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Department of CSE, Velammal Engineering College, Chennnai, India

Fortified Chain A Blockchain Based Frame for Security and Privacy Assured Internet of Medical things

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ABSTRACT: We have introduced the hybrid computing paradigm with blockchain-based Distributed Data Storage System (DDSS) to overcome blockchain-based cloud centric IoMT healthcare system drawbacks like high latency, high storage cost and single point of failure. A decentralized Selective Ring based Access Control (SRAC) mechanism is introduced along with device authentication and patient records anonymity algorithms to improve the proposed systems security capabilities.

KEYWORDS: Blockchain, Reduce high cost storage, Patient Records Database, Doctor Database.

I. INTRODUCTION

The Internet of medical things (IoMT) is an integrated embedded system of software, hardware, network access, and sensor/actuators. As these systems are more sophisticated and interfere with critical healthcare operations, due to which it raises many security and privacy issues. However, IoMT technology revolves at a greater speed, yet majority of devices are resource-constrained and limits us from considering the high-end mechanism for security and privacy perspectives. Regardless of having multiple protocols and standards for IoMT ecosystems, it lacks in security and privacy issues. In addition, the classical cloud-centric healthcare systems have inherent problems like a single point failure, lack of transparency, low level of control over personal data, and high latency. Because of less availability of medical service professionals, the healthcare industry is unable to provide critical healthcare services to large number of patients during pandemic time. These particular technical challenges are achievable with the help of a perfect combination of protocols, mechanisms, and enhanced system architecture. The remote patient monitoring system (RPMS) helps the healthcare service providers to eliminate unnecessary engagement of professionals in regular consultancy and provides more time for understanding the patient's health issues to improve the patient health status. It is suggestible to have a parallel supporting system to automate primary healthcare services to handle pandemics with limited healthcare professionals.The blockchain technology is a decentralized distributed ledger system which provides smart-contracts, and exhibits traceability, transparency in digital asset management. The transactions in blockchain are represented as blocks linked together to form a chain of blocks. If one block or transaction is forced to alter, then we need to change the entire chain header information of that blockchain. The transaction integrity is maintained by using Merkel tree mechanism. However, use of blockchain technology for IoMT or H-CPS is not straightforward due to several deficiencies in the original blockchain, such as lack of scalability and high computational demand. The smart-contracts automates event-driven actions without intervention of a third party to provide a cost-effective automation solutions. In order to mitigate large data storage problem of blockchain, we have adopted a distributed data storage system (DDSS) named as Inter Planetary File System (IPFS). The chosen DDSS provides a content-centric peer-to-peer faster data sharing. It uses data caching and file versioning to maintain multiple documents with same name. However, when a large size file is uploaded to DDSS, it breaks the file into multiple objects of 256kb and connects all these objects to an empty object to retrieve the complete file using Distributed Hash Tables (DHTs).

II. RELATED WORK

The security issue impacting the Internet-of-Things (IoT) paradigm has recently attracted significant attention from the research community. To this end, several surveys were put forward addressing various IoT-centric topics, including intrusion detection systems, threat modelling and emerging technologies. In contrast, in this paper, we exclusively focus on the

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ever-evolving IoT vulnerabilities. In this context, we initially provide a comprehensive classification of state-of-the-art surveys, which address various dimensions of the IoT.

