Big Data Audit Analysis in Shenyang De 'An Accounting Firmapplication Research in the Program

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Abstract. In recent years, big data and cloud computing technologies have been widely applied, profoundly changing peoples lifestyles and work methods. This paper provides a basic analysis of the characteristics of audit analytical procedures at different stages and periods, and elucidates all the limitations of traditional audit analytical procedures, thereby emphasizing the importance of applying big data analytics to auditing. It then discusses the application of big data in audit analytical procedures, using Shenyang De an Accounting Firm as an example to analyze how it uses big data to address issues in its work, and proposes strategies and suggestions for addressing the shortcomings and areas that need improvement in its application.

Keywords: big data; audit analysis; electronic data audit; "Internet +"

1   Introdution

Big data analysis technology has been widely applied in e-commerce, scientific research, business decision-making, and other fields, with related technologies gradually maturing. These technologies are extensively used for the in-depth mining and improvement of accounting and auditing information. The Ministry of Finance of China released its Thirteenth Five-Year Plan for Accounting Reform and Development, emphasizing that the government should actively participate in the development of international standards such as XBRL.[1] All these will lay a solid policy foundation for the application of big data in audit analysis. Therefore, taking Shenyang Dean Certified Public Accountants as an example, this paper analyzes how they use big data to address issues in their work, and proposes strategies and suggestions for addressing shortcomings and areas needing improvement in their application.

2   The Application of Big Data in the Analysis Program of Shenyang De an Office

2.1   Shenyang De an Accounting Firm Introduction

Shenyang De an Accounting Firm is a local small to medium-sized accounting firm located in Liaoning Province. The firm has over 150 employees, including nearly 50 certified public accountants. Its main business scope includes auditing corporate financial statements and issuing audit reports; verifying corporate capital and providing capital verification reports; handling audit services for mergers, splits, and liquidations of enterprises, as well as annual financial settlement audits for basic construction projects. In practical auditing work, the firm uses customized audit software, and internal and external network VPN technology enables remote office operations for auditors. Due to limitations in time and space in 202 3, the firms audit of Company X was less effective, leading to termination of the engagement. This article selects the firms audit case of Company X for the 202 3 fiscal year to demonstrate the advantages of big data technology in analytical procedures.

2.2   Big data is Applied in the Specific Application Process of Shenyang De an Affairs Office Analysis Program

During the risk identification phase, auditors at accounting firms typically rely on their professional judgment to identify risk points and then perform substantive procedures. The scope of these identifications usually focuses on several key financial data points in the financial statements, making it very easy for financial personnel to falsify information. In the past, when auditing corporate receivables, accounting firms would select historical data from their own company as comparative figures, such as accounts receivable turnover days. As shown in Figure 1, Company Xs accounts receivable turnover days decreased from 566.66 days to 538.73 days. Moreover, according to the financial statement data, Company Xs revenue increased compared to 20 22, while its accounts receivable balance decreased by 1.40% compared to last year. Auditors can conclude that the utilization rate of funds has improved compared to the same period last year, indicating an improvement in the quality of revenue.
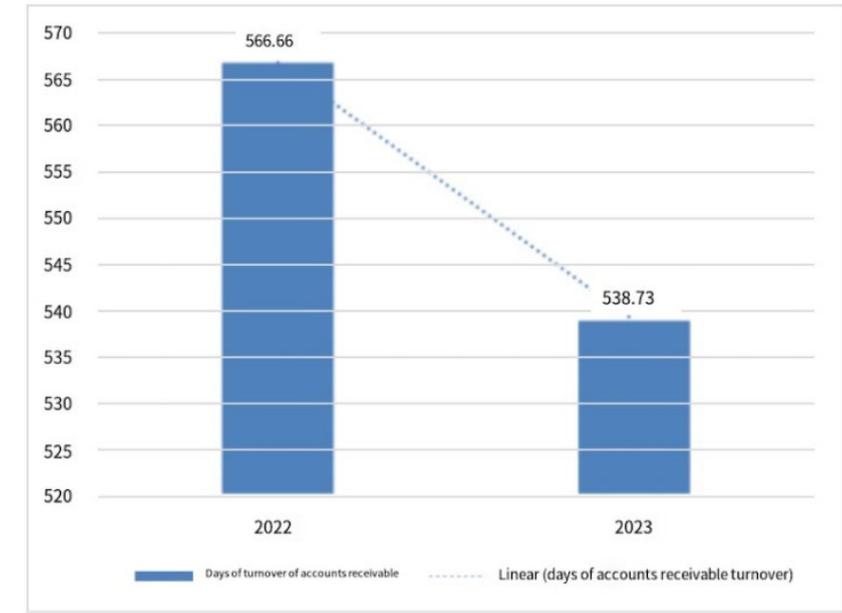
Fig. 1. Before the introduction of big data, the vertical comparison chart of accounts receivable turnover days of Company X

