

Application Analysis of Blockchain Technology in Accounting Profession

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Abstract: The application of blockchain technology in the accounting industry has become an inevitable trend. The article mainly adopts a case analysis method to discuss the connection between blockchain and the accounting industry and its impact on the accounting industry, and puts forward corresponding suggestions. Finally, we hope that blockchain technology can fully play a role in the accounting profession.

1. Introduction

In March 2021, the Outline of the Fourteenth Five-Year Plan was included in the chapter of "Accelerating Digital Development and Building a Digital China", blockchain is listed as one of the seven key digital economy industries in the "14th Five-Year Plan", usher in new opportunities for innovation and development. The Guiding Opinions on Accelerating the Application and Industrial Development of Blockchain Technology issued by the Ministry of Industry and Information Technology in June 2021 fully explains the clear development direction and objectives of the blockchain industry in the next five and ten years, and clearly pointed out the key measures for the development of blockchain industry. It can be seen from the spirit of the above relevant policy documents that blockchain is now regarded to be the fifth pillar of the IT revolution, has risen to the national strategy, and has become the key technology of China's "top two" priority development. With the exponential growth of China's blockchain market in the future, rapid accumulation of market capital, the demand for blockchain professionals will increase rapidly, according to an uncompleted statistic, at present, more than 30 universities in China have offered blockchain-related courses.[1]

2. Blockchain Overview

2.1. Basic Theory of Blockchain

The blockchain technology originated from the paper "Bitcoin: a peer-to-peer electronic cash system" published by a geek under the pseudonym "Nakamoto" in 2008, bitcoin adopts blockchain technology, but blockchain is not equal to bitcoin, bitcoin is an application of blockchain technology, as well as other blockchain applications. Narrowly defined as: blockchain is a distributed ledger technology that orderly connects data blocks, at the same time, cryptography is used to ensure its unforgeability and tamper-proof. In short, this technology is a distributed "ledger" based on cryptography, without the control of a third party, data can be safely operated throughout the network. It has the characteristics of decentralization, anti-tamper traceability, privacy security, and high reliability of the system; Its development has gone through four stages: Blockchain 1.0 enables digital cryptocurrency transactions; Blockchain 2.0 uses smart contracts; Blockchain 3.0 extends applications to areas beyond cryptocurrency and finance into government, health care, and supply chains; Blockchain 4.0 is for the joint use of blockchain and AI.[2]

2.2. Application Fields of Blockchain at This Stage

Blockchain technology itself as a new means, it is based on the characteristics of consensus system and distribution, ensure that the content and data of all nodes in the network are true and valid, at the same time, it has achieved full integration of different fields, therefore, the practical application effect in the field of logistics supply chain and finance is very significant.[3]

2.2.1. Financial Field

Blockchain technology actually originated from digital cryptocurrency, it is precisely because of this feature, it has a very close relationship with the financial profession. From the perspective of digital payment, decentralized blockchain technology relies on point-to-point transportation, completely overturned the transaction means carried out with the help of third-party institutions, it has greatly saved economic costs and improved transaction efficiency.[4]

2.2.2. Logistics Supply Chain

At present, blockchain is also widely used in transportation, encryption and other fields, however, considering the large number of nodes in the field of logistics supply chain, so during the actual transportation, the data information generated by different nodes will be hidden in different nodes, thus, data information cannot be shared among nodes. Finally, the overall transmission efficiency of the logistics supply chain is affected by the outside world.

Because the interactivity of blockchain technology itself, so there is correlation between different blocks in the data, will produce a more complete chain, so that relevant members will not be constrained by time and space in the process of obtaining information, so a large number of enterprises related to logistics and supply chain will make full use of blockchain technology in combination with their actual situation and business. With the development of global supply chain, build an integrated supply chain management platform, then realize the smooth interaction between information flow, capital flow and logistics, improve efficiency and control costs.

The following article will analyze how the blockchain technology is applied in the financial field with the help of the operational process of the blockchain supply chain finance case training.

3. Practical Training Analysis of Blockchain Supply Chain Finance Case

3.1. Operation Process of Case Training

Description of business background: Baowen Iron and Steel Co., Ltd. is a large iron and steel enterprise, Baowen Iron and Steel adopts blockchain technology to carry out supply chain finance business, enable first-tier supplier and N-level supplier to obtain low-cost financing through core enterprise credit endorsement.

