

# *Application of Block Chain Technology in Accounting*

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**Abstract:** Since the 21st century, the emergence of technologies such as the Internet, Internet of Things, cloud computing, and big data has driven social upgrading and transformation again and again, and the block chain has been called the fifth industrial revolution. Since 2016, the advantages of the block chain have gradually emerged. The block chain technology has sprouted in many economic segments such as financial technology, investment and wealth management, and fiscal and taxation auditing, especially for accounting. This paper aims to analyze the definition and characteristics of block chain, study the application prospect of block chain in accounting, and the challenges that block chain technology will face in accounting applications.

## **1. Introduction**

In 2008, Satoshi Nakamoto first proposed a new payment transfer system in the paper "Bitcoin: a peer-to-peer electronic cash system". This system has the characteristics of not relying on the central mechanism and completely peer-to-peer. Bitcoin turned out in the world. Today, the block chain, which is the underlying technology of Bitcoin, has gradually become the focus of global attention. In terms of technical research, scholars from various countries compete to publish their views on the block chain and prospects in the famous magazines, forums and other media; In the exploration of applied technologies, financial institutions such as Citibank and Microsoft have actively experimented to explore the diversified application prospects of block chains. In the field of accounting, the enthusiasm for the exploration of block chain has been continuously improved. The accounting firm represented by Deloitte is at the forefront to study how to improve the professional service system by means of block chain technology. This paper aims to study the block chain technology in financial accounting. This paper aims to study the application prospects of block chain technology in the field of financial accounting.

## 2. The Definition and Characteristics of Block Chain

### 2.1. The Definition of Block Chain

The essence of the block chain is like a giant book database, which is a block of blocks formed by a series of data, and these blocks are generated in chronological order. Once the new transaction information is generated, it is quickly recorded as a new block, and the constituent blocks are ordered to form a chain. After the block is created, it can completely record the transaction information that occurred during the period in which it was located, and together with the information recorded on each block, all the transaction information generated by the complete value exchange can be obtained.

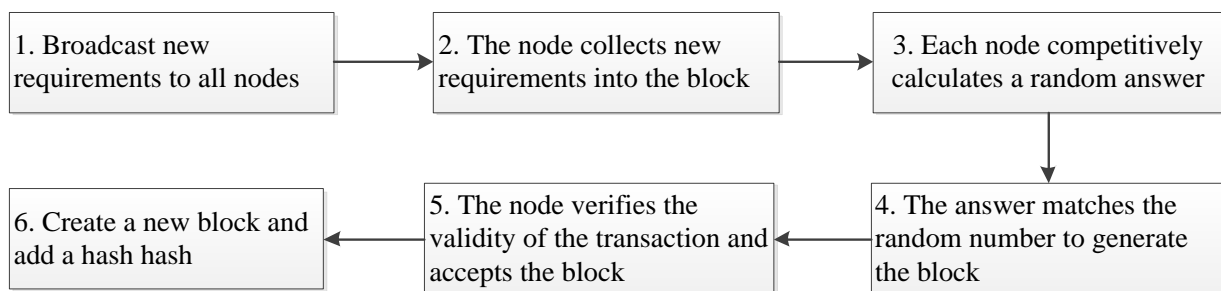


Figure 1: The main process of block chain formation

### 2.2. The Characteristics of Block Chain

#### 2.2.1. Decentralization

The “center” is the key hub of most transactions, and the block chain relies on the core technology of smart contracts to perform point-to-point information transfer, recording and storage directly at each network node, without the need for intermediate institutions or nodes to manage and maintain information. Any node has the same rights and obligations, and its changes will not affect the normal operation of the block chain, nor will it affect the information stored and recorded on the block chain. The shared concept of block chain and unique distributed structure can produce decentralized effects and reduce information asymmetry.

#### 2.2.2. Information is reliable and traceable

Since the block chain is a distributed storage structure, there is no central node being maliciously attacked, which makes the information more stable and reliable. At the same time, the decentralized data storage is not controlled by any center, and the occurrence of transactions is strictly recorded. We can easily find changes in assets and transactions, so block chain technology makes information traceable.

#### 2.2.3. Consensus Trust Mechanism

Block chain technology is a machine based on consensus-based mathematical algorithms to create trust. In the transaction, the participants replaced the centralized credit creation method through technical endorsement, and then realized cooperation. The algorithm of the block chain is used to prove the mechanism. The whole network node is billed, and the real-time broadcast is

performed on the whole network after being processed by the timestamp technology, so that the data is exchanged and verified at each node, and no trust process is required.

#### **2.2.4. Information Cannot Be Tampered**

The block chain is an open way of accounting. In addition to the protection of the private information of the participants, the information in the block chain is open to all. Each node has all the information, and the corresponding public or private key can be accessed through a public interface. The corresponding information and data are queried, so the information in the entire system is open and transparent. At the same time, once the information is verified, it will be stored permanently. Only at least half of the nodes in the whole network can control the information at the same time, but the cost is huge. If you want to tamper with the node information one by one, other nodes will quickly find and maintain it in time. To a certain extent, it is guaranteed that the system information cannot be arbitrarily falsified.

### **3. Application of Block Chain Technology In Accounting**

The application of block chain technology is mainly divided into three levels: one is to carry out simple data storage, the other is to process complex logical data, and the third is to use the block chain to process the operation flow. From the perspective of the accounting profession, these three functions can be reflected in the basic four accounting procedures, namely accounting confirmation, measurement, recording and reporting.

