Chapter 8
AI, IoT, and Blockchain in Healthcare:
Bridging Technology and Patient Wellbeing

Krishnaveni Subramani
SR University, India

Geetha Manoharan
https://orcid.org/0000-0002-8644-8871
SR University, India

ABSTRACT

Digital technology increases diagnosis, treatment, and efficiency, transforming healthcare. This article uses real-life business examples to demonstrate how blockchain technology, AI, and IoT are changing health care and how they may help. AI algorithms speed up and enhance diagnostic, prognostic, and therapeutic decision-making. IoT devices can monitor patients, offer remote health care, and collect data instantly, improving outcomes and resource use. Blockchain technology protects patient privacy and promotes healthcare system collaboration by securely and transparently managing medical records. As seen in this chapter, these technologies work well. Using AI in imaging and genetics simplifies early diagnosis and treatment planning. Wearable health monitoring, smart implants, and telemedicine can improve patient treatment. Blockchain technology will secure EHRs, manage medicine supply chains, and facilitate clinical trials. The Internet of Things, blockchain technology, and AI are improving data privacy, patient participation, and treatment availability in healthcare.

INTRODUCTION

The healthcare industry is witnessing a deep-rooted transformation through the injection of sophisticated technologies such as Artificial Intelligence, the Internet of Things, and Blockchain. The revolution fundamentally changes the patient care paradigm, makes operational processes better, and enhances data management. A rising demand for tailored and precise medical interventions is testimony to how these technologies can change outcomes for patients. They face persistent issues of healthcare, such as the issue of data privacy and interoperability, which poses a critical need for healthcare delivery to be carried

DOI: 10.4018/979-8-3373-0240-9.ch008

out in real-time. Chapter 2 discusses how the AI, IoT, and Blockchain technologies are influencing and redefining the current scenario of patient care welfare, healthcare delivery, and, above all, major critical issues of security, management of data, and centering patient care.

The Role of AI in Healthcare

Artificial intelligence carries out a variety of functions in the healthcare ecosystem. These functions range from diagnostics to personalised treatment. Artificial intelligence speeds up and enhances the accuracy of medical decision-making through the analysis of complex statistics, the recognition of new patterns, and the illumination of insights that were hitherto inaccessible to human practitioners (Goyal et al., 2015). These are all examples of how AI can improve the field of medicine.

- **AI and Predictive Analytics in Diagnostics**

This means artificial intelligence is pretty useful for recognizing patterns in diagnostic procedures, thereby giving a good advantage. Machine learning techniques have accuracy at par with that of human radiologists with data from medical images, which include X-rays, CT scans, or MRIs, for instance, when diagnosing disease cases like cancer, pneumonia, or fractures. Predictive analytics, which are fueled by artificial intelligence, will be able to predict potential disease outbreaks or the probability of patient readmissions, which is achieved by processing large amounts of patient information, including genomic data and electronic health records.

- **AI in Personalized Medicine**

Artificial intelligence is also shaping the outcomes in the domain of personalized medicine. Artificial intelligence helps to personalize pharmaceuticals by breaking down genomic data to ensure the enhancement of therapies about ailments such as diabetes, cardiovascular diseases, and cancer (Yadav et al., 2023). This allows medications that are tailored to the genetic profiles of specific patients. Artificial intelligence models allow a decrease in reliance on trial-and-error methods, thereby improving the patient's outcome. This is through identifying those drugs or therapies that benefit most particular patients (Ambika et al., 2023).

- **AI in Robotic Surgery**

The other major driving force for the change in the surgical procedure is artificial intelligence through robotic-assisted procedures. Patients undergoing robotic surgery enjoy the benefits of increased precision, lesser invasiveness, and quicker healing processes (Kumar et al., 2023). It reduces the chances of mistakes through human intervention in surgeons, as artificial intelligence algorithms make the surgeons more accurate, and these algorithms also offer quick insights. As a result of the developments in surgical robots, patients now have access to solutions that are safer and less intrusive, which has resulted in a transformation in the execution of complex surgeries (Alexopoulos et al., 2023).