During the audit report phase, accounting firms follow a three-level review system for audit working papers. Project managers and chief accountants need to conduct analytical reviews of significant matters to determine whether additional audit procedures are required or if the audit report needs to be revised or modified. In risk-oriented audits, the audit process should be continuous and timely; however, at this stage, most audits aim to issue an audit report as their ultimate goal, rather than maintaining ongoing attention, which also increases audit risks to some extent.

2.3 Application of Big Data in Substantive Analysis Procedures

Conclusions drawn from the analysis of internal data within audited entities cannot truly reflect the actual operating conditions of a company. In the context of big data, auditors need to leverage more external structured and unstructured data to support their audit judgments. An improved horizontal analysis chart for accounts receivable turnover days can be obtained, as shown in Figure 2. Vertical analysis and trend analysis using only historical data from the company cannot detect risks that auditors can quickly identify through the integration of big data technology with analytical procedures.[2] By comparing the charts, it is evident that Company Xs accounts receivable turnover days are significantly higher than the industry average. A high level of accounts receivable turnover can lead to low asset utilization efficiency and disrupt normal business operations.
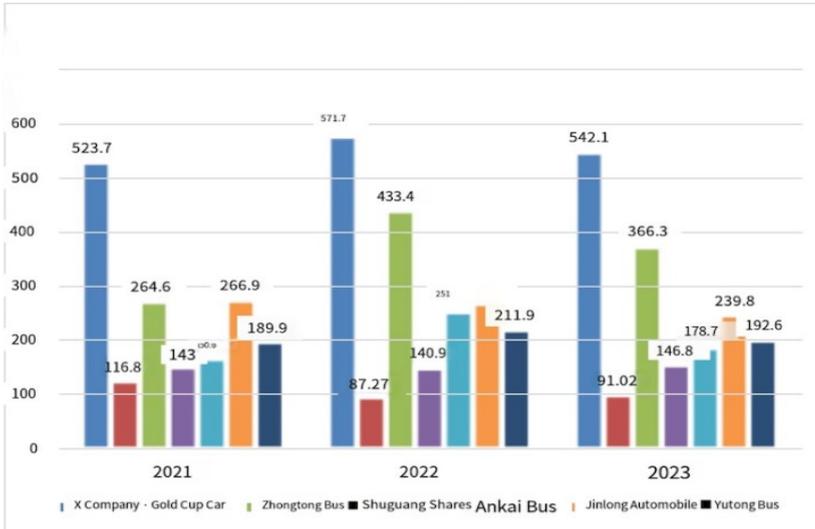
Fig. 2. Improved accounts receivable turnover days horizontal analysis chart

The decline in accounts receivable turnover days is also accompanied by an inflated revenue risk. In the past, firms would typically verify the authenticity of a companys business by sampling orders from its top five clients. Under the backdrop of informatization, while this sampling audit method ensures efficiency and reduces the workload for auditors, it results in a one-sided conclusion. To gain a comprehensive overview of the audited entitys data, firms believe that data visualization technology is essential. After introducing professional big data visualization software, using "order contract data" from Company Xs business information system as an example, we can examine the data missing in the "order contract data," model it using R language, and conduct visual analysis. The results are shown in Figure 3.
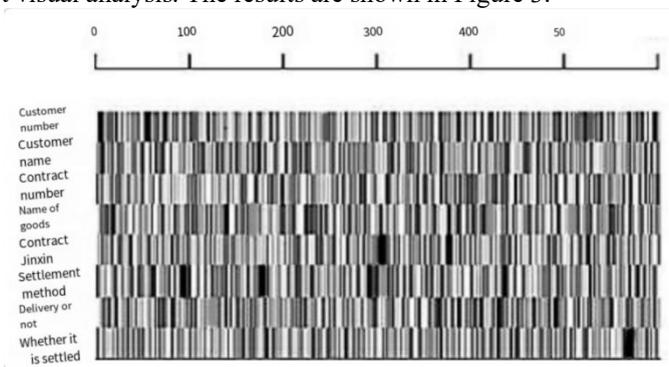

Fig. 3. Order contract data missing visual analysis chart

The color intensity of the barcode-like legend shown in the figure corresponds to the magnitude of the screening data values; the larger the value, the darker the color.

