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Research on Path of Blockchain Enabling Accounting Information System

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I. INTRODUCTION

Blockchain is a new application mode of computer technology such as distributed data storage, point-to-point transmission, consensus mechanism and encryption algorithm. Since the advent of blockchain technology, its development prospects have received great attention. Relevant parties have also invested a lot of research energy and funds here, and its application scope and field are more and more extensive. Blockchain technology is now also gradually applied to accounting information systems. At present, there are many drawbacks in the accounting information system of enterprises, including the problem of information technology, the conservative problem of reporting mode and the lack of supervision. These problems have been greatly alleviated to a certain extent due to the emergence of blockchain technology. There is a natural connection between blockchain technology and accounting, because blockchain technology is a big data ledger, and accounting itself is an economic information conversion technology that specializes in bookkeeping. Therefore, studying the connection between the two has a huge boost to the optimization and progress of accounting information systems. The advocacy and support of the state has greatly promoted the integrated development of blockchain and accounting technology.

At present, the development of accounting information system affected by the new normal economic development, can not meet the requirements of economic development, further development has

encountered bottlenecks. The national '14th Five-Year' accounting development plan puts forward new requirements for accounting information system. The '14th Five-Year Plan for Accounting Reform and Development (Draft)' has made a new development plan for the development of accounting, including promoting the digital transformation of accounting, accounting management and audit work. One is the digitization of accounting work. Planning pointed out that to design a good transformation of the top-level structure, improve the 'enterprise accounting information work norms', to achieve the unity of all enterprises and administrative institutions norms, and to make accounting information is applied to both accounting processes, but also in business activities to use. Establish a data standard including the whole process of accounting information input, processing and output, and apply it to the construction of accounting database of state-owned enterprise financial statements, industry management digital platform and fiscal and taxation sharing platform, so as to effectively accelerate the pace of digital transformation of accounting and auditing, and provide new engines and new advantages for the development of accounting. Second, digital accounting management. The plan puts forward new requirements from the establishment of an integrated management platform for accounting personnel information, credit management, CPA industry information, accounting firms, and agency accounting institutions. It is hoped that through the accounting data standard, the data of each platform will be integrated, and the accounting industry management big data technology will be used to empower the improvement of national governance capabilities; The third is the digitization of audit work. Formulate correspondence data standards, establish a digital platform for correspondence, give play to the functions and roles of modern technology to solve the problem of false correspondence, and improve audit efficiency. Use information technology and means to strengthen the anti-counterfeiting management of audit reports and solve the problem of false audit reports.

The 2035 vision for accounting reform and development places new demands on accounting information systems. The country's vision of accounting reform and development clearly states that the dream of an accounting power will be realized by 2035. This requires the improvement of the accounting legal system so that it is consistent with the level of economic

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development and capital flow at home and abroad; Establish accounting and auditing system standards, and ensure stable operation, significantly expand the right to speak in the formulation of international accounting and auditing standards, achieve high-quality accounting development, and be in a leading position in the world; Gradually optimize the structure of accounting talents, improve the professional ethics, ability level and knowledge level of accounting personnel, so that they can adapt to the identity of China's accounting power; Complete the digital transformation of accounting and auditing, basically solve the problem of accounting trust, ensure the quality of accounting and auditing work, strengthen the accounting service economy and society, and transform to the value chain, so that accounting can play an active role in building a digital China, building a high-standard market system, and improving the ability of national economic governance. In the new normal and new environment of the economy, the accounting information system should adapt to the new needs and new environment, find a breakthrough in the bottleneck that hinders the development, and blockchain technology is an inevitable choice, so this paper studies how the blockchain empowers the accounting information system in order to promote the further development of accounting.

II. THE ACCOUNTING INFORMATION SYSTEM FACES CHALLENGES AND OPPORTUNITIES

a) *The problems existing in the accounting information system*

Centralized mode The current accounting mode still adopts centralized mode, such as financial service sharing center and cloud mode. The model of accounting center has many disadvantages. All accounting information is centralized in the center, tampering cost is low, trustworthiness is questioned; All accounting information is concentrated in the center, poor transparency and openness, easy to be subjected to hackers and other network attacks, information theft, disclosure and other high risks, there are security risks; Fewer people participate in accounting data processing, it is difficult to play the collective wisdom, wisdom finance is difficult to develop; Financial report is only a fixed balance sheet, income statement, cash flow statement, difficult to meet the needs of various parties, the degree of information sharing is not high.

