HACKSPIRATION

TrustChain

- **Problem Statement Title-** TrustChain -Building Digital Trust through AI and Blockchain
- **Team Leader Name -** Vaishnavi Honkalas
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Team Members:

Vaishnavi Honkalas

Eshika Adwani

TITLE & VISION

Title: TrustChaint

Vision: To create a transparent, tamper-proof, and AI-driven trust verification system that ensures authenticity and reliability in digital interactions, certifications, and transactions.

PROBLEM & ALGORAND

PROBLEM

- Centralized attendance systems
- Data can be manipulated
- No transparency for students
- Manual, slow certificate verification
- Easy certificate fraud

⚠️ Trust is assumed, not verified

WHY ALGORAND

- Fast transaction finality
- Very low transaction cost
- Energy-efficient blockchain
- Secure Pure Proof-of-Stake
- Public, tamper-proof verification

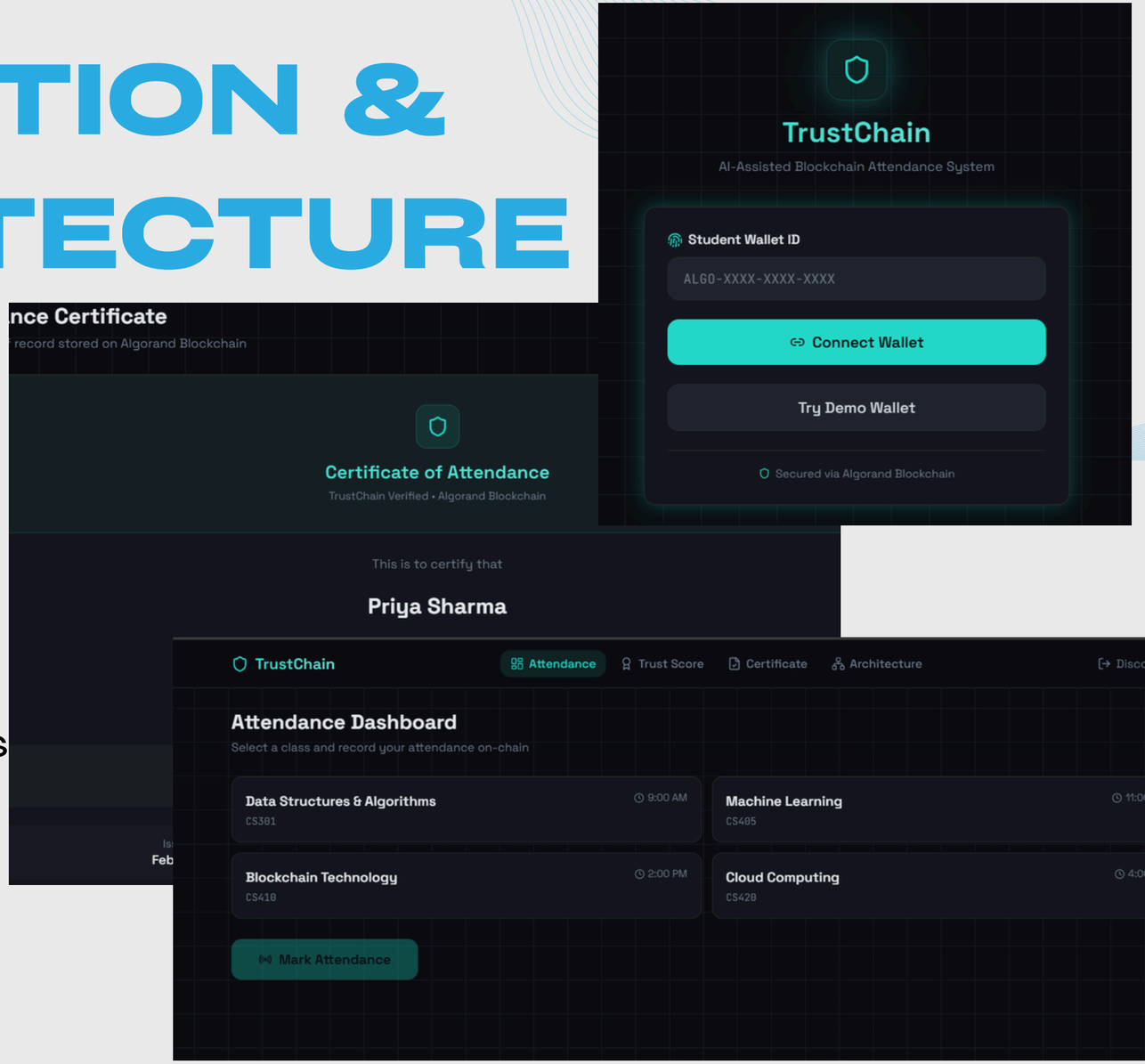
ALGORDAND IN TRUSTCHAIN

- Stores hashed attendance records
- Secures certificate authenticity
- Enables instant verification
- Prevents data tampering

Core Idea

AI evaluates trust. Algorand guarantees it.

SOLUTION & ARCHITECTURE



SOLUTION:

TrustChain

An AI + Blockchain based system that:

- Records attendance securely
- Analyzes behavior using AI
- Generates trust scores
- Issues blockchain-verified certificates
- Enables instant, public verification

✓ Transparent
✓ Tamper-proof
✓ Automated

Prototype Link: https://algorand-attend-aura.lovable.app

ARCHITECTURE
How TrustChain Works

Student Attendance Data

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AI Trust Score Engine (Off-Chain)

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Validated Attendance Record

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Algorand Blockchain

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Blockchain-Verified Certificate

Key Principle

AI decides trust. Blockchain secures it.

TECH STACK & DEMO

TECH STACK

- Frontend: React.js
- Backend: Node.js / Express
- AI Engine: Python (ML / Neural Network)
- Blockchain: Algorand
- Smart Contracts: Algorand Smart Contracts (ASC1)
- Database: PostgreSQL / Firebase
- APIs: REST APIs
- Security: Cryptographic Hashing (SHA-256)

DEMO FLOW

1. Student marks attendance
2. Attendance sent to backend
3. AI engine calculates trust score
4. Validated record hashed
5. Hash stored on Algorand blockchain
6. Certificate auto-generated
7. Certificate verified via blockchain

IMPACT & FUTURE SCOPE

IMPACT

- Eliminates attendance manipulation
- Prevents fake certificates
- Reduces administrative workload
- Builds student & recruiter trust
- Improves institutional credibility
- Scales across multiple institutions

FUTURE SCOPE

- Real-time attendance (IoT / biometric)
- Mobile app for students & admins
- Cross-institution certificate verification
- Advanced AI anomaly detection
- Integration with recruitment platforms
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Long-Term Vision

A unified, trust-first digital education ecosystem.