

# Problems and Suggestions for the Development of Big Data Auditing

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## Abstract

Technological advancement plays a significant role in the development of auditing work. The use of big data thinking to carry out statistical and auditing work has made great progress in the work environment and means of auditing and statistics through big data technology. Of course, the application of big data technology also brings certain challenges to traditional auditing work. This article delves into the significance and characteristics of big data auditing, analyzes the development trends and obstacles faced by big data auditing, and puts forward a series of targeted response strategies. Through systematic analysis and discussion, the aim is to provide theoretical and practical guidance for big data auditing, and to help auditing work continue to innovate and develop in the new era.

## Keywords

Big Data Auditing; Trends; Obstacles; Strategies.

## 1. Introduction

With the continuous development of the modern information technology industry, the once large and slow computers have evolved into compact and convenient microcomputers. At the same time, intelligent terminal devices have also been widely popularized and applied. Along with the rapid development of network technology, the transformation from wired to wireless has been achieved. People can no longer live and work without the support of the network in their daily lives. The demand for information is becoming increasingly urgent, but the realization of information must be based on various data foundations. In addition, with the continuous development of modern scientific and technological levels, cloud computing technology has also entered the public eye and experienced rapid development. Big data has high integration and storage capabilities, and cloud computing technology can rely on the network to perform various data calculations and storage, and flexibly operate based on different cloud-shared software. This not only lays the foundation for the application of big data from a technical perspective but also provides efficient and convenient ways for enterprises to use big data. By applying big data technology, important data can be integrated to form a certain scale of data sets, which can be applied to enterprises, banks, audit firms, and other units to support their management and operations. By relying on cloud sharing platforms to obtain the necessary data information, it can effectively improve work speed, shorten information acquisition time, and bring new methods and approaches to some work.

## 2. Literature Review

Liu Guochang and Hu Feng believe that big data technology can eliminate sampling risks, break through information barriers, and strengthen the continuity of audit supervision. However, there are still issues such as slow progress, massive audit data, complex audit subjects, and severe shortage of high-end information technology talents[2].

Liu Xing, Niu Yanfang, and others combined research on the application of big data technology in government audit practice, elaborating on the connotation of big data auditing from the perspectives of data, technology, and application characteristics. They pointed out the challenges that big data auditing will face in platform construction, data collection, processing and analysis, and organizational management[1].

Research by Chen Wei et al. shows that the application of big data technology brings both opportunities and challenges to the development of auditing. On the one hand, big data technology makes audit evidence more comprehensive, provides a more diverse selection of technical methods for audit analysis, and accelerates audit processing efficiency. On the other hand, big data technology sets higher quality control requirements for auditing, and the compatibility of big data platforms has become a decisive factor in the success or failure of auditing[3].

Wu Honghong et al. propose that auditing in the era of big data will bring innovative changes in evidence acquisition, program design, technical methods, internal controls, and personnel requirements[4].

Zhang Min believes that, based on the integration of AI algorithms and big data technology, the gradual realization of intelligent, platform-based auditing, as well as the inevitability of multi-dimensional, comprehensive, and visualized data, is a trend. At the same time, big data auditing also faces challenges such as high costs of data acquisition, difficulties in transforming inherent paradigms, scarcity of composite talents, complexity of industry business, and contradictions between big data technology and auditing theory. This study provides guidance for the application of big data technology in auditing[5].

### **3. Significance and Characteristics of Big Data Auditing**

#### **3.1. Significance of Big Data Auditing**

##### **3.1.1. Able to Effectively Prevent Internal Audit Risks**

Compared to traditional audit work, in terms of sample selection, big data technology is more scientific. The main content of traditional audit work includes sampling and screening information, followed by analysis. Subjective thoughts from auditors and other objective factors are difficult in this process, greatly affecting the authenticity of audit results. However, with the application of big data technology, auditing work can be done on all samples, allowing for the collection, processing, and analysis of relevant data in the fastest time possible, ensuring the comprehensiveness and authenticity of audit data, and reducing the risk of auditing.

