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AI for Bharat Hackathon

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Team Name : PrattyOps

Team Leader Name : Pratyaksh Singh

Problem Statement : AI for Rural Innovation & Sustainable Systems

SmartKisan360 – An AI-Powered Farmer Intelligence Platform

Brief SmartKisan360 – An AI-Powered Farmer Intelligence Platform

Content:
SmartKisan360 is an AI-powered, end-to-end farmer intelligence platform designed to help small and marginal farmers make better decisions throughout the entire farming lifecycle — from crop planning to selling in the market.

Unlike existing fragmented solutions that focus only on one stage (e.g., weather apps or mandi price apps), SmartKisan360 integrates planning, growing, predicting, and selling into a single intelligent system.

USP:

- Covers the full farming lifecycle: Plan → Grow → Predict → Sell
- Uses real AI models for forecasting and risk detection
- Designed for low literacy and low bandwidth users
- Works only on public and synthetic data
- Shows confidence & uncertainty for responsible decision-making

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Problem Faced by Farmers

Small and marginal farmers face multiple challenges:

They do not know which crop is best for their region and season

Water is often wasted due to poor irrigation planning

They cannot predict weather risks or crop failure

They do not know the best time or place to sell their produce

Market prices are unpredictable

They lack access to expert advisory support

These issues lead to:

Low income

High crop loss

Water wastage

Poor decision-making

Our Solution – SmartKisan360

SmartKisan360 is an AI-powered decision support system that helps farmers at every stage:

1. Plan

- AI-based crop recommendation
- Best sowing time suggestions
- Expected yield ranges

2. Grow

- Smart irrigation planning
- Water optimization
- Weather-aware alerts

3. Predict

- Yield prediction
- Weather and disease risk alerts
- Confidence-based recommendations

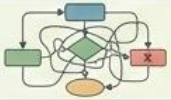
4. Sell

- Mandi price forecasting
- Best selling time recommendation
- Nearby market suggestions
- Buyer discovery platform

Title: Why Artificial Intelligence?

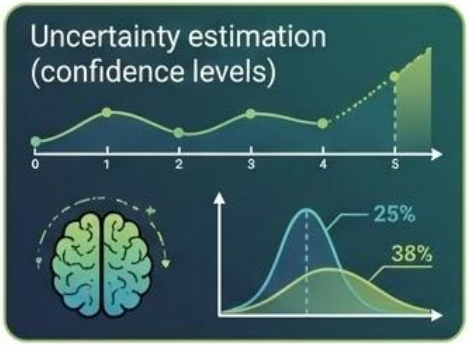
Why Artificial Intelligence?

Content:
Traditional rule-based systems cannot handle the complexity of agriculture.



SmartKisan360 uses AI for:

- Time-series forecasting (crop prices, yield, weather patterns)
- Pattern detection (risk zones, drought/heat trends)
- Uncertainty estimation (confidence levels)
- Adaptive learning from new data



This makes the system:

- More accurate
- Adaptive
- Scalable
- Intelligent

What Makes SmartKisan360 Different?

End-to-end farmer lifecycle coverage

Real AI models, not rule-based logic

Water-saving optimization

Market intelligence for farmers

Responsible AI with safety disclaimers

Designed for rural accessibility

Public and synthetic data only

Low-bandwidth mobile-first UI

Key Features

Core AI & Crop Insights

- AI-based crop recommendation
- Sowing window prediction
- Yield prediction with confidence bounds

Resource & Risk Management

- Smart irrigation planning
- Water usage optimization
- Risk alerts (heat, drought, heavy rain)

Market & Farmer Support

- Price forecasting with best sell window
- Nearby mandi recommendations
- Farmer–buyer listing platform
- Advisor/FPO dashboards

Future Enhancements

- Multi-language support (future)
- Offline support (future)

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Use Case Overview

Actors:


Farmer


Advisor/FPO


Buyer

Use Cases:


Get crop recommendation


Receive risk alerts


List produce


View dashboard

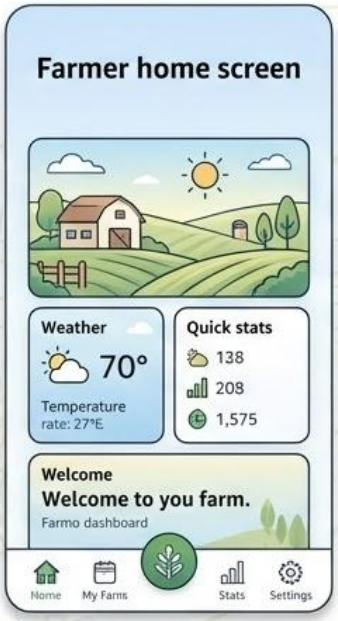

View irrigation plan

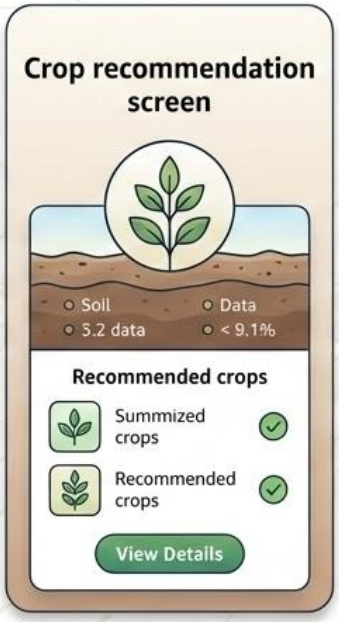

View price forecast

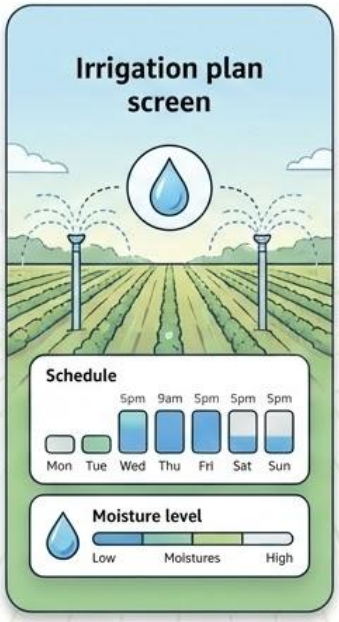

Search produce


Receive alerts

Sample Screens





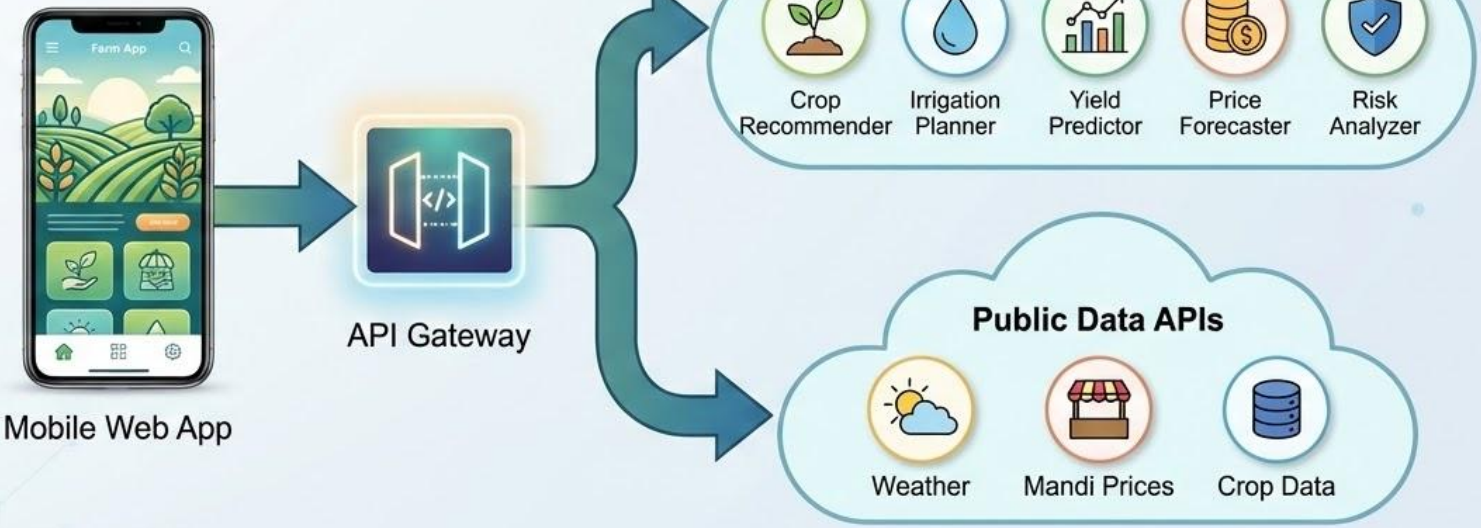


System Architecture

Title: System Architecture

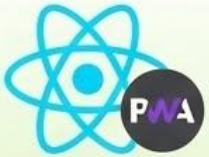
Simplified version:

Mobile Web App
↓
API Gateway
↓
AI Services
• Crop Recommender
• Irrigation Planner
• Yield Predictor
• Price Forecaster
• Risk Analyzer
↓
Public Data APIs
• Weather
• Mandi Prices
• Crop Data



Tech Stack

Frontend

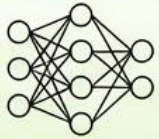


React PWA

Backend


Python FastAPI

AI/ML



Scikit-learn LSTM / ARIMA

Database


PostgreSQL Redis

APIs

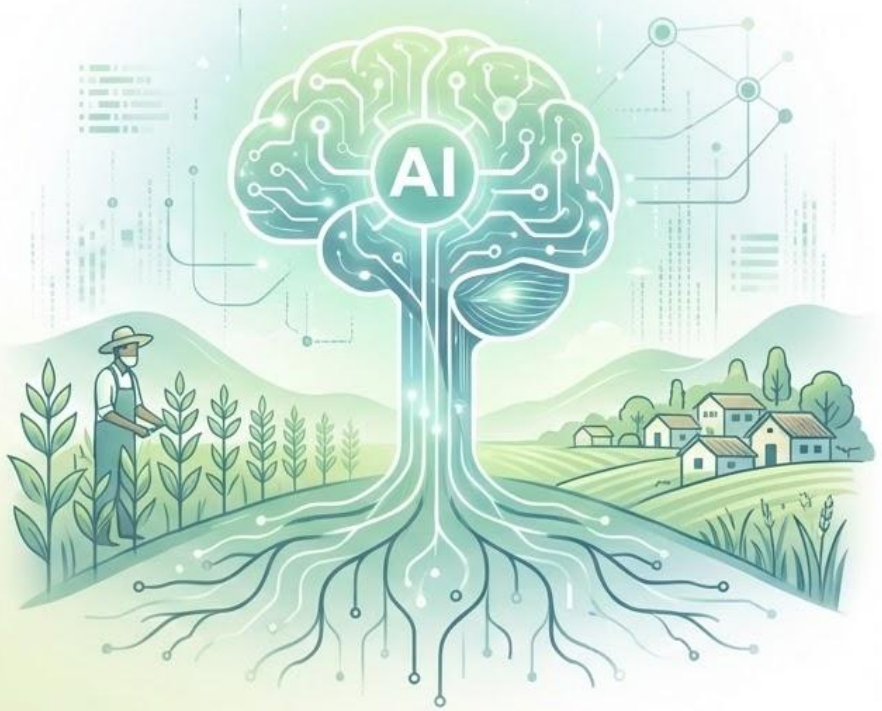

Weather APIs Agmarknet

Cloud

AWS

Responsible AI

- Uses only public & synthetic datasets
- No medical or harmful advice
- No pesticide dosage recommendations
- Shows confidence & uncertainty
- Advisory-only guidance
- District-level location only
- No GPS tracking



Expected Impact

- 15–25% better crop planning
- 20–30% water savings
- Reduced crop loss
- Higher farmer income
- Improved market access
- Better rural sustainability

Higher farmer income

Market sales and financial growth and financial growth.

20–30% water savings

Efficient irrigation systems and reservoir

Improved market access

Supply chain logistics to delive up with digital marketplace.

Reduced crop loss

Pest detection and detection and healthy harvest

Better rural sustainability

Renewable energy and energy and thriving rural community.

Scalability & Future Scope

Expand to all Indian districts

Expand to all Indian districts to India and

Add voice assistant

Farmer wourls speaking at sponts and AI assistant

Add regional languages

Add regional languages and spenitation

Add offline mode

Add offline to agricultural data matents and local storage

Integrate IoT sensors

Farm moisture sensors with weather station

Government & NGO deployment

Government & NGO deployment enterring a rural community

Estimated MVP Cost

Cloud compute: Free tier

Cloud compute: free tier - compute & server storage

AWS Free Tier for Compute & Storage

APIs: Free/public

APIs: intellocking weather, map, and voice services

Free/Public APIs

Developrer APIs

Garner source ML neurorflow and tools source services

Open-source ML tools

Open-source ML tools and PyTorch and scikt-learn toolbox

Estimated MVP: ₹0–₹5,000

Estimated MVP cost for ₹0–₹5,000 minimal cost

Exploved by

Estimated MVP: cost will put t low and in-now rural valuntage

₹0–₹5,000
(Minimal Cost)

Conclusion

SmartKisan360 empowers farmers with AI-driven insights, enabling smarter decisions, better sustainability, and improved income — all through a responsible and accessible design.

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Thank You