Blockchain as a Reliable and Patient-centered Technology to Combat COVID-19 Pandemic

Reihane Sharif ✉

Ph.D. in Health Information Management, Health Information Management Research Center (HIMRC), Department of Health Information Management and Technology, School of allied medical sciences, Kashan University of Medical Sciences, Kashan, Iran. Email: Fr.sharif@yahoo.com, ORCID: http://orcid.org/0000-0002-2081-5093.

Leila Shokrizadeh Arani

Ph.D. in Health Information Management, Health Information Management Research Center (HIMRC), Department of Health Information Management and Technology, School of allied medical sciences, Kashan University of Medical Sciences, Kashan, Iran.

Healthcare industry is seeking newer technologies to identify, track, monitor, and control Coronavirus infections due to its spread. Management of this pandemic relies heavily on accurate and reliable data. COVID-19 information is primarily obtained from healthcare centers. Privacy and data security are one of the challenges and concerns of policymakers (1) as they are not controlled, stored, and collected properly according to the established guidelines. Blockchain Technology (BT) can help solve this problem by tracking the spread of coronavirus, identifying high-risk patients, and serving as a real-time infection control database. A blockchain is a decentralized, continuously growing list of records known as 'blocks' which are connected and secured by cryptography in the absence of a central authority. In this way, blockchains have been introduced as a technology capable of offering decentralization, transparency, immutability, autonomy, open-source, and anonymity (2, 3).

COVID-19 and blockchain: how do they relate?

BT is primarily used in healthcare for electronic health records, interoperability, and patient-centered control of patient records. Accordingly, a very important reason is the concept of self-identity. Through this unique digital identity, third parties cannot misuse personal health information by controlling access to it. It is, therefore, possible to collect data more effectively and review the movement of patients to ensure social distancing requirements while maintaining their identity at the same time.

Moreover, BT can help researchers and physicians record and make available real-time clinical information. Besides, by tracking the people who have access to the data, this method improves the accuracy of the data and keeps them secure and private.

In light of COVID-19's emergency, for significant interruptions in the medical equipment and drug supply chains, and the ever-increasing demand, BT is the best option for supplying and tracking medical equipment and drugs. Since it connects all stakeholders to a supply chain network and eliminates third-party agents, it speeds up the validation process and reduces costs, shortens supply chains, lowers operational risks, and facilitates faster settlements (4).

What challenges and limitations may blockchain-based applications have?

Blockchain-based applications are known to face challenges and limitations in terms of interoperability, immutability, speed, and patient engagement. The interoperability challenge stems from the fact that there is still no clear standard for developing blockchain-based healthcare applications. Therefore, applications created by different vendors or platforms may not be able to interoperate. Furthermore, users may request complete removal of their medical records. Blockchain, on the other hand, is immutable. Once the data have been stored, they cannot be modified or deleted. Additionally, blockchain-based processes cause significant delays. As an example, the Ethereum blockchain platform requires all nodes to participate in the validation mechanism. Therefore, this slows down processing and creates a significant delay. Patient interaction with blockchain data management is another challenge. Patients, especially the elderly and the young, may not be interested or capable of managing their own health records (5).

This study concluded that BT has important features. It includes interacting with systems, patient-centered control of patient records, securely coordinating and combining information from different providers, improving patient engagement, real-time registration of patients' clinical information by providers and making them available, and tracking and managing medicine and medical equipment supply chains. However, it is recommended to consider its challenges before using this technology in the healthcare industry.

References

1. Attaran M. Blockchain technology in healthcare: Challenges and opportunities. International Journal of Healthcare Management. 2022 Jan 2; 15(1):70-83. DOI:10.1080/ 20479700.2020. 1843887.

2. Sambana B. Block chain approach to Space Industry and Applications. EasyChair; 2021 May 17.

3. Botene PH, de Azevedo AT, de Arruda Ignácio PS. Blockchain as an enabling technology in the COVID-19 pandemic: a systematic review. Health and Technology. 2021 Nov;11(6):1369-82. DOI: 10.1007/s12553-021-00593-z.

4. Sharma A, Bahl S, Bagha AK, Javaid M, Shukla DK, Haleem A. Blockchain technology and its applications to combat COVID-19 pandemic. Research on Biomedical Engineering. 2020 Oct 22:1-8. DOI: 10.1007/s42600-020-00106-3.

5. Abd-Alrazaq AA, Alajlani M, Alhuwail D, Erbad A, Giannicchi A, Shah Z, Hamdi M, Househ M. Blockchain technologies to mitigate COVID-19 challenges: A scoping review. Computer methods and programs in biomedicine update. 2021 Jan 1;1:100001. DOI: 10.1016/j.cmpbup.2020.100001.