



Basic Details of the Team and Problem Statement

Student Innovation: AICTE, MIC-Student Innovation

PS Code: SIH1478

Problem Statement Title: Student Innovation {Empowering cotton farmers with real-time monitoring, pest detection, and smart recommendations for optimized crop management.}

Team Name: Helping Hands

Team Leader Name: Dev Desai

Institute Code (AISHE): U-0149

Institute Name: Sardar Vallabhbhai National Institute of Technology, Surat

Theme Name: Agriculture, FoodTech & Rural Development

Idea/Approach Details

Idea/Solution:

Boosting Cotton Agriculture in India with a Smart Agricultural Solution:

In a bid to revolutionize cotton agriculture in India, we have launched a comprehensive website to enhance their crop yields. Our platform combines artificial intelligence, real-time data using sensors, and user-friendly interfaces to provide support to farmers.

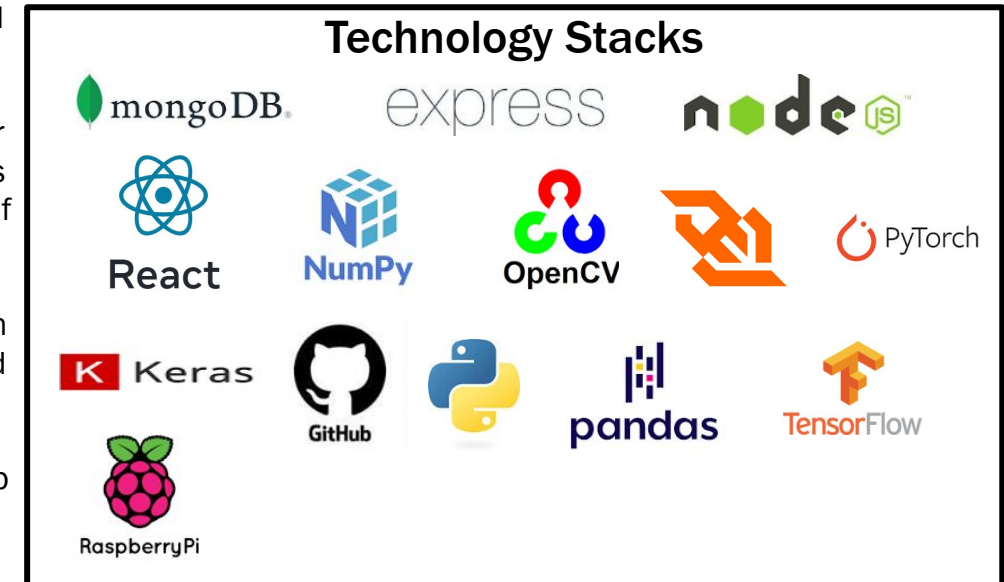
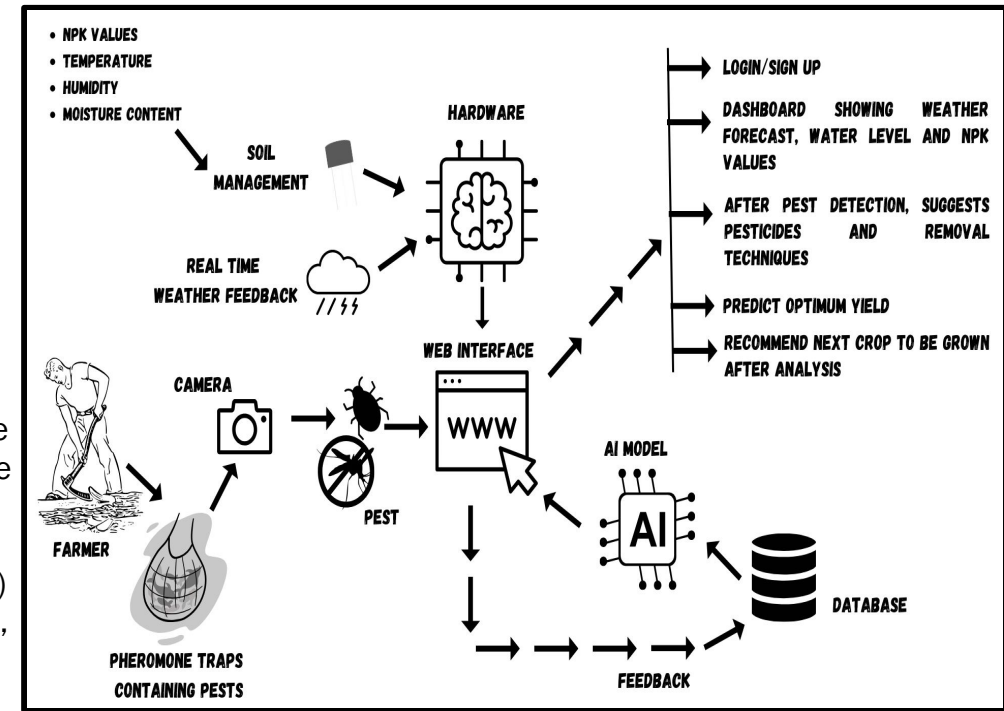
1. N.P.K. Calculator: Our website offers an optimal NPK (Nitrogen, Phosphorus, and Potassium) calculator powered by AI algorithms by considering parameters such as soil type, crop stage, and real time NPK readings from sensor **RS485** ensuring healthier cotton harvest.

