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Enhancing Data Privacy and Data Security across Healthcare: The Role of Blockchain Technology and Big Data on Healthcare Data

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Abstract. Lately, advanced technologies are developing as secure and trustworthy avenues for secure data sharing in use cases like the financial sector, manufacturing, energy, the internet, supply chain management, and most importantly healthcare. As the amount of data rapidly grows in nearly all these industries, the potent value for data analysis correspondingly soars – and so do the related privacy risks. Techniques and solutions of privacy protection developed some years back have become obsolete in today's bid data era. This is especially because they are either not strong enough or require the available data to be degraded to fit their capacity. Healthcare is ranked as a leading privacy-sensitive data domain and features some of the most unique regulatory requirements associated with privacy protection, mainly laid under notable industry-specific standards like the Health Insurance Portability and Accountability Act (HIPAA). In this light, security experts have developed contemporary tools and methodologies of privacy protection that enable simulated protection of healthcare data (data security) and privacy to leverage the potential of big data in the provision of healthcare while complying with state, international, and industry-specific regulations [5,18]. In this review survey, Blockchain and big data have been proposed as helpful tools to enhance data security and privacy across healthcare [1,2,4]. The goal of this study is to review the present state of data privacy and security in healthcare enabled by these state-of-the-art digital solutions in the provision of sturdy consent systems to patients, regarding the sharing of their sensitive, valuable information. The outcome of the review reveals that these contemporary tools enable fast, easy, efficient, and seamless interactions between data owners (patients) and data processors (healthcare organizations) while maintaining data security and privacy.

Main part. This qualitative review involved the accumulation of information from relevant research and resources regarding blockchain and big data solutions in healthcare. To enable effective selection of recent materials, the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) model was employed to conduct this qualitative review. The primary objective of the project was to survey the enhancement of data security and privacy in healthcare using blockchain and big data analytics. To compile the research, the scope of the study was specified using an established protocol, information sources, research strategy, eligibility criteria, and choice of sources.

Conclusion. Blockchain and big healthcare data bring credibility and reliability to clinical data. Patient data can be recorded on digital thumbprints as smart contracts that cannot be altered or stolen. Identity authentication of every participant, network infrastructure security, and consistent authorization patterns to access digital health data are some of the many benefits that come with the uptake of blockchain technology and big healthcare data.

References:
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