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# Decentralised Identity Management for Healthcare using Blockchain

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**ABSTRACT\_** Blockchain-based decentralized identity management offers a viable way to increase the scalability and security of healthcare systems. Due to their centralization, traditional identity management systems are non-scalable, single-points of failure, and susceptible to hacking and data breaches. Decentralized identity management, on the other hand, can guarantee transparent and safe access to patient data while protecting privacy thanks to blockchain technology. With this method, patients have ownership over their personal health information, but medical staff has permission to access certain data as needed. We suggest BDIMHS, a permissioned blockchain-based decentralized identity management solution for healthcare systems, which integrates Hyperledger Aries and Indy. We provide high-level procedures for network startup, enrollment, registration, issuance, verification, and revocation functionalities together with additional definitions of necessary functionalities. With the use of selective disclosure, zero-knowledge proofs, decentralized identifiers, verifiable credentials, and zero-knowledge proofs, the suggested method enhances data security, privacy, immutability, interoperability, and patient autonomy. We also assess the security and performance of the suggested solution and talk about possible implementation issues in the healthcare industry.

## 1.INTROUCTION

Decentralized character the board in medical services utilizing blockchain innovation offers a change in outlook in how patient information is put away, got to, and oversaw safely. By utilizing

blockchain's changeless and straightforward record, people deal with their own wellbeing data while guaranteeing protection, interoperability, and security across medical services frameworks. This approach changes

patient-driven care, empowering consistent information dividing between suppliers while moderating dangers related with unified data sets and unapproved access. This article investigates the groundbreaking capability of decentralized personality the board in medical care, revealing insight into its advantages, difficulties, and future ramifications for the business.

As of late, the medical care industry has seen a flood in information driven drives pointed toward working on quiet consideration, improving functional productivity, and driving clinical development. Vital to these endeavors is the idea of personality the board - the course of precisely distinguishing and confirming people inside the medical care biological system. Generally, personality the board in medical services has depended on brought together data sets and exclusive frameworks, raising worries over information protection, security weaknesses, and interoperability limits. Because of these difficulties, another worldview has arisen: decentralized personality the board fueled by blockchain innovation.

Blockchain, initially considered as the fundamental innovation behind digital forms of money, has quickly

developed into a flexible instrument with applications across different ventures, including medical services. At its center, blockchain is a decentralized, changeless record that records exchanges in a straightforward and alter safe way. By saddling cryptographic methods and agreement systems, blockchain empowers secure information stockpiling and shared exchanges without the requirement for go-betweens or incorporated control. With regards to character the board, blockchain offers an original way to deal with resolving longstanding issues connected with personality check, information honesty, and client security.

One of the vital highlights of decentralized character the board is the idea of self-sovereign character - the possibility that people ought to have full command over their advanced personalities and individual information. In customary medical services frameworks, patient information is frequently siloed inside divergent data sets constrained by medical services suppliers, back up plans, and different partners. This divided methodology convolutes information sharing and interoperability as well as opens delicate data to security dangers and protection breaks. Decentralized

personality arrangements based on blockchain innovation look to cure these inadequacies by enabling people to deal with their characters freely, while holding the capacity to unveil data to approved parties specifically

## **2.LITERATURE SURVEY**

### **2.1 BLOCKCHAIN-BASED ACCESS CONTROL MODEL TO PRESERVE PRIVACY FOR PERSONAL HEALTH RECORD SYSTEMS**

The personal health record system could be seen as a promising solution for preventive care of the PHR owners. PHR system enables the exchange of information with healthcare provider and it can help to foresee the health issues. Personal health record (PHR) stores the health-related personal data and usually contains highly sensitive information. Some incorrect modification or alteration of any PHR data may cause an irreversible harmful consequence. Thus, privacy becomes a key ingredient for any PHR system. In particular, a tamper resistance property is the most important feature for PHR system. PHR system would significantly provide the high-quality preventive personal healthcare if the lifelong health-related information of an

individual can be securely captured and stored on tamper resistant storage. Immutability, cryptographic verifiability, and backup characteristics of blockchain

### **2.2 BLOCKCHAIN FOR SECURE CHRS SHARING OF MOBILE CLOUD BASED E-HEALTH SYSTEMS**

Recently, there has been a growing interest in employing the blockchain technology to promote medical and e-health services. Blockchain with its decentralized and trustworthy nature has demonstrated immense potentials in various e-health sectors such as secure sharing of Cloud Health Records (CHRs) and data access management among multiple medical entities. Therefore, the adoption of blockchain can provide promising solutions to facilitate Healthcare delivery and thus revolutionize the healthcare industry. Patients now can collect their personal health information at home based on mobile devices (such as smartphones and wearable sensors) and share on cloud environments where healthcare providers can access instantly to analyze medical records and provide timely medical supports. This smart e-health Service allows healthcare providers remotely monitor patients and offer

ambulatory care at home, which not only facilitates healthcare delivery but also brings economic benefits to patients. Further, the availability of complete CHRs on clouds also helps healthcare providers track patient health and offers proper medical services during diagnosis and treatment processes. Besides all these great advantages, however, the trend of CHRs storage on clouds also poses security challenges which hinder the deployment of e-health applications on clouds.

