISMA "Preferred Reporting Items for Systematic Reviews and Meta-Analyses" criteria, which guarantee a methodical approach to choosing and screening pertinent research, are used to filter these documents in the following stage. By offering an organized method for document selection, screening, and inclusion, this framework makes sure that only the most pertinent research are taken into account for additional examination. As shown in Figure 4, a systematic literature review was carried out in compliance with the PRISMA flowchart principles.

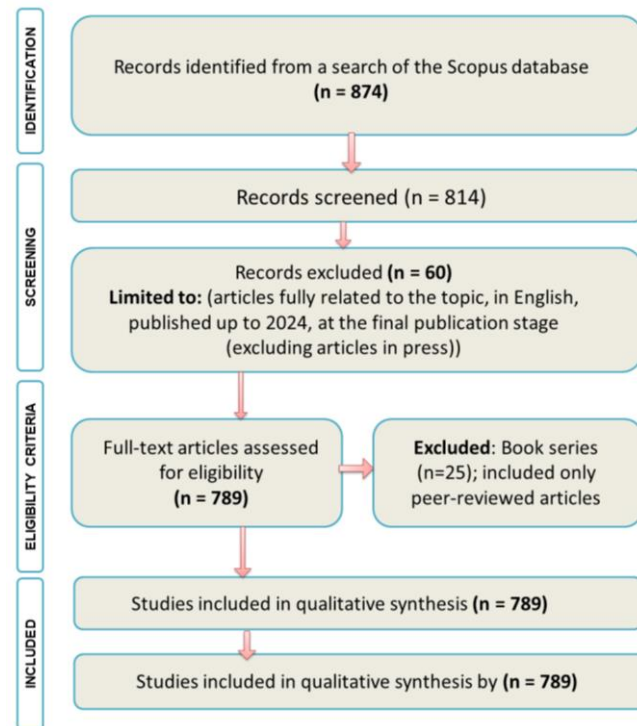


Figure 4: "PRISMA Flowchart detailing the article selection process from the Scopus database"

During the Identification step, 874 bibliographic records in total were first obtained from the Scopus database. This step ensures a thorough evaluation of pertinent material by capturing the scope of the first search. The study's scope was subsequently expanded by taking into consideration additional records from various sources. Out of 426 identified studies 60 were excluded due to duplicity, irrelevance to the topic, language limitation to English only, and publication type, leaving articles 'in press' out of consideration. In this procedure, it was ensured that only those studies that had direct relevance to the subject of the research were passed on to the next phase. During the eligibility stage a more comprehensive review of the articles was undertaken to ensure they met basic inclusion



criteria. Another twenty-five sources including book series which could not be assimilated in the format of the study were excluded at this stage. Due to most stringent filters to eligibility, the studies considered in the review were specifically those that dealt with AI's application in accounting. Of them, in the included stage, 789 research articles were remained for reviews. To determine how AI will affect accounting procedures, these experiments were thoroughly examined and studied. The ensuing subsections offer a thorough analysis of the advancements made in this discipline, emphasizing significant discoveries and takeaways from the chosen papers.

3.1 Analysis of Yearly Distribution

The yearly distribution study looks at historical patterns in the quantity of papers published about the use of AI in accounting. This study offers insights into the evolution of interest in this area, as illustrated in Figure 5, emphasizing critical years of substantial contributions to the field and identifying periods of heightened research effort.

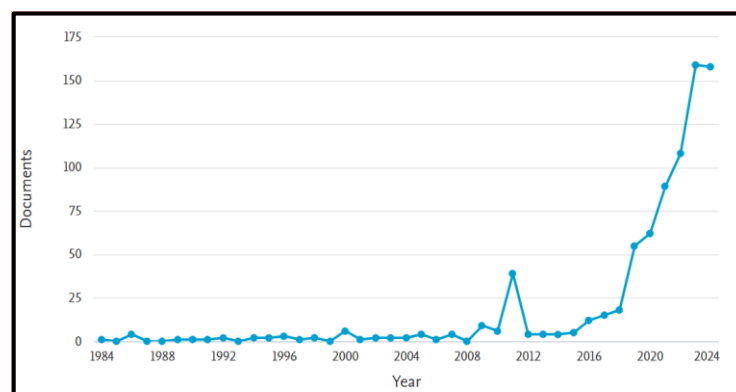


Figure 5: "Documents on the adoption of AI in accounting are distributed annually (1984–2024)"

Note: as of August 21, 2024, the citations and document count are accurate.

