Distributed Accounting and Blockchain Technology in Financial Accounting

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Abstract. Blockchain management involves all aspects of blockchain, and its ultimate goal is to improve the efficiency of blockchain operations. This research mainly discusses the application of distributed bookkeeping and blockchain technology in financial accounting. Distributed systems require all nodes within the enterprise to upload inventory data to the system regularly. These data can be uploaded only after most nodes in the system confirm that they are correct. Invalid information is filtered to ensure that the data is true, accurate and reliable. By constructing a blockchain-based supply chain system, the integration and reconstruction capabilities of the supply chain can be improved. The information recording of internal data and external related multi-source data in the block can improve the learning ability of the supply chain. With the passage of time, the cost of holding has gradually decreased from 200,000 yuan before the simulation to 80,000 after the simulation. This research helps to encourage companies to form inventory holding quantities that adapt to their own conditions and reduce inventory holding costs.

Keywords: Distributed Bookkeeping, Blockchain Technology, Financial Accounting, Integration Capabilities

1. Introduction
With the networking of supply chain business operations and the development of blockchain e-commerce, blockchain information sharing has become an important means to improve the efficiency of blockchain management, and corresponding research has also become the main issue of current research in the field of blockchain management. Blockchain information sharing refers to a state in which each business entity or business link in the blockchain can share the information of other business entities or business links, the development of information technology and network technology, the informationization of blockchain management and the promotion of network transactions information sharing on the blockchain.

The current blockchain structure has undergone great changes from the earlier blockchain structure [1-2]. The integration and coordination of the blockchain have been greatly improved [3-4]. Blockchain relies on computer networks, and uses e-commerce as its main business activity [5-6]. In the modern blockchain, in addition to the core enterprise, the flexibility of other blockchain business entities to enter and exit the blockchain is greatly improved, which improves the transparency and
sharing of information and the availability of different business content (links) of the blockchain. Selectivity, and at the same time, there is also certain application research progress in the group decision-making of each link of the blockchain business [7-8]. Compared with the traditional single chain structure of the blockchain, the modern supply network chain structure reflects greater complexity. Due to the sharing of network information and the virtual nature of the architecture, the blockchain structure also reflects the variability. It is possible for business entities in each link of the blockchain to dynamically select their counterparties [9-10].

In the blockchain-based supply chain business system, each business entity is not only the provider of information, but also the supervisor of information and the participant of the business. This solves the problem without changing the basic process structure of the supply chain business content. Supply chain information sharing realizes the coordination and management of supply chain business, improves the dynamic capabilities and credit level of the supply chain, and further improves the operating efficiency of the supply chain.

2. Distributed Accounting and Blockchain Technology

2.1 Blockchain

In a blockchain-based supply chain, all supply and demand data of the supply chain can be retrieved in the blockchain, which ensures that the information in the entire operation process of the supply chain cannot be tampered with, and helps to trace the quality of supply chain products. Once a product quality problem is found in a certain part of the supply chain, the production and processing information of the product can be retrieved through the blockchain reversely, and the root cause of the product problem can be found and held accountable. A large number of business entities composed of suppliers, manufacturers, sellers, etc.) can not only issue data evidence of the root causes of problem products, but also choose the business entities of the supply chain based on this.

Set the experimental data set and the number of clusters \( k \), usually use the Euclidean distance method to calculate the distance between the object and the cluster center, the formula is as follows:

\[
D(X_i, C_j) = \sqrt{(X_{i1} - C_{j1})^2 + (X_{i2} - C_{j2})^2 + \ldots + (X_{im} - C_{jm})^2}
\]

If \( D(X_i, C_j) \) meets the following conditions:

\[
D(X_i, C_j) = \min\{D(X_i, C_j)\}
\]

The data object \( X_i \) is put into the \( C_j \) class.

\[
C_j^* = \frac{1}{n} \sum_{i=1}^{n} x_i^j
\]

2.2 Distributed Accounting

The data layer of the distributed accounting module in the log alliance chain contains two types of data: log block and entity data. The entity data is the data that needs to be publicized and verified related to specific system applications implemented in specific scenarios, and is not stored in the blockchain. The database operation log in the log block is mainly used to record the operation content of the entity data in the application by each participating node in the system application. This design is mainly based on the application scenarios of the log alliance chain. In the field of notarization and publicity, the system's demand for write operations is far less than query operations, so the system has a stronger demand for improving query operation efficiency. The log alliance chain not only uses log blocks to record the entity data of specific system applications, but also separates the block data and system
entity data for storage and design, which reduces the log alliance chain's dependence on specific application systems.

