Innovation and Digital Transformation of Media Economy Based on Information Security Technology

Yan Meng[1], Jungjin Kim[2], Hak-chun Lee[3], Cho Dong Je[4] and Peiyun Cheng[5,*]

[1]*Chongqing Technology and Business University, Chongqing, China*
[2]*School of Artificial Intelligence Law, Southwest University of Political Science and Law, Chongqing, China*
[3]*Department of Law, Graduate School, Dong-A University, Busan, Korea*
[4]*Dong-A University Graduate School of Law, Busan, Korea*
[5]*School of Art, Chongqing Technology and Business University, Chongqing 400067, China*
E-mail: 343009741@qq.com; jini001@me.com; hclee@dau.ac.kr; chodj@dau.ac.kr; yiye.521@ctbu.edu.cn
[*]*Corresponding Author*

Received 19 July 2023; Accepted 14 August 2023;
Publication 11 September 2023

Abstract

This study aims to analyze the application of information security (IS) technology and blockchain in the media economy, and the impact of cross-border cooperation and value chain reconstruction combined with blockchain technology (BCT) on promoting innovation and digital transformation in the media economy. This study delves into the interplay between cross-border collaboration, value chain reconstruction, and BCT. It constructs a media economic digital platform by amalgamating blockchain and cross-border value

Journal of ICT Standardization, Vol. 11_3, 283–306.
doi: 10.13052/jicts2245-800X.1134

chain principles, subsequently evaluating and analyzing its performance. Findings indicate that the proposed model exhibits a reduced block propagation time and enhanced security performance, boasting a 5% improvement. The platform's latency remains stable at approximately 245 ms. Survey analysis reveals an agreement rate exceeding 57.94% across dimensions such as data mining, customer relationship management, and classification effectiveness, contributing to heightened user satisfaction. Consequently, this study offers valuable insights into user relationship security management within cross-border collaborations, shedding light on novel avenues for sustainable development and digital transformation in the realm of the media economy.

Keywords: Information security, blockchain, media economy, value chain reconstruction, digital transformation.

1 Introduction

1.1 Research Background and Motivations

In today's digital age, the media economy is undergoing tremendous change and transformation, and how people access information and entertainment has fundamentally changed (Huang, 2023; Cunningham and Craig, 2019). Yin et al. (2023) exemplify these changes through users transitioning from QQ to WeChat for social interactions, revealing evolving social media usage patterns. The digital transformation of the media economy, such as personalized content customization and accurate advertising, has brought many opportunities. However, it has also faced a series of challenges, especially the increasingly prominent problem of information security (IS). (Dzogbenuku et al., 2022). The infusion of IS technology into the digital media landscape emerges as a theoretical anchor for safeguarding user privacy, detecting fake news, upholding copyright integrity, and managing data (Liu et al., 2022; Ahmad et al., 2022). Thus, protecting users' data security and maintaining content credibility have become vital topics for innovation and digital transformation of the media economy.

Commercial banks, as a fundamental element of the financial economic system within the realm of economy, extend beyond financing and capital support to encompass critical functions like payment settlement and fund custody. Their partnership with media enterprises holds significance, particularly in the arena of customer relationship management, profoundly influencing

media companies' operations and growth. By leveraging meticulous customer analysis and tailored content distribution, media enterprises can adeptly cater to audience preferences, amplify user satisfaction, and elevate user involvement. This strategic alignment realizes collaborative objectives across industries, fostering mutual benefits for enterprises and clientele. In addition, cross-border cooperation and value chain reconstruction are also key factors driving innovation and digital transformation in the media economy. Traditional media organizations usually face the problem of limited resources and insufficient technical capabilities. Media organizations can obtain more resources and technical support through cooperation with other industries to achieve business expansion and innovation (Fioroni et al., 2022; Hill and Lee, 2022). Meanwhile, with the progress of digital transformation, the value chain of traditional media also needs to be restructured to adapt to new business models and user needs (Chen et al., 2022). Blockchain technology (BCT) can provide decentralized data storage and management solutions. It can be used for copyright protection and digital content management, which is of great significance for value chain reconstruction in the digital transformation of the media economy (Verhun et al., 2022; Khan et al., 2023).

1.2 Research Objectives

The current landscape of media economics underscores the urgency of innovation and digital transformation. Amid this evolution, heightened IS concerns underscore the pivotal importance of upholding user data integrity and content authenticity. Simultaneously, the strategic imperatives of cross-industry collaboration and value chain restructuring emerge as instrumental drivers of innovation and transformation within media economics. This study aims to probe these dynamics, with a specific focus on the infusion of IS technology. The study seeks to offer actionable insights and guidance to media institutions and researchers by exploring the potential integration of BCT and data mining techniques. The overarching goal is to catalyze sustainable development and digital transformation in media economics within the context of dynamic cross-industry collaborations and fortified IS paradigms.

2 Literature Review

With the rapid development of digital media, the security and privacy protection of media data has become critical. Blockchain's decentralization and immutability make it an ideal solution for securing media data. Many

scholars conducted relevant research on the application of BCT in IS. Liu et al. (2021) investigated blockchain's different application scenarios and challenges in the media sector and suggested some future directions. Finally, researchers were provided with a comprehensive understanding and research ideas on blockchain application in the media sector. Sharma et al. (2023) suggested that using BCT enhanced the security of medical records. The results revealed that the scheme could effectively protect medical records' confidentiality and integrity, providing higher security for health documents in the IoT digital health ecosystem. Issa et al. (2023) reviewed the latest research findings and applications of blockchain-based federated learning in securing IoT and discussed future directions.

