A Blockchain based Electronic Medical Health Records Framework using Smart Contracts

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Abstract— The common issues in medical services within the country are mostly associated with doctors' referral process, data transfer between health institutions, and portals for patients to access their medical information. Specific issues arise, such as sharing health Records across institutes or hospitals, problems with misuse of data once shared, no security, etc. The Electronic Health Record (EHR) Framework on Blockchain addresses those issues, resulting from a collaboration of all stakeholders involved. This paper explores the likelihood of representing medical records to make sure data privacy, data accessibility, and data interoperability for the healthcare-specific scenario. Data privacy refers to affording protection to ensure data is available when needed and not used, imparted, accessed, altered, or deleted while being stored or retrieved, or transmitted. Data accessibility is the ability to access the data regardless of natural or artificial accidents, hardware, or others. Improving the accessibility of health data in the healthcare sector while ensuring privacy has been identified as a necessary capability that involves every individual and organization. Traditionally, healthcare interoperability has centered on sharing data between business institutions, such as various hospital systems. The emphasis has lately been on patient-driven information sharing, where the exchange of medical information is patient-mediated and patient-driven. We propose implementing a large-scale information infrastructure to access Smart Contracts sponsored by EHRs as information mediators. The decentralized nature of blockchain technology will aid in making the EHR accessible over a broader network. Using Blockchain will help make far-reaching changes in the healthcare industry by providing immutable, authentic, and accessible medical records, privacy, and faster payments.

Keywords— *medical information sharing, Blockchain-based EHR, Consent based Health data sharing, Healthcare Record Management.*

I. INTRODUCTION

Blockchain is a decentralized, distributed, and transparent digital ledger used for recording transactions through several machines, such that no precise record will be retroactively changed without modifying all subsequent blocks. The concept of the Blockchain was released as a white paper by Satoshi Nakamoto in the year 2008. Protected Health Information of every patient is the most critical asset of any health care system. Blockchain technology offers an impressive and creative way to maintain references to the dispersed patient data. An Electronic Health Record (EHR) is a comprehensive system collection of patient personal information and health records that are stored electronically in a digital format. EHRs are patient-driven authentic documents that deliver the information available to authorized stakeholders immediately in a secured manner. An EHR includes patients' personal and medical histories. The EHR framework aims to exceed standard clinical data collection to be more inclusive of a broader viewpoint on patient outcomes. Imagine that every EHR submitted updates to an open-source, community-wide trustworthy ledger about medications, issues, and allergy lists, so changes to the medical records are well understood and auditable across organizations. Instead of just displaying data from a particular database, the EHR could show data from any database referenced in the ledger. The outcome would be perfectly balanced community-wide information, with assured credibility from the point of data generation to the time of requirement, without manual human interference.

Key Features Of EHR

• Automate and streamline provider workflow

• Data can be devised and maintained by approved suppliers.

• Maintained in a sharable digital format across multiple organizations.

• Exchange data with parties such as laboratories, consultants, medical imaging centers, pharmacies, emergency departments, and clinics at school and in the workplace.

• Improves quality of care.

• Improves Diagnostics and Patient Outcomes

Reasons For Adopting Blockchain

Blockchain is extremely secure and thus allows the EHR to be secured. It extends the ability to deploy a network of stakeholders who has access in a layered approach. This way, it will enable the patient to control their medical records and authenticate whatever doctor they deem necessary. The patients will also control how little is to be shared using the Blockchain's secure network.