3. Financial Accounting Application Experiment

3.1 Comprehensive Application of Information Management

The use of a distributed system to connect all departments of an enterprise and unify the data format of each department can promote the free flow of data in the system. Distributed systems require all nodes within the enterprise to upload inventory data to the system regularly. These data can be uploaded only after most nodes in the system confirm that they are correct. Invalid information is filtered to ensure that the data is true, accurate and reliable.

3.2 Improve the Information Collection and Analysis Mechanism

By building a blockchain-based supply chain system, the integration and reconstruction capabilities of the supply chain can be improved. The information recording of internal data and external related multi-source data in the supply chain can improve the learning ability of the supply chain. The internal and external information block link of the system is the further integration and reconstruction of the supply chain information resources in the block chain system. Table 1 shows the company's inventory backlog from 2018 to 2020.

Table 1. Inventory of enterprises from 2018 to 2020

| Project                        | 2018    | 2019    | 2020    |
|--------------------------------|---------|---------|---------|
| Inventory (ten thousand yuan)  | 405108  | 457858  | 520123  |
| Among them, overstock (ten thousand yuan) | 12136   | 10935   | 9832    |
| Overstock to inventory ratio (%) | 3.00%   | 2.39%   | 1.89%   |
| Inventory days (days)           | 186     | 166     | 148     |
| Industry average inventory turnaround days (days) | 139     | 150     | 159     |

4. Financial Accounting

4.1 Enterprise Inventory Input Analysis

Table 2. Enterprise inventory input

| Project                        | 2018    | 2019    | 2020    | Average growth rate (%) |
|--------------------------------|---------|---------|---------|-------------------------|
| Inventory (ten thousand yuan)  | 365213  | 347994  | 387675  | 11.42%                  |
| Including: overstock inventory (ten thousand yuan) | 12136   | 10935   | 9832    | -9.56%                  |
| Overstock to inventory ratio (%) | 3.00%   | 2.39%   | 1.89%   | 2.24%                   |
| Gross Profit (ten thousand Yuan) | 36335   | 35516   | 49755   | 7.38%                   |
| Enterprise (%)                  | 4.89%   | 4.49%   | 5.02%   | -15.31%                 |
| Industry Average (%)            | 13.44%  | 15.55%  | 14.74%  | 1.48%                   |

Enterprise inventory input is shown in Table 2. It can be seen from Table 2 that in the past five years, in order to meet the increasing demand, companies have gradually expanded production and continuously increased their investment in inventory, so that the average growth rate of inventory reached 1142%, while accelerating the production cycle and reducing the proportion of overstocked inventory. Gross profit grew steadily, with an average growth rate of 7.38%. However, comparing the company's gross profit margin with the industry average, it can be found that the company's gross profit margin is much lower than the industry average, indicating that the company's inventory cost control is inefficient and the inventory utilization rate is low. The management does not realize that the increase in inventory costs will reduce the company. Therefore, for company, it should promote the transformation of the concept of inventory cost control activities from controlling costs to creating
profits. The average inventory of Company A in 2018 was 3.678.35 million yuan. Calculated based on the benchmark one-year loan interest rate of 6.31% in the same period, the value of lost funds in one year was 232 million yuan. Calculated based on the benchmark one-year deposit interest rate of 1.50% in the same period, the value of lost funds in one year At 3.48 million yuan, if the company can make better use of the inventory, it will greatly reduce the cost of the company and increase its profitability.

