International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 10 Issue 5 ǁ 2022 ǁ PP. 06-12

Block Chain Based Implementation of Electronic Medical Health Record

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Abstract
This project's main purpose is to employ block chain technology to create a secure and dependable EMR knowledge management and sharing system. Time spent searching for unidentified notes, x-rays, admission or discharge information, and other papers has decreased. Access to a multitude of detailed, up-to-date patient information is quick, dependable, and safe. Streamlining clinical data and sophisticated technologies that support multidisciplinary team operations In the However, in the cryptocurrency world, block chain technology is gaining traction. becoming increasingly popular and has had significant success. It has a consensus technique, peer communications, confidence-building without the use of a trusted third party, and a transaction governed by conditions and functions using the intelligent contract technique.Block chain is an excellent option for creating a decentralized, self-contained IOT system that overcomes the issues described above. The architecture is based on the distribution of resource load. Devices with low resources are known as thin-clients, and devices with more resources are known as rich-clients. Both clients can collect data and access the block chain, but the rich-client can only mine.

Keywords: *Receptionist login, Automatic mail sending in Appointment Conformation,Patient login and diseases sending to doctor encryption,Doctor login and Patient disease perception encryption,.*

Date of Submission: 07-05-2022 Date of acceptance: 22-05-2022

I. INTRODUCTION

In the subject of data health, interoperability is still an issue. The main thing is to make sure that useful knowledge is freely available (health data) To track electronic health record references, smart contracts and block chain technology promise to be a fascinating and novel solution (EHRS). Block chain technology may help EHR systems that guarantee privacy and interoperability. As a result of the expanding usage of digitization in healthcare, massive electronic patient records have been generated. The requirement for healthcare data security during use and exchange has expanded dramatically as a result of this expansion. In terms of healthcare data privacy, security, and integrity, the introduction of block chain technology as a responsible and transparent platform for storing and transferring data has opened up new opportunities.Smart contract applications based on block chain technology have emerged in a variety of fields, including energy, financial services, voting, and healthcare. Transparency is provided through block chain technology, which eliminates the need for third-party administrators or intermediaries. In a trust less and unstable environment, it uses consensus procedures and cryptography to validate the authenticity of a transaction. The receiving node in a block chain distributed P2P network of transactions checks the message and stores it in a block if it is correct.The data in each block is then confirmed using a consensus mechanism known as "Proof-of-Work (POW)." After conducting the consensus method, the block will come into the chain, and every node in the network will admit it, spreading the chain indefinitely. Healthcare is one of the most well-known uses of block chain technology. Block chain's promise in healthcare is to solve problems such data security, privacy, sharing, and storage. Interoperability is one of the needs for the healthcare business. It is the ability of two parties, human or machine, to share data or information in an accurate, efficient, and consistent manner.

II. LITERATURE SURVEY

Ahmed Raza Rajput, Qianmu L entitled "EACMS: Emergency Access Control Management System for Personal Health Record Based on Block chain" was Published in 2019 in Industrial Engineering and Engineering Management, 2009. This paper highlights that the Mobility of persons and goods currently represents an Personal health records (PHRS) are private and vital assets for every patient. There have been introduced many works on various aspects of managing and organizing the PHR so far. However, there is an uncertain remaining issue for the role of PHR in emergencies. In a traditional emergency access system, the patient cannot give consent to emergency staff for accessing his/her PHR. Moreover, there is no secured record management of patient's PHR, which reveals highly confidential personal information, such as what happened, when, and who has access to such information. This paper proposes an emergency access control management system (EACMS) based on permission block chain hyper ledger fabric and hyper ledger composer. In the proposed system, we defined some rules using the smart contracts for emergency condition and time duration for the emergency access PHR data items that patient can assign some limitations for controlling the PHR permissions. We analyzed the performance of our proposed framework by implementing it through the hyper ledger composer based on the response time, privacy, security, and accessibility.