A deep gray indicates missing data values. By using visualization techniques, auditors can see that there are indeed discrepancies in the order contract data within the companys information system, with varying degrees of missing data. The existence of these issues reflects inadequate contract management and potential discrepancies between records and actual conditions in the audited entity, necessitating further audit procedures. Additionally, big data technology broadens the horizons of auditors, enabling them to make comprehensive judgments about the companys operations and industry conditions.

According to industry data from 2023, Yutong Bus, a company specializing in bus manufacturing, stands out as the leader. Although Company Xs main products are similar to Yutong Bus, its scale and efficiency fall far short. After a comprehensive understanding of the domestic industry situation, an accounting firm believes that Company Xs future direction should be to expand overseas and enhance brand influence. However, considering both domestic and international circumstances, the COVID-19 pandemic has impacted market demand, making it difficult for Company X to expand its market externally in 202 4 and even for a considerable period thereafter. The bus market is unlikely to see significant growth in the future.

3   Problems Existing in the Application of Big Data in Shenyang De An Accounting Firm

3.1   The Application of Audit Technology in Information Technology is Still Insufficient

Big data technology is still in its developmental stage, and its application in auditing has not yet matured. When auditing companies, the focus is mainly on collecting and aggregating information, from which financial anomalies can be identified by comparing industry data.[3] Moreover, the audit information system currently used by Shenyang De an Certified Public Accountants has not been improved. If accountants want to grasp and analyze the massive amounts of data from each large company, they first need to understand the companys internal control situation. However, at present, most companies internal controls use cloud data processing systems, such as Huatai Securities and Suning Cloud Business. These companies employ systems that differ from ordinary computer processing and manual handling, using cloud computing systems or units for data processing. The overall volume of data is enormous, placing higher technical demands on audit work, thus achieving significant results. This places high demands on the auditing work of certified public accountants, bringing many challenges to the audit process.

3.2   The Construction of Audit Platform and Big Data Analysis Platform is not Perfect, and the Degree of Information Security is Low

For Shenyang Dean Accounting Firm, establishing a big data analysis platform and a cloud audit platform is an innovative endeavor of great significance. Currently, the

firm has preliminarily set up a data analysis platform and an audit platform, marking a significant advancement; by using these platforms for audits, accountants can easily access most of the business data and accounting information from the audited entities. Through this platform, business data and accounting information can be automatically generated into audit working papers to perform audit procedures. However, the establishment of these platforms is still in its early stages, with numerous shortcomings. First, the application programs on these platforms are not stable or accurate enough, leading to frequent technical failures during audit operations and compromising data security; second, the audit software and data audit analysis models used by the accounting firm have yet to meet the demands of big data auditing, resulting in often incomplete and superficial analysis results[4].

3.3   There is a Shortage of Composite Talents

As times progress, the recruitment standards for auditing professionals have shifted from specialized to versatile. Firms urgently need to attract talents who are proficient in both computers and accounting. However, Shenyang De an Accounting Firm falls short in this regard. Versatile talent is indispensable for firms. In areas such as information system testing, corporate financial data analysis, audit objective setting, audit procedure design, and audit process control, the application of professional knowledge in accounting and computing is essential. Currently, all major accounting firms have introduced various welfare policies to attract talent. However, in reality, Chinas Big Four accounting firms are fair in their efforts to attract talent, while other accounting firms fall far short in building teams of versatile professionals. There is a contradiction between supply and demand. On one hand, accounting firms lack a solid material foundation to attract high-quality talent. On the other hand, there is an insufficient number of interdisciplinary talents with computer skills. The limitations in accounting work are indeed due to both subjective and objective factors.

4   Countermeasures for Problems in the Application of Big Data in Shenyang De an Accounting Firm

4.1   Expand the Application of Audit Technology in Information Technology

The application of technologies such as cloud computing and big data in auditing requires a cumulative process, with the key to technology application lying in platform establishment. The creation of a big data audit analysis platform can integrate big data technology with auditing work. Whether it is a cloud audit platform or a big data audit platform, both can achieve data collection and analysis, as well as mobile computation and remote storage. The functionality of a big data audit platform is realized through its integration with service models like PaaS, IaaS, and SaaS, then fully leveraging the unique advantages of the auditing industry to build a cross-domain, cross-industry cloud audit platform. The establishment of a big data analysis platform should be designed according to the characteristics of different industries[5].