This increasing trend emphasizes how AI is becoming more and more important in accounting for process automation, accuracy improvement, and decision-making. The dramatic increase in recent papers indicates that the use of AI to accounting processes is a rapidly developing area that is garnering a lot of interest from both professionals and academics.

3.2 Top Contributing Authors

Based on the quantity of published papers, Table 1 lists the top 10 writers who have made a substantial contribution to the subject of artificial intelligence in accounting. The table illustrates the significance of the researcher's research in the academic community by including information about their h-index, most cited work, and number of citations for that work alongside their contribution. Though the current analysis only focuses on the research the researchers have published about the chosen keywords—AI & accounting—they have authored more articles than those listed in the table. Table 1: Top 10 Authors of Contributions in Accounting and AI Research

Author Name	No. of Documents	h-index	Most cited document	Citation count
Vasarhelyi, M.A.	10	36	Ideas for research on artificial intelligence in auditing: formalizing auditing and enhancing workforce	196
Lehner, O.M.	7	17	A changing profession: participants, duties and positions in AI-powered accounting	71



Sun, T.	6	8	A transforming profession: roles responsibilities, and roles in AI-powered accounting	190
Chiu, V.	5	11	A bibliometric examination of periodicals on accounting information systems and their contributions to developing technologies	53
Hamdan, A.	4	23	Factors influencing the usage of chatgpt by accounting students: a fraud triangle application	7
Sutton, S.G.	4	28	"My death has been greatly exaggerated in reports."—Accounting research using AI	114
Vasarhelyi, M.	4	36	The Consequences for Ethics of Using AI in Auditing	180
Liu, Q.	4	8	A bibliometric examination of periodicals on accounting information systems and their contributions to developing technologies	53
Arnold, V.	4	22	"My death has been greatly exaggerated in reports."—Accounting research using AI	114
Wood, David A.	3	30	How Well Does the ChatGPT AI Chatbot Respond to Questions About Accounting Assessment?	32

Note: "citations and documents count are accurate as of 21 August 2024"

3.3 Most frequently cited papers

Table 2 showcases the most significant research contributions by including a selection of the top 10 referenced documents in the fields of accounting and artificial intelligence. The table, which shows the influence of these studies within the academic community, includes the title of each document, the number of citations, the names of the authors, and the year of publication.

Table: Top Two Cited Research Papers in Accounting and AI

Document Title	Citations count	Authors' name	Year publication
A naïve Bayesian machine learning approach to the information content of forward-looking statements in company filings	704	Li, F.	2010
Bankruptcy prediction utilising neural networks	477	Wilson, R.L., Sharda, R.	1994
Sealing the AI Accountability Gap: Establishing comprehensive structure for internal algorithmic examination	356	Raji, I.D., Smart, A., White, R.N., ... Theron, D., Barnes, P.	2020
	305	Min, Q., Lu, Y., Liu, Z., Su, C., Wang, B.	2019



A Digital Twin Framework for Production Optimization in the Petrochemical Industry Based on Machine Learning			
Artificial intelligence's rise: How automation is transforming audits	261	Kokina, J., Davenport, T.H.	2017
The impact of internet-related technologies on accountants' jobs: New avenues for accounting study	257	Moll, J., Yigitbasioglu, O.	2019
Deep item-based collaborative filtering for top-N recommendation	246	Xue, F., He, X., Wang, X., Liu, K., Hong, R.	2019
AI's place in the operational environment: a review and bibliometric investigation	191	Dhamija, P., Bag, S.	2020
Ideas for research on artificial intelligence in auditing formalizing auditing and enhancing workforce	190	Issa, H., Sun, T., Vasarhelyi M.A.	2016
The impact of digital transformation in external audit on corporate governance	189	Manita, R., Elommal, N., Baudier, P., Hikkerova, L.	2020

Note: "citations and documents count are accurate as of 21 August 2024"

The most frequently referenced papers in accounting and AI research demonstrate how the fields are developing. Through the study, Li, F. (2010) made a noteworthy contribution with 704 citations. A naïve Bayesian machine learning approach illustrates the information quality of forward-looking statements in business filings and shows how machine learning improves predictive financial analysis. The work Bankruptcy prediction using neural networks by Wilson, R.L., & Sharda, R. (1994), which has 477 citations, is considered a seminal work in the use of neural networks to anticipate financial distress. Closing the AI accountability gap: Defining an end-to-end framework for internal algorithmic audits by Raji, I.D., et al. (2020), mentioned 356 times, is another important contribution that tackles the need for ethical AI use and offers a paradigm for internal auditing of AI systems. Similar to this, Min, Q., et al. (2019) with 305 citations provides insightful information about AI's role in operational efficiency that may be applied to accounting procedures, even though it focuses on the petrochemical industry in Machine Learning-based Digital Twin Framework for Production Optimization.

