

# *Inter-Organizational Management Accounting Innovation Embedded in Blockchain*

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**Keywords:** Blockchain cross-organizational management accounting innovation

**Abstract:** With the intensification of economic globalization and the rapid development of emerging technologies, companies are paying more and more attention to cross-organizational business relationships. The externalities of corporate behavior continue to increase, and the relationship between specific organizations such as strategic alliances, joint ventures, and industrial communities continues to emerge. The object of cross-organizational management accounting shifts from internal activities to inter-enterprise activities, serving the value creation and competition across the organization as a whole. Force shaping. As a kind of universal underlying technology framework, blockchain embedded in cross-organizational management accounting will have great potential to rely on a large distributed information network. This paper proposes that cross-organization management accounting innovation embedded in blockchain includes four aspects: main structure and institutional arrangement, cost co-management of embedded blockchain, forecasting and decision-making analysis, and performance evaluation of inter-organizational cooperation.

## 1. Introduction

Currently, there are three types of blockchain technologies depending on the development object. (1) The public chain, that is, completely decentralized, completely transparent, without permission, nodes can join or withdraw at will, and anyone can read information and block the block of transactions. For example, basic business such as production, sales, and performance evaluation in enterprise management accounting can apply the public chain. (2) The alliance chain, that is, partial decentralization, has certain permission settings, is open to a specific organization, and is applicable to a blockchain in which multiple member roles participate together and share accounts. For example, a strategic alliance between a limited number of participants in enterprise management accounting can apply a coalition chain. (3) Private chain, that is, centralized control, requires identity authentication and permission setting, and is only open to individual entities, and is only used in the blockchain inside the organization. For example, deep-seated business such as internal audit and strategic decision-making in enterprise management accounting can apply the private chain. In contrast, the openness of the public chain is stronger, the data is completely transparent, and the user rights can be better protected; the alliance chain is controlled by multiple centers, each node corresponds to an entity, and the work is coordinated based on the consensus mechanism. The

transaction needs to be decided internally by the alliance; the private chain requires only a small number of nodes for verification, the transaction speed is fast, and the transaction cost is low [1].

## 2. Specific Practices of Chinese Enterprises Based on Blockchain Technology

Emerging technologies must empower the real economy to create value. As a major technological innovation, blockchain continues to move from theory to practice, focusing on its distributed architecture, decentralization, trust, and arbitrarily tampering, to explore real-world application scenarios. In recent years, the development of the network and the advancement of science and technology continue to promote industrial upgrading. All walks of life in China have begun to explore innovative practices embedded in blockchains, and continue to take practical steps in the field of blockchain applications. For example, Sinochem Group has realized international trade in petroleum based on blockchain. In December 2017, Sinochem Group's Energy Internet Group applied blockchain technology based on digital bill of lading and smart contracts, which is characterized by transparency, efficiency, security and stability, to complete crude oil import business from the Middle East to China. This China's first blockchain crude oil import transaction successfully achieved a substantial increase in transaction execution efficiency and effective savings in transaction financing costs. In March 2018, Sinochem Energy Technology Co., Ltd., a subsidiary of Sinochem Corporation, applied blockchain technology to complete the gasoline export business from Quanzhou, China to Singapore. The world's first blockchain project involving government departments not only broke through the scene of the oil trade blockchain, but also was the first in the world to cover the application of multiple parties in the blockchain process. Participating entities include subsidiaries of Sinochem Group, China Inspection and Certification Group, Customs, Banks, Shipowners and Freight Forwarders. Sinochem Group has carried out crude oil import business and refined oil export trading based on blockchain technology twice, which marks the deep application of Sinochem Group in the field of blockchain technology and the embedded blockchain in the field of energy and chemical import and export trade. Successful inspection. It is worth noting that the multi-participation of cross-border transactions, especially the participation of customs in the blockchain network, has further improved time efficiency and transaction execution efficiency. The digital process of cross-border transactions, especially the digital information recording and circulation of various contracts, orders, bills, exchanges, supervision, etc., relies on the blockchain network that cannot be falsified and forged, further improving the various links. Efficiency and safety [2].