Some scholars also researched on the value chain construction in developing the digital media economy. Cai and Li (2022) proposed a path selection and optimization method to help China's manufacturing industry find the best positioning and optimization strategy in the global value chain (GSC). The results revealed the important factors and strategies for the path selection and optimization of the manufacturing industry's participation in GSC reconstruction. They provided a useful reference for the development and transformation of China's manufacturing industry. Cui et al. (2023) developed a cross-border supply chain cooperation model to study cross-border supply chain cooperation under the Belt and Road (B&R) Initiative. The research results provided an in-depth understanding of this model and the B&R Initiative, and give an important reference for promoting cross-border supply chain cooperation and implementing the B&R Initiative.

In conclusion, the analysis of the research conducted by the aforementioned scholars reveals the widespread application of BCT in various fields, including media economics and digital healthcare. Studies conducted by Liu et al. (2021) and Sharma et al. (2023) provide evidence of its effectiveness in safeguarding the security of privacy data. However, despite existing studies related to value chain restructuring in the digital transformation of media economics, limited attention has been given to the intersection of media economics and cross-industry collaboration. This study addresses this gap by introducing BCT and IS techniques to enhance data information mining during the process of media economic transformation. This integrated approach ensures the security of customer relationships and information within cross-industry collaborations, providing valuable insights for promoting innovation in media economics, optimizing resource allocation, and refining cooperative management with customers.

3 Research Model

3.1 IS Analysis of the Blockchain in the Media Economy

As a decentralized distributed ledger technology, blockchain's core features include distributed sharing, immutability, and anonymity (Qu et al., 2022). Generally, BCT can be divided into public, private, and consortium blockchains according to the degree of centralization difference, as displayed in Figure 1 (Unal and Aysan, 2022; Agrawal and Narain, 2023; Moro Visconti et al., 2022).

Figure 1 denotes that the chain structure of the blockchain includes three kinds of public, consortium, and private blockchains. Among them, the public blockchain's data storage and transaction verification are done by a widely distributed network of nodes, which reach consensus through consensus mechanisms. Its merits are decentralization and high transparency, but certain privacy and performance limitations exist. The private blockchain is primarily used for internal business applications, such as supply chain management (SCM) or data exchange within an enterprise. It has higher privacy and performance, but lacks some decentralization and transparency. The consortium blockchain comprises multiple entities or organizations that work together to manage and maintain the blockchain network. The advantages are high flexibility, controllable privacy, and higher performance.

In IS guarantee, BCT carries out a safe storage and transmission framework for data in the media economy, as presented in Figure 2.

Figure 2 signifies that in the secure storage and transmission of media economic data, the blockchain data is first stored in a distributed manner on multiple nodes in the network. Each node maintains a complete copy of the ledger, and this distributed storage makes the data not dependent on a single central server, thus improving data reliability and resistance to attack (Basile et al., 2023). Second, blockchain uses digital signatures to verify the authenticity and integrity of transactions. The sender signs the transaction using its private key, and the receiver verifies it by adopting the sender's public key. Moreover, blockchain employs hash functions to convert transaction data into a unique fixed-length hash value and uses a consensus mechanism to ensure data consistency and credibility (Jabbar et al., 2021).

In BCT, the consensus mechanism acts as an algorithm or protocol by which nodes in the network agree on which blocks can be added to the chain. Common consensus mechanisms include Proof-of-Work (PoW), Proof-of-Stake (PoS), Byzantine Fault Tolerance (BFT), etc. (Kumar and

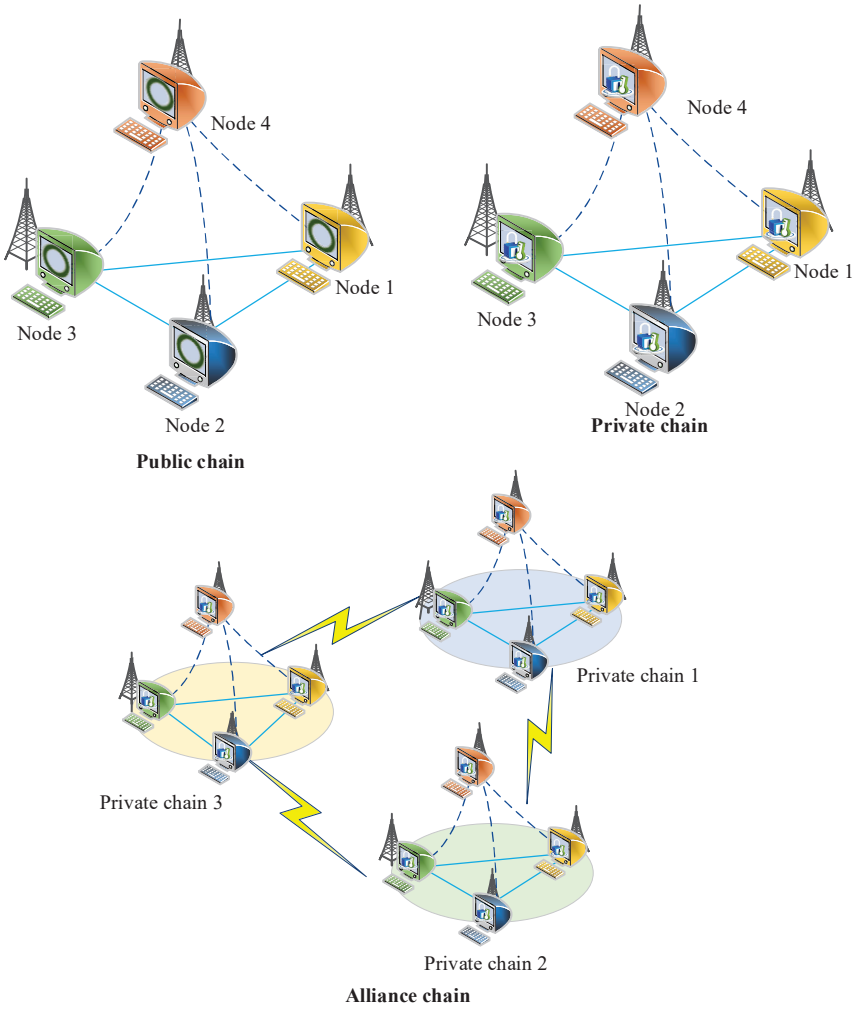

Figure 1 Chain structure classification of blockchain.

