

Analysis on the Impact of Blockchain Technology on the Accounting Profession

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ABSTRACT

With the birth of Bitcoin to the maturity of development, blockchain has been sought after by various industries, and the application research around blockchain technology has developed rapidly. Blockchain has excellent characteristics such as decentralization, openness, independence, security, and anonymity. Applying the characteristics, types and core technologies of blockchain technology to the management model and management methods of the accounting industry will definitely have an important impact on the development and innovation of the accounting industry. By analyzing and discussing the impact of blockchain technology on the informatization construction, data security, fund settlement, financial audit and other aspects of the accounting industry, it is expected that mature blockchain technology will be applied to the accounting industry, which will definitely help the steady development of the accounting industry and promote the virtuous circle and development of the entire accounting industry.

Keywords: Blockchain technology, Accounting profession, Influence.

1. INTRODUCTION

With the birth of Bitcoin to its maturity of development, blockchain has been sought after by various industries, and research on the application of blockchain technology has developed rapidly. Blockchain technology uses block chain data structures to verify and store data, uses distributed node consensus algorithms to generate and update data, uses cryptography to ensure the security of data transmission and access, uses cryptography to ensure the security of data transmission and access, and uses smart contracts composed of automated script codes to program and manipulate data in a new distributed infrastructure and computing paradigm [1]. With the development of blockchain technology, both the depth and breadth of technology and the breadth of application scenarios have achieved great breakthroughs. Blockchain is a new application mode of computer technology with distributed data storage, point-to-point transmission, consensus mechanism, and encryption algorithm. Blockchain has excellent features such as decentralization, openness, independence, security, anonymity, etc. [2], attracting the attention of people in the global accounting

industry. It is hoped that the blockchain can change the accounting industry, and even cause changes in the accounting industry, and promote the healthy growth and development of the accounting industry. For the accounting profession, the emergence and rapid development of blockchain technology will surely change the status quo of the accounting profession, make accounting practitioners more efficient and convenient in business processing, and will inevitably bring about earth-shaking changes and influences on the information construction, data security, fund settlement, and financial auditing of the accounting industry.

2. BLOCKCHAIN TECHNOLOGY

With the rise of blockchain technology, blockchain has gradually expanded in various industries, and attached great importance to the national level of blockchain. In October 2016, the Ministry of Industry and Information Technology of China issued the explanation of the "Blockchain Technology and Application Development White Paper": in a narrow sense, a blockchain is a distributed ledger that combines data blocks in

sequence in a chronological order into a chained data structure and is cryptographically guaranteed that cannot be tampered with and cannot be forged. Broadly speaking, blockchain technology uses blockchain data structures to verify and store data, uses distributed node consensus algorithms to generate and update data, uses cryptography to ensure the security of data transmission and access, and uses smart contracts composed of automated script codes to program and manipulate data in a new distributed infrastructure and computing paradigm. From a technological perspective, blockchain involves the intersection of many disciplines such as mathematics, cryptography, the Internet, and computer programming. From the perspective of application, the blockchain is a distributed shared ledger database with technical features such as decentralization, non-tampering, full trace retention, traceability, collective maintenance, and openness and transparency. These characteristics ensure the trustworthiness and transparency of the blockchain and lay the foundation for the trustworthiness of the blockchain.

2.1 Features of Blockchain

Integrating blockchain technology into the accounting industry, combined with the application of blockchain in the accounting field, the following mainly analyzes its characteristics from the aspects of decentralization, openness, and independence. The first is decentralization and it does not rely on third parties. Due to the use of distributed accounting and storage, there is no centralized hardware or management organization, the rights and obligations of any node are equal, and the data blocks in the system are jointly maintained by nodes with maintenance functions in the entire system. The second is openness, It is open and transparent. The system is open. In addition to the encryption of the private information of all parties to the transaction, the data of the blockchain is open to everyone, and data can be obtained and related applications developed through the open interface. Therefore, the entire system information is highly transparent. The third is independence, avoiding human intervention. Blockchain adopts consensus-based specifications and protocols, so that all nodes in the entire system can exchange data freely and securely in a trustless environment. The way of trust is to trust the machine, and any human intervention does not work. The fourth is security, and information cannot be tampered with. Once the information is verified and added to the blockchain, it will be permanently stored. Unless more than 51% of the nodes in the system can be controlled at the same time, the modification of

the database on a single node is invalid, so the data stability and reliability of the blockchain is extremely high. The fifth is anonymity and de-trust. Since the exchanges between nodes follow a fixed algorithm, the data interaction does not need to be based on trust, nor does it need to obtain mutual trust, so the two parties to the transaction can trade without disclosing their identities.

