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AI for Bharat Hackathon

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Team Name : ASTRAX

Team Leader Name : A YASH

Problem Statement : **3. [Professional Track] AI for Rural Innovation & Sustainable Systems**

KrishiSevak

AI-Powered Crop Intelligence Platform for Climate-Resilient Farming

Problem:

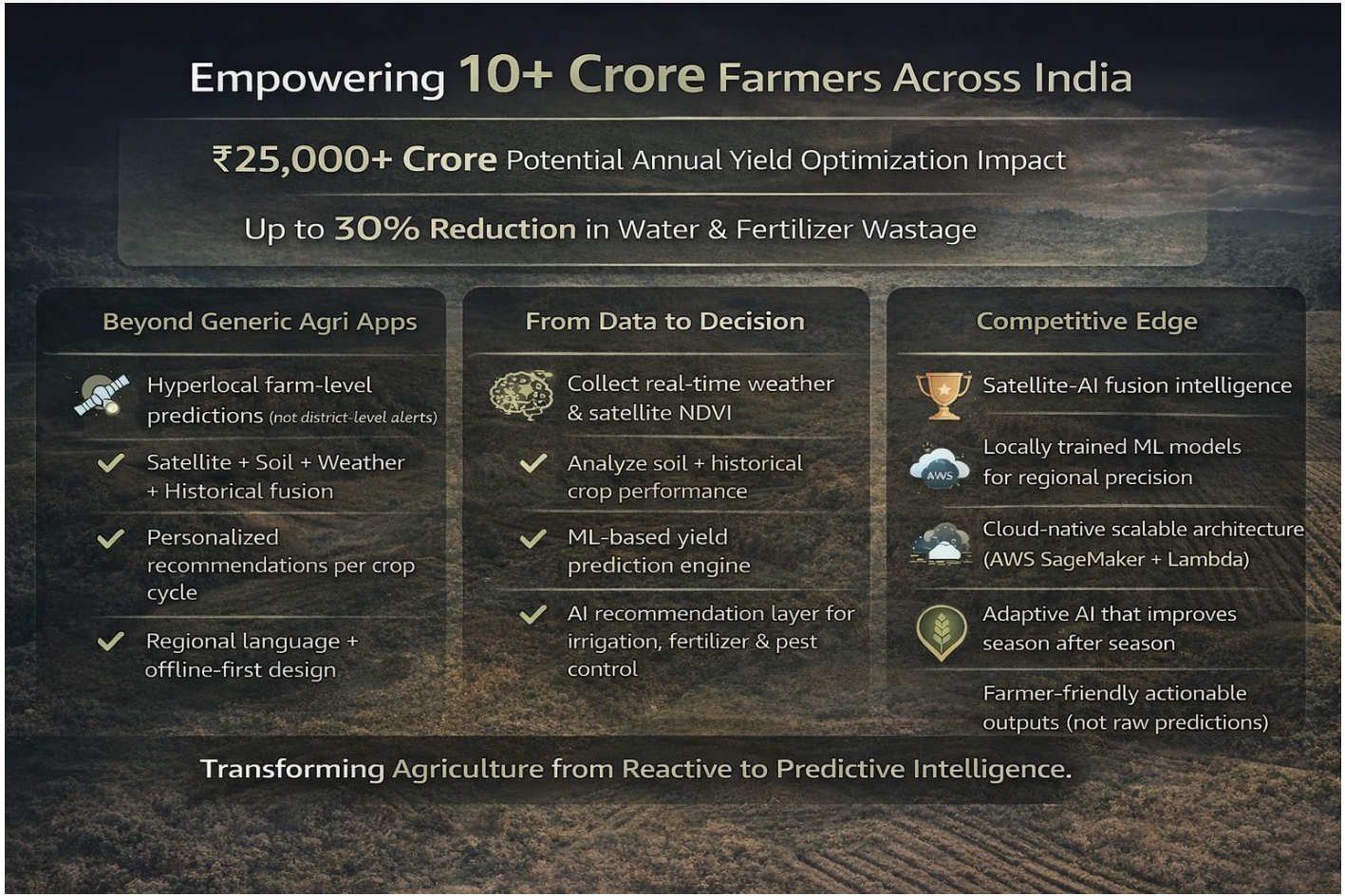
77% of Indian farmers face unpredictable crop yields due to lack **of real-time intelligence.**

Solution:

KrishiSevak combines **satellite data, real-time weather APIs, soil intelligence,** and **AI models** to deliver hyperlocal crop predictions and actionable farming recommendations.

