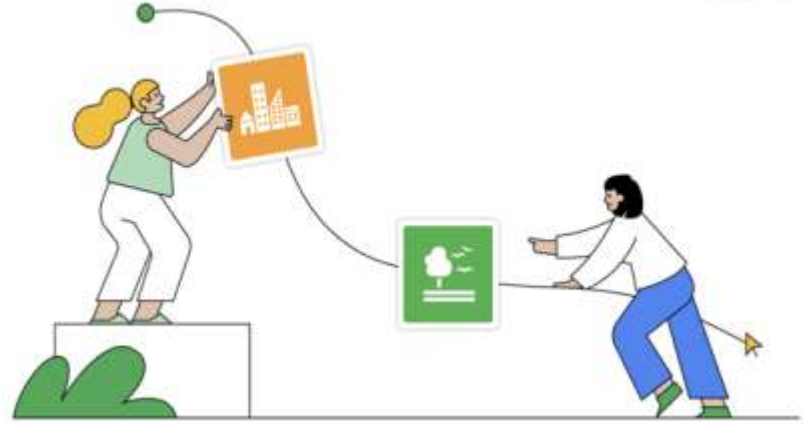


Solution Challenge



Team Details

- a. Team name: Team NextGen
- b. Team leader name: Saikat Das
- c. Problem Statement: Empowering Small and Marginal Farmers with AI-Driven Agricultural Solutions

Brief about your solution

This solution is a collaboration work of **AI, Machine Learning** to **empower small and marginal farmers** by providing **personalized agricultural insights**.

◆ **AI-Powered Crop Recommendation** – Predicts the best crop based on soil health, weather's historical data.

◆ **Yield Prediction Model** – Uses weather patterns, soil moisture, and past trends to forecast crop productivity.

◆ **Soil Health Monitoring** – Collected Survey data on the location's soil data helps to improve soil quality.

◆ **Web Application** – Provides real-time access to AI-driven advisory for farmers.

Impact

- **Increases Yield & Reduces Losses**
- **Optimizes Resource Usage (Water, Fertilizers)**
- **Enhances Climate Resilience**
- **Improves Farmers' Livelihoods**

Opportunities

Unlike traditional agricultural advisory systems ideas, this **AI-powered** solution provides **real-time, personalized** recommendations based on **machine learning, Artificial intelligence**. This system continuously learns and **adapts to changing climate, soil, and market conditions**.

How Will It Solve the Problem?

- ✓ **Data-Driven Crop Selection** – AI recommends the best crops based on **soil health, weather forecasts, and historical data**.
- ✓ **Precision Farming** – IoT sensors and satellite data enable **real-time monitoring** of soil, water, and weather conditions.
- ✓ **Early Pest & Disease Detection** – AI detects crop diseases early using **image recognition and sensor data**, reducing losses.
- ✓ **Smart Irrigation & Resource Management** – AI optimizes **water and fertilizer usage**, preventing overuse and ensuring sustainability.

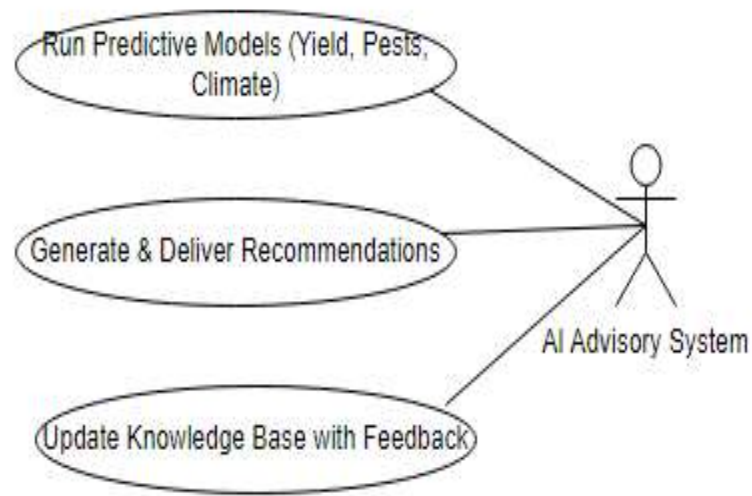
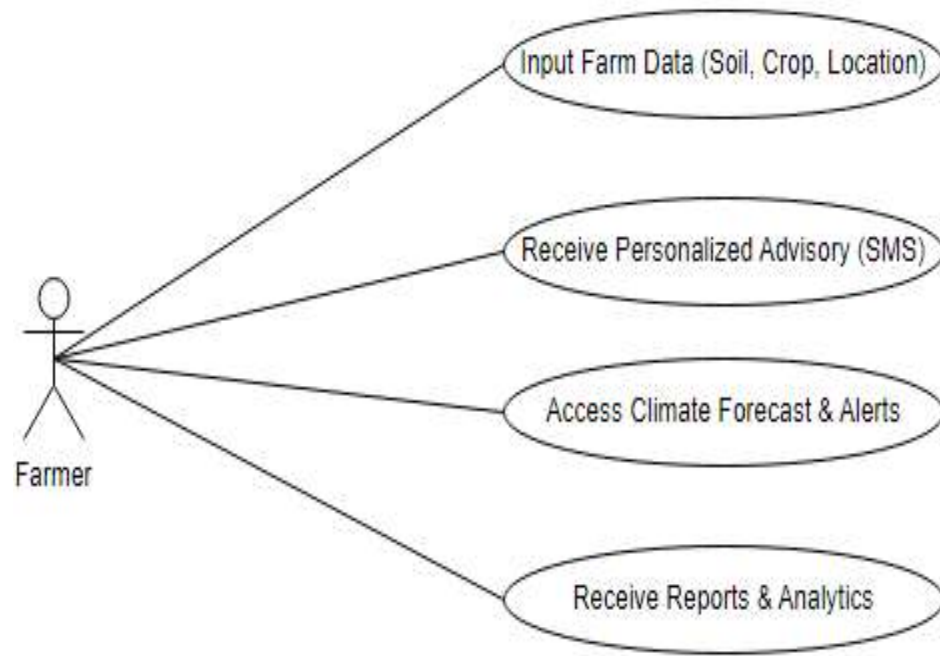
Most Essential Problem Focused Solution

