

AI for Bharat Hackathon

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Team Name : Artificial Devs

Team Leader Name : Javali Murari

Problem Statement : Build an AI-powered solution that supports rural ecosystems, sustainability, or resource-efficient systems.

Brief about the Idea:

AI Krishi Mitra is a **agentic AI-based** system designed to **educate, protect, and empower farmers** by providing timely guidance, risk alerts, and profit-focused recommendations through a single accessible system. The platform integrates multiple specialized AI agents that address real challenges faced by farmers across the crop lifecycle:

- A **general farming assistant AI agent** that answers queries on crops, soil, irrigation, seasonal practices, and government schemes in simple language.
- A **crop disease prediction AI agent** that analyzes images or symptoms to detect possible diseases and recommend treatment steps.
- A **fertilizer advisory AI agent** that suggests optimal fertilizer composition and type to improve yield while maximizing profitability and reducing unnecessary input costs.
- A **market intelligence AI agent** that helps farmers locate nearby mandis and provides current selling prices for their commodity, enabling better selling decisions.
- A **disaster alert AI agent** that warns farmers in advance about extreme weather or potential disasters via SMS/email and can generate summary reports for planning and documentation.

How Is This Different From Existing Solutions?

- **End-to-End Lifecycle Support**

Supports farmers from **query resolution** → **crop growth** → **risk protection** → **selling decisions**, instead of offering isolated features.

- **Agentic AI Architecture**

Uses **multiple specialized AI agents working together**, not a single chatbot. This enables the system to handle tasks like disease prediction, fertilizer planning, market lookup, and alerts in a coordinated way.

- **Built for Rural Use**

Includes **local language support** and is designed for **mobile and low-bandwidth environments**, making it practical for real deployment.

- **Reliable, Data-Grounded AI**

Combines **RAG** with **external APIs** to reduce hallucinations and provide responses based on real data and verified practices.

- **Scalable and Always Available**

Low-cost, automated, and **24x7 accessible**, reducing dependence on limited farming experts while supporting farmers at scale.

How Will It Solve the Problem?

- Farmers will be able to make general-purpose queries related to farming.
- Farmers will be able to check the health condition of their crops by uploading crop leaf images.
- Farmers will be able to receive fertilizer composition recommendations based on current weather and soil conditions to maximize crop production.
- Farmers will be able to know the standard market value of their commodity and locate nearby mandis where they can sell their crops.
- Farmers will receive SMS or email notifications before any disaster so they can prepare in advance.
- Data-driven decisions help improve sustainability and resilience.

USP (Unique Selling Proposition)

- One platform – six critical solutions (all-in-one farming support).
- AI + MCP-powered system providing crop health intelligence, fertilizer recommendations using soil and weather data, regional mandi price insights, and early SOS alerts before disasters.

List of features offered by the solution

Agentic AI based farming assistant

- Multilingual chat & voice support
- Crop education & best practices
- Fertilizer, irrigation, and pest Q&A

AI based weather disaster alert system

- AI-based detection of floods, droughts, heatwaves.
- Alerts via SMS / email.

AI based quality and quantity of fertilizer suggestion

- Based on soil conditions and weather environment, AI will suggest the best crop and fertilizer for that period.

