

# Research on Intelligent Economic Responsibility Audit of Leaders of State-Owned Enterprises

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**Abstract:** Economic responsibility audit supervises the power of national leaders, promotes scientific development and anti-corruption work, and plays an important role in promoting the modernization of national governance capacity. Combined with our state-owned enterprise leaders of economic responsibility audit status and intelligent demand, and the lack of national auditors, heavy task contradiction, this paper selects innovative audit tools and intelligent audit process, build a set can solve the current economic responsibility audit low efficiency, high cost, and reasonable guarantee of intelligent economic responsibility audit quality mechanism, in order to realize the modernization of national governance ability and governance system.

## 1. Introduction

Economic responsibility audit belongs to China's unique audit system. Economic responsibility audit can effectively define whether the performance of the responsibilities of leading cadres at all levels is legal and compliant, and whether the authenticity is guaranteed. The economic responsibility audit of leaders is to independently verify the performance of the economic responsibility of leaders through scientific and effective systematic ways, from the aspects of behavior, system and information, do a good job of responsibility definition and responsibility supervision, and complete the evaluation work.

The establishment of intelligent analysis and evaluation mechanism based on machine learning should become the development direction of intelligent economic responsibility audit of leaders. Audit intelligence includes the intelligence of audit tools and the intelligent audit process. At the technical level, the application of AI technology to the collection, processing and output of audit data. At the level of audit thinking, the mode of audit method first and audit data later is adopted, integrating the methods and ideas of the auditors of all parties, and the audit work can be efficiently completed through the scientific mode of man-machine integration.

In recent years, all kinds of audit institutions have begun to actively explore the application of big data, artificial intelligence, cloud computing and other specific technologies in the audit work, which can improve the audit efficiency and audit quality, and promote the intelligent and comprehensive development of the audit work. Intelligent audit has also achieved initial results in the field of economic responsibility audit. However, with the transformation of the economic responsibility audit of the leaders of state-owned enterprises from manual audit to intelligent audit and manual audit, the auditors still have difficulties to solve and break through in the application of the emerging audit technology. This paper aims to provide theoretical reference for promoting the intelligent economic responsibility audit of the leaders of state-owned enterprises, and to lay a solid foundation for improving the economic responsibility audit efficiency and audit quality of state-owned enterprises. In the process of the economic responsibility audit of the leaders, after clarifying the economic responsibilities that the leaders of state-owned enterprises should perform, it is still necessary to design the audit path applicable to this special audit method to improve the quality and efficiency of the economic responsibility audit of the leaders of state-owned enterprises.

## **2. Development Status of Economic Responsibility Audit and Intelligent Audit for Leaders of State-Owned Enterprises**

At the first meeting of the Audit Commission of the CPC Central Committee proposed to strengthen audit through science and technology and strengthen the construction of audit informatization. In recent years, the internal audit departments of state audit institutions, accounting firms and enterprises and institutions have begun to actively explore the application of new artificial intelligence technologies in audit work, in order to cope with the challenges of new technologies to audit, and promote the continuous intelligent development of audit. On the technical side, data collection and processing should be strengthened to ensure efficient data operation. At the level of audit thinking, the idea of “audit method first, audit data later” is adopted to integrate the wisdom of auditors, and realize the efficient completion of audit work in the hybrid intelligent system integrated with man and machine. Big data, cloud computing, the Internet of things, block chain and other emerging technologies and the combination of economic responsibility audit is not yet mature, but in foreign countries for the application of artificial intelligence in the field of audit research is relatively more, some literature that auditors in the use of artificial intelligence, RPA auxiliary audit can improve the quality of audit, and improve the audit process[1].

However, intelligent audit is also facing new challenges. The phenomenon of “information island” leads to small degree of data correlation; imperfection of big data audit rules and regulations, hinder the process of economic responsibility audit; lack of big data technology tools, affect the quality of data audit; lack of big data application ability, cannot achieve early warning effect. Big data audit faces the challenge of information security management. Big data also means big responsibility. The preservation and destruction after data collection will be an unavoidable risk point for big data applications[2].