- ◆ **Localized & Personalized Advice** – Provides **customized recommendations** based on farm-specific data.
- ◆ **Climate-Resilient Farming** – Helps farmers **adapt to unpredictable weather patterns**.
- ◆ **Market Linkages & Financial Support** – Connects farmers with **buyers, government schemes, and financial resources**.

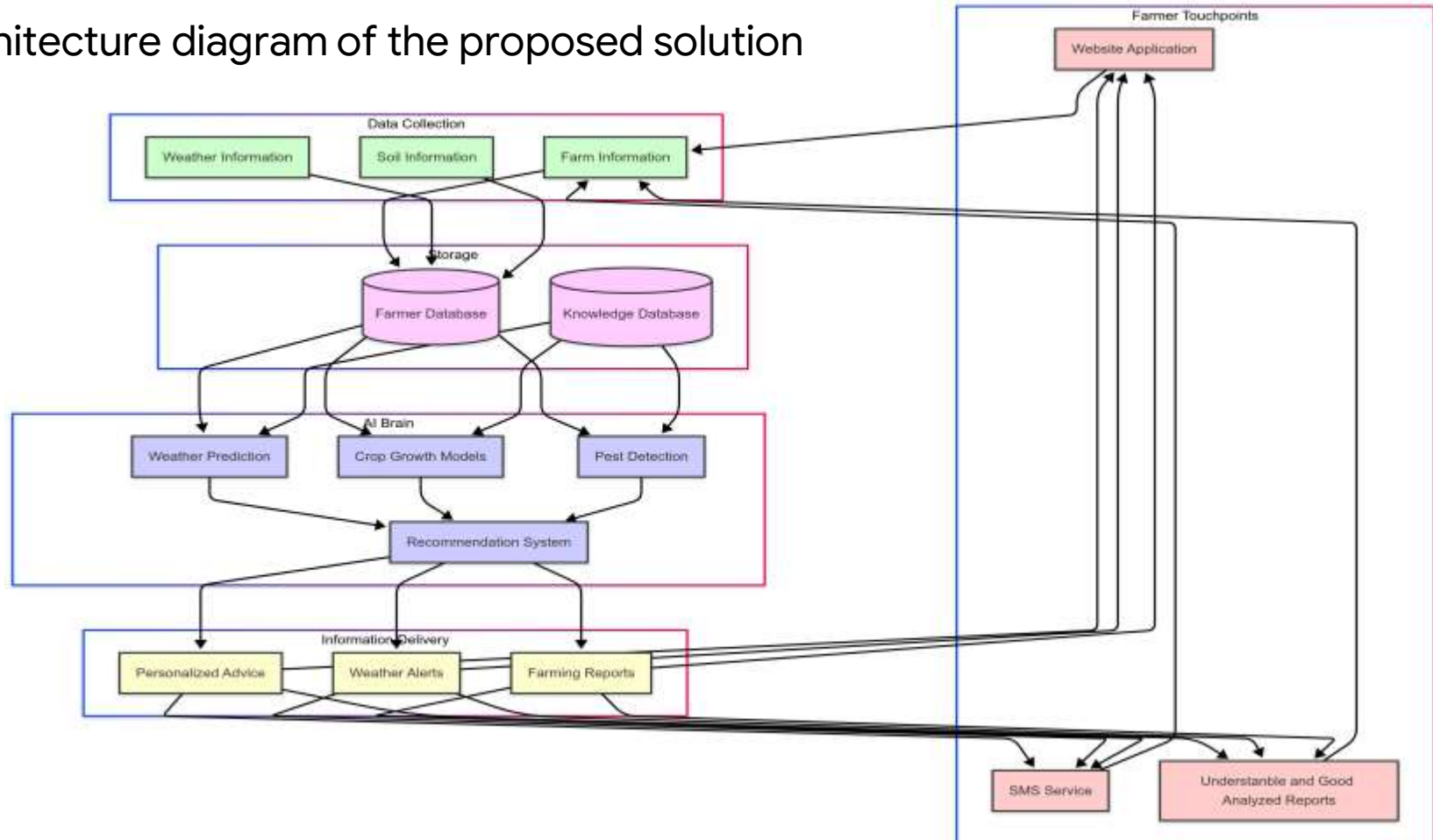
List of features offered by the solution