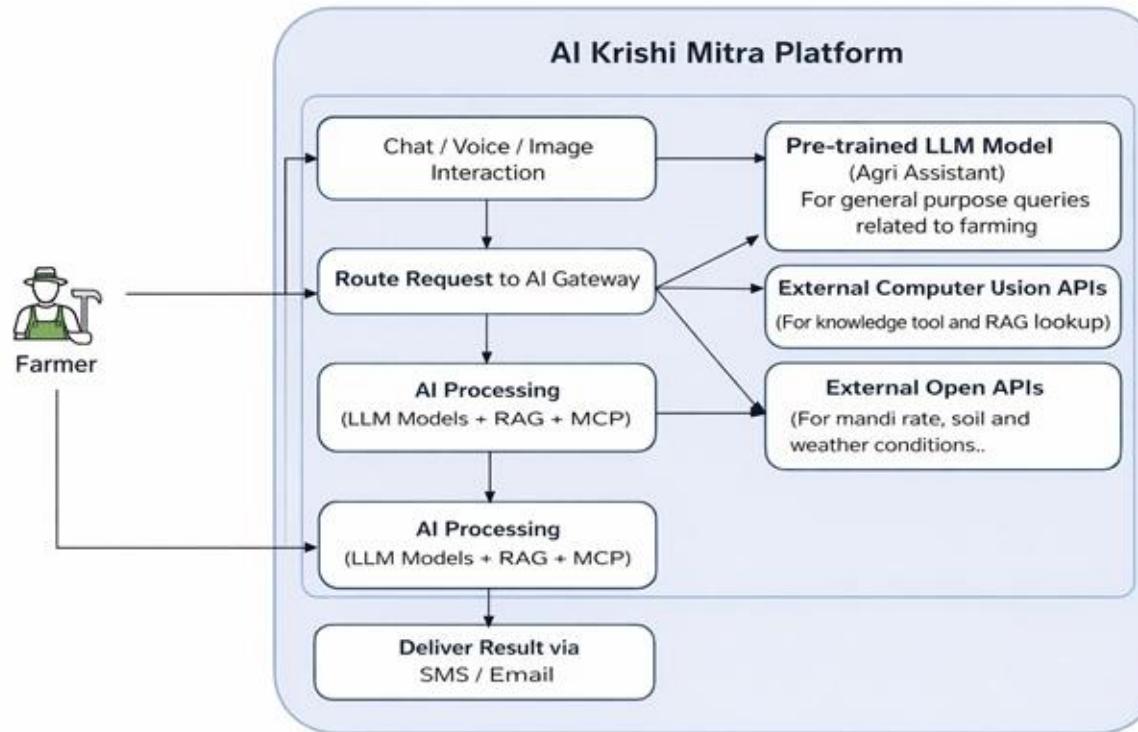
AI based crop health detection

- Image-based disease detection
- Treatment & prevention suggestions

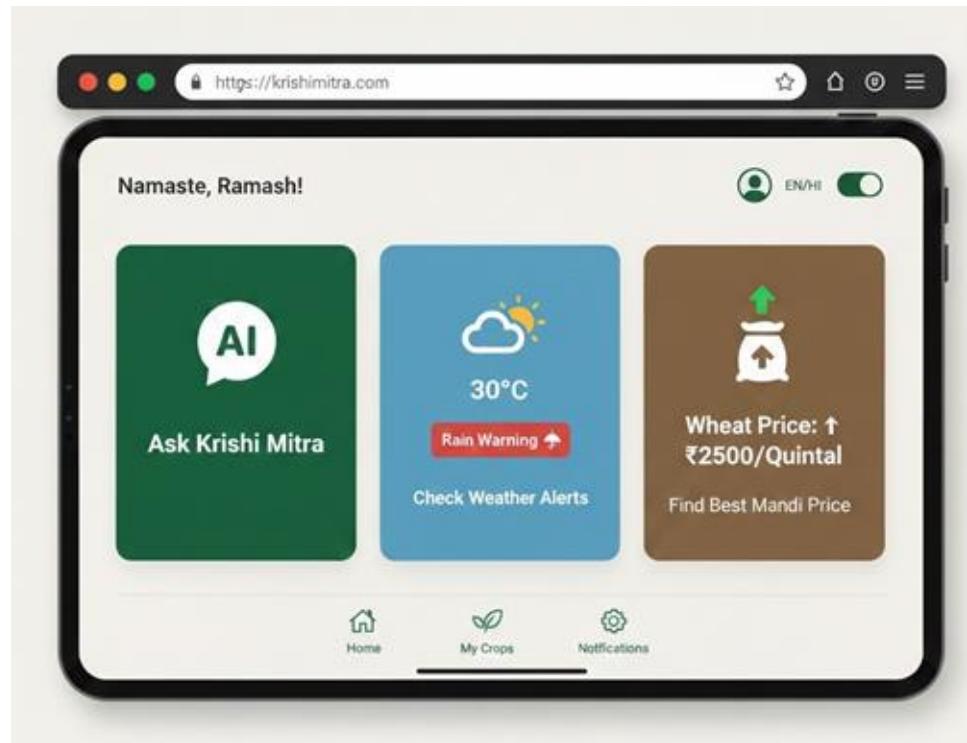
AI based smart mandi price finder

- Best nearby mandi rates and location.

