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IoT Health guard withBlockchain

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ABSTRACT: The convergence of the Internet of Things (IoT) and blockchain technologies has paved the way for innovative solutions in healthcare, and "IoT HealthGuard with Blockchain" is at the forefront of this revolution. This system introduces a robust, secure, and efficient approach to health monitoring, data management, and privacy in the healthcare sector. IoT HealthGuard leverages a network of interconnected sensors and devices to continuously collect and transmit a patient's vital signs and health-related data. This data is securely stored on a decentralized blockchain ledger, ensuring immutability, transparency, and integrity. Utilizing blockchain technology enhances data security and allows for permission access, putting the patient in control of their healthcare information. Key features of IoT HealthGuard with Blockchain include real-time monitoring of vital signs, secure and transparent data sharing with healthcare providers, encrypted end-to-end communication, and automated smart contracts for streamlined healthcare processes. Patients can grant specific permissions for access to their data, ensuring privacy and confidentiality.

KEYWORD: Blockchain, IoT, Data security, Smart contracts, Real-time monitoring, Healthcare providers, Immutability

I. INTRODUCTION

In the dynamic landscape of modern healthcare, the convergence of cutting-edge technologies has given rise to innovative solutions that promise to transform the way we monitor, manage, and secure our health data. "IoT HealthGuard with Blockchain" is a groundbreaking system at the forefront of this technological revolution. It seamlessly combines the power of the Internet of Things (IoT) with the security and transparency of blockchain technology to create a comprehensive and patient-centric approach to healthcare.The IoT HealthGuard system represents a new era in health monitoring, offering real-time tracking of vital signs and health-related data. These data streams are securely stored on a decentralized blockchain ledger, ensuring unparalleled data integrity and security. Moreover, the integration of blockchain enables permissioned access, putting the patient in control of their healthcare information and ensuring their privacy. In this introduction, we embark on a journey to explore the innovative blend of IoT and blockchain within the realm of healthcare. We will delve into the key features and advantages of IoT HealthGuard with Blockchain, showcasing its potential to redefine healthcare systems by offering continuous monitoring, enhanced data security, and the empowerment of patients in managing their well-being. This system represents a monumental step toward a future where healthcare is not only more efficient but also more patient-centric and secure.

II. RELATED WORKS

IoT (Internet of Things) healthcare monitoring refers to the application of IoT technology to monitor and manage the health and well-being of patients, either in a clinical setting or remotely. This approach involves the use of interconnected devices and sensors to collect and transmit health-related data, which can be analyzed and acted upon by healthcare providers. Patients with chronic diseases like diabetes, hypertension, or heart conditions can use IoT monitoring to track their health regularly and manage their conditions more effectively. This reduces the need for frequent in-person visits and empowers patients to take control of their health.

III. EXISTING METHOD

Cloud-based EHR systems allow healthcare providers to store, manage, and access patient records electronically. This enables seamless sharing of patient information among different healthcare facilities while ensuring data security. IoT devices, such as wearables and home monitoring equipment, collect patient data and transmit it to the cloud. This data can include vital signs, medication adherence, and symptoms.Many healthcare providers offer cloud-based patient portals where patients can access their health records, and test results, and communicate with their healthcare teams.

These portals enhance patient engagement and access to information.

