Research on the Application of Artificial Intelligence in the Audit Field-Taking Ernst&Young as an Example

Zhiyu Pan

Suzhou Science and Technology Town Foreign Language High School, Suzhou, China
Gracepan88888888@gmail.com

Abstract: This research further delves into how EY's AI - based audit model impacts the overall audit market landscape. By analyzing market share changes and competitive dynamics, it becomes evident that EY's innovative approach has spurred other firms to accelerate their digital transformation efforts. This has led to a more competitive yet dynamic audit market, ultimately benefiting clients through improved services and more accurate risk assessments.Moreover, the study explores the long - term implications of AI in auditing. As AI technology continues to evolve, there is a possibility of new audit services emerging. For example, predictive auditing, where AI can forecast future financial risks and business trends based on historical data, could become a standard offering. However, this also raises questions about the future role of auditors. While AI can handle a significant portion of data - processing tasks, the need for human judgment in complex audit situations remains crucial.In conclusion, this research not only provides a detailed analysis of EY's AI - based audit practices but also offers a forward - looking perspective on the future of the audit industry. It serves as a call to action for audit firms to embrace AI technology while being mindful of the associated challenges, in order to stay competitive.

Keywords: Artificial intelligence, Audit innovation, Digital transformation, Risk management, Data analytics.

1. Introduction

In the era of global digital transformation, the audit industry is experiencing unparalleled changes. As the business operating environment becomes more complex and business scales expand continuously, the volume of data generated by enterprises has grown exponentially. Traditional audit methods are gradually showing their limitations when dealing with large - scale data and intricate business scenarios. For instance, audit efficiency is relatively low, and it is difficult to complete a comprehensive review within the stipulated time. Moreover, the ability to identify risks is restricted, and potential risk points are easily overlooked.Artificial intelligence (AI) technology, with its excellent data - processing ability, intelligent analysis features, and automation advantages, presents new opportunities for the development of the audit industry. AI can quickly process and analyze large - scale data. By leveraging deep - learning and pattern - recognition technologies, it can accurately identify abnormal situations and potential risks within the data, providing more comprehensive and in - depth information for audit work and enabling auditors to make more precise judgments.As a world - renowned professional services firm, Ernst & Young has always been at the forefront of technological innovation. In recent years, Ernst & Young has actively promoted the application of AI

technology in the audit field. By meticulously crafting intelligent audit solutions, it has comprehensively optimized the audit process and significantly improved audit quality. Its successful AI - based audit practices not only create great value for its own business development but also offer valuable experience for the digital transformation of the entire audit industry. Furthermore, the integration of AI into the audit process is not just about enhancing efficiency and accuracy. It also has the potential to reshape the entire audit paradigm. With AI, auditors can shift their focus from manual, repetitive tasks to more complex, value - added activities such as in - depth data interpretation and strategic decision - making support. This transformation can lead to a more proactive and forward - looking audit approach. For example, real - time risk monitoring enabled by AI allows auditors to detect emerging risks promptly and provide timely advice to clients, helping them better manage their financial and operational risks. However, this transformation also requires a fundamental change in the way audit firms operate, including adjustments to their organizational structures, work processes, and the skills of their employees.

Many previous studies have explored various aspects of AI application in the audit field [1-4]. Some studies have concentrated on the application of AI technology in a specific stage of the audit process, analyzing its theoretical feasibility and potential benefits, which provides a theoretical foundation for integrating AI into audit operations [1]. There are also studies that have examined the adaptability and application effects of AI in specific industry audit scenarios, offering some references for audit practices in different industries [2]. However, existing research has obvious flaws. Firstly, there is a lack of in - depth and systematic research on the specific practical process of large - scale professional service institutions fully integrating AI technology into audit operations. In particular, there is insufficiently detailed research on how to optimize each key step in the audit process with the aid of AI. Secondly, regarding the practical problems encountered in the application of AI in auditing, most existing studies remain at the theoretical analysis level, lacking a comprehensive review and in - depth analysis of the coping strategies adopted by enterprises in actual operations.This study takes Ernst & Young as an example to deeply explore the specific ways it integrates AI technology into audit practices. It focuses on the specific steps in the audit process that can optimize the audit and thus improve audit efficiency. Meanwhile, this study will also analyze the main problems faced by Ernst & Young in the application of AI in auditing, such as data protection issues, over - dependence on technology, and a shortage of professional talents, and systematically organize its corresponding solutions. Through a comprehensive and systematic analysis of Ernst & Young's actual situation, this study aims to provide strong theoretical support and practical suggestions for the digital transformation of the audit industry and further promote the improvement of the overall service level of audit operations.

