MediChain-Empowering Healthcare with Secure, Transparent, and Patient Controlled Data.

PHASE 1- Proposal & Idea Submission

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Problem Statement

The healthcare industry faces significant challenges in managing medical records securely, efficiently, and transparently. Traditional centralized systems for storing and sharing medical records are vulnerable to data breaches, unauthorized access, and information tampering. Patients often lack control over their personal health information, while healthcare providers struggle with interoperability and timely access to critical data. These issues result in delays in treatment, increased costs, and compromised patient care. There is a pressing need for a decentralized, secure, and tamper-proof system that ensures data integrity, privacy, and real-time accessibility of medical records to authorized stakeholders.

Proposed Solution

MediChain offers a decentralized, blockchain-based platform for secure medical record management. Leveraging the immutable and distributed nature of blockchain technology, the system ensures that medical records are securely stored and only accessible to authorized users. Each record is cryptographically encrypted and linked to the blockchain, enabling transparency, traceability, and tamper-resistance. Patients maintain ownership of their data and can grant or revoke access to healthcare providers as needed. Smart contracts automate permission handling and record sharing, enhancing trust and reducing administrative overhead. MediChain promotes interoperability, data security, and patient-centric healthcare by providing a unified and reliable platform for all stakeholders.

Objectives

- To develop a secure and decentralized system for managing medical records using blockchain technology.
- To ensure data integrity, privacy, and immutability of patient health information.
- To provide patients with complete ownership and control over their medical records.
- To enable seamless and secure data sharing among authorized healthcare providers.
- To reduce dependency on centralized data storage and prevent unauthorized access or

tampering.

Innovation & Uniqueness

- Utilizes blockchain technology to ensure tamper-proof and immutable medical records.
- Empowers patients with full control over their data through decentralized access management.
- Implements smart contracts to automate and secure permission-based data sharing.
- Eliminates reliance on centralized servers, reducing risks of data breaches and single points of failure.
- Provides real-time access to health records across different healthcare providers and platforms.

Technologies to be Used

Component	**Technology**
Frontend	React.js / HTML, CSS, JavaScript
Backend	Node.js, Express.js
Blockchain	Ethereum / Hyperledger Fabric
Deployment	AWS

Expected Outcome

- A fully functional decentralized medical record management system using blockchain.
- Secure storage and retrieval of patient health records with ensured data integrity.
- Role-based access control allowing only authorized users to access sensitive information.
- Improved patient autonomy through data ownership and permission management.
- Seamless sharing of medical records across healthcare providers.

Scope for Extension

- Integration with wearable health devices for real-time health data updates.
- Support for AI-based analytics on medical records for predictive healthcare.
- Incorporation of biometric authentication for enhanced security.
- Expansion to include insurance providers for claim verification and processing.