The Influence of Block Chain Technology on Cost Management

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Abstract. Block chain technology can bring innovation and change to the cost management of enterprises, help enterprises to establish a “decentralized” cost management information system, optimize various types of costs and enhance enterprise value. After reviewing the research on cost management under block chain technology, this paper explores the impact of block chain technology on enterprise cost management, and discusses the impact of block chain technology on cost and its structure, cost management mode, method, prediction, control, accounting report, assessment and evaluation. Although the application of block chain technology is not mature at present, its development prospects can greatly improve the accuracy and breadth of enterprise cost management, but also can promote the comprehensive ability of financial personnel.

Introduction

With the deepening of economic globalization, the enterprises are facing competitive environment which is becoming more and more complex. If enterprises want to achieve sustainable development in the fierce competitive environment, they must make corresponding innovations in cost management with the change of internal and external environment. Cost management helps enterprises to solve how to utilize the relevant costs. It is conducive to the effective allocation of resources, the optimization of resources utilization and the maximization of enterprise value. With the rapid development of information technology, Internet, Internet of things, big data and block chain technology burst out constantly. Advanced information technology has become the main technical methods to promote enterprise management and development. However, the traditional organizational structure is around the "centralization" to operate, the transaction costs, trust costs, search costs, supervision costs are increasing with the importance of data information. The emergence of block chain technology makes it possible to change the existing cost management mode, methods, control, accounting reports, assessment and evaluation, and also helps enterprises to establish a decentralized cost management information system. In order to adapt to the globalization of technological innovation and economic development, this paper applies block chain technology to the cost management of enterprises, and analyzes the impact of block chain technology on various aspects of enterprise cost management.

The Summary of the Research on Cost Management under Block Chain Technology

Block chain is a new application mode of computer technology, such as distributed data storage, consensus mechanism, point-to-point transmission, encryption algorithm and so on. Block chain technology has the characteristics of de-centralization, de-trust, transparency, timing, traceability and security. It can effectively reduce various costs when it is applied to finance, audit, tax and other fields.

From the perspective of decentralization, we can bypass the original intermediary links, reduce transaction costs, accounting and clearing costs, issuance costs, operating costs and so on. Tong Maodi (2018) said that the distributed bookkeeping constructed by block chain technology can reduce distrust of intermediate links. In the financial sector, decentralization can reduce transaction costs and audit and liquidation costs. In the field of digital money, the issue cost of digital money...
can be reduced. In establishing the standard of fund transfer, the influence of intermediary payment is reduced, and the operation cost is reduced [1, 2]. In addition, due to the "de-centralized" feature, data storage in various fields does not require a central server, saving the corresponding hardware acquisition costs, installation costs, and saving the site costs and server operator training costs [3,4]. Xu Jinye and Lumeijing (2017) also show the de-centralization characteristics of block chain technology, reducing the need for centralized cloud data storage capacity, saving the corresponding site costs, hardware acquisition and installation costs, and personnel training costs[5]. Sun Yuefan (2018) believes that the decentralization of block chains reduces the pressure on the construction of internal systems, saves the cost of system maintenance and optimization, improves the security of data, and reduces the cost of data storage [6].

From the perspective of de-trust characteristics, block chain technology reduces the cost of building trust and contract costs. Cai Lixin (2017) said block chain technology made trust between different organizations and reduced the cost of trust. The integrity, reliability and authenticity of the transaction data can be verified among the agents that are familiar with the rules of the block chain system to ensure that the recorded data on the chain are authentic and reduce the related trust costs[7]. Xu Ruoyu (2017) also believes that block chain technology will promote the establishment of our credit mechanism, contribute to a good business environment and financial environment, so that inter-organizational transactions have lower costs[8]. According to the de-trust feature, block chain technology can establish smart contracts and establish self-executing agreements, which greatly reduces the cost of contract management and implementation, and reduces the cost of arbitration due to contractual loss of trust [9,10].

From the perspective of transparency characteristics, block chain technology reduces the cost of searching and acquiring information for organizations. Block chain technology allows nodes at different locations to simultaneously share a transaction database. Block chain technology not only realizes the transparency and openness of data, but also ensures the accuracy and security of data information, which reduces transaction costs and potential financial risks to a certain extent [11]. Zhong Wei and Jia Yingzi (2016) believes that since the transaction data will be synchronized with other nodes, each node has comprehensive information, provides data transparency, and reduces the search cost and acquisition cost of the information[12]. Xu Jinye and Xia Fan (2017) also indicated that the search cost was reduced by reducing the dependence on intermediaries by accessing the Block Chain system for business information [13].