Intelligent audit is still in the exploratory stage, which is all project-driven audit with data analysis mode centering on specific audit objectives. It is restricted by project time, objectives and other factors, which does not adapt to the requirements of “full coverage” and “normalization” of big data audit in the new era[3]. After all, modeling in the big data framework is not an exception in ordinary audit projects. Auditors need to establish a batch of standardized modeling libraries that can be called by the same multiple class of audit projects and multiple audit models. On the basis of the big data analysis mode of “centralized analysis, suspicious points discovery, decentralized verification and systematic research”.

## **3. Onstruction of the Theoretical Framework of Economic Responsibility Audit of Leaders of State-Owned Enterprises**

### **3.1 Audit Object**

According to the Audit Law and its implementation regulations, the first paragraph of this article divides the audit object scope of state-owned enterprise leaders as: ① wholly state-owned enterprises; ② state-owned capital accounts for more than 50% of the total enterprise capital, and state-owned capital accounts for less than 50% of the total enterprise capital, but the state-owned assets investors essentially have control; ③ state-owned enterprise leaders' performance of economic responsibility; ④ related regulators of state-owned assets.

### **3.2 Audit Content**

In the process of conducting audit work against the relevant leading personnel of state-owned enterprises, audit institutions and auditors shall, in accordance with the relevant policies of the State and the characteristics and specific factors of the industrial development of state-owned enterprises, reasonably determine the audit priorities according to the contents of Article 12 of the provisions. When choosing the key audit points, it may not cover all aspects, but it should reflect the industry characteristics and main business of the state-owned enterprises, and reflect the performance

characteristics of the audited leaders, so as to conduct a comprehensive, objective and accurate audit evaluation of the leaders of the state-owned enterprises.

### **3.3 Audit Environment**

Audit environment can be divided into political environment, legal environment, social environment, economic environment, and internal environment of national audit organization. At present, the most prominent -- science and technology level in the social environment, has played a huge role in promoting the development of the economic responsibility audit of the leaders of state-owned enterprises. With the continuous development of emerging technologies such as big data, cloud computing and artificial intelligence, economic responsibility audit is also undergoing all-round changes in this wave of technological revolution. Big data audit has changed the current audit mode from offline audit to online audit and sampling audit to full-coverage audit. Through the big data audit technology, the efficiency of economic responsibility audit work can be improved, and the overall audit quality can also be improved, laying a solid foundation for the strong audit of science and technology.

### **3.4 Audit Implementation**

Audit environment can be divided into political environment, legal environment, social environment, economic environment, and internal environment of national audit organization. At present, the most prominent -- science and technology level in the social environment, has played a huge role in promoting the development of the economic responsibility audit of the leaders of state-owned enterprises. With the continuous development of emerging technologies such as big data, cloud computing and artificial intelligence, economic responsibility audit is also undergoing all-round changes in this wave of technological revolution. Big data audit has changed the current audit mode from offline audit to online audit and sampling audit to full-coverage audit. Through the big data audit technology, the efficiency of economic responsibility audit work can be improved, and the overall audit quality can also be improved, laying a solid foundation for the strong audit of science and technology.

#### **3.4.1 Preparation of the Audit Plan**

State-owned enterprise leadership personnel economic responsibility audit complete audit process mainly includes the following processes: first by the audit institutions put forward preliminary Suggestions, entrusted by the organization department audit recommendations, and then the leading group (joint meeting) office draft audit plan, approved by the government executive approved the draft audit plan, the final audit institutions will be included in the annual audit work plan.

