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Privacy Preservation of Medical Evidences Using Blockchain Technology

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Abstract - Technology has physically contacted the empyrean in every sector as we make use of it every single minute. In terms of security, we are very vigilant that in todays' generation hacking and leaking of data or information is mundane of course due to advancement of technology. To surmount this issue of data corruption and leakage we came up with this solution of blockchain security over medical evidence of people to maintain transparency iniquity. In this system, any kind of document cognate to medical evidence can be stored and can be shared only with sanctioned users. So this way the system will be all protective against malefactor larceny of the documents. We made utilization of blockchain security to implement our project prosperously. For storage, web-hosting is utilized so that the security should be maintained through cryptography. For the access of shared data, a private key system is proposed. The whole project is implemented utilizing web framework and blockchain security.

Keywords **- Privacy protection, hyper ledger security, blockchain, cloud hosting, medical evidence.**

1.INTRODUCTION

Custody of Digital Files in Digital Investigation is the Best Alternative to Traditional Hard Copies. Online Portal known as Custody Chain, it reserves all the records with transparency and maintenance. It will store the identification of evidence and maintain integrity. While It's Tempering and Misidentification or Adulteration Risks are Eliminated. The cloud server is used as a data storage and the data will be encrypted using private security known as Hyperledger fabric blockchain.
Security of medical documents is very compulsory for both the medicos and the patients because it contains all the fundamental as well as private information regarding the patient's body and needs to be kept private. With the utilization of blockchain technology, our system has become virtually 100 % secure from hackers and no one can make changes to the secured documents and no one can cheat over it. Our system will be a kind of peer-to-peer system, no third party is involved in between so that the data can be stored and shared securely with cryptography.

Due to the highest precision and one-to-one interaction concept blockchain concept is being used here no centralized ascendancy is presented here. A web server is used to design and develop the GUI for the system which will allow users to input data and share it with the person they want as a private, public view. The anterior system utilized in storing medical evidence USB and hard drives were utilized but due to virus and damage of the hardware contrivances, we launched this concept.

2.LITERATURE REVIEW

[1] Monia Lusetti, Andrea Dallatana came up with the concept of Forensic Science International:

Digital Investigation in IEEE et.al., (2018) where they discussed about. Some important formulas of popular medicines are kept at a secret level to make it patent. And no one can duplicate the formula to make the medicine without permission.

[2] Shancang li, Tao Gin and Geyong Min proposed a system called blockchain on medicos, where they showed that patients can share the medical documents with the authorised person for further investigation of their case and take proper treatment with the concerned doctors. This system was designed for users to store personal data with a login system.

[3] Forensic Chain: Ethereum Blockchain Based Digital Forensics by KV Mishra states that privacy of the victim's medical reports is to be maintained and hence developed an android application integrated with python for security purpose where the data can be uploaded and shared among authorised person via link and a security key will be provided to access the data.

[4] A system developed using big data to tackle big files transfer issues over the internet and securely provide information of the person through wireless communication basis named as Cryptography of Documentation using Big data by Sarvesh Madhukar El, at.(2020)

2.METHODOLOGY

We have made use of blockchain technology with a web framework and free page builder to make this project work and affordable. Details of technology are described below.

Blockchain Security:
A blockchain is further divided into four types i.e., 1. Public, 2. Private, 3. Federated, 4. Hybrid Blockchain. We made use of private blockchain in our project as it is a matter of medical evidence and it should be kept in a very secure platform. We have also added other facilities like it depends on the admin with whom they want to share the data and of what type like private public and other.

Web framework:
A web framework is nothing but a consummate package that contains all the files and folders with all the coming up with still as development implements like HTML, CSS, bootstrap, JavaScript. It is commonly used for designing and development of GUI for the software with responsiveness. A net server is used to store knowledge on the cloud for a considerable magnitude of knowledge storage. {a net|an internet|an online} app framework or web framework may be a software package framework that's engendered to fortify the event of dynamic sites, net accommodations, and net applications.

Web Hosting: Unlike other storage devices we have used a unique style of data storage for storing the data entered by the admin, it will be used as a storage device unlike pendrives, hard drives, etc.