2.2 Types of Blockchain

Blockchain is divided into public chains, alliance chains and private chains according to application scenarios and development levels [4]. The first is the public chain, which is characterized by that everyone can participate, and the public chain system is the most open. Anyone can participate in the maintenance and reading of blockchain data. It is easy to deploy applications, and complete decentralization is not controlled by any institution. The second is the alliance chain, which is characterized by the participation of alliance members only. The alliance chain is a semi-open system and requires registration permission to access. Only the members of the alliance can participate, and the size of the alliance can be between countries or between enterprises. The third is the private chain, which is characterized by limited participation by individuals or units. The private chain system is the most closed and limited to internal use by enterprises, state institutions or individual individuals. It cannot completely solve the trust problem, but it can improve data security.

2.3 The Core Technology of Blockchain

The first is distributed ledger. Distributed ledger is the distributed storage of blockchain. Transaction accounting is distributed in different locations and nodes to complete together, and nodes can supervise and testify to each other. Since each node records a complete account, and the transactions are organized into blocks, and finally organized into a logical chain, the blockchain storage ledger continues to grow. Since the ledger is completely open and the number of nodes is large, malicious damage is avoided, the possibility of data loss is small, and the security of data is guaranteed. The second is encryption based on cryptography. Blockchain is based on cryptographic principles and methods for data encryption and privacy protection, which mainly include hash algorithms and asymmetric encryption algorithms. Fundamentally speaking, the so-called encryption of the hash algorithm is actually to be able to extract the data characteristics. Therefore, the specified data

hash value can be regarded as the characteristic information of the data. The encryption principle of asymmetric encryption algorithm is composed of a pair of asymmetric encryption keys, namely, a public key and a private key. Since the public and private keys are uniquely paired, only users with a certain key can decrypt the encrypted information, and any other unauthorized users have no right to decrypt this information. The third is a multi-party consensus mechanism. Under predetermined rules, multiple parties participate and interact through multiple nodes to reach an agreement on certain data, behaviors, or processes. The consensus mechanism includes algorithms, protocols, and rules that define the consensus process. It is a mechanism for blockchain or distributed ledger technology applications. It does not require central authorization to identify and verify specific values or transactions. Consensus mechanisms such as proof of work and proof of rights can reduce the occurrence of counterfeit transactions and facilitate the establishment of transaction verification rules suitable for different application scenarios, thereby striking a balance between efficiency and security. The fourth is smart contracts. A smart contract is a computer agreement. Its essence is a digital contract. It is transmitted, processed and deposited in an information-based way, and its content can be traced and cannot be tampered with. The abundant resources and value on the blockchain enable various contracts to be automatically executed, which not only ensures that the blockchain can effectively perform transaction contracts without the supervision of a central node, but also creates a programmable era based on blockchain transactions.

3. ANALYSIS OF THE IMPACT OF BLOCKCHAIN TECHNOLOGY ON THE ACCOUNTING PROFESSION

Applying the characteristics, types and core technologies of blockchain technology to the management model and management methods of the accounting profession will definitely have an important impact on the development and innovation of the accounting profession

3.1 Impact on the Accounting Information System

The influence and role of accounting information system in the accounting profession is extremely important, and it can effectively improve the management and economic benefits of enterprises. The development of the accounting information

system in the accounting profession has also experienced several important processes from the initial manual bookkeeping to the later mechanized processing, which is gradually replaced by computerized processing, to the current information processing based on the network. Each stage plays an important role in the promotion of the accounting profession. Nowadays, with the rise of blockchain technology and the maturity of application technology, it has become a reality to introduce the characteristics and advantages of blockchain technology into accounting information systems. The core of the blockchain technology is the distributed ledger, that is, a decentralized distributed database. The distributed ledger of the blockchain is consistent with the ledger of the accounting information system, which can completely replace the existing model of the accounting information system. The characteristics of decentralization can change the limitations of the installation and deployment of the accounting information system in the past. It does not rely on a central server or management organization, ensuring that the blockchain system has excellent robustness, and can be collectively maintained and trusted. In practical applications, according to different application scenarios and the needs of the enterprise, the application modes that can be selected are public chain, alliance chain and private chain. If the enterprise is large in scale and scattered, it can choose the application mode of alliance chain. If the enterprise's privacy requirements are high, it can choose the application mode of the private chain. Enterprises with small scale and no privacy requirements can choose the public chain application mode. The choice of application mode should be based on the needs of the enterprise itself, that is, the best choice is the one that suits the enterprise. Utilizing the multi-party consensus mechanism technology of the blockchain to define rules and reach a multi-party consensus according to the accounting rules of the accounting industry can ensure the effectiveness of the accounting processing of the distributed ledger. Using the smart contract technology of the blockchain to restrict the data collection, processing and processing of the ledger can ensure the security and confidentiality of the data.