Jingdong Refractory Co., Ltd. is the first-tier supplier of Baowen Iron and Steel, provide refractory materials to Baowen Iron and Steel. Jingbei Chemical Co., Ltd. is the secondary-level supplier of Baowen Steel, provide chemical raw materials to Jingdong Refractory Co., Ltd. Jingxi Bank is a cooperative financial institution of Baowen Iron and Steel Co., Ltd, provide financing services for enterprises in other supply chains.

The training steps are as follows:

Step 1: Authorize all enterprises and institutions required in the business process to join the alliance chain, financial institutions will operate credit lines for core enterprises.

Select all participating enterprises and institutions, Baowen Iron and Steel Co., Ltd., Jingdong Refractory Co., Ltd., Jingbei Chemical Co., Ltd. and Jingxi Bank authorized them. As a partner, Jingxi Bank provides possible capital services for Baowen Steel to carry out business, it is required to set credit line. According to the investigation and negotiation, the credit line is 1 million yuan, and the credit period is 500 days.

Step 2: Core enterprises sign offline contracts with first-tier suppliers. Baowen Iron and Steel Company needs to purchase a batch of refractory materials, Now, we have signed a procurement contract with Jingdong Refractory Co., Ltd. (a first-tier supplier), which has been cooperating for a

long time, and have completed the signing. Baowen Iron and Steel Co., Ltd. carefully read the contract and seal it at the bottom of the contract to complete the signing operation.

Step 3: Create a new account payable and complete the digital certificate.

The company has signed an offline contract with the first-tier supplier - Jingdong Refractory Co., Ltd. and has received the goods, according to the negotiation, the accounts payable mode is adopted for payment. In the supply chain finance platform, create accounts payable, and the relevant information should be consistent with the signed contract. That is, the amount of accounts payable is 170000 yuan and the accounting period is 100 days.

In order to ensure that the accounts payable bill can be reviewed and passed, it is necessary to enter transaction information and submit transaction proof materials. Namely, the name of the contract is refractory material procurement contract, contract No.: BW201912251396, accounts payable has been successfully created, waiting for review by the company's reviewer; then recheck the created accounts payable as a company reviewer; then generate a hash and link the information.

Receivables transferred from Baowen Iron and Steel Co., Ltd, check relevant information, confirm and sign, the core information can be recorded for subsequent use.

Step 4: Split transfer of accounts receivable.

According to business needs, the company purchases processing raw materials from Jingbei Chemical Co., Ltd, payment method is payable document payment. Therefore, it is necessary to split the account sheet of Baowen Iron and Steel Co., Ltd, it is used to pay for material procurement. The company signed the raw material procurement contract "Refractory Raw Material Procurement Contract" with Jingbei Chemical Co., Ltd, contract No.: JD201912280019, contract amount: 100000 yuan (split accounts payable for payment). The next step is the same as above. The reviewer reviews, generates a hash, and links the information. Received the account receivable from JD Refractory Co., Ltd, the company checks relevant information and signs for it.

Step 5: Apply for financing.

Due to production demand, it is necessary to finance through accounts receivable, Jingdong Refractory Co., Ltd. and Jingbei Chemical Co., Ltd. respectively create financing bills on the supply chain platform, use the switch button at the top left corner of the page to switch identity. The supplier can use the currently valid accounts receivable for financing (discount), apply for financing from financial institutions on the supply chain finance platform. Fill in relevant financing information, the financing amount is less than any amount in the accounts receivable, fill in 50000 yuan here. After JD Refractory Co., Ltd. applies for financing, it waits for the other party to review, generate a hash, and link the information. At this time, the amount of accounts receivable of Baowen Iron and Steel Co., Ltd. was divided into 70000 yuan and 100000 yuan.

Jingbei Chemical Co., Ltd. uses the currently valid accounts receivable for financing (discount), apply for financing from Jingxi Bank, a financial institution on the supply chain finance platform, and fill in 50000 yuan here. Fill in relevant financing information, the contract name is Refractory Raw Material Purchase Contract, and the contract number is JD201912280019, after applying for financing, wait for the other party to review, generate a hash, and link the information.

