Could Blockchain Revolutionize Data Management in the Healthcare Industry?

Introduction

With the rise of the Internet of Things (IoT), the type of data we gather has increased exponentially creating a need for new data management methods. Within the last ten years, the healthcare industry has witnessed a massive migration from paper records to electronic records for patients' medical data. Proper measures must be implemented to guard against data loss including theft, unauthorized access, and misuse of records, as well as utilization of secure storage facilities. Blockchain, a relatively new technology, may be the solution to solving these problems.

Literature / Standpoint

Blockchain is a distributed database solution that maintains a dynamic storage of data that is validated by all nodes participating in the blockchain. In order for a blockchain to work, nodes on the network have to record every transaction into a block. [4] Once the block is filled, the nodes perform mathematical operations that are difficult but the correct solution can be verified with ease. Figure 1 shows a comparison between existing centralized networks, decentralized networks, and blockchain-based decentralized networks.

A lightweight, blockchain-based wrapper has been proposed for conventional databases to offer notary services. The service would be able to provide immutable proof that the data was retrieved, what the specific query was, and who placed it, thus ensuring that the consumer's query transaction was not affected by anything malicious. [12]

Utilizing blockchain technology could vastly decrease the cost of verification and networking. [13] Its ability to verify transaction details such as who, when, and where, along with its innate data integrity and exclusion of costly intermediates play a key role in understanding how patient-driven interoperability would be improved through blockchain technology.

Another application includes automated health claims adjudication – using blockchain to support enabling concepts such as "disintermediation and trustless exchange" using a "smart contract" structure, and online patient access. [14]

Conclusions

We've discussed how Blockchain can revolutionize data management in the healthcare industry. Blockchain could provide expedited medical records transfers, access controlled by patients, and a secure framework to reduce the risk of the data being tampered with. While Blockchain poses a few drawbacks, it's still in an early state. If the technology improves to eliminate those factors, then blockchain has the potential to revolutionize the healthcare industry by changing how data is managed.

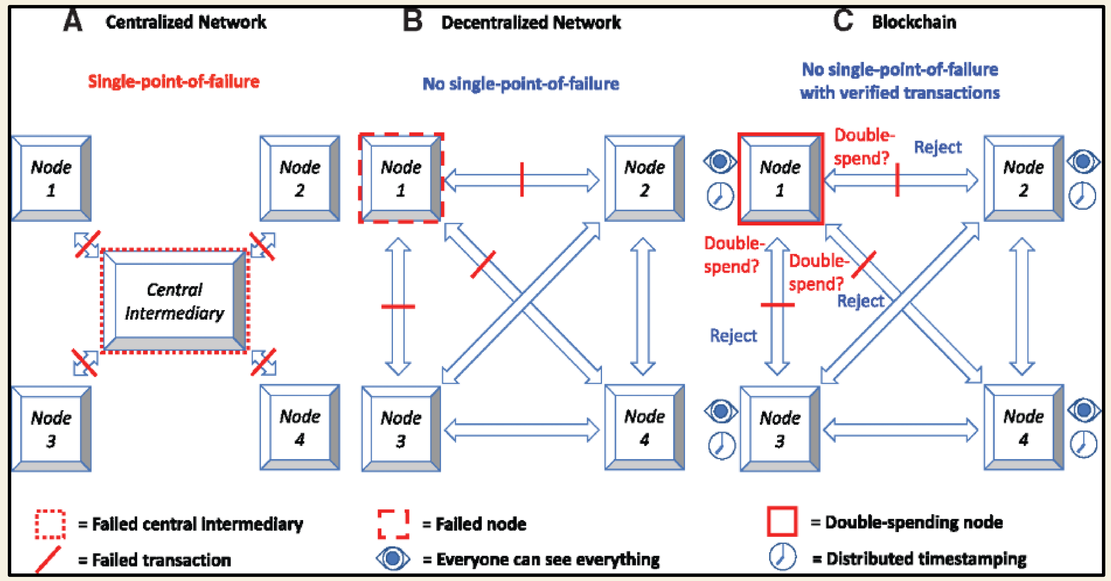

***Figure 1**: Comparison of the distributed network topologies.*

What is the deliverable for this project and why is this topic Data Science?

The deliverables for this project are an extended abstract and a poster submission revealing insights about the benefits of utilizing Blockchain technology in the healthcare industry.

The science behind "data science" is using scientific methods, processes, algorithms and systems to extract knowledge and insights from data. When that data is tampered with, it affects the overall study. Blockchain is a technology that can assist with storing and securing data in a less tamper-prone infrastructure. This adds an additional layer of data protection and more readily accessible data.

References

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