### **2.3 EMERGENCY ACCESS CONTROL MANAGEMENT SYSTEM FOR PERSONAL HEALTH RECORD BASED ON BLOCKCHAIN**

Some applications of big data for health care services and medications may be dealt with third parties or the public for surveys and the extraction of the useful report. In some cases, the healthcare data for sensitive patients may be exposed to malicious attacks, and the risks are involved in this process such as tampering and unauthorized access. Therefore, it is an essential issue that must be considered to ensure security and privacy during the system design for sensitive healthcare data. A PHR is a tool for electronically saving a person's lifelong health data. It

must grant specific access control for managing, tracing, and participating in their health care data. PHR carries integrated and complete health care data such as healthcare history, medication procedures, and significant disease as well as allergy information, home-monitored data, family member's history, social records and lifestyle, immunization record

### **3. PROPOSED SYSTEM**

Blockchain technology is a game-changer with the potential to impact not one or two industries, but the complete landscape of how business is done. When 200 healthcare executives were surveyed, 16 percent expect to have a commercial blockchain solution at scale sometime this year. The key players for blockchain adoption will be regulators, industry groups and market makers. Managing and securing data within healthcare and supply chain.

#### **Healthcare**

Better data sharing between healthcare providers means a higher probability of accurate diagnoses, more effective treatments, and the overall increased ability of healthcare organizations to deliver cost-effective care. Blockchain technology can allow various stakeholders in the healthcare value-chain

to share access to their networks without compromising data security and integrity, by allowing them to track data provenance as well as any changes made.

### **Health Chain Management**

One of the most Merkle Hash Tree applicable aspects of blockchain technology is that it enables more secure and transparent monitoring of transactions. With blockchain, the transactions can be documented in a permanent decentralized record reducing time delays, added costs and human errors.

Data managed by medical organizations includes:

- Patient health information (PHI);
- Cloud Health Records;
- Data collected from monitoring systems.

## **3.1 IMPLEMENTATION**

### **Healthcare Roles**

Doctor, Nurse, Pathologist, Administrator: These roles represent the users who will interact with the system.

Each role has specific permissions and access rights to patient data.

### **Blockchain Handshaker**

Function acts as the interface between healthcare users and the blockchain network. Blockchain Wrapper implements the communication protocol with the blockchain, ensuring secure and efficient data handling.

### **Verification Process**

Medical transactions are sent to the blockchain for verification. If Acknowledgment is once verified, the system sends back a confirmation to the Blockchain Handshaker.

### **Cloud Integration**

Cloud-based EHR Management System manages electronic health records in a cloud environment, providing scalability and remote accessibility. Cloud Database stores patient data securely in the cloud, allowing for efficient data retrieval and management.

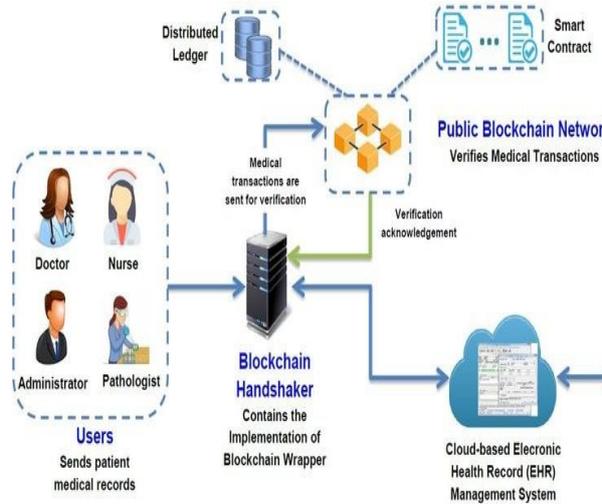
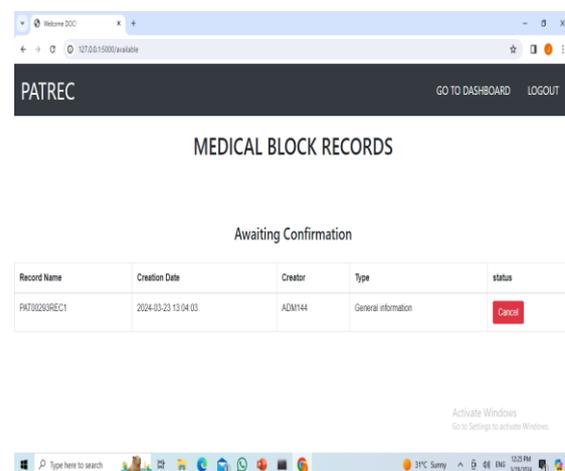
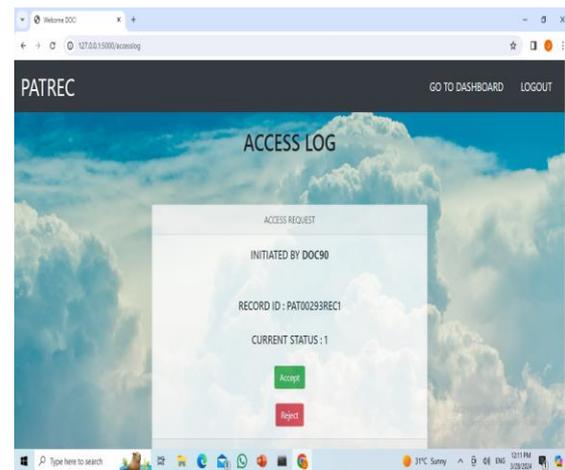
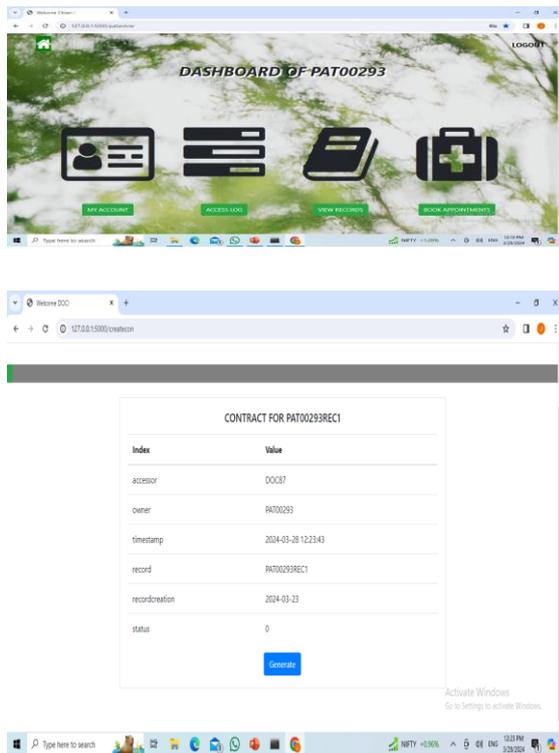