Step 6: Provide funds and loan.

Jingxi Bank received financing applications from Jingdong Refractory Co., Ltd. and Jingbei Chemical Co., Ltd. and reviewed them, the loan date can be selected today or any time after. Jingxi Bank approved the financing application, Jingdong Refractory Co., Ltd. and Jingbei Chemical Co., Ltd. respectively signed and sealed the application receipt for confirmation. The financing enterprise needs to check the financing contract information and sign the financing contract. The transfer amount between Jingdong Refractory Co., Ltd. and Jingbei Chemical Co., Ltd. is 50000 yuan, and the expiry date is November 3, 2019. The financing application has been signed and confirmed, confirm the loan for financing as Jingxi Bank, then generate a hash and link the information.

Step 7: Repayment due.

The repayment period is approaching, and the company will settle all the arrears, reconcile and confirm in the supply chain platform. This is the end of all operation processes.

3.2. Blockchain Solves the Pain Point of Supply Chain Finance

It can be seen from the above training operation process, the model adopted in this case is accounts receivable financing. In short, in order to obtain more working capital, on the premise of accounts receivable generated by the contract signed between the buyer and the seller, so as to provide the seller with financing business based on accounts receivable, it can fully solve the following problems:

3.2.1. Solve Information Asymmetry

Blockchain technology can fully integrate financial institutions, upstream and downstream enterprises of core enterprises and enterprises with a certain distance from them, so as to realize real information sharing.

3.2.2. Solve Trade Authenticity

The chain structure of blockchain and point-to-point distributed network ensure that data cannot be tampered with, thus ensuring that any node's data can be modified and all nodes can be clear, this shields the possibility that lucky enterprises want to fake data by modifying it. Data shall be synchronized in real time, with clear rights and responsibilities, mutual restriction, mutual supervision and efficient cooperation.

3.2.3. Solve Business Operational Risks

Smart contract plays the role of efficient and accurate automatic operation tool in the implementation of supply chain finance business, thus, the difficulties encountered in the implementation of the contract can be easily solved.

4. Application Analysis of Blockchain in Accounting Profession

4.1. Combination of Blockchain and Accounting Profession

Based on the above case analysis, we can find that blockchain technology is widely used in the financial field, but whether blockchain technology can be fully integrated with the accounting profession, and provide them with a new trust system and maintain the relationship between interest subjects, it will be a hot research topic in the accounting profession in the next few years.[5]

With the advent of the era of big data and artificial intelligence, efficient information processing and refining has gradually become the focus of the development of accounting and auditing, the field of accounting and auditing is also facing a new round of baptism and reshaping of cutting-edge technology. Accounting itself is an information system, which is born, developed and constantly improved with the development of social production and the requirements of economic management. Accounting books have the functions of calculating and supervision, and credit is the foundation of accounting.[6] However, today's credit establishment and maintenance of the accounting system faces many challenges, false or missing data may lead to errors in the account book itself, increase huge audit costs, increase the risk of tax loss, and face high costs in maintaining the system. At the same time, with the rapid development of information technology, the security and privacy of online bookkeeping has become a matter of great concern to the accounting profession, blockchain itself has many characteristics, such as traceability, information tampering and so on, this has a high degree of similarity with the security, confidentiality and tamperability of the accounting profession, therefore, it is highly feasible to fully combine accounting profession with blockchain technology. The combination points are as follows:

4.1.1. Combination of Blockchain Technology and Bank Loans

Distributed ledger technology of blockchain can be combined with bank loan business; the tamper-proof and traceable nature of blockchain greatly reduces the potential risk of asset re-mortgage; the execution of smart contracts can better reveal the details of transactions, such as historical transaction records, historical guarantee value of assets, and asset ownership records. If

the transaction touches the red line set by us in the smart contract, the transaction will be terminated immediately, realize real-time audit of asset mortgage and simpler KYC. Typical representatives are Northern Trust Company and PricewaterhouseCoopers (PwC).