III. METHODOLOGY

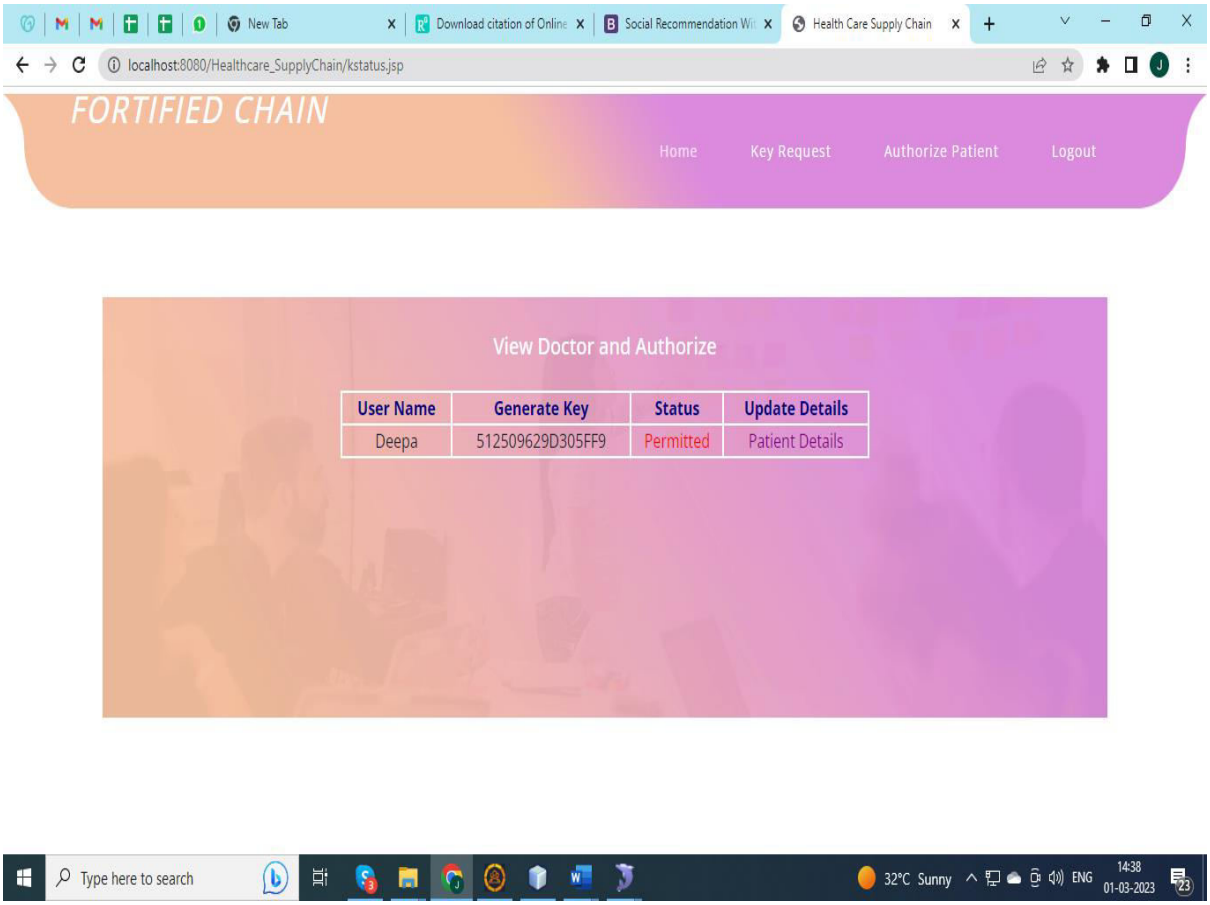
The Java Platform

A *platform* is the hardware or software environment in which program runs. We've already mentioned some of the most popular platforms like Windows 2000, Linux, Solaris, and MacOS. Most platforms can be described as a combination of the operating system and hardware. The Java platform differs from most other platforms in that it's a software-only platform that runs on top of other hardware-based platforms.

You've already been introduced to the Java VM. It's the base for the Java platform and is ported onto various hardware-based platforms.

The Java API is a large collection of ready-made software components that provide many useful capabilities, such as graphical user interface (GUI) widgets. The Java API is grouped into libraries of related classes and interfaces; these libraries are known as *packages*. The next section, What Can Java Technology Do? Highlights what functionality some of the packages in the Java API provide.

IV. EXPERIMENTAL RESULT



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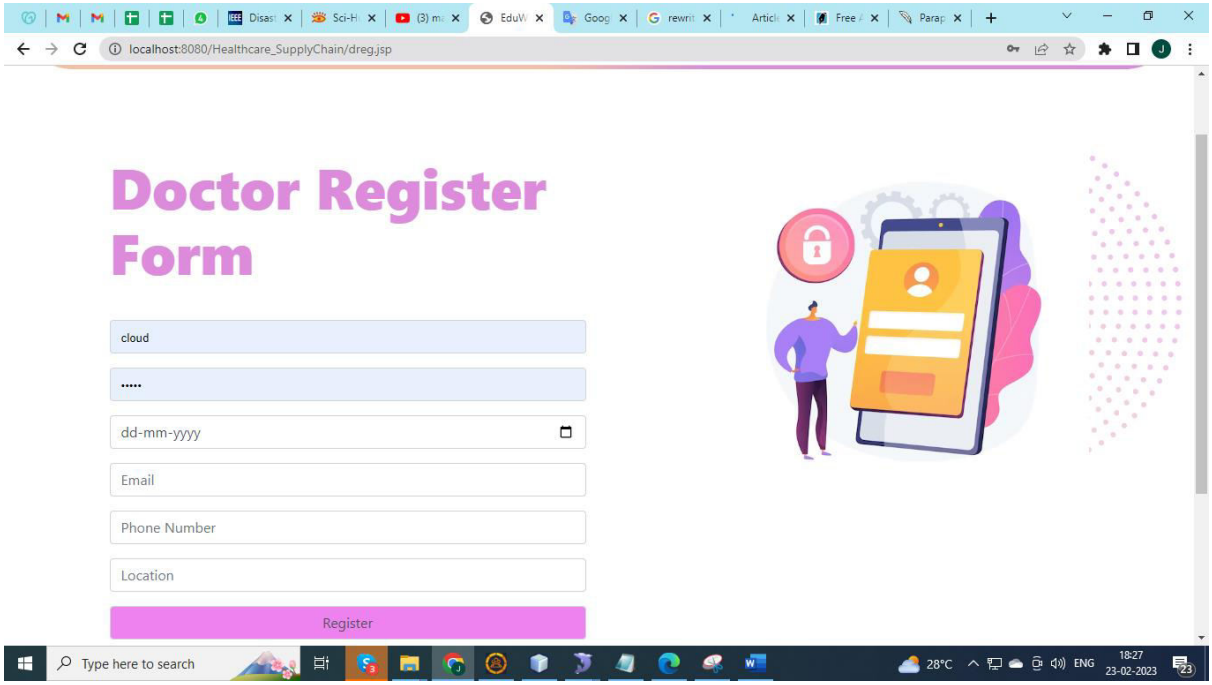

