HACK THE WINTER
THE SECOND WAVE

KHETMITRA

THEME: OPEN INNOVATION

- **Problem Statement Title - Open Innovation -** Soil-Health Monitoring Kit with AI Recommendations
- **Theme -** Agriculture & Rural Development
- **Team Name - AI (Aloo Intelligence)**
- **Team Member -** Nitish Sheoran (Team Leader)
  Narayan Prasad
  Shyla Sharma
  Nikhil Raghav

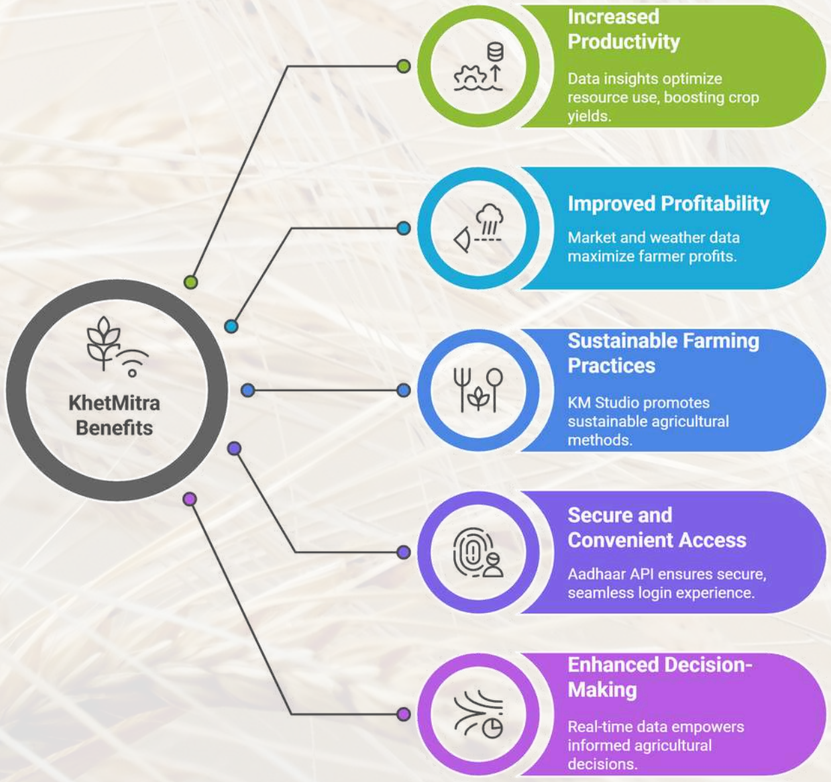
KHETMITRA : AI-Powered Personal Farming Assistant for Farmers

Your AI-powered farming companion for smarter, sustainable harvests

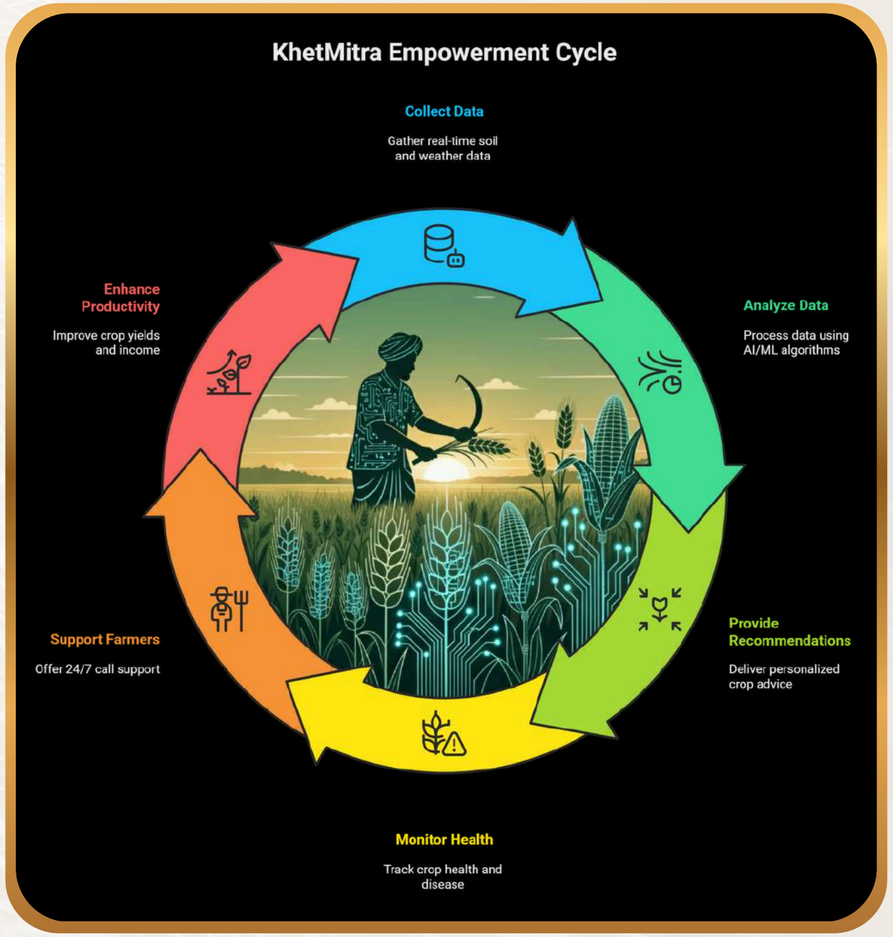
DETAILED EXPLANATION OF THE PROPOSED SOLUTION

