Reconstruction of Enterprise Internal Control System under Blockchain Audit Mode

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Absract

With the smooth progress of the new round of technological revolution and industrial transformation, blockchain, a modern science and technology based on big data analysis, has emerged. The rise of blockchain technology is bound to have a huge impact on traditional audit models, thereby driving innovation in audit models. The development trend of future audit models is towards the organic integration of audit activities with control and management activities. Therefore, the transformation and reconstruction of the internal control system of enterprises is imperative. From the perspective of blockchain technology, this article explores the future concept of blockchain audit mode and the ideas for constructing internal control systems in enterprises under this mode, providing theoretical reference for the transformation and reconstruction of internal control systems in enterprises under the background of big data.

Keywords

Blockchain; Big data; Audit; Internal controls.

1. INTRODUCTION

With the rapid development of information science and technology, modern digital technologies represented by big data have gradually penetrated people's lives, playing a promoting role in the transformation and transformation of various industries to a certain extent. Among them, blockchain, as the main carrier for carrying and recording data, will have a huge impact on traditional auditing work. Traditional auditing uses post audit and sampling audit as the main working modes, in which the workload of auditing has been reduced and the procedural nature of auditing work has been standardized. However, drawbacks such as delayed audit timing and inherent risks in sampling audits also arise. Moreover, with the rapid development of the national economy and the continuous promotion of preferential policies for enterprises, the audit workload will only increase without decreasing, and the efficiency of audit work urgently needs to be improved. In addition, with the continuous innovation of accounting application technology, the accounting computerization stage has successfully transitioned to the information technology stage. In the future, the intelligent stage is also expected to be achieved. That is to say, the application scope of big data in accounting will become increasingly broad. At the same time, with the impact of the information technology wave, auditors are facing increasing audit risks. Auditors not only need to audit the information technology relied on by the economic activities of the audited entity, but also express assurance opinions on the economic activities of the audited entity. In addition, in the face of the new

organizational operating environment, how to use information technology to carry out audit work is an important issue that the auditing profession urgently needs and is exploring, known as computer-aided auditing. At present, computer-aided auditing is a widespread application of computer technology in the field of auditing. Its essence is computer simulation based on traditional manual auditing mode, which has greatly fallen behind the requirements of the big data era. It can be seen that the development of blockchain technology will not only have a profound impact on traditional audit techniques and methods, but also on the audit environment, audit procedures, and audit models. Therefore, the future audit model must comply with the trend of the big data era, achieve transformation, upgrading, and innovation, in order to adapt to the development of science and technology in the new era.

In addition, audit work, as the "last checkpoint" to ensure the authenticity and reliability of data, is based on the financial and daily business activities of the enterprise. The scope of supervision and review runs through all aspects of the enterprise's production and operation, and is a key focus of internal control in the enterprise. As an important component of the internal control system of enterprises, the change in internal audit mode will directly cause changes in the internal control system of enterprises to a certain extent. At the same time, external audit has a dependency on internal audit work. In the process of implementing various business and work through external audit, the internal audit system and processes will serve as reference standards. Moreover, external audit will further strengthen the application of internal audit work results. Therefore, changes in the external audit model will indirectly affect the adjustment and reconstruction of the internal control system of the audited entity. In summary, blockchain technology will use the auditing field as the "bridge" and decentralized distributed databases as the "cornerstone". Not only does it utilize its own data processing characteristics to influence the environment, operational mode, and work procedures of audit work, but it also builds a secure and efficient information sharing platform based on databases. Thus, it permeates all aspects of the adjustment and transformation of the internal control system of the enterprise, promoting earth shaking changes in the internal control system of the enterprise.

2. OVERVIEW OF BLOCKCHAIN TECHNOLOGY

2.1. The meaning and characteristics of blockchain technology

Blockchain technology is a data structure that utilizes cryptographic principles to record the flow of transaction funds. It relies on distributed ledger technology, utilizing the characteristics of "decentralization" and "distributed nodes" for data storage, verification, transmission, and communication. At the same time, it has installed special "recorders" for information, and the source, transmission process, and change path of each piece of information will be recorded in the chain, providing a secure, stable, transparent, traceable, and efficient platform for information recording and data exchange for internal enterprises and information users. In summary, blockchain technology can solve the problems exposed in current audit work with its advantages of high security, high confidentiality, high reliability, traceability, irreversibility, and tamper resistance. At the same time, the characteristics of blockchain technology such as "peer-to-peer transmission" and "decentralization" also reduce the possibility of central institutions being attacked and the cost of complex operations, in order to improve audit security and reduce audit costs.