In The Emergence of Artificial Intelligence: How Automation is Changing Auditing, Kokina, J., & Davenport, T.H. (2017) (261 citations), highlights how AI is revolutionizing audit practices through automation and reshaping, while Moll, J., & Yigitbasioglu, O. (2019) examine how digital tools, such as AI, are influencing the future of accounting in their work The role of internet-related technologies in shaping the work of accountants (257 citations). AI's applicability to accounting is expanded by Xue, F., et al. (2019) in Deep item-based collaborative filtering for top-N recommendation (246 citations), which makes use of cutting-edge methods like deep learning to improve decision-making. AI's incorporation into operational workflows is highlighted in Dhamija, P., & Bag, S. (2020) with 191 citations in Role of AI in Operations Environment. This has important implication of the efficiency of accounting. In Auditing, AI's applicability in formalizing audit practices, and utilization in improving the capability of the workforce is discussed in Issa, H., Sun, T., & Vasarhelyi, M. A. (2016) Research ideas for AI in auditing (190 citation), similarly, Manita, R., et al. (2020) The digital transformation of external audit and its impact on corporate governance As we can see from all these articles, there is a profound impact of AI in several accounting-related areas such as prediction analysis, audit, working productivity and governance among others.

3.4 Leading Contributory Nations

Ranking 10 top states for study within AI and considering based on the quantity of researches published is conducted below.

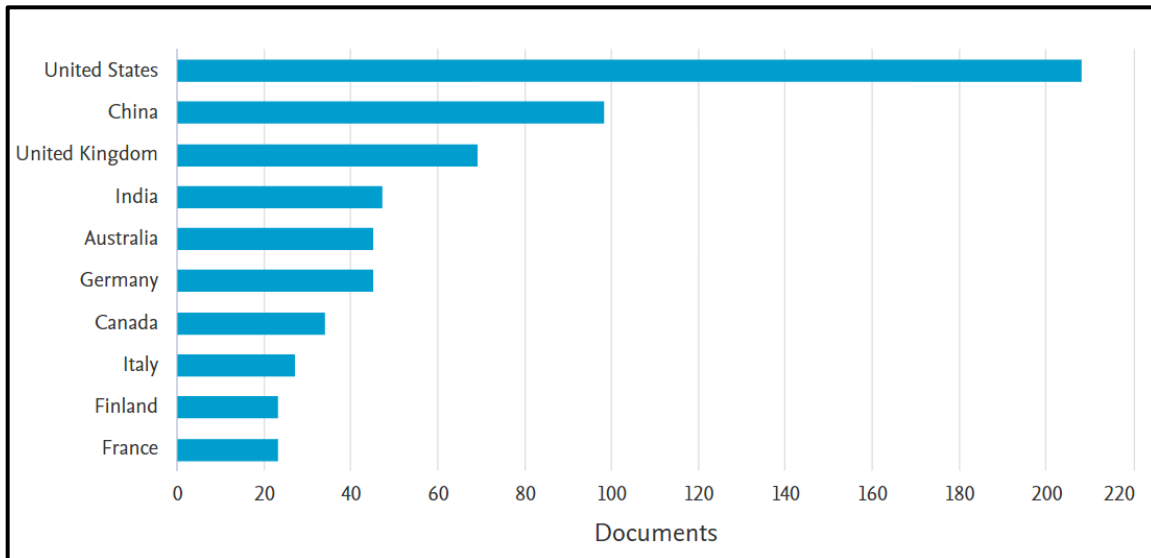


Figure 6: Top 10 nations funding research in accounting and AI

With 98 documents, China is the second-largest contributor, demonstrating significant research efforts in this field. With 69 documents, the UK comes in third place, indicating even more of its active participation in this field of study. Significant contributions from Germany (45 documents), Australia (45 documents), and India (47 documents) also show that these three regions are becoming more and more interested in the application of AI in accounting.