By integrating cloud and big data, data can be expanded to include financial and commercial data such as social security, housing, and public safety. This extends single-data comparison to comprehensive cloud platform audits across multiple industries, such as maximum value and all-around data comparison. The sampling frequency is extended to several times a year or real-time acquisition and integration of various audit analysis platforms and types of data. This breaks through the limitations of existing single data sources, increases network audit data sources, expands the scope of audits to cover networks, strengthens the connections between different data comparisons, and conducts comprehensive statistical analysis, cluster analysis, correlation analysis, and other data mining techniques. This further addresses issues, reveals causes, and enhances data utilization. It breaks the single-project model by combining planning resources with the "project library" to meet the requirements of comprehensive audit coverage.

4.2   We will Improve the Construction of Audit and Big Data Analysis Platforms and Improve Information Security

Regarding platform applications, Shenyang Dean Accounting Firm should strengthen relevant construction, invest necessary costs to upgrade the platform and big data platform in this field, and hire professional talents for guidance and advice. In addition, the audit software and data audit analysis models used by accounting firms should also be re-planned. The planning project should seek out professional planning companies to submit better and more advanced upgrade software and model solutions. Furthermore, models should be gradually built to enhance the reliability and usability of extended model platform analysis results. Moreover, data security is the lifeline of enterprises. If an enterprise cannot ensure privacy safety, then the application of big data technology would be impossible. Cambridge University once shocked the world by using Facebook user data to interfere with U.S. elections, exposing flaws in data management and proving the importance of data security.

4.3   Attach Importance to the Training of Compound Talents

With the introduction of new concepts such as "Made in China 2025," "Industry 4.0," and "Artificial Intelligence," emerging technologies like big data, the Internet of Things, and artificial intelligence have become closely intertwined with the production and daily life of the Peoples Daily, driving rapid development in the information age. In this context, the advancement of auditing and accounting work at The Times will inevitably place higher professional quality demands on auditors and accountants. As The Times continues to grow rapidly, talent development is essential for the growth of all industries. Therefore, Shenyang De an Accounting Firm should prioritize the training of auditing professionals, recognizing that both enterprises and schools are cradles of talent cultivation. For companies, it is crucial to emphasize the training, exchange, and evaluation of auditing personnel. From the perspective of university education, this is key to nurturing auditing professionals. Universities

should focus on cultivating applied talents, ensuring a steady stream of qualified individuals across various sectors.

5   Conclusion

The practical research of big data audit application of Shenyang De 'an Accounting Firm shows that big data technology has significant value in optimizing audit process and improving risk identification ability, but it still faces multi-dimensional challenges in the process of technology implementation. It is found that by integrating multi-source heterogeneous data (such as financial data, industry dynamics and unstructured business information), big data analysis can break through the sampling limitations of traditional audit and achieve correlation analysis and anomaly detection of full data. However, the research also reveals three core problems of the current big data audit application: First, the depth of technology integration is insufficient, and the existing information system of the firm is difficult to adapt to the iterative requirements of emerging technologies such as cloud computing and blockchain, resulting in the data analysis model staying in the superficial stage; Second, there are shortcomings in the platform construction. The stability of data security mechanism and audit analysis tools need to be improved, and the defects of some functional modules directly affect the reliability of audit evidence. Third, the shortage of interdisciplinary talents restricts the technical efficiency. Cross-border talents who are proficient in data analysis tools such as Python and R and have practical experience in auditing are scarce, which hinders the transformation of technical achievements into practical scenarios. In view of the above problems, this study proposes a systematic improvement path: at the technical level, an intelligent audit platform based on PaaS architecture should be built to integrate machine learning algorithm and dynamic risk early warning module to realize automatic iteration of audit procedures; At the management level, it is recommended that the firm jointly develop customized solutions with third-party technology suppliers and strengthen data security through ISO 27001 certification; At the talent level, the "industry-university-research" collaborative education mechanism should be promoted, and the micro-major of "intelligent audit" should be set up jointly with colleges and universities. At the same time, the internal technical training system should be established to improve the digital literacy of the team through case analysis and sandtable simulation.

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