Chopra, 2022; Panasenko et al., 2021). SThe PoW consensus algorithm can determine the block owner by calculating the difficulty value. It ensures the data information security of the media economy in the network and prevents malicious behavior and data tampering. ince the PoW believes that the maximum number of blocks is the link branch when information conflicts occur, malicious attackers must ensure that the length of the attack chain they send exceeds the main chain to obtain the data tampering right of the

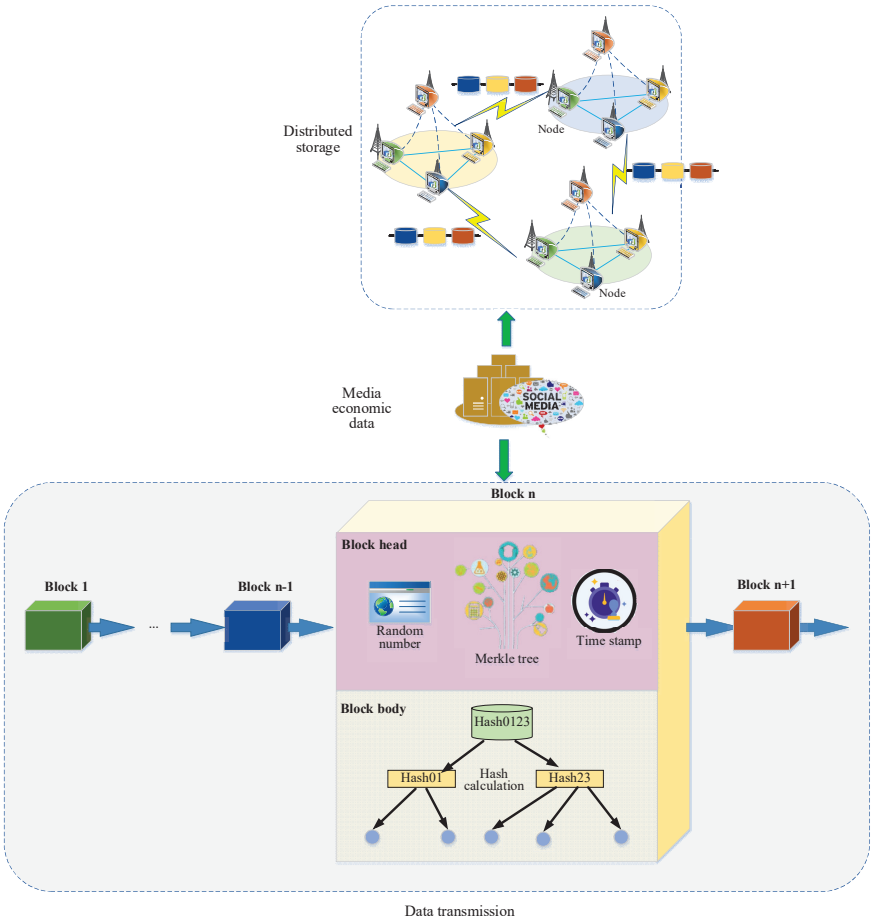

Figure 2 Schematic diagrams of secure storage and transmission framework for BCT application in media economic data.

entire blockchain (Ramos et al., 2021). Its probability P_n can be expressed as Equation (1):

$$P_n = \begin{cases} 1, & q_F \geq p_T \\ (q_F/p_T)^n, & q_F < p_T \end{cases} \tag{1}$$

P_T and q_F represent the probability that the next block belongs to a credit and malicious node; P_n refers to the probability that a malicious attacker tampers with n blocks. On this basis, assuming that a good credit node can produce a block every other average expected time, then the potential

progress of the malicious node should satisfy the Poisson distribution, and its expected value λ is as in Equation (2):

$$\lambda = nq_F/p_T \tag{2}$$

Thus, when the number of blocks published by malicious nodes exceeds that of credit nodes, the malicious node completes the attack. The probability *P* of this occurrence should be obtained by multiplying the probability density of the Poisson distribution of the number of blocks *k* published by the malicious node and the probability that the malicious node can still complete the attack at this time, and the specific result is calculated as follows:

$$P = \sum_{k=0}^{\infty} \frac{\lambda^k e^{-\lambda}}{k} \begin{cases} (q_F/p_T)^{n-k} & k \le n \\ 1 & k > n \end{cases} \tag{3}$$

The probability *P* is further simplified, and the result is shown in Equation (4):

$$P = 1 - \sum_{k=0}^{n} \frac{\lambda^k e^{-\lambda}}{k} [1 - (q_F/p_T)^{n-k}] \tag{4}$$

It is calculated that when the computing power of the malicious node is less than 50%, the probability of a successful attack decreases with the increase of *n*. In the application of data information security in the specific media economy, *n* is often set to 6, that is, a new block of information will be considered safe and effective after 6 block generation.

Consequently, the role of applying BCT to the data information security of the media economy is mainly reflected in the safe storage and transmission of data, the immutability and traceability of copyright information, and the establishment of a decentralized digital rights management system (DRMS). These features and functions provide an innovative solution for the media industry, which ultimately achieves the purpose of improving the security of media economic data and the protection of private information.

