# IT Industry Project

## Project Final Report

## Digital Skills Wallets for Rural High Schooler Engagement and Employment
## Project No. :18



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| Criteria | High Distinction | Distinction | Credit | Pass | Fail |
|---|---|---|---|---|---|
| ***Project Outcome and success***<br>• *Value*<br>• *Useful*<br>• *Complete*<br><br>**25 marks** | Demonstrates a sophisticated understanding of the project context including the nature of the business or organization and the sector within which it operates<br><br>The project goals are listed and explained so that their impact is clear. There is a clear and professional assessment of the extent to which the goals were achieved, and explanation provided as to how the assessment was achieved including any metrics use for evaluation. | Demonstrates a high understanding of the project context including the nature of the business or organization and the sector within which it operates<br><br>The project goals are listed and explained clearly but lack sophisticated engagement and depth of understanding. An evaluation of effectiveness is clearly presented but lacking depth of engagement and inclusion of logical rationale or metric. | Demonstrates a good understanding of the project context including the nature of the business or organization and the sector within which it operates<br><br>Project goals are listed and an explanation is provided but is missing clear articulation of their impact and value. A general assessment of success is included with limited depth and no inclusion of rationale or evaluative metric. | Demonstrates an understanding of some significant aspects of the project including the nature of the business or industry.<br><br>The project goals are presented but not explained with depth or detail. Most information is pertinent to the project. A simplistic assessment of success is included with limited, or no rationale or evaluative metric included. | Does not display an understanding of the project correctly, significant aspects missing.<br><br>Reasoning is deficient. Information is not relevant or flawed.<br><br>Project goals are not articulated, incorrect or unprofessional in engagement |
| **Project Progress & Reflections**<br>• Critical Analysis<br>• Problem Solving<br>• Efficiencies<br>• Effectiveness<br><br>**25 marks** | • The project increments were executed completely as outlined in the Assessment 2 Project Plan<br>• All increment level evidence on the project progress is included using accepted tools (Trello images, burndown charts, Gantt Charts and retrospective records)<br>• Revisions to the Assessment 2 Project Plan are discussed and justified professionally.<br>• Relevant experiences related to issues your group faced are critically analysed, presented with insightful resolutions | • The project increments were executed mostly as outlined in the Assessment 2 Project Plan<br>• Most increment level evidence on the project progress is included using accepted tools (Trello images, burndown charts, Gantt Charts and retrospective records)<br>• Revisions to the Assessment 2 Project Plan are discussed in detail and justified<br>• Relevant experiences related to group level issues are properly analysed, presented with original resolutions | • The project increments were executed partly as outlined in the Assessment 2 Project Plan<br>• Some of the increment level evidence on the project progress is included using accepted tools (Trello images, burndown charts, Gantt Charts and retrospective records)<br>• Revisions to the Assessment 2 Project Plan are described with limited justifications<br>• Relevant experiences related to group level issues are analysed, presented with basic resolutions | • Most of the project increments did not deliver meaningful outcomes<br>• The increment level evidence on the project progress is not relevant or not included from the tools (Trello images, burndown charts, Gantt Charts and retrospective records, "Done" lists)<br>• Limited Revisions to the Assessment 2 Project Plan are mentioned<br>• Relevant experiences related to group level issues are not discussed | • No useful outcomes were delivered in all increments<br>• The increment level evidence on the project progress is not included from accepted tools (Trello images, burndown charts, Gantt Charts and retrospective records)<br>• Revisions to the Assessment 2 Project Plan are not covered at all<br>• Relevant experiences related to group level issues are not discussed (no group level reflections) |
| ***IT artefacts Delivered to the customer***<br>• *Quality*<br>• *Professional Standards*<br>**40 marks** | The artefacts and its subcomponents submission fully match with the scope agreed with the client<br><br>Those are delivered to with high quality standards and well above normal expectations of the industry partner or tutor<br><br>The IT artefacts are indistinguishable from one produced in a similar time frame by an experienced professional team. | The artefact submission encompasses much of the scope agreed with the client or tutor but falls short in several important areas, with key components either not attempted or completed, or completed well below a professional standard.<br><br>Overall, the artefact reflects work of a good standard for the work successfully delivered, while remaining below the level as those in the higher-grade band. | The artefact submission broadly reflects the scope agreed with the client, but some aspects of the agreed deliverable may not have been completed or may not have been completed to a professional standard.<br><br>Overall, the artefact reflects work of a near professional standard for the work successfully delivered, without perhaps reaching the same level as those in the higher-grade band. | The artefact submission encompasses some of the scope agreed with the client but falls well short of an acceptable deliverable for the project.<br><br>Key components are either not attempted or completed or completed poorly.<br><br>Overall, the artefact reflects work of a relatively weak standard for the work successfully delivered, | The artefact submission encompasses little or none of the scope agreed with the client or tutor<br><br>None of the agreed components of the artefact have been delivered, and those mentioned are of poor quality.<br><br>Key components are either not attempted or |

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| | | normal expectations of a team of Master of IT final year students. | | | poorly. |
| ***Communications***<br>• *Clarity*<br>• *Conciseness*<br>• *Correctness*<br><br>**10 marks** | The report is consistently professional in tone and structure and addresses each of the listed requirements in great detail<br><br>No errors of grammar or structure.<br><br>Report is organized to aid understanding, and this is assisted by the layout and formatting.<br><br>The standard of writing exceeds well above expectations | The report is generally professional in tone and structure and addresses each of the listed requirements in detail<br><br>Very limited errors in grammar or structure.<br><br>The report is well organized, and the layout and formatting are well chosen.<br><br>The standard of writing is above expectations | The report is professional in tone and structure but lacks some detail in a small number of the listed requirements.<br><br>There may be frequent and occasional errors of grammar or structure.<br><br>Organization and layout remain good,<br><br>The standard of writing meets the expectations of this level. | The report does not meet expectations, and the coverage is deficient in several the listed requirements.<br><br>Grammar and structure are variable but are usually ok.<br><br>The organization is deficient, but some effort has been made to structure and format the document.<br><br>The standard of writing may lie below the expectations at this level | The report doesn't meet the requirements set out in the brief.<br><br>Sections missing or poorly covered.<br><br>Meaning unclear as grammar and/or spelling contain frequent errors<br><br>Disorganised or incoherent writing<br><br>Structure either absent or incoherent and the standard of writing may be well below the expectations at this level |

## Executive Summary

The project addresses the challenges rural high school students face when it comes to displaying and verifying their digital skills so that their chances for employment increase. As for schools, it lacks infrastructure to provide and track digital skill development of their students, and for local businesses, it is a means to identify the potential talents that suit their business needs. Therefore, the proposal from the client to address this disparity among these three stakeholders is a solution to develop a system using a blockchain-based verification and a secure, privacy-enabling algorithm.