2.2. Core working mechanism of blockchain technology

2.2.1. Timestamp mechanism

The timestamp mechanism is based on real-time random hash operation technology. On the premise of confirming and proving that the data truly exists at a specific moment, after each set of data is stored in block form through consensus among multiple parties, the system will

automatically activate the operation mechanism to generate random hash values and add time stamps. Therefore, the timestamp mechanism ensures that a certain data must be real at a specific moment. In addition, there is a certain connection between data from the same process in the same economic business activity. Taking the chronological order of process progress as an example, in an ideal state, we can consider the entire process as a "journey" and the "timestamp" as a "station". Each station has a reserve of forage for feeding horses with different varieties. At the same time, we can consider the program stamped with a "timestamp" as a "pedestrian", who will rest and feed their horses every time they pass through a station. Before departure, always bring the hay from the previous station and store it in the slot where the hay is stored at the next station, and mix it thoroughly and evenly. When the next departure, carry the thoroughly mixed grass, and place the target in the storage tank of the next station's grass, and so on. That is to say, the "newly formed" timestamp will incorporate the previous timestamp into its random hash value, and each subsequent timestamp will enhance the previous timestamp to form a complete traceability mechanism, ensuring that all data stored on the blockchain can be confirmed and traced.

2.2.2. Consensus mechanism

Information can only be recorded in the chain after reaching consensus among various economic stakeholders, but achieving the goal of "efficiently reaching consensus" in distributed systems is not an easy task. We can illustrate this viewpoint by analogy with the opposing relationship between "democracy" and "concentration" in the social system. Democracy presents the characteristics of decentralized decision-making power, high stakeholder satisfaction, and low decision-making efficiency. This also means that in this mode, the accuracy and fairness of data recording can be guaranteed, but the efficiency of reaching consensus in the system is relatively low; However, "centralization" has the characteristics of centralized decision-making power, high decision-making efficiency, susceptibility to authoritarianism, dictatorship, and injustice, which cannot highlight the characteristics of collective maintenance and openness of blockchain technology. Therefore, the introduction of consensus mechanism is crucial for resolving this "contradiction". Blockchain introduces a specific, decentralized verification system when performing hash value operations, achieving the goal of "efficiently reaching consensus among nodes on the effectiveness of block data in a highly decentralized decision-making system". The mainstream consensus mechanisms include Proof of Work (POW), Proof of Equity (POS), and Proof of Authorized Equity (DPOS). The consensus mechanism ensures the real-time, authenticity, security, and reliability of data on the blockchain.

2.2.3. Merkel tree mechanism

MerkleTrees are a fundamental component of blockchain technology, which splits a large amount of aggregated data 'chunks' into smaller units (BUCKET) through hash operations. Then, each BUCKET unit data is hashed again, repeating the same process until the remaining total hash count is 1, which is the root hash. The data stored in the Merkel tree database can be traced back to all its hash branches through root hashing. At the practical level, the audit subject can verify the authenticity and effectiveness of the entire data chain by verifying the root hash of the target data. This mechanism simplifies the process of data query, while making data processing more efficient, improving audit efficiency, and reducing audit costs.

2.2.4. Smart contract mechanism

Smart contracts are computer programs that are built on economic and business activities and run on shared blockchain data ledgers driven by events. It can absorb various types of data that have been agreed upon and successfully recorded by various economic stakeholders, and process, analyze, and store the absorbed data in manual control command issuing mode or automatic mode. Moreover, smart contracts are not an independent and separate program, but rather an embedded programmatic contract. It can achieve interoperability with blockchain

data, economic transactions, tangible or intangible assets, forming programmable controlled software defined systems, markets, and assets. Smart contracts not only provide innovative solutions for the issuance, trading, creation, and management of traditional financial assets, but also play an important role in asset management, contract management, regulatory enforcement, and other affairs in the social system.

3. CONCEPTION OF BLOCKCHAIN AUDIT MODEL

In recent years, blockchain technology has been put into practice and applied in financial crisis warning, financial fraud detection, audit evidence analysis, and audit risk assessment. The current workload, low efficiency, high cost, lack of trust, and high human operational risks in audit work can be resolved through the combination of blockchain technology to achieve efficient, timely, and accurate audit work.

