Online-Journals.org

iJIM International Journal of Interactive Mobile Technologies

iJIM | eISSN: 1865-7923 | Vol. 19 No. 10 (2025) | OPEN ACCESS

https://doi.org/10.3991/ijim.v19i10.55483

PAPER

Risk Research on Blockchain Technology in Interactive Mobile Hospitals Based on the Entropy Method

Cui Zhang[1], Xiaofeng Wang[2](✉), Davron Aslonqulovich Juraev[3,4], Rakib Feyruz Efendiev[5], Xiao-Guang Yue[2]

[1]School of Information Engineering, Nanning College of Technology, Guilin, China

[2]College of Management, Shenzhen University, Shenzhen, China

[3]Scientific Research Center, Baku Engineering University, Baku, Azerbaijan

[4]Department of Scientific Research, Innovation and Training of Scientific and Pedagogical Staff, University of Economics and Pedagogy, Karshi, Uzbekistan

[5]Department of Mathematics, Baku Engineering University, Baku, Azerbaijan

freewxf@szu.edu.cn

ABSTRACT

This paper aims to study the risk situation of blockchain technology in interactive mobile hospitals. With the development of blockchain technology, interactive mobile hospitals have begun to use blockchain technology to empower technological capabilities in aspects such as diagnosis and treatment management, data security, and sharing. Firstly, by referring to relevant literature, this paper identifies that the existing risks include technical risks, privacy risks, compliance risks, management and operation risks, as well as cognitive and acceptance risks. Then, the entropy method is used to analyze the weights of these risks, and the fuzzy comprehensive evaluation (FCE) method is applied to calculate the risk levels. The calculation results show that the overall risk score of blockchain technology in interactive mobile hospitals is 63.3705, among which the technical risk score is 59.3491, the management and operation risk score is 59.8643, the privacy risk score is 65.8097, the compliance risk score is 64.1854, and the cognitive and acceptance risk score is 69.2427. This study conclusion is that the degree of risk of blockchain technology in interactive mobile hospitals is between general and high. Among them, technical risks and management and operation risks are between low and general, while privacy risks, compliance risks, and cognitive and acceptance risks are between general and high. Finally, this paper puts forward corresponding countermeasures and suggestions based on the risk conclusions. This paper hopes that the interactive mobile hospital industry can strengthen risk management in aspects such as enhancing technological research and development, protecting privacy, improving laws and regulations, optimizing management processes, and increasing the awareness of all parties so as to promote the healthy and stable development of the entire mobile medical industry.

KEYWORDS

entropy method, blockchain technology, interactive mobile hospital, fuzzy comprehensive evaluation (FCE), risk management

Zhang, C., Wang, X., Juraev, D.A., Efendiev, R.F., Yue, X-G. (2025). Risk Research on Blockchain Technology in Interactive Mobile Hospitals Based on the Entropy Method. *International Journal of Interactive Mobile Technologies (iJIM)*, 19(10), pp. 152–162. https://doi.org/10.3991/ijim.v19i10.55483

Article submitted 2025-1-12. Revision uploaded 2025-03-06. Final acceptance 2025-03-12.

1 INTRODUCTION

An interactive mobile hospital refers to a new medical service model in which a hospital breaks away from the traditional hospital operation model. Through Internet technology, using mobile terminals such as smartphones, tablets, and VR as carriers, and relying on touch interaction technology, voice interaction technology, and virtual reality technology, it provides patients with convenient medical services. It extends some functions of the hospital to patients' mobile terminals such as smartphones, tablets, and VR, achieving the mobility and convenience of medical services. The emergence of interactive mobile hospitals has broken the time and space limitations of traditional medical services, providing patients with more convenient and efficient medical services. The birth of blockchain technology has provided a new technical route and method for the management and operation of interactive mobile hospitals [1].

Firstly, blockchain technology ensures the sharing and security of data in interactive mobile hospitals.

Blockchain technology uses encryption technology and distributed ledger technology to establish a unified, secure, and reliable storage and sharing platform among different interactive mobile hospitals. For example, when a patient seeks medical treatment in different hospitals, data such as his diagnosis results can be shared between different hospitals through blockchain technology [2].

Secondly, blockchain technology facilitates telemedicine in interactive mobile hospitals.