The project has been designed and delivered a solution called the Digital Skill Wallet that was built using a frontend using Angular frontend framework, a backend using Node.js, a database in MySQL and the Hyperledger Fabric blockchain network. The system enables the students to collect skill coins based on the different skills and knowledge that they have tested over the years as a student and verified by the school. The team had implemented the core features such as the User Login based on their respective role, corresponding dashboard views for school and student, skill coin computation using CRA rubrics and secure using a zero-knowledge proofs algorithm.

As the technologies used for the development were new to us, there were a few issues with the cross-platform setup, but the team worked through the issues. Moreover, we had adjusted the scope of the project due to the time constraints and decided to focus on only two stakeholders' perspectives, i.e. the school and students. Keeping this all in mind, the team has developed a working prototype that meets the core features of the project and can be scaled further in the future to include the employers' perspective.

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# 1. Analysis

The Digital Skills Wallet project emerged from a clear gap in the current educational landscape: rural students often lack access to digital credentials that are secure, traceable and meaningful outside their context. Although many schools conduct assessments, the outcomes are rarely transformed into portable skill records or verified artefacts that can be trusted by other institutions or employers. The repository for the project is available here.

This section outlines how the project team identified and addressed several unknowns, developed a strategy to convert learning evidence into verifiable credentials, and evolved the system design through critical analysis and iterative development.

## 1.1. Understanding the Problem Statement

At the start of the project, the team identified five major analytical challenges:

a) How can student skills be digitally represented and stored immutably?
b) How do we convert raw test scores into transferable skill indicators?
c) How should we separate blockchain-responsible logic from backend logic?
d) How do we ensure verifiability without compromising student privacy?
e) How can the system support detailed skill tracking over multiple years and tests?

Each of these challenges informed the architecture, tooling, and design decisions taken throughout the development lifecycle.

## 1.2. Problem-Solution Mapping

To address the challenges, the team engaged in focused research and experimentation. Table 1 outlines how each problem was tackled:

*Table 1: Analytical Challenges and Responses*

| **Problem** | **Team Strategy** | **Implemented Solution** |
|---|---|---|
| Verifiable skill record | Use blockchain to create a tamper-proof audit trail | Skills stored immutably on Hyperledger Fabric |
| Complex translation from test to skill | Develop CRA-to-skill mapping and define rubric-based scoring | SkillCoins based on Logical Thinking, Problem Solving, etc |
| Too much processing in smart contracts | Decouple logic: off-chain for evaluation, on-chain for storage | Node.js for translation + proof, Fabric for persistence |
| Risk of data exposure in verification | Apply Zero-Knowledge Proof (ZKP) for private validation | Integrated snarkjs to generate and verify proofs |
| Need to show multi-year progress | Design a student wallet as a ledger of time-stamped skill entries | Each test = blockchain transaction with traceable history |

### 1.3. Data Modelling and Simulation

Since live test data and school artefacts were not available during development, the team created a simulation model in the frontend. This involved:

- Generating random test scores using a structured CRA rubric
- Mapping scores to predefined skill dimensions (logical thinking, etc.)
- Aggregating scores into a "SkillCoin" representation
- Simulating submission flows and proof generation

This allowed the full system, from UI input to blockchain commit, to be tested under realistic conditions using dummy data.

### 1.4. On-Chain vs Off-Chain Boundary Analysis

A key design decision was the allocation of responsibilities between off-chain (Node.js + MySQL) and on-chain (Fabric chaincode) components. The decision matrix (Table 2) was based on considerations of computational efficiency, privacy, and verification requirements.

*Table 2: On-Chain vs Off-Chain Responsibility Matrix*

| Task | Location | Reason |
|---|---|---|
| Skill calculation & rubric logic | Off-chain (Node.js) | Allows flexibility and versioning; reduces chaincode complexity |
| ZKP generation | Off-chain | Requires cryptographic libraries not supported in the Fabric chaincode |
| SkillCoin storage | On-chain (Fabric) | Guarantees traceable and immutable records |

### 1.5. Audit Trail and Wallet Structure

To support longitudinal tracking, the team designed the student wallet to function like a skill ledger:

- Each blockchain transaction represents one test submission
- Every submission stores multiple skills and a timestamp
- The full skill record across Grades 9–12 can be reconstructed from on-chain data
- Artefact hashes are included for post-hoc verification or audit

This model ensures that even if a student changes schools, their verified skill history remains intact and accessible.

### 1.6. Team Workflow and Development Strategy

Our team adopted DSDM to handle ambiguities and changing needs during the project (DSDM Project Framework Handbook, n.d). Its iterative process made it possible to produce early prototypes that were regularly improved in response to input from peers, our supervisor, and weekly check-ins with industry clients. In a realistic educational setting, this helped guarantee that important objectives like privacy, verifiability, and usability stayed in line with stakeholder expectations. Development was structured around clearly defined roles, enabling parallel progress across different system layers:

*Table 1.6: Team Roles and Core Contributions*

| Team Member | Key Area | Core Contributions |
|---|---|---|
| Frontend Developer | Angular UI | Test form, login, dashboard, simulated data generator |
| Backend Developer | Node.js + Fabric SDK | API endpoints, auth, skill translation, ZKP proof handler |
| Blockchain Lead | Chaincode & Ledger | Chaincode logic, endorsement testing, and ledger query design |
| Integration & DB | MySQL, Testing | Off-chain data store, user auth |

To manage the project effectively, the team utilised ClickUp and Trello for task management and sprint coordination. Using Gantt views, we tracked assignments, due dates, and progress across modules. Weekly check-ins ensured alignment across technical domains, while the use of status labels (e.g, To Do, In progress, Completed) helped monitor progress and resolve blockers efficiently.