There are three types of blockchain: public chain, alliance chain, and private chain. Their openness is showing a decreasing trend, with the public chain being open to the entire network, with the highest degree of openness. Compared to private chains, alliance chains have a lower degree of openness. In general, alliances are formed between enterprises and organizations in the form of alliance chains, while private chains are used internally. To some extent, it weakens the characteristics of decentralization, improves the efficiency of decision-making, and also enhances the security of data. Due to the controllable and limited number of nodes participating in both alliance and private chains, the problems of low data security and slow transaction processing speed in public chains do not exist for them. The security of blockchain technology for data maintenance is their focus. As one of the audit elements, audit evidence involves the core business data and trade secrets of the audited entity. If a public chain is used, it cannot guarantee the security of enterprise transaction data, which can easily lead to issues such as stealing trade secrets and vicious competition. However, if a private chain with the lowest degree of openness is used, the authorization of nodes is controlled by the audited entity, and the integrity and authenticity of the data and information collected by the auditing party cannot be guaranteed. The partially decentralized alliance chain has the characteristics of security and efficiency, which is more suitable for the needs of audit scenarios. Based on this, the audited entity can establish "alliances" with relevant parties such as the audit subject, business partners, creditors, and the government, and restrict the viewing and changing permissions of data information, while retaining browsing traces and maintaining the security of the enterprise's own information.

Taking production and manufacturing enterprises as an example, the scope of audit work starts from the procurement process and ends in the sales process. Throughout the entire process of procurement, production, and sales, a large amount of data is generated. Among them, a portion of the data serves as the main basis for internal decision-making, providing information support for the smooth progress of daily business activities and the stable operation of enterprise operations. The other part of the data that enterprises regularly disclose to the public in accordance with the law should be provided to external users on the premise of ensuring its accuracy and trustworthiness. Following this approach, we can construct a model architecture that centers around the audited unit and combines the "internal audit chain" with the "external audit chain".

The internal audit chain is composed of the audited unit, internal audit, and related parties of the audited unit. It timely and effectively warns and regulates internal information risks through real-time recording and analysis of economic activity information. Due to the need for strict confidentiality of internal information within the enterprise, a nested form of "private chain" and "alliance chain" can be used: various functional departments within the enterprise (such as information recording and analysis departments, risk monitoring and evaluation

departments, and finance departments) can record and store information and its analytical value in the form of a "private chain"; Enterprises (audited entities) can establish an "alliance chain" with related parties (other enterprises or organizations that engage in economic transactions), and can only share information related to their own enterprise. They do not have access to view or edit other aspects of the information of the partner enterprise. The external audit chain is composed of the audited entity, the auditing party, and the regulatory party. The presence of a third party with a regulatory role will further enhance the authenticity and accuracy of information, and at the same time, it will be more objective and fair in evaluating information quality and analyzing financial conditions. The branches of the external audit chain are dominated by "alliance chains": enterprises and auditors, enterprises and regulators, and auditors and regulators can respectively establish "alliance chains" to form an information loop and achieve multi-party sharing of information. Moreover, the "internal audit chain" and the "external audit chain" are not independent and unrelated to each other, but exhibit a mutually restrictive and complementary relationship. After the transaction data of the audited entity is successfully verified by all parties in the internal audit chain and uploaded, the key is used for encryption processing. After being collected into the external audit chain, the auditor can decrypt and read it using the private key. After the audit architecture is completed, all data of the audited object will be automatically recorded and stored on the chain.

