01 Quality Check Portal for Agricultural Imports and Exports

Enable exporters and importers to upload product details, conduct quality checks, and receive verifiable digital certificates for agricultural produce.

Build a web-based portal for exporters and QA agencies to upload product data, conduct quality inspections, and generate verifiable digital certificates for agricultural raw materials.

Complexity Level: High

Overview:

The AgriQCert portal will enable agricultural product exporters to submit product batches for quality checks, QA agencies to issue digitally signed Verifiable Credentials (VCs), and importers/customs to verify credentials using QR codes. It will be used to digitize and secure the agricultural export/import certification process, particularly for compliance with international quality standards.

- Upload **product details** (e.g., rice, wheat, spices)
- Conduct **quality inspections**
- Generate **digitally verifiable quality certificates**
- Verify certificates instantly before import/export

The solution will support Verifiable Credentials based on W3C and OpenID4VP standards and use DID-based digital identities for trust and interoperability.

Typical Workflow

Step-by-step Process:

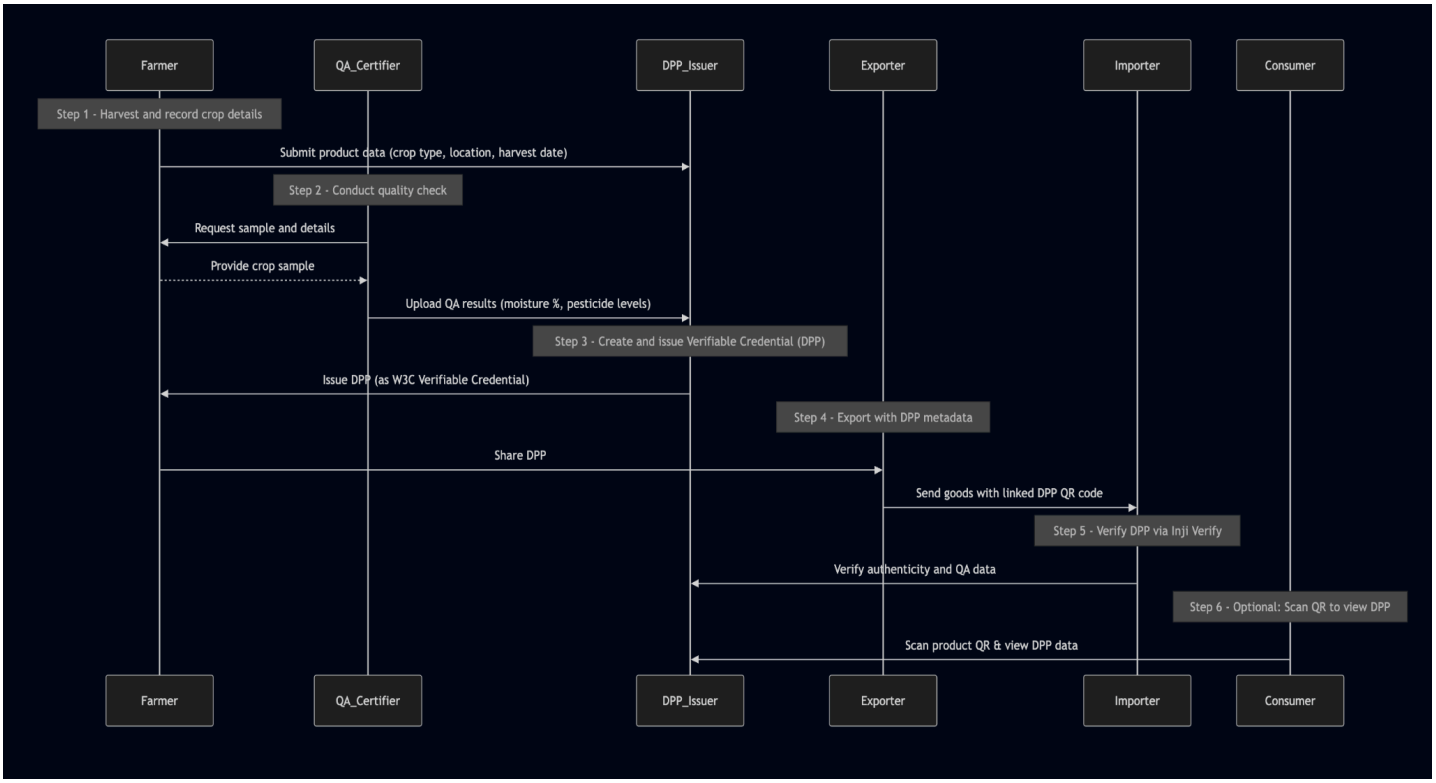
1. **Exporter Login & Batch Submission**
    - Exporter uploads product information:
        - Product type, quantity, location, destination
        - Attachments: lab reports, farming data, packaging images