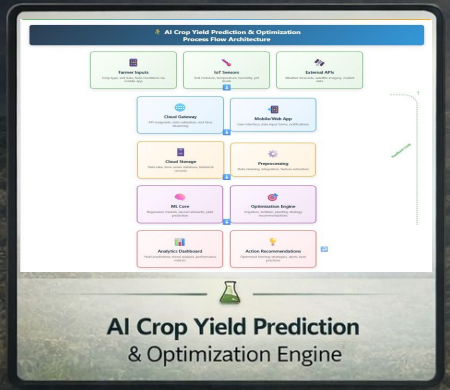
Why It Matters:

- **Increase yield accuracy**
- Reduce **water & fertilizer waste**
- Enable **data-driven** farming for small farmers


Empowering 10+ Crore Farmers Across India
₹25,000+ Crore Potential Annual Yield Optimization Impact
Up to 30% Reduction in Water & Fertilizer Wastage
Beyond Generic Agri Apps
Hyperlocal farm-level predictions (not district-level alerts)
Satellite + Soil + Weather + Historical fusion
Personalized recommendations per crop cycle
Regional language + offline-first design
From Data to Decision
Collect real-time weather & satellite NDVI
Analyze soil + historical crop performance
ML-based yield prediction engine
AI recommendation layer for irrigation, fertilizer & pest control
Competitive Edge
Satellite-AI fusion intelligence
Locally trained ML models for regional precision
Cloud-native scalable architecture (AWS SageMaker + Lambda)
Adaptive AI that improves season after season
Farmer-friendly actionable outputs (not raw predictions)
Transforming Agriculture from Reactive to Predictive Intelligence.

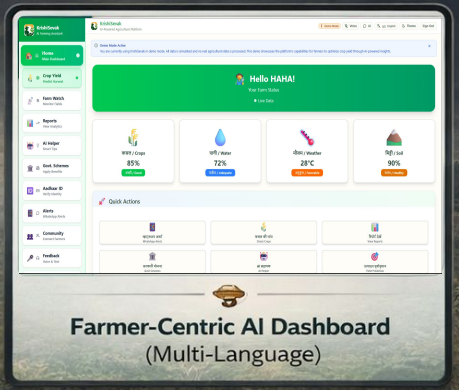
KrishiSevak – Intelligent Agriculture Platform

End-to-End AI-Powered Crop Intelligence Ecosystem



AI Crop Yield Prediction
& Optimization Engine

Sustainable & Scalable
Revenue Model



Farmer-Centric AI Dashboard
(Multi-Language)

AI & Intelligence Layer

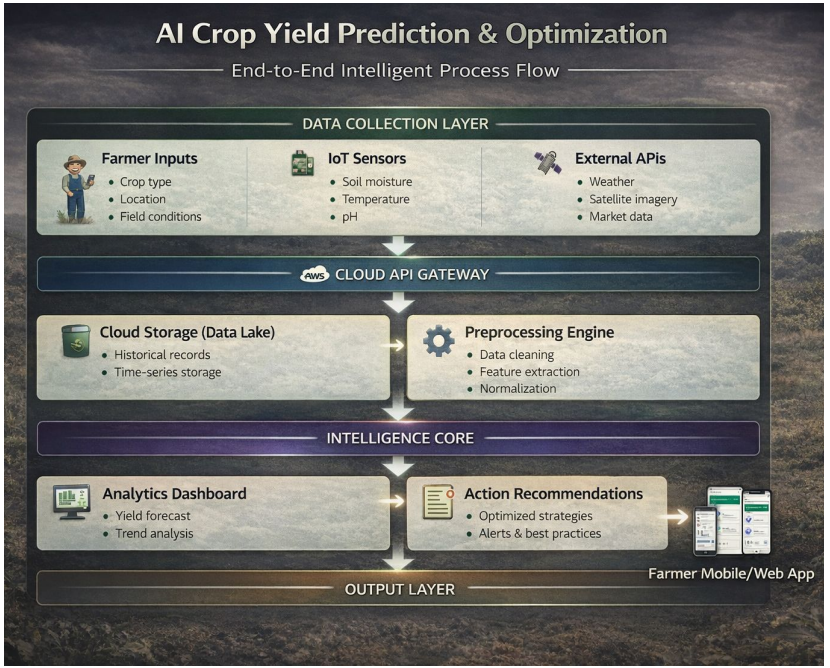
- Hyperlocal Yield Prediction
- Satellite NDVI Monitoring
- Soil Health Analysis
- Weather Pattern Forecasting
- Irrigation Optimization Engine
- Fertilizer & Pest Advisory
- ML-based Seasonal Learning