4. THE IMPACT OF BLOCKCHAIN AUDIT MODE ON INTERNAL CONTROL OF ENTERPRISES

4.1. In terms of controlling the environment

The blockchain audit model, with its guarantee of information accuracy, timeliness, and effectiveness, will have a series of positive impacts on enterprise development strategy adjustment, human resource optimization, social responsibility implementation, corporate culture cultivation, and internal audit system improvement. Specifically, at the application level, if blockchain technology is used in internal audits of enterprises, related enterprises, and audit entities, suppliers, enterprises themselves, and audit entities will have information related to specific businesses from procurement, production, to transaction processes. Moreover, every "addition" of information must be achieved through consensus, and each change step and person will be permanently recorded and saved at each participant's node, achieving complete transparency and visualization of the information. Enterprise management can gain a deeper understanding of the daily operational status and actual revenue status of the enterprise by viewing system data, rather than staying away from the "front line", separating strategic decisions from actual business execution. In addition, the smart contract mechanism of blockchain technology can automate the analysis of raw data, preliminarily achieving information analysis and application. Enterprise management can judge whether decisions are effective, whether the company's development strategy is feasible, and whether the implementation effect of the plan is significant based on the results of data analysis. On this basis, blockchain technology will implement real-time monitoring of data from a macro perspective. Once abnormal fluctuations are detected, an alarm will be immediately issued to remind managers to prevent risks, adjust enterprise development strategies in a timely manner, and adapt to external environmental changes. Furthermore, personnel in the human resources management department of an enterprise can also judge the professional competence and work focus of the company's employees based on the number of individual corrections or errors made during the information recording process, in order to select excellent employees and replace employees whose abilities are not suitable for their work. In order to improve the efficiency of enterprise business operation, ensure the quality of business operation, and achieve sustainable development of the enterprise.

In addition, for a company, the accuracy of its financial information largely depends on the completeness of the company's internal trust system construction. The audit information of accounting firms comes entirely from the data transmitted by the enterprise from the interface to the audit platform, and it is unknown whether these data have been processed and polished. For the audit subject, as the business difficulty and complexity of the audited unit gradually increase, the audit workload will become increasingly large. In general, the audit subject and the corresponding audit object, i.e. the audited entity, will establish a stable cooperative relationship in the short term. Different types of enterprises have different characteristics, and the focus of audit work may also vary. If a "credit rating system" can be established for the audited entity based on blockchain technology by integrating big data and predictive analysis, then each audit object will have a "credit card". Audit units can prioritize and prioritize audit content based on the results of the "credit rating system", efficiently carry out audit work, and improve audit quality. The smart contract mechanism of blockchain can set up a "personalized" smart contract program in advance based on the characteristics of the audited entity. This program can automatically calculate, organize, and analyze raw data to form reliable financial data, and then generate intelligent audit reports. Trusted financial data will simplify on-site audit verification procedures, and intelligent audit reports can reduce repetitive audit work, which will greatly save manpower and communication costs. At the same time, the audited entity will consciously abide by industry standards and laws and regulations, actively fulfill social responsibilities, and establish a good corporate image. Not only that, enterprises will also consciously form an honest and trustworthy corporate culture, which will to some extent reduce the probability of fraud incidents. Finally, the most direct impact is on the internal audit system. The decentralized nature of blockchain solves the problem of internal auditing being easily controlled by management and lacking independence. In addition, as the audited entity can authorize specific nodes to the audit subject to participate in the construction of some internal audit chains, this can achieve efficient and accurate data recording, and solve the problems of delayed audit time, low audit efficiency, and high audit costs.

4.2. Risk assessment

Blockchain technology can have a positive impact on enterprise risk identification, risk analysis, and risk response through its unique advantages of collective maintenance, traceability, and openness. After the enterprise sets strategic and business level goals, users code risk identification related procedures in the system, and some risk factors that affect the achievement of the goals will be identified by the system. Timely identification of risk factors, analysis of the likelihood of risk occurrence and the degree of impact on objectives, and development of risk response strategies and measures are crucial for the effective operation of the internal control system of enterprises. Firstly, within the enterprise, all data generated from daily business activities can be shared in real-time among various departments, and the recording, modification, and maintenance of information require the participation of all staff. When risk factors arise, with the support of smart contract mechanisms, all departments and enterprise management can receive risk alerts. The identification of risk factors is undoubtedly timely and accurate. In addition, the Merkel tree mechanism of blockchain technology enables rapid traceability of risk factors. Simply verify the root hash of the data related to the risk point, and then the system can review the entire data chain according to the business process to determine the data set that promotes the generation of risk factors. Finally, manually analyze and verify the dataset to determine the likelihood and impact of risks, and then determine risk response strategies to avoid unnecessary losses. At the same time, the de trust, decentralization, and smart contracts of blockchain have also laid a certain foundation for other intelligent risk identification tools.

