Chapter 7
Blockchain-Based Intelligent, Interactive Healthcare Systems

V. Hemamalini
SRM Institute of Science and Technology, Chennai, India

Amit Kumar Tyagi
https://orcid.org/0000-0003-2657-8700
National Institute of Fashion Technology, New Delhi, India

A. Rajivkannan
K.S.R. College of Engineering, KSR Kalvinagar, India

ABSTRACT

When it comes to the smart healthcare sector, blockchain technology presents several prospects. Aside from its usage in the financial industry, blockchain technology is now also utilised in the process of establishing trust, protecting privacy, and ensuring security. Within the scope of this work, we will provide an explanation of a new development in the healthcare business that strives to enhance the effectiveness and safety of the administration of healthcare data. We employ blockchain technology to construct a decentralised and tamper-proof network that facilitates safe data exchange among healthcare stakeholders such as patients, providers, and insurers. This technique is known as Blockchain-based Intelligent and Interactive Healthcare Systems (Blockchain-based IHS). The purpose of this chapter is to present an overview of BIIHS, including its advantages, disadvantages, and potential future paths. The BIIHS has the potential to enhance patient outcomes by facilitating personalised treatment plans, lowering the number of medical mistakes, and offering real-time access to vital and sensitive health data. Nevertheless, in order to fully realise the promise of BIIHS, it is necessary to solve problems such as regulation compliance, interoperability, and privacy concerns. Artificial intelligence and the internet of things are two examples of upcoming technologies that might be included into BIIHS in the future. This would allow for the healthcare sector to further improve its capabilities.

DOI: 10.4018/979-8-3693-2359-5.ch007

1. INTRODUCTION ABOUT INTELLIGENT AND INTERACTIVE HEALTHCARE

New healthcare systems called Blockchain-based Intelligent and Interactive Healthcare Systems (BIIHS) use blockchain technology to create a secure and decentralised network for healthcare data management. With its innovative approach to connecting patients, providers, and insurers, BIIHS might completely transform the way healthcare data is stored, managed, and shared. Among the many issues that have beset conventional healthcare systems are data breaches, an absence of interoperability, and inadequate data management. BIIHS proposes a solution to these problems by creating an unbreakable and transparent network that safeguards healthcare data and guarantees its complete integrity while also preventing tampering. Patients have more say over their healthcare data when they utilise BIIHS, which means they can trust their physicians and insurance providers with their sensitive information. Healthcare professionals may be able to access patient data in real-time and create personalised treatment plans with the aid of BIIHS. Insurance providers, meanwhile, may use the system to more accurately assess risks and provide better coverage to their customers. The use of blockchain technology in healthcare has the potential to revolutionise the industry, leading to safer, more accessible, and more effective healthcare for all. However, there are still challenges that must be overcome, including industry-wide concerns about privacy, interoperability, and regulatory compliance. Keep in mind that BIIHS is a groundbreaking novel finding with the potential to significantly alter the future of healthcare.

1.1 Smart and Secure Healthcare Systems is a Necessity of Modern Society: View from Industry 5.0's Perspective

Intelligent and secure healthcare systems are a need in modern society, and the Industry 5.0 viewpoint highlights the crucial role that technology can play in achieving this goal. Industry 5.0, the most current version of the manufacturing sector, integrates state-of-the-art technology such as blockchain, artificial intelligence (AI), and the Internet of Things (IoT) to create interconnected and smart systems. Smart and secure healthcare systems that boost patient outcomes, tighten data security and privacy, and enable more efficient and cost-effective healthcare delivery are within reach with the help of Industry 5.0 in the healthcare sector. Some of the most crucial parts of smart and safe healthcare systems, according to Industry 5.0, are:

- Using networked devices, sensors, and wearables to gather and send patient data in real-time is a key component of the connected devices idea within the framework of Industry 5.0. Doctors and nurses can now check in on their patients from afar and intervene quickly if issues emerge thanks to this technology.
- The importance of intelligent analytics is highlighted by the Industry 5.0 viewpoint as a means to decipher the massive amounts of data generated by interconnected devices. Healthcare providers can benefit from the use of AI and machine learning algorithms because these tools can identify patterns, predict results, and provide insights that improve decision-making.
- Blockchain Technology: From an Industry 5.0 point of view, blockchain has the ability to build trustworthy healthcare systems. By utilising blockchain technology, it is possible to generate a permanent and unchangeable record of patient data, ensuring the data's privacy and security. Furthermore, it may be used to ensure the authenticity and high quality of medical goods and devices by facilitating the transparent and safe management of supply chains.