Report on

“Blockchain Technology”

B.E. [Computer Engineering]

Submitted By

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Problem Statement

Develop a Blockchain based application for health-related medical records

Introduction

Blockchain is an emerging technology being applied for creating innovative solutions in various sectors, including healthcare. A Blockchain network is used in the healthcare system to preserve and exchange patient data through hospitals, diagnostic laboratories, pharmacy firms, and physicians. Blockchain applications can accurately identify severe mistakes and even dangerous ones in the medical field. Thus, it can improve the performance, security, and transparency of sharing medical data in the health care system. This technology is helpful to medical institutions to gain insight and enhance the analysis of medical records. In this paper, we studied Blockchain technology and its significant benefits in healthcare. Various Capabilities, Enablers, and Unified Work-Flow Process of Blockchain Technology to support healthcare globally are discussed diagrammatically. Finally, the paper identifies and debates fourteen significant applications of Blockchain for healthcare. Blockchain plays a decisive part in handling deception in clinical trials; here, the potential of this technology offer is to improve data efficiency for healthcare. It can help avoid the fear of data manipulation in healthcare and supports a unique data storage pattern at the highest level of security. It provides versatility, interconnection, accountability, and authentication for data access. For different purposes, health records must be kept safe and confidential. Blockchain helps for the decentralised protection of data in healthcare and avoids specific threats. Blockchain helps marketers to maintain an overview of the products used in medicine. Health and pharmaceuticals will get rid of counterfeit medications using Blockchain technologies, enabling tracing of all these medicines. It helps discover the cause of falsification. Blockchain can guarantee the confidentiality of patient records; when medical history is developed, Blockchain can also store it, and this record cannot be modified. This decentralised network is used with all commodity hardware in the hospital. Researchers allow computing estimates for therapies, medicines, and remedies of diverse illnesses and disorders using the resources saved by these devices

Need of blockchain in healthcare

As far as healthcare is concerned, the urgency of development increases to more incredible speeds. Today the need is for quality health facilities supported by advanced and newer technologies. Here, Blockchain would play a critical role in transforming the healthcare sector. In addition, the landscape of the health system is moving towards a patient-centred approach focusing on two main aspects: accessible services and appropriate healthcare resources at all times. The Blockchain enhances healthcare organisations to provide adequate patient care and high-quality health facilities. Health Information Exchange is another time-consuming and repetitive process that leads to high health industry costs, quickly sorted out using this technology. Using Blockchain technology, citizens may take part in health study programs. In addition, better research and shared data on public wellbeing will enhance treatment for different communities. A centralised database is used to manage the entire healthcare system and organisations

Blockchain applications for healthcare

Blockchain is a relatively modern and emerging technology that has innovative applications during its successful healthcare implementation. Smooth, efficient data sharing and delivery across all the prominent network members and healthcare providers contribute to developing economical therapies and sophisticated treatments for many diseases. The opportunities offered by Blockchain technology in the logistics industry have been revealed recently and show the healthcare sector's advantages. As this area directly affects life quality, it is one of the first areas in which digital transformation improves and innovations. At the same time, Blockchain technology is becoming more common, mainly in the financial sphere. It offers several important and impressive chances for the healthcare industry, from science and logistics to relationships among practitioners and patients

The blockchain application for healthcare:

1. Managing electronic medical record (EMR) data
2. Protection of healthcare data
3. Personal health record data management
4. Point-of-care genomics management
5. Electronics health records data management
6. Interoperable electronic health records
7. Mobile health apps and remote monitoring
8. Data security