4.3. Control activities

Incompatible job separation control, authorization approval control, and accounting system control in enterprise control activities will undergo significant changes relying on blockchain technology. Firstly, enterprises can use keys to record data and edit permissions between incompatible positions, implementing complete separation and control, and forming a work mechanism where each performs its own duties, assumes its own responsibilities, and restricts each other. Secondly, under the premise of information sharing, the editing and modification permissions of information can adopt a selective authorization mechanism. That is, under the premise of information being shared and linked, the editing and modification of specific nodes can only be operated by specific functional personnel. This ensures that all levels of management personnel within the enterprise must exercise their powers and assume responsibilities within the authorized scope, and business operators must handle business within the authorized scope. In addition, the consensus mechanism of blockchain enables enterprises and their related parties to grasp the real-time processing and change process of information. Thirdly, the goal of accounting system control is to ensure the authenticity and completeness of enterprise accounting information. Firstly, as a distributed shared ledger and database, blockchain can record and encrypt information in real-time through timestamp mechanisms, ensuring the timeliness and accuracy of information recording. At the same time, all transaction information will be synchronized and linked in chronological order, strictly following the established information processing mechanism, achieving automatic information verification, processing, storage, and reporting functions. In terms of accounting records, blockchain is expected to achieve multi-agent distributed bookkeeping, addressing the shortcomings of existing accounting information systems. The entire network nodes participate in bookkeeping together, and the accounting records of the enterprise will be broadcasted to other blocks on the chain. This way, the accounting records of the enterprise are also stored in other blocks on the chain, which to some extent constrains accounting personnel and improves the authenticity of accounting records. Moreover, blockchain and related smart contracts can securely store accounting data, share relevant information with stakeholders in real-time, and increase the verifiability of business data. Moreover, collective maintenance and supervision allow each node to obtain a true copy of the accounting books, and each accounting information is reviewed and verified by each participating node to prevent tampering with records and reduce accounting fraud and errors.

4.4. Information and Communication

Based on the premise that information can be recorded and stored normally, communication can be divided into internal information communication and external information communication according to the object of communication. Taking the internal audit workflow of enterprises as an example, under the traditional internal audit model, audit work is generally carried out after the completion of economic transactions, which inevitably leads to a problem of time lag. Severe time lag makes internal problems within the enterprise difficult to detect and solve in a timely manner, resulting in ineffective control activities. This phenomenon indicates that the internal information communication system of enterprises has the drawbacks of lag and low efficiency, that is, the inability to achieve real-time information sharing between business departments, financial departments, and internal audit departments, resulting in low efficiency of information communication. If information can be shared in real-time among various departments within the enterprise, the information recorded by business and financial personnel, as well as the original data related to the business, can be transmitted in real-time to the internal audit department through the internal audit chain. Compared with traditional information transmission, it greatly improves the efficiency of information transmission. Moreover, internal auditors can track and supervise their business in real-time based on their

mastery of all raw data and relevant information. Once problems and risks are identified, they can be returned and fed back at any time, achieving effective information communication between departments. Moreover, the smart contract mechanism can build an automatic communication bridge between departments by recording and analyzing errors and forming a feedback mechanism. When encountering similar business and problems again in the future, the system can automatically identify and provide feedback, and auditors will break away from the tedious and repetitive work, focus on suspicious points, and conduct manual verification, analysis, and suggestions. And this process will also provide a reference for the intelligent audit part of the system in the previous step, ensuring the accuracy and credibility of internal data of the enterprise from multiple aspects, thereby reducing the occurrence of accounting errors. In addition, issues discovered by auditors will also be timestamped, packaged and stored in the blockchain. The transparency, reliability, and effectiveness of internal audit work will be improved, which helps to improve the objectivity and independence of internal auditors in enterprises.