KhetMitra uses soil sensors with an **ESP32 and SIM module** to collect real-time soil data, combined with weather, satellite data, soil maps, crop history, and current mandi bhav. AI/ML analyzes this data to recommend crops, predict yield and profit, monitor crop health, detect diseases, and support sustainable farming. The platform offers an **"end-to-end solution—from crop selection to selling"**—helping farmers make smarter decisions and boost productivity. It supports multiple languages, works offline for areas with poor connectivity, and provides 24/7 call support to assist farmers anytime.

INNOVATION & UNIQUENESS OF THE SOLUTION



HOW IT ADDRESSES THE PROBLEM



TECHNICAL APPROACH

TECHNOLOGIES TO BE USED

SOFTWARE:

AI/ML: python, TensorFlow, Keras

Data Sources & APIs: SoilGrids, Bhuvan (Indian Geo-Platform of ISRO), OpenWeather

Android: Kotlin

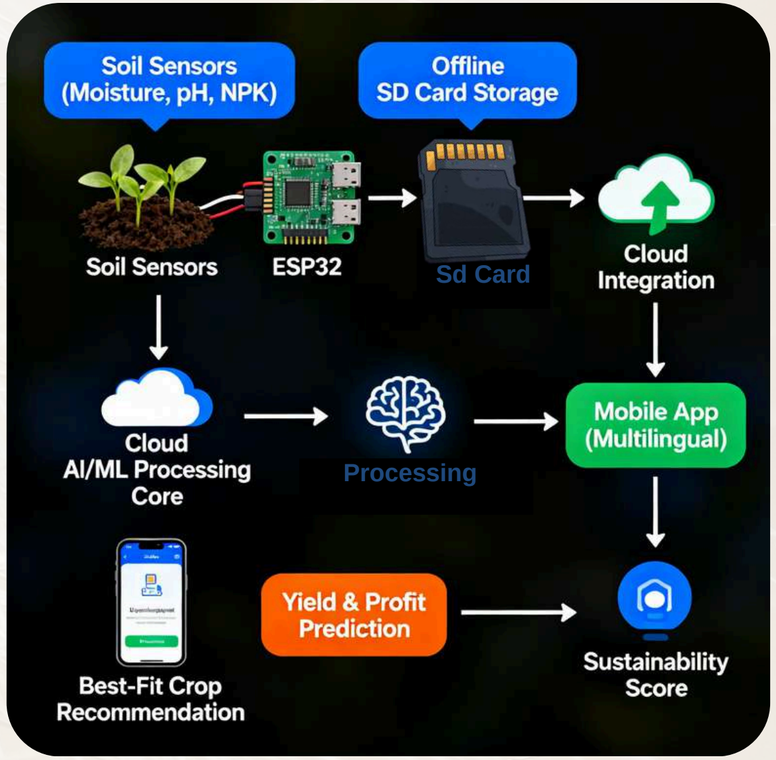
Backend: REST API, mongoDB Atlas, node.js, Express JS

Web dashboard UI: React JS, Material UI, Redux

HARDWARE:

- Soil Sensors (pH, Moisture, Nutrients)
- ESP32 Microcontroller
- SD Card Module
- IoT connectivity (Wi-Fi&4G).