Sandro Amofa, Emmanuel Boateng Sifah entitled "A Block chain-based Architecture Framework for Secure Sharing of Personal Health Data." International magazine of emerging trends in science and technology,published is 2018 Health information exchanges have been popular for some time with their advantages known and widely researched. In spite of their utility in increasing provider efficiency and decreasing administrative costs, one challenge that has persisted is the data owner's inability to control data after transmission. The lack of technical mechanisms to effectively control patients' health data in the network significantly affects participation of health and medical institutions while perpetrating the silo-based data management that locks value and potential inherent in the data. This not only affects researchers due to the lack of data for research and analysis but the quality of life of patients. We present a bloc chain-supported architectural framework for secure control of personal data in a health information exchange by pairing user-generated acceptable use policies with smart contracts. We highlight the merits of our system, its user centrism focus and also show experimental results along with directions for extending our work. The framework introduces minimal risk to data by architecture a mechanism for controlling data after sharing. In adopting our framework, health service providers can deliver a stronger assurance for data management than is possible with current systems.

Lanxiang Chen , Wai-Kong Lee entitled "Block chain based searchable encryption for electronic health record sharing" published in 2018 in the International Journal of Recent Technology and Engineering (IJRTE) Data leakage in electronic health records (EHRS) could result in the compromise of patient privacy (e.g. medical conditions). Generally most data in EHRS remain unchanged once they are uploaded to the system; thus, block chain can be potentially used to facilitate the sharing of such data. Different participating medical organizations and individuals (e.g. medical practitioners, hospitals, medical labs and insurance companies) can then access EHRS stored on the block chain with a higher level of confidence. In this paper, a block chain based searchable encryption scheme for EHS is proposed. The index for EHRS is constructed through complex logic expressions and stored in the block chain, so that a data user can utilize the expressions to search the index. As only the index is migrated to the block chain to facilitate propagation, the data owners have full control over who can see their EHRS data. The use of block chain technology ensures the integrity, anti-tampering, and traceability of EHRS index. Finally, the performance of the proposed scheme is evaluated from two aspects, namely in terms of the overhead for extracting the document IDs from EHRS and the overhead associated with conducting transactions on smart contract in Ethereum.

Fiona WY LAI, Joyce A KANT entitled "Variables associated with completeness of medical record documentation in the emergency department" published in 2019 in the international journal of Recent Technology and Engineering The completeness of ED medical record documentation is often sub optimal. We aimed to determine the variables associated with documentation completeness in a large, tertiary referral ED. Data were collected on patient and treating doctor variables. Documentation completeness was assessed using a 0–10 point scoring tool designed for the study. A maximum score was achieved if each of 10 pr-determined important items, specific to the presenting complaint, were documented (five medical history items, five physical examination items). Data were analyzed using multivariate regression. The presenting year, day and time, patient age and gender, preferred language, interpreter requirement, discharge destination and doctor gender were not associated with documentation completeness ($P > 0.05$). Patients with triage category 3 or pain score of 6–7 had higher documentation scores ($P < 0.05$). Compared to interns, registrars (effect size −0.72, 95% CI −1.02 to −0.42, $P < 0.01$) and consultants (−1.62, 95% CI −1.95 to −1.29, $P < 0.01$) scored significantly less. The headache patient subgroup scored significantly less than the other patient subgroups (−0.35, 95% CI −0.63 to −0.08, $P = 0.01$). For all presenting complaint subgroups, examination findings were less well documented than history items ($P < 0.001$). Conclusion: Documentation completeness is less among senior doctors, headache

patients and for examination findings. Research should determine if the supervision responsibilities of senior doctors affects documentation and if medico legal and patient care implications exist.

III. EXISTING METHOD

In the existing system, a bit coin-based mechanism has been implemented. Authentication-based scheme, encryption-based scheme, cryptographically secure and decentralized currency scheme for financial transactions have all been developed. A strategy based on attributes has been implemented. The application of block chain technology in hospitals has begun to be tested in various pilot programmers throughout the world. Last year, Booz Allen Hamilton Consulting in the United States created and executed a block chain-based pilot platform to assist the Food and Drug Administration's Office of Translation Sciences in determining how to employ the technology for healthcare data management.