From the perspective of non-traceability, it can reduce the financial cost of the organization and save the financial supervision and audit costs of the enterprise. The time stamp is a major feature of the block chain. The system will reflect the generated time for the processed information, which is equivalent to adding the time stamp. The timestamp is a proof of the existence of the transaction record, providing convenience for process optimization, cost management, etc. [14]. The chain structure can make any data traced back to the source. Under the block chain technology, the false information on any node will be rejected by all nodes, thus replacing the management level and reducing the financial cost [15]. Sun Yuefan et al. (2017) believe that time stamping technology enables block information to be checked and verified in time order, and the data information marked with time stamp has traceability function, effectively preventing information records from being tampered with or forged, as well as saving the cost of accounting supervision and audit for enterprises[16].

From the perspective of security characteristics, block chain can reduce the cost of social credit and post-audit audit costs. Xian Jingchen (2017) believes that the information of electronic credit information based on block chain technology cannot be falsified, which helps to realize the sharing of credit information, enhances the credibility of social credit reporting systems, and reduces the cost of credit reporting[17]. Guo Yongzhen (2017) said that the distributed account book system can monitor the inflow and outflow of funds in real time, prevent financial risks, and reduce post-audit costs. In addition, because the block chain technology can eliminate the cumbersome transaction process of the intermediary and shorten the transaction time. In the enterprise's risk management system, the distributed book characteristics and non-temperable features of the block chain technology can minimize the labor costs and maintenance costs [18, 19].
As can be seen from these characteristics, block chain technology can help reduce the cost of the enterprise. If the block chain technology is integrated into the cost management of the enterprise, it can not only improve the operational efficiency of the enterprise, but also reduce the transaction cost, credit cost, operation cost, search cost, contract cost, etc., and ensure the transparency and security of the operation. It also helps to realize information sharing. Sharing finance can enable enterprises to save labor costs, realize efficient, fast, accurate and safe information management processes and improve management efficiency [20]. When Yu Hongyan (2017) talked about how to build a cost management and control system for platform-based enterprises, he believed that the core of platformization is “user-centered”, and the platform of the platform-based service ecosystem is provided through the “de-intermediate” platform. The production and sales parties directly connect, share data information, and simplify the value chain process [21].

It can be seen from the above that the applications of block chain technology in various fields that can help to further reduce the cost of the organization, improve the analysis quality, prediction effect and operational efficiency of the data information, and optimize the resource allocation of the organization's talents. However, the above perspective of cost reduction is not systematic enough, if the block chain technology and cost management can be fully integrated, it will help to optimize the overall cost of the organization.

The Impact of Block Chain Technology on Enterprise Cost Management

The Impact of Bock Chain on Cost and Structure

Each scholar has a different understanding of cost. Generally speaking, it can be understood as the value of giving up or sacrificing in order to achieve a specific purpose, which can be measured in money. With the development of society, economy, science and technology, the connotation of the concept of cost is expanding. It can be understood and classified from multi-disciplinary, multi-level and multi-field. If we understand cost in the broadest sense, Zhang Wuchang thinks that after deducting the cost of material production process, the rest is the cost incurred in the process of contract and organization, that is transaction cost.

Taking the financial industry as an example, the customer information of the financial industry is very important. Anti-money laundering, anti-terrorism financing and anti-proliferation financing are also important responsibilities of financial institutions such as banks. In order to strengthen the relevant security of the credit system, financial institutions continue to invest funds, which is a huge amount of money. The decentralization of block chain technology can greatly reduce the cost that enterprises must spend for customer data security issues and security issues of credit reporting systems. If the decentralization of the block chain is used, Distributed Accounting and collective data maintenance can minimize the maintenance cost and labor costs of the financial security system. From the perspective of enterprise cost management, the actual operation cost and financial cost of the enterprise are reduced, the cost management information system of the enterprise is optimized, and the management efficiency of the enterprise is improved. From the perspective of cost accounting, the proportion of transaction costs that are difficult to calculate will decrease with the mature application of block chain technology, and the accounting of material production costs can be more transparent and accurate.

