BLOCKCHAIN DRIVEN LAND OWNERSHIP VERIFICATION SYSTEM

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Introduction:

1. Land is one of the most valuable assets, and maintaining accurate and trustworthy ownership records is essential for individuals, businesses, and government authorities. However, traditional land record systems, which rely on paper-based or centralized databases, often suffer from issues such as data tampering, duplication, loss of records, and lack of transparency. These limitations lead to disputes, delays in verification, and increased chances of fraud.
2. To address these challenges, the proposed Blockchain Driven Land Ownership Verification System utilizes blockchain technology to create a secure, decentralized, and tamper-proof platform for managing land records. In this system, all land transactions are stored in a distributed ledger, ensuring immutability and transparency. Smart contracts are used to automate processes such as land registration, ownership transfer, and verification, allowing transactions to occur only after proper validation.
3. Additionally, the system stores cryptographic hashes of land documents on the blockchain while maintaining the actual documents in secure off-chain storage. This approach ensures both data integrity and privacy. By providing a reliable and transparent mechanism for land ownership verification, the system reduces fraud, improves efficiency, and enhances trust among all stakeholders involved in land administration.

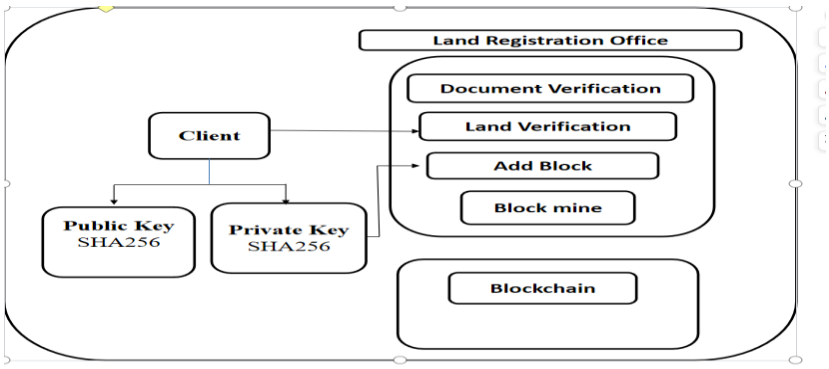

Figure 1: System Architecture of Proposed System

Objectives:

1. To prevent fraud by maintaining secure and tamper-proof records.
2. To ensure no third parties are involved in the process.
3. To minimize the human errors by automating the process with verifiable smart contracts.

Methodology:

1. The proposed system is developed using a blockchain-based architecture to ensure secure, transparent, and efficient land ownership verification.
2. Users register in the system using secure public–private key authentication.
3. Landowners upload land details and supporting documents, which are stored securely in off-chain storage (IPFS/cloud).
4. A land inspector verifies user identity and land details to ensure authenticity.
5. Smart contracts are used to automate land registration, verification, and ownership transfer processes.
6. Once verified, transactions are recorded as blocks in the blockchain using cryptographic hashing (SHA-256), ensuring immutability and traceability.
7. The system integrates frontend (HTML, CSS, JavaScript), backend (Python Flask), and blockchain (Ethereum) components for seamless operation.

Result and Conclusion:

1. The proposed **Blockchain Driven Land Ownership Verification System** was successfully implemented by integrating frontend, backend, blockchain smart contracts, and secure storage components. The system allows users to register land, verify ownership, and transfer property through a decentralized application interface.
2. The results show that land transactions are securely recorded on the blockchain, ensuring immutability, transparency, and traceability. Smart contracts automate ownership transfer and validation processes, reducing manual errors and improving efficiency. The use of cryptographic hashing (SHA-256) ensures data integrity, while off-chain storage (IPFS/cloud) securely manages supporting documents.
3. System testing confirmed that all modules—including user authentication, land registration, document verification, and ownership transfer—function correctly with accurate outputs. The system successfully prevents unauthorized access, detects duplicate records, and maintains a reliable audit trail of transactions.
4. In conclusion, the developed system overcomes the limitations of traditional land record systems by providing a secure, transparent, and efficient blockchain-based solution. It reduces fraud, enhances trust among stakeholders, and supports accurate and reliable land ownership verification.

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Future Scope:

The future scope of this project includes:

1. Integration of AI for fraud detection
2. Implementation of real-time government database integration
3. Enhancement with mobile application and cloud deployment