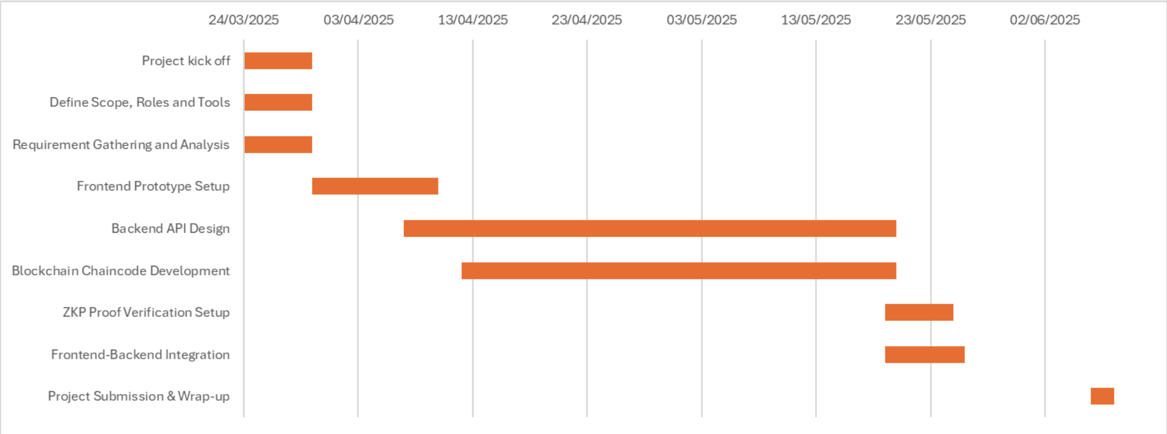


*Figure 1.6: Gantt Chart*

This visual plan helped ensure milestone clarity, coordinated contributions and time-bound execution across the multi-disciplinary teams.

## 2. Design

The design of the Digital Skills Wallet platform demonstrates the practical application of key ICT concepts, including blockchain architecture, web development, access control, data privacy and security and agile project management.

The project is based on a secure blockchain system that will help rural students acquire their digital skills and prove their capabilities. The goal of the system is to enable rural high school students to securely receive, store, and share digital skill credentials with schools and local employers using a decentralised, privacy-preserving platform built on Hyperledger Fabric.

## 2.1. Use Cases

There are three users in the system. However, the duration of the project was limited, so the team decided to focus on two users, namely, the school and the student.

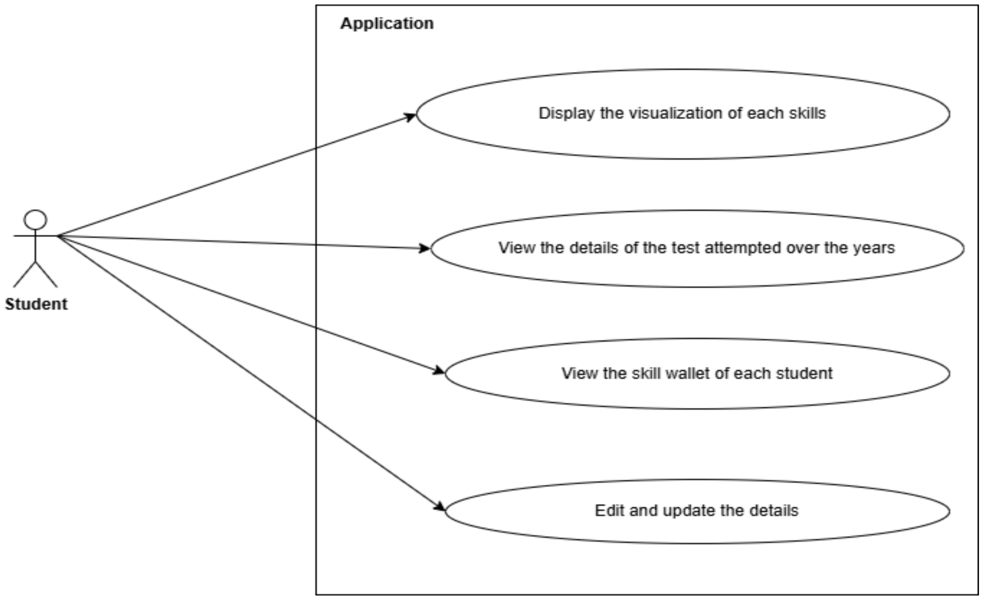


*Figure 2.1 (a): Use Case for Student*

*Figure 2.1 (a)* outlines the core functionalities available to student users. It uses the application mainly to view and manage their own academic performance and skill development. It enables students to visualize data in the form of bar charts and pie charts to get a better understanding. It allows access to historical records of all tests the student has completed over the years of his/her schooling. It displays a personalized skill wallet showing skill coins and other information. Also, it can update the details of the student's information.

