



Application and Effect Analysis of Blockchain Technology in Enterprise Financial Management in the Era of Fintech

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Abstract. With the rapid advancement of fintech, blockchain technology is evolving at an unprecedented pace, characterized by scalability, transparency, and promising application prospects. This study explores the application of blockchain technology in enterprise financial management by analyzing relevant scenarios and evaluating actual data and benefits. The findings suggest that blockchain can significantly enhance the efficiency and transparency of financial management, reduce costs, and improve risk management capabilities. However, its practical implementation still faces technical and managerial challenges, which require further research and exploration.

Keywords: blockchain technology, enterprise financial management, cost reduction, smart contracts

1 Introduction

The rise of fintech has introduced several transformative technologies, including blockchain, artificial intelligence, and big data, which are reshaping the financial industry. Blockchain technology, characterized by its decentralization, immutability, and transparency, is particularly gaining traction in the field of enterprise financial management. It is anticipated to become a leading technology with increasingly evident advantages. The blockchain industry spans data management, finance, and financial regulation, necessitating that enterprises enhance data transparency, reduce costs, and foster collaborative innovation. This study aims to explore the application of blockchain technology in enterprise financial management, assess its actual impact, provide data and case analyses, and investigate its future development trajectory.

2 Literature Review

2.1 Principles and Characteristics of Blockchain

Blockchain technology is a distributed ledger consisting of a series of blocks linked by cryptography. Each block contains the transaction data, the timestamp, and the hash value of the previous block, making each transaction a tamper-proof and traceable [1]. The decentralized nature of the blockchain means that there is no single control point, which improves the security and transparency of the system. In addition, the blockchain uses the consensus mechanism to ensure the consistency of all nodes to the ledger, preventing data tampering and double payment issues.

2.2 Application of Blockchain in the Financial Field

The application of blockchain technology in the financial field mainly focuses on payment and clearing, cross-border payments, digital currency and smart contracts. In terms of payment and clearing, blockchain significantly improves efficiency and reduces cost [2] by processing transactions in real time and reducing intermediate links. Cross-border payments use blockchain technology to achieve fast and low-cost international transfers, avoiding cumbersome procedures in traditional financial systems. Digital currencies are typical applications of blockchain technology, which provide decentralized transactions. Smart contracts reduce human intervention and operational risks by automatically enforcing contract terms.

2.3 Pain Points in Traditional Financial Management

Traditional financial management faces many challenges, including the credibility of data, transaction efficiency, cost and transparency. First, the dispersion of data recording and storage leads to inconsistent information, which increases the verification cost of data verification. Secondly, the settlement and settlement of traditional financial systems usually takes several days, which is inefficient [3]. High intermediary fees further increase transaction costs, especially in cross-border payments. Finally, the lack of transparency and traceability makes audit and supervision more difficult and increases the risk of financial fraud.

2.4 Innovative Advantages of Blockchain Technology in Financial Management

Blockchain technology shows a variety of innovative advantages in financial management. First of all, the decentralized and tamper-free features of blockchain ensure the authenticity and integrity of data, and significantly improve the credibility of information [4]. Secondly, the blockchain records transactions in real time through a distributed ledger, which reduces the clearing and settlement time and improves the transaction efficiency. Third, blockchain technology automates transactions and contract terms through smart contracts, reducing the complexity and cost of human oper-

ations. Finally, the transparency and traceability of blockchain improve the transparency of financial operations, facilitate audit and supervision, and help to prevent financial fraud.

To sum up, blockchain technology has significant advantages in improving the efficiency of the financial system, reducing costs, improving transparency and security, and is gradually becoming an important technological innovation in the field of financial management.

3 The Application of Blockchain in Enterprise Financial Management

3.1 Accounting Treatment and Responsibilities

3.1.1 Real-Time Accounting and Transparency.

The application of blockchain technology in enterprise financial management is first reflected in the accounting treatment and responsibility. Blockchain's distributed ledger technology allows enterprises to record and update transaction information in real time at multiple nodes [5]. This real-time bookkeeping method greatly improves the transparency of financial information. In traditional financial systems, bookkeeping often relies on regular manual updates, with the risk of time lag and human error. Blockchain technology, on the other hand, ensures that each transaction record is verified and stored by multiple parties when it is generated, almost impossible to be tampered with. This not only improves the accuracy and reliability of financial data, but also enables relevant stakeholders to obtain the latest financial information at any time, and enhances the transparency and accountability of financial management of enterprises.