2. Case Study

2.1. Core measures of Ernst & Young's AI - based audit

Ernst & Young fully utilizes AI technology to develop a complete end - to - end intelligent audit solution, covering the entire audit process from data collection to risk identification. In the data collection phase, Ernst & Young uses automated tools to efficiently extract financial data from enterprise resource planning (ERP) systems, financial statement systems, and various other data sources. Subsequently, intelligent algorithms are employed to automatically complete data integration and cleaning. This process significantly reduces the time required for data preparation and greatly improves the accuracy and consistency of data, laying a solid foundation for subsequent data analysis.In the data analysis stage, Ernst & Young uses machine - learning algorithms to conduct in - depth exploration of massive financial data and constructs multi - dimensional risk - prediction models. These models can accurately identify abnormal patterns and potential risk points in the data

by learning from historical data. For example, the AI model can determine whether the fluctuation trends of enterprise revenues and costs conform to normal business logic through analysis, thereby effectively identifying potential financial fraud. Additionally, AI can conduct real - time monitoring of enterprise operation data and promptly send accurate risk alerts to auditors when abnormal situations are detected.

2.2. Typical case - the audit project of yonghui supermarket

Yonghui Supermarket, a leading retail enterprise in China, has a wide - ranging business scope across many regions of the country, a large number of stores, and a complex supply chain system. Its daily operations generate a vast amount of sales data, inventory data, procurement data, and supplier transaction accounts. Traditional audit methods often have low efficiency and are prone to omissions when dealing with such large and complex data, making it difficult to meet the strict requirements of enterprises for audit accuracy and timeliness [5-6]. After undertaking the audit project of Yonghui Supermarket, Ernst & Young comprehensively introduced AI - based audit technology. In the data collection stage, Ernst & Young uses self - developed AI data collection tools to seamlessly connect with Yonghui Supermarket's ERP system, financial system, and the sales terminal systems of each store, quickly obtaining the key financial data scattered in various systems. The AI tool can not only automatically complete data cleaning and preliminary sorting but also classify and label the data according to predefined rules, effectively ensuring the accuracy and consistency of the data.In the data analysis stage, the AI model plays a crucial role. Ernst & Young constructs a sales data analysis model to compare the sales performance of different regions, different stores at different time periods, and combines market trends and seasonal factors. It is found that the sales volume of some stores shows abnormal fluctuations during non - promotion periods. For example, the sales volume of certain stores suddenly increases significantly during non - promotion periods, and the growth rate is significantly different from that of surrounding similar stores and historical data. After in - depth investigation, the audit team discovered that there were false sales records in these stores, and employees fabricated some sales transactions to meet performance targets.In addition, AI also conducts in - depth analysis of Yonghui Supermarket's inventory data. Through the inventory turnover rate analysis model, combined with the sales cycle of commodities and historical inventory levels, the AI system discovers that the inventory turnover rate of some commodities is far below the normal level, indicating a risk of inventory backlog. At the same time, for some popular commodities, the inventory data shows that replenishment is not timely, which may lead to out - of - stock situations and thus affect sales performance. Through the intelligent review of procurement contracts and supplier transaction accounts, the AI system also discovers that some contract terms have potential risks, such as ambiguous supplier delivery times and unclear price - adjustment mechanisms, which may cause economic losses to the enterprise.

3. Advantages and challenge

3.1. Advantages of AI - based audit

Substantial Efficiency Enhancement: AI technology automates data processing and analysis, greatly shortening the audit cycle. In the Yonghui Supermarket audit project, the AI tool completed data collection and preliminary analysis in just a few days, while traditional manual processing of the same amount of data usually takes weeks [6]. This significant improvement in efficiency enables auditors to submit audit reports to clients more rapidly, meeting the enterprises' requirements for audit timeliness [5].

High - accuracy Risk Identification: With the assistance of machine - learning algorithms, AI can conduct in - depth analysis of massive data and accurately identify abnormal patterns and potential

risks hidden in the data. In the case of Yonghui Supermarket, AI successfully identified false sales issues that were difficult to detect using traditional audit methods and issued early warnings about potential risks in inventory management and procurement contracts [3]. This high - accuracy risk - identification ability provides more comprehensive risk - prevention and control support for enterprises [5,7].

Powerful Data - processing Comprehensiveness: AI has the ability to process large - scale and multi - dimensional data, effectively overcoming the limitations of manual audit in data - processing capabilities. In the Yonghui Supermarket audit project, AI provides more in - depth audit insights for the enterprise through the comprehensive analysis of sales data, inventory data, procurement data, and supplier transaction accounts [6]. This comprehensive data - processing ability allows auditors to examine the financial status and operational conditions of enterprises from multiple perspectives and discover associated risks that are easily overlooked by manual audit [2,5].

