The Impact of Artificial Intelligence on Audit Efficiency

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Abstract. In the era of digital transformation, traditional audit lags in handling data. Artificial Intelligence (AI) with its tech edge, has entered audit but its efficiency impact needs study. This qualitative lit review analyzes AI-used tech for audit efficiency, evaluation, improvement, risks and countermeasures. AI shortens audit cycle, cuts costs, and boosts accuracy. However, it has high development costs, lacks rational judgment, demands skilled staff, and risks data security. Strengthening industry-academia-research cooperation, man-machine collaboration, training, and data security can ease these issues. AI offers audit transformation, and addressing challenges will drive audit industry's intelligent growth. For regulatory agencies, it offers insights to optimize regulatory policies, ensuring AI in audit is properly supervised. For audit firms, it provides guidance to enhance audit services using AI, improving competitiveness. For enterprises, it helps them make better use of AI-based audit results for more informed business decisions.

1 Introduction

With the progress of technology and the development of the times nowadays, digital transformation has swept across various fields around the world. Emerging technologies such as cloud computing, big data, and the Internet of Things have been booming, deeply changing the operation mode and business ecosystem of enterprises. The business scale of enterprises continues to expand, transactions are becoming more frequent and complex, and the amount of data generated is growing exponentially.

In such an environment, the traditional audit mode relies too much on manual operations. When faced with massive amounts of data, auditors need to spend a lot of time and energy on data collection, organization, and analysis. The process is cumbersome and inefficient. Moreover, in the audit of complex businesses, manual judgment is extremely prone to omissions and deviations. Artificial intelligence, with its powerful algorithms and computing capabilities, is integrating into the audit field at an unimaginable speed. It can accurately solve many problems of traditional audits and inject strong impetus into the innovation of audit work.

However, there are many aspects that need to be studied. For example, regarding the impact of artificial intelligence on audit efficiency, we lack in - depth analysis of which

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technologies are used, what the actual effects are, how the effects can be quantified, what its potential risks are, and the non-quantifiable benefits of AI auditing, such as its long - term strategic impact. Besides, most of the existing studies focus on large enterprises, lacking applicability for small and medium-sized enterprises. All these still need to be studied by people.

Therefore, the purpose of this article is to explore the technologies used by artificial intelligence in improving audit efficiency, how to judge audit efficiency, the methods to improve audit efficiency, as well as its potential risks and countermeasures.Studying this topic helps to clearly understand the transformation trend of the audit industry. In short, it contributes to the upgrading of the audit industry, the improvement of enterprises' audit efficiency, the optimization of regulatory policy formulation, and the development of academic theories.

2 Introduction to the application of artificial intelligence in auditing

Artificial intelligence technology is widely used in the auditing field. In data collection and analysis, AI can precisely gather the data needed for auditing from a vast amount of data and conduct in - depth analysis on it to find abnormal patterns, trends, and relationships. In risk assessment, AI can accurately identify risks. Based on its own risk assessment models, it can consider multiple factors and issue early warnings about audit risks to alert auditors to potential risks. In terms of internal control evaluation, AI can automatically analyze a company's business processes. By simulating various processes, it can identify possible risks and loopholes. At the same time, relevant personnel can use AI technology to test internal controls.

In audit evidence acquisition and verification, AI can not only collect audit evidence automatically but also verify the authenticity and reliability of the evidence using technologies such as image and voice recognition [1]. Natural language processing (NLP) also has practical applications here, especially in contract analysis. NLP can quickly scan and understand complex legal contracts. It can extract important information such as contract terms, obligations, and expiration dates. This helps auditors to efficiently review a large number of contracts, ensuring compliance and identifying potential risks. For example, Deloitte's "Argus" system uses NLP technology. It can analyze a large volume of contracts at a fast speed. By using machine learning algorithms, "Argus" can flag any inconsistent or high - risk clauses in contracts. Auditors no longer need to manually read through countless pages of contracts. Instead, they can rely on "Argus" to highlight areas that require further attention. This not only saves a significant amount of time but also improves the accuracy of contract review in the auditing process.

