Consortium Blockchain-based Model for Data Management Applications in the Healthcare Sector

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Abstract : Current distributed healthcare systems face the challenge of interoperability of health data. Storing electronic health records (EHR) in local databases causes them to be fragmented. This problem is aggravated as patients visit multiple healthcare providers in their lifetime. Existing solutions are unable to solve this issue and have caused burdens to healthcare specialists and patients alike. Blockchain technology was found to be able to increase the interoperability of health data by implementing digital access rules, enabling uniformed patient identity, and providing data aggregation. Consortium blockchain was found to have high read throughputs, is more trustworthy, more secure against external disruptions and accommodates transactions without fees. Therefore, this paper proposes a blockchain-based model for data management applications. In this model, a consortium blockchain is implemented by using a delegated proof of stake (DPoS) as its consensus mechanism. This blockchain allows collaboration between users from different organizations such as hospitals and medical bureaus. Patients serve as the owner of their information, where users from other parties require authorization from the patient to view their information. Hospitals upload the hash value of patients' generated data to the blockchain, whereas the encrypted information is stored in a distributed cloud storage.