INTERNET OF MEDICAL THINGS: A POTENTIAL TOOL FOR EMERGING SMART HEALTHCARE

Abstract

The "Internet of Things" (IoT) is a system of physical things consolidated and attached to the internet to share information with other systems and devices. In terms of technical implementation, it means expediting sharing of data and keeping the data on a safe web-based computing, the site at which computers connected to a network for the exchange information and dialogue with one another over the server. Many innovations are available, smart gadgets are preferred even in healthcare system also. Assessment and detection is also preferred to be done with the use of IoMT. Blockchain is also being used as a method for security and assessment in healthcare systems. In this chapter details about the IoMT will be discussed.

Keywords: Internet of medical things, healthcare, data, web-based, disease management, physicians, information, blockchain

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I. INTRODUCTION

The "Internet of Things" (IoT) is an accumulation of real-world items or "Things" that are currently interconnected and associated with the internet in order to share information with other systems and gadgets and exchange data. It involves quickening transmission of information and putting information on an encrypted online server in terms of infrastructure. where a grapewine of connected computing tools can divide data and communicate with each other across the data processor. Numerous innovations have been made on items and devices "smart" by adding integrated software that either unlocks previously unattainable features or enhances already available ones. [1] In response to COVID-19, scientists have come up with a new, "smart" healthcare system that stresses early diagnosis, spreading-prevention, education, and treatment as well as making it quicker to adapt to what is now the standard. In addition to examining the corpus of evidence already available that shows how well IoMT improves patients and the healthcare system. [2] Through the use of telehealth made possible by the IoMT, both caretakers or physicians and ill persons have successfully accepted surveillance, assessment, and therapy of patients remotely. Especially in the midst of a global epidemic, smart devices driven by the IoMT are multiplying everywhere. The high volume of requirement, however, makes the healthcare industry one of IoMT's most challenging application fields. [3] A smart health providing system that is based on internet of medical things comprises of a network of several smart medical devices that are joined to one another through the cyber space. The following stages describe how an IoMT-based smart healthcare system is built.:. Firstly, a patient's body will be used to gather medical data using smart sensors built into devices that are implantable or wearable and connected through a wireless sensor network (WSN) or a body sensor network (BSN). [4]

The component in charge of conducting the prediction and analysis stage will then receive this data via internet transmission. Using a suitable AI-based data transformation and interpretation technique, analysis can be carried out after receiving the medical data.

II. IoMT AND HEALTHCARE FACILITY

Smartphone apps with artificial intelligence can be used to contact physicians or other healthcare needs in the event of critical issues. Self-preventive techniques can be applied in non-serious situations. [5] Real-time disease management and prevention are both made possible by AI, which also enhances user experience. SHS deals with the patient's most private medical information. Therefore, it is a very important task to provide necessary safety techniques in IoMT-based SHS. Utilising an IoMT-SAF device to do web-based security assessments, identifying intermediate security threats within the IoMT systems and network intrusions, etc. IoMT security can also be provided by AI. [6] AI can automatically inform several parties in an emergency circumstance, which will help save a life by taking quick action. Therefore, clinicians may effectively handle patient records and provide after-hours medical care by using AI. In an IoMT network, blockchain can also be used to ensure security. The security and accuracy of the data are guaranteed by this distributed database, which electronically preserves secure and decentralised information in a digital format. Consequently, it promotes confidence on its own, without a third party's assistance. In the Internet of Medical Things (IoMT), blockchain can be used to enhance security in medical servers that house electronic health records like MedRec, which can be used to govern access rights and permissions to medical data. [7].

III. BLOCKCHAIN

Information may be securely and transparently stored and transmitted thanks to blockchain technology. It comprises of a database that records all previous communications among its users. This directory is distributable and safe. The fact that it is distributed among its users directly, without the use of a middleman, allows everyone to verify the chain's reliability.

There are three ways to use the blockchain, It employs trustworthy and secure transactions. To transfer assets (such as cash, shares and securities, etc.).For a better supply chain and asset and product tracability To protect private information (such as ballots, health records, degrees, etc.) [8]Furthermore, the manufacturing sector has a wide range of uses for blockchain technology. We will leverage sensor data to effectively utilise blockchain in companies, and particularly in Industry 4.0. In this framework, we talk about Internet of Things (IoT) technology, which serves as a data source for the blockchain to protect.[9]

IV. HEALTH AND BLOCKCHAIN

Data interchange between different medical devices and healthcare providers is crucial in an IoT network. Instead of this, one of the biggest issues with safe data communication is division of data. A knowledge gap between healthcare workers caring for the same patient could be caused by data fragmentation. The recovery procedure could be more challenging if there is a shortage of knowledge. Blockchain technology is employed to address the issue of information breakage and aid health maintenance facilities in connecting the network's data repositories. [10]

Three variables may contribute to the secure transmission of blockchain technology. It has an unchangeable "ledger" that users may access and manage as a start. It guarantees that records added to the ledger cannot be changed once they are there. In addition, a set of predetermined rules apply to every transaction in the ledger. The second is that blockchain is a distributed system that operates simultaneously on a variety of computers and gadgets. Third, a smart contract is essential to blockchain methodology to adhere to contract norms and data sharing laws. Access privileges to the electronic medical records (EMRs) kept on the blockchain are set by the smart contract, which also controls identities. According to the illustration, doctors can only access EMRs to which they have been granted access. [11] Blockchain is widely acknowledged as a useful tool in the healthcare industry for preventing data breaches, improving the accuracy of medical information, and lowering expenses. Blockchain technology is being tested in some nations, including Australia and the UK, to coordinate patient, healthcare provider, and insurance company medical information and transactions. Because the Blockchain is controlled by a decentralised network of computers, which simultaneously records every transaction, conflicting information is quickly identified. [12] We may simply gather varied medical data from numerous nodes using IoT and Blockchain., do in-flight patient monitoring, and store the data more securely.. Big Data tools could be used to store the data effectively because Blockchain technology currently lacks database functionalities. Big data and blockchain technologies have both grown quickly. Combining these two cutting-edge technologies solves two crucial requirements for Big Data analysis, namely security and effective data organisation. [13]

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