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Project Proposal: MediData Chain

Problem Background

Blockchain is a relatively modern and emerging technology that has innovative applications during its successful healthcare implementation. This data structure provides smooth efficient data sharing, non-repudiation and delivery across all the prominent network members and healthcare providers contributing to developing economical therapies and sophisticated treatments for many diseases.

The biggest problem faced by the healthcare industry is the leaking of essential data and used for malicious devices and other special interests which the application of this technological structure can quickly sort out.

A company which has taken into implementation this blockchain technology is a company in South Korea called MediBloc. This is blockchain health information platform where patients have full control over their medical records. It allows patients to choose what data they want to share with healthcare providers and researchers securely without fear of exposure of medical, valuable and private personal information.

Solution

A blockchain platform designed to improve coordination of medical data between health officers and patients. This empowers patients to organise and share their medical data securely globally hence this improves interoperability and faster access to health care services and benefits. It also aims to enhance the efficiency of health delivery by ensuring data integrity and accessibility. An addition of reward system of issue out to certain rewards to patients.

The overall healthcare costs are reduced by utilizing blockchain's decentralized and immutable nature and hence revolutionize how patient data is stored.

Novelty

The provided problem possess novelty in that it addresses the issue of mishandling of patient private medical background. This mishandling of information has caused individuals with devious intents to pose threats and even ransom patients when patients medical history is leaked. The problem also high lights instances where patient data is manipulated to give out wrong knowledge thus this destroys the authentication of information. The deployment of non-repudiation allows for tracking and accountability of information and patients data for integrity and legibility purposes. Medical facilities limit their sharing of information to other medical facilities for private and security reasons but this path of implementation acts as a stumbling block on promoting interoperability regardless of where the patient is located in the world. Retrieving patients information can act as a risk factor as all the patients data can be retrieved when only a specific set of data is required, hence no filtering option in the system to indicate what exactly and in what quantity the information should be returned.

Logic and Complexity

The logic which has to be implemented will rotate around using the features of the blockchain technology namely immutability, cryptographic security, non-repudiation ability, decentralization among others to ensure patients health data is secured and maintenance of information in terms of confidentiality and integrity. The system is developed to store information on patients ranging from medical medication, history that is catalogued into a ledger ensuring it can not be tampered with and only accessible to verified and authorized personals.

The main structure is the block chain where it consists of blocks storing as elements patient health data transactions, through cryptographic hashes. Patient data will most likely be stored through encryption by way of asymmetric cryptography.

Using a Proof of Stake under the Consensus Algorithm to be used to ensure the linkage of state of the blockchain among the associated participants over the network.

Hash functions: Storing data in hash tables after process through hash fucntions.

Encryption Algorithm: Asymmetric encryption algorithms to encrypt the patient data, to ensure even in the case of a leakage or shutdown of the system data is not exposed, placing patients at a risk.

Crypto Libraries: could be taken into consideration for implementation and helpful in utilizing certain helper functions and accessing proposed methods.

GUI Wireframe