Use-case diagram



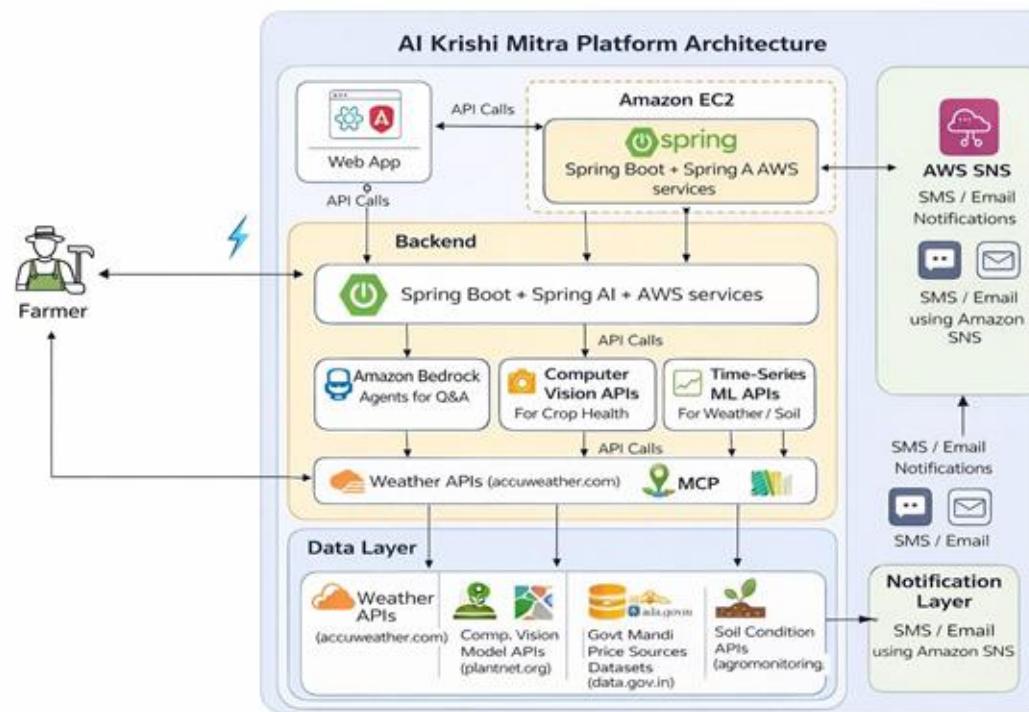
Wireframes/Mock diagrams of the proposed solution (optional)



Architecture Diagram

- **Frontend:** Web using React.js/Angular
- **Backend:** Spring Boot + Spring AI + AWS services
- **Deployment:** Amazon EC2
- **AI Layer:**
 - Amazon bedrock agents for Q&A
 - Computer vision model APIs for crop health
 - Time-series ML APIs for fetching weather and soil data.
 - MCP for mandi price aggregation and mandi locator.
- **Data Layer:**
 - Weather APIs ([accuweather.com](https://www.accuweather.com))
 - Computer vision model APIs (plantnet.org)
 - Government mandi price sources datasets (data.gov.in)
 - Soil condition APIs (agromonitoring.com)
- **Notification Layer:**
 - SMS / Email notifications using Amazon SNS

Architecture diagram of the proposed solution:



Technologies to be used in the solution:

Backend & AI

- Spring Boot
- Spring AI
- MCP Servers
- Bedrock Agents

AI Models

- LLM (for reasoning)
- Computer vision model (crop disease)

Communication

- SMS/Email Gateway: Amazon SNS
- Push Notifications

Data Sources

- Weather APIs
- Government Mandi price datasets APIs
- Soil condition APIs
- RAG

Estimated implementation cost:

- Cloud infrastructure: Low to Medium
- AI APIs (LLM, Vision): Pay-per-use
- SMS/Email alerts: Minimal per user

Affordable and scalable for large rural adoption

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Thank You