Fig 1: Architecture

This architecture leverages the inherent security and transparency features of blockchain technology to manage identities and medical records. The decentralized approach ensures that no single entity has control over the entire system, which enhances trust and reliability in the system. The integration with cloud services suggests a modern, scalable solution that can adapt to the growing needs of the healthcare industry.

#### 4.RESULTS AND DISCUSSION





MEDICAL BLOCK RECORDS	
RECORD ID: PAT00293REC1	
CREATED ON: 2024-03-23 13:04:03	
ID	PAT00293REC1
owner	PAT00293
Type	General information
creator	ACM144
gender	Female
Age	22
Weight	67
height	6
BMI	18611.111111111113
Blood_grp	O+
BP	433

## 5.CONCLUSION

The patient has lifetime access to and secure usage of their report through the Decentralised Identity Management for Healthcare utilizing Blockchain technology. The patient's private key is used, and it can be used to access the reports going forward. A person lacking the private key is unable to participate in the data retrieval procedure. As a result, patient health records are better protected using Block-Chain technology and may be accessed by the patient using their own private key for future reference. The challenge of acquiring Ethereum units is currently a major barrier to using the Ethereum platform.

## REFERENCES

[1] Lyndon Lyons and Andreas Bachmann Jan Seffinga, "The Blockchain (R)evolution –The Swiss Perspective", Switzerland, 2017.

[2] Don Tapscott and Alex Tapscott, "Realizing the Potential of Blockchain-A Multi-stakeholder Approach to the Stewardship of

Blockchain and Cryptocurrencies," in *World Economic Forum*, 2017.

[3] Alex Tapscott, *BLOCKCHAIN REVOLUTION: Understanding the 2nd Generation of The Internet and the New Economy*, 2017.

[4] Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, 2008, White Paper.

[5] George F. Hurlburt and Irena Bojanova, "Bitcoin: Benefit or Curse?", in *IEEE*, 2014.

[6] Nicola Dimitri, *The Blockchain Technology: Some Theory and Applications*, 2017, MSM-Working Paper No.2017/03.

[7] Deokyeon Ko, Sujin Choi, Sooyong Park, Kari Smolander Jesse Yli-Huumo, "Where Is Current Research on Blockchain Technology? A Systematic Review," October 2016.

[8] Nirmala Singh and Sachchidanand Singh, "Blockchain: Future of financial and cyber security," in *IEEE*, Noida, 2016.

[9] Engin Zeydan and Suayb Sb Arslan Gültekin Berahan Mermer, "An overview of blockchain technologies: Principles, opportunities and challenges," in *IEEE*, Turkey, 2018.

[10] Narn-Yih Lee, Chien Chi and Yi-Hua Chen Jiin-Chiou Cheng, "Blockchain and smart contract for digital certificate," in *IEEE*, Japan, 2018.

[11] Henrique Rocha, Marcus Denker and Stephane Ducasse Santiago Bragagnolo,

"SmartInspect: solidity smart contract inspector," in *IEEE*, Itly, p. 2018.

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