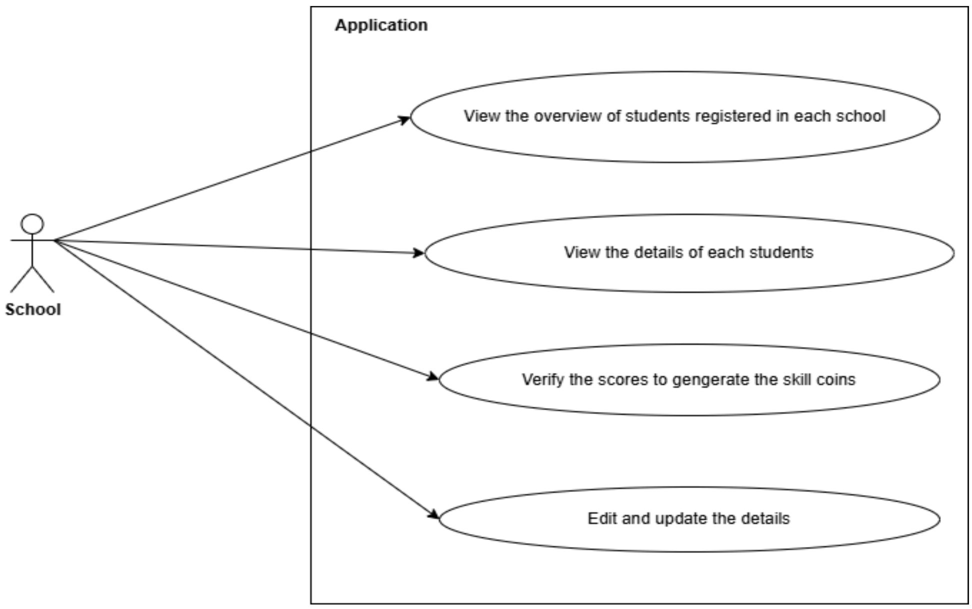


*Figure 2.1 (b): Use Case for School*

*Figure 2.1 (b)* represents the use cases for the school user. It enables the school administrator to access the student details associated with the school and play a verification role in generating the skill coins for the students. It provides a dashboard with the data visualization of the overall student information. It enables access to the information of all students. It is responsible for verifying the submitted test data before generating the skill coins. Also, it is able to edit and update the details of the school.

## 2.2. System Architecture

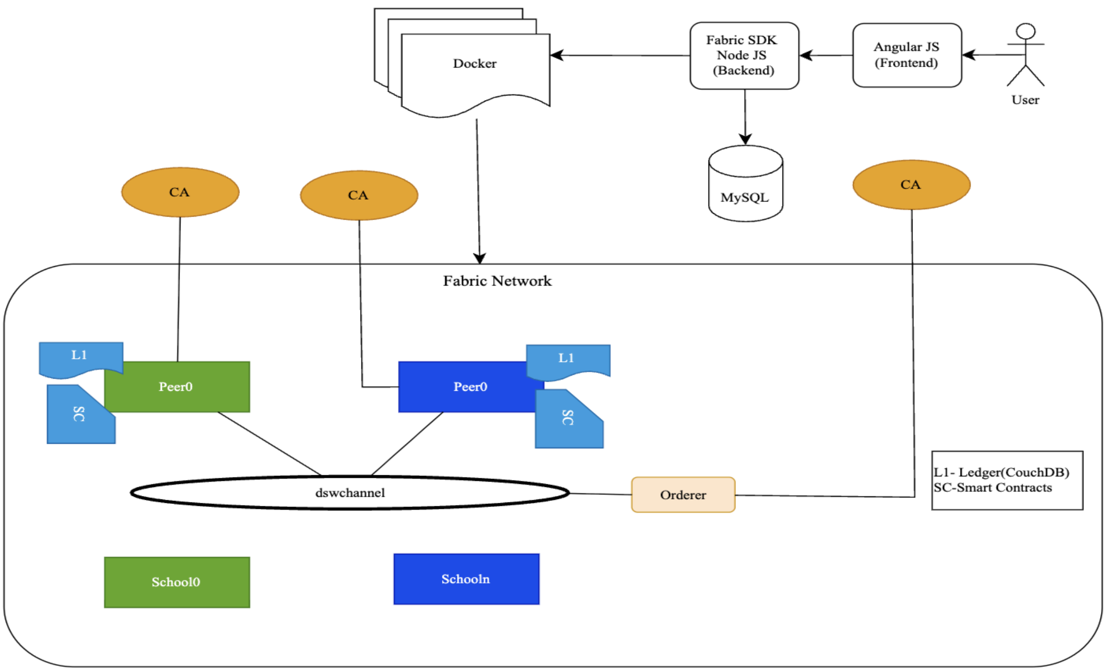


*Figure 2.2 (a): System Architecture*

Figure 2.2 represents a blockchain-based system architecture designed using Hyperledger Fabric to support the secure management and verification of digital skill credentials for rural high school students. The core of the system is the Fabric Network, a permissioned blockchain where each school maintains its own peer node (e.g., Peer0 from School0). These peer nodes store the distributed ledger data using CouchDB and execute smart contracts (chaincode) that govern key operations such as issuing, storing, and validating student credentials.

Communication between participating nodes is facilitated by a dedicated private channel (dswchannel), guaranteeing that only trusted parties can access credential-related information. In order to maintain network consistency, the Orderer component manages block formation and transaction sequencing. By providing participants with digital certificates that secure and authorize their interactions, a Certificate Authority (CA) manages identification and authentication.

The application layer consists of a backend created with Node.js and the Hyperledger Fabric SDK, enabling connectivity between the user interface and the blockchain network. It incorporates a MySQL database for off-chain data storage, which includes user information and actual credential links, thus improving system performance. The frontend is developed with AngularJS, offering a user-friendly web interface for students, schools, and employers to issue, verify, or request access to credentials.

All services are encapsulated in Docker containers, facilitating easier deployment and management. This modular architecture enables scaling and updating of individual components without affecting the entire system. The design seamlessly integrates blockchain security, privacy protection, and user-friendly interfaces, providing a strong solution for validating digital skills in rural education settings.