Finally, in the audit report generation stage, AI can generate a draft audit report based on the results of audit work and conduct a quality check on the completed report. Many empirical studies and cases show that AI significantly improves audit efficiency. Large accounting firms have introduced intelligent audit systems. The processing of a large amount of financial data that originally took weeks can now be completed in just a few days with the help of algorithms, and the accuracy and comprehensiveness are higher. In the risk assessment stage, AI models can provide accurate assessments considering multiple factors, reducing audit risks.

In quantitative research on application effects, scholars usually compare indicators such as the completion time of audit projects, the number of problems found, and audit costs before and after the introduction of AI to directly show the degree of improvement. For example, studies show that after the introduction of AI, the average completion cycle of

audit projects is shortened by 30% - 50%, the number of problems found increases by 20% - 30%, and labor costs are reduced by 15% - 25% [2].

However, there are potential risks in the application of AI in auditing. Poor data quality can lead to incorrect results from the model. Algorithm bias may result in unfair audit conclusions. The system's security also faces threats such as hacker attacks and data leakage.

Although machine learning and natural language processing technologies have been applied, there is not enough research on how to deeply integrate multiple AI technologies to build a more comprehensive and intelligent audit system. For example, in actual audits, the data processing, risk assessment, and audit report generation processes are interrelated. Existing research rarely explores how to achieve seamless connection between these processes through technology integration to make the audit process more coherent and efficient.

Most research focuses on large enterprises or accounting firms, with insufficient research on the applicability of AI in small and medium - sized enterprises (SMEs). Due to limited resources and different business characteristics from large enterprises, SMEs face different challenges when introducing AI audit technology, such as cost control and technology adaptation. There are no mature solutions in relevant research.

Although there are studies on measuring the improvement of audit efficiency by AI through comparative indicators, there is a lack of in - depth exploration of some non - quantifiable benefits, such as the impact of audit quality on a company's long - term strategic decisions and the maintenance of its reputation. This makes the evaluation of the application value of AI in auditing incomplete and unable to provide more forward - looking decision - making basis for enterprises and audit institutions.

Although data quality, algorithm bias, and security issues have been identified as potential risks in AI auditing, progress in quantifying these risks is slow. It is difficult to accurately assess the specific losses caused by data quality problems, algorithm bias, and security incidents to audit results and enterprises, resulting in a lack of precision and pertinence in formulating countermeasures.

3 The paths and achievements of artificial intelligence in improving audit efficiency

3.1 Evaluation dimensions of audit efficiency

The evaluation dimensions of audit efficiency are divided into three parts: the time dimension, the cost dimension, and the quality dimension.

From the time dimension, the time taken to complete an audit task is an intuitive indicator for evaluating audit efficiency. In traditional audits, data collection, organization, and evidence verification require a large amount of human labor time. For example, when manually collecting data from multiple business systems of an enterprise, it is necessary to check and enter data sheet by sheet, which is inefficient and error-prone. However, with the help of artificial intelligence, data crawling tools can automatically collect data, and machine learning algorithms can quickly analyze it.   For instance, automated audit software can process a large amount of data in a short time and generate a draft audit report, greatly shortening the audit cycle and improving the overall progress [3].

From the cost dimension, audit costs include many aspects such as human resources, time, and technical equipment. Although the application of artificial intelligence requires upfront investment in research and development, equipment purchase, and personnel training, it can reduce costs and increase efficiency in the long run. Take the audit of a large

enterprise as an example. In the past, a large number of junior auditors were needed, resulting in high labor costs. After using artificial intelligence to assist in auditing, the manual workload has been reduced, and labor costs have decreased. At the same time, the improvement in audit efficiency has shortened the time, and the time cost has also been reduced accordingly [4]. Moreover, due to the improvement of audit quality, the potential losses of audit failure have been reduced, indirectly controlling the costs.

From the quality dimension, audit quality is the core of auditing, and a high-quality audit can provide reliable information for stakeholders. The powerful data processing and analysis capabilities of artificial intelligence can improve the accuracy and comprehensiveness of audits. Machine learning algorithms can deeply mine data, discover abnormalities and risks that are difficult for humans to detect, and avoid audit omissions. Natural language processing technology can accurately analyze text information such as contracts and documents, providing richer and more accurate evidence for audits and enhancing the reliability of audit conclusions, thus better ensuring audit quality [5].

