**SECURE ELECTRONIC MEDICAL RECORD SHARING USING BLOCKCHAIN TECHNOLOGY**

**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.

**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.

**PROBLEM STATEMENT**

The main problem of the current health care is that the organizations hold multiple and fragmented medical records of patients.

The Proposed System aims to solve the health care sector's current problems by hosting medical record transactions on the Blockchain to create a smart ecosystem. The goal is to provide secure access to patient data, avoiding the third party accessing it without permission.

**OBJECTIVES**

The aim or objective of our proposed project is to securely share patients health record details to doctor and lab technician and to prevent hacking or leaking of patients private data by using blockchain technology.

**EXISTING SYSTEM**

The main problem of the current health care is that the organizations hold multiple and fragmented medical records of patients. Data is stored in third party databases which is not secure and also may lead to loss of data during hardware failure. It takes more time to access data from database since data is stored in encrypted format.

**PROPOSED SYSTEM**

The Proposed System aims to solve the health care sector's current problems by hosting medical record transactions on the Blockchain to create a smart ecosystem. The goal is to provide secure access to patient data, avoiding the third party accessing it without permission.

EHR Framework uses blockchain technology to securely store the records and maintain a single version of the truth. The stakeholders will have to request permission to access a patient's history and commit the transaction to the distributed ledger.

**LITERATURE SURVEY**

1. **BIG DATA ANALYTICS FRAMEWORK FOR OPINION MINING OF PATIENT HEALTH CARE EXPERIENCE**

**Authors:** G. Sabarmathi and R. Chinnaiyan

**Year: 2020**

**Link:** [**https://ieeexplore.ieee.org/document/9076477**](https://ieeexplore.ieee.org/document/9076477)

**Abstract**

WAC (Web based life, Analysis and Cloud) s the data system that produces a seamless information spreading quicker that is bigger than a Big data. The huge amount of data derived from this humongous volume of information, so called Big data, demands the advancement of a proficient and viable choice with emotionally ground-breaking supportive network schemes in the region of healthcare. The pool of data could be investigated in a manner to assist the framework that more likely comprehend its partner requirements by gathering, mining conclusions on each subject of premium. Preciously administration might be able to acknowledge the crucial decision making process where the new investigations would be accounted for different research avenues. There is a tire need for review every break down and assess research outcomes of crosswise over writing that encouraged us to distinguish existing patterns, potential headings of the future work within the space. This article is going to deal with detailed review of existing research works proposed in the field of opinion mining for healthcare sector.

1. **INVESTIGATIONS ON BIG DATA FEATURES RESEARCH CHALLENGES AND APPLICATIONS**

**Authors:** G. Sabarmathi and R. Chinnaiyan

**Year:** 2017

**Link:** <https://ieeexplore.ieee.org/document/8250569>

**Abstract**

This paper evaluates the different dimensions of Big Data in various fields of applications with the Volume, Variety and frequency of generations of huge data. Also this paper focuses on the areas where large volume of data is being used for the growth and progress of the organizations, in which the data received currently, must ensure that it attains the uniqueness which will be taken by the different stakeholders of the organizations in their respective environments.

1. **RELIABLE MACHINE LEARNING APPROACH TO PREDICT PATIENT SATISFACTION FOR OPTIMAL DECISION MAKING AND QUALITY HEALTH CARE**

**Authors**: G. Sabarmathi and R. Chinnaiyan

**Year:** 2019

**Link:** <https://ieeexplore.ieee.org/document/9002593>

**Abstract**

In this paper a unique approach towards decision making process and better quality care in healthcare applications is developed by using the Machine Learning (ML) concepts as an alternative mode for identifying the characteristics and patient satisfaction (PS) in the proposed healthcare system. Extracting the information from raw data using some algorithmic approach is known as Data mining. In this a ML approach is used in determining the patient satisfaction in health care sector. Applied regression models to determine the patient satisfaction and also correlation methods is identified as an important attribute to be considered in determining the better quality of health care application models. The data set is taken based on the opinion on three types of data such as a) patient opinion towards hospital care b) nurse opinion towards workplace and c) Administrative aspects of healthcare. Our findings revealed high accuracy in Regression (88%), that helps in concluding by considering the administrative and workplace attributes related to patient satisfaction. The results are validated using traditional statistical methods like binomial correlation and linear regression.

**FUNCTIONAL REQUIREMENTS**

A functional requirement defines a function of a software-system or its component. A function is described as a set of inputs, the behavior, and outputs. The proposed system is achieved by implementing blockchain technology for securely sharing patient record to concerned people.

**NON-FUNCTIONAL REQUIREMENTS**

**EFFICIENCY**

To address the scalability issue, we propose an edge-centric clustering scheme to extract sparse social dimensions. In sparse social dimensions, the social dimension based approach can efficiently handle networks of millions of actors while demonstrating comparable prediction performance as other non-scalable methods.

**RELIABILITY**

The dynamic nature of networks entails efficient update of the model for collective behavior prediction.

**SOFTWARE REQUIREMENTS**

Operating System : Windows Family.

Development Tools : JDK 1.8 and Netbeans 8.2

Front End : Java Swings

Backend : Mysql Server 5.0 / blockchain technology

**HARDWARE REQUIREMENTS**

Processor : Any Processor above 3 GHZ.

Ram : 4 GB.

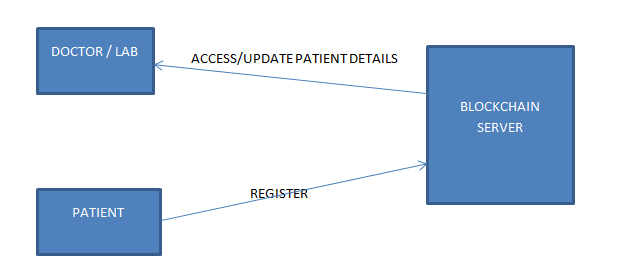
Hard Disk : 10 Gb.

Compact Disk : 650 Mb.

Input device : Standard Keyboard and Mouse.

Output device : VGA and High Resolution Monitor.

**SYSTEM ARCHITECTURE**



**CONCLUSION**

Adopting the Blockchain to deploy the EHR solves the significant issues of accessibility and authority. The Blockchain allows ease of access to the records as it is available to any personnel authorized to access them. Since it is deployed on a Distributed network, it can be accessed from anywhere. However, there are a few issues that could still be addressed in the future.