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Systematic Review on AI-Blockchain Based E-Healthcare Records Management Systems

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Applications of blockchain in ensuring the security and privacy of electronic health record systems: A survey

Abstract

Electronic health records (EHRs) are digitally saved health records that provide information about a person's health. EHRs are generally shared among healthcare stakeholders, and thus are susceptible to power failures, data misuse, a lack of privacy, security, and an audit trail, among other problems. Blockchain, on the other hand, is a groundbreaking technology that provides a distributed and decentralized environment in which nodes in a list of networks can connect to each other without the need for a central authority. It has the potential to overcome the limits of EHR management and create a more secure, decentralized, and safer environment for exchanging EHR data. Further, blockchain is a distributed ledger on which data can be stored and shared in a cryptographically secure, validated, and mutually agreed-upon manner across all mining nodes. The blockchain stores data with a high level of integrity and robustness, and it cannot be altered. When smart contracts are used to make decisions and conduct analytics with machine-learning algorithms, the results may be trusted and unquestioned. However, Blockchain is not always indestructible and suffers from scalability and complexity issues that might render it inefficient. Combining AI and blockchain technology can handle some of the drawbacks of these two technical ecosystems effectively. AI algorithms rely on data or information to learn, analyze, and reach conclusions. The performance of AI algorithms is enhanced through the data obtained from a data repository or a reliable, secure, trustworthy, and credible platform. Researchers have identified three categories of blockchain-based potential solutions for the management of electronic health records: conceptual, prototype, and implemented. The purpose of this research work is to conduct a Systematic Literature Review (SLR) to identify and assess research articles that were either conceptual or implemented to manage EHRs using blockchain technology. The study conducts a comprehensive evaluation of the literature on blockchain technology and enhanced health record management systems utilizing artificial intelligence technologies. The study examined 189 research papers collected from various publication categories. The in-depth analysis focuses on the privacy, security, accessibility, and scalability of publications. The SLR has illustrated that blockchain technology has the potential to deliver decentralization, security, and privacy that are frequently lacking in traditional EHRs. Additionally, the outcomes of the extensive analysis inform future researchers about the type of blockchain to use in their research. Additionally, methods used in healthcare are summarized per application area while their pros and cons are highlighted. Finally, the emphasized taxonomy combines blockchain and artificial intelligence, which enables us to analyze possible blockchain and artificial intelligence applications in health records management systems. The article ends with a discussion on open issues for research and future directions. © 2013 IEEE.

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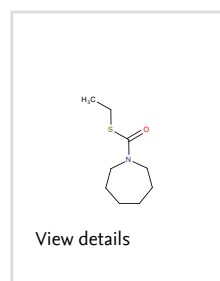
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