Implementation

Sample Code:

```
<html><head>

<title>Register Hospital</title>

</head> <body>

<p><a href="doctor.html"><button type="submit" class="hidden" style='margin-right:16px'>Doctor Registration</button></a><a href="patient.html"><button type="submit" class="hidden" style='margin-right:16px'>Patient Registration</button></a><a href="patient_details.html"><button type="submit" class="hidden" style='margin-right:16px'>View Patient Details</button></a><a href="record_details.html"><button type="submit" class="hidden" style='margin-right:16px'>View Medical Record</button></a><a href="examine_details.html"><button type="submit" class="hidden" style='margin-right:16px'>View Patient Examine details</button></a></p>

      <h1>Hospital Registration </h1>

      <script src="https://cdn.jsdelivr.net/npm/web3@1.2.8/dist/web3.js"></script>

   <script>

         var account;

         window.addEventListener('load', async () => {

if (typeof window.ethereum !== 'undefined') {

                        console.log("MetaMask is Available :) !");

                        }


                  if (window.ethereum) {

                        window.web3 = new Web3(ethereum);

                        ethereum.autoRefreshOnNetworkChange = false;

                        const accounts = await ethereum.enable();

                        account = accounts[0];

                        }
```

```
        else if (window.web3) {
                //window.web3 = new Web3(web3.currentProvider);
                window.web3 = new Web3(new
Web3.providers.HttpProvider("https://ropsten.infura.io/v3/cbd9dc11b30147e9a2cc974be655ef7c")); }
        else {
                console.log('Non-Ethereum browser detected. Please install MetaMask');
                }
                }); var abi = [
    {
        "inputs": [
                {
                        "internalType": "uint256",
                        "name": "hospital_id",
                        "type": "uint256"
                },
                {
                        "internalType": "string",
                        "name": "_hospital_name",
                        "type": "string"},
                {
                        "internalType": "string",
                        "name": "_hospital_address",
                        "type": "string"
                },
                {
                        "internalType": "string",
```

```
                "name": "_hospital_spec",
                "type": "string"
            }
        ],
        "name": "store_doctor_details",
        "outputs": [],
        "stateMutability": "nonpayable",
        "type": "function"
    },
```


Output:

Hospital Registration

Register Hospital

Enter Hospital Id:
Hospital Name:
Hospital Address:
Hospital Specification:
Register

To get details of a hospital Click Here

Patient Registration

Register Patient

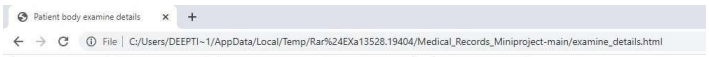
Enter Patient Id:
Patient Name:
Age:
Gender:
Height(in ft):
Weight(in kg):
Address:
Phone Number:
Email Id:
Date:

Patient's Attendant Details

Enter Patient Id:
Attendant Name:
Attendant Relation:
Phone Number:

Register

To get details of a patient Click Here



To update details of a patient body examine Click Here

Previous dates of medical record updated

Enter Patient Id:
Get Details
Dates:

Patient Body Examine Details

Enter Record Id: Get Details

Investigations

Blood Test:
Urine Test:
ECG:
MRI Scan:
CT Scan:
X-ray:
Lab Test(if any other):

General Examination

Built:
Nourishment:
Eyes:

Conclusion

There are innovative applications of Blockchain in healthcare due to inherent encryption and decentralisation. It enhances the security of patients' electronic medical records, promotes the monetisation of health information, improves interoperability among healthcare organisations, and helps counterfeit combat medicines. Different healthcare fields can change with Blockchain technology; areas like healthcare, digital agreements allowed by intelligent contracts constitute one of Blockchain's most critical applications. By removing intermediaries from the payment chain, intelligent contracts will minimise costs. The Blockchain potential in healthcare depends significantly on the adoption of associated advanced technologies in the ecosystem. It includes system tracking, healthcare insurance, medicines tracing, and clinical trials. Hospitals can chart their services using a Blockchain framework, even over the entire life cycle, using device tracking. Blockchain technology can well be used to improve patient history management, especially tracking and the insurance mediation process, thereby accelerate clinical actions with optimised data maintenance. Overall, this technology would significantly enhance and eventually revolutionise how patients and physicians treat and use clinical records and improve healthcare services.