


Chapter 3


Blockchain Application for Healthcare Data Management and Patient Experience

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ABSTRACT

Blockchain technology is transforming the healthcare sector in light of data management and patient experience. It can be used in building a more secure data management platform that allows patients to retain ownership over their medical records. Permitted healthcare practitioners can also monitor patients' medical histories, view their most recent prescriptions, and provide prognoses with excellent patient experience. Ultimately, healthcare policymakers responsible for the regulation of innovation should create a favourable environment that will spur the building of blockchain digital solutions with the propensity of providing a single protocol of trust among healthcare stakeholders. This will standardise the implementation of blockchain in the global healthcare space. Green-oriented organisations should also join the conversation on how blockchains are designed, especially ensuring that blockchain is built with sustainability principles.

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INTRODUCTION

Smart technologies, including blockchain technology, artificial intelligence (AI), metaverse, cloud computing, internet of things (IoT), cyber security, machine learning (ML), virtual reality (VR), and augmented reality (AR), have revolutionised the financial, manufacturing, supply chain, and healthcare sectors. (Zaabar et al., 2021; Ayarnah et al., 2023). The healthcare industry sector is concentrating its efforts on utilizing emerging technology to improve the intelligence and effectiveness of healthcare systems. According to Statista (2022), market revenue for medical technology is anticipated to reach US\$579.40 billion this year.

The global healthcare industry is a clinical realm that regularly generates, accesses, and disseminates enormous amounts of data. The sensitive nature of healthcare data suggests the need to use secured platforms that allows traceability and consensus. Thus, both patients and providers of healthcare services continue to have serious concerns about the security and privacy of electronic health records (EHRs).

For instance, the healthcare industry in the United States experienced more than 340 data intrusion incidents in 2022. This shows a huge increase from 2005 when the industry reported only 16 data breaches nationwide. Fast forward 398 data breaches were recorded in 2019 (Statista, 2023). Sensitive health information is revealed as a result of these healthcare system breaches. This data comprises both common details, such as the patient's gender and date of birth, as well as particular details about the particular service offered, like the procedure carried out, the care plan, and other notes. This data is typically maintained in centralized databases, which introduces security flaws and encourages cyberattacks.

Personal health records (PHRs) are crucial medical records that help improve patient safety, healthcare services, and experiences. (Kim et al., 2022). Medical professionals may effectively diagnose and treat patients, as well as eliminate needless lab or test procedures, thanks to data and information. (Abel et al., 2017). Following current practice, a patient must sign a paper-based agreement that details the sort of data that will be shared, who it will be shared to and how will it be properly secured to reduce data breaches. However, the majority of this data sharing is still a time-consuming manual procedure, and it frequently takes days for the records to become accessible. Thus, resulting in significant delays in patient care and a negative patient experience (Dubovitskaya et al., 2020).

Blockchain technology has been the subject of certain studies in the healthcare industry. Patient-centred platforms, such OmniPHR, MedRec Solve.Care, Medicalchain, and FHIRChain, are utilised to transform the sharing of patient health data. (Roehrs et al., 2017; Zhang et al., 2018). When it comes to managing patient data in the healthcare industry, a convenient, secure, and mutually agreeable method is needed because data are dispersed among healthcare stakeholders like hospitals,

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