METHODOLOGY & PROCESS OF IMPLEMENTATION



Website:-https://www.khetmitra.live/

FEASIBILITY AND VIABILITY

FEASIBILITY ANALYSIS

- ✔ Cost-effective at ₹4,500
- ✔ Government policy alignment (PM-KISAN)
- ✔ Multiple revenue streams & scalable model

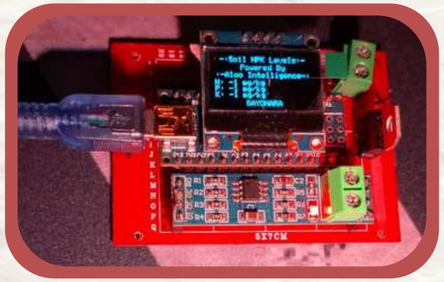
CHALLENGES & RISKS

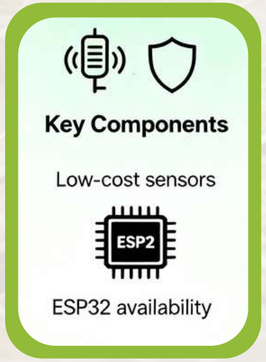
- Calibration accuracy
- Rural connectivity gaps
- Data privacy issues

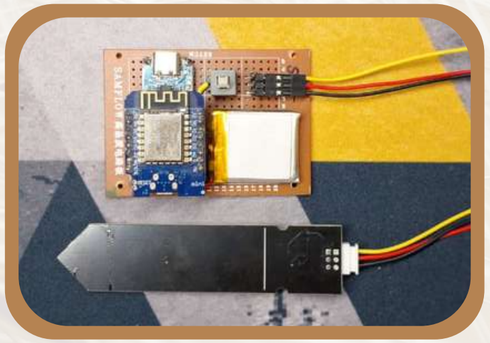
STRATEGIES

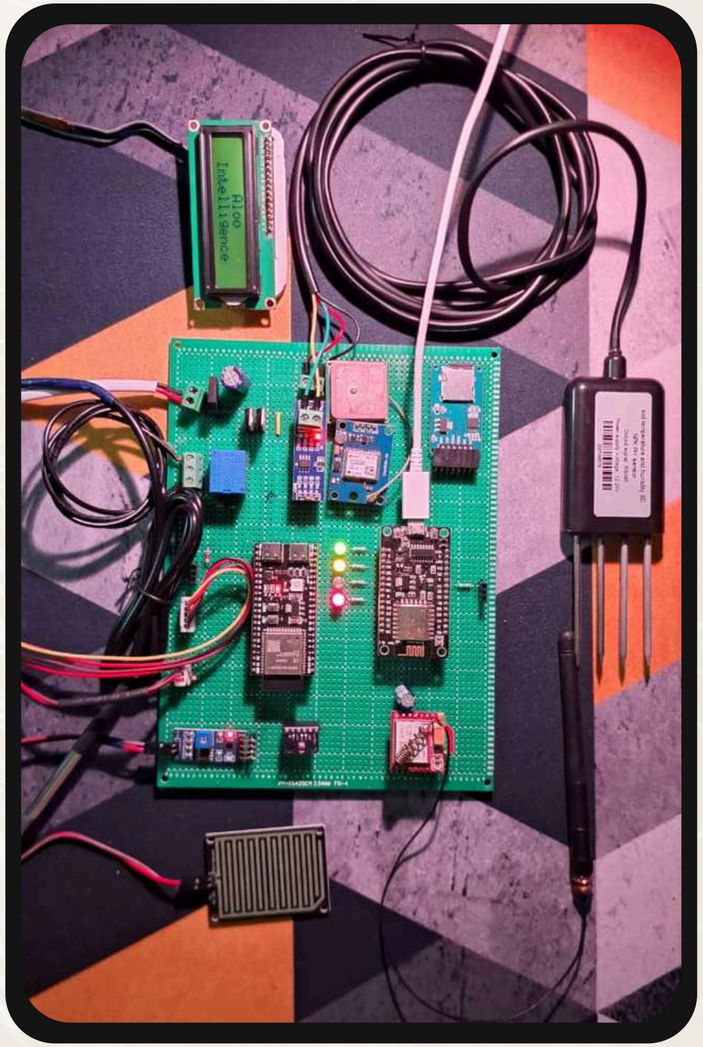
- Field validation + calibration
- Offline data logging (ESP32 + SD card)
- Secure APIs + cloud encryption

