SMART INDIA HACKATHON 2023

Team and Problem Statement

Organization Name: Government of Jammu and Kashmir

PS Code: 1352

Problem Statement Title: Traditional agriculture practices lack real-time monitoring and efficient operation on fields This leads to inefficiencies and low production levels.

Team Name: CROPCRAFTERS

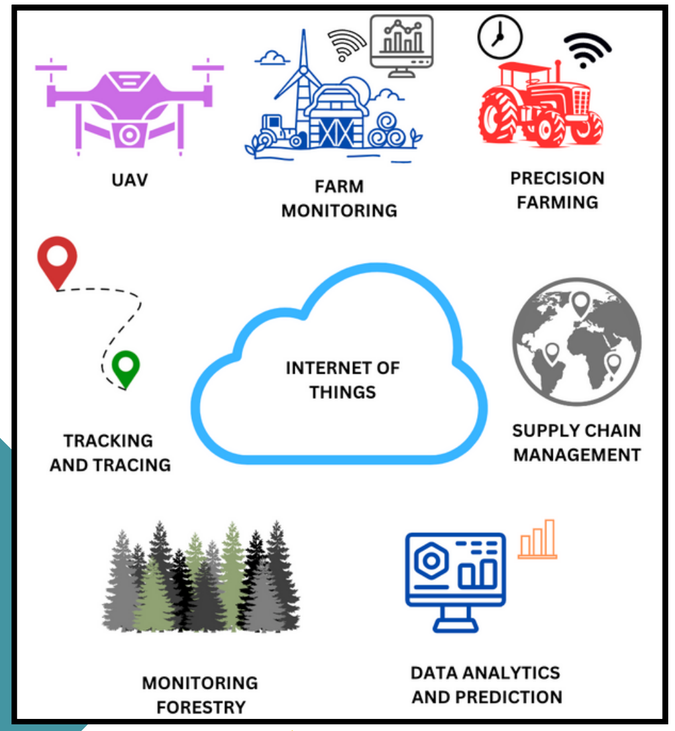
Team Leader Name: Paras Atal

Institute Code (AISHE): U-0473

Institute Name: SRM Institute of Science And Technology

Theme Name: Agriculture, FoodTech & Rural Development

Idea / Approach Details



Data Collection and Transmission

- Utilize IoT sensors for soil data (moisture, temperature, humidity, pH, nutrients), weather station report for weather conditions, RFID tags for livestock tracking, and cameras for pest and weed identification.

Data Processing and Analysis

- Implement machine learning algorithms with Pandas and NumPy for optimizing fertilizer application based on soil and weather data.
- Integrate Open Mateo API to gather real-time meteorological data like temperature and rainfall for informed irrigation decisions.
- Utilize GPS and telematics technology to track and manage farm vehicles and machinery. Monitor fuel consumption, maintenance schedules, and routes.
- Monitor inventory levels, storage conditions using survillence cameras.