3.2 Impact on Accounting Data Management

In the accounting profession, accounting work must truthfully reflect the process of business economic activities, and ensure that accounting information and data are true and reliable, complete in content, and accurate in data. In the distributed

ledger system of the blockchain, any participating node will keep a complete record and compose block data in chronological order. The blocks on the same chain pass the mutual verification of the key. After all the records are completed, they must be broadcast on the network, and the entire network nodes obtain the data information of the latest block, making it almost impossible to falsify and tamper with block information, effectively ensuring the authenticity and reliability of accounting data. The double-entry debit and credit bookkeeping method realizes the horizontal connection and trial balance of accounts, and is an error correction mechanism under the concept of two-way bookkeeping [5]. Under the blockchain technology, each node of the data on the chain mutually verifies the accuracy of the data. Through the mutual connection between the nodes, the historical data can be traced and validated, ensuring that the data will not be tampered with and the data can be trusted. The blockchain determines accounting rules through a consensus mechanism, and also attracts all nodes to participate in accounting activities through a reward mechanism, which reduces the situation of incorrect accounting and improves accounting efficiency. The core technology of blockchain technology is de-trustfulness and decentralization [6]. Through its anonymity, the blockchain encrypts all accounting data. It uses a double encryption method of public and private keys to ensure the security of the data, making the data irreversible once recorded, which can prevent theft and tampering of data to the greatest extent, so that the security of data and information has a greater guarantee. Blockchain makes the accounting data cannot be tampered at will after encryption. Every business data record of accounting has a timestamp signature. Through the mutual verification of adjacent data blocks on the chain, the traceability can make the falsification no longer exist, and also make the accounting data highly transparent.

3.3 Impact on the Settlement of Accounting Funds

In the field of accounting business, fund settlement is the core business of an enterprise, and it is also the lifeblood of an enterprise. Fund settlement is divided into cash settlement and non-cash settlement. Cash settlement is more used in the transaction process of small commodities. However, with the development and progress of social technology, cash settlement is gradually replaced by electronic payment, such as Alipay, WeChat and other payment systems. When dealing with bulk commodity transactions, more often the non-cash

settlement is chosen, that is, to complete the recovery through the transfer of financial institutions or the transfer of bills. Similarly, with the advancement of society and the development of technology, financial institutions and high-tech enterprises have introduced electronic payment systems. Electronic payments have gradually replaced traditional payment methods, improving the efficiency of fund settlement and making fund settlement more convenient. Especially when it comes to cross-border settlement, electronic payment greatly improves the calculation efficiency and better guarantees the safety of funds. The above-mentioned fund settlements all rely on third-party trust institutions (financial institutions). Although the efficiency of settlement has improved compared with the previous ones, it is not the most optimal yet. The decentralization and trustlessness of the blockchain, and the fund payment platform based on blockchain technology will make the process of fund settlement in the same region and cross-border settlement in different regions simple and fast. It also makes point-to-point transactions in the blockchain network do not require the intervention of third parties, such as banks, lawyers, etc. In particular, cross-border settlement can greatly improve payment efficiency, and the payment link is clear and transparent, and transactions are more secure. Blockchain technology bypasses third-party financial institutions, direct transactions between peer-to-peer companies, saves transaction costs, and realizes payment and settlement in seconds, which also improves work efficiency, effectively improves the efficiency of capital operation, and reduces the cost of financial operations.

3.4 Impact on Accounting and Financial Audit

Regular financial audits start with the determination of audit objectives, through the formulation of audit plans and the implementation of the audit process, the final audit results and opinions are issued. In the process of financial auditing, the auditor's evidence collection includes the most primitive audit evidence such as accounting vouchers and accounting statements. These evidences include paper-based and non-paper-based (electronic data), and the retrieval and review of paper-based evidence and statistical analysis are heavy and inefficient. The retrieval of non-paper evidence, analysis and statistics, etc. are relatively convenient and efficient, but the occurrence of man-made data tampering, fraud, and fraud cannot be avoided. The above situation has caused the appearance of low efficiency of financial auditing, inaccurate audit results, and

increased audit costs. The characteristics and core technology of the blockchain are applied to financial audits, which can better solve the above problems. First, it is necessary to upload the financial data generated by the accounting to the blockchain distributed ledger. Only the two parties to the transaction can view the details of the data on the blockchain. Then, it will be a must to set up special permission role users on the blockchain, and the users cannot be tampered with and can be tracked. Finally, when conducting financial audit activities, it is a necessity to assign users with special permissions to auditor users to conduct financial audits. By storing financial data in the blockchain system, its own characteristics determine the non-tamperable and traceable data on the chain, and encryption technology ensures the integrity and security of the data. The various characteristics of the blockchain avoid the occurrence of fraud and tampering of financial data for auditing, and also greatly improve the efficiency of auditing and reduce the cost of financial auditing.

4. CONCLUSION

With the rapid development and mature application of blockchain technology in various industries and fields, there will be some shortcomings in blockchain technology in the application process, but the defects cannot belittle virtues. It is believed that with the wide application of blockchain in various business fields and the continuous iterative update of blockchain technology, all aspects of its technology will inevitably become mature and perfect. Blockchain will definitely help the steady development of the accounting profession field, promote the reform and conceptual innovation of the management model and management methods of the accounting profession, and promote the virtuous circle and development of the entire accounting profession

AUTHORS' CONTRIBUTIONS

Xiaoguang Su wrote the manuscript, Yu Xiao contributed significantly to analysis and manuscript preparation, Shaohua Liu contributed to revising and editing.

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