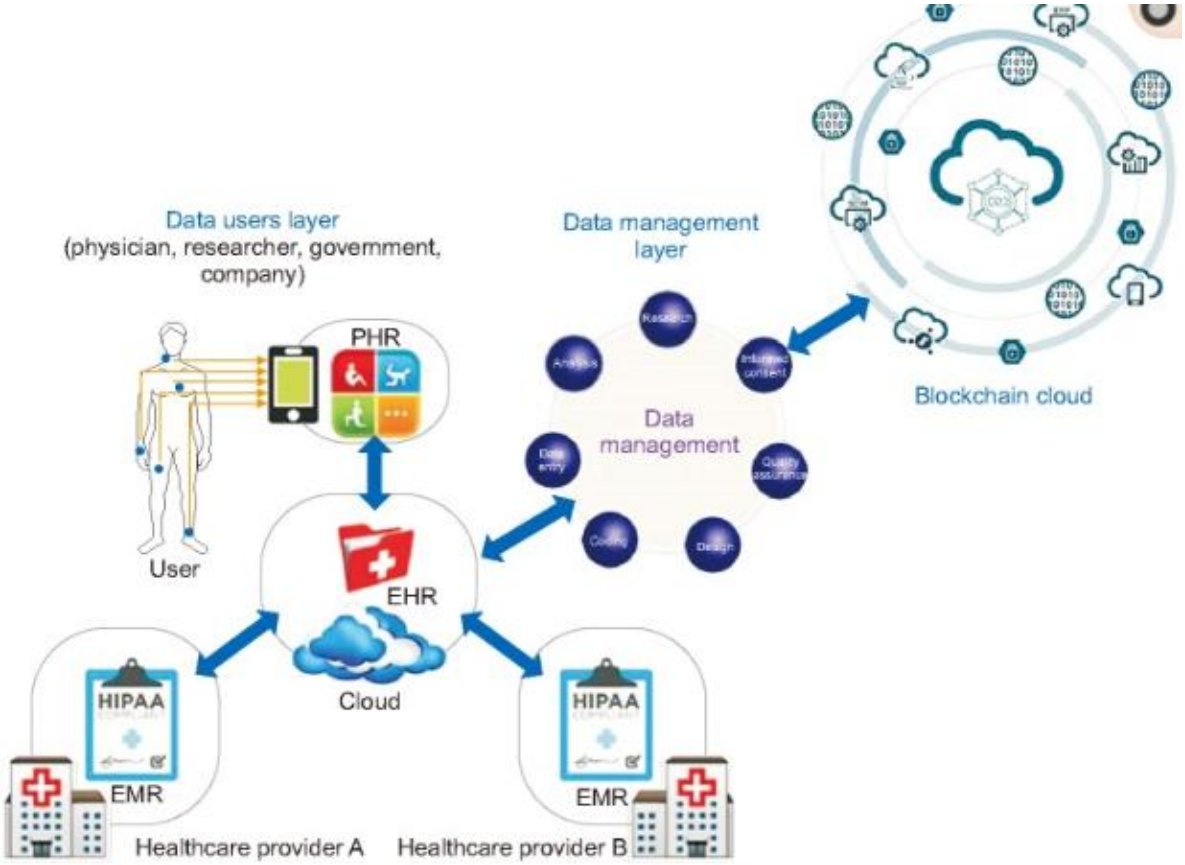


Fig 3.1 Flow Diagram of Existing Method

It's debatable if block chains and Europe's General Data Protection Regulation (GDPR) are compatible. On one hand, block chains look to be GDPR compliant (when it comes to data portability, as an example, or consent management, data traceability and lawful access audit ability). On the other hand, many challenges can be identified (when it comes to right to be forgotten, but also when the technical implementation through smart contracts might weaken the actual control over data, through automatic execution). Dynamic consent management is one solution to this problem that is fully consistent with the GDPR consent requirement. Furthermore, 'private block chains,' such as Enterprise Block chain, are expected to readily comply with GDPR rules due to the block chain's transactions.As personal health records, wearable sensors or medical IOT devices have lately begun to capture personal life-long data (PHR). Patients, physicians,

