Category : Industry Personnel **Problem Code**: MU1

Problem Statement: **Block-chain based certificate validation**

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Problem Statement:

Storing the school/university/board certificates is a recurring process. For the Organization, verifying the authenticity of the certificates is tedious and cumbersome . The proposed solution will help the institutions to store the certificates in the decentralized way using the BlockChain system and give access to any organizations or any institution with the consent of the individual using multi-sign. What we want: sharable decentralized storage using digital signature and access.

Technology Stack:

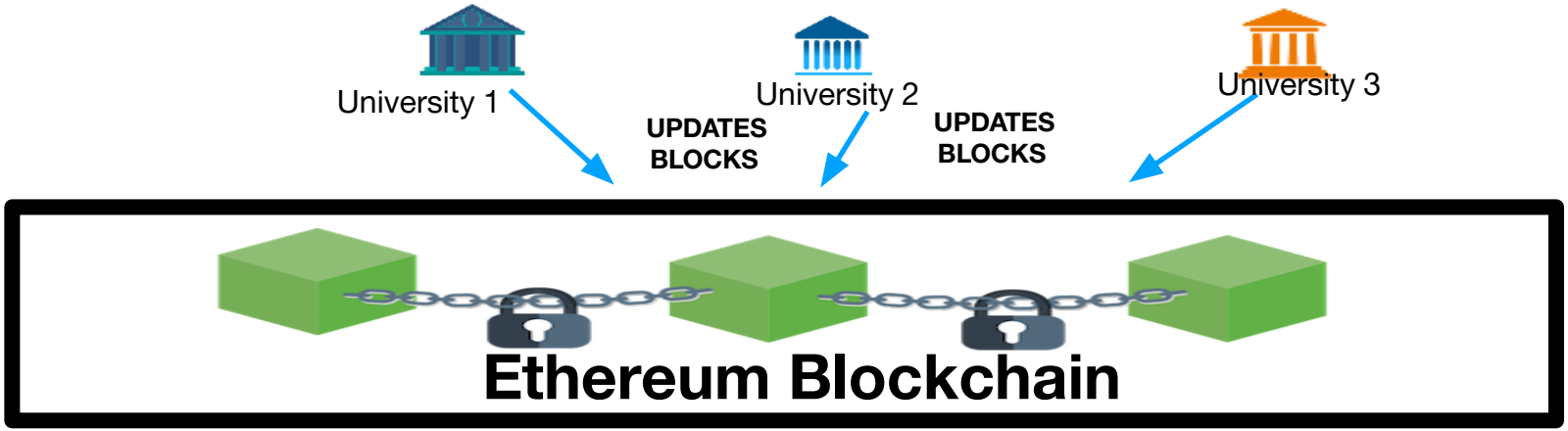
- Ethereum Smart Contracts
- Python
- HTML, CSS
- MySQL
- JavaScript

Idea

- The basic idea is to create a software application or a web based application with interface for block mining , verification and access.
- The trusted nodes(miners) like Universities will have the authority to add new blocks containing hashes of the certificates.
- **Verification:** The certificate is sent into hashing algorithm and the generated hash is used to verify if it exists on the block chain.
- **Access >> Multi Signature Wallet:** The certificates are stored in wallets which require three keys instead of one (multisignature wallet). It can be accessed only with the majority of keys (at least 2 keys).

- Since the hashes are stored on the blockchain rather than the actual certificates the privacy and identity theft is prevented.
- The MultiSignature wallet allows the control over the wallet be shared between entities rather than a single authority to prevent misuse.
- Since the certificates are stored on blockchain and because of its immutability it's tamper proof and fraud resistant.

BLOCKCHAIN


University 1
University 2
University 3
UPDATES BLOCKS
UPDATES BLOCKS
Ethereum Blockchain
Verifies on blockchain
Submits certificates
MultiSig wallet
Certificate Issuer
Govt Body
Certificate Owner

Addition of Blocks (Mining):

- Each node makes and collects certificates and digitalise them
- The ability to add a block to the chain is distributed to nodes at specific intervals of time.
- During the specified time the node will add and broadcast its block of certificates and all the nodes will verify them and update it on their chain as well.
- A copy of the certificate is sent to the certificate owner .

