

Introduction

The Blockchain-Based E-Vault for Legal Records is a secure platform that uses blockchain, AES encryption, and SHA-256 hashing to ensure document integrity, confidentiality, and secure transfers. With a user-friendly Streamlit interface and immutable audit trails, it provides a transparent and efficient solution for legal record management.

Problem Statement

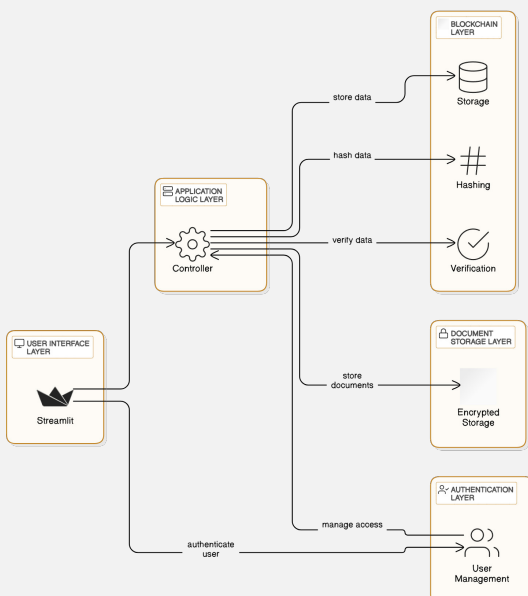
Legal document management faces security risks and inefficiencies. Traditional systems lack tamper-proof storage and transparent ownership verification. Our Blockchain-Based E-Vault ensures secure storage, authentication, and transfer using blockchain and encryption.

Objective:

- Ensure secure legal document storage and transfer using blockchain.
- Utilize cryptographic hashing and encryption for document integrity.

System Architecture:

- Blockchain Integration
- Custom Lightweight Blockchain for Secure Transactions
- Python with Streamlit and PyCryptodome
- Cryptographic Hashing and AES Encryption
- Immutable Audit Trails and Ownership Verification



System Architecture

Weeks 1–4: Research & System Architecture Activities:

- Integrated blockchain for secure document storage
- Implemented AES encryption & SHA-256 hashing
- Developed a lightweight blockchain for transactions
- Built a Streamlit UI for user interaction
- Designed an immutable audit trail

Outcomes:

- Secure & tamper-proof document storage
- Transparent ownership verification
- Encrypted file storage & blockchain tracking
- User-friendly document management UI

Weeks 5–8: Development & Integration

Frontend Development:

- Built an interactive UI using Streamlit for seamless user experience
- Designed reusable components for document upload, transfer, and verification
- Enabled real-time blockchain updates and transaction tracking

Backend Development:

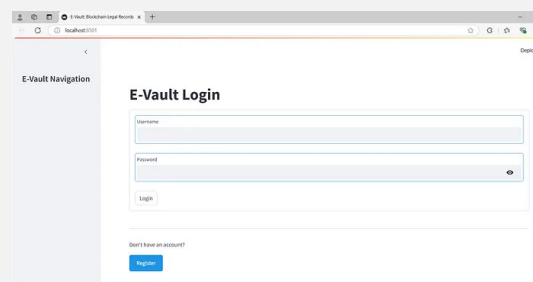
- Developed a lightweight blockchain using Python for secure document storage
- Implemented AES encryption & SHA-256 hashing for data security
- Automated ownership verification and transfer processes

APIs and Integration:

- Integrated blockchain transactions for real-time document verification
- Established secure backend functions for encryption and authentication

Outcomes:

- Functional blockchain-based eVault with secure storage & transfer
- Real-time document integrity verification and ownership tracking
- User-friendly interface for legal professionals



Blockchain for Legal Recordss

Weeks 9–12: Testing & Optimization

Unit Testing:

- Tested blockchain transactions, encryption, and document integrity
- Verified authentication and ownership transfer mechanisms

Integration Testing:

- Ensured seamless interaction between blockchain, encryption, and Streamlit UI
- Verified real-time document updates and audit trail consistency

End-to-End Testing:

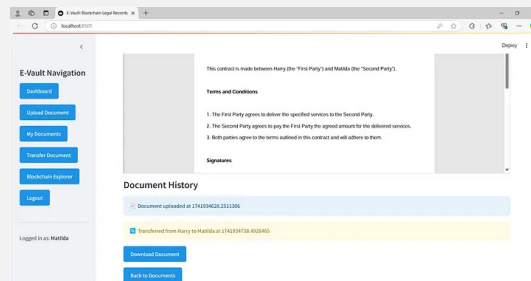
- Simulated user workflows (document upload, verification, and transfer)
- Assessed system performance under various usage scenarios

Bug Fixing and Refinements:

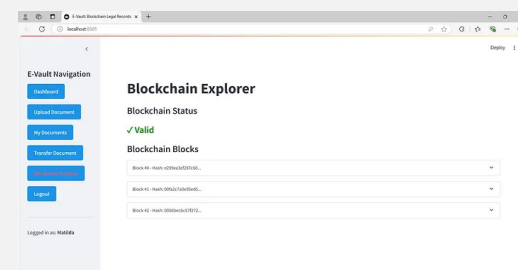
- Optimized encryption efficiency and blockchain transaction processing.

Outcomes:

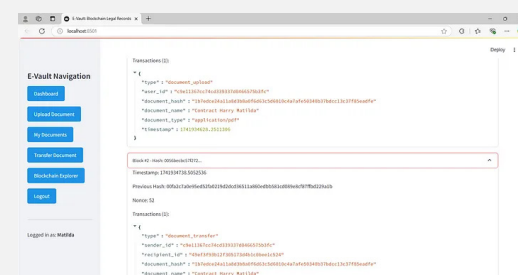
- Delivered a stable and secure blockchain-based legal document management system



Document History is shown



BBlockchain Explorer Page



Blockchain explorer: Tracks all transactions