3.2 The Key Links and Implementation Methods of Value Chain Reconstruction

GSC refers to a form of economic organization in which multinational enterprises participate in the production and delivery process of products or services globally and cooperate. Its characteristics mainly cover division of labor, cross-border cooperation, supply chain integration, and technology

and knowledge intensity (Charoenwong et al., 2023). Elements of international trade indicate various factors and factor combinations such as goods and services, labor, capital, technology, and knowledge that participate in international trade activities (Fraccastoro et al., 2021). Globalization and information technology (IT) progress make GSC more complex and close. The cross-border flow of international trade elements promotes the optimal allocation of resources and economic prosperity.

According to the characteristics of GVC and the elements of international trade, this study derives the evolution of the gravity model to explain the formation mechanism of cross-border "Internet +" gradient connection and complementary connection between two trading partners or two economically related regions (Yang et al., 2022), as denoted in Equation (5):

$$F_{ij} = K_{ij} \frac{GDP_i \cdot GDP_j}{Dist_{ij}^2} \tag{5}$$

F_{ij} indicates the connection between countries *i* and *j*; GDP_i and GDP_j refer to the size of the economies of countries *i* and *j*; $Dist_{ij}$ means the geographical distance between countries *i* and *j*; K_{ij} stands for connection force constant.

To highlight the influence of the Internet in cross-border trade, the "Internet +" factor of both sides of the trade is added to K_{ij}, and the corresponding weight is given according to the influence of each factor. From this, the modified connection force model is obtained, as represented in Equation (6):

$$F_{nij} = K_{nij} \frac{V_{ni} \cdot V_{nj}}{Cost_{nij}^2} \tag{6}$$

F_{nij} represents the connection force of country *i* to country *j* in the value module n; V_{ni} and V_{nj} indicate the output value of countries *i* and *j* in the module; $Cost_{nij}$ refers to the total cost of countries *i* and *j* in the module (including transportation costs, information costs, technology costs, etc.); K_{nij} stands for the connection force constant of country *i* in this module, and its calculation reads:

$$K_{nij} = \alpha \frac{V_{ni}}{V_{ni} + V_{nj}} \tag{7}$$

α refers to the "Internet+" related influencing factors, and the influence of α on the connection force is a positive promotion effect, that is, $\alpha > 0$.

Equation (6) can then be written as follows:

$$F_{nij} = \alpha \frac{V_{ni}}{V_{ni} + V_{nj}} \times \frac{V_{ni} \cdot V_{nj}}{Cost_{nij}^2} = \alpha \frac{V_{ni}^2 \cdot V_{nj}}{(V_{ni} + V_{nj}) \cdot Cost_{nij}^2} \tag{8}$$

3.3 Construction Analysis of Digital Platform of the Media Economy Using Blockchain and Cross-Border Value Chain

The digital platform of media economy is a carrier of media service and content interaction built on the basis of IT and digital means, aiming to realize the digital transformation of content production, communication, and business operation. In this study, a digital platform of media economy by the blockchain and a cross-border value chain is designed, as suggested in Figure 3.

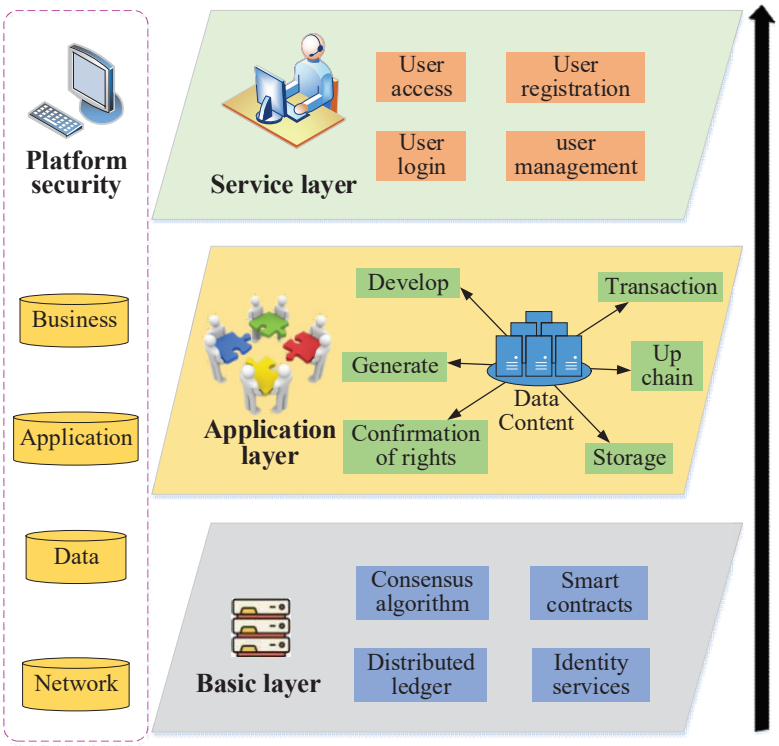

Figure 3 Digital platform architecture of media economy based on blockchain and cross-border value chain.

In Figure 3, the digital platform architecture mainly includes the foundation, application, and service layers. In the foundational layer, the incorporation of BCT, with its distinctive attributes of decentralization, distributed nature, and immutability, has forged a secure, transparent, and reliable infrastructure for media economics. This foundation instills a sense of trust, particularly in the context of inter-industry collaborations, where data sharing and cooperative innovation are paramount.

The application layer capitalizes on data mining techniques to extract invaluable insights from extensive datasets. These insights empower media enterprises to gain deeper insights into user behaviors, interests, and needs. As a result, content creation, advertising placement, user engagement, and overall user experiences can be optimized to a higher degree.

Within the service layer, significant focus is directed toward customer relationship management. By harnessing the capabilities of data mining techniques, platforms are adept at conducting thorough analyses of customer behaviors and preferences. This approach facilitates the provision of personalized interactions and services. Consequently, this approach nurtures robust customer relationships, enhancing user loyalty and satisfaction. Simultaneously, it paves the way for new avenues of cross-industry collaboration.