2. Water Management: Moisture sensors, along with NPK sensors strategically placed across the field, provide real-time data to our website. This helps farmers **save water, energy, and time** by **pinpointing areas in need of irrigation** instead of watering the entire field.

3. Pest Detection (Pink Bollworm): To combat **Pink Bollworm** infestations in Cotton Fields, our AI model analyzes weekly images of **Pheromone Traps** placed across the field. It counts trapped worms, considers weather conditions and crop stage, and alerts the farmer if intervention is needed, offering countermeasure suggestions.

4. Weather Monitoring: The **DHT11** real-time weather sensor integrated into our platform delivers precise **farm-specific weather monitoring**, empowering farmers to make informed decisions on planting, harvesting, and selecting the optimal crops for the upcoming season.

5. Yield Prediction: Our AI model analyzes weather and ground sensor data to predict crop yield, helping farmers estimate their harvest potential.



Idea/Approach Details

Show Stoppers :

- The system needs to be redesigned for different types of crops.
- Farmers have to manually click photos of caught pink bollworms to get pest detection alerts.
- Farmers have to commit to detect pests regularly every week.
- The system relies on accurate and reliable soil quality data. Dependence on malfunctioning or inaccurate sensors can hinder the quality of recommendations.
- The unique pest detection method relies on pheromone traps. Regular maintenance and replacement of traps are necessary for accurate pest detection.

Revenue Streams :

Channels: Govt. portals, Agricultural Industries etc.

Revenue Streams:

- Direct selling of Product
- Subscription based Maintenance services
- Rental services

Use Cases :

Pest Monitoring and Alerting:

- Farmers upload photos of moths collected in Pheromone Traps to the website.
- The website analyzes the photos and counts the number of pink bollworms.
- When the pink bollworm count exceeds a predefined threshold, the system sends immediate alerts, as these pests pose a significant threat to cotton crops.

Real-time Sensor Data Collection:

- The website continuously collects real-time data from various sensors, including temperature, humidity, pressure, NPK levels, and soil moisture.

Weather Monitoring and Irrigation Recommendations:

- Utilizing soil moisture data, the system recommends optimal irrigation patterns farmers should adopt to ensure efficient water usage and crop health.

Crop Management and Next Crop Recommendations:

- The system predicts crop yields by analyzing NPK levels and weather data.
- Using the yield predictions and best practices for crop rotation, the system suggests the next crop to plant, optimizing agricultural productivity.

Fertilizer and Pesticide Reminders:

- The system sends timely reminders to users, accounting for crop type, soil fertility.
- Accurate predictions provided by our system will pinpoint the precise location on field and timing for fertilizer and pesticide application, resulting in a significant reduction in the quantity of pesticides and fertilizers required, thus promoting more sustainable and eco-friendly agricultural practices.

User Interaction and Recommendations:

- Users access the system through a secure login on the web interface with role-based access control.
- The dashboard provides real-time data, weather conditions, NPK levels, and soil moisture, allowing farmers to make informed decisions.
- Users receive recommendations covering pest control, irrigation practices, crop selection, and fertilizer/pesticide application, enhancing crop management and overall farm cost-effectiveness.