BLOCKCHAIN-ENABLED HEALTH RECORD MANAGEMENT SYSTEM

CLIENT PROFILE

Our client is an emerging Decentralized Autonomous Organization dealing in Virtual Healthcare. They are developing a blockchain based virtual care network platform. They strongly advocate bringing blockchain to the healthcare industry and nursing profession in particular.

BUSINESS CHALLENGE

Health records are currently centrally stored with medical organizations and that puts the personal as well as medical records of patients at a high risk. Also, medical privacy laws require that patients have the ownership of their medical records. Client wanted a virtual healthcare system that would maintain and secure the sensitive patient records using blockchain. The application would give the complete data ownership and sharing rights to the patient.

SURETEK SOLUTION

Suretek proposed a safe and secure system of maintaining and sharing records on Ethereum public blockchain. Also, a token implementation has been done which would be utilized for incentivizing the patients and healthcare providers. The system includes following major applications.

- **Virtual Clinic DAO**
- **Smart Population Management Contract Suite**
- **Value Based Payment Manager**

The blockchain network broadly benefits healthcare payors, health systems, nurses, licensing boards, and education organizations as follows:

- **Reduce costs related to issuing and obtaining credentials, recruiting, and staffing nurses**
- **Reduce costs related to home healthcare and telemedicine fraud and malicious behavior**
- **Reduce costs and latency associated with payments and billing**
- **Reduce the need for third-party intermediaries**

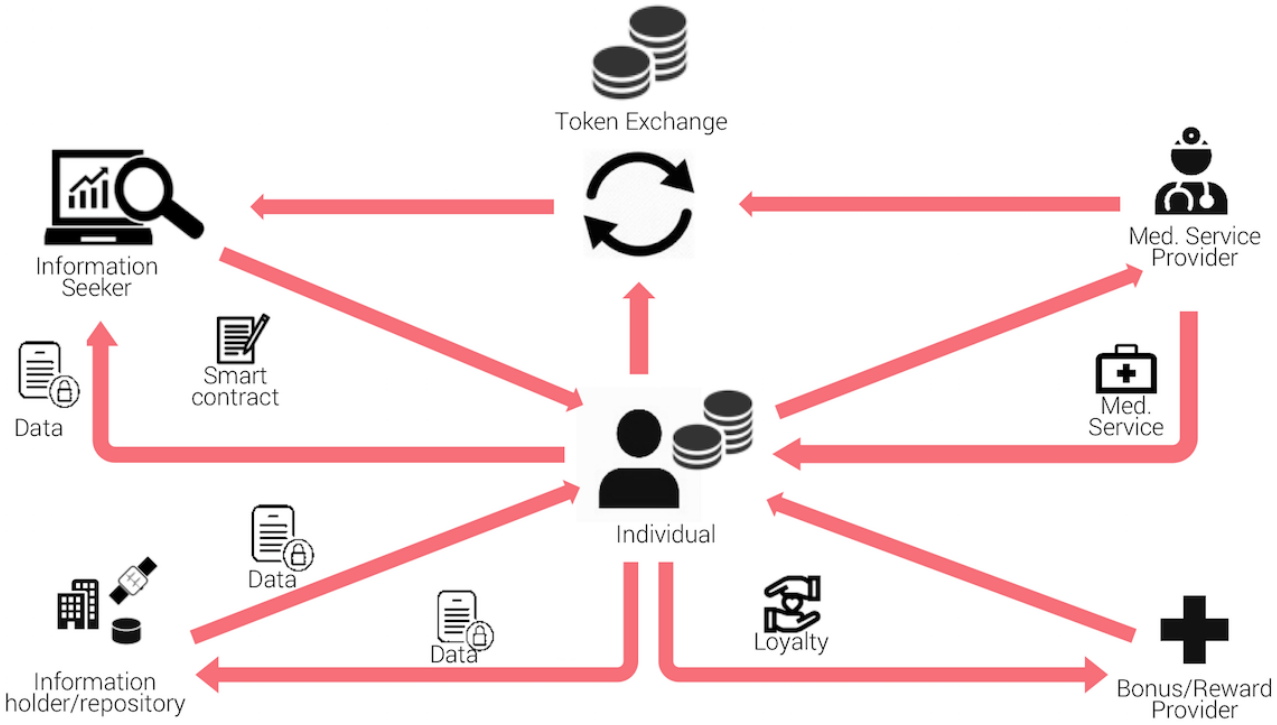
Complexities such as speed, cost and even privacy is solved with the application of blockchain, but here sharing and providing utmost safety to the records is the priority. How? Patient records when stored on the ledger for the first time are shown as transactions. These transactions are further distributed to every other member in the network who maintain the record of all the transactions

ever made keeping the data secure while having the capability of sharing the sensitive secured data when in need.

SURETEK'S DEVELOPMENT CONTRIBUTIONS

- **Suretek team worked on finalizing the appropriate public blockchain to be used.**
- **Finalized the consensus algorithm to be used in application.**
- **Developed web app and mobile app with following features**
  - **A user-friendly user interface for seamless interoperability between the physicians and patients.**
  - **User registration**
  - **Provider registration**
  - **Appointment booking of patients with providers**
  - **Requesting access to medical health record of patient**
  - **Sharing for health records with providers/researchers**
- **Integrated NuCypher KMS with the application for secure data management.**
- **Implemented registration, patient-nurse relationship and summary smart contract.**
- **Implemented Proof of Authority consensus algorithm in the application.**
- **Maintaining of encrypted health records in the private storage of patients.**
- **Recovery method for recovering the private encryption keys in the case of loss or damage of device holding the private key**
- **IPFS node implementation for sharing of encrypted health records with the authorized users.**
- **Activating push notifications to assists both the care giver and the patient to book an appointment in advance.**
- **Transparency to every health record to the network making the entire workflow tamper-free and secure end-to-end. Hence, the security of the sensitive information is ensured.**
- **Setting up the smart contracts for issuing tokens and rewards.**

SURETEK INFOSOFT *CASE STUDY*



Technologies used

NuCypher Kms, PHP (laravel), iOS and Android development platform Python IPFS, Ethereum.