Italy contributes 27 documents, and Canada comes in second with 34. Finland and France each have 23 documents to complete the list. The distribution of documents among these nations illustrates how international accounting AI research is, with substantial contributions from both Western and Asian nations. This variety demonstrates how widely acknowledged AI's ability to revolutionize accounting procedures is across the globe.

3.5 Top contributing journal

131 distinct journals that supported accounting and artificial intelligence research were included in the comprehensive analysis. The top 10 journals, indicated in Table 3, emphasize the most important papers and their contributions to the field and account for a sizeable amount of the research output in this area.

Table 3: Document Count, Most Cited Documents, and Top 10 Journals Contributing to Accounting and AI Research

journal name	document count	most cited document	citations count	Year of publication
Journal Of Cleaner Production	27	Industry 4.0 accounting and reporting for sustainability	109	2020
Journal Of Emerging Technologies In Account	24	Artificial intelligence's rise: How automation is transforming audits	261	2017
International Journal Of Accounting Information System	19	A survey of the literature on blockchain technology and artificial intelligence in accounting and auditing	119	2023
2011 2nd Intl. Conf. on AI Management Science	16	Risk transfer from debt to equity in the coal industry economy	1	2011
Decision Support Systems	10	Predicting bankruptcy with neural networks	477	1994



Journal Of Risk And Financial Management	9	Crypto currency Trading Using Machine Learning	28	2020
2024 ACM Conference on Accountability, Transparency, and Fairness	9	Examining the New York City algorithmic bias audit system: Auditing Work	2	2024
Technological Prediction And Social Transformation	8	The influence of external audit's digital transformation on corporate governance	189	2020
Intelligent Systems in Finance, Management, and Accounting	8	A Review of the Literature on Natural Language Processing in Accounting Auditing, and Finance and a Plan for Further Research	127	2016
Cogent Business and Management	8	A comprehensive overview of the difficulties facing accounting education in the Era 5.0	12	2023

Note: "citations and documents count are accurate as of 21 August 2024"

These findings show how AI is having a significant impact on several areas of accounting, including corporate governance, financial risk management, auditing, and education. The range of subjects addressed by these esteemed journals is indicative of the increasing acknowledgement of artificial intelligence's capacity to revolutionize the accounting field. As a result of the systematic literature study, notable contributions from numerous important publications were identified, demonstrating the depth and breadth of research being done at the nexus of accounting and artificial intelligence. The bulk of the contributions—61.7% in the form of articles and 16.9% in the form of conference papers—were made as illustrated in Figure 7.

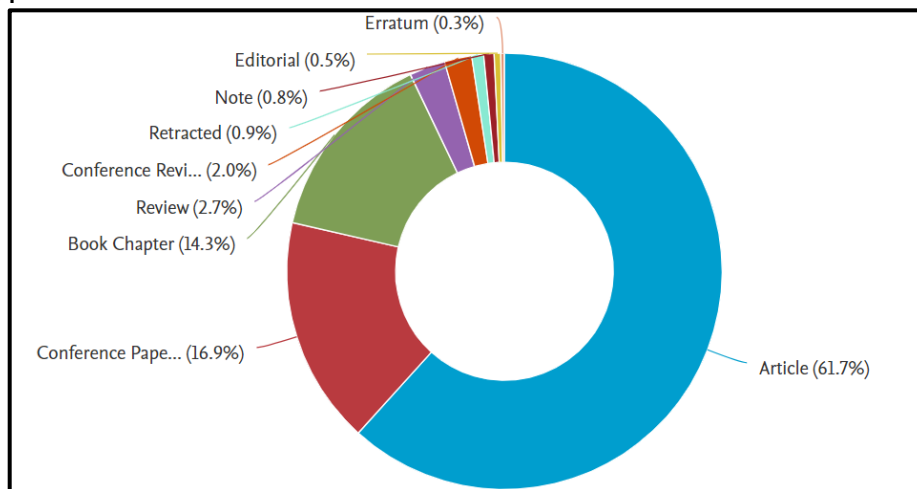


Figure 7: "Document type distribution supporting AI and accounting studies"

Additional contributions demonstrated the variety of publication formats in this quickly expanding field of study, including reviews, conference reviews, and editorial remarks.

3. Analyzing AI Tools and Applications in Accounting Comparatively

Traditional methods have been changed by the integration of AI into different businesses, accounting being no exception. The impact of AI technologies on accounting procedures, productivity, and decision-making is becoming more and more obvious as they develop. Figure 8 provides a summary of the various AI strategies that were highlighted in the studies.

