Secure Patient E-Health Records using Blockchain Technology

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Abstract:
Data privacy is an important aspect in the protecting any electronic health records. Electronic health records are most prone to misuse as the data is spread widely across different health organizations. Since the data is widely spread across different service providers, misuse rate is high. To resolve this problem, we can make use of new technology called Blockchain to preserve the records from external misuses. Along with blockchain, we have used Nucypher key management system, which provides double encryption to the records. The Patient has entire control over the e-health records. These records cannot be accessed until the patient grants access to view the file.

I. INTRODUCTION:
In the current Era, the technology is growing rapidly and the amount of the data available today is so huge. There is a great demand in protecting the personal data and securing the data from the misuse. When we consider electronically generated health report, these data are primarily stored in the medicinal aid centers.

There is a possibility that the information can be dissipated over the distinctive database from one therapeutic focus to the next which again prompts abuse of individual data. There are issues like consistency, security blunder and they need in norms. The one technology, which helps to overcome this issue, is by using Blockchain technology.

It is the distributed ledger system. The Blockchain technology has several applications, for example, monetary management system, Health care, and other several examples are available. Blockchain helps in securing health care data across the network. Once the environment is set up we can have control on the personal health care data. Each exchange is timestamped and it is in real time.

This health dataset can be shared with the group of individual or to an organization only if that person willing to share the report and access should be provided. In this manner, securing the reports. Blockchain was initially developed for the monetary system such as bitcoin, which later gained wide acceptance in the Western Countries. It offers a variety of applications as well. One such application is the Health care systems.

II. LITERATURE SURVEY:
Xiao Yue [1], Huiju Wang [2], Dawei Jin [3] Mingqiang Li[4], "Healthcare Data Gateways: Found Healthcare Intelligence on Blockchain with Novel Privacy Risk Control”.
This paper propose a solution wherein patients can secure the data using a secured gateway in a health care ecosystem. In this customized human services technique, the patients could get to, screen, furthermore, deal with their own clinical information and social insurance rundown, and put away on a private blockchain (a concentrated database framework with limited access control just qualified for approved or explicit clients. [1]

Kristen N. Griggs [1], Olya Ossipova [2], Christopher P. Kohlios [3], Alessandro N. Baccarini[4], Healthcare Blockchain System Using Smart Contracts for Secure Automated Remote Patient Monitoring”
In this paper, they made use of blockchain to protect the data obtained from the medical sensors. The blockchain feature used here provided an additional security role in terms of data protection. Received a private blockchain, considering the Ethereum convention, to encourage not just protected and secure utilization of restorative sensors, and furthermore annihilated the security dangers related with a remote patient observing framework. Their blockchain-based technique can encourage secure constant remote checking, hence enabling specialists to follow the status of the medicinal services of their patients from inaccessible areas, while likewise keeping up a sheltered, secure, and state-of-the-art history of patients. [2]

In this paper, they propose a solution for the advanced Block chain for the data transfer in the large health sector that helped the health industry to boost up the speed of the data storage and retrieval. [3]

In this paper, they proposed a solution, which provided combined blockchain and cloud-based storage network using which the patient, could share the records. The proposed plan utilized to accomplish the sheltered and secure stockpiling and trade of individual patient therapeutic information. The recommended approach is novel in its inclination, as it gives patients complete access to and command over their own restorative information, therefore barring the association of any outer outsider [4]

RUI GUO [1], HUIXIAN SHI [2], QINGLAN ZHAO [3], DONG ZHENG [4] “Secure Attribute-Based Signature Scheme With Multiple Authorities for Blockchain in Electronic Health Records Systems”
In this paper, they proposed a solution attribute based signature systems for the file transfer in the medical repository in the health organizations [5]
III. WORKING:

The main architecture consists of mainly three nodes, patient node, service provider node and Physician node. Let us see what happens at each phase of the system.

a. **Patient node**: The patient will have all the health records issued by the provider. Now in the ethereum client, with the help of the smart contract he will edit the access permissions for the records to prevent the file from scattering across different nodes. Nucypher key management system is used with umbral to provide double encryption for the records.

b. **Service provider node**: The service provider especially the health organisation maintains the individual reports. These reports are sent to the end user safely. They also participate in the Blockchain network to initiate a transaction bounty is requested.

c. **Physician node**: The Physician request the end customer that is the patients to send the reports to check his health status. The patient would provide the view permission to doctor to view the patient record. The medical blockchain will transparently offer data on a while, wherein and for what motive the healthcare records modified into used. Access to all medical facts on the scientific blockchain is managed by way of the person, which prevents malicious get entry to medical information from the resource.

IV. RESULTS:

Open the browser, type localhost, user interface for the secure patient e-health record login page is displayed.

![Figure.2. Snapshot of uploaded health records.](image-url)
V. CONCLUSION

It is significant viewpoint for each wellbeing associations just as for a person to verify his wellbeing records. Protection and security assumes a noteworthy job in safeguarding this information from the data abuse. In this task, we have edified the utilization of blockchain innovation to protect the information from any sorts of outer abuse of the reports and we have created EHR-Management application to see the document move. These reports are entirely profitable. We have presented twofold encryption process by utilizing Nucypher key administration frameworks. In future, this venture could be executed for a bigger client with increasingly improved security highlights, it assists the individual and wellbeing association with keeping track of the information.

VI. REFERENCES:


[5]. Ruiguo, Huixianshi, Qinglanzhao, Dong Zheng “ Secure Attribute-Based Signature Scheme With Multiple Authorities for Blockchain in Electronic Health Records Systems”

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