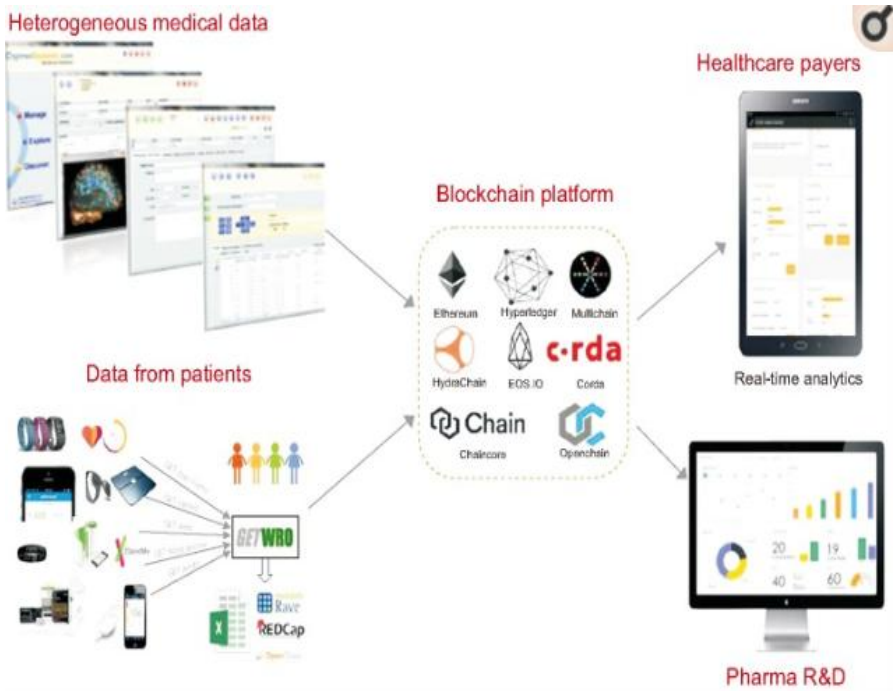


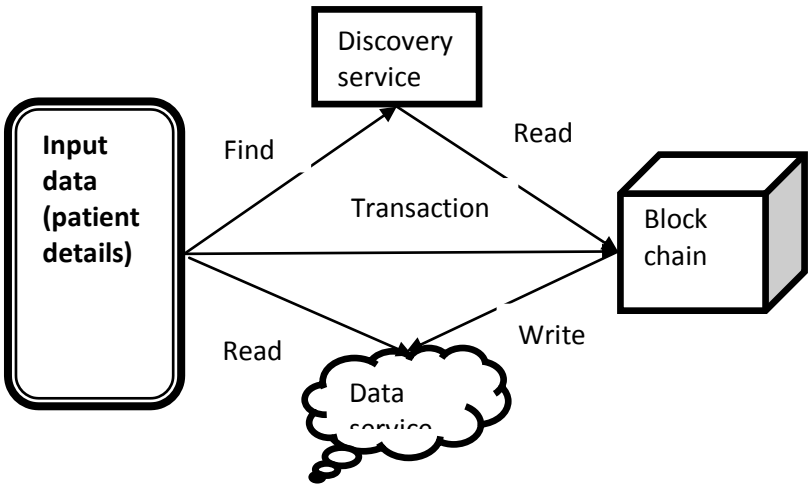
Fig 2 Personal health record data for block chain service providers or data brokers.

powered healthcare analytic. For block chain service providers, the complete PHR service trajectory is becoming a rich source of data. Developed on the block chain, distributed or decentralized applications (D apps) enable physicians and patients to easily participate in tale medicine with no middleman costs other than the Ethereum network's minimum fees, improving patient empowerment.

IV PROPOSED SYSTEM

4.1 Health Care:

A framework for administering cancer patient care and sharing EMR data. A framework is imposed through a paradigm in conjunction with a hospital that assures privacy, security, availability, and fine-grained access management over EMR information. The proposed work will significantly reduce the time it takes to share EMRS, improve treatment decision-making, and lower the cost. This presents a unique opportunity to use block chain to create and deploy a secure, trustworthy EMR information management and sharing system. This system is proposed. ETHEREUM Ethereum is a decentralize block chain network that builds on the block chain technology that was first employed in the popular crypto currency Bitcoin. Ethereum was first introduced in the year. 2015, with the goal of creating a trustless smart contract platform.



4.3 Database:

Before being uploaded to the cloud, the files are encrypted. The data owners have the option of entering keywords for the files they upload to the server. The lite in SQLite indicates "lightweight" in terms of setup, database management systems, and required resources. SQLite's key features include self-contained.

The validation system returns to the webpage area that will show the validation status, Hence the patient can have their diseases. if the patient fails to show a diseases details. It gives a Warning to the patient diseases encryption via the Screen.