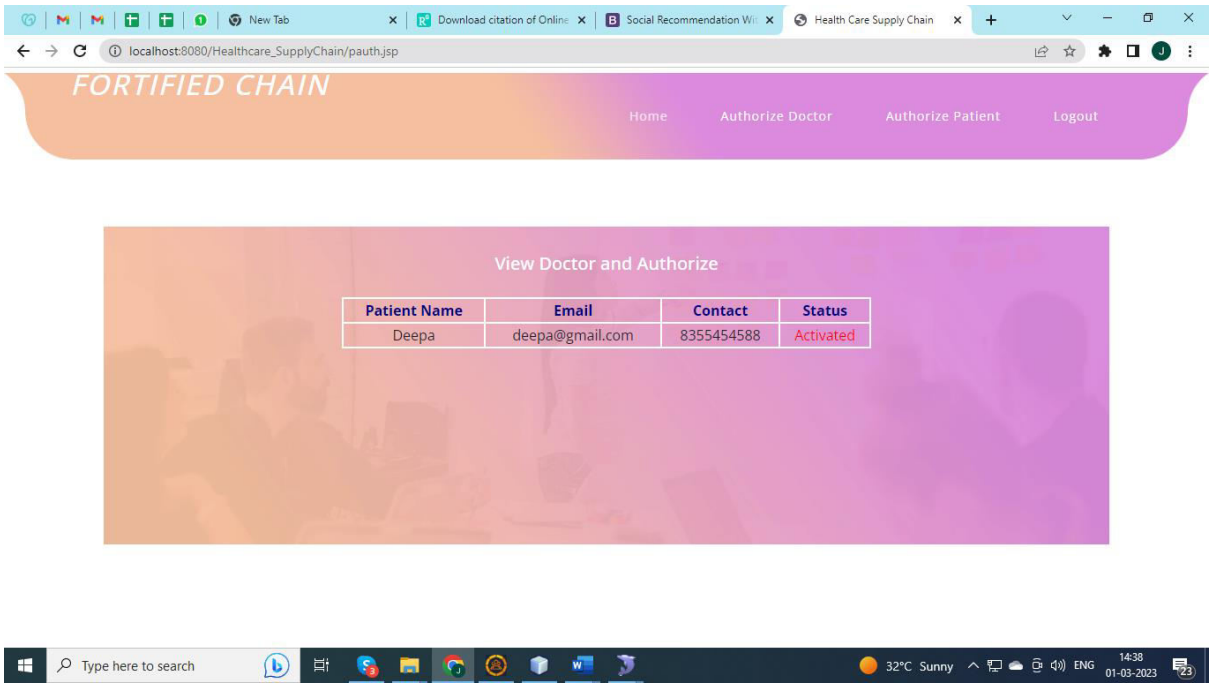

V. CONCLUSION

In this work, we have elucidated a novel approach to solve the problems related to latency, data security, privacy, anonymity, and traceability in decentralized IoMT based smart healthcare architecture level solutions to the discussed issues. The system level traceability is achieved through blockchain-based tamper-proof public ledgers. The SRAC and other proposed cryptography techniques assure the medical data security and privacy. On the other hand, smart contract automates the medical emergency alerting and primary medical services. Simultaneously, the proposed architecture provides a platform fordifferent stakeholders in the healthcare industry to make digital agreements. In the logical analysis, our system exhibited expected functionalities like low latency in data sharing for critical situations. In the

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future work, we will explore the techniques to leverage the intelligence to our system by using AI/ML technology. Our focus will be on future generation critical patient monitoring and assisting system framework requirements to deal with different types of pandemics. Aim of our future work is to provide a robust system to enhance healthcare services capability along with quality of services (QoS). Moreover, we will develop a full level prototype with all the proposed capabilities in real time scenario. In addition, the future work will be able to detect and alert all stake holders about pre pandemic identifications related to a particular area in real time.

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