North South University
Department of Electrical and Computer Engineering
Spring 2024

PROJECT PROPOSAL

— Group 4 —

Members

Mohammad Zonayet Hassan Polok	2031267642	mohammad.polok@northsouth.edu
Ahnaf Akib Ahmed	2312304642	ahnaf.ahmed09@northsouth.edu
Tasmia Rashed Ramisha	2312131042	tasmia.ramisha@northsouth.edu
Sumya akter	21119133642	sumya.akter@northsouth.edu

CSE299L(Section 4)

Faculty: Mohammad Shifat-E-Rabbi

Proposal 1

Project: Simulated Blockchain-based Verification System.

Name: Asure

Description

It will solve a *real-world problem*: **Certificates Verification**, **Medicine Authenticity Verification, Product Authenticity Verification** . We will build a system where:

- Universities, institutes, companies issue **certificates or Authenticity check reports on the blockchain**.
- Products, medicines or **certificates will link through a QR code**.
- Employers and users can instantly **verify authenticity** online.

Asure developed using Solidity, JavaScript(React.js), Node.js + Express, MongoDB (NoSQL), HTML, CSS & Bootstrap. We will offer users a platform for verifying authenticity. With an **user interface,** users will experience smooth navigation and enhanced usability. The application will include **BlockChain operations** for secure user information storage and settings. Additionally, **file operations** will handle tasks like verification updates.

Planned App Features:

- **User Registration:** Allow users to create accounts by providing institutional information or personal details.

- **Blockchain-Backed QR Codes**
  Every certificate, product, or medicine gets a unique QR code linked directly to its blockchain record — impossible to fake or duplicate.

- **Dynamic Authenticity Updates**
  If an issuer revokes or reissues a document, the change automatically reflects in real-time on the blockchain.

- **Multi-Signature Verification**
  High-value certificates or reports require multiple institutional approvals before becoming valid, ensuring extra trust.

- **NFT Certificates**
  Each verified certificate can be minted as an NFT, proving digital ownership and transfer history on-chain.

- **Tamper Detection Alerts**
  Instantly alerts users if a certificate, product, or QR code hash doesn't match the original blockchain record.

- **Reputation Scoring for Issuers**
  Institutions and companies earn a blockchain-based "**Trust Score**" based on their verification history and reliability.

- **Crowd-Verified Reporting System**
  Users can report suspicious or fake certificates/products, helping others avoid fraud and improving system transparency.

- **Geo-Verification Map**
  Tracks where verification scans happen, helping detect counterfeit hotspots (useful for medicine & product tracking).

- **AI-Powered Fake Detection**
  Before blockchain verification, AI scans uploaded documents or product images for tampering or forgery signs