- **AI-Powered Crop & Seed Selection** – Uses ML to recommend optimal crops and high-yield seeds based on soil quality, weather, and past yield data.
- **Climate & Weather Prediction** – Provides real-time weather forecasts and AI-driven risk analysis to mitigate climate threats.
- **Disease & Pest Detection** – Uses image-based AI to identify pests and diseases, suggesting effective organic or chemical treatments.
- **Smart Soil Management** – Analyzes soil health and recommends fertilizers, promoting sustainable farming practices.
- **Market Price Prediction & Direct Selling** – Forecasts crop demand and prices while connecting farmers to buyers and government schemes.
- **Web-Based Platform for Easy Access**
A farmer-friendly mobile & web app for real-time access to all AI-driven recommendations.

Process flow diagram or Use-case diagram



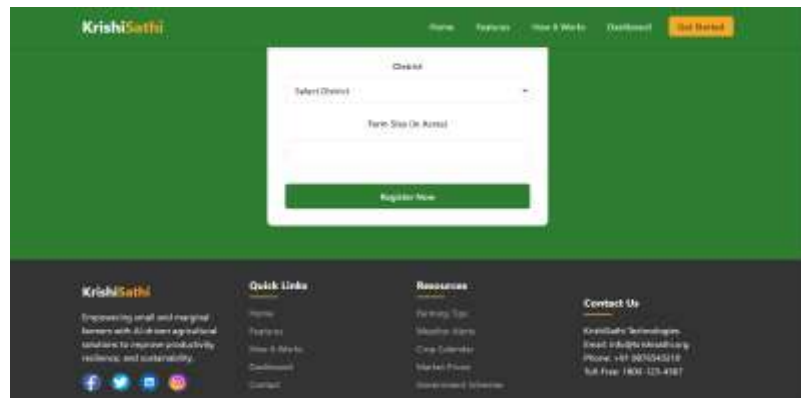
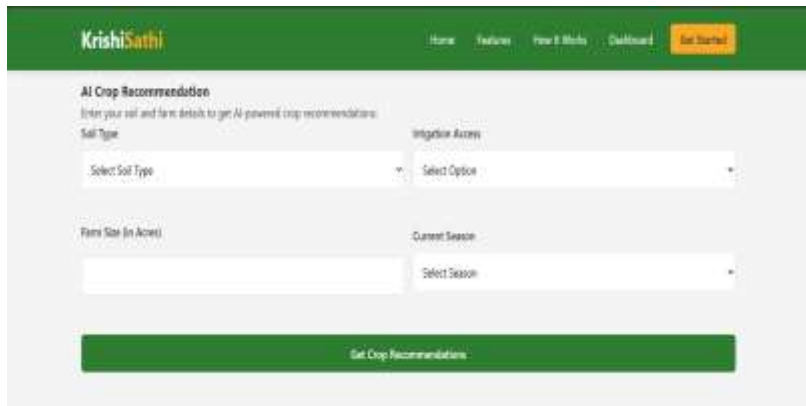
Architecture diagram of the proposed solution



Technologies to be used in the solution

- HTML,CSS(Frontend)
- Machine Learning
- MongoDB,JAVASCRIPT(Backend)
- Weather API(OpenWeather.com)
- Soil API(AgroMonitoring.com)

Snapshots of the MVP



Additional Details/Future Development (if any)

- Add the Good Database System for Farmers.
- Add a Community Section for all the local farmers.
- Add a Tutorial section for learning
- Add a Market Place where Farmers get the perfect pricing for their corps.

Provide links to your:

1. GitHub Public Repository : <https://github.com/SaikatDash/Empowering-Small-and-Marginal-Farmers-with-AI-Driven-Agricultural-Solutions>
2. Demo Video Link (3 Minutes) :
3. MVP Link : [KrishiSathi - AI-Driven Agricultural Solutions](#)



Solution Challenge



Thank you

