HEALTHCARE INDUSTRY

Blockchain technology is one of the most important and disruptive technologies in the world. Multiple industries are adopting the blockchain technology to innovate the way they function. One of the industries that are looking to adopt the blockchain is the healthcare industry. The challenges now facing the nation's healthcare system are well-known. From onerous data sharing procedures and the ambiguity about clinical trials and medical research to complex billing and optimal patient adherence.

HIPPA, Health Insurance Portability, and Accountability Act has strict regulations around the privacy of a patient's data. It requires PHI (Patient health information) to be secure from breaches and modification. Despite the security regulations, patient data cannot be restricted. Healthcare being a complex system with multiple entities requires a patient to share their data and medical records across the ecosystem.

The business problem in healthcare sector which I am interested in working is :

Medical Data Sharing and Management

Problem :

Medical error is the third leading cause of death in the U.S. Sharing patient data between doctor's offices can be a tricky process ,especially if a patient needs to see multiple specialists or is involved with multiple private practices. During a lifetime, patients scatter their medical records across a myriad of organizations and from one health system silo to the next often losing access to critical past data.

Solution :

Blockchain can securely ease the transfer of patient records among health systems both nationally and across borders, and boost the coordination of member health management, lower transaction costs and risks, and even support medical tourism. Using the blockchain, a decentralized system which is centered on the patient instead of the data holder, creates a shared database of patient data.

The patients are identified via their hash ID which will be their unique identifier. The hashing allows the ID to be unique and secures the privacy of the user. Every transaction on the chain is time-stamped becoming a permanent record of the entire whole that can't be altered afterward.

Advantages of Medical Healthcare Blockchain :

❑ Since the **blockchain is immutable and traceable**, patients can easily send records to anyone without the fear of data corruption or tampering.

❑ A medical record that has been generated and added to the **blockchain will be completely secure**.

❑ The patient can have some control over how their medical data gets used and shared by the institutes.

❑ Since all the data will not be stored in a centralized infrastructure, it will be **impossible to hack the system** and get their hands on all of the data. This keeps the system leakage-free and it also helps secure the privacy of the patients.

❑ Various medical institutes around the world conduct their own research and clinical trials on various new drugs and medications. A blockchain will help **create a single global database** to collect all this data and put them in one place.

❑ The patient can also be incentivized to for good behavior via a reward mechanism. they can be rewarded by tokens for giving their data for clinical trials and research

Component Architecture :

PATIENT DATA MANAGEMENT using BLOCKCHAIN

Data is stored «off-chain» in secured databases owned by healthcare organization

All medical data is encrypted and digitally signed

Patients digitally sign consent forms deciding who has access to their medical data.

Healthcare providers and patients produce data from various sources: imagery, biological exams, medical tests etc

The blockchain acts like a catalogue listing the data present in the database. All the information is timestamped

o Healthcare providers query the dB to gain access

o If the patient gives consent to share the information with doctor making the query, the medical records become available.