

Blockchain Technology and Artificial Intelligence Based Decentralized Access Control Model to Enable Secure Interoperability for Healthcare

ABSTRACT

Healthcare, one of the most important industries, is data-oriented, but most of the research in this industry focuses on incorporating the internet of things (IoT) or connecting medical equipment. Very few researchers are looking at the data generated in the healthcare industry. Data are very important tools in this competitive world, as they can be integrated with artificial intelligence (AI) to promote sustainability. Healthcare data include the health records of patients, drug-related data, clinical trials data, data from various medical equipment, etc. Most of the data management processes are manual, time-consuming, and error-prone. Even then, different healthcare industries do not trust each other to share and collaborate on data. Distributed ledger technology is being used for innovations in different sectors including healthcare. This technology can be incorporated to maintain and exchange data between different healthcare organizations, such as hospitals, insurance companies, laboratories, pharmacies, etc. Various attributes of this technology, such as its immutability, transparency, provenance etc., can bring trust and security to the domain of the healthcare sector. In this paper, a decentralized access control model is proposed to enable the secure interoperability of different healthcare organizations. This model uses the Ethereum blockchain for its implementation. This model interfaces patients, doctors, chemists, and insurance companies, empowering the consistent and secure exchange of data. The major concerns are maintaining a history of the transactions and avoiding unauthorized updates in health records. Any transaction that changes the state of the data is reflected in the distributed ledger and can be easily traced with this model. Only authorized entities can access their respective data. Even the administrator will not be able to modify any medical records.