Problem Statement No. : 6

Team Name : Omicode

Team Members :

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PROBLEM STATEMENT

Blockchain-based Academic Credential System

Significance of the Issue

- Credential verification is often delayed, costly, and prone to fraud, impacting trust and efficiency in academic and professional domains.
- Addressing this ensures integrity, reduces administrative burden, and empowers students with ownership of their academic records.

PROPOSED SOLUTION

Solution

EduChainVerify is a decentralized blockchain platform that securely stores and verifies academic credentials, addressing issues of delayed, costly, and fraudulent verification through automation and tamper-proof records.

Step-by-Step BREAKDOWN

1. **Credential Issuance**: Institutions issue tamper-proof credentials using smart contracts.
2. **User Wallet Creation**: Students create secure wallets to manage their credentials.
3. **Blockchain Integration**: Credentials are stored on the blockchain for security and verification.
4. **Off-Chain Storage**: Large files are stored off-chain using IPFS/Filecoin, linked to blockchain records.
5. **Access Control**: OAuth ensures secure, authorized access to the platform.
6. **Credential Management**: Students can manage and update their credentials at any time.
7. **Performance Monitoring**: System performance is monitored using tools like Grafana.

PROPOSED SOLUTION

Innovation

1. **Decentralization:** Blockchain ensures tamper-proof, immutable credential records.
2. **Automation:** Smart contracts streamline credential issuance and verification.
3. **User Ownership:** Secure digital wallets empower students to manage their academic records.

How Practical and Achievable is

1. 🔒 **Secure Technologies:** Leverages blockchain and smart contracts for tamper-proof, efficient operations.
2. 🚀 **Stepwise Deployment:** Follows a clear roadmap for seamless implementation.
3. 📱 **User-Centric Design:** Prioritizes ease of use with an intuitive interface.
4. 🔧 **Proven Feasibility:** Built on scalable and adaptable frameworks to ensure success.

TECHNICAL APPROACH

Implementation Methodology

1. 📝 Develop smart contracts for **credential issuance** and **verification.**
2. 💻 Build a **user-friendly** interface with Streamlit for student interaction.
3. ⚙️ Implement backend logic using Flask to handle **API requests**.
4. 🔒 **Store credentials** securely on the blockchain with metadata on Filecoin**.**
5. 🔑 Use Metamask for secure user authentication and blockchain **transactions**.

Technologies

- ▹ Ethereum
- ▹ Solidity
- ▹ Streamlit
- ▹ Flask
- ▹ IPFS
- ▹ OAuth 2.0
- ▹ Web3.py
- ▹ Metamask

Feasibility

- **Technological Readiness:** Uses proven, scalable technologies like Ethereum.
- **Security:** Blockchain ensures tamper-proof data and fraud prevention.

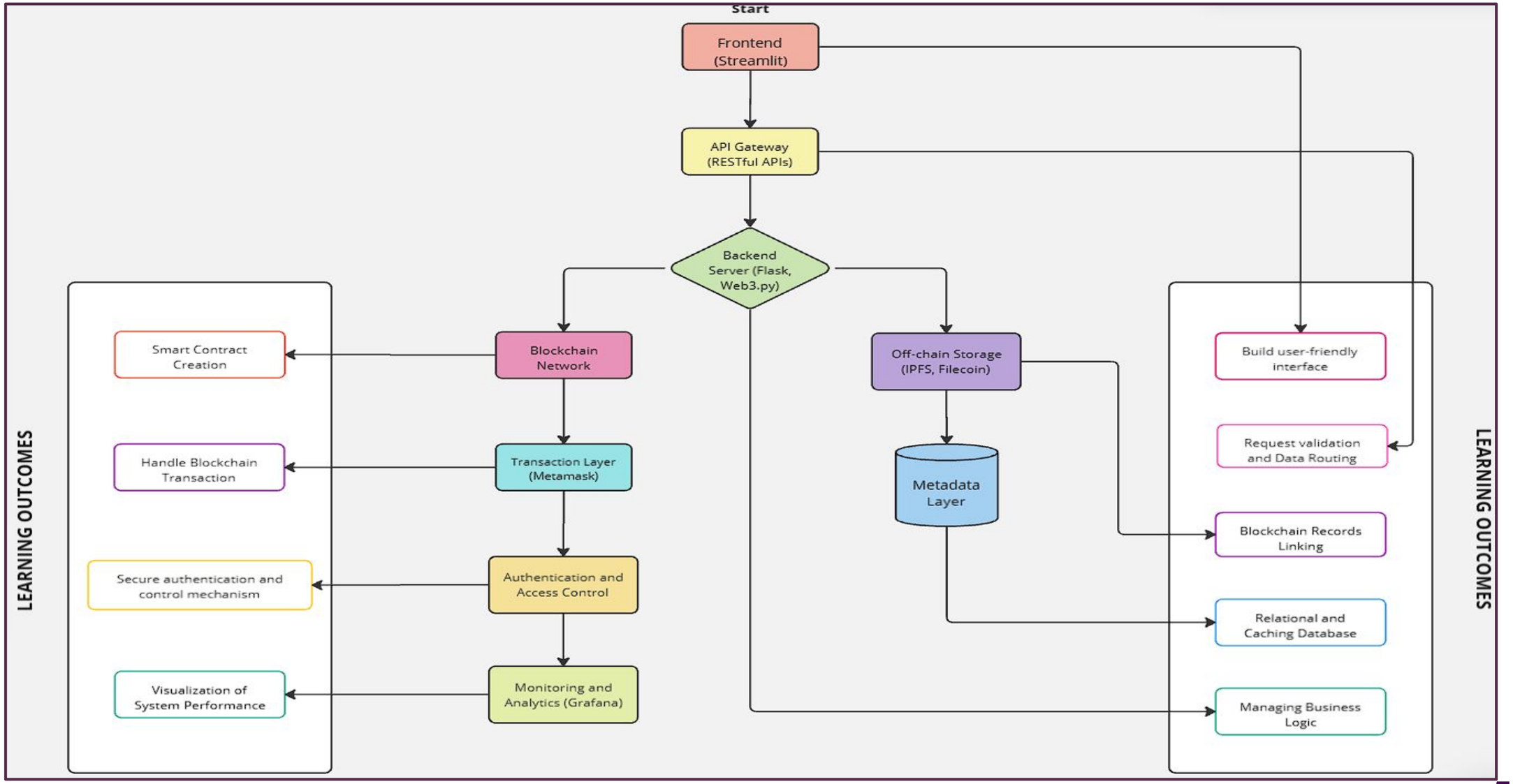
Viability

- **Cost-Effective:** Automates verification, reducing administrative costs.
- **Wide Adoption:** Serves educational institutions, students, and employers globally.

Robustness

- **Secure Transactions:** Blockchain and smart contracts ensure data integrity.
- **Fault Tolerance:** Decentralized system provides resilience and uptime.

USER WORKFLOW



IMPACT AND BENEFITS

Impact

- **Students:** Control and share credentials securely, enhancing employability.
- **Institutions:** Automate processes and reduce fraud, ensuring quicker, easier verification.
- **Employers:** Verify qualifications instantly, ensuring credibility and saving time.

Benefits & Advantages

- **Tamper-Proof Records:** Blockchain's immutability ensures fraud-proof academic records.
- **Cost-Effective:** Automated processes lower operational and administrative costs.
- **Instant Verification:** Solidity linked credentials for immediate access and validation.

Scalability & Sustainability

- **Scalable Infrastructure**: Supports growth with more institutions and users.
- **Tech Adaptability**: Future-proofed to integrate with emerging blockchain solutions.