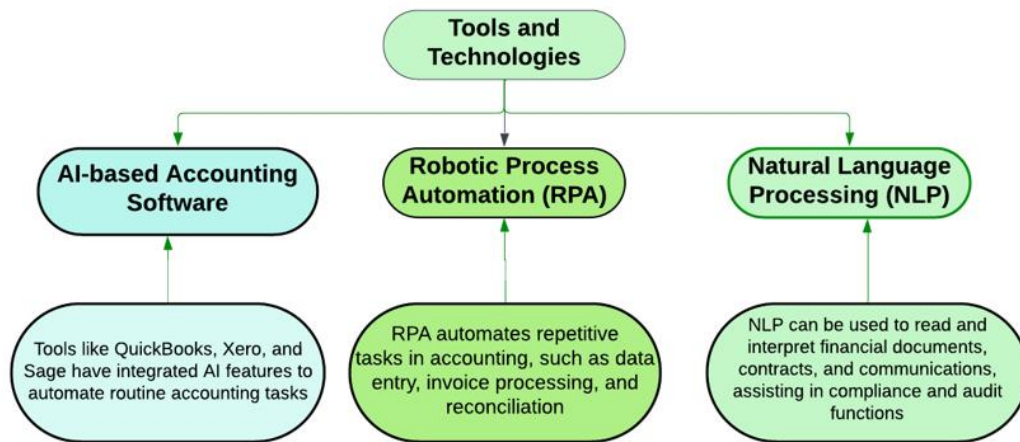
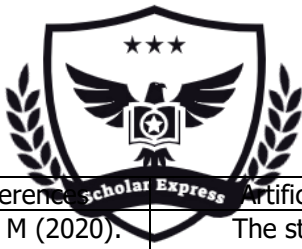


Figure 8: Software, Automation, and NLP as the Main AI Tools and Technologies in Accounting

Key tools and technology utilized in AI-driven accounting processes are shown in Figure 8. It emphasizes how crucial elements for automating repetitive processes, processing financial data, and understanding documents are robotic process automation (RPA), natural language processing (NLP), and AI-based accounting software. Every instrument has a distinct function that contributes to increasing productivity, decreasing manual labor, and assisting with accounting compliance and auditing.

The objective of this literature review is to examine and summarize the corpus of research on the use of AI in accounting, emphasizing the advantages and difficulties of this technological revolution. Artificial intelligence (AI) technologies, such as robotic process automation, natural language processing, and machine learning, will be reviewed. These developments are increasing accuracy and simplifying tasks. The important works that investigate these technologies are compiled in Table 4 below, with an emphasis on the techniques, applications, and noteworthy discoveries in the accounting domain.

Table 4: Key Findings and Methods of a Comparative Analysis of AI Research in Accounting



Reference	Artificial intelligent	Tools of the study	Findings
(Alles, M (2020).	The study examined the connection between professionalism, accounting ethics and the employment of AI systems in the field.	The study analyzed a group of research papers of three years to study the most important aspects of these studies whether they focused on the ethics of adopting information systems or not .	According to the study's findings, a small number of papers have been written around the ethics of accounting information systems. Only three of the nine studies in the field addressed this issue.
(Manita et al, 2020)	The paper aimed to study the influence of digitalization on audit's business and to understand how it can improve the role of audit as a governance mechanism.	A qualitative approach was conducted by interviewing auditors from the five largest auditing firms in France	This study helps to shed light on the function of technology in auditing as well as the need for electronic transformation. It also advocated for the need to provide the tools and techniques for digital transformation, which include employing personnel training, utilizing new abilities and skills, and implementing accurate technology.
(Zhang et al, 2022)	The study's objective was to introduce audit practitioners and researchers to one of the AI auditing methodologies. The article focuses on using this technology in a way that complies with audit standards and regulations.	Three artificial intelligence techniques were employed in the study: Shapley Additive exPlanations (SHAP), Local Interpretable Modelagnostic Explanations (LIME), and Explainable AI (X AI).	By utilizing a number of methods, the study has disproved the myth that there are no AI systems that can interpret auditing. The study also included instructions on how to verify the validity of the methods used.
Grosu, et al,2023)	By asking accountants about their attitudes on automated accounting this study sought to demonstrate the level of preparedness for this technology.	The study conducted a survey of accountants and the questionnaire was formulated with four factors and the extent of their impact on the work of accountants and the challenges they face	The study came to the conclusion that a number of factors, the most significant of which are: organizational policies, respondents' performance levels, and their perceptions of how easy it is to use digital accounting tools at the level of use and unit readiness. The concern of accountants about losing their jobs to AI services and being replaced by them, as well as the rapid advancement of technology, embodied the risks and challenges.
Ghobakhloo et) (al., 2023	The researchers studied the impact of the firms' technological, organizational, environmental and human resource aspects on the AI implementation. of auditing. The study also focused on contexts impact AI implementation.	The researchers studied the impact of the firms' technological, organizational, environmental and human resource aspects on the AI implementation. of auditing. The study also focused on contexts impact AI implementation	The study concluded that little research had been done on AI. The study discovered that the impact of AI on the long-term viability of business operations was not the main emphasis of earlier research. Considering the societal implications of AI applications can help decision makers make better choices.
AI Ghatrif, et.al, 2023	The writers of this report assessed the research on the use of technology in accounting	The study evaluated around sixty studies in accounting automation.	The investigation came to the conclusion that over the previous 20 years, there has been a notable growth in research in this field. The study suggested that emerging



