Audit Risks and Preventive Measures for Accounting Firms in the Context of Big Data

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Abstract: Under the background of big data, the daily life of residents and business operations are gradually relying on the information-based environment, making the development of big data auditing an inevitable trend, which also poses a corresponding challenge to the audit work carried out by accounting firms. As China's big data audit is currently in the groping stage, the laws and regulations are still unsound, and there are certain risks for auditors in data collection, storage and analysis. Therefore, this paper analyses the risks of big data auditing in China's accounting firms and puts forward corresponding preventive countermeasures, aiming at improving the quality of auditing work and providing reference.

Keywords: Big Data Background; Audit Risk; Preventive Measures.

1. Introduction
The 21st century is the era of digitisation, with rapid development and application of information technology, and all industries are deeply affected by it. According to the data revealed in the Digital China Development Report (2022), China's data production will reach 8.1ZB in 2022, a year-on-year growth of 22.7%, with a global share of 10.5%, ranking second in the world. This shows that both residents' daily lives and business operations are gradually relying on an information-based environment. The application of big data technology by enterprises has prompted corresponding changes in auditing, so the Audit Commission issued the "14th Five-Year Plan for the Development of State Auditing Work" in 2021, proposing to build a pattern of full coverage of auditing, utilising modern technology, innovating auditing methods, and improving the quality of auditing. However, China's current big data audit is still in the groping stage, there is no unified big data auditing standards, and there are certain risks in the collection, storage management and analysis and application of data and information by auditors. Therefore, this paper mainly starts from the background of big data environment, studies the risks existing in the audit work of accounting firms and puts forward the corresponding solution countermeasures.

2. Characteristics of a Big Data Audit
2.1. Wide Range of Data Sources
Due to the limitation of time cost and manpower cost, the traditional audit cannot collect all the data of the audited unit, and can only speculate on the overall situation from point to point by means of sample audit. The randomness of the sample leads to the corresponding risk of this audit method, which is easy to ignore the financial fraud of the audited unit in certain operations. Under the big data technology, the source of audit data not only stays in the audited unit's financial level data, but also includes the audited unit's data in the management and business level, and the data involves a wide range of objects, in addition to the audited unit itself, but also includes the associated enterprises, banking institutions and securities institutions, etc., which have dealings with the audited unit. This broadens the boundaries of the scope of traditional audit evidence and enables the audit unit to obtain audit data with a wider scope of coverage.

2.2. Diversity of Audit Models
Big data auditing breaks the limitations of time and space, reduces the various costs of accounting firms travelling to the site or field, and provides a platform for auditors to work remotely, making online auditing possible. Big data auditing helps accounting firms to achieve changes in the audit model, and realise the transformation from offline auditing to a combination of offline and online auditing. Not only that, the traditional audit is often in an accounting year after the start of the enterprise audit work, so in the audit process found in certain problems and suspicions have a corresponding lag. However, based on the Internet and information technology, auditors can monitor the economic activities of enterprises in real time, find doubts and intervene to carry out audits in a timely manner to prevent major losses, with a certain degree of timeliness. In the context of big data, auditing is conducive to the transformation from after-auditing to continuous auditing.

2.3. Sophistication of Audit Techniques
Big data auditing applies a series of advanced technologies and methods in the collection, storage and analysis of data. Data collection technology is constantly integrating geographic remote sensing, sensors and other technologies from traditional ETL technology; storage management technology is evolving from centralised to distributed architecture; and mining and analysis technology is evolving from simple summary statistics to complexity, visualisation and intelligence[1].