#### **3.4.2 Audit Organization Mode**

The combination of corporate economic responsibility audit and budget implementation audit, investment audit, investment audit, special fund audit and other professional audit can realize the integration of all kinds of resources, arrange the audit organization mode more properly, and improve the utilization efficiency of audit resources. When audit institutions at all levels adopt the organizational mode of combining economic responsibility audit with other professional audit, they should take economic responsibility audit as a platform and lead other projects according to economic responsibility audit. In combination with other audit work audit, to closely around the audited enterprise leaders of the economic responsibility to carry out the audit, other professional audit audit goals to achieve its professional audit audit goals, more important is to meet the needs of economic responsibility audit and goals, make the audit results get integrated application, maximize the audit results.

## **4. Explore the Path of Intelligent Audit Technology Applied to Economic Responsibility Audit**

### **4.1 Necessity and Feasibility Analysis**

Compared with the continuous innovation and expansion of big data audit, there is still a lot of room for improvement in the continuous change and development of the face-to-face audit needs of information-assisted audit in recent years. On the one hand, the audit reading time of paper documents is still continuously growing. Many direct audit evidence such as internal management documents, engineering construction documents and financial documents of the audit objects are often kept in paper documents. Access to electronic documents, auditors still need to search a lot of paper materials. On the other hand, the daily use of graphic identification tools does not meet the audit requirements. Due to the flexibility and particularity of the audit requirements, such tools do not fit well with the audit, which is difficult to reuse under different audit needs, and cannot cope with the changeable audit environment, and ineffectively increases the audit cost.

The intelligent graphic identification audit technology can be effectively applied to the economic responsibility audit of the leaders of state-owned enterprises. In the process of economic responsibility audit, the meeting minutes of the board of directors of enterprises, written resolutions and meeting minutes of the office meeting are an important basis for judging the economic responsibility of the audited leaders. If the cumbersome written paper data retrieval only by the auditor naked eye comparison and analysis, will greatly reduce the audit efficiency and accuracy. The graphic identification function of intelligent audit can be developed, which can interpret the laws and regulations, policy documents and meeting minutes related to the audit objects in batches, and intelligently prompt the audit ideas.

### **4.2 Technical Implementation**

Semi-open intelligent audit solutions are roughly divided into five architectural levels. The information processing layer, graphic recognition layer, information buffer layer, cache layer, data analysis layer and optimization output layer. At the technical implementation level, the data flow between the layers flows in one way, and the downward feedback is conducted through the optimization layer, so as to finally output the results of the composite audit requirements. The language choice of the solution prioritizes the python suitable for machine learning and data analysis, and Java and C++ can also be used as alternatives, depending on the technical background of different people. The working capabilities of the five levels are as follows: (1) the information processing layer is mainly used for the preprocessing of pictures and pictures to process the recognition of the basic images. For non-data audit evidence, such as leaders' work plan, work summary, economic contract, meeting minutes, business files, etc., it is uploaded in the form of pictures, and the improvement of graphic identification can be completed at this level.(2) The graphic recognition layer mainly realizes image recognition and realizes the transformation from image to data. The identification of text pictures is similar to text extraction, transforming the audit evidence after the first layer into data that can be analyzed and judged; the image recognition has two ways of computer recognition, which can intelligently identify the target in the map, more accurate than the auditor human eye recognition.(3) Information cache layer is a standardized storage to realize intelligent graphic and text recognition, which includes two aspects: standardized data structure and personalized access interface. For completing a single audit project requirement, identification analysis does not require much consideration of standardized storage, thus saving model development time. However, from the perspective of the overall management of economic responsibility audit projects, it is necessary to strengthen the governance of relevant data through the information cache layer, which not only facilitates the storage and management of post-identification data, but also provides efficient ways for other audit projects that reuse the identification results.(4) The data analysis layer is the core of intelligent audit solutions, the direct link between graphic identification and audit plan requirements, and the fundamental place that is different from traditional OCR tools or platforms. The data analysis layer implements all the audit requirements after graphic identification, and also provides a module interface for various secondary development in the later stage. At the data analysis layer, auditors and data analysts need

to encode the audit logic in the audit data analysis scheme, build the industry audit model, and complete the comparison and screening of the identification data.(5) The purpose of optimizing the output layer is to output the identification and analysis results to facilitate the audit evidence collection and extension. The most commonly used method is to store as a table, data with a database. For the identification results that require further audit decisions, it is necessary for auditors to observe and judge in the form of rich ICONS.