2. **Quality Check Initiation**
    - cSystem matches batch to a certified QA agency
    - QA agency receives request and schedules physical/virtual inspection

3. **VC Issuance - Digital Product Passport (DPP)**
    - QA agency updates inspection results:
        - Moisture level, pesticide content, organic status, ISO codes, etc.
    - Generates a **Verifiable Credential (VC)** for the batch

4. **VC Issuance - Digital Product Passport (DPP)**
    - The quality certificate is issued as a **W3C Verifiable Credential**
    - The exporter receives the credential in an **Inji wallet**
    - QR code can be printed on packaging or export documents

5. **Verification by Importers / Customs**
    - Importer or customs scans QR or uploads DPP on the Inji Verify portal
    - Verifies:
        - Who issued it
        - When it was issued



Sequence Flow Diagram

Recommended Tech Stack:

1. Frontend: React.js + Tailwind CSS
2. Backend: Node.js / Spring Boot (Java)
3. Database: PostgreSQL
4. VC Issuance: Inji Certify
5. Wallet Integration: Inji Wallet
6. VC Verification: Inji Verify

7. QR Code Generator: qrcode (JavaScript lib)

Exact Task

Mandatory Tasks:

These are the core requirements that the hackathon team **must implement** to have a working, end-to-end solution:

1. **Exporter Login & Batch Submission**
   - Login screen (username/password or token)
   - A batch submission form to upload product details
   - Ability to upload attachments (lab reports, images, etc.)

2. **QA Agency Role & Inspection**
   - Mock role-based access for a QA agency
   - Page to receive batch inspection requests
   - Form to submit inspection results (moisture, pesticide, ISO code, etc.)

3. **Verifiable Credential (VC) Issuance**
   - Define VC schema (Digitalproductpassport)
   - Issue W3C-compliant VC using Inji Certify data-provider plugin
   - Store VC and make it downloadable via the Inji wallet

4. **QR Code Generation**
   - Generate a QR code with VC data, which should be verifiable in the Inji Verify portal

5. **Enable verification via Inji Verify:**
   - The importer should be able to scan or upload a QR code to check the DPP.
   - Display parsed certificate details (issuer, product info, verification status)

Good-to-have Tasks:

1. **Role-based Access**
   - Separate dashboard views for exporters, QA agencies, and customs officials

2. **VC Revocation Check**
   - Add the ability to revoke or expire a VC and reflect that in verification results

3. **Audit Logs**
    - Track every verification and issuance action with timestamps and user role

4. **Progress Tracker**
    - Status flow for batch lifecycle (Submitted → Under Inspection → Certified → Verified)

5. **Mobile Responsiveness**
    - AgriQCert Portal to be mobile responsive and work properly in all kinds of browsers.

Bonus Tasks:

1. **Multilingual Support**
    - Add translation/localization for UI (e.g., Hindi, French, Arabic, Spanish, Tamil, Sinhala & Portuguese).

2. **Create a separate verification app for importers**
    - Deliver a responsive or native mobile version for importers scanning QR codes in the field

3. **Digital Twin or Product Traceability Tree**
    - Visualise the supply chain or components related to the product using /api/irs/<processId>/tree

Deliverables:

- Fully functional multi-role portal (QA, Exporter)
- REST APIs for issuing Verifiable Credentials
- Credential verification (QR scanner or credential upload) to be executed by Inji Verify
- At least one working sample of a VC (Digital Product Passport)
- Admin view for managing users and certificate templates
- API documentation (Swagger/Postman)
- Deployed instance or dockerized image for deployment
- Technical Design Document should include:
    - Architecture diagram (API layer, VC issuance, database, UI)

  - Credential schema definitions
  - DID and VC flow (issuance and verification)
  - Endpoint specifications (e.g., /uploadBatch, /issueVC, /verifyVC)
  - Error handling and response format

- User Guide to include:
  - How to log in as each role (QA agency, Exporter)
  - How to upload a batch and request an inspection
  - How a QA agency performs and logs inspections
  - How VC is generated and downloaded
  - How Importer verifies certificate using QR via Inji Verify

Resources:

1. Repository hosts the source code, documentation, and other related files for the Inji Certify project
2. GitHub - mosip/inji-wallet
3. Repository host the source code, documentation, and other related files for the Inji Verify project.
4. Overview | Inji
5. Inji Mobile
6. Inji Web
7. Overview | Inji
8. https://github.com/mosip/pixelpass/tags
9. Generate QR Code | Inji