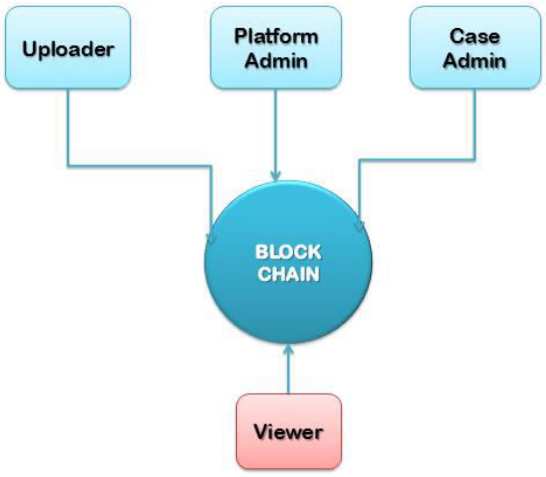

Fig. 1 Proposed Flowchart

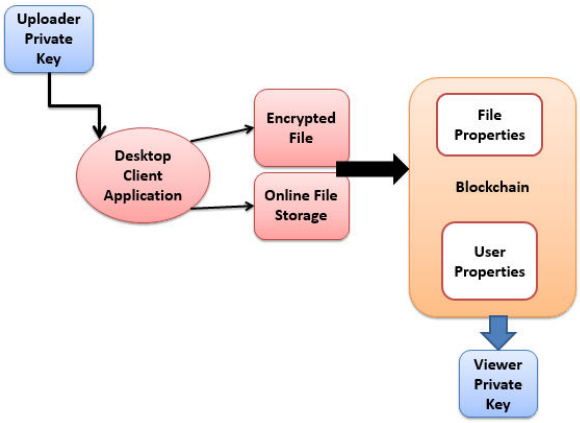

Fig. 2 Proposed Block Diagram

Above diagram shows the flowchart and block diagram of our proposed system and their explanation is given below in detail.

Step one: The admin or user both can upload the data or evidence in the system by login with proper details and share it with others.

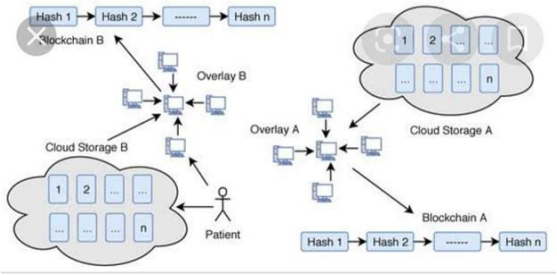

Fig. 4 Server Storage

Step two: After uploading the data on the server the data will be stored in the encrypted format so that it cannot be used further by any third party without a security key. The data stored here can be of any kind; it can be jpeg file, PNG file, pdf, word and pptx file.

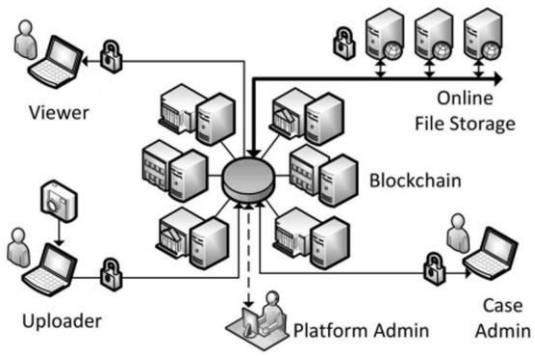

Fig. 5 Functional Diagram

Step three: Now if the user wants to read the data first he needs to have a security or private key to access the file. If an admin wants the data to be kept between two people only then he can share it with that person only and others will not be able to see the file or document. No user other than can delete files on the server except admin.

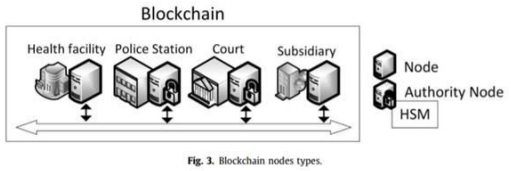

Fig. 6 Nodes of blockchain

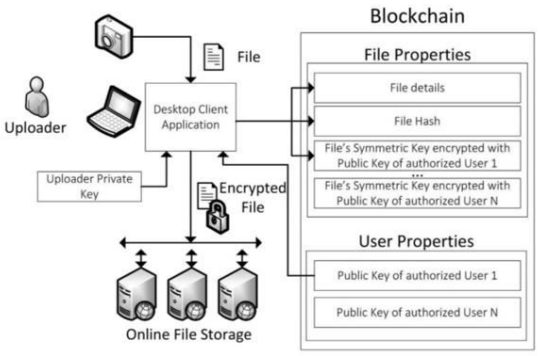

Fig. 7 Functional Diagram

Step four:

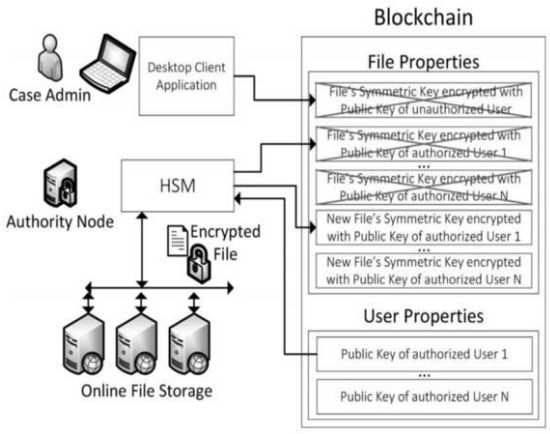

Fig. 8 Access Restriction diagram

Registered professionals like judges and lawyers will be able to view the files only when assigned to the corresponding Viewing Rights by the Admin. Each Information Access Like Data, Time and Users Data is Traceable Since Recorded and Stored into the Blockchain. As the Case Evolves, Users and the Official in Charge May Change. So Administrative Rights are Transferred and Viewing Rights Can be Integrated or Revoked Within the Platform.

Our system is all protected and the content in it cannot be downloaded, copy paste is disabled and even they cannot open the file via link sharing, they can only make changes when the admin allows them. Operations Like Uploads, Views, or Expunctions are Perpetually and Permanently Recorded on the Blockchain.

I. RESULTS

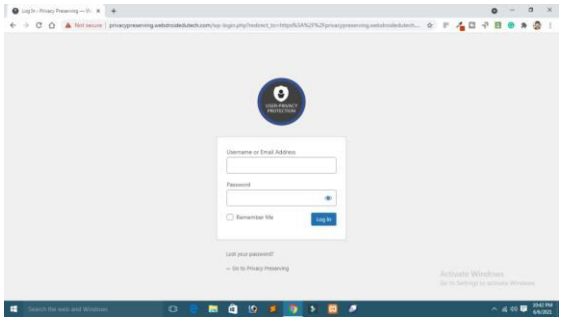

Fig. 9 Login Panel

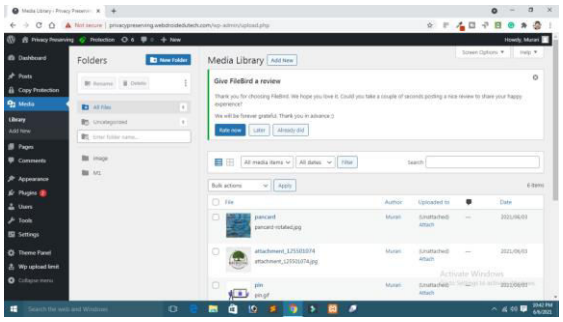

Fig. 10 Document Uploading Panel

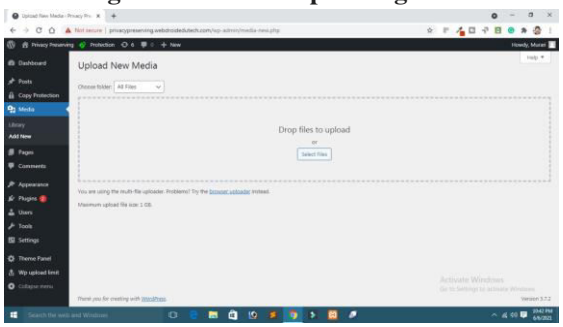

Fig. 11 File uploaded

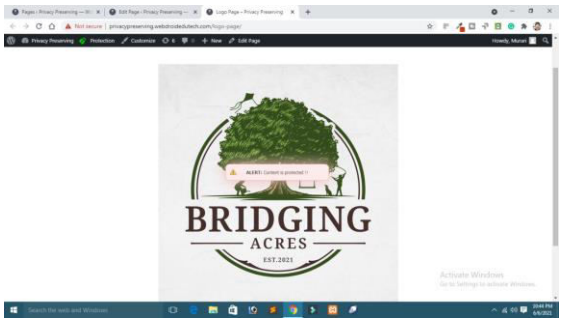

Fig. 12 Content Protected by cryptography with blockchain security

5.CONCLUSION

A solution for the custody and sharing of digital files in rhetorical medicine while not hopping on a centralized network is projected here. At first, we have a tendency to fixate on the main problems underneath the patient's perspective, the professionals' views, and therefore the licit requisites, analysing the present, predominant guidelines. The network is safe and accessible through an avid application. All data is acceded upon and shared between the blockchain nodes to evade single points of failure, and secure access to files is assured by cumulating cryptography and therefore the blockchain accord mechanism. Despite some inhibitions, associate implementable resolution for the custody of digital files in medical specialty has been known.

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