	education.		nations should concentrate more on accounting technology research. The study made the recommendation that accounting research should rely more on technology by implementing AI and other tools like the Excel and Idea programs.
Mushtaq et al, 2022	This study aimed to determine the sentiments of 10- k report prediction using one of the AI tools, the purpose of the study was to help investors investigate and evaluate the performance of the companies using 10-k reports.	Using NLP, one of the AI techniques, the study examined 3729 yearly 10-k files for a sample of S&P 500 corporations from 2002 to 2019.	The study conducted that the firm's financial performance indicators are not affecting the positivity of 10-ks. The results also indicate that other firm characteristics such as corporate governance, cash holding, and R&D expenditure have mixed results of their impact on Positivity and Negativity.
Han et al, 2023	The study showed the effect of using block chain on accounting and auditing supported by artificial intelligence. The goal of the study was to investigate the way of enhancing the efficiency and the transparency of blockchain in accounting.	Analysis of the literature pertaining to the research issue was the study's main task.	The study's findings demonstrated how adopting the agency and stakeholder theories in conjunction with block chain technology might advance efforts to reduce information asymmetry. The report also highlighted the difficulties businesses should be aware of while implementing block chain.
Zhang et al, 2023	This study looks at the pre- and post-adoption phases of AI's ethical implications for managerial accounting.	This study examines the ethical implications of AI for managerial accounting in the pre- and post-adoption stages.	The study found a number of significant ethical hazards, including those related to data security, privacy, and misuse; accountability; accessibility; advantages and difficulties; and transparency and trust, that are connected to the development and application of AI in managerial accounting.
(Kureljusic& Karger,2023)	This paper aims to provide an overview of the current research on the application of AI for financial accounting forecasting, given the paucity of available data. By providing a comprehensive review, the authors hope to promote the generalizability of information in this field and set the stage for future study.	The authors' scientific databases were Web of Science and Scopus. Following the data collection process, 47 studies made up the final sample. Based on the forecasting goals, sample sizes, time periods, and machine learning methods used in these research, an analysis was conducted.	The results show that generalizable and sociotechnical knowledge is still lacking. The authors suggest an open research agenda for future scholars to fill this gap and enable more regular and efficient application of AI-based forecasting in financial accounting.

Studies have been conducted on the impact of AI in several areas of accounting as portrayed in the studies highlighted in the above table in financial accounting, management accounting and Auditing. The practical part was done using the survey, the interviews of the experts, the usage of concrete AI tools, and the analysis of the several companies. The investigations were based on different artificial intelligence paradigms. Mushtaq et al. (2022) used one of the AI approaches to analyse the textual content of the financial reports and the technique employed is Named Entity Pronoun Linking (NPL). Three artificial intelligence techniques were utilized by (Zhang et al. , 2022): among which the most popular techniques include the Shapley Additive exPlanations (SHAP), Local Interpretable Model-agnostic Explanations (LIME), and the Explainable AI (XAI). The research you've listed cover numerous issues related to implementation of technology into the financial management, auditing and accounting with special focus on digitalization, ethical concerns, and technical



receptiveness. This is a thorough examination of the research findings from these studies: This is a thorough examination of the research findings from these studies:

1. Alles in the year 2020 analysed the ethical considerations of accounting information systems.

Finding: As a result of this, it can be stated that there is a severe deficiency of research papers that focus on the analysis of accounting information systems' ethics. Of the nine reviewed studies, only three of them discussed this ethical concern.