The external communication objects of enterprises mainly include suppliers, investors, creditors, customers, and regulatory agencies (not limited to audit departments). Below, we will elaborate from the perspective of the audit subject. Under the traditional audit model, sampling audits use a small and representative data sample as the main basis to comprehensively evaluate the accuracy of a company's financial work. That is to say, the information disclosed by the audited entity cannot be fully utilized by the audit subject, and the transmission of information between the audited entity and the audit subject lacks integrity. For enterprises with simple data sources, strong regularity of risk points, and single business types, this can to some extent reduce audit workload and reduce audit pressure. However, with the continuous expansion of business scope and overall scale in various industries, as well as the continuous increase in business types, the advantages of sampling audit are gradually weakened. At this point, it is necessary for the audited entity and the audit subject to adopt an efficient communication mechanism to achieve real-time transmission of business data, in order to meet the requirements of the overall audit. In addition, while audit efficiency and accuracy have significantly decreased, some new problems have emerged. For example, the choice of accounting policies can greatly affect the reflection of a company's financial situation. However, after a large amount of original information is "processed", auditors need to spend a lot of time and energy verifying the relevant information one by one. How to efficiently identify these decorations has become an important challenge in auditing work. These problems can be solved through blockchain technology. Firstly, blockchain can enable timely and unimpeded transmission of information to audit units, improving the quality and reliability of information, thereby improving communication efficiency and enabling timely and effective disclosure of information. That is to say, after being authorized, the audit subject can obtain the original data, business information, and financial information of the audited entity in real-time through the external audit chain. The auditor verifies the accuracy and completeness of financial information records based on raw data and business data. At first, the audit subject conducted a comprehensive audit and verification of the audited entity. Later, with the support of the smart contract mechanism, it can quickly conduct district audits and key audits based on the business characteristics of the audited entity, greatly improving audit efficiency and quality of audit work. Moreover, the consensus mechanism of blockchain requires that enterprises on the chain obtain recognition from more than 50% of nodes when conducting accounting measurements, which curbs the occurrence of "intentional changes" and "irregular records" by enterprise accountants from the source. Therefore, when choosing accounting policies, enterprises cannot choose favorable policies for accounting as they have done in the past, but instead accurately measure accounting in accordance with regulations and industry systems. In this way, the fairness of the audited entity's financial statements will be improved, ensuring the quality of accounting

information to a high extent, and thereby reducing the risk of accounting fraud and errors. Moreover, with the support of blockchain technology, all raw data has undergone strict comparison and verification. In addition, due to the existence of timestamp mechanisms, any changes made by one party to the information on the chain will leave indelible traces. This makes it technically difficult to implement fraudulent practices such as post recording, editing, and tampering. In addition, due to the traditional mode, report users cannot verify the authenticity of audit reports.

4.5. Internal supervision

Firstly, the collective maintenance and openness of blockchain eliminate the problem of information asymmetry, providing data support for the establishment, execution inspection, and effectiveness evaluation of internal control systems. Secondly, the immutability and anonymity of blockchain can provide sufficient constraints and control between various departments of the enterprise, enabling the effective operation of the internal control system of the enterprise. Taking manufacturing enterprises as an example, from the beginning of product production to the completion of assembly before leaving the factory, enterprises should implement monitoring layer by layer, and strictly regulate and supervise each link. Once a defect occurs, it is necessary to immediately identify and evaluate its importance. Moreover, relevant personnel should regularly evaluate and adjust the internal control structure, report any issues to the board of directors, supervisory board, or management, and control and emphasize potential risks. And blockchain technology can achieve the comprehensiveness, balance, and effectiveness of supervision and control work. The combination of internal control and blockchain technology can timely respond to changes within the organization, continuously supervise the operation of the internal control system, effectively reduce the occurrence of significant risk consequences and fraud phenomena, thereby reducing the operational and management risks of the enterprise itself, as well as the control risks faced by audit work.

5. RECONSTRUCTION OF ENTERPRISE INTERNAL CONTROL SYSTEM UNDER BLOCKCHAIN AUDIT MODE

On the premise of combining blockchain technology with the construction of enterprise internal control systems, the reconstruction of internal control systems can be elaborated from five aspects: internal environment, risk assessment, control activities, information and communication, and internal supervision.

5.1. Creating a good internal control environment for enterprises

The 'internal environment' is the foundation for building an internal control architecture. Only in a good internal environment can the internal control processes of enterprises be carried out in an orderly manner. Therefore, enterprises should first use blockchain technology to collect and analyze various aspects of information, and scientifically and reasonably formulate long-term development strategies based on the actual situation and maximum capabilities of the enterprise. In this process, the visualization and sharing of data on the blockchain are the foundation for the successful formulation and effective implementation of development strategies, reducing the risk of business loss caused by overly aggressive strategies and financial fraud in order to achieve established "goals". At the same time, in the daily operation process, it is necessary to pay attention to the construction of corporate culture, create a good social responsibility culture atmosphere for the internal control of the enterprise, and eliminate all unethical behaviors that only consider interests and social responsibility from the source. Enterprises can improve the system construction of the internal audit chain and strengthen the constraints on internal auditors to avoid the phenomenon of internal audit departments being "virtual". In addition, enterprises can establish a reward and punishment system for accounting