The Impact of Block Chain Technology on Cost Management

The Impact of Cost Management Mode. Cost management is the core content of modern enterprise management, which plays a vital role in the survival and development of enterprises. This paper will take the value chain cost management model as an example to explore the impact of block chain technology on the cost management model. The value chain first appeared in the book Competition and Advantage that was written by Michael Porter who was a professor at Harvard University. The value chain can be divided into internal value chain, vertical value chain and horizontal value chain. There are three types of block chains, public chain, alliance chain and private chain. Public chain: completely decentralized, represented by bit coin. Alliance chain: Partial
decentralization/multi-centralization, applicable to organizations, alliances or industry chains composed of multiple entities. Private chain: fully centralized, the central authority controls the write permissions, and selectively develops read access. Enterprises in the context of block chain technology can further expand the boundaries of the organization. In the value chain cost management mode, the internal value chain of the enterprise includes the basic activities and related supporting activities for the enterprise to create value for the customer. The enterprise can set up a private chain to manage the cost information of the enterprise. The horizontal value chain management analyzes the value movement process of similar products among different producers by comprehensively considering the current and potential competitors of the enterprise in order to obtain a favorable competitive advantage. Vertical value chain is an enterprise to expand the value chain up and down, up to the supplier of raw materials, down to the end product customers, users. The alliance chain can regard the enterprise, supplier and customer as a whole. Enterprises can manage the vertical and horizontal costs of enterprises by setting up alliance chains. Members in the alliance chain can trade directly with the upstream and downstream enterprises in the supply chain. Relevant transaction data will be recorded in the block chain information platform. Each block node is stored and data information can be shared. It is not only convenient for system members to view at any time, but also provides real and reliable data support for cost management decisions. At the same time, block chain technology has a set of logical and rigorous encryption technology to ensure the safety and standardization of the operation process, breaking the national and regional constraints, effectively eliminating the currency and cultural barriers faced in the transaction between different countries and organizations. In this way, not only will enterprises further broaden their own boundaries, but also reduce the cost of the supply chain. And with the help of consensus algorithm and intelligent contract technology, block chain technology can effectively solve the trust problem between enterprises, prevent the risk of performance, and improve the efficiency of performance.

The Impact on Cost Management Methods. The cost management method is a method principle that is mainly applied to the business process and has relatively independent normative objects [22]. The cost management method includes a lot of content, and its core content is activity-based costing, standard cost management, target cost management, and liability costing. The following is an example of the activity cost management method to discuss the impact of block chain technology on the activity cost management method. The principle of activity-based costing management is that products consume activities, activities consume resources, and one activity transfers to another. At the same time, along with the transfer of value, the final product is the set of all activities, but also the value of all activities. When applying block chain technology to activity-based costing management, each block in the chain can be regarded as an activity center of an enterprise. The successive establishment of each block is equivalent to the transfer of one job activity to another. The formation of each block records all the data of the job activity, and finally forms a complete job chain. Activity-based costing management based on block chain technology can accurately analyze the origin and development of enterprise cost. The application of cost analysis method of management accounting can not only analyze the data structure, but also face the analysis before, during and after the event. Cost information will be more valuable, and will also help improve the effectiveness and efficiency of corporate decision-making.

The Impact on Cost Forecast. Cost forecasting can make a scientific estimate of the future cost level and its changing trend. Cost forecasting helps to reduce the possibility of blind decision-making, and makes it easy for managers to choose the best scheme and make correct decisions. In the current environment of advanced information technology, the role of large data on various industries is beyond doubt. To condense the complex data can help enterprises to formulate personalized, specialized and refined development strategy, and provide more accurate cost forecasting for enterprises. However, the data systems of enterprises are now distributed in a centralized manner. Enterprises will spend a lot of time and cost in collating, collecting and retrieving. In view of the contribution of big data to economic development and the technical characteristics of block chain, the combination of large data, block chain and cost management information system can not only preserve large data but also preserve large data. The advantages of
data in cost forecasting can also add the following advantages: First, it can effectively solve the problem of centralization of cost management information systems. Second, the privacy of cost information can be guaranteed. Third, the block chain system has a strong safety factor and ensures cost information security. With these advantages of block chain technology, it can play a more effective role in enterprise cost management, and make the cost forecast more accurate.

**The Impact of Cost Control.** In the process of cost control, enterprises should not only control the amount of cost which can be calculated by accounting, but also control the cost which cannot be accurately calculated by the organization and the cost management of the enterprise. The value of transforming enterprise cost management into a series of rules, conventions and procedures lies in the effective reduction of related supervision costs, information acquisition costs, organizational system costs and costs caused by uncertainty. In the advanced information technology environment, the organizational level of enterprises is gradually decreasing, and the organizational system model is more important than the accounting measurement model [23]. The systematic arrangement of cost management, together with hierarchical decomposition and decentralized management, will improve the relevance and accuracy of cost information provided by cost management, reduce the cost of supporting information, and also be conducive to enterprise cost analysis and decision-making.