4.2 Enterprise Inventory Cost Control
The change trend of the total cost of enterprise inventory is shown in Figure 1, and the corresponding graph is displayed under the name of the inventory cost. It can be found that affected by multiple factors, the total inventory cost reached its peak on the 64th day, and finally stabilized at around 650,000 yuan. The transportation cost, which accounts for a relatively high proportion of the total inventory cost, reached its peak on the 62nd day and finally remained at the level of 500,000. The next largest inventory holding cost reached its lowest value on the 47th day, and finally remained at 150,000 yuan. The out-of-stock cost, which accounts for the lowest proportion of the total inventory cost, reached its highest value on the 49th day and fluctuated around 200 yuan after a period of fluctuation. The out-of-stock cost and transportation cost are 0 yuan within 29 days, indicating that the company has been using existing inventory for production during these 29 days and has not placed orders. With the advancement of production, survival continues to be consumed, resulting in shortages. Enterprises immediately place orders to replenish inventory, which leads to fluctuations in various costs of inventory, and finally stabilizes with the advancement of production. It can be seen from the figure that the change trend of opportunity cost is similar to the total cost of inventory. Opportunity cost will reach its lowest point on the 48th day, and will remain at 60,000 yuan. The operating cost rose to the highest point on the 70th day, and finally stabilized at 50,000 yuan. The risk cost accounted for a relatively high proportion at the beginning of the simulation, but it was reduced to a minimum on the 51st day, and remained around 30,000 yuan thereafter.

4.3 Trends in the Total Cost of Corporate Inventory
The comparison of simulation results before and after the implementation of the management means is shown in Figure 2. Due to the use of distributed accounting technology to establish a distributed system, the company's inventory-related information flows more smoothly between the company's internal and external, and the company's internal inventory usage can be shared among various departments. In addition, the distributed system can predict future usage based on the data of each professional factory's inventory consumption at any time, and place an order with the supplier. The supplier can quickly receive the order and carry out production. The professional factory can adjust at any time according to the status of the supplier, prompting the enterprise The inventory is in a stable
state. Due to the improvement of the efficiency of information transmission between enterprises, the time for enterprises to receive goods from suppliers will speed up, while taking into account various factors affecting supplier delivery, and combining the changes in the company's external environment, the company will receive goods from suppliers. The delivery delay time of the goods is changed to obey the normal distribution of Random Normal (1, 10, 5, 3, 0). The total cost of inventory has fallen. It can be seen from Figure 2 that after analyzing distributed accounting technology, it can speed up the flow of information between enterprises and suppliers, improve delivery delay time, and perform simulations. It is found that the total cost of inventory is significantly compared with the original. The reduction, and always staying at around 200,000, shows that the use of distributed accounting technology can speed up the flow of information and improve the delivery delay time, while reducing the total cost of the company's inventory, so as to achieve the purpose of controlling inventory costs and increasing the use of inventory by the company's efficiency. Transportation costs have fallen. Observing the transportation cost, which accounts for a relatively high proportion of the total inventory cost, we can find that the transportation cost after simulation has been greatly reduced, indicating that after the use of distributed accounting technology, the internal and external information flow of the enterprise is more smooth, and the future of the enterprise is constantly predicted through the system. The order quantity and adjustment can make the inventory purchase quantity match the production schedule of the enterprise higher, reduce the possibility of the enterprise purchasing excessive inventory, thereby reducing the transportation cost. Inventory holding costs have fallen. The inventory holding cost was relatively high at the beginning of the simulation, but over time, the holding cost gradually decreased from 200,000 yuan before the simulation to 80,000 after the simulation, indicating that distributed accounting technology can promote inventory information between enterprises. The flow of inventory improves the situation of enterprises holding inventories, prompts enterprises to form inventory holding quantities that adapt to their own conditions, and reduce inventory holding costs. Although the improved out-of-stock cost fluctuates slightly, it finally stabilized, and compared with the original, it only increased by at most 200 yuan. The amount is small and the proportion is small. Therefore, only the slightly higher out-of-stock cost does not affect the simulation. The total effect.

Figure 2. Simulation results before and after the implementation of management methods

5. Conclusion
The fusion and mutual promotion between the real economy and the capital market make my country's securities market gradually develop, and the corresponding regulatory system has also been well developed. Due to the need for fast and efficient communication, the ability to apply the timely production system on a large scale benefits from the development of the ERP system. ERP system can not only strengthen the construction of enterprise information management, but also help enterprises
optimize inventory and resource allocation. Its most notable feature is that it can provide solutions in different situations according to the characteristics of the enterprise.

For our country, the prospects of blockchain technology in the accounting industry and the disruptive impact it can produce are huge. The four major institutes have conducted a series of explorations on the application of blockchain technology to auditing business, and have also achieved corresponding results. These new achievements have a far-reaching impact on regulating the healthy development of listed companies in our country, especially for the financial fraud of listed companies.

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