errors and corrections. When internal auditors discover accounting errors through auditing, they can use the traceable nature of blockchain technology to locate the source of information. When the error information record is corrected, the information of the corrector will be recorded in the chain. If the information is corrected too many times, corresponding penalties will be imposed. The more times auditors discover incorrect information, the more generous the rewards they will receive. This can actually serve as an employee incentive mechanism to standardize the professional ethics of internal accounting personnel in enterprises, improve work focus and accuracy, and curb the occurrence of accounting fraud from the source. In addition, it also greatly helps to enhance the enthusiasm of auditors in their work. Moreover, the management of the enterprise manages the entire company from a macro perspective, and their ideology and sense of responsibility directly affect the employees from all levels of the enterprise, leading the culture of the entire enterprise. Once the management of the enterprise carries out management activities with a "fraudulent" attitude, the management can not only manipulate financial data within their scope of responsibility. Moreover, all departments of the enterprise will be influenced by the management. In the end, serious consequences of fraud will cause huge losses to stakeholders such as investors, creditors, and the social economy. Enterprises can leverage the advantages of collective maintenance and openness of blockchain technology to replace management level control with consensus mechanisms and smart contract mechanisms. Transaction information is synchronously generated and updated in real-time on distributed ledger information at all nodes. Full network synchronization, openness and transparency help to form comprehensive supervision and avoid manager fraud caused by information asymmetry. In addition, the internal audit architecture of enterprises can be transformed and innovated based on blockchain technology.

5.2. Improve the enterprise risk assessment system

In the process of increasingly globalized economic development, modern enterprises will encounter risks from various aspects in the production and operation process. In the risk assessment system, risk identification and risk analysis are used as evaluation methods, with the fundamental purpose of achieving effective risk response. Meanwhile, due to the basic requirements of dynamic, continuous, and systematic risk identification work, the smart contract mechanism of blockchain technology can meet this condition, achieving automated and programmed identification of risk factors. So, enterprises can focus their work on risk analysis and transfer most of the risk identification work to blockchain technology. This will greatly save labor costs, while paying more attention and attention to various risks, achieving in-depth analysis and mining, and gaining knowledge and experience. In order to timely adjust and optimize the development strategy, organizational structure, human resources, audit procedures and methods of the enterprise, and reduce the occurrence of risk factors from the source.

5.3. Optimizing enterprise control activities

The internal control activities of enterprises can be roughly divided into seven aspects. Among them, the main areas that will undergo transformation and restructuring under the influence of blockchain technology are incompatible job separation control (organizational structure control), authorization approval control, and accounting system control. Firstly, in accordance with the principles of science, simplification, efficiency, transparency, and balance, blockchain should be used as a data verification platform, taking into account factors such as enterprise nature, development strategy, cultural concepts, management requirements, and environmental changes. Internal functional organizations should be reasonably set up and adjusted in a timely manner, with clear responsibilities and authorities of each organization. A work mechanism should be formed that each performs its own duties, assumes its own

responsibilities, restricts each other, and coordinates with each other. Below is a detailed explanation of organizational structure control under blockchain technology.

Taking a high-tech enterprise as an example, it adopts a traditional functional organizational structure, which divides departments based on professional functions. Functional organizations and personnel are established under various levels of management personnel according to business needs to assist them in functional management work. Among them, the general manager can exercise direct control over the chief designer, executive vice president, deputy general manager, personnel administrative director, and financial director, while indirect control over departments such as production director, audit department, marketing center, etc. requires the executive vice president and deputy general manager. It is worth noting that the finance department and the audit department are subordinate to different entities that implement direct control. Therefore, in general, the functions of the audit department can be fully utilized. However, as the General Manager can exercise indirect control over the Audit Department through the Executive Vice President, if the General Manager colludes with the Executive Vice President, the independence of internal audit cannot be guaranteed, and its supervisory role will be greatly reduced. In addition, the information center of the enterprise belongs to the direct control of the executive vice president, and other management personnel of the enterprise cannot directly obtain the original information of the daily business activities of the enterprise, which poses a risk of information asymmetry.