In the context of block chain technology, cost management, decentralization and collective maintenance can make the application of hierarchical decomposition and decentralization to the extreme. Decentralized and collectively maintained cost management enables each node to have autonomy, and changes the position of the right center of the enterprise organization. It will make cost control more efficient, more reasonable, more accurate, and make the cost information obtained more relevant. In addition, the block chain uses asymmetric cryptography to ensure unchangeable data modification. The application of time-stamped timestamps enables traceability of transaction data. These three features can effectively solve the problem of cost data sharing and security and easy retrieval. Open and transparent transaction data enables the entire cost management system to provide a coherent and comprehensive flow of information. Anti-mite modification improves control over cost management, and traceability enables companies to detect defects in past cost management controls in a timely manner.

**The Impact of Cost Accounting and Reporting.** Cost accounting is an important part of enterprise cost management. Whether the cost accounting is correct, it directly affects the cost prediction, control, reporting, evaluation and other control work of the enterprise, but also has a significant impact on the correct cost decision-making and management decision-making of the enterprise. When undertaking cost accounting, enterprises will work out relevant cost accounting system. Cost accounting system is mainly used in a series of processes such as cost confirmation, collection, distribution and calculation. The purpose is to reduce the randomness of cost accounting and improve the authenticity of cost information.

Based on the block chain technology enterprise cost accounting, first of all, the block chain has superior error correction capability, the enterprise cost information will be backed up at each node, making the cost traceability, ensuring the cost confirmation of the enterprise, making the accuracy and reliability of the cost data has been unanimously recognized. Secondly, the collection and distribution of costs can use the block chain technology to collect and allocate the cost of the organization according to the object activities of the enterprise, and then accurately calculate the cost of the enterprise and the expenses in various business processes.
In terms of information reporting, the block chain technology can obtain different levels of cost information reports of enterprises according to different levels of public chain, alliance chain and private chain. The cost report will be automatically obtained from the original active acquisition, and the user can obtain it in real time. All the data in the cost management information system eliminates the risk caused by information asymmetry. In addition, since cost information has been "identified" at each node of the block chain, the quality of cost information will also be improved, reducing the possibility of obtaining false cost information, and improving the value of cost reporting.

**The Impact of Cost Assessment and Evaluation.** In the context of block chain technology, cost management, decentralization and collective maintenance make cost information more accurate, more fair and more relevant. After obtaining the relevant cost management information, its assessment and evaluation is an important means and measures to achieve cost management. Strict examination and evaluation system, the role of cost management cannot be measured. Therefore, it is necessary to establish and improve the cost assessment index system, set up the corresponding assessment, evaluation levels and terms. Activity records of each node will be automatically classified, corresponding to the relevant assessment, evaluation dimensions, the system will be compared with the initial set of standards to ensure that the assessment, evaluation of transparency and fairness. Enterprises should set up effective and reasonable evaluation index of cost management, periodically assess and evaluate the cost responsibility subjects, establish corresponding reward and punishment mechanism, clearly distinguish reward and punishment, and form a complete set of cost evaluation system based on block chain technology.

**Conclusion**

In recent years, with the rise of block chain technology, its application scope has not only been limited to virtual currency, third-party payment, financial products, digital asset management and other fields, but will also be extended to other areas of society. With the development of China’s economy, cost management plays an important role in enterprises. Cost management is not only to reduce the cost of enterprises, but also to establish a basis for achieving sustainable competitive advantage and creating a better competitive and cooperative environment.

It is possible to integrate the block chain technology into the cost management of enterprises, establish a decentralized cost management information system, and realize the structural innovation of the cost management information system. However, the block chain technology itself is still in the state of development, and relevant technological innovations and legal regulations are being tried. Compared with the block chain application 1.0 and the application 2.0 phase of gradual maturity, the application in the field of cost management is still in the exploration stage. Based on block chain technology, the cost management field will face the specific combination of how to combine block chain technology and value chain cost management, how to integrate with the internal operations of the enterprise, how to carry out distributed book accounting costs, and how to carry out effective costs Information management and how to equip with more high-quality comprehensive ability and excellent financial manpower. With the maturity of information technology, the above problems will be solved well. Enterprises need to grasp the development trend of management accounting, take active and effective measures to meet the challenges, and realize the maximization of enterprise value.

**Reference**


