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Functions: -

1) Add Medical Record:

Adding medical records to a blockchain-based system involves several key steps:

- Authentication: To ensure data security, authorized users, such as healthcare providers, need to be authenticated through secure login procedures.
- Data Entry: After authentication, users can add medical records. These records typically include patient information, diagnoses, treatment history, and test results. The data is then entered into the blockchain ledger.
- Smart Contracts: Smart contracts can be used to automate certain aspects of data entry, ensuring that only authorized individuals can make entries and that data is consistent and valid.
- Encryption: Patient data must be encrypted to protect privacy and security. Blockchain systems often use cryptographic techniques to secure the information.
- Consensus Mechanism: The blockchain network must reach consensus on the validity of the new record. This is usually achieved through a consensus algorithm such as proof of work or proof of stake.
- Record Storage: Once validated, the medical record is stored in a decentralized and immutable manner on the blockchain. This means that no single entity has control over the data, reducing the risk of unauthorized alterations.

2) Update Medical Record:

Updating medical records on a blockchain system is a carefully controlled process:

- Access Control: Only authorized users should have the ability to update medical records. This is typically managed through role-based access control.
- Request for Update: The individual or healthcare provider who wishes to update a record makes a request, indicating the specific changes needed.
- Smart Contracts: Smart contracts can automate the approval process. They can verify the authenticity of the requester and the validity of the update request.
- Consensus: As with adding records, achieving consensus is crucial to ensuring that updates are valid and accepted by the network.
- Timestamping: Each update is timestamped, creating a transparent and immutable history of changes.
- Notification: Relevant parties, such as the patient and their primary healthcare provider, may receive notifications of the update to maintain transparency.

3) Get Medical Record:

Accessing medical records from a blockchain-based system is designed for security and convenience:

- Authentication: Authorized users, including patients, healthcare providers, and other stakeholders, must authenticate themselves before accessing records.
- Search and Retrieval: Users can search for specific records by patient identifier or other relevant criteria. The blockchain's distributed nature ensures data availability.
- Data Privacy: Access permissions and encryption mechanisms safeguard patient data privacy.
- Immutable Records: Users can trust that the records retrieved are accurate and unaltered, as the blockchain's immutability ensures data integrity.
- Audit Trail: Users can view the entire history of a medical record, including all updates and access events. This transparency builds trust.

A blockchain-based health-related medical record system offers a secure and transparent way to add, update, and access patient records. These functions are underpinned by authentication, encryption, smart contracts, consensus mechanisms, and the blockchain's core principles of decentralization and immutability. This technology holds great promise in revolutionizing healthcare data management by enhancing data security and patient control while reducing the risk of errors and fraud.

Conclusion

In conclusion, blockchain-based medical record systems have the potential to revolutionize healthcare by enhancing data security, accessibility, and patient-centred care.Thus, we have implemented a Health-Related Medical Record System using Blockchain. Blockchain-based health-related medical record systems offer a promising solution to the challenges of healthcare data management. By utilizing blockchain technology, patient records can be securely stored, accessed, and shared among healthcare providers, ensuring data integrity and privacy. This innovation reduces the risk of data breaches and streamlines the exchange of medical information, leading to more efficient and accurate diagnoses and treatments. Additionally, patients gain greater control over their health data, empowering them to make informed decisions about their care. The transparency and immutability of blockchain enhance trust in the healthcare ecosystem.