If enterprises integrate blockchain technology into organizational structure construction, the above problems can be solved. Firstly, information can be shared in all aspects and at multiple levels. The information center is no longer fixed as a department, but is established in a more flexible form on the blockchain. Moreover, blockchain can reduce the cost of central institutions being attacked and complex operations through its decentralized and peer-to-peer transmission characteristics. Furthermore, based on blockchain technology, the finance and audit departments of enterprises can attempt to establish parallel hierarchical relationships. That is to say, the recording and transmission of information are recorded one by one in chronological order with the support of timestamp mechanism, and there is no phenomenon of information transmission being interrupted due to crossing management levels. So, the information does not need to go through complex submission processes, but is transmitted in real-time to the corresponding database system of the target node. The information and communication channels between the finance department and the audit department have shifted from offline to online, making information acquisition faster, more efficient, and accurate for the audit department. In addition, based on blockchain technology, we can independently design systems to fix the scope of authority for enterprise management, business managers, and company employees, ensuring that management and business operators exercise their power or handle business within the authorized scope.

5.4. Expand information and communication channels

Information and communication are the timely and accurate collection and transmission of information related to internal control by enterprises, ensuring effective communication within the enterprise and between the enterprise and external parties. The effective transmission of information in the internal control process of enterprises has a direct impact on achieving the effectiveness of internal control. Only by establishing an efficient information and communication system and continuously improving information processing and transmission procedures can the efficiency of internal and external information transmission and communication be improved in enterprises. At present, the transmission and communication of information within and outside enterprises mainly rely on the Internet, which is a networked communication channel. It includes top-down communication, horizontal communication, and external communication. Top-down communication enables everyone to understand their

responsibilities and clarify the various rules and regulations of internal control. Everyone can clearly define their role positioning and responsibilities in the internal control system; Horizontal communication enables timely and regular information transmission between different departments of the enterprise, especially among interrelated departments, to avoid the phenomenon of "information asymmetry" and reduce various risks caused by information loss; External communication refers to communication with external stakeholders of the enterprise, which can timely disclose relevant information of the enterprise to the outside world through online platforms. With the widespread application of blockchain technology, more efficient ways can be used for internal and external information transmission and communication within enterprises. Blockchain can enable data to be shared between different departments and levels, avoiding issues such as information silos and information asymmetry. It facilitates the collection, storage, processing, and reporting of information by enterprise management agencies, enabling timely and unimpeded transmission of information to information users, improving the quality and reliability of information, and ultimately improving communication efficiency. Moreover, it can create channels for employees to transmit information upwards and effectively protect 'whistleblowers', enabling management to promptly and accurately understand relevant information. In addition, blockchain can enable all parties to communicate without mutual trust, enabling timely and effective disclosure of information, and strengthening communication between enterprises and external information users; It can also effectively connect enterprises with their suppliers and customers, timely understand relevant information of suppliers and customers, and adjust business decisions in a timely manner.

5.5. Improve the internal supervision mechanism of enterprises

In the process of internal control system construction, execution, and ultimately demonstrating effectiveness, internal supervision is essential. It ensures the normal operation of all aspects of the internal control system and plays a role in "macro regulation". Not only that, internal supervision should also focus on controlling detailed issues. At key nodes, it should effectively play a supervisory role, identify and resolve doubts and risks that arise within the enterprise in a timely manner, and maintain the independence, effectiveness, and timeliness of supervision. Based on the smart contract mechanism, the audited entity can incorporate the entire process of internal control and regulatory priorities into the blockchain system by setting certain monitoring and analysis indicators, which can monitor the internal control situation of the company's business operations at any time, detect some abnormal business behaviors at any time, implement effective in-process supervision, reduce the risks faced by post audit, and make real-time audit supervision possible.

6. CONCLUSION

In summary, blockchain technology, as an emerging scientific and technological method, with its characteristics, will have a certain impact on the audit environment, audit work procedures, as well as audit subjects and audit objects. In the future, with the deep application of blockchain technology in the field of auditing, the transformation and reconstruction of the internal control system of enterprises will become a key concern for audited units. Therefore, a forward-looking enterprise should first accelerate the process of upgrading its technological facilities and encourage its internal auditors to achieve transformation. In addition, enterprises should always pay attention to the direction of national policies, seize opportunities, and meet challenges. On this basis, create a good internal control environment for the enterprise, improve the enterprise risk assessment system, strengthen control activities in all aspects of enterprise production and operation, expand internal and external information and communication channels, and improve the internal supervision mechanism of the enterprise to ensure the

efficiency, comprehensiveness, and systematicity of internal control. On the basis of full participation, comprehensive deployment, and full coordination and supervision, achieve the healthy and stable development of the enterprise.

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