Blockchain has powerful encryption technology and identity authentication mechanisms. Patients and doctors do not need to worry about data leakage during remote diagnosis, treatment, and consultation. When patients seek medical treatment in different interactive mobile hospitals, remote doctors can quickly obtain patient's past medical histories, historical examination reports, and other information through blockchain technology, improving the efficiency and quality of patient's medical treatment [3].

Thirdly, blockchain technology facilitates the auditing and supervision of the entire diagnosis and treatment process.

The transparency and traceability of blockchain technology enable patients to clearly understand the usage of their medical data and the execution process of medical services. More importantly, the immutability and traceability of blockchain can record information such as the operational behaviors of medical staff and medical decisions, which is convenient for the supervision and auditing of medical quality [4].

2 NOUN DEFINITIONS AND RELATED THEORIES

2.1 Definition of blockchain

Nakamoto's paper "Bitcoin: A Peer-to-Peer Electronic Cash System" is a classic document on blockchain technology. It marks the birth of Bitcoin and also makes blockchain technology begin to attract people's attention [5].

The hierarchical architecture of blockchain is shown in Figure 1.

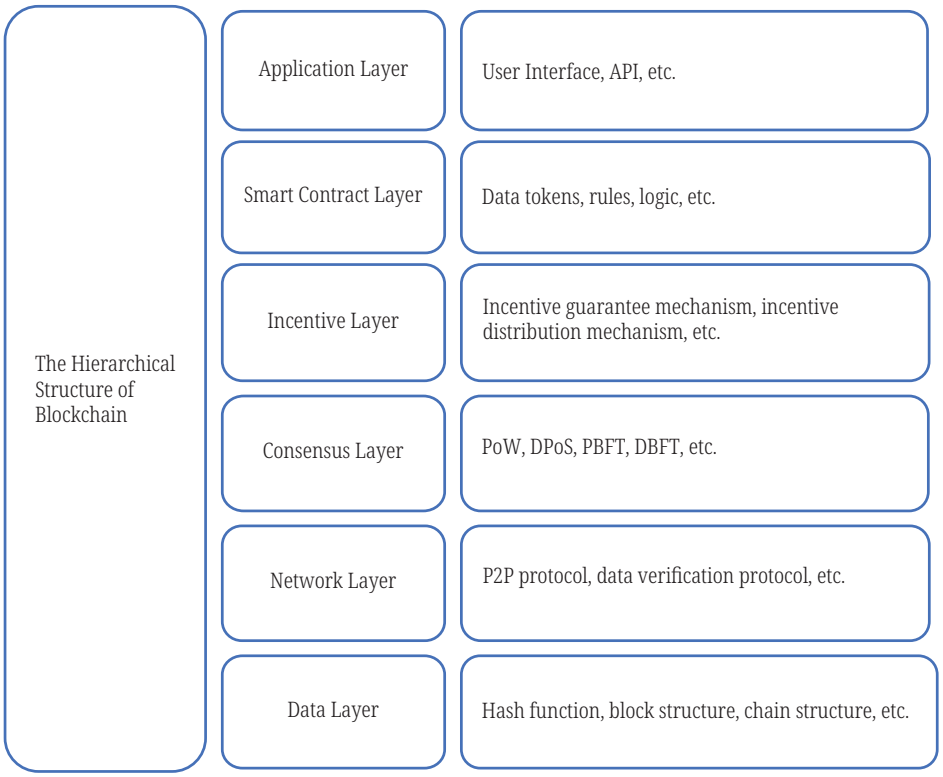

Fig. 1. Hierarchical architecture of blockchain

2.2 Progress of medical informatization

Taking China as an example, this paper lists various policies issued successively since 2017. The introduction of these policies has consolidated the informatization foundation of smart healthcare and promoted the healthy development of Internet-based medical services [6].

Since 2017, the National Health Commission of China has successively introduced a five-year plan for the development of national population health informatization, standards for health care big data, management measures for security and services, standards for the informatization construction of primary medical institutions, a standard system for the classification and evaluation of smart hospital services, as well as various systems and documents such as improving the appointment and diagnosis system and strengthening the construction of smart hospitals. In 2018, the State Council also issued guidelines to promote the development of "Internet + Medical Health" [7], [8].

The introduction of these policies has played a positive role in improving the quality of medical informatization services, innovating new medical service models, strengthening the supervision of the medical industry, and promoting the healthy and stable development of medical informatization [9].