Pest and Weed Detection

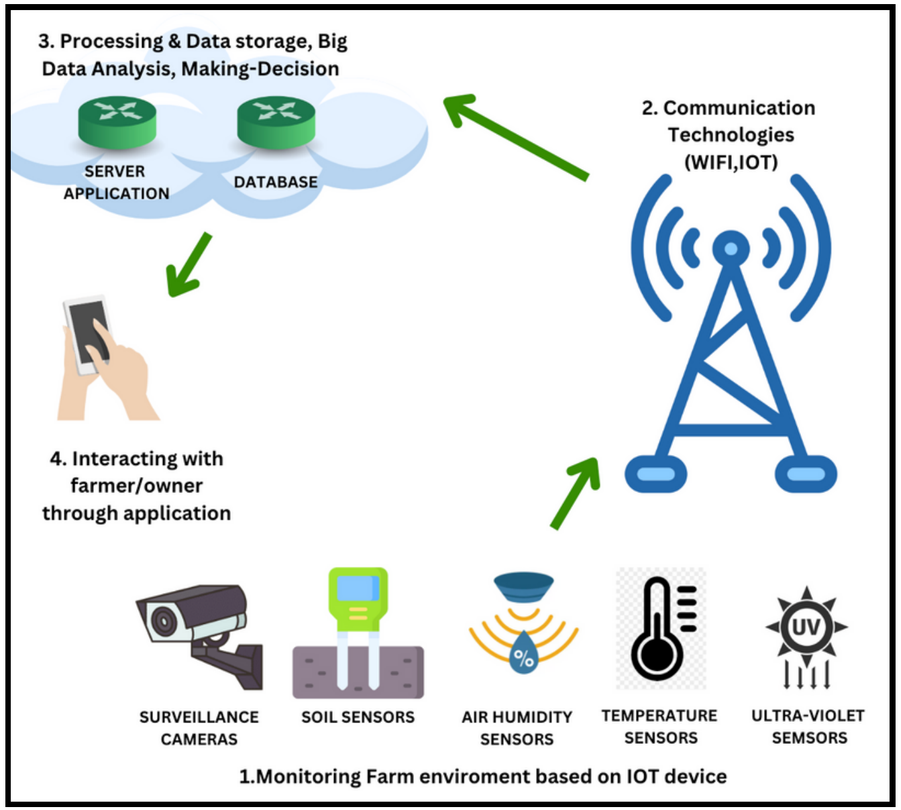
- Employ a Coarse-to-Fine Network (CFN) for pest detection using NBAIR dataset.
- Utilize drone camera feeds for identifying detrimental weeds.

RFID Tag Management

- Use NodeMCU ESP8266MOD with RFID RC522 module for livestock RFID data.

Centralized Dashboard

- A user-friendly dashboard for farmers to monitor and manage all aspects of the farm.



TECHNOLOGY USED:

TENSORFLOW
PYTHON
KERAS
HTML
JAVASCRIPT
CSS
PYTORCH
MONGODB

Idea/Approach Details

Optimized Irrigation

Utilize soil moisture data from IoT sensors. Incorporate weather data for rainfall predictions. Implement simple machine learning to recommend efficient irrigation schedules.

Pest & Weed Detection

Employ image recognition using existing camera feeds. Detect and identify common pests and detrimental weeds. Send notifications when pests or weeds are identified.

Inventory and Storage Monitoring

Install surveillance cameras in storage areas.
Monitor inventory levels and storage conditions.
Receive alerts for inventory shortages or adverse storage conditions.

Livestock Tracking

Use RFID tags for livestock tracking.
Monitor livestock locations and movements. Receive alerts for unusual behavior or potential health issues.

Vehicle & Machinery Monitoring

Utilize GPS tracking for key farm vehicles. Monitor vehicle locations and fuel consumption.
Schedule maintenance based on usage data.

Centralized Dashboard

Provide a simplified dashboard for farmers. Display key information such as soil moisture, livestock status, pest/weed alerts, vehicle locations, and inventory. Enable remote monitoring and basic decision-making support.

SHOWSTOPPER

- In remote or rural farming locations, reliable power sources and internet connectivity may not be readily available. Ensuring continuous operation of IoT devices can be problematic in such areas.
- Integrating various hardware components, APIs, and software systems can be complex. Farmers may require specialized expertise or technical support to set up and maintain the system effectively.
- Managing and analyzing the vast amount of data generated by IoT sensors and cameras can be challenging. Farmers need the tools and skills to make sense of this data and translate it into actionable insights.

Team Member Details

Team Leader Name: PARAS ATAL

Branch : BTech Stream : CSE with AIML Year : III

Team Member 1 Name: ANKIT SINGH

Branch : BTech Stream : CSE with AIML Year : III

Team Member 2 Name: PRATHAM AGARWALLA

Branch : BTech Stream : CSE with AIML Year : III

Team Member 3 Name: CH. MALVIKA REDDY

Branch : BTech Stream : CSE with AIML Year : III

Team Member 4 Name: ANURADHA KRISHNAN

Branch : BTech Stream : CSE with AIML Year : III

Team Member 5 Name: LAIKHURAM KOROUHANBA KHUMAN

Branch : BTech Stream : CSE with AIML Year : III

Team Mentor 1 Name: DR. S. AMUDHA

Category : Academic Expertise : AIML Domain Experience (in years): 18+ years