3.2 Paths for artificial intelligence to improve audit efficiency

Automate data collection and organization to replace time-consuming and low-tech manual work. Use web crawler technology to automatically collect data needed for audits from various online platforms and databases, avoiding the cumbersome process of manual individual searching and downloading, and greatly improving the data collection speed. Use data cleaning tools and algorithms to automatically identify and process noise, outliers, and duplicate data in the data, and quickly organize the data into a standardized and unified format to prepare for subsequent analysis [6].

3.3 Achievements of artificial intelligence in improving audit efficiency

The project cycle is significantly shortened, and human resources can be reallocated to high-value tasks. Improve audit quality and accuracy, greatly reducing the audit error rate and ensuring the reliability of audit results. Enhance the timeliness and forward-looking nature of audits, helping enterprises make early arrangements and seize development opportunities [7].

4 Challenges and countermeasures of the application of artificial intelligence in auditing

4.1 Challenges in the Application of Artificial Intelligence in Auditing

In the field of auditing, the introduction of artificial intelligence has undoubtedly brought new development opportunities, but it has also given rise to many thorny problems.

The primary issue is the high investment cost. To develop an artificial intelligence system for auditing, a cross-disciplinary professional team needs to be formed. Team members should not only be proficient in computer science knowledge and skilled in algorithm design, but also have an in-depth and comprehensive understanding of the auditing business process. This means hiring professionals with multi-disciplinary backgrounds, and the labor cost is naturally high. At the same time, high-performance hardware devices are indispensable. Auditing work involves the processing of massive amounts of data, and ordinary hardware is difficult to meet the requirements in terms of computing speed and storage capacity. Professional servers, advanced graphics processing units (GPUs), etc. must be purchased, which is undoubtedly a huge expense. In addition,

the process of data acquisition and management is extremely complex. To enable the artificial intelligence model to operate accurately, various types of data such as an enterprise's financial statements and transaction records over many years need to be widely collected. After collection, the data also needs to go through strict cleaning, classification, and storage. A large amount of resources need to be invested in each link, which puts great pressure on the financial reserves of auditing institutions and enterprises.

In practical application scenarios, artificial intelligence has obvious shortcomings in rational judgment. It works based on preset algorithms and input data and lacks the logical reasoning ability that humans possess. Facing complex auditing situations, human auditors can make trade-off judgments by comprehensively considering multiple factors based on their rich long-term accumulated experience. Take the analysis of related-party transactions of an enterprise as an example. Humans can understand the complex network of interest relationships behind it, while artificial intelligence can only judge according to established rules, and it is very easy to overlook potential risk points, thus leading to deviations in audit results [8].

Furthermore, auditors face new challenges in improving their professional capabilities. They not only need to master traditional auditing knowledge proficiently, such as professional skills like financial statement analysis and audit procedure execution, but also need to deeply study the principles of artificial intelligence technology and master data processing and analysis methods to collaborate with artificial intelligence. However, in reality, it is not easy to cultivate compound talents who are proficient in both auditing business and artificial intelligence technology, which poses a severe test to the talent reserve of the auditing industry [9].

Finally, the risks of data privacy and security cannot be ignored. Audit data contains a large amount of sensitive information, such as enterprise trade secrets and customer privacy. Since artificial intelligence systems involve large-scale data storage and transmission, they have become the main targets of cyberattacks. From the vulnerabilities in the data collection channels in the data collection stage, to the weak links in the database protection system in the storage stage, and then to the non-standard management of access rights in the data use stage, any problem in any link may lead to the leakage of sensitive data, causing serious economic losses and reputation crises [10].

4.2 Countermeasures

Facing the problem of the too-high investment cost of artificial intelligence, cooperation and sharing can be sought. Auditing institutions are encouraged to cooperate with universities and scientific research institutions, carry out research and development together, and share technological achievements. Also, investment can be made gradually in stages, and further plans can be made according to the effects at different stages.

Facing the problem that artificial intelligence cannot make rational judgments, the problem can be solved through a human-machine collaboration model. In the audit model with humans as the leading role and AI as the assistant, the data analysis ability of artificial intelligence is combined with the rational judgment ability of auditors to achieve twice the result with half the effort [11].