PricewaterhouseCoopers (PwC) is the most active accounting firm for blockchain technology among the big four accounting firms. As early as 2017, it began to accept Bitcoin as its way of serving blockchain companies. The international sector also took blockchain technology as an important audit business in 2018 and invested in Ve Chain currency.

Northern Trust Company released the first commercial implementation plan of blockchain technology for private equity in 2018, this scheme allows a limited number of customers to manage their share of ownership through their distributed ledger technology platform. Northern Trust Company chooses to cooperate with PricewaterhouseCoopers (PwC), PricewaterhouseCoopers (PwC) can have its own blockchain nodes, manage access to relevant fund data, so as to realize real-time audit function. Through a more transparent asset-based trading platform, the efficiency of each node participating in the transaction will be improved.

4.1.2. The Combination of Blockchain Technology and Tax

From the perspective of blockchain technology characteristics, timestamp ensures that the data on the blockchain is a complete, verifiable and traceable data, you can know which time node this data occurred, the data can not be tampered with by means of cryptography. The traceability, decentralization, and tamper-resistance of blockchain, it has unlimited possibilities in the fields of bill identification, quantitative collection and management, and credit rating of tax payers in tax management.

At present, China's electronic invoice has gradually replaced the machine-printed invoice, this also lays a good foundation for the integration of blockchain technology. When all tax information is linked, such as business type, amount, time and other details, it is conducive to the joint management of multiple tax authorities, distributed bookkeeping also ensures the transparency and authenticity of invoices. The blockchain electronic invoice was first launched in Shenzhen in 2018, this also means that blockchain technology will inevitably be applied to the accounting profession in the future development process. [7]

4.2. The Impact of Blockchain on the Accounting Profession

The advantages of blockchain technology applied to the accounting profession mainly include [8]:

1. Distributed bookkeeping and data storage allow multiple people from different geographical locations to participate in transactions, each participant has the same obligations and responsibilities, even if a single person or node has problems, it will not affect the operation of the whole system and greatly improve the fault tolerance of the whole system.

2. Collective participation and supervision provide each participant and node with the same true copy of the account book, the generation and recording of each transaction requires separate review and verification of each node, greatly reduce accounting fraud and error.

3. The asymmetric key and signature of the blockchain can protect the privacy of the account book; the timestamp of the blockchain, like the tracing point on the timeline, extends infinitely to the future and the past, the oldest data can be traced and verified, with the help of blockchain technology itself is tamper-proof, to ensure the accuracy and authenticity of information.

4. Blockchain technology may also overturn the double-entry bookkeeping method we are used to, simplify the two-way bookkeeping habit of debit and credit bookkeeping to a single summary table, just share the account book in the summary table format with all participating nodes.[9]

There are also many challenges [10]:

1. Blockchain technology is not perfect

Although blockchain technology has been fully applied in many fields, however, this core technology still has some shortcomings, and then have a certain impact on the security of data and the accuracy of information, this is also the most troublesome problem for users. At the same time, the technology should not only fully process and improve the data provided by business

departments and financial departments, we should also solve the data of subsidiaries, and fully apply the trade information of the industry to the blockchain, therefore, the workload of blockchain will be greatly increased. However, as a new means, it is difficult to solve such complicated work content.

2. Business rules face challenges

At the present stage, the accounting system of domestic enterprises basically adopts the means of centralized management of information, and then calculate the internal financial information of the enterprise, therefore, under the new means, enterprises often need to use sample information to further evaluate the authenticity and effectiveness of the algorithm, and then fully improve the distributed information system. At the same time, we should also consider the actual demands of accounting quality control, under the premise of ensuring that historical data does not change, reorganize and adjust the original data, this will ensure that the rectified information resources can be fully connected with the distributed requirements with high efficiency and low cost.

3. Lack of professional talents in the industry

With the continuous development of society and economic progress, the accounting field is no longer restricted to traditional statements, calculating and preparation, at the same time, we should also ensure professional judgment and information processing ability. Fully integrate blockchain technology with the accounting profession, It is not only required that professionals in the accounting field should learn more professional knowledge, at the same time, we should fully understand the basic principles of the underlying design of the blockchain, more familiar with business processes, but such talents are very scarce in the market.