Collectively, the developed digital platform establishes a secure, efficient, and innovative ecosystem within media economics. This design catalyzes the digital transformation and sustainable evolution of the industry, positioning it at the forefront of contemporary advancements.

4 Experimental Design and Performance Evaluation

4.1 Datasets Collection

The data source of this study is public speech information on Weibo. The crawler obtained media economy-related terms of Weibo public data from March 2021 to July 2022 and finally got 52,718 Weibo data after data cleaning and anonymization. In the data collection process, the relevant laws, regulations, and ethical guidelines were strictly observed, and user privacy and IS were not violated to ensure the legality and compliance of data.

4.2 Experimental Environment

In the constructed digital platform, the specific experimental environment configuration is exhibited in Table 1.

Table 1 Experimental environment configuration

	Configuration		Configuration
Computer	Intel Core i7 processor, 16GB memory, 1TB hard drive	Blockchain platform	Ethereum 2.0
Cloud server	8-core processor, 32GB memory, 500GB hard drive	Smart Contract development language	Solidity
Operating system	Linux operating system (Ubuntu 18.04)	Development framework	Truffle
Blockchain testing network	Ganache	Database management system	MySQL 8.0
Data collection tools	Python	Visualization tools	Matplotlib and Seaborn
system nodes	340	Block return G	50

4.3 Parameters Setting

In the performance analysis of the model, it is verified and adjusted through the experiment and optimization process. 2 MB is selected as the block size, the block confirmation time is 15 minutes, the consensus algorithm is PoW, and the bandwidth limit value is 100 Mbps, to optimize the performance of the digital platform of the media economy.

4.4 Performance Evaluation

The proposed model algorithm is analyzed with BFT, Redundant Byzantine Fault Tolerance (RBFT), Delegated Byzantine fault tolerance (DBFT), and Sharma et al. (2023) from the aspects of computational overhead, throughput, security (average leakage rate), and latency, respectively, as revealed in Figures 4–7.

The analysis of computational overhead is drawn in Figure 4, which shows that with the increase of system node data, the overall block propagation time increases. The block propagation time of the proposed framework model is significantly smaller than that of other model algorithms. In addition, the time required for each model is the proposed algorithm $<$ Sharma et al. (2023) $<$RBFT$<$DBFT$<$BFT, which means that this framework proposed in this study can form consensus more quickly, and the system operation

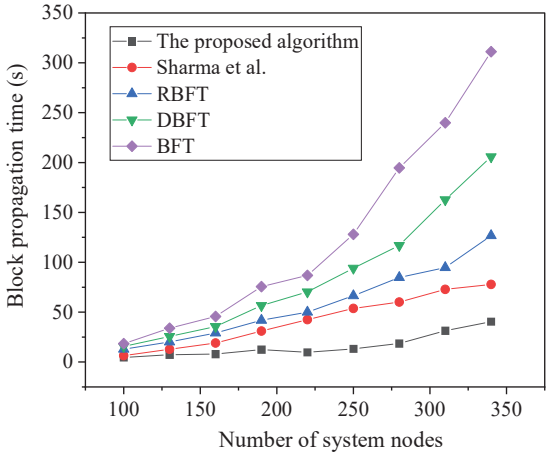

Figure 4 The computational overhead of each algorithm under different number of nodes.

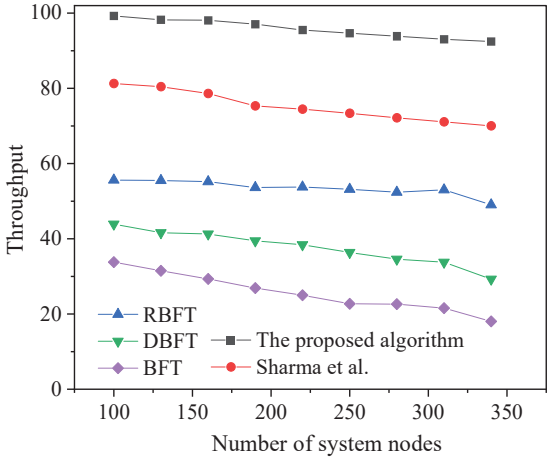

Figure 5 Throughput for each algorithm with different number of nodes.

efficiency is higher. Consequently, the exceptional efficacy of the proposed framework model in achieving consensus is substantiated by conducting a comprehensive analysis of computational expenses, with a specific focus on the examination of block propagation time. This substantiation serves as a compelling validation that bolsters the advancement of proficient and expedient BCTs.

Figure 5 is the throughput analysis, and the system's throughput using the proposed framework mechanism is apparently higher than that of other model

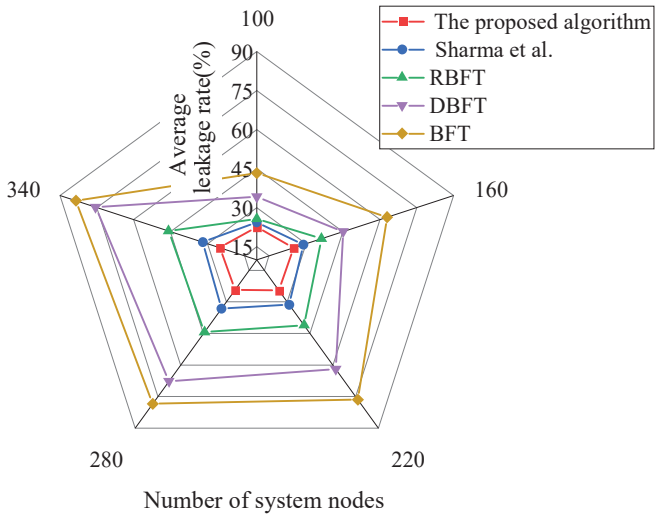

Figure 6 Security for each algorithm with various numbers of nodes.