In the current accounting information system, the financial department and the business department are still separated obviously, and the integration is not high. Nowadays, information technology is developed and information exchange is convenient. However, the lack of professional information exchange platform and the lack of awareness of the integration of business departments and financial departments lead to the

obstruction of information sharing and communication. The cross-departmental business ability of financial personnel and business personnel needs to be improved. Financial personnel do not understand business, business personnel do not understand finance, and the knowledge and business skills of staff need to be transformed and upgraded. The enterprise management system is not perfect, the evaluation system is defective, the business department and the financial department only consider the problem from their own perspective, the business only considers the increase of performance and sales, does not consider the financial risk, the financial only considers the control of risk, does not consider the increase of business performance, these problems are not conducive to the integration of industry and finance.

There are many problems in the development of accounting. Compared with the needs of economic and social development, there are still gaps in the construction of accounting auditing standard system. Compared with the requirements of the reform of "release regulation and service", the management of accounting service market still needs innovation; Compared with the construction of a high standard market system, the quality of accounting audit work still needs to be improved; Compared with the requirements of high quality development, the supply of high-end accounting talents is still insufficient; Compared with the comprehensive rule of law requirements, accounting rule of law construction still needs to be strengthened; Compared with the requirement of digital development, the informatization level of accounting audit work still needs to be improved. These problems need to be solved by institutional innovation, institutional optimization and institutional reform during the 14th Five-Year Plan period. During the "14th Five-Year Plan" period, accounting, as a foundational work in the macroeconomic management and allocation of market resources, faces rare development opportunities in the course of deepening reform comprehensively and integrating deeply into economic globalization in our country.

Opportunities and challenges brought by the new international situation From the international perspective, the international situation is undergoing profound and complex changes, will profoundly affect the existing international accounting order; International economic and trade exchanges and cross-border capital flows have raised new requirements for cross-border accounting, auditing cooperation and supervision; New business models emerge in endlessly in economic development, which will profoundly affect the development trend of accounting standards. From the domestic point of view, in the steady and slow economic operation situation, accounting audit illegal behavior has a trend of rising, capital market financial fraud cases, causing widespread concern from all walks

of life; With the development of science and technology and the wide application of new technology, accounting challenges and opportunities coexist.

In the face of these new situations, new problems, new challenges and new opportunities, it is required that the accounting law and accounting standards are constantly perfected and effectively implemented, that the accounting practitioners continue to improve their quality, accelerate their transformation, and that the accounting management departments continue to change their ideas and improve their methods.

III. THE INTEGRATION OF BLOCKCHAIN AND ACCOUNTING

a) *The macro environment of integration*

In December 2016, The State Council issued the 13th Five-Year National Informatization Plan, which for the first time included blockchain technology as a strategic technology in the plan. The plan emphasizes the strategic layout of basic R&D and frontier of new technologies such as blockchain. In March 2021, the "14th Five-Year" National Informatization Plan is being formulated to promote the implementation of the plan from nine aspects such as information infrastructure construction and the deep integration of digital technology and the real economy. The decentralized point-to-point value delivery transaction mode of blockchain technology is a natural digital technology, and accounting is an effective tool to calculate digital value. The two have a natural basis for integration. The strategic layout of the country also provides a good macro environment for the integration of blockchain and accounting.

b) *The theoretical basis of integration*

First of all, accounting is a technology that processes the procurement, production, inventory and sales business information of an enterprise into value information with professional accounting technology. It is a professional business processing information technology and belongs to the information category. Blockchain is an information technology that processes all economic information in accordance with the contract and consensus mechanism. It also belongs to the information category, so accounting and blockchain both have the attributes of information and information technology. Secondly, blockchain solidifies and stores all transaction information with timestamp and asymmetric encryption algorithm to preserve information completely and accurately and ensure authenticity. The goal of accounting is to confirm, measure and report the actual transactions or matters, truthfully reflect the various accounting elements and other relevant information that meet the requirements of recognition and measurement, and ensure that the accounting information is true and reliable and the content is

complete. Therefore, they are consistent in attribute and target, which provides a theoretical basis for fusion.