2.3 Entropy method and FCE method

This paper uses the entropy method and the fuzzy comprehensive evaluation (FCE) method to calculate the risks. The main reason is that they can complement each other. The entropy method is suitable for the situation where there is a certain

correlation between the indicators. It can dig out the importance of the indicators through the analysis of the data. The FCE method is suitable for the situation where the evaluation objects are fuzzy and difficult to be described by accurate numerical values, as well as the situation where there are many evaluation indicators and the hierarchical structure is complex [10].

Therefore, combining the entropy method with the FCE method can use the objectivity of the entropy method to correct the subjectively determined weights in the FCE method, making the determination of weights more reasonable, and can more comprehensively and accurately deal with the complex problems in risk assessment [11].

3 RESEARCH METHODS

3.1 Risk identification

After referring to the relevant literature, this paper finds that the application of blockchain technology in interactive mobile hospitals has the following risks.

- **Technical risks:** Blockchain technology itself is still in the stage of continuous development and improvement, and its application in the medical field has not yet formed a mature technical system and solution. For example, there may be performance bottlenecks, making it difficult to meet the needs of rapid storage and retrieval of a large amount of data in hospitals, resulting in slow system response and affecting the efficiency of medical work [12].

  Medical data comes from a wide range of sources and has various formats, and the data standards among different medical institutions are not unified. This makes it difficult to integrate the data onto the blockchain, affecting the interoperability and sharing value of the data [13].

  Therefore, this paper believes that the application of blockchain technology in interactive mobile hospitals has technical risks.
- **Privacy risks:** Although blockchain encryption technology can enhance the privacy of data, there may still be risks of privacy leakage in practical applications [14].

  During the sharing process of medical data in interactive mobile hospitals, due to improper permission management, patients' data may be accessed by unauthorized personnel [15].

  Therefore, this paper believes that the application of blockchain technology in interactive mobile hospitals has privacy risks.
- **Compliance risks:** Application of blockchain technology in the medical field involves many legal and regulatory issues, such as patient privacy protection, data security, medical ethics, etc., and the current relevant laws and regulations are not yet perfect. When hospitals use blockchain technology, they may face compliance risks, such as whether the use and sharing of data meet the requirements of laws and regulations and the legal validity of smart contracts [16].

  Therefore, this paper believes that the application of blockchain technology in interactive mobile hospitals has compliance risks.
- **Management and operation risks:** Operational errors or violations by hospital internal staff may pose risks to the blockchain system. For example, employees may cause data errors due to mis-operations or violate access control regulations, resulting in the leakage of patients' data. In addition, the hospital's insufficient management and maintenance capabilities of the blockchain system may also affect the stable operation of the system [17].

The initial implementation of blockchain technology in hospitals requires a large amount of capital investment from the hospital for the procurement of software and hardware, personnel training, etc., and also requires operation and maintenance costs in the later stage [18].

The application of blockchain technology in hospitals often requires cooperation and coordination among multiple institutions, such as different hospitals, pharmaceutical companies, insurance companies, etc. If the interests of all parties are inconsistent during the cooperation process, problems such as weak willingness to share data and poor communication will occur, thus affecting the promotion and implementation of blockchain projects [19].

Therefore, this paper believes that the application of blockchain technology in interactive mobile hospitals has management and operation risks.

- **Cognitive and acceptance risks:** Most patients have limited knowledge of blockchain technology and may be worried about storing their medical data on the blockchain, fearing that the security and privacy of the data cannot be guaranteed, thus affecting the promotion and application of blockchain in the medical field [20].

  Some medical staff may have a low acceptance of new technologies, lack relevant technical knowledge and operation skills, and be unwilling to change the existing work processes and models, thus having a resistant attitude towards the application of blockchain technology in hospitals [21].

  Therefore, this paper believes that the application of blockchain technology in interactive mobile hospitals has cognitive and acceptance risks.

3.2 Risk analysis

To sum up, the risk model is established as shown in Table 1. For the scoring table of the risk model, it is planned to adopt the form of an online questionnaire.