• Implication: This gap calls for a more focused investigation on how ethics may foretell the use of technology in the accounting systems. Since technological solutions play an increasingly critical role in the financial processes, ethical considerations are increasingly relevant, and the solution of these problems may enhance the reliability of the accounting systems.

2. Technology's Role in Auditing Audit as a Service, Blockchain, Artificial Intelligence and Machine Learning (Manita et al., 2020)

• Findings: The paper outlines the importance of digitalisation in auditing and proposes to introduce certain technology, train personnel and acquire new skills.

• Implication: This points toward a shift toward policies in engaging new technology into auditing processes. To cope with the ever emerging auditing standards and techniques, organizations must make investments into technology and training. A positive outcome of an adoption of digital would ensure more effectiveness and efficiency in audits.

3. Auditing Technology from the perspective of artificial intelligence The employed technology The authors employed artificial intelligence in auditing technology The possibility of technology use in auditing Domain of technology used The authors used technology using Artificial intelligence as the domain of the technology Is the technology used a possibility for auditing The authors categorized artificial intelligence as the used technology for auditing Is technology a possibility for the domain of Auditing The authors suggested the possibility of technology, specifically Artificial Intelligence for Auditing.

• Findings: This investigation disapproves the auditability thesis that auditing AI systems cannot offer interpretation. It also entails the procedure of establishing reliability of these methods.

Implication: Auditing can now benefit from artificial intelligence to a huge extent due to improvement in the technology. In order to apply these tools as new practices of auditing for professional accountants it is crucial to ensure their reliability. This may enhance the confidence people have towards the new technologies, such as AI in enhancing the quality of audits.

4. Digital Accounting Readiness (Grosu and colleagues, 2023)

• Finding: Concerns with regards to the effect of AI towards job security, the levels of performance, policies in organizations, and how easy the software is to use also affect the readiness towards digital accounting.

• Implication: The challenges signifying that when deploying the digital accounting solutions, organizations require to assess the technical and social frameworks. The key to a good digital adaption is to overcome resistance that is the result of concerns for job losses and ensure that new tMFs are usable.

5. smart applications are changing the world and with its growing use Intelligent Automation's Impact (Ghobakhloo et al., 2023).

• Findings: Little research has been done to determine how intelligent automation affects the sustainability of business processes in the long run. Its use also has sociological factors that are important kept into consideration in an effort to make the best decisions.

• Implication: It means that there is more research that needs to be done in order to understand the impact AI will have on business sustainability in the long run. An integration of sociological points of view can improve decision-making process and address the remaining impacts of AI beyond the mechanical optimum.

6. only Accounting Studies with Technological orientation (AI Ghatrif et al., 2023)

• Finding: In the past two decades there has been a rising interest in using technology in the teaching of accounting. As it has been stated in the given report, it is time for the countries in the development to focus more on the accounting technology.

• Implication: The general public might benefit from improved technology utilization in the field of accounting by the developing nations through [];

7. Firm features' effect on financial outcomes (Mushtaq et al., 2022).

• Finding: Analysing the optimism of the 10-K filings, there is a weak sensitivity of the optimism level with the results of the firm's financial performance measures. Other business attribute is inconclusive which includes corporate governance and research and developments expenses.

• Implication: While this financial performance of Dow Chemical appears impressive, the nature of the 10-K filing contains numerous complicated factors such as governance as well as research and development. Due to such circumstances, it



becomes possible to have that some corporations might require considering a multitude of factors while evaluating, therefore reporting, their financial positions.

8. Accounting with Blockchain (Han et al., 2023)

- Finding: Both the stakeholder and agency Model suggest that maybe blockchain could reduce information asymmetry. This report also highlight on the challenges that are encountered when implementing this technology known as blockchain.
- Implication: Accounting itself, which, as discussed thus far, is a profession that may benefit from improved transparency and less information asymmetry, may be improved through the use of blockchain technologies.

9. Zhang et al. *italicised the title Ethical Risks of AI in Managerial Accounting* (2023).

- Finding: The paper examines and outlines major ethical concerns regarding the use of AI in managerial accounting such as; High stakes/ Data security & privacy, and; Accountability & Accessibility-Benefits: vs. Challenges; and Transparency.