Platform & Farmer Experience

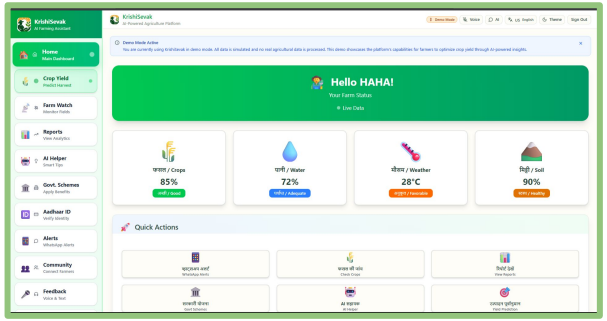
- Multi-language Support
- Offline Mode for Rural Areas
- WhatsApp Alert Integration
- Government Scheme Suggestions
- AI Smart Helper Assistant
- Reports Planning Tool
- Reports & Analytics Dashboard

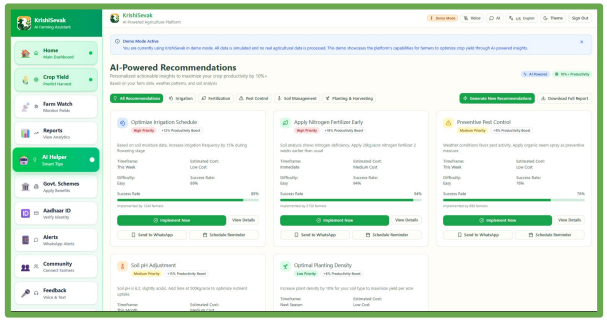
A Complete Digital Agriculture Intelligence Stack – From Data Collection to Decision Execution

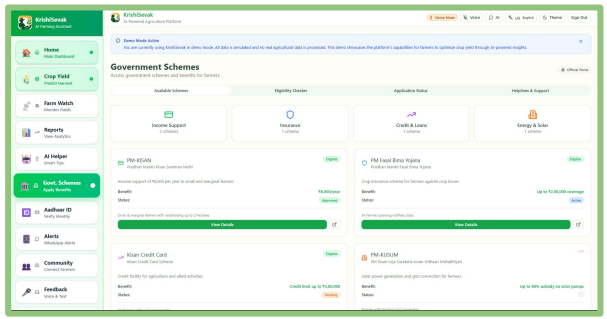

KRISHISEVAK
BUSINESS MODEL CANVAS
KEY PARTNERS
Agricultural Universities & Research Institutes
Krishi Vigyan Kendras (KVKs)
Government Agriculture Departments
Weather & Satellite Data Providers
NGOs & Farmer Cooperatives
IoT Soil Sensor Manufacturers
KEY ACTIVITIES
AI/ML Model Development
Crop Yield Optimization
Satellite Image Analysis
VALUE PROPOSITIONS
Accurate Yield Prediction
Actionable Recommendations
Regional Language Support
CUSTOMER RELATIONSHIPS
Personalized Advice
Regional Language Support
Seasonal Alerts
CUSTOMER SEGMENTS
Personalized Advice
Regional Language Support
Seasonal Alerts
Long-Term Engageme
CHANNELS
Mobile & Web App
KVKs & Cooperatives
Cloud Infrastructure
Web & Mobile Platform
CUSTOMER SEGMENTS
Small & Marginal Farmers
Large-Scale Farmers
Cooperatives & NGOs
Agri Businesses
COST STRUCTURE
AI Development
Cloud & API Costs
Cloud & API Costs
Marketing & Operations
Marketing & Operations
REVENUE STREAMS
Free ₹ 0
Basic Tips & Alerts
Premium ₹299/season
Advanced Advisory
Enterprise / Govt
Custom Pricing
Large-Scale Solutions
Transforming Agriculture with AI-Powered Insights, Recommendations, and Predictive Analytics