##### **3.1.2. Promoting the Transformation of Internal Audit Models in Enterprises**

Traditional audit modes usually require the audited unit to provide the audit department with a work site for on-site audits. This type of audit belongs to post-audit and has a certain degree of passivity. With the support of big data technology, the audited unit can provide timely feedback to the auditors, analyze information data scientifically through an intelligent audit platform, clarify data doubts, and effectively improve the quality and efficiency of audit work. Replacing traditional on-site post-audits with non-site continuous audits allows internal audit work to be better supervised.

##### **3.1.3. Breaking the Limitations of Internal Auditing**

In the complex operational environment of modern enterprises, traditional manual auditing methods often appear inadequate when facing numerous business departments and their respective industries, making it difficult to cover comprehensively and gain deep insights. However, with the rapid development of big data technology, audit professionals have encountered unprecedented opportunities. Through big data technology, auditors can easily cross barriers between different departments and industries to achieve comprehensive

auditing work. This interdisciplinary auditing model not only enhances the comprehensiveness and breadth of information obtained but also strengthens the typicality and universality of information, enabling auditors to examine enterprise operations from a more macro perspective and maximize the role of internal auditing.

### **3.2. Characteristics of Big Data Auditing**

#### **3.2.1. Data Collection is more Convenient**

In the era of big data, the way audit data is obtained has undergone a fundamental change. Auditors no longer need to personally visit the audited unit, but can access audit platforms remotely to easily obtain data and information related to the audited unit or enterprise. This direct viewing method greatly improves the efficiency of audit work, and also makes data retrieval and viewing more convenient. Audit platforms not only make data retrieval more convenient, but also ensure the authenticity and reliability of the data, providing strong support for audit work.

#### **3.2.2. The Scope of Auditing Has Become more Comprehensive**

For traditional auditing work, when faced with a large amount of data samples, auditors often need to conduct their work through sampling audits. This method to some extent limits the accuracy of the audit, thereby affecting the effectiveness of the audit work. However, with the support of big data technology, the capacity of audit samples has been greatly increased, and the audit speed has also significantly accelerated. Through a data-driven approach, auditors can quickly and accurately obtain and analyze data, thereby focusing more on actual issues. With the in-depth analysis of data and network technology, audit assessment results become more comprehensive and accurate.

#### **3.2.3. The 5V Characteristics of Big Data Auditing**

The characteristics of big data technology meet the work requirements of full coverage auditing in the new era, and can effectively solve the challenges faced by auditing in the new era. IBM proposed that big data has 5V characteristics: Volume (large quantity), Velocity (high speed), Variety (diversity), Value (low value density), and Veracity (truthfulness). Firstly, in terms of volume, facing the current situation of cross-industry, cross-level, and cross-domain full coverage auditing, big data technology can store and process data from different sources, formats, and standards, avoiding narrowing the scope of audit data analysis due to traditional data sampling methods; secondly, in terms of speed, facing the problems of heavy audit tasks, tight deadlines, and limited personnel, advanced computer processing technology and algorithms can greatly improve audit efficiency; thirdly, in terms of diversity, facing more complex audit tasks, traditional single data analysis cannot present the full picture of the problem, while the diversity brought by big data will comprehensively collect and analyze audit data based on the characteristics of different data; fourthly, in terms of value, for audit tasks that are difficult to find audit clues, big data can be used to correlate data from different levels to capture the value of data; fifthly, in terms of veracity, especially for audit data, the accuracy and reliability of data are very important, as they directly affect the accuracy of audit results.

## **4. The Development Trends of Big Data Auditing**

### **4.1. Increasing the Application of Big Data in the Accounting and Auditing Fields**

Applying big data technology in the field of finance and accounting can ensure the timeliness and accuracy of auditing work. In terms of organizing and collecting financial data, big data relies mainly on artificial intelligence for data accounting. From data collection to organization to analysis, the speed is faster and more accurate, saving on labor costs. In addition, for financial

reports generated through big data technology, relevant personnel need to increase the intensity of review, promptly fill in any data gaps, and provide assurance for the accuracy of the reports.