3.2. Challenges of AI - based audit

At the same time, Ernst & Young actively recruits talents with professional backgrounds in data science, com• Data Security Risks: Audit work involves a large amount of sensitive financial data of enterprises. AI systems face security threats such as data leakage and tampering during data storage, transmission, and usage [8]. In the Yonghui Supermarket audit project, a large amount of sales data, customer information, etc. are stored in the AI system. Ensuring the security of these data has become a crucial issue. Once a data - security problem occurs, it will not only affect the accuracy of audit results but also may bring serious legal risks and reputation losses to the enterprise [8].

Technology - Dependence Risks: AI - based audit highly depends on algorithms and models. If there are flaws in the algorithms or the model training data is insufficient, the audit results may be inaccurate [9]. Moreover, AI technology is evolving rapidly, and continuous resource investment is required for technology upgrades and maintenance. In the case of Yonghui Supermarket, the AI model has limited understanding of some special business scenarios in the retail industry, which may misinterpret some normal business fluctuations as risk points, thus affecting the accuracy of audit results [6].

Shortage of Skilled Talents: AI - based audit requires auditors to possess interdisciplinary knowledge and skills, such as data analysis and machine learning. Currently, there is a relative shortage of such compound talents in the industry. In the Yonghui Supermarket audit project, the audit team needs personnel who are proficient in both audit business and AI technology to operate and interpret the AI analysis results. However, the number of such talents is limited, which restricts the effectiveness of AI - based audit. In addition, the rapid development of AI technology also places higher demands on the continuous learning ability of auditors [10].

4. Solutions and suggestions

4.1. Data security protection measures

To effectively address data - security risks, Ernst & Young has implemented a series of strict data - security protection measures. Firstly, Ernst & Young uses advanced data - encryption technology to encrypt data during transmission and storage, ensuring the security of data in these processes. Secondly, Ernst & Young has established a complete access - control mechanism. Based on the job responsibilities of employees and the requirements of audit tasks, data - access rights are accurately assigned to prevent data abuse and leakage. In addition, Ernst & Young regularly conducts data - security vulnerability scanning and repair work to promptly detect and address potential data - security threats.

4.2. Technology optimization strategies

To improve the accuracy and stability of AI - based audit, Ernst & Young continuously optimizes AI algorithms and models. Ernst & Young introduces the latest technology frameworks and algorithm libraries to continuously enhance the accuracy and stability of the models. At the same time, Ernst & Young strengthens the verification and testing of the models. A large amount of actual business data is used to repeatedly verify the models to ensure their reliability in different business scenarios. Moreover, Ernst & Young has established a technology - monitoring system to monitor the running status of the AI system in real - time and promptly detect and resolve technical problems.

4.3. Talent cultivation and introduction

To solve the problem of talent shortage, Ernst & Young has increased the training intensity for internal auditors. Ernst & Young offers relevant training courses on data analysis, AI technology application, etc., to enhance the technical capabilities of existing personnel. Through internal training and online learning platforms, auditors gradually master the basic skills of AI - based audiputer science, etc., to enrich the audit team and optimize the talent structure. In addition, Ernst & Young collaborates with universities and research institutions to cultivate AI talents suitable for the audit industry in a targeted manner, providing talent support for the sustainable development of AI - based audit.

5. Conclusions

The practices of Ernst & Young in the field of AI - based audit fully demonstrate that AI technology has significant advantages in improving audit efficiency and enhancing risk - identification capabilities. Through the analysis of the Yonghui Supermarket audit case, it can be seen that AI can help auditors quickly process massive data, accurately identify potential risks, and provide more valuable audit services for enterprises. However, the application of AI - based audit also faces many challenges, which need to be addressed from multiple aspects, such as data security, technology optimization, and talent cultivation. For the audit industry as a whole, the case of Ernst & Young serves as a pivotal example. It offers a blueprint for other accounting firms to follow in their digital transformation journey. By emulating EY's strategies, firms can start by assessing their current technological infrastructure and identifying areas where AI can be effectively integrated. This could involve pilot projects in specific audit areas to test the waters and gradually expand AI applications based on the results. In terms of data security, the industry needs to establish unified standards and best practices. This includes not only the use of advanced encryption techniques but also the implementation of regular security audits and employee training programs. By doing so, audit firms can build trust with their clients and ensure the integrity of the audit process. Regarding technology optimization, continuous research and development are essential. Firms should invest in improving AI algorithms and models, and also explore emerging technologies such as block chain - based audit solutions. Blockchain can enhance data security and immutability, further strengthening the audit process.The shortage of skilled talents remains a critical issue. Audit firms need to collaborate more closely with educational institutions to develop specialized courses that combine audit knowledge with AI skills. Additionally, offering attractive incentives and career development opportunities can help retain and attract top - notch talent in this field. Looking ahead, with the continuous development and improvement of AI technology, its application prospects in the audit field will be broader. AI - based audit tools are likely to become more user - friendly and accessible, even for smaller audit firms. This will level the playing field and promote healthy competition across the industry.

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