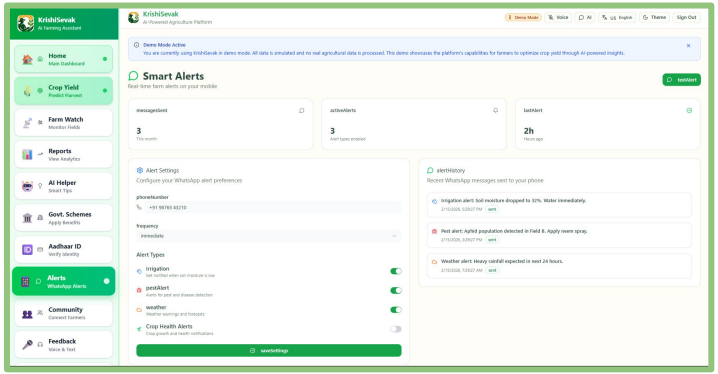

AI Crop Yield Prediction & Optimization
End-to-End Intelligent Process Flow
DATA COLLECTION LAYER
Farmer Inputs
Crop type
Location
Field conditions
IoT Sensors
Soil moisture
Temperature
pH
External APIs
Weather
Satellite imagery
Market data
CLOUD API GATEWAY
Cloud Storage (Data Lake)
Historical records
Time-series storage
Preprocessing Engine
Data cleaning
Feature extraction
Normalization
INTELLIGENCE CORE
Analytics Dashboard
Yield forecast
Trend analysis
Action Recommendations
Optimized strategies
Alerts & best practices
Farmer Mobile/Web App
OUTPUT LAYER

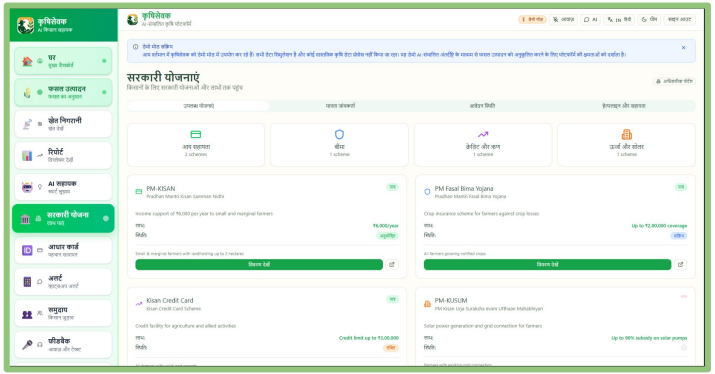
Wireframes/Mock diagrams of the proposed solution





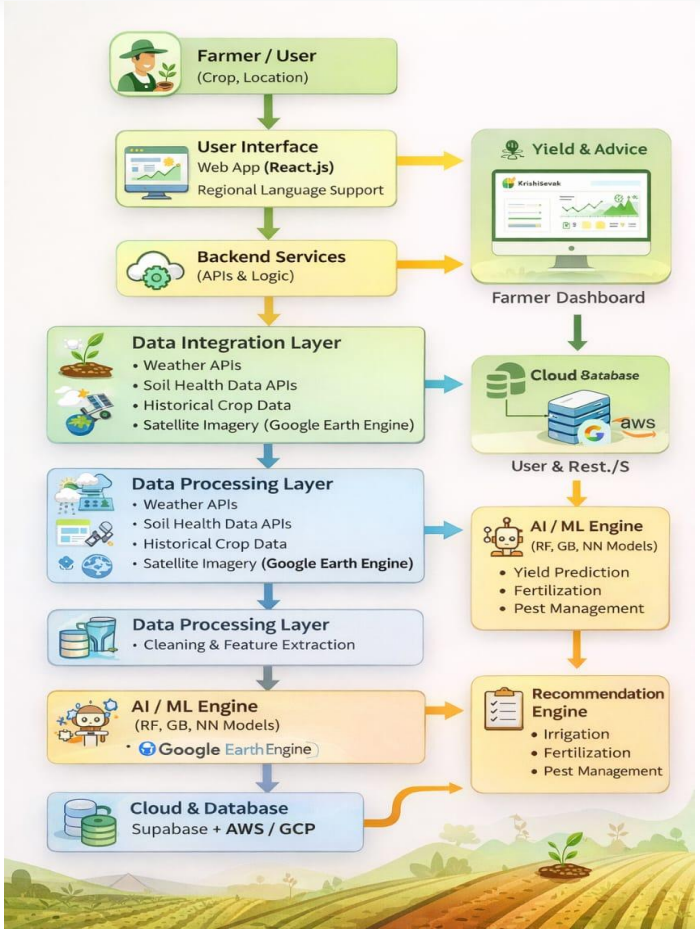






Architecture Overview:

- **Data input layer:** Historical crop data, real-time weather data, soil health data, and satellite imagery
- **Remote Sensing Layer:** Google Earth Engine for monitoring vegetation, soil moisture, and crop health
- **AI & Analytics Layer:** AI/ML models trained on local farming data for yield prediction and analysis
- **Recommendation Engine:** Generates actionable advice for irrigation, fertilization, and pest control User Interface Layer: Farmer-friendly dashboard with regional language support and low-network usability



Technologies to be used in the solution:

AI & Algorithm Development:
LLM-based decision support system leveraging OpenAI APIs, geospatial inputs, and Agromonitoring satellite analytics for crop recommendations.