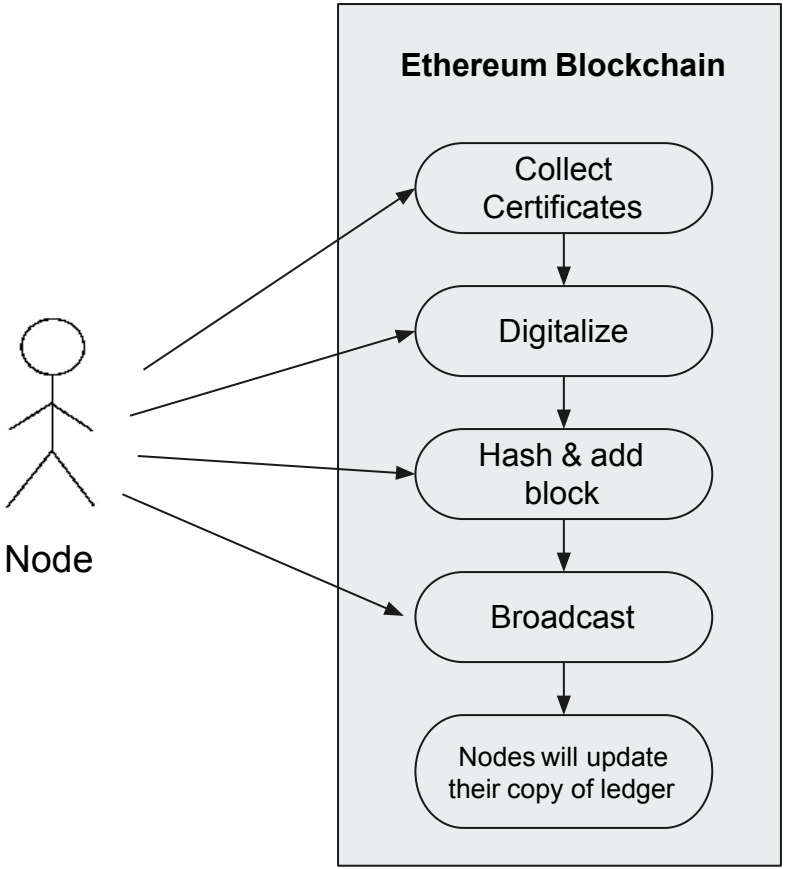
Verification:

- The certificate holder will submit a copy of his digital certificate to the company for job application.
- The company will upload the digital certificate to the site and the system will generate the hash.
- The system will scan the blockchain and Verify it.

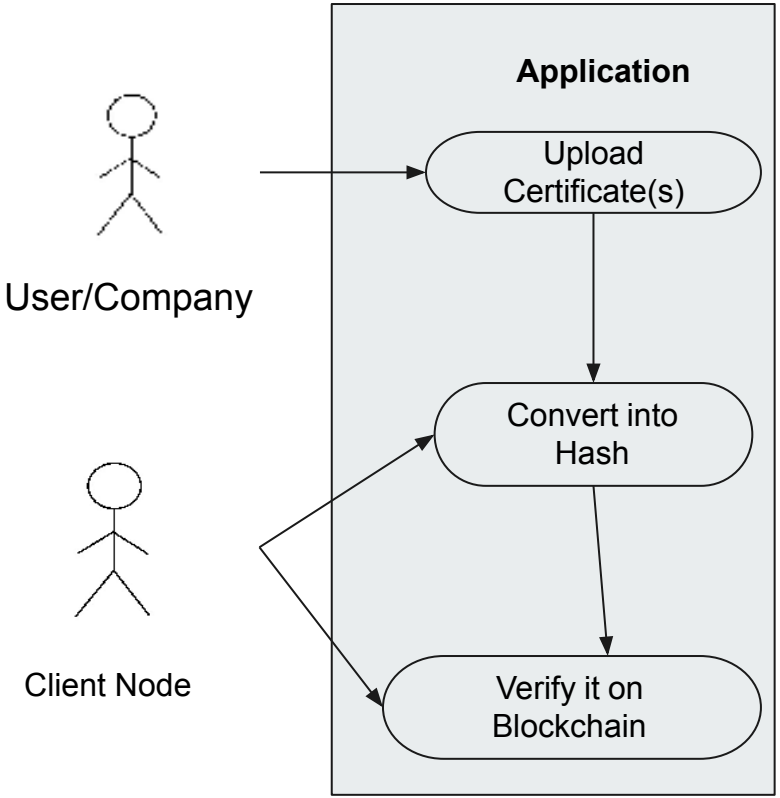
Wallet:

- The interested parties will submit their digital signature of their approval and when the majority of keys are received the blockchain will grant access to the wallet .
- When a company/entity requests access to a wallet a notification is sent to all the entities holding keys to the wallet.

ADDITION OF BLOCKS



VERIFICATION



Multi Signature Wallet