SMART INDIA HACKATHON 2022

Basic Details of the Team and Problem Statement

Ministry: Ministry of Micro, Small & Medium Enterprises (MSME)

PS Code: RK1129

Problem Statement Title: App-Based solution to identify & solve disease in plants/crops.

Team Name: Byte the Dust

Team Leader Name: Ishan Kulkarni

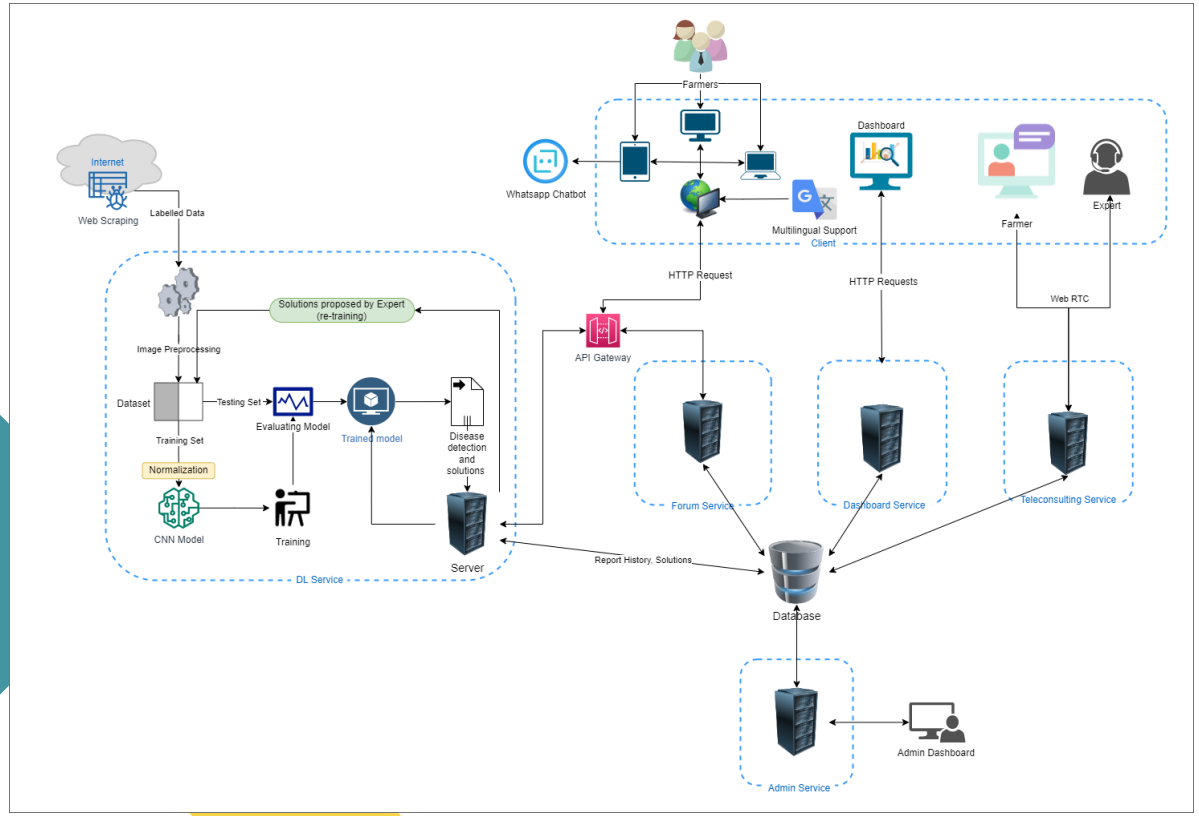
Institute Code (AISHE): U-1085

Institute Name: K.J. Somaiya College of Engineering.

Theme Name: Agriculture, FoodTech and Rural Development.

Idea/Approach Details

Architecture Diagram:



Proposed Solution:

- 'Fasal Mitra', a fully **responsive and automated plant disease** detection **Progressive Web Application (PWA)**
- Farmers need to upload a photo of the **suspected diseased crop** to our servers. A **detailed report** will be generated which will detect the presence of **crop disease**, predict the type of disease, and will also provide **solutions** for the same.
- If required, farmers can **verify** the **disease report** from experts using our app's **Teleconsulting feature**.
- Text to speech feature for farmers.
- The collected data will help our system **detect and predict** plant/crop diseases with increasing accuracy by way of its self-learning and **continuous improvement mechanism**.
- The key features of our solution are:
  (i) **Language selection option** (Indian regional languages)
  (ii) Tracking of **IP addresses** to detect **possible outbreaks** and issuing alerts for the same
  (iii) **Prediction of upcoming outbreaks** (over time, via self-learning)
  (iv) A **statistics dashboard** with analytics
  (v) A **community forum** for farmers
  (vi) A **chatbot for personal communication** (alerts, updates, etc.)

Technology Stack:

Technology used	Purpose
React, Tailwind CSS, Material UI	Frontend Development
Flask, NodeJS	Backend Development
Selenium, Requests	Web Scraping for Data Collection (in addition to dataset)
OpenCV	Image Processing
PyTorch, Deep learning model (ResNet) Architecture.	Deep Learning Model Development
MongoDB, Redis	Database
Docker	Containerization
AWS/DigitalOcean	Hosting and Deployment
Nginx	Reverse Proxying and for authentication gateway

Idea/Approach Details

Use Cases:

- User (**farmer/agro-industry/lab expert**) can create an account.
- User logs in into his/her account.
- User can **select preferred language** (English or Indian regional languages).
- User can upload photo of plant/crop to get a **comprehensive disease report.**
- User can opt for in-app expert **teleconsultation** (WebRTC) to get a **second opinion** on the disease report/to obtain **more information** on predicted disease and its solutions provided in the report.
- User can post queries on the **community forum**/ responds to a query/ upvote on someone's response/ share someone's response
- User can **receive personal communication** (alerts regarding a possible plant disease outbreak in their geographical region, updates regarding a disease that has been added recently to the database, etc) on their registered mobile number via a **chatbot**

Describe your Dependencies / Show stopper here

(i) Users should have a **smart phone** with a **working camera** to click photos of suspected diseased crops.

(ii) Users should have an **internet connection** to get access to application. A **stable internet connection** will ensure **optimal working** of the app along with its features like Teleconsulting, forum.

(iii) Users should have a **registered WhatsApp number** so that they can receive **alerts of outbreaks** sent from our server using a **WhatsApp chatbot.**

Team Member Details

Team Leader Name: Ishan Kulkarni

Branch: Btech | Stream: IT | Year: III

Team Member 1 Name: Anurag Ghosh

Branch: Btech | Stream: IT | Year: III

Team Member 2 Name: Dhruv Solanki

Branch: Btech | Stream: IT | Year: III

Team Member 3 Name: Rajas Bondale

Branch: Btech | Stream: IT | Year: III

Team Member 4 Name: Aditi Pawar

Branch: Btech | Stream: IT | Year: III

Team Member 5 Name: Tanishk Shah

Branch: Btech | Stream: CSE | Year: III

Team Mentor 1 Name: Smita Sankhe

Category: Academic . | Expertise: ML, AI , Data Science & IOT | Domain Experience (in years): 14

Team Mentor 2 Name: Era Johri

Category: Academic | Expertise: Data Science, Application Development. | Domain Experience (in years): 14