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Blockchain in Smart Healthcare

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ABSTRACT

Blockchain technology has grown in popularity over the last decade, attracting interest from a variety of industries including finance, government, energy, and health. Blockchain technology has been emerged in the last decade and has gained a lot of interest from several sectors such as finance, government, energy, health, etc[2]. Blockchain solutions have been demonstrated to be used in healthcare to supply secure data and safely manage medical data. Furthermore, blockchain is altering traditional medical practices in positive ways, such as successfully diagnosing problems and treating them through safe data sharing. Healthcare personnel and the government are finding it difficult to preserve and record sensitive data about individuals as a result of Covid-19. During the pandemic, the distribution of false information has also grown, and the inadequacy of existing platforms to validate information has caused public concern.[1] For accurate and valid information sharing between people and the government, blockchain-based tracking systems must be used. Without a question, blockchain will play a role in personalized, legitimate, and secure healthcare in the future by merging patient medical information and delivering it in a safe and up-to-date format.

KEYWORDS: Blockchain, Healthcare, Distributed Ledger.

1. INTRODUCTION

Healthcare is a very information-intensive clinical sector in which a large quantity of data is collected, used, and shared on a daily basis. Because of the sensitivity of the data and constraints such as security and privacy, storing and distributing this massive amount of data is both necessary and problematic. Because medical professionals share the patient's medical information with concerned authorities for regular updates and follow-up, secure sharing and management of information are critical in this field. With the growing popularity of blockchain technology in a variety of fields, the healthcare industry has identified some of its use cases as blockchain applications. It's a decentralized, distributed, immutable ledger that's used to securely record transactions across multiple computers in a peer-to-peer network without the use of a third party. Blockchain is seen as a critical technology for providing accurate and transparent reporting in order to facilitate effective decision-making. E-health and telemedicine are two important fields in healthcare where information is sent remotely to specialists for improved suggestions. Decentralization, privacy, and security are three of the most intriguing properties of blockchain that are helpful to healthcare applications. For example, blockchain technology may enable secure access to medical data for patients and other stakeholders.

2. BLOCKCHAIN AND HEALTHCARE

A blockchain is a decentralized database that is shared among computer network nodes. A blockchain acts as a database, storing information in a digital format. Blockchains are well known for their critical role in keeping a secure and decentralized record of transactions in cryptocurrency systems like Bitcoin. The blockchain's novelty is that it ensures the fidelity and security of a data record while also generating trust without the requirement for a trusted third party. The purpose of blockchain is to enable the recording and distribution of digital data without the ability to modify it. In this sense, a blockchain serves as the foundation for immutable ledgers, or transaction records that can't be changed, erased, or destroyed. Blockchains are also known as distributed ledger technology because of this (DLT).

Information and technology are being used in health and medical practices all around the world as a result of the integration of healthcare and smart cities. The occupants' quality of life and health has improved as a result of the integration. However, the integration has exposed the healthcare business to security risks, including the privacy of patients' health information and the security of nearby mobile health users[8]. The adoption of Blockchain, on the other hand, is a promising technology that will help healthcare to address security issues in smart cities. The use of blockchain technology has made it possible to store patient data in a safe and secure manner in the healthcare system.

3. REVIEW

Many research in recent years has explored the aspects of blockchain that are facilitating healthcare services with numerous benefits. Some nations, like Chile, Germany, and the United Kingdom, have recently chosen to provide immunity certificates to those who have experienced covid-19 infection and are immune to the disease, allowing them to return to work and school and resume normal activities. Implementing these immunity certificates is difficult because it may encourage forgers to seek illness and raise uncertainty about who can and cannot participate in social activities or gatherings. To address these issues, the government has built blockchain networks for the purpose of maintaining and authenticating covid-19-related data

4. METHODOLOGY

Blockchain could be used to establish a system for controlling access to cloud-based EHRs. Using a blockchain can improve interoperability while also protecting data privacy and security. It has inherent integrity and follows stringent legal guidelines. Health outcomes would benefit from increased interoperability. Although most people are unfamiliar with this technology, expenditures in building a user-friendly interface and teaching users how to best use it might result in better health outcomes.

Because blockchain can preserve an incorruptible, decentralized, and transparent log of all patient data, it's ripe for security applications. Furthermore, while blockchain is visible, it is also private, hiding any individual's identity behind complicated and secure algorithms that can preserve the sensitivity of medical data. Patients, doctors, and healthcare providers can all share the same information swiftly and safely thanks to the technology's decentralized structure. Obtaining access to a patient's medical records takes time, which depletes staff resources and delays patient care. The use of blockchain-based medical records may provide a solution to these problems[10]. The technology's decentralized structure generates a single ecosystem of patient data that doctors, hospitals, pharmacists, and anybody else involved in treatment may access quickly and efficiently. The blockchain can help to speed up diagnosis and customize care programs in this way. The decentralization of blockchain ensures complete transparency in the shipping process, which has severe implications for the pharmaceutical supply chain management. The point of origin will be marked on a drug ledger once it is generated. The ledger will then record data every step of the way until it reaches the consumer, including who handled it and where it went. The system can also keep track of labor expenditures and waste emissions. Because it can safely store billions of genetic data points, blockchain is an ideal fit for this burgeoning business.

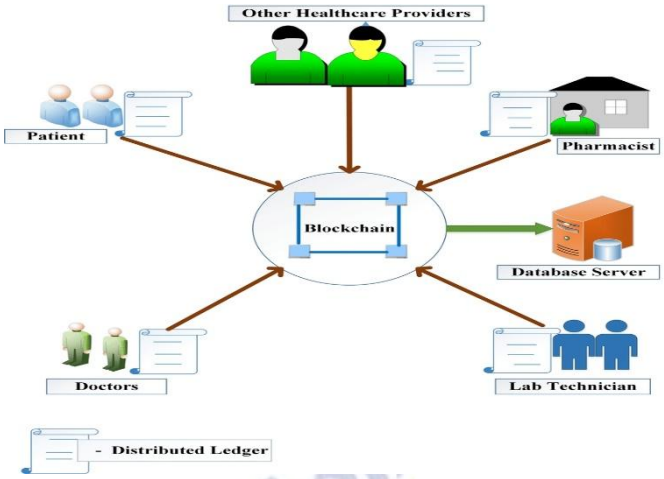

Fig. 1. Blockchain utilization in various healthcare applications

5. FUTURE ENHANCEMENT

In a variety of ways, blockchain technology has aided healthcare applications. This technology is projected to take healthcare applications to the next level in the future by providing advanced security, infinite storage, and information management. Using distributed ledger to implement blockchain in healthcare apps would provide the applications with strong security mechanisms and address existing security and privacy difficulties and challenges.

6. CONCLUSION

Due to different security attacks such as data breaches, data theft or leakage, data alteration, and so on, secure data management and storage are difficult in healthcare systems. Traditionally, healthcare applications were more vulnerable to assaults and relied on antiquated security approaches to protect themselves, which were ineffective. In recent years, blockchain has introduced new security approaches and processes for healthcare applications, giving high security and privacy to data as well as a variety of healthcare applications.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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