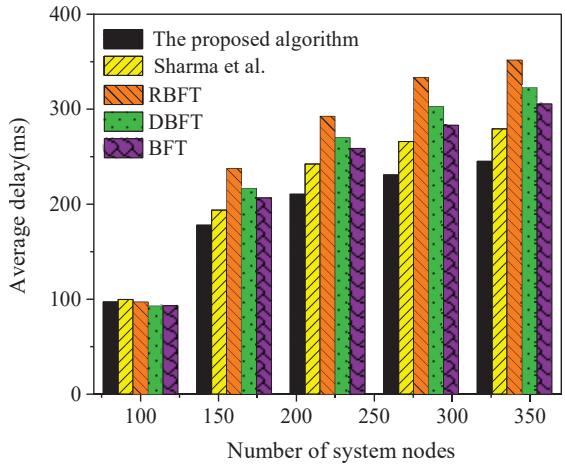

Figure 7 Latency for each algorithm with different numbers of nodes.

algorithms. Moreover, as the number of nodes increases, the throughput of the proposed framework mechanism does not decrease evidently. Additionally, the throughput of each model is the proposed algorithm > Sharma et al. (2023) >RBFT>DBFT>BFT, and the throughput reaches 92.45 when the number of nodes is 340. This indicates that the system with this model has higher operating efficiency and can process more data simultaneously.

By comparing the network data security transmission performance of each mechanism algorithm with a different number of nodes, the results are illustrated in Figure 6. With the increase in the number of transmission nodes in the system, the average leakage rate of network data has basically no marked variation, and this proposed algorithm is less than 25%. In comparison, the other model algorithms are more than 30%. Thereby, compared with different model algorithms, the security performance of the proposed algorithm is improved by 5%, which can make the digital platform of the media economy have better security performance in the construction process.

The latency of each algorithm with different number of nodes is further analysed, as portrayed in Figure 7. In Figures 5–8, the comparison results reveal that the average latency shows an increasing trend as system nodes increase. The average latency of each mechanism algorithm is the proposed algorithm < Sharma et al. (2023) <RBFT<DBFT<BFT. Beyond that, the average latency of the proposed model algorithm is basically stable at about 245 ms when the number of nodes is 340. Thus, from the perspective of a different number of nodes, the constructed digital platform prominently shows

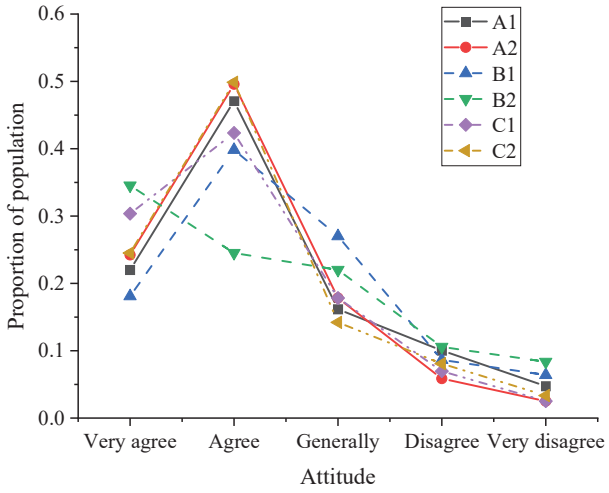

Figure 8 Survey results in various dimensions of the digital platform (A1: The data mining function of the platform is beneficial in delivering personalized content recommendations and analysis; A2: The outcomes of data mining on the platform align with your interests and requirements; B1: The platform's personalized interactions and tailored services more effectively cater to your needs; B2: The platform demonstrates proactive and efficient responsiveness to user feedback; C1: The platform accurately classifies distinct types of content. C2: The platform proficiently addresses your information requirements.)

lower latency to have efficient and secure data transmission performance of the media economy network.

Additionally, employing a questionnaire survey method, this study conducts an in-depth analysis of the effectiveness of the developed digital platform. The analysis primarily concentrates on three key dimensions: data mining, customer relationship management, and categorization effects. The study participants are drawn from the working population of City S during the period spanning September 2022 to December 2022. The collected survey questionnaires underwent careful screening, with ineligible responses excluded, resulting in a total of 359 valid questionnaire responses. The reliability and validity of the questionnaire results are rigorously assessed, revealing Cronbach's α values all exceeding 0.800, Kaiser-Meyer-Olkin (KMO) values surpassing 0.700, and Sig values at 0.000, indicative of statistical significance below the 0.050 threshold. The specific survey findings are visually presented in Figure 8.

Figure 8 demonstrates the survey findings, revealing positive assessments of the blockchain-based media economic digital platform incorporating cross-border value chains. Within the dimensions of data mining, customer relationship management, and classification effectiveness, the platform garners favorable evaluations, evidenced by agreement rates surpassing 57.94%. These results signify the platform's effective strides in digital transformation, affirming its accomplishments and underscoring its pivotal role in advancing innovation and ensuring the enduring development of the media economy.

Furthermore, an in-depth exploration involved conducting multiple regression analyses on the survey outcomes across various dimensions, as depicted in Table 2.

Table 2 illustrates that the multiple regression analysis results highlight significant statistical distinctions. Specifically, the data mining and customer relationship management dimensions manifest noteworthy variations

Table 2 Multiple regression results for each dimension

	Coefficient	Std. Error	t-value	p-value
Intercept	2.243	0.427	5.255	0.000
Data mining dimension	0.352	0.113	3.034	0.003
Customer relationship management dimension	0.498	0.128	3.895	0.000
Classification effectiveness dimension	0.276	0.142	2.945	0.033

in customer satisfaction ($p < 0.01$), while the classification effectiveness dimension's influence also presents statistical significance ($p < 0.05$). As such, the model formulated within this study contributes valuable insights for enhanced optimization and informed decision-making.