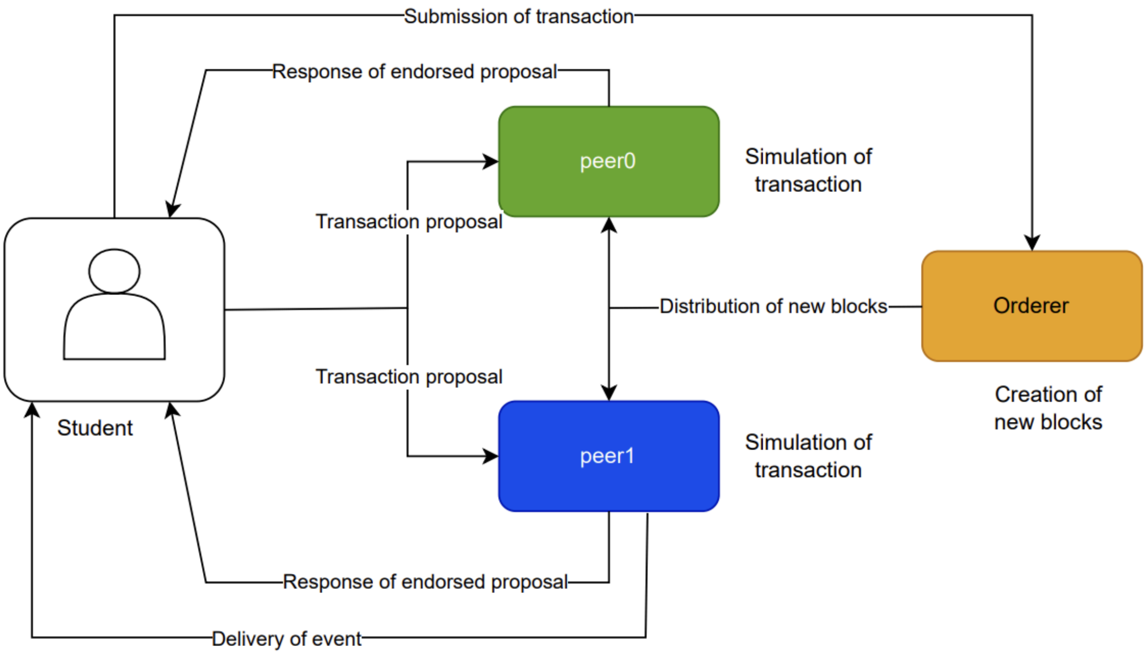


*Figure 2.2 (b): Workflow diagram*

Figure 2.2 explains how a student's skill submission flows through the Hyperledger Fabric network from initial proposal to final ledger commit using the Fabric SDK in the backend. The transaction flow adheres to Fabric's endorsement, ordering, and validation model to ensure consistency and traceability.

1. Student Action (Frontend Initiation): The student triggers an action in the Angular frontend (e.g., submitting skill data). This sends a structured request to the Node.js backend.
2. Transaction Proposal (Backend SDK): The backend uses the Fabric SDK to send a transaction proposal to two endorsing peers:
    - peer0.org1.example.com (shown as peer0)
    - peer0.org2.example.com (shown as peer1)

   At this stage, no data has yet been recorded on the blockchain. Peers only simulate the chaincode to predict the result of the proposed state change.
3. Simulation by peers
   Each peer:
    - Simulates the transaction using the current world state (CouchDB)
    - Verifies logic: student existence, SkillCoin balance, artefact hashes
    - Generates a read/write set without changing the ledger
    - Signs (endorses) the result if it matches the endorsement policy
4. Endorsement Collection
   The backend receives responses from the peers. If all endorsements match the defined policy (e.g., 2 out of 2 orgs must sign), the proposal is considered valid.
5. Submission to the Orderer

The endorsed transaction is sent to the orderer, which:

- Packages multiple valid transactions into a block
- Maintains sequencing across channels
- Does not run any business logic- it just orders and broadcasts

6. Block Delivery to Peers
   The orderer broadcasts the new block to all committing peers (including peer0 and peer1). Each peer then:
   - validates the endorsement signatures
   - ensures the world state hasn't changed since endorsement
   - writes the transaction to the ledger and updates CouchDB

   For example:
   - The student's new SkillCoin balance is recorded
   - A new skill submission entry is appended with a timestamp and artefact hash
7. Block Event Emission
   Once committed, peers emit a block event. The backend SDK listens for this event and notifies the frontend.
8. Frontend Confirmation
   The frontend receives confirmation that the skill record has been successfully submitted and stored immutably.

# 3. Outcomes

## 3.1. System Components Delivered

The team was able to deliver the working application based on the perspective of the two users, namely the school and the student.

### 3.1.1. Project Folder Structure

**backend/**: Contains Fabric client setups, routes, and server-side logic.
**frontend:** The client-side application (such as an Angular-based one).
**fabric-samples/**: Contains the chaincode and Hyperledger Fabric test network.

### 3.1.2. Login for Users

The login page was created for both users. Based on their role, each user will be directed to their respective dashboard. The details of the users have been saved in the database manually. Therefore, the team has not considered building the registration form page. The passwords have been saved and encrypted using bcrypt, and each of the users has the same password.