c) *Advantages of integration*

"Blockchain + Accounting" will improve the quality of accounting information Blockchain technology can optimize the path of accounting information generation and improve the quality of accounting information. At present, Kingdee, Yonyou and other accounting software have designed a set of automatic accounting system according to the principle of double-entry bookkeeping and the process of confirmation, measurement, bookkeeping and reporting: The cashier will input the information of fund receipt and payment into the system based on invoices, bank payment slips, bank receipts, expense claims, etc., and the system will automatically register the cash journal and bank deposit journal according to the procedures designed by the system. The accountant will input the purchase invoice, sales invoice, production document, inventory document and expense document into the system manually, and the system will automatically register all kinds of subsidiary ledger and general ledger according to the designed process. The statement system will issue three major statements (balance sheet, income statement and cash flow statement) according to the designed statement template. Therefore, the current accounting information system is only the man-machine collaboration mode, rather than the machine mode and artificial intelligence mode of blockchain technology. The former can still be tampered with according to human intervention methods such as replication, deletion, recovery of bookkeeping and cancellation of bookkeeping, and the general ledger type of centralized mode is extremely easy to tamper with, which brings great challenges to the reliability of accounting information. However, blockchain uses the value Internet technology which is completely different from the information Internet technology. It is the transmission of value rather than the replication of information, so tampering is bound to leave traces. In addition, blockchain records all the information of each transaction through the time stamp and consensus mechanism. According to the time sequence, it can not only trace forward, but also continuously extend backward, which makes it technically difficult to modify and steal data and other tampering behaviors, so as to ensure the integrity and authenticity of information technically.

"Blockchain + Accounting" will improve the intelligent level of accounting treatment. The recording and verification of accounting information under blockchain will be automatically completed by a pre-set computer program, which improves the intelligent level of accounting treatment. Kingdee, ufile software stand-alone mode, financial Shared schema or cloud model, on the business process, in the accounting process, all

need audit personnel to check the information and check, this is human-machine collaborative mode, is not completely machines, automation, prone to error, the manipulation of information as well as the low efficiency and so on. And block chain accounting information system, through the embedded intelligent contract (by the financial contracts, supply, supervision, auditing, production and sales contracts, etc), contract layer embedded code, when the business to the expected contract rule conditions and check, the system will automatically perform significantly improve the processing efficiency and accuracy of accounting information system.

Block type chain would promote accounting accounting information system to intelligent accounting information system accounting accounting information system, only the computer outside accounting into the computer, through the technique of artificial scans or entry input source documents, each business in the accounting software to the original credentials in accordance with the accounting theory is processed into accounting information, Through the establishment of a good accounting system to automatically complete the subsequent accounting processing, such as the registration of detailed accounts, issuing accounting statements, etc. Computer in the transmission, inquiry, sorting out accounting data, processing efficiency has been greatly improved, to a certain extent, improve the level of accounting information, but there is still a big gap with the management accounting goals. The objectives of management accounting include strategic accounting, intelligent accounting and intelligent accounting. The transformation and upgrading of financial accounting into management accounting cannot be done without the help of blockchain.

IV. OPPORTUNITIES AND CHALLENGES BROUGHT BY BLOCKCHAIN TO ACCOUNTING INFORMATION SYSTEM

The accounting information system has shortcomings such as information island, information lag, centralization and separation of industry and finance, and the enabling of blockchain can fundamentally improve or even eliminate these shortcomings. The whole process of blockchain is open and transparent, resistant to tampering and self-trust, which can meet the requirements of obtaining authentic and reliable original vouchers of accounting information system, and also meet the new requirements of economic development on the acquisition automation of accounting information system. Blockchain decentralization and distributed accounting can solve the requirements of intelligent accounting voucher preparation, and solve the problem of information lag; The advantages of blockchain traceability and easy accountability can easily solve the problems and

requirements of accounting information system book registration automation; The advantages of financial integration and synchronization of blockchain business and timely information sharing bring opportunities to break through the bottleneck of accounting reports, which can meet the new requirements of current economic development and solve the shortcomings of separation of industry and finance and insufficient integration. Of course, the application of blockchain technology in accounting also has certain challenges. Blockchain technology itself is immature, application scenarios are limited, it cannot solve the problem of off-chain data security, the digitalization of financial business needs to use other technologies, and the data on-chain is not sufficient.

V. THE PATH OF ACCOUNTING INFORMATION SYSTEM ENABLED BY BLOCKCHAIN

a) *Information fidelity*

The trust of accounting information system ensures that the characteristics of blockchain technology, such as decentralization, distributed bookkeeping and resistance to tampering, coincide with the requirements of true and reliable accounting information, and can fully guarantee the authenticity of accounting information. However, computer hardware and software technology insufficiency, system related parties, malicious hackers and so on have brought great security risks to the accounting information system. In addition, the current financial sharing service center and cloud accounting mode are both centralized processing methods, with low tampering cost, which is a big problem for accounting information system to provide true and reliable information. Therefore, the embedding of multi-node two-layer blockchain technology and the construction and operation of the vertical and horizontal bidirectional degree model can play the role of firewall and booster, and promote the construction of the credit guarantee mechanism of accounting information system. In addition, blockchain plays a role in solidifying the original transaction information and the accounting processing process. Making full use of blockchain technology to process accounting data and using artificial intelligence mode will enable the information fidelity of accounting information system.