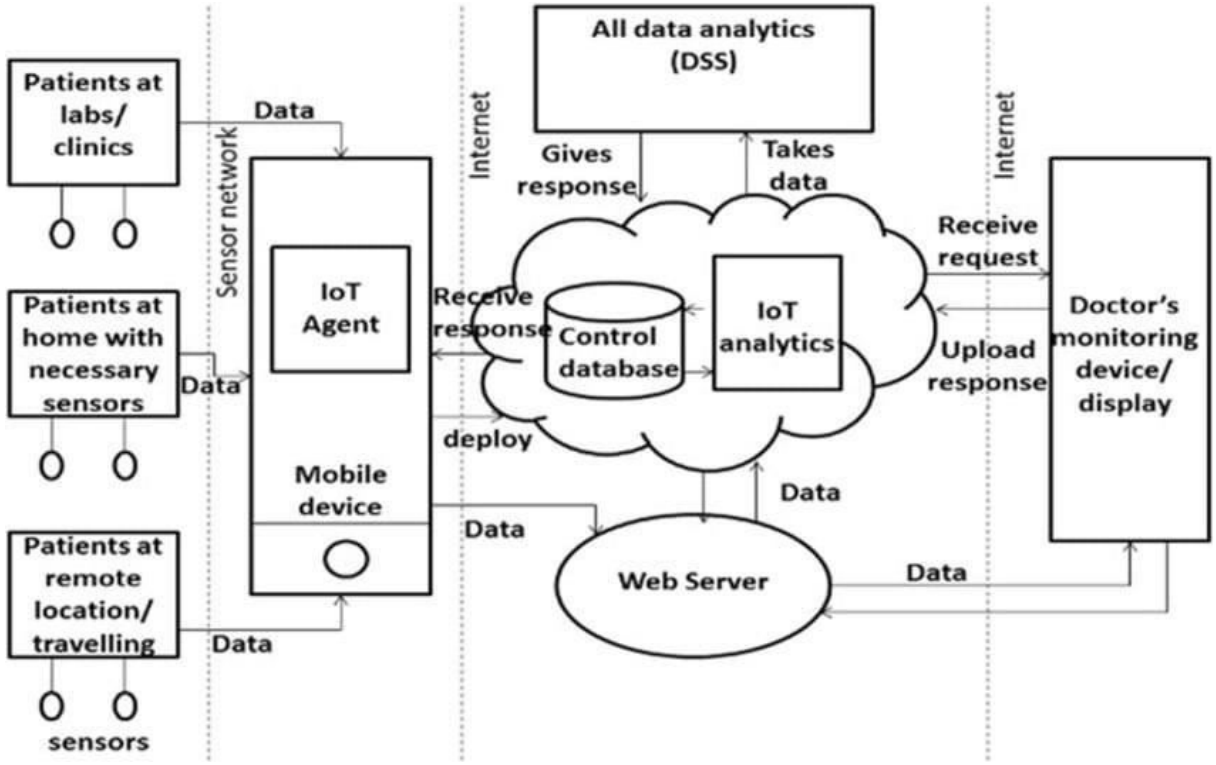
IV. PROPOSED SYSTEM

Blockchain enables secure and tamper-resistant health data exchange among different healthcare providers, patients, and relevant stakeholders. Patientscan control access to their health records, and authorized parties can view a complete and immutable medical history. Patients can maintain their Personal Health Records (PHR) on a blockchain. They have full control over who accesses their data, making it an excellent tool for healthcare monitoring, as patients can grant permission to different healthcare providers as needed. Blockchain can be used to manage patient consent and data-sharing preferences. Smart contracts canenforce rules, allowing patients to specify who can access their data, under what conditions, and for how long. Blockchain employs advanced encryption and consensus mechanisms to secure health data. It helps address privacy concerns and ensures that data is only accessible to authorized parties.

V. BLOCK DIAGRAM

It encompasses several facets, such as health surveillance, early disease detection, and treatment. The foundation of remote monitoring relies on a combination of IoMT, cloud computing, blockchain, and modern biotechnology, which are extensively employed in all its aspects. To comprehend the IoMT architecture for Remote Health Monitoring (RHM), it's crucial to grasp the components of a comprehensive IoMT system. The cloud serves as a pivotal element in this architecture, housing the IoMT software responsible for storing and analyzing data collected from sensors, followed by decision-making. For instance, blood pressure measurements are archived on the cloud, and in case of abnormal readings, actions are triggered, such as notifying a healthcare provider."

BLOCKCHAIN: The accuracy and robust security of data exchange between devices and the cloud are of paramount importance. Specifically in the realm of Remote Health Monitoring (RHM), highly sensitive patient medical information is stored and transmitted between devices and the cloud. Hence, it is critical to have stringent security measures in place to safeguard this data. Blockchain technology emerges as a highly valuable asset in RHM use cases, especially in terms of ensuring security and privacy. Blockchain is essentially a decentralized database that maintains an ever-expanding, orderly list of records, known as "blocks." These blocks are interconnected through cryptographic means, with each block containing a cryptographic hash of the preceding one, along with a timestamp and transactional data.



(fig1).Architecture of Healthcare Monitoring System

Remote Health Monitoring (RHM) systems can employ blockchain- based smart contracts as a core component of their architecture to enhance data security. Smart contracts ensure that only authorized individuals can access the block, and designated nodes can verify new blocks within the system. Security measures can be enforced through the concept of valid from inserting false transactions into the chain since only pre-authorized, verified nodes can be part of the network. The architecture p blocks, which necessitate signatures from a specified minimum number of members. This approach prevents any malicious nodes from leveraging the versatility of smart contracts within the blockchain system. These smart contracts are modular and can be customized to send notifications to both patients and healthcare professionals.

VI. EXPERIMENTAL RESULT

"In this paper, we introduce a secure health monitoring system built on blockchain technology. Our system incorporates a secure and probabilistic routing algorithm based on blockchain for consensus validation. To assess its performance, we conducted a comparative analysis between our model andestablished epidemic routing methods. Furthermore, we employ a transfer learning mechanism within our approach to classify patient information, a criticalfactor in determining their health status. Our study involves simulations using a skin dataset, with each patient's information assigned to one of seven predefined classes. The proposed routing strategy incorporates elements like probability, credibility rating, node energy, among others, to efficiently direct data to its destination, reducing network overhead and minimizing energy consumption. Toemulate realistic human mobility, we utilized the STEPS model for simulation. The results of our simulations clearly demonstrate the superior performance of our proposed scheme when compared to benchmark methods, and it reinforces security through blockchain implementation."