Table 1. Risk model

First-Level Index	Second-Level Index	Very High/Relatively High/ General/Relatively Low/Very Low
Technical Risks	• Node Security Risk • Inconsistent Data Standards Risk • Smart Contract Vulnerabilities Risk	
Privacy Risks	• Privacy Protection Risk • Identity Verification Risk	
Compliance Risks	• Legal and Regulatory Risk • Supervision Risk	
Management and Operation Risks	• Internal Management Risk • Cost Input Risk • Cooperation and Coordination Risk	
Cognitive and Acceptance Risks	• Insufficient Patient Awareness Risk • Insufficient Acceptance by Medical Staff Risk	

A total of 30 scoring experts are planned to be selected. Among them, five professors from the School of Computer Science in universities will be selected, five technical experts from blockchain companies will be selected, five engineers from the construction party of the interactive mobile hospital system will be selected, seven staff members from the interactive mobile hospital will be selected, and eight patients will be selected. The situation of expert selection is shown in Table 2.

Table 2. Situation of expert selection

Expert Type	Position	Quantity
School of Computer Science in Universities	Professor	5
Blockchain Company	Technical Expert	5
Construction Party of Interactive Mobile Hospital System	Engineer	5
Interactive Mobile Hospital	Staff	7
Patient	None	8

3.3 Risk evaluation

On February 20, 2025, 30 experts used the entropy method to score each risk indicator respectively. The calculation results of the entropy method are shown in Table 3.

Table 3. Calculation results of the entropy method

First-Level Index	Weight	Second-Level Index	Entropy Value	Difference Coefficient	Weight	Comprehensive Weight
Technical Risks	.2276	• Node Security Risk • Inconsistent Data Standards Risk • Smart Contract Vulnerabilities Risk	.9435 .9619 .9471	.0565 .0381 .0529	.3833 .2580 .3588	.0872 .0587 .0817
Privacy Risks	.1391	• Privacy Protection Risk • Identity Verification Risk	.9613 .9485	.0387 .0515	.4286 .5714	.0596 .0795
Compliance Risks	.1356	• Legal and Regulatory Risk • Supervision Risk	.9533 .9589	.0467 .0411	.5317 .4683	.0721 .0635
Management and Operation Risks	.2620	• Internal Management Risk • Cost Input Risk • Cooperation and Coordination Risk	.9589 .9364 .9349	.0411 .0636 .0651	.2422 .3745 .3833	.0634 .0981 .1004
Cognitive and Acceptance Risks	.2357	• Insufficient Patient Awareness Risk • Insufficient Acceptance by Medical Staff Risk	.8995 .9477	.1005 .0523	.6576 .3424	.1550 .0807

In the FCE of this paper, five levels of evaluation comments are set for each indicator, that is, V = [V1, V2, V3, V4, V5] = [Very High, Relatively High, General, Relatively Low, Very Low], and the assigned values are V = [100, 80, 60, 40, 20]. Thirty experts score the indicators, establish a single-factor FCE, and the calculation results are shown in Table 4 as follows.

Table 4. Results of experts' scoring

	V1	V2	V3	V4	V5
Node Security Risk	2	6	10	9	3
Inconsistent Data Standards Risk	4	7	10	8	1
Smart Contract Vulnerabilities Risk	2	8	10	7	3
Privacy Protection Risk	8	8	6	7	1
Identity Verification Risk	4	7	11	5	3
Legal and Regulatory Risk	3	9	8	8	2

(Continued)

Table 4. Results of experts' scoring *(Continued)*

	V1	V2	V3	V4	V5
Supervision Risk	3	14	5	6	2
Internal Management Risk	4	8	11	5	2
Cost Input Risk	4	6	7	10	3
Cooperation and Coordination Risk	5	3	9	10	3
Insufficient Patient Awareness Risk	9	9	4	8	0
Insufficient Acceptance by Medical Staff Risk	3	10	8	6	3

Evaluation vector of technical risk

$$B_1 = (0.3833, 0.2580, 0.3588)\begin{bmatrix} 0.0667 & 0.2000 & 0.3333 & 0.3000 & 0.1000 \\ 0.1333 & 0.2333 & 0.3333 & 0.2667 & 0.0333 \\ 0.0667 & 0.2667 & 0.3333 & 0.2333 & 0.1000 \end{bmatrix}$$
$$= (0.0839, 0.2325, 0.3334, 0.2675, 0.0828)$$

Evaluation vector of privacy risk

$$B_2 = (0.4286, 0.5714)\begin{bmatrix} 0.2667 & 0.2667 & 0.2000 & 0.2333 & 0.0333 \\ 0.1333 & 0.2333 & 0.3667 & 0.1667 & 0.1000 \end{bmatrix}$$
$$= (0.1905, 0.2476, 0.2952, 0.1952, 0.0714)$$