#### **4.2. Improving the Risk Control and Management of Big Data Auditing**

Currently, the use of big data in auditing work in China is still in its early stages, with many loopholes and risks. It is necessary for the government to further improve laws and regulations related to auditing and e-government, so that the use of electronic data becomes more standardized and auditing work can be carried out in accordance with relevant laws and regulations. At the same time, in the context of big data, relevant departments should further establish and improve related auditing guidelines and standards, clarify operational methods, and unify auditing standards. In the process of handling relevant auditing data, it is necessary to not only detect the comprehensiveness of the data, but also to ensure the security and quality of the data. Additionally, auditing authorities should conduct regular evaluations and inspections of platform systems to better ensure the authenticity and confidentiality of data.

#### **4.3. Cultivating an Internal Audit Team that Meets the Development Needs of the Big Data Era**

Companies should continuously improve their audit management system internally, enhance the quality of audit staff, strengthen the team's comprehensive ability, integrate internal audit work with the company's organizational development, enhance the value of the management chain, align it with the company's goals, and make it part of the company's management system. In addition, employees need to have the ability to discover and innovate. In short, enterprises should pay attention to cultivating and attracting high-quality talents, promote the development of the company's personnel structure towards diversification, and better carry out internal audit work within the company.

In conclusion, in the era of big data, innovative audit models are one of the important aspects of audit work for most companies. Companies need to integrate internal audit work with big data technology, strengthen the function of internal audit work, and ensure the long-term development of the company.

### **5. Obstacles Facing the Development of Big Data Auditing**

In the new era, big data auditing is required to be more intelligent. Building an intelligent big data auditing platform that integrates data collection, storage, management, and analysis is the fundamental way to achieve end-to-end intelligent big data auditing. Although big data auditing has become a trend now, challenges such as slow initial development and a shortage of high-end talent in information review types have led to many challenges in the process of solving audit data collection, management, and analysis.

#### **5.1. The Development of Big Data Databases is Still in the Promotion Stage**

The field of enterprise auditing is expanding, and the scope of comprehensive auditing is increasing. In the auditing of big data systems, there is still a considerable amount of data that has not been fully entered, and some parts are difficult to be statistically analyzed using big data methods. Auditors cannot use big data technology for auditing objects with missing overall data. In addition, it is not feasible to only conduct online audits using big data for information that requires manual data entry. In conclusion, at this early stage of big data auditing, the methods for big data auditing are still not perfect, and there is a need for continuous innovation in auditing practices.

## **5.2. The Massive Growth of Audit Data**

With the rapid expansion of the scope of audit coverage, audit data has shown an explosive growth trend. These data are no longer limited to traditional structured database forms, but cover various non-structured data such as images, text, and voice. For auditors, traditional data collection techniques are no longer sufficient to deal with this diversified data format. They will face massive financial data and need to classify, refine, summarize, and analyze these data in depth. This is a highly challenging task that requires auditors to not only have professional auditing knowledge but also to master advanced data processing techniques to ensure the accuracy and efficiency of audit work.

## **5.3. The Relationship between Data is Becoming more Complex**

With the increasing complexity of audit business requirements, we are facing unprecedented challenges. Relying solely on data itself is no longer sufficient to meet current needs, as the patterns and knowledge hidden behind the data are the core of auditing. However, extracting these patterns from massive amounts of data, building an intelligent audit data analysis system, is undoubtedly a daunting task. This requires us to not only have advanced data analysis technology, but also to have a deep understanding of audit business, and to closely integrate technology with business. The future development of big data auditing requires intelligent solutions that can automatically discover the patterns behind the data, build audit knowledge models, and conduct in-depth inferential analysis to meet the growing audit demands.

## **5.4. Lack of Compound Talents in Big Data Auditing**

In the wave of the big data era, the requirements for practitioners in auditing work are becoming increasingly strict. In order to ensure the accuracy and efficiency of auditing work, auditing professionals not only need to have a deep knowledge base in the financial and auditing fields, but also must be proficient in big data technology, mastering its principles and applications. This change requires auditing professionals to continuously improve their knowledge and keep pace with the development of the times.