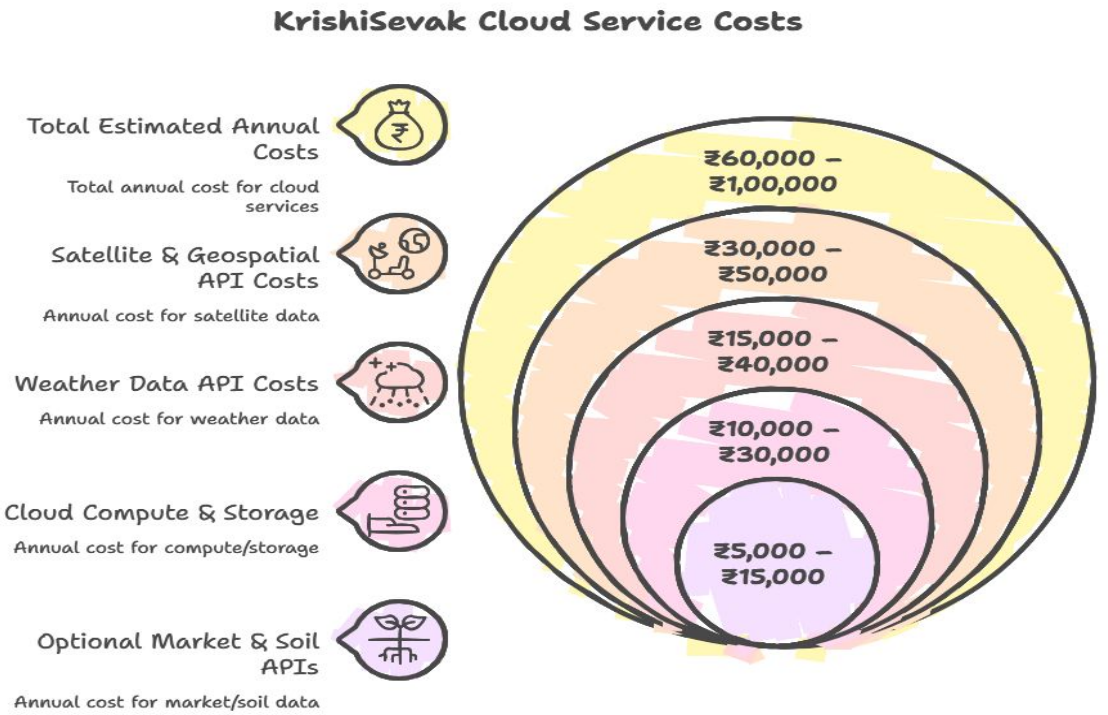
Frameworks & Libraries:
Scikit-learn, pandas, numpy, matplotlib, seaborn, request, json, datetime, warnings,
Google Earth Engine – Satellite imagery & remote sensing integration
Google Search + AI – Knowledge augmentation for adaptive recommendations

Application Development:
Web App: React.js / Next.js for interactive farmer dashboard job

Data & Cloud Infrastructure:
Database: Supabase for structured agricultural & farmer data
Cloud Services: AWS / GCP for scalability, storage, and deployment
APIs: Weather APIs, Soil Data APIs, Google Earth Engine APIs

Product Status
70% product build completed and further build is in progress. Testing and validation processes are next to be undertaken.

Estimated implementation cost:



Innovation & Uniqueness

What Makes Us Different:

- Only platform combining AI, satellite monitoring, and voice interface for rural farmers
- Hybrid intelligence: ML models + LLM + community feedback loop
- Locally trained models achieve 85%+ accuracy vs 65 to 75% generic solutions
- Voice-first design in 15+ regional languages breaks literacy barriers

Real-World Impact

Farmer Benefits:

- 25 to 35% income increase through optimized yields
- 20 to 35% reduction in water and fertilizer wastage
- 40 to 60% prevention of crop losses through early warnings

Feasibility & Readiness

Development Status: 70% Complete Core ML models trained and validated
Dashboard operational with API integrations
Database and authentication implemented
Voice assistant and satellite integration in progress
Testing and field validation upcoming

Resources Available:

- Existing government agricultural datasets and weather archives
- Proven open-source tech stack (React, Node.js, Python)
- Partnership potential with KVKs and agricultural universities

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Thank You