Evaluation vector of compliance risk

$$B_3 = (0.5317, 0.4683)\begin{bmatrix} 0.1000 & 0.3000 & 0.2667 & 0.2667 & 0.0667 \\ 0.1000 & 0.4667 & 0.1667 & 0.2000 & 0.0667 \end{bmatrix}$$
$$= (0.1000, 0.3781, 0.2198, 0.2354, 0.0667)$$

Evaluation vector of management and operation risk

$$B_4 = (0.2422, 0.3745, 0.3833)\begin{bmatrix} 0.1333 & 0.2667 & 0.3667 & 0.1667 & 0.0667 \\ 0.1333 & 0.2000 & 0.2333 & 0.3333 & 0.1000 \\ 0.1667 & 0.1000 & 0.3000 & 0.3333 & 0.1000 \end{bmatrix}$$
$$= (0.1461, 0.1778, 0.2912, 0.2930, 0.0919)$$

Evaluation vector of cognitive and acceptance risk

$$B_5 = (0.6576, 0.3424)\begin{bmatrix} 0.3000 & 0.3000 & 0.1333 & 0.2667 & 0.0000 \\ 0.1000 & 0.3333 & 0.2667 & 0.2000 & 0.1000 \end{bmatrix}$$
$$= (0.2315, 0.3114, 0.1790, 0.2438, 0.0342)$$

Furthermore, the fuzzy membership matrix of the first-level indicators can be obtained as follows:

$$R = \begin{bmatrix} 0.0839 & 0.2325 & 0.3334 & 0.2675 & 0.0828 \\ 0.1905 & 0.2476 & 0.2952 & 0.1952 & 0.0714 \\ 0.1000 & 0.3781 & 0.2198 & 0.2354 & 0.0667 \\ 0.1461 & 0.1778 & 0.2912 & 0.2930 & 0.0919 \\ 0.2315 & 0.3114 & 0.1790 & 0.2438 & 0.0342 \end{bmatrix}$$

The weight vector of the first-level indicators calculated by the entropy method previously.

$$W = (0.2276, 0.1391, 0.1356, 0.2620, 0.2357)$$

Multiply the weight vector of the first-level indicators by the fuzzy membership matrix of the first-level indicators to obtain the overall evaluation vector.

$$B = WR = (0.1520, 0.2586, 0.2652, 0.2542, 0.0700)$$

According to the overall evaluation vector and the grade score vector, calculate the evaluation score using F = VBT.

$$F = VB^T = (100 \;\; 80 \;\; 60 \;\; 40 \;\; 20)\begin{bmatrix} 0.1520 \\ 0.2586 \\ 0.2652 \\ 0.2542 \\ 0.0700 \end{bmatrix} = 63.3705$$

After calculation, the overall score values are shown in Table 5.

Table 5. Results of risk score

Indicator	Risk	Risk Score
Second-level Index	• Node Security Risk	56.6667
	• Inconsistent Data Standards Risk	63.3333
	• Smart Contract Vulnerabilities Risk	59.3333
	• Privacy Protection Risk	70.0000
	• Identity Verification Risk	62.6667
	• Legal and Regulatory Risk	62.0000
	• Supervision Risk	66.6667
	• Internal Management Risk	64.6667
	• Cost Input Risk	58.6667
	• Cooperation and Coordination Risk	58.0000
	• Insufficient Patient Awareness Risk	72.6667
	• Insufficient Acceptance by Medical Staff Risk	62.6667
First-level Index	• Technical Risks	59.3491
	• Privacy Risks	65.8097
	• Compliance Risks	64.1854
	• Management and Operation Risks	59.8643
	• Cognitive and Acceptance Risks	69.2427
Overall	• Overall Risk	63.3705

4 CONCLUSIONS AND SUGGESTIONS

4.1 Conclusions

According to the above research results, the risk score of blockchain technology in interactive mobile hospitals is 63.3705, and the risk level is between general and relatively high.

Among them, the technical risk score is 59.3491, and the management and operation risk score are 59.8643. The risk levels are between relatively low and general.

The privacy risk score is 65.8097, the compliance risk score is 64.1854, and the cognitive and acceptance risk score is 69.2427. The risk levels are between general and relatively high.

4.2 Suggestions

Based on the above research conclusions, the following risk response measures are proposed.