3. Analysis of Audit Risks Faced by Accounting Firms in the Context of Big Data
3.1. Data Collection and Quality Risks
Data collection and quality risk refers to the risk of issuing an erroneous audit report due to the wide range of audit data sources and the redundancy of information, which can easily influence the auditor's judgement. The key work of auditing is to discover suspicions from the collected data to find audit
clues and make audit judgement. Based on the background of big data, auditors can obtain data information from multiple channels, multiple scopes and multiple fields, and these data types include structured and unstructured, and the value of audit data from a wide range of sources and diverse types varies, which may lead to the existence of blind spots and noise in the collection of data by auditors. Not only that, the data information provided by the audited unit may be intentionally hidden, artificially modified or falsified economic operations [2], which makes it difficult for auditors to find doubts in the huge amount of information generated by the audited unit, leading to the issuance of erroneous audit reports. For example, when Ernst & Young audited Ruixing Coffee, due to the fact that Ruixing Coffee mainly adopts the promotion mode of online operation, the user coverage is wide, and the application of all kinds of preferential activities and the design of rules are complicated, which increased the auditors' judgement on the authenticity of the massive data, and also covered up Ruixing's business falsification to a certain extent, which all brought corresponding data quality risk. Therefore, the accounting firm should focus on managing and preventing the occurrence of this kind of situation and take corresponding countermeasures.

3.2. Data Storage Management Risks

The risk of data storage management refers to the possibility of data loss, tampering, leakage and other security problems in the process of data storage management. Under the information age, most of the business management information of enterprises relies on big data technology to be stored in the cloud platform in the form of electronic information, which is convenient for the staff to save with one click and check in the later stage, but at the same time, it also increases the risk of the emergence of security loopholes. For example, hackers use network technology, implantation of Trojan horses, network crawler attacks and other penetration tools to maliciously tamper with data and steal relevant secrets. In addition, the data information obtained by the auditor involves a wide range of subjects and objects of forensics, and if in the data storage management link, the auditor is subject to bribery and the use of his position to arbitrarily disclose or delete important information, as well as due to the unclear allocation of management rights and triggered many private data in the process of accessing and dissemination of information leakage and disruption, which seriously threatens the security of data storage and the audit information flows around. Serious threat to the security of data storage and dissemination of audit information.

3.3. Data Analysis Application Risk

The risk of data analysis application refers to the fact that due to the lack of skills of the auditors themselves, they cannot master the data analysis tools, resulting in the possibility of errors in the process of data analysis, or they do not know how to correctly apply the results of data analysis because of their narrow scope of knowledge, thus increasing the audit risk. Under the support of information technology, the characteristics of big data auditing are becoming more and more obvious, and the difficulty of auditing work is getting bigger and bigger, which makes the demand for composite auditing talents rising day by day. At this stage, most auditors in accounting firms can make good use of certain computer software office, but this does not meet the needs of the current audit work in the context of big data. Nowadays, big data audit is more necessary to use data analysis tools to analyse and process the electronic information of the audited unit and then provide audit evidence, such as: SPass, Python, Stata, etc., which is a long time to learn and difficult to master for auditors who have not learned computer knowledge and big data analysis, so that they cannot correctly analyse the information they have gathered or may make mistakes in the analysis process. In addition, the professional background of the auditors in most accounting firms mainly focuses on accounting, finance and auditing, and there is a lack of knowledge in finance, engineering management, laws and regulations, etc. Even if they have a certain degree of professional knowledge, in the context of big data, as the information of the auditing projects faced by accounting firms involves a large number of subjects and fields, which makes the auditors who only have professional knowledge A relatively low level of understanding of the project as a whole makes it difficult to reduce the data to specific business scenarios, and it is impossible to deeply comprehend the problems reflected in the data, thus increasing the audit risk.

3.4. Industry Competition Risk

Accounting firms using information technology to carry out audits need to rely on the support of the big data auditing platform, which takes longer to build, has a greater demand for technical personnel, a higher risk of failure, and a higher cost of investment. For some small-scale accounting firms, although the volume of their audit projects is larger, the audit fee charged is lower and the economic profit they can obtain is also smaller, so it increases the difficulty of building a big data audit platform for such small-scale accounting firms. On the contrary, for some large firms, such as PwC, KPMG, Deloitte, etc., in order to improve the audit efficiency and grasp the audit quality, they have the ability and willingness to invest a certain amount of cost and manpower to complete the construction of big data audit platform. This will make many enterprises prefer to cooperate with large-scale firms with strength and technology, which will in turn lead to a widening gap between large and small-scale accounting firms. Therefore, in order to solve the existential crisis, some small firms deliberately quote low prices in order to undertake business, which triggers vicious competition at low prices and undermines the normal operation order of the industry.