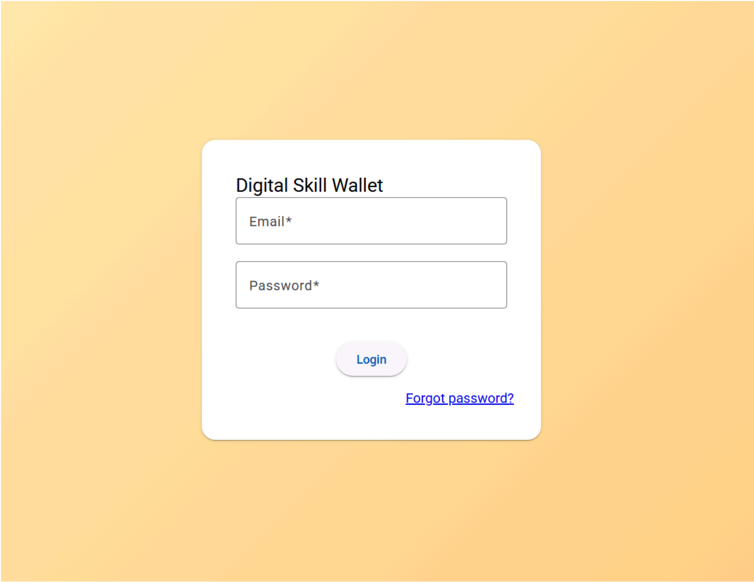


*Figure 3.1.1. Login page*

### 3.1.3. School Dashboard

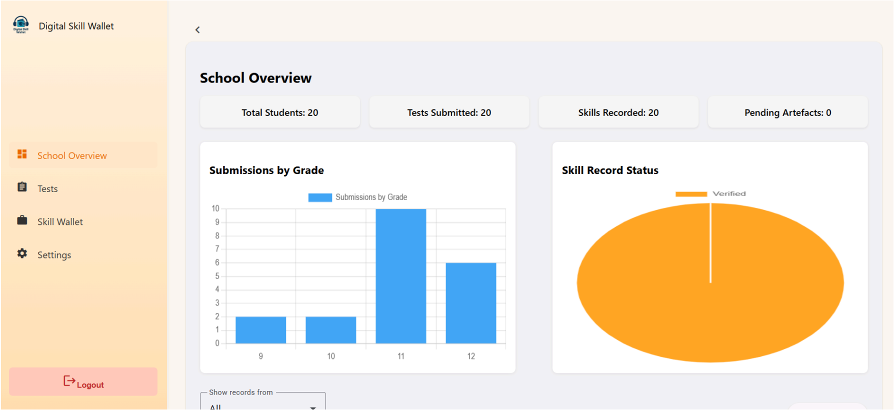


*Figure 3.1.2 (a): School Dashboard*

Upon login, the user's school will be able to view the dashboard that is designed with the data visualization of the information of students associated with the school. Moreover, there are other menus such as ‘Tests’ and ‘Settings’ that show the details of each student specifically, ' Skill Wallet’ where the school is able to verify and generate the skill coin for the student by applying the Zero-Knowledge Proof (ZKP) algorithm. The following is the file structure for the application of the ZKP:-

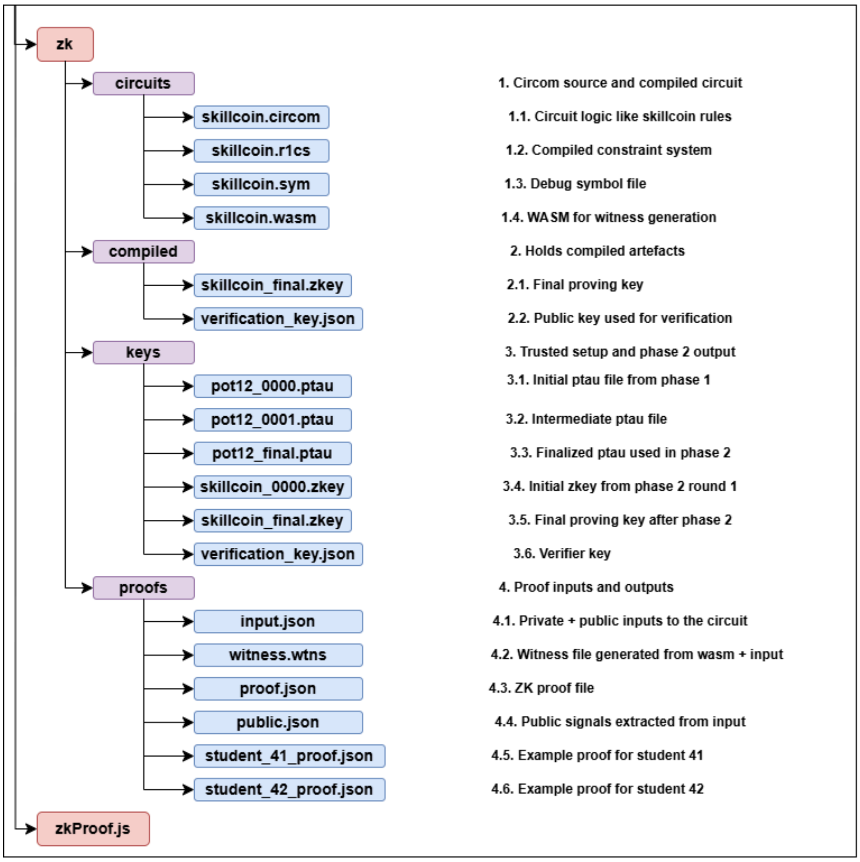


*Figure 3.1.2 (b): File structure of ZKP application*

### 3.1.4. Student Dashboard

Similarly, the user student will be directed to the student dashboard. Each student will be able to see the data visualization of the different skills such as logical thinking, critical analysis and problem solving. There will be three other menus that will show the historical data of all the tests done over the years in school by the student.

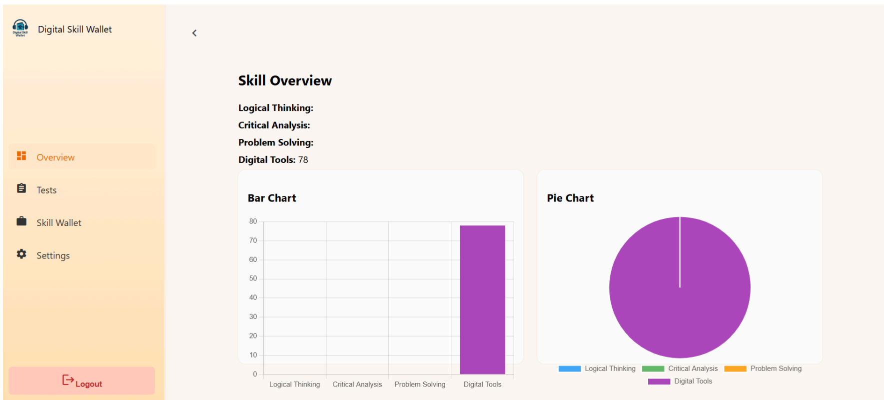


*Figure 3.1.3 : Student Dashboard*

### 3.1.5. API development

The DIGITAL_SKILL_WALLET project requires API development and its frontend connectivity in order to integrate the Hyperledger Fabric network and skillcoin chaincode for student skill coin management. APIs that are used in backend/routes with student-like routes. JavaScript act as a centralized, secure layer to manage calls to chaincode.