In terms of ensuring the fidelity of accounting information, blockchain can achieve dissemination fidelity and a certain degree of release fidelity in general application scenarios; In the field of audit, a scheme to improve the quality of accounting information can be constructed, which can protect the privacy of reasonable accounting information, detect false participants, eliminate unnecessary human influence and avoid bias in audit reports, so as to provide a more powerful guarantee for the fidelity of information.

The application of blockchain technology can optimize the accounting information system. For example, in the purchase and sale business, the information process can be reconstructed from internal and external aspects, and then the optimization of its security, information risk and other aspects under the blockchain technology can be deeply discussed. In particular, environmental accounting is severely restricted by the bottleneck of technology, reporting mode and supervision mechanism, and the integration of blockchain technology will break the bottleneck and promote the further optimization and development of environmental accounting information system.

b) *Information sharing*

Accounting information system of the intelligent block distributed record and store chain, each node record all transactions in chronological order, the relationship between all nodes are equal, open and transparent operation rules, abide by the same consensus algorithm trading rules, the point-to-point connections, jointly safeguard, the trust, information sharing, intelligence, wisdom, for the accounting information system laid a foundation. Because of the self-trust, all users on the chain give full play to the wisdom of free trade, innovation of production mode, change the production relationship, each enterprise to optimize the accounting information system, and business integration, the whole economy will be a great wisdom of the accounting information system. No matter which industry, to achieve a high degree of information sharing, we can analyze the advantages and disadvantages of the company's accounting system and business system, and then explain how to integrate the information system process and business process through process optimization and transformation, so as to achieve the purpose of wisdom.

Blockchain technology can promote the optimization of accounting information system. For example, the enterprise procurement system can analyze the optimization application value of blockchain technology in financial accounting and management accounting by constructing the procurement activity accounting model. According to the analysis results, the procurement system can be taken as the entry point to play a role in system optimization. In terms of optimizing accounting supervision, first of all, it is necessary to analyze the necessity of building a blockchain accounting supervision system. Then, according to the characteristics of business processes, it is necessary to analyze how blockchain can help standardize the supervision process, optimize accounting supervision and play a role in optimizing the system.

c) *Application of information*

Value creation of accounting information system Accounting information system has the disadvantage of information island, while blockchain technology enables

accounting information sharing, openness and transparency, facilitates the operation and use of accounting information, and creates value from it. Blockchain is combined with "big, smart, mobile, cloud, things" and other technologies to build a blockchain management accounting digital skills ecosystem, making it possible for management accounting to build a value creation platform for enterprises. From the perspective of intelligent management accounting, the technology of "big, smart, mobile, cloud, material" can also be used to transform the accounting information system into an intelligent financial sharing platform, so as to provide real-time useful information for all parties with information needs, predict risks, and realize the value creation of accounting information. The management accounting report system is constructed through the technology of physical layer, definition layer, network layer, collaboration layer and application layer of blockchain, so that the function of management accounting to create value by information becomes a reality. Moreover, the management accounting information system based on the core technology of blockchain, including data physical layer, data definition layer, data storage layer, data processing layer, data link layer and data application layer, can make the management accounting information information and promote the accounting information system to create value.

The application of blockchain technology in the value creation of accounting information, referring to the practice of Deloitte Rubix platform in the operation process of cross-border payment, accounting, data storage and business audit, can analyze how to deal with challenges and opportunities through SWOT matrix analysis model, in order to better play the role of this platform. Blockchain has been applied in strategic management accounting and has made some breakthroughs. For example, the use of blockchain to establish the framework of management accounting tools, from the application target, application platform, application evaluation system to form a systematic and integrated system application of management accounting tools, can promote the value creation of accounting information system. The application of blockchain technology in the preparation of management accounting report is also practical and feasible. As long as it is feasible in theory and reality, the application of blockchain technology in the preparation of management accounting report is within reach.

VI. CONCLUSION

Blockchain technology is a very hot technology in today's society, and its application in the accounting industry has also attracted wide attention. More and more scholars have begun to study the application of blockchain technology in the accounting field. Its

advantage is to establish distributed ledger, improve the quality of accounting information, strengthen enterprise supervision and management, so as to promote the optimization of enterprise accounting management information system. To sum up, with constant innovation and development block chain technology, in the future the technology will be increasingly perfect and mature, it will give the accounting field brings a huge innovation, so as to promote its transformation, promote reform and innovation of accounting management information system, improve the enterprise's management method, management, operation mode, makes in the chain of blocks technical background, Enterprise accounting management information system has been further optimized and improved.

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