4.5 Discussion

By analyzing the performance of the digital platform for media economy based on blockchain and cross-border value chain, it can be found that compared with other existing models such as Sharma et al. (2023), RBFT, DBFT, and BFT, the proposed model algorithm shows obvious advantages in terms of computing overhead, throughput, secure transmission of network data, and latency. Among them, the block propagation time of the proposed framework model is shorter. When the number of nodes is 340, the throughput of this model reaches 92.45, which improves the security performance by 5%, and the latency is basically stable at about 245 ms. These findings indicate that the constructed digital platform can effectively enhance the innovation of the media economy. It can be effectively applied to the field of media economy, improve the operating efficiency and security of the platform, and make positive contributions to the development of the digital media economy (Awan et al., 2022; Oguntegbe et al., 2023).

In addition, the introduction of cross-border cooperation and value chain construction in the digital platform can optimize computational overhead and improve throughput, speed up the flow of information, and reduce the latency of information transmission. This helps to accelerate cooperation and exchange among participants in the value chain, improve synergies and facilitate collaborative operation in the production, distribution, and consumption of media content (Fraccastoro et al., 2021). Furthermore, by reducing latency, the platform is able to improve the real-time and interactivity of media content, meeting users' demands for instant information and personalized services. This is important for constructing a competitive and innovative digital media value chain to help the media industry achieve better business growth and social impact.

Concurrently, a comprehensive analysis of the digital platform's impact is undertaken through questionnaire surveys. The findings reveal notable enhancements across various dimensions. Personalized content recommendations and analyses result in heightened user satisfaction within the data mining dimension. In the customer relationship management dimension,

personalized interactions, tailored services, and adept user feedback management lead to elevated user contentment. Furthermore, the classification effectiveness dimension sees improvements in user satisfaction owing to meticulous and effective content grouping. Consequently, these outcomes collectively contribute to the augmentation of user experiences, amplifying user loyalty, and facilitating innovation and transformation within the digital landscape of the media economy.

5 Conclusion

5.1 Research Contribution

Aiming at the digital innovation and development of cross-border cooperation and value chain reconstruction of the media economy, this research introduces BCT and builds a digital platform of media economy by the cross-border value chain and blockchain. The experimental analysis manifests that the platform has significant advantages in block propagation time, throughput, data security transmission performance, and latency, and has improved security performance by 5%. Therefore, this study can improve the security performance of the digital platform of the media economy and protect the copyright and intellectual property rights of media content.

5.2 Future Works and Research Limitations

Although this study has achieved some practical conclusions in terms of the constructed digital platform, there are still some limitations and improvements, which provide directions for future exploration. Firstly, this study employs specific parameter values in the experimental phase; however, varying parameter values can potentially influence the platform's performance. Future research will encompass sensitivity analyses of these parameters to identify the optimal combination for optimizing platform performance. Secondly, this study predominantly conducts assessments within theoretical and experimental frameworks, whereas real-world applications may introduce further challenges and constraints. While the constructed model's efficacy is appraised through questionnaire analysis, the chosen sample size remains limited. Subsequent research will involve the implementation of the platform in actual application scenarios, enabling the collection and validation of larger volumes of real-world data. This validation process would serve to substantiate the platform's practical performance and effectiveness comprehensively.

References

Agrawal, P., and Narain, R. (2023). Analysis of enablers for the digitalization of supply chain using an interpretive structural modelling approach. International Journal of Productivity and Performance Management, 72(2), 410–439.

Ahmad, K., Maabreh, M., Ghaly, M., Khan, K., Qadir, J., and Al-Fuqaha, A. (2022). Developing future human-centered smart cities: Critical analysis of smart city security, Data management, and Ethical challenges. Computer Science Review, 43, 100452.

Awan, U., Sroufe, R., and Bozan, K. (2022). Designing value chains for industry 4.0 and a circular economy: A review of the literature. Sustainability, 14(12), 7084.

Basile, D., D'Adamo, I., Goretti, V., and Rosa, P. (2023). Digitalizing Circular Economy through Blockchains: The Blockchain Circular Economy Index. Journal of Industrial and Production Engineering, 40(4), 233–245.

Cai, Q., and Li, L. (2022). Path Selection and Optimization of Chinese Manufacturing Industry Participating in Global Value Chain Reconstruction. Sustainability, 14(11), 6688.

Charoenwong, B., Han, M., and Wu, J. (2023). Trade and Foreign Economic Policy Uncertainty in Supply Chain Networks: Who Comes Home?. Manufacturing & Service Operations Management, 25(1), 126–147.

Chen, W., Botchie, D., Braganza, A., and Han, H. (2022). A transaction cost perspective on blockchain governance in global value chains. Strategic Change, 31(1), 75–87.

Cui, L., Gao, M., Sarkis, J., Lei, Z., and Kusi-Sarpong, S. (2023). Modeling cross-border supply chain collaboration: the case of the Belt and Road Initiative. International Transactions in Operational Research, 30(3), 1187–1215.

Cunningham, S., and Craig, D. (2019). Creator governance in social media entertainment. Social Media+ Society, 5(4), 2056305119883428.

Dzogbenuku, R. K., Doe, J. K., and Amoako, G. K. (2022). Social media information and student performance: the mediating role of hedonic value (entertainment). Journal of Research in Innovative Teaching & Learning, 15(1), 132–146.

Fioroni, S. B., Lotz, A. D., Soroka, S., and Hiaeshutter-Rice, D. (2022). Political sorting in US entertainment media. Popular Communication, 20(2), 117–132.