- Implication: It is crucial to deal with these ethical risks to learn more about the proper usage of AI in managerial accounting. Measures to address the risk surrounding data security, privacy and the openness of the algorithm can reduce prospects of possible problems with the adoption of artificial intelligence.

10. An analysis of research gaps identified in AI forecasting studies, which has been undertaken by Kureljusic & Karger (2023).

Finding: Currently, no sociotechnical and generalizable knowledge on AI-based forecasting is available in the context of financial accounting. The authors offer an agenda for future research to fill such a gap.

- Implication: For more detailed understanding of the sociotechnical aspects and for developing such knowledge to apply and enhance the use of AI in the actual forecasting of financial status, more research has to be done. This may make the use of AI in financial accounting to become more often and effective.

All the identified studies show how it is increasingly significant to integrate new technologies into accountancy and audit work including blockchain, artificial intelligence and digital. Although the technological advances provide immense benefits, there are at the same time significant topics that are less explored, for instance sociotechnical impact of existing day technologies, readiness towards the digital shift, and concerns. Such outcomes indicate that various gaps when closed can lead to putting to better use of technology in financial management and auditing, which is more efficient plus moral.

CONCLUSION:

In this fast moving world where financial affairs are constantly evolving, artificial intelligence (AI) has become an increasingly relevant part of both accounting and auditing processes.

The precision, transparency, and efficiency of financial management processes are a few of the radical developments that technology has made possible.

Automation and artificial intelligence (AI) together offer many advantages. They include but are not limited to: Greater Precision & Productivity: unfortunate human errors are reduced and repetitive tasks accelerated. More precise financial reporting and auditing becomes possible 2. Greater Transparency: AI technology provides an immutable decentralized account book that can reduce information asymmetries and improve the accuracy of financial data; and 3. Sophisticated Analytical abilities: Artificial intelligence (AI) allows data to be analyzed with the kind of preconceived biases--for example, using rules about which attributes are typically correlated together in reality. Although these advantages, researches are still required in crucial areas.

1. Ethical Considerations: Using technologies raises important ethical issues in privacy, accountability, and data security. For AI applications in finance to remain trustworthy and honest it must observe moral standards.

2. Readiness for Digital Transformation: Organizational readiness is essential to the effective application of technology. This includes not just the hardware of technology but what kind of preparation employees have received. It is also crucial if transitions are to proceed unimpeded that worries about job security be addressed and resistance to change overcome.

3. Sociotechnical Implications: It's important to consider how technology will influence both the human and organizational factors in accounting and auditing. This means you should be mindful of how company culture, job responsibilities, how work is done are being affected by technological progress.

To optimally apply technologies in accounting and auditing, the above gaps must be met. Move can encourage organizations to urge the moral use of technology by stressing ethical factors, guaranteeing the organization to be in expectancy of the digital change and research on sociotechnical implications. Such a comprehensive approach shall ensure a positive impact of technological changes not only on the efficiency of the financial processes but throughout the larger financial value system as well. Based on the conclusion of the study, the author recommends that future studies be conducted on artificial intelligence (AI) and its relevance in financial accounting with specific focus on the consequences of applying the use of this advancement especially in countries where researchers have shown limited interest in the area of financial accounting.



The following is a summary of the recommendations: The following is a summary of the recommendations:

1. Expanding AI Research: Further research should be done on the application of AI in accounting especially in the countries that have adopted this technology in the recent past. This might help in developing a further knowledge of how AI could aid these nations enhance the effectiveness as well as efficiency of their respective accounting environments.
2. Emphasizing Digital Transformation: This in turn suggests that it's useful to look at some of the processes that are linked to the transition from the use of manual methods to the application of automated ones. Research in this field can provide information about how best to address the change, identify related prospects and issues and guide the usage of AI in organisations more effectively.
3. Global Comparison: The findings of the current study reveal that USA, China and UK are in the forefront in AI accounting research. Therefore, for the purpose of providing a global equilibrium of both knowledge and applications, one must encourage research in this area in other countries also.
4. The Effect on Underdeveloped Nations: It could provide valuable pointers regarding the prospects of AI in the developing countries if the focus is based on the benefits accruing from this technology. Increasing the existing knowledge and optimal application of this technology will require future funding on AI in financial accounting and the advantages and issues with this technology in many areas geographically. This can enhance current and potential accounting systems' effectiveness and productivity and help in the achievement of the industry's digital goals and objectives.

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