Similar to the above blockchain application case, at least two aspects of the signal are passed. First, blockchain technology is a new type of Internet technology in the era of big data. It reflects a new "distributed" idea, which will bring unique technical support to the operation and management of enterprises, and reconstruct the value circulation chain for enterprises. In turn, the simultaneous transmission of information and value plays a key role. Second, enterprise management accounting often mentioned in the theoretical circle often focuses on management activities within the organization. Under the influence of blockchain and inter-organizational relationships, the definition boundaries are increasingly blurred, and the too connotative concept connotation is not conducive to management practice. . Therefore, the theory and practice of enterprise cross-organizational management accounting must consider the challenges and changes brought by blockchain technology.

### **3. Key Points of Cross-Organizational Management Accounting Innovation Embedded in Blockchain**

#### **3.1. Main Structure and Institutional Arrangements**

Institutional arrangements between organizations are the basis for ensuring orderly transactions between organizational entities. The basic feature of cross-organizational relationships is that there is a trust relationship between organizations, and the realization of this trust relationship will be greatly guaranteed in the blockchain network. Signing formal contracts is often the necessary way to manage and control cross-organizational relationships, that is, to reduce excessive competition and promote inter-organizational cooperation through institutional arrangements. Smart contracts are in the form of an embedded programmatic contract and are the core components of the blockchain. It is a computer protocol that negotiates, verifies, and executes digitally, and is an effective trust mechanism for cross-organizational control of embedded blockchains. Smart contracts can provide an effective tool for pre-management between the various entities across the organization by defining the roles and responsibilities of the parties and providing enforcement methods to achieve efficient peer-to-peer transactions and value transfer. Trust mechanism and guarantee the communication of information between organizations play a certain role. Smart contracts can ensure that currency payment behavior or asset transfer behaviors are automatically executed when triggering pre-set conditions. Therefore, the refined oil import and export business of Sino-Singapore involving multi-party transactions in the supply chain can utilize the intelligence of blockchain. The contract function realizes the automatic execution of the transaction and the dissemination of the contract content, backup and accounting, realizes the automatic payment behavior when the goods are delivered, and realizes the real-time follow-up of the logistics information of the whole link [3].

#### **3.2. Cost Co-Management of Embedded Blockchain**

In the past, management accounting usually only paid attention to quantifiable cost drivers for cost management, but the advancement of cross-organizational cooperation and product complexity continued to indicate the externalization of information required for cost management. Traditional accounting digital information such as cost, budget, profit, etc. can no longer meet the cost refinement and precise control. The broader information such as product technical characteristics, customer demand, and response agility has become the new pursuit of inter-organizational management accounting information system. The systems and methods of cost management must adapt to the changes in the social environment and the development of science and technology. Inter-organizational cost management, as a cross-organizational boundary cost-based collaborative management activity based on different organizational coordination and cooperation, exists in the form of independent blocks between the organizational entities after embedding the underlying support technology of the blockchain. Easier to coordinate the supply chain or value chain.

Activities, in turn, expand the cost management of a single enterprise to the various transaction entities of the business, and implement the planning and control of individual costs, so that the overall cost of the supply chain is minimized. In fact, cost co-management of embedded blockchains is more manifested as a chain of cost management. It can be clearly reflected in the supply chain or value chain, presenting the flow and distribution of the total cost of a business or transaction between the various participating entities. The information sharing of each participating entity in the blockchain network can also reduce the cost to a certain extent, and the increase of information exchange between the organizations can effectively reduce the time cost and transaction cost, and achieve effective cost coordinated management.

## 4. Conclusions

Firstly, the application of cross-organizational relationships to management accounting practices requires consideration of the challenges and changes brought about by blockchain technology. At present, China has applied corresponding field applications based on blockchain technology, such as Sinochem's petroleum international trade based on blockchain and Sichuan Changhong's cross-platform interconnection scheme based on blockchain.

Secondly, in the inter-organizational management accounting of embedded blockchain, the traditional organizational boundaries are broken, the multi-agent business transaction model will become the mainstream, and the trust mechanism based on smart contracts becomes the new institutional arrangement.

Thirdly, cost co-management of embedded blockchain will eliminate non-value-added operations to a certain extent, effectively reducing time and transaction costs.

## Acknowledgements

This article was specially funded by Dalian University's 2019 Ph.D. Startup Fund (20182QL001) and 2019 Jinpu New District Science and Technology Project.

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