

Chapter 12

Blockchain and Its Applications in Healthcare

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ABSTRACT

Growing organizations, institutions, and SMEs demand for transformation in all the aspects of their businesses along with the progression in time and technology. When it comes to healthcare, the growth should be heightened to higher levels with necessity. The need of providing quality of service (QoS) in healthcare is taking significant place, allowing health institutions and medical compliances to develop an ecosystem with cutting-edge technology with the same reliability but better productivity and performance. Moreover, the healthcare systems are aiming for a more patient-centric strategy. Healthcare systems work on complicated and traditional methods, oftentimes administered via teams of professionals who manage data and supportive mechanisms of the system. Blockchain could streamline and automate those methods, conserving weeks of effort in the company's production line to increase the overall revenue and discover new opportunities. This chapter aims to illustrate blockchain technology along with its state-of-the-art applications in healthcare.

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INTRODUCTION

Healthcare is one of the oldest and the most critical industries for mankind. The Healthcare sector is a complex system and consists of numerous components, including doctors, other staff, hospital management, pharmaceuticals, medical equipment manufacturing units, insurance/mediclaime providers, etc. Healthcare starts with the patient and doctor's relation and ends at the pharma conglomerates and the insurance institutions. The overview depicts a perspicuous image about the healthcare sector; however, an intricate set of factors are required to manage and operate the products, information and sometimes, the patient itself under different scenarios. In short, it is not just a single industry with specialized personnel. In fact, multiple industries are involved to safeguard human lives.

Unfortunately, access to healthcare across countries, communities, and individuals is not the same. It is influenced by socio-economic conditions as well as the health policies. A city is said to be healthy, when health services can be accessed in a timely manner to achieve the best possible health outcomes. Restrictions on the use of healthcare services can affect the overall well-being of a particular area/state and the country. An effective healthcare system not only functions as a backbone for human development, but also contributes to the country's overall economy and industrialization. However, ensuring the healthcare system robustness requires an extensive perception of the existing system and its drawbacks.

Businesses are witnessing significant transformation in their conventional business models and huge changes in every aspect as time and technology progress. Medicine and healthcare are one of those fields that need to keep up with the ever-changing technology for the ease and betterment of mankind. The quality of healthcare services can be improved by using the latest technology. Hence, in this field, the urgency of growth mandated by the emerging technology escalates to higher levels. Along with this, for customer satisfaction, healthcare is transitioning towards a more patient-centric approach, which requires focusing on two key factors: cost-effective treatments and appropriate healthcare facilities at all times.

The new and upcoming technology, namely, Blockchain gives a new value to the word 'trust' in commercial markets. It is simply a chain of blocks that traces all the activities as well as the transactions happening throughout a network. Blockchain technology comprises extremely secure, shared blocks of transactions called distributed ledgers which are distributed among thousands of computers in an agreed state of authenticity. Due to its decentralized system, no intervention or alteration is possible in blocks. Hence, security is high, and users can trust the platform for storing and sharing their data. Once equipped in all systems, it will be very easy to manage and keep track of all the data which cannot be changed.

The problems in healthcare systems can be handled competently by deploying blockchain. A blockchain-enabled healthcare system would allow sharing and analytics of important data for service providers and legal authorities assigned to manage that data. Hence, the data management processes will be improved, and their time complexity will be remarkably minimized. In the medical supply chain, the products from the companies are transferred through various checkpoints before it reaches the patient. It is a very complex process, as the medicines which are unused and in good condition can be sold to other customers and the expired stock is sent back to the company. Thus, it is a challenging task for the people involved in the process to keep track of the medicines and where they are being sold like retail shops, health systems, hospitals, or other organizations. In addition to easing the movement of physical products, a blockchain-enabled platform could greatly simplify how products are paid for and reimbursed as part of the contract administration process used by group purchasing organizations (GPOs), manufacturers and distributors. All these problems and some of the available use cases in the market are described in the chapter (Bell et al., 2018).

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