3.5. Inadequate Laws and Regulations

The current rapid development of science and technology and information technology has subtly changed the business management of enterprises. Audit work as an important pillar to promote the high-quality development of the economy and society, the state proposed to make the audit work in line with the development of the times, to create a new situation for the audit work, and to innovate the audit methodology, and then issued a number of opinions or guidelines on the audit of big data, and put forward the details of the requirements for the promotion of the audit work of big data. China's audit laws and regulations are relatively perfect for accounting firms to carry out the audit work provides a basis, but these are mainly applicable to the traditional audit environment, and in the context of big data, the audit work has undergone a certain transformation, and some of the work content has exceeded the provisions of the existing laws and regulations. However, the current laws and regulations on big data auditing are not sound, and there are no specific regulations on data collection, transmission, storage, etc., which lacks certain constraints.
This may make some enterprises or accounting firms take the opportunity to exploit the legal loopholes, resulting in audit work in vain, the audit content of the false, etc., increasing the audit risk.

4. Countermeasures Against Audit Risk in the Context of Big Data

4.1. Guaranteeing Data Authenticity and Integrity

The data information under big data auditing comes from a wide range of sources, is voluminous and complex, which puts to the test the authenticity and completeness of the data information collected by auditors. When conducting data collection, auditors can use artificial intelligence technologies to collect and identify problems in the data, such as intelligent robots, language and image recognition systems. Through the use of these tools, massive data modelling, intelligent analysis and processing of data information of relevance to the audited unit, analysis of the cause and effect relationship, and the discovery of logical flaws; not only that, these tools can also automatically identify and analyses a single piece of data, and find out whether or not there are forgeries, such as: fake signatures, fake receipts and so on[3]. For example, Deloitte Touche Tohmatsu and Amazon have jointly developed the De Data Insight Platform, which uses artificial intelligence and cloud computing technology to extract massive data generated by multiple channels, solving the defects of manual and mechanical forensics through intelligent collection, safeguarding the authenticity and integrity of data information in the process of collection and transmission, and ensuring the trustworthiness and reliability of subsequent audit results. In addition to this, with the combination of online and offline auditing, auditors should strengthen their ability to judge the comprehensiveness and authenticity of data, so as to facilitate an in-depth understanding of data anomalies and risk points in the audited unit's business model, strategic planning and financial status.

4.2. Enhanced Data Security Management

Risk prevention measures for accounting firms in the data storage phase of big data auditing can be carried out from the following points: first, strengthen the classification and storage management of data. For the data information collected from the audited unit or generated in the process of performing audit work, it should be classified and then stored, which is not only convenient for auditors to access in the later stage, but also differentiates important data from ordinary information, thus strengthening the management of data confidentiality. For example, KPMG uses clustering and outlier analysis to classify and store the data of the transaction users, and implements encrypted management for the initial positioning of the abnormal users and transactions to implement encryption management. Second, strengthen data encryption and software virus checking. In order to ensure that audit data can be used safely, the stored data should be encrypted and anti-virus software should be installed to prevent malicious attacks and tampering from the outside and to avoid the possibility of audit data being destroyed. Third, establish an authorisation and approval system and set access rights according to job levels. According to the different job levels, each employee can be given different data access privileges, and an authorisation and approval system should be established for the download and transmission of data of higher importance, so as to prevent and control data security at all levels. Fourth, set up risk warning procedures. Risk warning procedures are mainly for the original operating habits with large differences in the corresponding preventive measures taken. For example, if high-frequency access to and download of sensitive audit data are monitored, and sensitive audit data are transmitted to the outside world through multiple channels, the risk warning procedure will react to prevent the misuse and leakage of sensitive data, so as to safeguard the security of audit data[4].