Fraccastoro, S., Gabrielsson, M., and Chetty, S. (2021). Social media firm specific advantages as enablers of network embeddedness of international entrepreneurial ventures. Journal of World Business, 56(3), 101164.

Fraccastoro, S., Gabrielsson, M., and Pullins, E. B. (2021). The integrated use of social media, digital, and traditional communication tools in the B2B sales process of international SMEs. International Business Review, 30(4), 101776.

Hill, A., and Lee, J. C. (2022). Roamers: audiences on the move across entertainment platforms in Southeast Asia. Javnost-The Public, 29(1), 98–114.

Huang, H. (2023). Feminism in Chinese Cultural Entertainment Industry: A Case Study of Script Homicide Industry. Journal of Education, Humanities and Social Sciences, 8, 210–216.

Issa, W., Moustafa, N., Turnbull, B., Sohrabi, N., and Tari, Z. (2023). Blockchain-based federated learning for securing internet of things: A comprehensive survey. ACM Computing Surveys, 55(9), 1–43.

Jabbar, S., Lloyd, H., Hammoudeh, M., Adebisi, B., and Raza, U. (2021). Blockchain-enabled supply chain: analysis, challenges, and future directions. Multimedia Systems, 27, 787–806.

Khan, A. A., Laghari, A. A., Li, P., Dootio, M. A., and Karim, S. (2023). The collaborative role of blockchain, artificial intelligence, and industrial internet of things in digitalization of small and medium-size enterprises. Scientific Reports, 13(1), 1656.

Kumar, N. M., and Chopra, S. S. (2022). Leveraging blockchain and smart contract technologies to overcome circular economy implementation challenges. Sustainability, 14(15), 9492.

Liu, B., Pavlou, P. A., and Cheng, X. (2022). Achieving a balance between privacy protection and data collection: A field experimental examination of a theory-driven information technology solution. Information Systems Research, 33(1), 203–223.

Liu, L., Zhang, W., and Han, C. (2021). A survey for the application of blockchain technology in the media. Peer-to-Peer Networking and Applications, 14(5), 3143–3165.

Moro Visconti, R., Trevisi, C., and Cesaretti, A. (2022). Non-Fungible Tokens (NFT): business models, legal aspects, and market valuation. MEDIA LAWS, (1), 1–26.

Oguntegbe, K. F., Di Paola, N., and Vona, R. (2023). Communicating responsible management and the role of blockchain technology: social media

analytics for the luxury fashion supply chain. The TQM Journal, 35(2), 446–469.

Panasenko, S. V., Stukalova, I. B., Kurenkova, V. P., Mironov, A. V., and Bezvesilnaya, A. A. (2021). Blockchain in Trade in the Digital Economy. Revista Geintec-Gestao Inovacao E Tecnologias, 11(4), 494–502.

Qu, F., Tian, X., Li, L., He, S., and Han, M. (2022). A state-of-art survey: Digitalization of money to cryptocurrency. Issues in Information Systems, 23(2), 193–199.

Ramos, S., Pianese, F., Leach, T., and Oliveras, E. (2021). A great disturbance in the crypto: Understanding cryptocurrency returns under attacks. Blockchain: Research and Applications, 2(3), 100021.

Sharma, P., Namasudra, S., Crespo, R. G., Parra-Fuente, J., and Trivedi, M. C. (2023). EHDHE: Enhancing security of healthcare documents in IoT-enabled digital healthcare ecosystems using blockchain. Information Sciences, 629, 703–718.

Unal, I. M., and Aysan, A. F. (2022). Fintech, Digitalization, and Blockchain in Islamic Finance: Retrospective Investigation. FinTech, 1(4), 388–398.

Verhun, A., Buntova, N., Boretska, N., Borysova, O., and Shevchuk, S. (2022). Digital Tools for the Development of the Hospitality and Tourism Industry in the Context of a Digitized Economy. Economic Affairs, 67(4s), 869–876.

Yang, B., Liu, B., Peng, J., and Liu, X. (2022). The impact of the embedded global value chain position on energy-biased technology progress: Evidence from chinas manufacturing. Technology in Society, 71, 102065.

Yin, C., Zhou, Y., He, P., and Tu, M. (2023). Research on the influencing factors of the switching behavior of Chinese social media users: QQ transfer to WeChat. Library Hi Tech, 41(3), 771-787.

Biographies

Yan Meng is a Ph.D. holder and currently associate professor of management at The Chongqing Technology and Business University. Her main research

directions include international trade, international business, and international commercial law. She ever served in an overseas trading company. I hold several years of practical experience combining both theories and practices. She has published several papers in international indexed journals related to international trade and economic development and their impacts on the economy. She has also conducted relevant research in trade rules.

Jungjin Kim, Professor of Law, Doctoral Supervisor, University of East Asia, Korea, currently working at Southwest University of Political Science and Law, Professor Emeritus, main research interests Cultural Economy, International Law, Commercial Law.

Hak-chun Lee, Professor of Law and Doctoral Supervisor, University of East Asia, Korea, with major research interests in cultural trade, international commercial law, and international law.

Cho Dong Je, Degree: Professor, Doctor of Laws, Affiliation: Graduate School of Law, Dong-A University, Busan, Korea, Detailed address: LS521, Graduate School of Law, Dong-A University, 1 Bummin-dong 2-ga, Seo-gu, Busan, Korea.

Peiyun Cheng was born in Taiyuan, Shanxi. P.R. China, in 1996. She graduated from Chongqing Technology and Business University with a bachelor's degree. Now she is studying for a master's degree in Art and design of Chongqing Technology and Business University. Her research interest include intangible cultural heritage regeneration design research, Brand and Visual Communication design research.