PROTOTYPE IMAGES



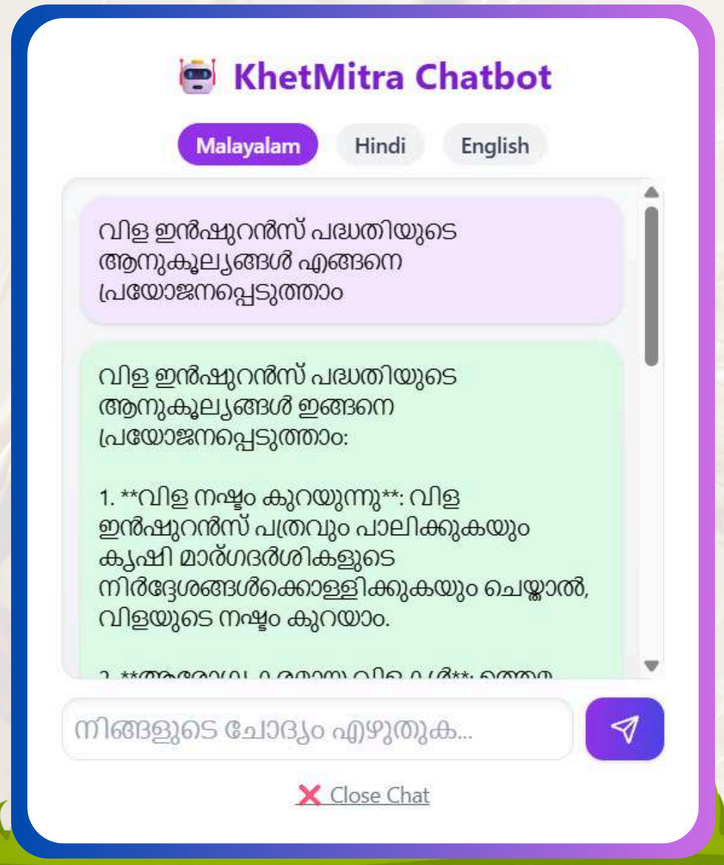






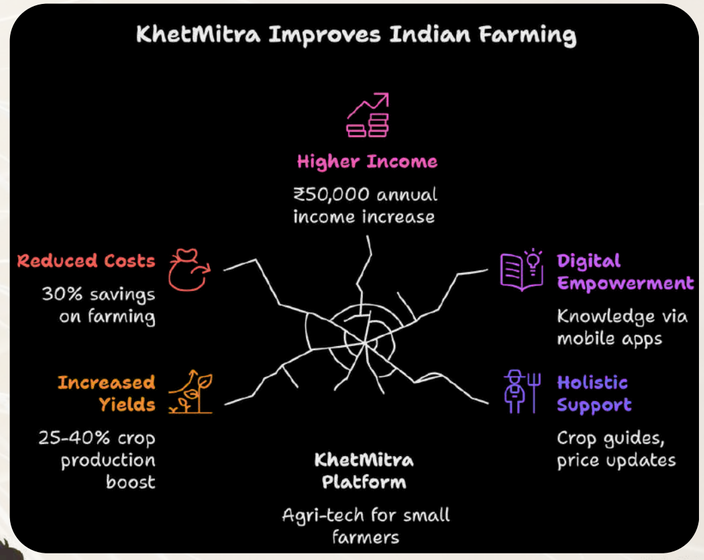
IMPACT AND BENEFITS

BENIFIT OF THE SOLUTION



POTENTIAL IMPACT

- Data-driven crop recommendations & yield prediction
- AI-backed insights replacing guesswork
- Smarter irrigation & fertilizer planning
- Real-time alerts (weather, pests, soil health, Grazing & High wind)
- Market linkage support for better income



RESEARCH AND REFERENCES

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