Facing the problem of higher requirements for auditors, professional training can be carried out for auditors. Regular training courses on artificial intelligence technology can be organized, or talents with computer and data analysis backgrounds can be introduced to cooperate with traditional auditors and form a diversified team.

Facing the risks of data privacy and security, advanced encryption, access control, data backup and recovery technologies can be adopted to ensure the security and integrity of

audit data. At the same time, a perfect data management system should be strictly formulated to prevent data leakage caused by the illegal operations of internal personnel.

To deal with the challenges of applying artificial intelligence in auditing, policies can be formulated in several ways. Regarding cost reduction, the government can set up special support funds and give financial subsidies to enterprises and institutions developing artificial intelligence systems for auditing to ease their R&D investment pressure. For talent cultivation, encourage policies should be issued to urge universities and vocational colleges to offer courses integrating auditing and artificial intelligence, so as to supply composite talents for the auditing industry. Data security matters a lot. Strict data security laws should be made to clarify the security management norms for the whole process of audit data. Penalties for illegal operations should be severe to enhance data security protection and promote the healthy and efficient application of artificial intelligence in auditing.

5 Conclusion

The application of artificial intelligence in the field of auditing has greatly improved audit efficiency. Through paths such as the automation of data collection and organization, it has shown remarkable achievements in the dimensions of time, cost, and quality, saving time and labor costs, improving audit quality, and enhancing timeliness and forward-looking nature. However, it also faces challenges such as high costs, lack of rational judgment, high requirements for personnel, and data security. Nevertheless, through strategies such as cooperation and sharing, human-machine collaboration, professional training, and strengthening technical protection, these challenges can be effectively addressed. With the continuous development and improvement of technology, artificial intelligence is expected to play a greater role in the field of auditing and promote the auditing industry to move forward continuously in a more efficient and intelligent direction.

References

1. G. Gao, "How AI Reshapes the Accounting and Auditing Industry". China Accounting News, **Mar. 7**, 003 (2025)
2. Q. Zhao, Y. Q. Pan, P. C. Qin, "How to Use AI and Python Language to Write Practical Audit Tools". Modern Auditing & Accounting, **03**, 25 – 26 (2025)
3. Y. Zhu, G. Q. Hua, J. W. Lou, "The Impact of Artificial Intelligence on the Development of the Auditing Profession under the Background of New Quality Productivity —— An Empirical Study Based on Auditors' Perception". Friends of Accounting, **06**, 147 – 153 (2025)
4. S. He, "The Application Prospects and Challenges of Artificial Intelligence in Auditing Work". Henan Economic News, **21**, 009 (2025)
5. N. Li, H. Jiang, "Does AI Adoption Redefine Financial Reporting Accuracy, Auditing Efficiency, and Information Asymmetry? An Integrated Model of TOE - TAM - RDT and Big Data Governance". Computers in Human Behavior Rep, **24,** 17100572 – 100572 (2024)
6. K. Cao, "Research on Audit Management Innovation in AI Context". Forum on Research and Innovation Management, **2**, 7 (2024)
7. Y. Li, S. Goel, "Making It Possible for the Auditing of AI: A Systematic Review of AI Audits and AI Auditability". Inf. Syst. Front, **7**,1 – 31 (2024)
8. W. Murikah, K. J. Nthenge, M. F. Musyoka, "Bias and Ethics of AI Systems Applied in Auditing - A Systematic Review". Sci. Afr., **25**, 02281 – 02281 (2024)

9. Koshiyama, E. Kazim, P. Treleaven, et al., "Towards Algorithm Auditing: Managing Legal, Ethical and Technological Risks of AI, ML and Associated Algorithms". R. Soc. Open Sci., **11(5)**, 230859 (2024)

10. J. Du, "Research on Audit Risks and Prevention in Accounting Firms under the Background of Artificial Intelligence". Modern Marketing (Early Edition), **01**, 49 – 51(2024)

11. Y. P. Shen, L. N. Qiao, "Reflections on the Impact of the Auditing Industry in the Era of Artificial Intelligence". Bohai Economic Outlook, **07**, 14 – 15 (2022)