3.1.2 Automation of Audit Process.

In the audit process, blockchain technology also shows great potential. Traditional audits usually require a lot of time and manpower to check the accounts and verify the legality and authenticity of the transactions. Blockchain technology can automate the audit process through its tamper-proof ledger features and smart contract functions [6]. For example, smart contracts can pre-set audit rules to automatically trigger audit procedures and generate audit reports when certain conditions are met. This not only greatly reduces the workload of manual audit, but also improves the efficiency and accuracy of the audit.

3.2 Accounts Receivable and Payment Management

3.2.1 Smart Contract Application.

In terms of accounts receivable and payment management, the smart contract function of blockchain technology plays a key role. A smart contract is a self-executed code protocol that automatically enforces contract terms when specific conditions are met. With smart contracts, enterprises can automate receivables management [7]. For example, when the goods are delivered and receipt is confirmed, the smart contract au-

tomatically triggers the payment process to ensure that the receivables arrive timely. This not only reduces the risk of manual intervention and operational error, but also accelerates the capital turnover and improves the efficiency of the cash flow management of the enterprise.

3.2.2 Accounts Receivable Financing.

Blockchain technology also provides new solutions for accounts receivable financing. Traditional accounts receivable financing usually requires enterprises to provide a large number of supporting documents, the process is complex and long time [8]. Through the blockchain technology, the accounts receivable information of enterprises can be recorded and verified in real time, and financial institutions can quickly evaluate the credit status of enterprises and provide financing services based on these transparent and reliable data. This method not only simplifies the financing process, but also reduces the risk of financial institutions, and improves the speed and convenience of enterprises to obtain financing.

3.3 Risk Management

3.3.1 Data Security and Tamper-Proof.

In terms of risk management, blockchain technology provides enterprises with a highly secure data protection mechanism through its unique encryption algorithm and decentralized features. Traditional centralized financial systems are easy to become the target of cyber attacks, and there is a risk of data tampering or leakage. Blockchain technology, through distributed storage and encryption verification, ensures that every transaction data is difficult to be tampered with, and even if a node is breached, it will not affect the security of the entire system. In addition, the transparency of the blockchain makes all transaction records publicly available, helping to prevent internal fraud and financial fraud.

3.3.2 Risk Control and Compliance Management.

Blockchain technology also plays an important role in the risk control and compliance management of enterprises. With smart contracts, companies can automatically implement compliance policies to ensure that all financial operations comply with relevant regulations and internal control standards. For example, smart contracts can pre-set risk control indicators and automatically alert or take action when certain operations are beyond the preset risk range. In addition, the transparency and traceability of blockchain make it easier for regulators to conduct audit and supervision, improving the compliance and risk management level of enterprises.

To sum up, the application of blockchain technology in enterprise financial management not only improves the efficiency and transparency of accounting treatment, but also optimizes the accounts receivable and payment management process, and enhances the data security and risk management capabilities. With the continuous maturity and popularization of blockchain technology, it is expected that its application

in enterprise financial management will be more extensive and in-depth, and promote enterprises to achieve more efficient and secure financial operations.

4 Effect Analysis and Empirical Analysis

4.1 Application Effect and Combination

4.1.1 Quantitative Indicators: Cost, Efficiency and Accuracy.

The application effect of blockchain technology in enterprise financial management can be measured by multiple quantitative indicators. The application of blockchain technology has significantly reduced the labor and intermediary costs in financial management. The implementation of blockchain technology has reduced corporate transaction costs by an average of 30 percent. Blockchain technology has greatly improved the efficiency of transactions and clearing through smart contracts and distributed ledgers. The clearing time in traditional financial systems is usually 2 to 3 days, but the clearing time can be reduced to a few minutes.

4.1.2 Evaluation Indicators: User Satisfaction and Price Control.

User satisfaction is an important indicator to measure the effect of blockchain application. Through the questionnaire survey [9], the results show that 85% of financial managers believe that blockchain technology has improved work efficiency, and 70% of users are satisfied with its transparency and security. The application of blockchain technology has also performed well in price control. By reducing intermediate links and improving transparency, businesses can better control their costs.

4.2 Empirical Data and Case Analysis

4.2.1 Case 1: Financial Improvement of the Blockchain Application of an Enterprise.

A large manufacturing company began to implement blockchain technology in 2019 to improve its financial management process. The following is the comparison data of the enterprise before and after the application of blockchain technology. The following Table 1 gives a summary of all heading levels.

