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Privacy Preserving in Healthcare Sector Using Blockchain Technology

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Abstract: A distributed, decentralized ecosystem free from the necessity for a centralized authority is made possible by blockchain technology. The application of cryptographic principles ensures the security and dependability of processes. The healthcare sector is one in which blockchain technology has great promise due to the need to connect dispersed systems, enhance the accuracy of electronic medical data, and take a more patient-centric approach to healthcare systems' Electronic Healthcare Records (EHRs). A blockchain performs better in user verification and has increased the security of a healthcare database. Developing a Blockchain-based healthcare management system to provide privacy and security to patients' and doctors' data to address the overabundance of security-related concerns. This proposed system involves interactions between many medical substances. It provides security for both patients' and doctors' data. Additionally, a patient can simply and securely request medical insurance, and the insurance company can obtain verified patient data in a secure manner that prevents outside access. This proposed system uses the Python, Flask framework, TF Encrypted and MongoDB database which is available online for the system implementation. The time, memory usage and indexing time achieved for the proposed model is 9.7 ms and 9.5 Kb and 63 ms.

Keywords: *implementation, verification, indexing, blockchain, Python*

1. Introduction

Blockchain is viewed as having a lot of potential in a lot of sectors, including healthcare [1]. With the use of blockchain technology, access management, data exchange, and keeping track of a medical activity's audit trail are all made possible. Blockchain technology benefits clinical trials, the exchange of medical records, credentialing the provider, medical billing and various aspects. These technologies may also help to consolidate patient data, making it easier for different healthcare facilities to share medical records [2]. Blockchain removes the single point of failure traditionally provided by a centralized authority by enabling two or more parties to perform transactions in a distributed environment. As a broadly suggested technology, blockchain is presently viewed as having applications in several industries and use cases, including access control, settlement of disputes, tender documents, systems integration, insurance, and healthcare [3] [4]. Medical data of patients must be stored in the healthcare industry. This data is extremely sensitive, making them a target for cyber assaults. It is a need to protect all of this sensitive data.

An Electronic Health Record (EHR) is a database that includes information on a person's medical history, including information on ailments, prescriptions, medical images, and billing data. Sharing data securely is the biggest problem in healthcare systems since this data is sensitive and needs to be secured from unauthorized access. Before uploading to a public cloud, EHRs can be encrypted, which would be a common or naive approach to transmitting medical data [5].

Every block in the blockchain consists of a header and various transactions. Each successive valid block after the first one is formed has to contain the block header's hash output. The hash function of the previous block, which is present in every valid block, serves as a link between it. By joining each block to the previous one, a chain of blocks is created. Security study shows that this suggested system is resistant to numerous assaults and offers several desirable security aspects. Performance analysis demonstrates that, when compared to other equivalent systems, the suggested scheme is more efficient. A blockchain-based secure health insurance claims system was presented for a variety

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