#### **3.1. Confirmation**

If the horizontal linkage and trial balance between accounting accounts are realized through the double-entry bookkeeping method, the block chain technology can continuously trace the history and extend infinitely to the future. Under the two-way accounting concept of accounting, the debit and credit bookkeeping method can play a role in error correction. Similarly, in the application of block chain, there is also a correction mechanism. In the block chain network, each node performs information copying and backup, so the error correction mechanism of the block chain technology is very powerful. In the case that all members of the network are recognized, the accounting elements can be confirmed, thus ensuring the accuracy and consistency of the accounting elements.

#### **3.2. Measurement**

All data information is independently retained in each node under the block chain. The data information of these different time periods are arranged in a chain and are subject to review by all nodes. Block chain technology can make the influencing factors of various measurement attributes more transparent, thus providing more objective and comprehensive information for various measurement attributes. Standardized and standardized accounting information and business process are also accurate and objective. Value measurement provides protection, which makes the accounting fair measurement method more accurate.

#### **3.3. Record**

In the current Internet environment, assets need to be recognized by the central end because the assets in the Internet model exist in the form of simple data and can be freely copied. If there is no central end, some simple facts, such as whether the asset has been traded or not, can not be confirmed, which creates a "double payment" problem. Therefore, in response to this problem, the

general ledger used to reflect the overall change of each accounting subject has the necessity of establishment. In the block chain mode, the transaction information stored in each block is arranged in chronological order, and all transaction information is completely public. Therefore, repetitive transactions will not be recognized by other blocks, thus solving the problem of “double payment”.

All in all, the application of block chain technology has changed the traditional accounting method of the accounting system, decentralized, and the central position of the general ledger has been weakened. All accounting information no longer needs to be verified by the Internet-based server, but all verification work is done by the network. Traceability can track and query its compliance in real time to prevent data information from being tampered with. Reduced accounting errors and fraud, and ensured high-quality information records.

In practice, the introduction of block chain technology can enable the finance department, archives authority, and financial application department to fully participate in the update and maintenance of the accounting electronic files, Thus forming a distributed financial archive network, an inter-departmental financial co-construction and sharing network..

### 3.4. Report

From the perspective of information disclosure, using the advantages of block chain, the company's financial information is changed from active disclosure to automatic disclosure. At the same time, information search is no longer dominated by people, but is dominated by information, customized and distributed for demand subjects. The block chain has greatly improved the traditional, Internet-based approach to information disclosure. Internet information is fragmented and fragmented, and all online users have access to information without paying the associated costs. In the block chain mode, the risk of information asymmetry will be effectively eliminated, because the user can get all the data in the block chain in real time. However, although each block contains all the data information, each user has different functional keys in the accounting program of the block chain, and can only obtain the information of the corresponding block.

In terms of audit work, under traditional accounting, auditors must endorse at the central end in order to obtain comprehensive accounting information. Under the block chain technology, any node can grasp the comprehensive accounting information and identify and reject the wrong accounting information. It can be seen that the application of block chain technology will greatly reduce the workload of auditors or will gradually replace the entire audit work.

Table 1: Block chain technology function and accounting program correspondence table

Accounting procedure	The function of block chain in accounting procedures		
Confirmation	Information traceable and extended	Information can be backed up and corrected	Accurate confirmation of all recognition guarantees
Measurement	Node review	Data flow standardization	Provide comprehensive, objective and accurate information for all types of measurement attributes
Record	Avoid double payment	All recorded information data is completed by the network, distributed management of the master data	
Report	Customize the distribution of "report information" to the main body of the request; The user obtains the "secret key" at zero cost, eliminating information asymmetry		

## 4. Major Challenges and Prospects of Block Chain Technology Applied in Accounting

### 4.1. Major Challenge

The consumption of resources is large. The current accounting informationization adopts centralized processing. The centralized accounting mode makes only one core node, and the accounting information can communicate with each other only in the central organization. The single centralization process makes the artificial energy consumption. drop to lowest. However, with the introduction of block chain technology, the basic idea is to decentralize and involve the whole people. In many global nodes from the value interaction process, as the number of participants increases, it also brings about high energy consumption. The high consumption of electricity and the occupation of network resources will become one of the challenges facing the block chain.

The requirements for accountants are higher. The nature of the accounting work will change. Accounting will not only collect the invoices, but collect and analyze the data of the whole network. Block chain technology will generate a large amount of relevant information, which requires accounting to have a strong ability to deal with analytical problems. Because the nature of block chain technology itself is rapidly recorded and generated on the Internet, it is more traditional than accounting. The processing cycle will be significantly shortened, which means that the personnel required for future accounting positions must have both “high business capability” and “high analytical capability”.

### 4.2. Future Prospects

Block chain technology's security, traceability, non-destructive modification and decentralization will serve many aspects of corporate accounting, providing the most basic financial processing services, while also combining artificial intelligence, intelligent Internet of Things and other technologies. Thereby achieving the landing of accounting and financial scenarios, the intelligentization of financial accounting management and more effective and information processing capabilities. Although there are still many technical limitations and security risks, the "block chain + accounting" can give us an autonomous, credible, efficient and intelligent accounting and financial processing space.

## 5. Conclusion

Every technological revolution brought about by Internet technology is a subversive change in various industries, and it takes a long time to go from germination to maturity. The emergence of block chain technology this time will inevitably have a huge impact on the overall layout of the accounting industry, with opportunities and challenges coexisting. Although the road to accounting change is difficult and long, the overall situation will also spiral upward. The application of accounting to the block chain will gradually be recognized by the public and gradually penetrate into the application of various industries.

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