


Chapter 13


Applications of Distributed Ledger (Blockchain) Technology in E-Healthcare

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ABSTRACT

A technology that can guarantee to help improve potency and security within the healthcare industry is blockchain. The term 'blockchain' denotes a shared changeless record, of a sequence of transactions, each comprising one block, with the blocks being controlled along by cryptological keys. Within the simplest terms, blockchain is going to be represented as a data structure that holds transactional records and guarantees security, transparency, and decentralization. It has the potential to rework healthcare, putting the patient at the center of the healthcare system and increasing the protection, privacy, and ability of health information. Due to the reasons that are mentioned above, blockchain has gained a lot of attention from several sectors such as government, energy, finance, health, etc. This chapter attempts to provide a deeper insight by discovering the scope of blockchain in healthcare and identifying the challenges of blockchain technology in the healthcare industry.

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INTRODUCTION

With such a pace of escalating prices, governments and insurance suppliers would positively welcome any new technology that may facilitate them economizing while conjointly guaranteeing higher patient care. Blockchain has emerged as one of the most promising technologies in the last decade. It has gained the attention of many academic and industry researchers. Satoshi Nakamoto was the first to describe this concept in a paper in 2008 (Nakamoto, 2008). It consists of a decentralized, distributed, and immutable ledger being used to securely record transactions across many computers or nodes in a peer-to-peer network without the use or need of any third party. Blockchain 1.0, the first iteration of blockchain, is based on bitcoin, the first cryptocurrency-based blockchain implementation. 1. The notion of smart contracts has evolved in the next generation, dubbed blockchain 2.0, and is defined as a piece of code that is defined, executed, and recorded in the distributed ledger. Blockchain 3.0, is the third generation of blockchain technology, which focuses on government, energy, and health like non-financial applications. In reality, some healthcare organizations have accepted this technology and put it to use in a variety of ways. 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 (insurance companies, hospitals, etc.).

Healthcare has a reputation for being a conventional business that is difficult to evaluate due to the realities of change and resistive to new ideas. Healthcare issues (such as privacy, quality of care, and information security) have gotten a lot of attention in recent years all around the world due to their importance. Blockchain technology is becoming more recognized as a means for overcoming current difficulties in the medical industry to provide a solution. It has the potential to improve immediate healthcare practices, such as health service delivery and care support quality (Zhang et al., 2018). A recent report by market research future (mfr) states that blockchain technology in healthcare will create over 42 million dollars in value by 2023, with a compound annual growth rate of 71.8 percent (Xia et al., 2017). The advantages of blockchain such as decentralized ledger technology's inherited blockchain qualities of higher transparency, improved security and privacy, increased traceability, boosted efficiency, and decreased costs will prove to be the reason for such tremendous growth. In this survey, the most applicable research in the healthcare sector using blockchain is presented (Wood, 2014). Electronic medical records, remote patient monitoring, pharmaceutical supply chain, and health insurance claims (Roehrs et al., 2017) are among the approaches studied. Additionally, the applicability of these solutions and their technical limitations are discussed in this study. Lessons learned and research directions are also identified. This technology may offer a novel model for health data exchanges by creating electronic medical records that are disintermediated, economical, and secure.

The structure of the rest of the paper has been organized as follows. The key concepts for understanding blockchain technology are introduced in section 2. Section 3 contains some medical applications in healthcare that include this promising technology. Research challenges and opportunities are highlighted in section 4. And Section 5 finally concludes the paper and provides suggestions for further research.

In the medical field, study has been intensified on the approach of using distributed ledger technology to centre on integrity, integration and entry power of related patient data and health records. Although, further various and fascinating programs are addressing emerging medical trials, medical insurance and biomedical databases. Administration of Blockchain technology shall give the reach to enhance and maintain verifiable insist agreement which will help healthcare financing plans and also helps real-time claim adjudication which will be restoring the health task intervention with transparent

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