However, the reality is that many accountants and auditors have little understanding of big data collection, screening, analysis technologies, as well as related computer software and network technologies. This makes it difficult for them to quickly and accurately extract valuable information when faced with massive amounts of data. Although investment in learning and training in auditing departments is increasing, the existing shortage of compound talents in big data auditing still cannot meet market demand. Therefore, strengthening the training of big data auditing talents and improving the overall quality of auditing teams has become an urgent task.

## **5.5. The Level of Risk Control Needs to Be Improved**

For auditing work, the authenticity, completeness, and accuracy of data must be guaranteed. However, the open network also brings more risks to auditing, affecting the authenticity and accuracy of auditing data. In addition, different units and departments have a certain degree of independence, lack of information sharing, leading to possible data loss. The security of data transmission and storage processes also needs to be improved, especially cloud services and cloud storage technologies may pose risks due to immature technology.

## **5.6. Discrepancies in Audited Units**

In the current auditing work, we face a significant challenge: the uneven level of informatization of audited units. Especially in some regions, the informationization level of some audited units is relatively low, and the application and development of big data information technology appear slow. In this situation, the effective data held by these units often have issues in terms of completeness and accuracy, making it difficult to ensure the quality of their data. Due to this



weak data foundation, these audited units often struggle to keep up with the rapid development pace of auditing technology. Therefore, only through the continuous progress of science and technology can these units effectively connect with the big data systems of auditing authorities, ensuring the smooth progress of auditing work.

## **6. Insights and Suggestions**

### **6.1. Establishing and Improving Policies and Legal Systems Related to Big Data Auditing**

The improvement of policies and regulations is crucial for the widespread application of big data technology in the field of auditing. On the one hand, we need to establish a sound regulatory guidance and policy incentive system for the application of big data technology. This not only provides clear guidance and direction for auditing institutions that have not yet entered the field of big data technology, but also effectively stimulates various government departments to actively invest in the upgrading of big data, promoting technological progress in the entire industry. On the other hand, we must establish a strict punishment mechanism for violations of platform information security, which can strengthen the legal awareness of auditors and related workers, and ensure that they always adhere to the principles of integrity in fulfilling their duties, maintaining information security and the fairness of auditing work through the dual constraints of law and ethics.

### **6.2. Designing Big Data Audit Platforms Requires Attention to Data Calibration Standardization**

Due to the uneven promotion of big data audit technology in China, the progress of big data audit platform construction varies in different regions. Therefore, when conducting cross-domain cooperation in various regions, it may be difficult to reach a unified standard for data information, greatly affecting work efficiency. In response to this phenomenon, when constructing and upgrading big data audit platforms, attention should be paid to the standardization of financial and non-financial data processing. Subsequently, efforts should be made to promote the construction of a nationwide shared database based on big data audit platforms.

### **6.3. Traditional Audit Theories Need to be Updated and Transformed in Combination with Big Data Theories**

Traditional audit theories based on risk-oriented relevant theories have been basically formed, and the issuance of audit opinions involves a probability component. Big data technology, on the other hand, has characteristics such as comprehensiveness, real-time processing, and high efficiency, which may inevitably conflict with risk-oriented theories in practice. In the future, it is necessary to focus on theoretical research related to audit strategies, audit priorities, audit decisions, etc., and promote audit personnel to establish a macroscopic awareness, strategic awareness, and overall awareness. Continuous advancement of audit technology and methods is essential to prepare for the arrival of the research-oriented audit era.

### **6.4. Setting up Big Data Auditing Professional Qualification Certificate**

In order to promote accounting firms to carry out big data auditing work, the Ministry of Finance can establish professional qualification certificates related to big data auditing. The knowledge system of the big data auditing professional qualification exam should include both traditional auditing and big data auditing knowledge, and the exam subjects for the qualification certificate should combine theory with practical application. Individuals who have already obtained a Certified Public Accountant (CPA) certificate can directly apply for the theoretical and practical subjects related to big data auditing, while those who have not

obtained a CPA certificate must take all the subjects. Individuals who pass this qualification exam will be able to engage in big data auditing work.

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