V. KEY RESULT

5.1 Appointment Booking:

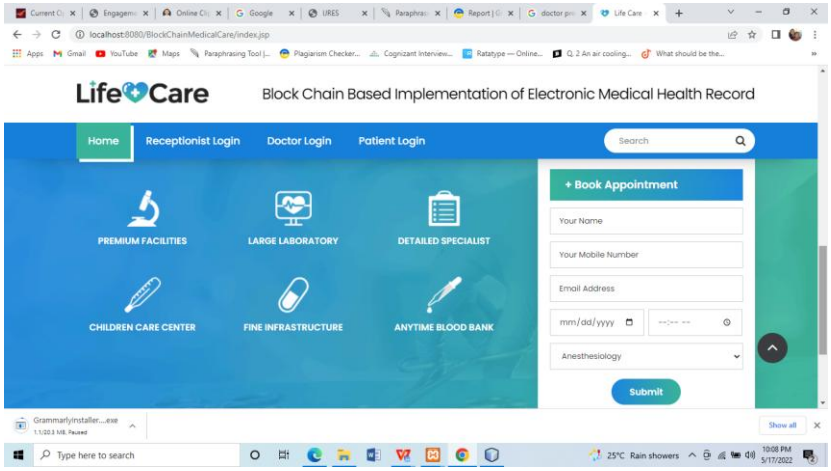


Fig 5..1 Appointment Booking

5.2 Receptionist login

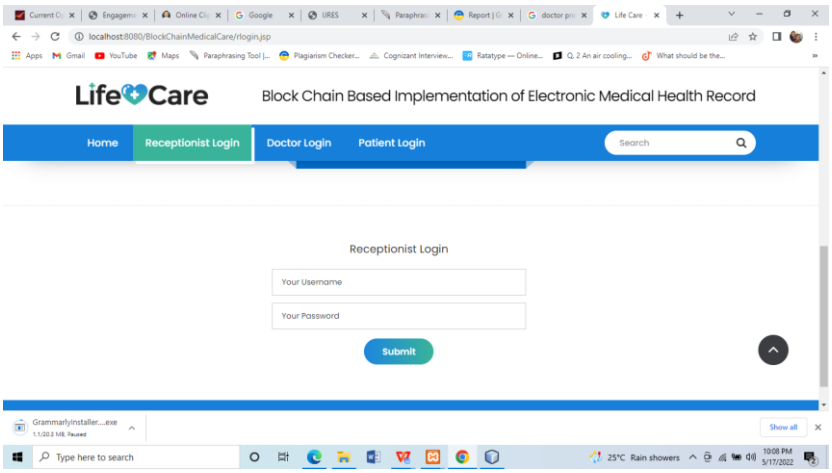


Fig 5.2 Receptionist Login

5.3 Receptionist Appointment Booking Details:

Block chain can securely ease the transfer of patient records among health systems both nationally and across borders, and boost the coordination of member health management, lower transaction costs and risks, and even support medical tourism.

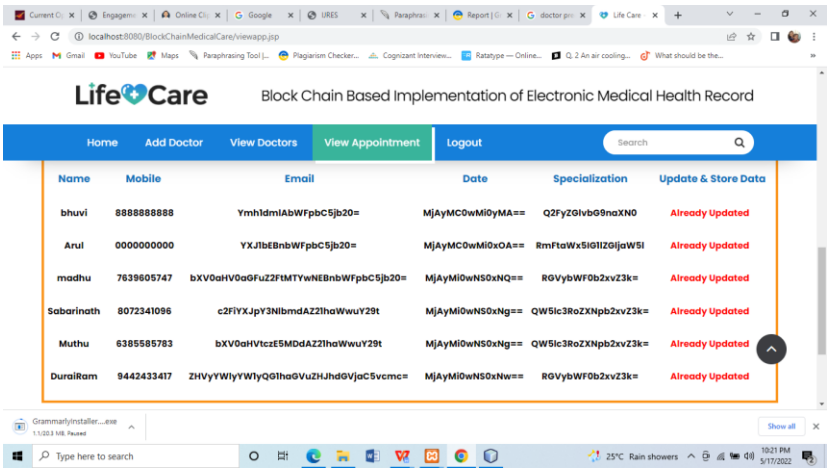


Fig 5.3 Appointment Booking Details

5.4Doctor Login:

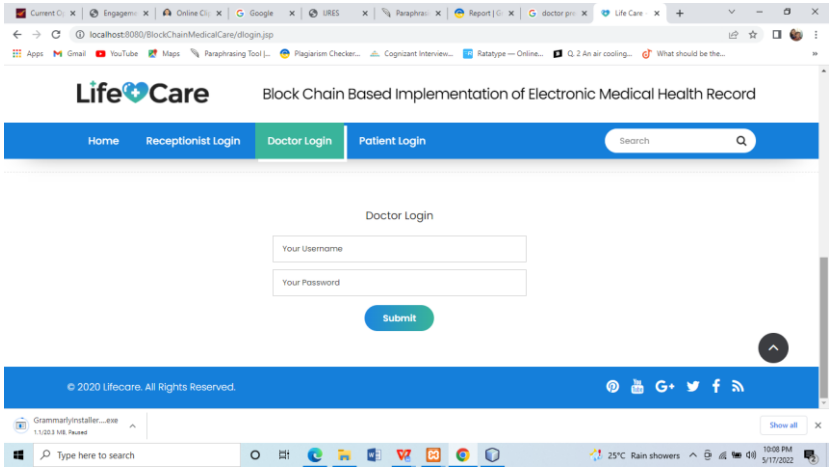


Fig 5.4Doctor Login

5.5 Patient Login:

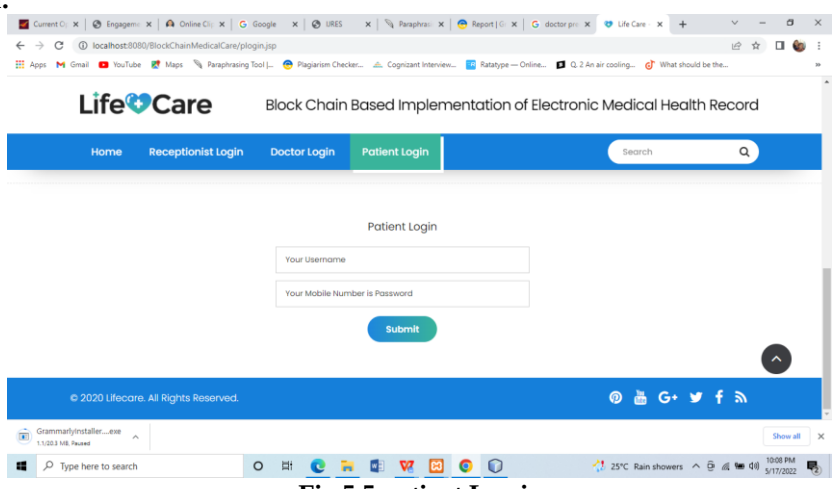


Fig 5.5 patient Log in

VI. FUTURE ENHANCEMENTS

The main motivation is to Electronic Health Record without visiting Hospital Appointment Booking in any Location but the system must stop the persons with the ease of Booking Slot visiting The Your Specialist Doctor. The foundation of expansion and adaptability that block chain technology enables is one of the most fascinating elements of the technology. Though it will have the same limits as today's technology in the

beginning, block chain's open nature will stimulate and support industry-wide innovation for many years to come. According to BIS Research, by 2025, the rapid implementation and integration of block chain in healthcare may save more than $100 billion in costs linked to IT, operations, support functions, staff, and health data breaches.

VII. CONCLUSION

In this project, we presented block chain innovation value scenarios in a number of social insurance situations, including critical attention, restorative data inquiry, and associated wellness. We talked about how keeping a permanent and easy document that video exhibits all of the events that happened on the device could assist to improve and encourage therapeutic record management. Medical scans provide valuable information from which value judgments can be made, leading to positive consequences. The Med Chain protects users' privacy by using timed-based smart contracts to manage transactions and by enforcing proper use rules to monitor EMR computations. The usage of hashing techniques ensures data integrity.Advanced encryption and authentication procedures are used across the block chain to preserve security and access control. The usage of extensive logs ensures interoperability, audit ability, and accessibility. Our solution is not tied to any single system, and its modifications could be used to other systems with various access to electronic information. This paper proposes a new incentive system coupled with the POA for mining, as medical records are patients' assets and not a cryptocurrency or digital currency to be swapped.It takes into account the importance of providers' work in keeping medical data and establishing new blocks. Because the majority of current health providers are welfare-oriented and do not intend to include any monetary value, our mechanism rewards the "block's creator" with an incentive to be added to its degree, lowering the likelihood of re-creating the next block instead of simply creating a digital currency.

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