- **Response measures for technical risks:** Interactive mobile hospitals should establish a real-time monitoring system to monitor the actual operation status of blockchain technology in hospital diagnosis and treatment and other links in real time. Potential problems should be detected and solved in a timely manner to ensure its stable and reliable operation [22].
- **Response measures for privacy risks:** Data should be encrypted during the transmission process in interactive mobile hospitals to ensure that there is no data leakage. In addition, hospitals should also establish strict data access rights, and configure different roles and rights according to users' usage situations to ensure data security [23].
- **Response measures for compliance risks:** Interactive mobile hospitals should pay close attention to laws, regulations, and policies strengthen the compliant operation of the application of blockchain technology in the field of interactive mobile hospitals. In terms of data protection, safe operation, and the division of medical responsibilities, it is necessary to ensure that all applications of blockchain technology in hospitals comply with the requirements of laws and regulations [24].
- **Response measures for management and operation risks:** Interactive mobile hospitals should establish a cross-departmental coordination mechanism to strengthen communication and collaboration among different departments and departments. At the same time, it is also necessary to optimize the entire business process, comprehensively sort out and optimize the hospital's business process, so that the application of blockchain technology in the hospital can achieve the unity of convenience and practicality [25].
- **Response measures for cognitive and acceptance risks:** Interactive mobile hospitals should publicize the application advantages and security of blockchain technology to doctors and patients through various channels, such as the hospital's official website, WeChat official account, Douyin and other social media, and electronic promotional brochures, so as to improve their awareness and understanding of blockchain technology and enhance their acceptance. In addition, it is also necessary to timely collect the opinions and suggestions of doctors and patients on the application of blockchain technology in interactive mobile hospitals. And according to the feedback information, the system should be continuously optimized and improved in a timely manner [26].

5 ACKNOWLEDGMENT

This study is supported by the National Social Science Foundation of China (Grant No. 20BGL218).

6 REFERENCES

[1] M. S. Uddin *et al.*, "Blockchain for drug supply chain management: A systematic literature review," *IEEE Access*, vol. 8, pp. 113371–113387, 2020.

[2] M. E. Gürsoy *et al.*, "A blockchain-based approach for secure and privacy-preserving genomic data sharing," *IEEE Transactions on Biomedical Engineering*, vol. 66, no. 12, pp. 3468–3478, 2019.

[3] K. K. Y. Wong *et al.*, "Blockchain in clinical trials: A systematic review," *Journal of Medical Internet Research*, vol. 21, no. 11, p. e14769, 2019.

[4] N. Su, "Application progress of blockchain technology in digital medicine and health," *Digital Medicine and Health*, vol. 2, no. 2, pp. 119–123, 2024.

[5] S. Nakamoto, "Bitcoin: A peer-to-peer electronic cash system," *Bitcoin*, 2008. [Online]. Available: https://bitcoin.org/bitcoin.pdf

[6] W. Liu *et al.*, "Current situation and development trends of research on internet hospitals in China based on citespace and VOSviewer," *Journal of Medical Informatics*, vol. 45, no. 2, pp. 45–52, 2024.

[7] P. Chen and J. H. Li, "Reflections on the informatization construction of hospitals in the context of 'internet + smart healthcare'," *China New Telecommunications*, vol. 26, no. 5, pp. 158–160, 2024.

[8] J. Wang, "Innovative paths for the informatization construction of hospitals under the 'internet + medical care' model," *China Health Industry*, vol. 21, no. 2, pp. 180–183, 2024.

[9] X. C. Sun, "Comparison of informatization modes between traditional hospitals and "internet + hospitals'," *China Digital Medicine*, vol. 19, no. 5, pp. 121–124, 2024.

[10] Y. F. Li, "Research on the business model and risk prevention of virtual accounts in Z bank," Kunming University of Science and Technology, 2021.