Table 1. Comparison of enterprise application of blockchain technology data [10].

metric	The traditional system	Regional chain system	Improve the effect
Monthly financial management expenses	\$500,000	\$350,000	-30%
Liquidation time	48 Hours	10 Minutes	-99.65%
Financial record error rate	2%	0.2%	-90%

Before the implementation of blockchain, the monthly financial management expenses were about \$500,000, but after the implementation, it dropped to \$350,000. The average clearing time under traditional systems is 48 hours, and the blockchain system reduces the clearing time to 10 minutes. After the implementation of blockchain technology, the error rate of financial records has dropped from 2% to 0.2%. The company has also introduced smart contracts to automate the processing of payment and invoice management in the supply chain. Through smart contracts, companies reduce the time of manual audit and save 200 hours of manual work per month.

4.2.2 Case 2: Practice of Blockchain in the Financial Management of Smes.

A small and medium-sized enterprise (SME) group introduced blockchain technology in 2020 to solve the pain points in its financial management. Here are the key data after the application of blockchain technology. The following Table 2 gives a summary of all heading levels.

Table 2. Key data after the application of blockchain technology [11].

metric	The traditional system	Blockchain system	Improve the effect
Accounts receivable recovery cycle	45 Days	20 Days	-55.56%
Annual financial management expenses	\$120, 000	\$80, 000	-33.33%
User satisfaction (financial personnel)	N/A	90%	promote
User satisfaction (Manager)	N/A	80%	promote

Under the traditional system, the average recovery period of receivables is 45 days, and after the introduction of blockchain technology, the recovery cycle is shortened to 20 days. Traditional financial management costs are \$120,000 a year, reduced to \$80,000 after the introduction of blockchain technology. 90% of financial personnel believe that blockchain technology simplifies the financial process, and 80% of managers approve of blockchain technology. The group also uses blockchain technology for risk management, reducing the risk of financial fraud through transparent transaction records and a tamper-proof ledger. The company also adopted a blockchain-based credit evaluation system, which improved the financing efficiency and increased the financing success rate by 25%.

4.3 Data and the Model

In order to quantify the effectiveness of blockchain technology, the study was analyzed using the following models:

Cost-reduction formula:

$$\text{Cost reduction rate} = \frac{\text{Pre-implementation costs} - \text{Post-implementation costs}}{\text{Pre-implementation costs}} * 100\% \quad (1)$$

The cost of an enterprise before implementing the blockchain is \$500,000, and after the implementation is \$350,000, so the cost reduction rate is 30%.

Efficiency improvement formula:

$$\text{Error rate reduction rate} = \frac{\text{Pre-implementation error rate} - \text{Post-implementation error rate}}{\text{Pre-implementation error rate}} * 100\% \quad (2)$$

The liquidation time drops from 48 hours to 10 minutes, and the efficiency improvement rate is about 99.65%.

Accuracy improvement formula:

$$\text{Error rate reduction rate} = \frac{\text{Pre-implementation error rate} - \text{Post-implementation error rate}}{\text{Pre-implementation error rate}} * 100\% \quad (3)$$

The reduced error rate from 2% to 0.2% reduced the error rate by 90%.

Through the above formula and model, the application effect of blockchain technology in enterprise financial management can be clearly quantified to provide scientific decision-making basis for enterprises. To sum up, blockchain technology has shown significant advantages in cost, efficiency, accuracy, user satisfaction and price control, and has a broad application prospect in enterprise financial management in the future.

5 Conclusion and Discussion

5.1 Summary of the Study Findings

This study finds that the implementation of blockchain technology in enterprise financial management markedly enhances processing efficiency, reduces management costs, and increases both data accuracy and transparency. Empirical data and case analyses reveal that blockchain technology offers substantial benefits in real-time bookkeeping, smart contract applications, accounts receivable management, and risk control. Specifically, blockchain technology lowers labor costs and error rates in financial management, accelerates clearing and settlement processes, and strengthens capital turnover and risk management capabilities for enterprises.

This study investigates the practical impact of blockchain technology on the financial management of enterprises across various sizes and industries. By analyzing case studies from both large manufacturing firms and small to medium-sized enterprises, the research highlights the broad applicability and significant benefits of blockchain technology in diverse settings. Additionally, through a comparative analysis of quantitative metrics and evaluation criteria—such as user satisfaction and cost control—this

study provides a comprehensive assessment of blockchain technology's value in financial management.

5.2 Future Research Direction and Application Prospects

Future research should explore the application of blockchain technology across a broader range of enterprise environments and financial management segments. For instance, investigations could focus on applying blockchain technology to multi-currency financial management within multinational enterprises and integrating artificial intelligence and big data to enhance the design and execution of smart contracts. Additionally, as blockchain technology continues to evolve, its potential applications in financial management will expand. This includes the development of more sophisticated financial decision support systems and more transparent and efficient auditing processes. In summary, blockchain technology is poised to play a crucial role in the future of enterprise financial management, driving advancements towards greater digitalization and intelligence.

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