4. Relevant laws are not perfect

In recent years, China has given many constructive opinions on the application of blockchain technology, but so far, no authoritative legal documents have been issued. In addition, as the technology itself is a new means, its security and practical application in various fields, the state has not yet issued formal guidance, at the same time, no notice of accounting supervision based on the new distributed bookkeeping model was issued.

5. Suggestions on the Application of Blockchain in the Accounting Profession

5.1. Improve the Relevant Laws and Policies for the Application of Blockchain in the Accounting Profession

At present, the actual application of blockchain technology in the accounting profession is not perfect, it can also be said that it is in the initial stage of development, so the relevant legal documents are not complete, the accounting principles used by enterprises in the past can not fully match them, so from the perspective of the government, the first thing to do is to fully realize the actual cost of blockchain technology in the accounting profession, and issue relevant policies on this basis, ensure that it can be fully practiced in the accounting profession; Secondly, we should constantly improve the relevant legal documents, fully integrate blockchain technology and current accounting standards, clear use standard, ensure that blockchain technology can be fully applied and supervised in the field of enterprise accounting; Finally, establish a reward and punishment system, improve risk prevention awareness, ensure that the accounting behavior based on blockchain can be implemented according to laws.

5.2. Improve the Maturity of Blockchain Technology and Develop the Blockchain Accounting Training Platform

Compared with Internet technology, blockchain technology is not yet mature, in the period of the development of Internet technology, it is inevitable to encounter many attacks from network hackers, after a long time of improvement, the attacks of network hackers have gradually decreased. In the blockchain system, all data is stored on the chain, once attacked by network hackers, then all data on the chain may be illegally stolen, it is obvious that the harm of data loss in the blockchain is much greater than that of Internet technology attacks. Compared with the Internet, protecting the

data in the blockchain system is more important.

In order to achieve high-quality application of technology, the most important thing is to ensure the security and reliability of the internal data of the system, in the application of blockchain technology, the security problem of data storage exists, if you want to achieve the safety and reliability of data, you can't just rely on supervision, more security should depend on the technology itself. At present, the research on the security of blockchain technology is not mature enough, the relevant technical personnel who study the technology should carry out in-depth exploration, grasp the core content of technology and strive to solve the emerging information security problems. Enterprises developing relevant applications should strive to develop blockchain accounting training platform, make full use of the advantages of encouraging technological innovation, actively accept new technologies, conform to the trend of development of the times, explore and pilot various application scenarios while solving technical problems, carry out product development and application test based on the research of business process.

5.3. Add Blockchain Accounting-related Competitions to Cultivate Complex Accounting Talents

Currently in the accounting profession, there are very few talents who are proficient in the knowledge of blockchain technology while possessing the professional theory, with the rapid progress and development of technology, talent is the top priority. Without talents, all technologies can't be talked about, the lack of relevant high-quality compound talents will hinder the in-depth research of blockchain technology. The future blockchain technology can effectively promote the transformation and upgrading of the accounting profession, it is necessary to cultivate more complex high-quality talents with both blockchain theoretical knowledge and accounting theory, accelerate the combination of production, learning and research, accelerate the implementation of technology applications, and let the society benefit from technological advantages.

We can combine technical theory courses with accounting theory courses, encourage students to use new technology to develop new financial systems. Intensify research on application scenarios and vigorously advocate school-enterprise cooperation, actively develop relevant application systems, use relevant systems to add blockchain accounting-related competitions, encourage students to actively participate in such competitions and promote the pilot work of technology, transforming theory into practice. In the process of the pilot project, we can also solve the problems existing in the application of blockchain technology in the accounting profession and repair them in time, establish corresponding solutions, ensure that blockchain technology can be implemented in the accounting profession as soon as possible, vigorously cultivate versatile talents with blockchain technical knowledge and rich experience in the accounting profession.

6. Conclusions

In short, the application of blockchain technology in the accounting industry has become an inevitable trend, this is undoubtedly a huge challenge for the accounting profession, but it is also an opportunity. At the current stage, the application field of blockchain technology is relatively limited and the technology is still immature, it still needs to be improved in the future development process, for enterprises, they should make full use of the advantages and values of blockchain technology itself, cultivate more versatile talents, make blockchain technology play a full role in the accounting profession.

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