[11] H. L. Zhao, L. H. Yao, G. Mei, T. Y. Liu, and Y. S. Ning, "A fuzzy comprehensive evaluation method based on AHP and entropy for a landslide susceptibility map," *Entropy*, vol. 19, no. 8, p. 396, 2017. https://doi.org/10.3390/e19080396

[12] A. A. Mazlan, S. M. Daud, S. M. Sam, H. Abas, S. Z. A. Rasid, and M. F. Yusof, "Scalability challenges in healthcare blockchain system – A systematic review," *IEEE Access*, vol. 8, pp. 23663–23673, 2020. https://doi.org/10.1109/ACCESS.2020.2969230

[13] J. P. Bansler and E. C. Havn, "Pilot implementation of health information systems: Issues and challenges," *International Journal of Medical Informatics*, vol. 79, no. 9, pp. 637–648, 2010. https://doi.org/10.1016/j.ijmedinf.2010.05.004

[14] B. K. Mohanta, D. Jena, S. S. Panda, and S. Sobhanayak, "Blockchain technology: A survey on applications and security privacy challenges," *Internet of Things*, vol. 8, p. 100107, 2019. https://doi.org/10.1016/j.iot.2019.100107

[15] L. Ismail and H. Materwala, "A review of blockchain architecture and consensus protocols: Use cases, challenges, and solutions," *Symmetry*, vol. 11, no. 10, p. 1198, 2019. https://doi.org/10.3390/sym11101198

[16] M. E. Burge, "Apple pay, bitcoin, and consumers: The ABCs of future public payments law," *Hastings Law Journal*, vol. 67, no. 6, pp. 1493–1550, 2016.

[17] J. Kvedar, M. J. Coye, and W. Everett, "The expanding universe of telemedicine," *Health Affairs*, vol. 33, no. 2, pp. 194–199, 2014. https://doi.org/10.1377/hlthaff.2013.0992

[18] A. Mehrotra, D. P. Goldman, and H. A. Huskamp, "Can telemedicine improve health care access and quality?" *Health Affairs*, vol. 36, no. 7, pp. 1198–1205, 2017.

[19] R. Agarwal and J. Prasad, "A conceptual and operational definition of personal innovativeness in the domain of information technology," *Information Systems Research*, vol. 9, no. 2, pp. 204–215, 1998. https://doi.org/10.1287/isre.9.2.204

[20] L. Dong, D. Neufeld, and C. Higgins, "Top management support of enterprise systems implementations," *Journal of Information Technology*, vol. 24, no. 1, pp. 55–80, 2009. https://doi.org/10.1057/jit.2008.21

[21] D. Li *et al.*, "Determinants of patients' intention to use the online inquiry services provided by internet hospitals: Empirical evidence from China," *Journal of Medical Internet Research*, vol. 22, no. 10, p. e22716, 2020. [Online]. Available: https://doi.org/10.2196/22716

[22] D. W. Bates and H. Singh, "Safety of internet of things and connected devices in health care," *JAMA*, vol. 318, no. 19, pp. 1859–1860, 2017.

[23] J. G. Anderson and S. J. Jay, "Health information technology and patient safety: An agenda for advancing research," *Journal of Patient Safety*, vol. 11, no. 1, pp. 1–7, 2015.

[24] The Office of the National Coordinator for Health Information Technology, "Health IT Policy Committee Recommendations on Health IT and Privacy and Security," U.S. Department of Health and Human Services, 2015.

[25] P. C. Tang, J. S. Ash, D. W. Bates, J. M. Overhage, and D. Z. Sands, "Personal health records: Definitions, benefits, and strategies for overcoming barriers to adoption," *Journal of the American Medical Informatics Association*, vol. 13, no. 2, pp. 121–126, 2006. https://doi.org/10.1197/jamia.M2025

[26] M. D. Huesch, E. Currid-Halkett, and J. N. Doctor, "Public hospital quality report awareness: Evidence from national and californian internet searches and social media mentions," *BMJ Open*, vol. 4, no. 3, p. e004417, 2014. [Online]. Available: https://doi.org/10.1136/bmjopen-2013-004417.

7 AUTHORS

Cui Zhang is with the School of Information Engineering, Nanning College of Technology, Guilin 541006, China.

Xiaofeng Wang is with the College of Management, Shenzhen University, Shenzhen, China (E-mail: freewxf@szu.edu.cn).

Davron Aslonqulovich Juraev is with the Scientific Research Center, Baku Engineering University, Baku AZ0102, Azerbaijan; Department of Scientific Research, Innovation and Training of Scientific and Pedagogical Staff, University of Economics and Pedagogy, Karshi 180100, Uzbekistan.

Rakib Feyruz Efendiev is with the Department of Mathematics, Baku Engineering University, Baku AZ0102, Azerbaijan.

Xiao-Guang Yue is with the College of Management, Shenzhen University, Shenzhen, China.