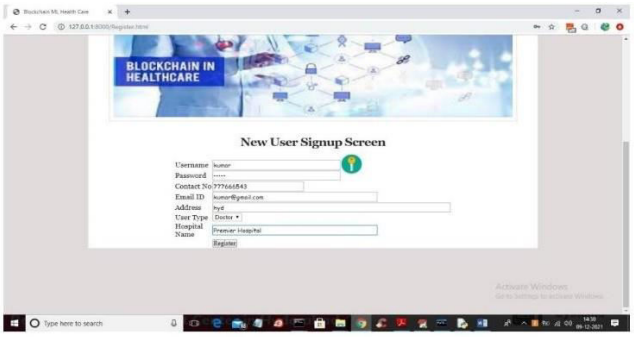


Fig 1: Sign up Page

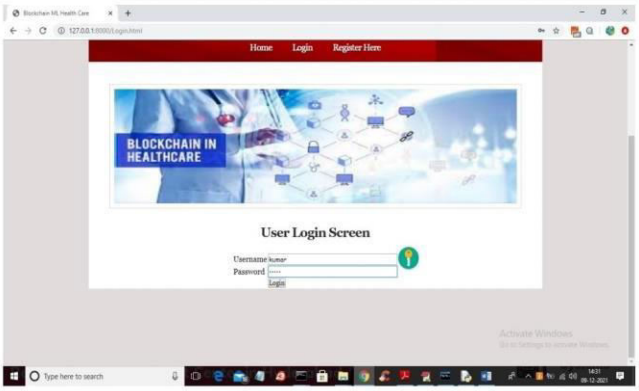


Fig 2: Login Page

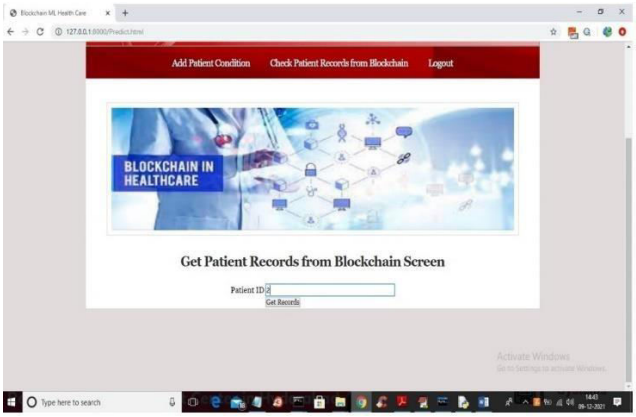


Fig 3: Patient record From blockchain screen

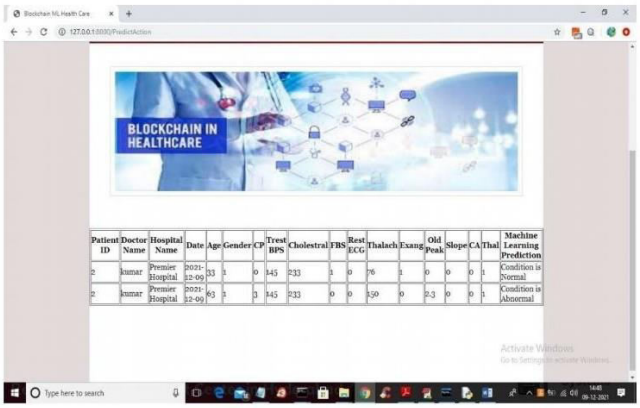


Fig 4: Details of Patient

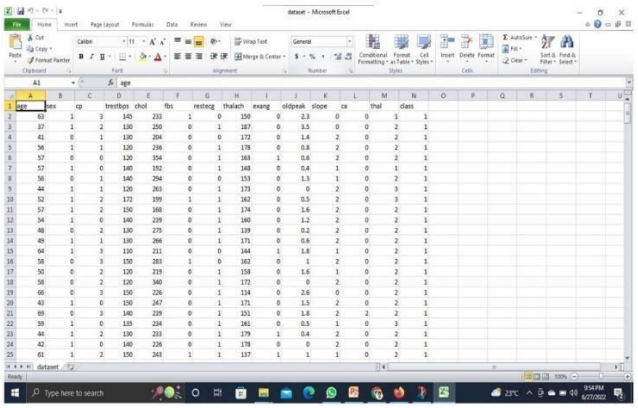


Fig 5: Data sets

VII. CONCLUSION

The integration of IoT (Internet of Things) and blockchain technology in healthcare, often referred to as IoT HealthGuard, holds tremendous promise for enhancing the security, privacy, and efficiency of healthcare systems. This innovative combination enables the secure and transparent exchange of sensitive medical data, ensures data integrity, and reduces the risk of data breaches and fraud. As IoT devices continue to proliferate in the healthcare industry, the use ofblockchain to safeguard patient information and enable secure transactions can

help usher in a new era of trust and reliability in healthcare services. However, it is essential to address the challenges of scalability, interoperability, and regulatory compliance to fully realize the potential benefits of IoT HealthGuard. With continued research, development, and collaboration between technology providers and healthcare stakeholders, IoT HealthGuard with blockchain has the potential to revolutionize healthcare, providing patients and healthcare providers with a more secure and efficient ecosystem for managing and sharing health- related data.

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