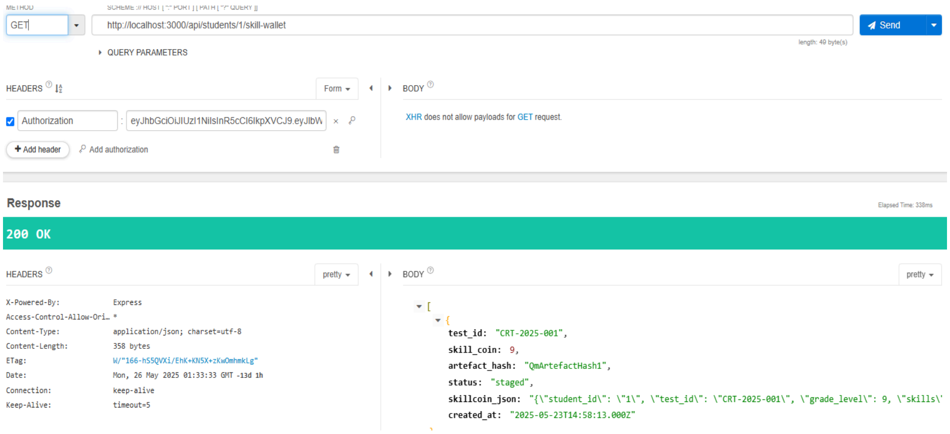


*Figure 3.1.5: API Testing*

### 3.1.6. Docker Containerization & Network Testing in Hyperledger Fabric

While./network.sh up createChannel initializes a new blockchain network by launching new Docker containers for peers/orderers, generating cryptographic materials, creating a channel ("mychannel"), joining peers to the channel, and updating anchor peers—creating a clean, standardized environment for chaincode deployment and transaction testing—./network.sh down cleans up all Docker containers, networks, and volumes from prior Hyperledger Fabric deployments to avoid conflicts.

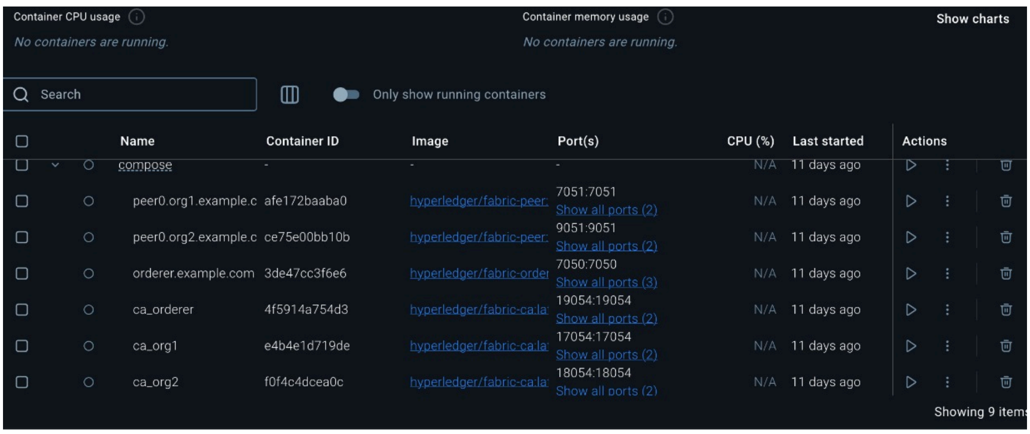


*Figure 3.1.6: Docker Containers*

### 3.1.7. Create channel and peer

This command is ./network.sh deployCC -ccn skillcoin -ccp ../chaincode/mychaincode -ccl javascript

Using JavaScript source code from../chaincode/mychaincode, this command deploys the skillcoin chaincode (smart contract). It then packages it into Docker containers, installs it on all network peers, authorizes the chaincode definition on the channel, and commits it to "mychannel" to allow transaction execution on the blockchain network.

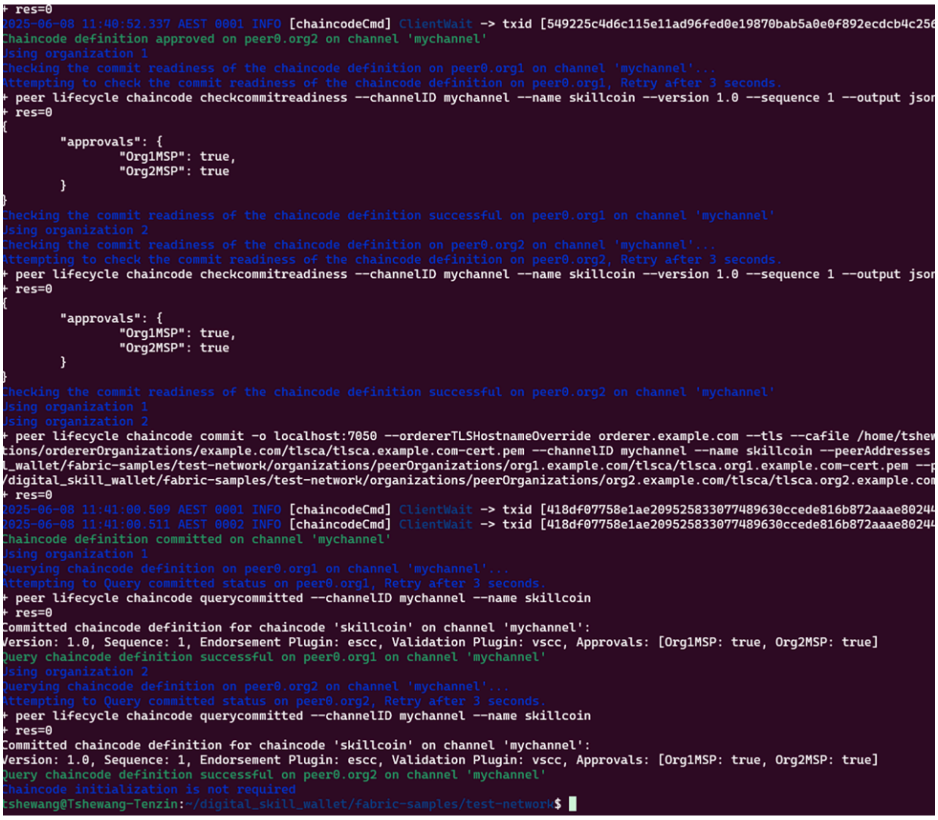


*Figure 3.1.7: Creation of channel*

### 3.1.8. Backend and database connection

In order to create a database connection in backend development, server-side logic must be configured to communicate with a database system via secure drivers or APIs. Connection strings, environment variables, and ORM libraries are used to convert application data into database operations, guaranteeing persistent data storage, retrieval, and synchronization between the database engine and the application layer.