4.3. Focusing on the Development of Composite Talents

In the era of big data, enterprises gradually integrate information technology into operation and management, and the development trend of big data audit is inevitable. Due to the characteristics of big data auditing, the difficulty of auditing work has been improved, and higher requirements have been put forward for the knowledge, skills and professionalism of auditors. First of all, colleges and universities should actively open big data auditing courses, for the training of audit personnel in addition to basic auditing, accounting and other professional knowledge, should also be coordinated to increase the computer and other cross-disciplinary related courses, to help students to understand and master a number of computer technologies and software tools, mainly including the big wisdom to move the cloud, artificial intelligence and data mining analysis, etc., and then through the specific cases of classroom practice to help students to integrate knowledge and skills. Students integrate knowledge and skills, and are committed to cultivating audit composite talents. Secondly, for on-the-job auditors of accounting firms, government authorities should take the lead in actively carrying out various lectures and activities to provide a platform for peers engaged in auditing and data information technology experts to exchange and learn, keep abreast of the times, learn from each other, and continuously improve the quality of auditing work as well as the ability to apply data analysis and information technology. Finally, accounting firms should regularly conduct relevant training, in addition to various courses on auditing, accounting and financial data mining and analysis, and should also focus on improving the professionalism of auditors and educating them to strictly abide by professional ethical standards. The number of trainings and the results of trainings should be reasonably incorporated into the remuneration system as a motivation for them to learn and improve their knowledge, skills and professionalism so as to better meet the needs of big data auditing.

4.4. Maintaining a Level Playing Field for the Industry

In the context of big data, in order to promote the smooth implementation of the audit work and guarantee the normal competitive order of the accounting firm industry, we can start from the following aspects. First of all, the data platform is the basis for realising big data auditing, and the relevant departments in China should make use of advanced information technology, led by government departments, promoted by auditing departments, and participated by relevant departments, to develop a data sharing platform with the help of cloud technology, and establish an information sharing mechanism[5]. The platform collects in real time the relevant data and information generated by enterprises in
production management and has information on past audit cases, and auditing units, whether large or small, can obtain most of the information they need from it free of charge to ensure fairness. Secondly, the state should vigorously promote accounting firms to join hands with software enterprises to follow the development of the times, combine their own business characteristics, and research and develop big data auditing software that is suitable for the development of the accounting firm and meets the standards. For these enterprises and firms, the state can adopt appropriate policies to support them according to their size and profitability, such as tax incentives, financial subsidies, etc., to reduce the gap between firms to a certain extent, and alleviate the pressure on the survival of small-scale firms. Finally, strengthen the cooperation between large and small firms to reduce the pressure of peer competition. Most of the audit projects undertaken by large-scale accounting firms originate from large enterprises or listed companies, therefore, certain audit projects often involve more data volume, audit difficulty, and the demand for auditors will increase. Large firms can cooperate with small and medium-sized firms that specialise in this field of audit work according to the type of audit project, which not only saves time and manpower costs and reduces the opportunity cost, but also makes up for the deficiencies in the audit work or management by taking advantage of their strengths and weaknesses.

4.5. Improvement of Laws and Regulations

The smooth implementation of big data auditing depends to a large extent on whether there are relevant laws and regulations to ensure that accounting firms can have laws and regulations to follow in the process of big data auditing. Starting from the national level, we should learn from the past laws and regulations on auditing, and then improve and add new relevant laws and regulations for specific links, taking into account the existing problems and characteristics of big data auditing. For example, for enterprises and accounting firms in the process of uploading, collecting, transporting and storing data and information, the responsibilities of the auditing body should be clearly delineated, and the corresponding penalties should be clarified to protect the authority of the audit results and effectively regulate the auditing behaviour. In addition, laws and regulations should stipulate the specific content and process of big data auditing, and clarify the purpose, scope and implementation method of big data auditing, so as to facilitate the source tracing after the occurrence of audit risks.

5. Conclusion

In conclusion, today's advanced information technology provides opportunities for big data auditing work and also brings corresponding challenges. Accounting firms in the audit of big data audit risk is mainly reflected in the industry's competitive pressure, laws and regulations are not sound, auditors in the data collection, storage management and analysis and application, if you do not strengthen the audit risk prevention of big data, it will have a certain impact on the development of audit work and audit quality. This paper analyses these audit risks and puts forward the following targeted preventive measures: to maintain the order of fair competition in the industry, sound laws and regulations, safeguard the truth and integrity of the data, strengthen the security of data storage, and focus on the cultivation of composite talents, and it is expected that this study will be an effective reference for the improvement of the quality of the audit in the subsequent audit of big data in accounting firms.

References