## **5. Promote the Intelligent Implementation Mechanism of Economic Responsibility Audit of State-Owned Enterprise Leaders**

### **5.1 Establish a Long-Term Research Mechanism**

Compared with the naked eye analysis and judgment of the auditors, the current audit field covered by the intelligent audit technology analysis is still very limited, and there is still considerable room for development. Therefore, it is necessary to establish and improve a long-term application research mechanism, constantly improve the existing business functions, and expand more audit service fields. Drawing on the subject management model, we should conduct overall management in fund budget implementation, personnel organization and coordination, technical exchange and practice, achievement transformation and extraction, and other aspects, so as to systematically improve the automation and intelligent level of audit analysis.

Current AI technologies rely more on deep learning and neural networks, that is, on backpropagation and outcome feedback, which is a dynamic process of constant adjustment. Therefore, the identification and analysis of intelligent audit also needs to continuously expand the scope of feedback information collection, and reflect more audit results and use experience to data analysts, so as to provide experience for optimizing the model and adjusting the framework.

### **5.2 Expand the Scope of Use to Collect Feedback**

The audit institutions in the process of work, should pay attention to the reasonable arrangement of economic responsibility audit data, on the basis of data resource sharing, need to make scientific induction and sorting, in the overall planning of data resources, also should continue to explore the economic responsibility audit management platform construction work, constantly improve the economic responsibility of library and audit object library. Strengthen the combination of on-site audit and non-site audit, make more effective use of off-site big data audit methods, timely summarize, refine and popularize the experience of information audit experts, and improve the quality and efficiency of economic responsibility audit.

### **5.3 Strengthen the Audit Team Building**

To promote the application of intelligent audit technology in the economic responsibility audit of leaders of state-owned enterprises, the building of a professional team is the top priority. Team members should break through the restrictions of the audit industry, emphasize the combination of knowledge and ability, and scientifically mix the strength of personnel. The members shall include three teams: macro policy experts, full-time government audit personnel, and technical experts skilled in the technical tools of big data analysis. Macro policy experts are responsible for following up relevant national policies, determining macro audit data analysis requirements and objectives, guiding the macro data analysis plan and evaluating the analysis effect; tracking and grasping departmental industry policies and development trends; guiding thematic data analysis requirements and objectives; evaluating the data analysis plan, and adjust and optimize the audit model according to the feedback of data analysis effect.

## **6. Conclusion**

The audit object of the economic responsibility audit of the leaders of state-owned enterprises cannot be simply understood as the audit of their working units. The correct interpretation of the duties of the relevant economic activities is the object of the audit. In the audit process, the written

decision materials of the board of directors minutes such as written resolutions are an important basis for the judgment of the economic responsibility of the audited leaders. If the redundant written paper data retrieval is only compared and analyzed by the auditors, the audit efficiency and accuracy will be greatly reduced. This paper puts forward the construction and implementation mechanism of intelligent audit technology.

In the foreseeable future, the intelligent audit technology will build a bridge of wisdom to comprehensively cover the economic responsibility audit. At that time, the static data analysis results for a single business demand will no longer be the goal of the audit pursuit. The final vision of intelligent audit is the big data integration application that can break through the limitations of data structure, have complete security control, efficient reuse of multi-class models, friendly and convenient operation interface, and can dynamically deduce intelligent reasoning. Once artificial intelligence technology is widely used in information audit, the economic responsibility audit of state-owned enterprises will achieve large-scale improvement of quality and efficiency.

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