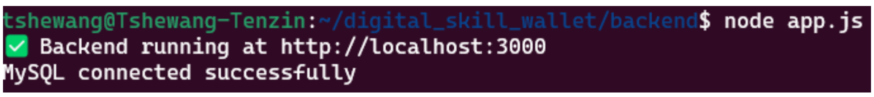


*Figure 3.1.8: Connection testing*

## 3.2. Quality Control Measures

To ensure the reliability, correctness and security of the system, several quality control steps were adopted:

- ❖ Code Review and Version Control (GitHub): All development work was maintained in a private GitHub repository. Key practices included:

- Feature branching for modular development (frontend, backend, chaincode)
- Pull requests and peer reviews before merging any new logic into the main branch
- Commit history tracking to monitor changes and facilitate rollback when needed
- Issue tracking to assign bugs and improvements during testing

❖ Environment Isolation: All sensitive information was kept in .env files. These files were excluded from GitHub via .gitignore to prevent accidental leaks.

❖ Proof Reproducibility: ZKP-related input data and witness files were logged (hashed) and can be regenerated from known input parameters. This allows consistent and tamper-proof validation of proof generation.

### 3.3. Implementation Considerations

The system is currently deployed in a local development environment using Dockerized Hyperledger Fabric and MySQL. Some key considerations for real-world implementation include:

- Artefact File Hosting: The current version assumes artefacts are described via metadata; future versions should include cloud storage integration for actual files
- Identity and Credentialing: For wider deployment, integration with a trusted Certificate Authority (CA) for digital student ID will be required.
- Scalability: The current chaincode and API layer can support a few schools and student records; horizontal scaling may be considered for production.
- Performance Optimization: ZKP generation is currently slow due to frontend-backend relaying; this can be optimized by introducing job queues and dedicated proof workers

## 4. Group reflections

During the period of the project, the team has faced multiple challenges, and this reflection showcases the teamwork within the group in resolving problems, our experiences with new technologies and the corresponding ways to overcome these obstacles to succeed as a team.

Our team adopted a collaborative and solutions-oriented approach right from the initial phase to address the challenges faced during implementation. We implemented the Agile DSDM framework from the start to guide our development processes, allowing us to manage uncertainties iteratively and enhance our solution through continuous feedback from our industry partner and tutor. A significant challenge arose in integrating Hyperledger Fabric with the necessary privacy-enhancing mechanisms for student credential verification, a task further complicated by our multi-stakeholder use case. To mitigate this issue, we assigned tasks based on individual expertise. Some members focused on implementing on-chain smart contracts and configuring the blockchain network, whereas others dedicated their efforts to designing and testing off-chain components, such as authentication frameworks, backend integration, and encryption protocols. Regular stand-up meetings, collaborative coding sessions, and retrospective reviews proved essential in identifying issues early, including data formatting discrepancies and endorsement policy configurations, as well as in collaboratively brainstorming solutions. When misunderstandings arose regarding transaction flow and endorsement logic in Hyperledger Fabric, experienced team members provided guidance on fundamental concepts and best practices, ensuring comprehensive alignment among all members. With the help of social applications like WhatsApp, it has made it possible for us to communicate easily, which in turn has helped us in tackling challenges and bringing the project to fruition.

As we processed, our team was presented with a significant potential to connect with emerging technologies, particularly blockchain and Hyperledger Fabric, which are entirely unfamiliar to us. Given the novelty of these platforms, we needed to undertake extensive independent and joint research to comprehend their architecture, capabilities and implementation requirements. Although some team members were already familiar with the Angular framework, others had to rapidly develop new skills, which encouraged additional research and collaborative learning. Through the research-driven approach, we learned how to configure blockchain peer nodes, establish endorsement policies, and deploy chain code using Java SDK, thereby building a strong foundation in the permissioned blockchain network. We looked into zero-knowledge proofs on the frontend using Snarkjs and Circon, developing a privacy-preserving system that verifies credentials without disclosing private data. Our technical skill set and understanding of the practical uses of blockchain and cryptography technologies were greatly enhanced by this experience, which also reaffirmed the importance of ongoing education and flexibility in the ever-changing IT sector.

Building upon this framework of collaboration and learning, our team successfully handled changes during the project. The Agile DSDM methodology provided the structure needed to remain responsive to new challenges while maintaining project cohesion. We held regular sprint reviews and retrospectives to plan and implement adjustments collaboratively, documented all changes in a shared repository to ensure consistency and conducted impact assessments to understand the effects on components like smart contracts and frontend design. We made sure that every change was executed effectively and that all team members were informed and involved by encouraging open communication via Trello, Git, and Slack. This open approach promoted a sense of shared ownership and accountability by making sure that everyone on the team understood the rationale behind the changes and their part in putting them into practice, this open approach promoted a sense of shared ownership and accountability. We were able to effectively handle both technical and procedural changes by using these organised procedures, which allowed the project to remain flexible while still producing a coherent and excellent product..

## REFERENCES

*DSDM Project Framework Handbook*. (n.d.). Agile Business Consortium. Retrieved April 6, 2025, from https://www.agilebusiness.org/dsdm-project-framework.html