

Chapter 8

Application of AI and Blockchain Technologies in the Medical Domain

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ABSTRACT

The rapid advancements in artificial intelligence (AI) and blockchain technologies have brought about significant transformations in various sectors, including healthcare. This proposal outlines a research paper that aims to investigate the different approaches and applications of AI and blockchain technologies in the medical domain. By exploring the integration of these technologies, the authors seek to analyze their potential benefits, challenges, and ethical implications in revolutionizing healthcare practices. The study will involve a comprehensive review of relevant literature, case studies, and interviews with experts in the field. The findings will contribute to a deeper understanding of the synergistic effects of AI and blockchain in healthcare, paving the way for enhanced decision-making, data security, interoperability, and patient-centric care.

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INTRODUCTION

Blockchain technology is one of the most pioneering gizmos in the AI sector. The main focus on the facets of blockchain and artificial intelligence is to integrate these powerful technologies to bring about a meaningful distinction in healthcare by encouraging the application of a broadly analytical technology that can be involved in a more sheer risk management strategy. The required information on healthcare indices is assembled from the Web of Sciences and other Google surveys conducted by numerous governing agencies. This features has exhibited many prospects for developing dependable artificial intelligence models in e-Health employing blockchain, which is an open network for authorisation and sharing of information. The access of blockchain to view the medical reports of patients will be given to healthcare professionals and artificial intelligence uses a wide range of alleged algorithms and decision-making capabilities, as well as dealing with large quantities of information. Now, when there's an integration of the most recent breakthroughs of these technologies, there will be a medical system that is more efficient, affordable, and standardised. Blockchain makes it possible to reserve cryptographic records which is required by AI. Blockchain also assists the development of a system that prompts and manages content blocks called ledgers with secure and automated data analysis. The secure collection and evaluation of every bit of data about health will deliver rapid updates for medical professionals, payers, and healthcare workers. By adding AI algorithms to the blockchain, its functionality is advanced further (Tagde et al., 2021).

In the areas of data privacy, transparency, traceability, security, flexible access, immutability, and audit, present-day healthcare data management systems are facing serious obstacles. Additionally, the majority of the healthcare systems used for data management are centralized. This increases the risk of a single point of failure in the unfortunate occurrence of any natural disaster. To overcome these challenges blockchain technology is employed. It is a novel and decentralized technology that can drastically change the way data is being managed in healthcare systems. By integrating artificial intelligence and blockchain technology, the efficiency of data analytics could boost significantly. Blockchain helps in real-time data monitoring and AI would perform innovative analytics without any human interaction. This technology has been shown to minimize the necessity of routine medical tests in hospitals. Connected home health monitoring systems can cut the expenses of hospital stays, admission, and repeated diagnosis. It is projected that blockchain adoption can save up to \$100-\$150 billion in data breach-related expenditures by 2025, along with the reduction in fraud and counterfeit products (Yaqoob et al., 2021).

The study examines the relationship between healthcare systems and blockchain technology, focusing on the security and privacy aspects. It analyzes case studies of telecare medicine systems, Electronic Health Records (EHR), and e-Health. The study highlights potential challenges like scalability, storage capacity, and interoperability. However, it also promotes the implementation of blockchain technology in the healthcare domain, highlighting its potential to improve data security, confidentiality, and interoperability by decentralizing the healthcare network and utilizing blockchain-based approaches, schemes, algorithms, frameworks, or protocols. Overall, the importance of blockchain technology highlights the potential challenges it poses on healthcare thereafter providing apt solutions (Hussien et al., 2021).

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