AI for Bharat Hackathon

Powered by aws

Team Name : Trinaari AI

Team Leader Name : Sowmya Akula

Title : KrishiMitra :"Empowering farmers with voice-powered intelligence"

Problem Statement

Small and marginal farmers in India often suffer severe crop losses due to delayed detection of drought, pest infestation, disease, or irrigation failures. Existing systems are reactive, generic, or inaccessible due to language and literacy barriers.

There is no intelligent, multilingual, voice-first AI system that:

- **Monitors** crops **autonomously**
- **Predicts** stress before damage
- **Explains** problems clearly
- **Engages** farmers conversationally
- **Continuously learns** and **improves**

🌾 KrishiMitra

A Proactive, Agentic, Voice-First AI System for farmers

- Monitors crops using satellite + weather data,
- predicts stress 3+ days early, and
- calls farmers in their local language with personalized advice.
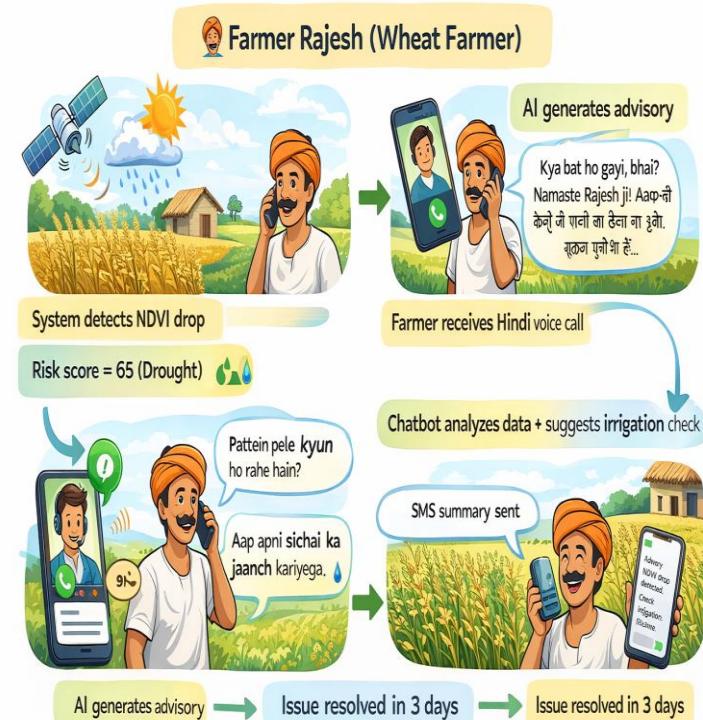
What Makes It Different?
⚡ AI-based early stress prediction
🧠 Agentic AI reasoning (not rule-based alerts)
🎙️ Multilingual voice chatbot
🔄 Continuous self-learning
🎯 False-alert reduction via autonomous investigation

Outcome
A self-learning agricultural intelligence network — not just an alert system.

Use Case Example

🧑‍🌾 Farmer Rajesh (Wheat Farmer)

AI generates advisory

Kya bat ho gayi, bhai? Namaste Rajesh ji! Aap-ki ... बुझ पुछो भी हे...

System detects NDVI drop

Risk score = 65 (Drought)

Farmer receives Hindi voice call

Chatbot analyzes data + suggests irrigation check

Pattein pele kyun ho rahe hain?

Aap apni sichai ka jaanch kariyega.

SMS summary sent

AI generates advisory → Issue resolved in 3 days → Issue resolved in 3 days

Unique Selling Proposition

| Traditional Solutions	Our Solution
Reactive (after damage)	Proactive (predict before damage)
Text SMS alerts	Voice calls in local language
Static advisory	Interactive AI conversation
Human expert dependency	AI-driven 24/7 support
One-size-fits-all	Personalized per farm

This is not just monitoring.
It is an **Autonomous Agricultural AI Assistant.**

KrishiMitra – Key Features

- **Satellite & Weather Auto Monitoring**
  Continuous remote sensing every 3 days + 6-hour weather tracking

- **3-Day Early Stress Prediction**
  AI risk scoring with drought, pest, disease detection

- **Personalized Agentic AI Advisories**
  Budget-aware, resource-specific, explainable recommendations

- **Multilingual Proactive Voice Alerts**
  Auto-calls within 30 mins in 10+ Indian languages

- **24/7 Conversational Voice Chatbot**
  Natural, multi-turn support with <2 sec response time

- **Outcome Tracking & Smart Analytics**
  Call success, farmer feedback, regional impact insights
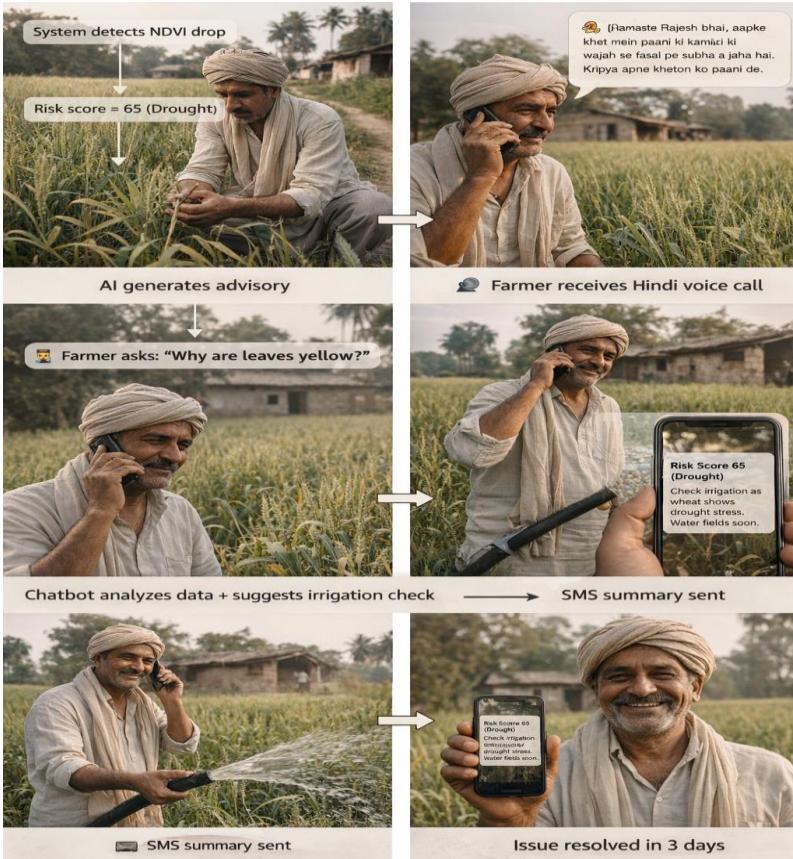
- **Self-Learning & False Alert Reduction**
  Autonomous investigation + continuous model improvement

- **Secure, Scalable, Cloud-Ready Architecture**
  Encrypted, resilient, supports 10,000+ farmers
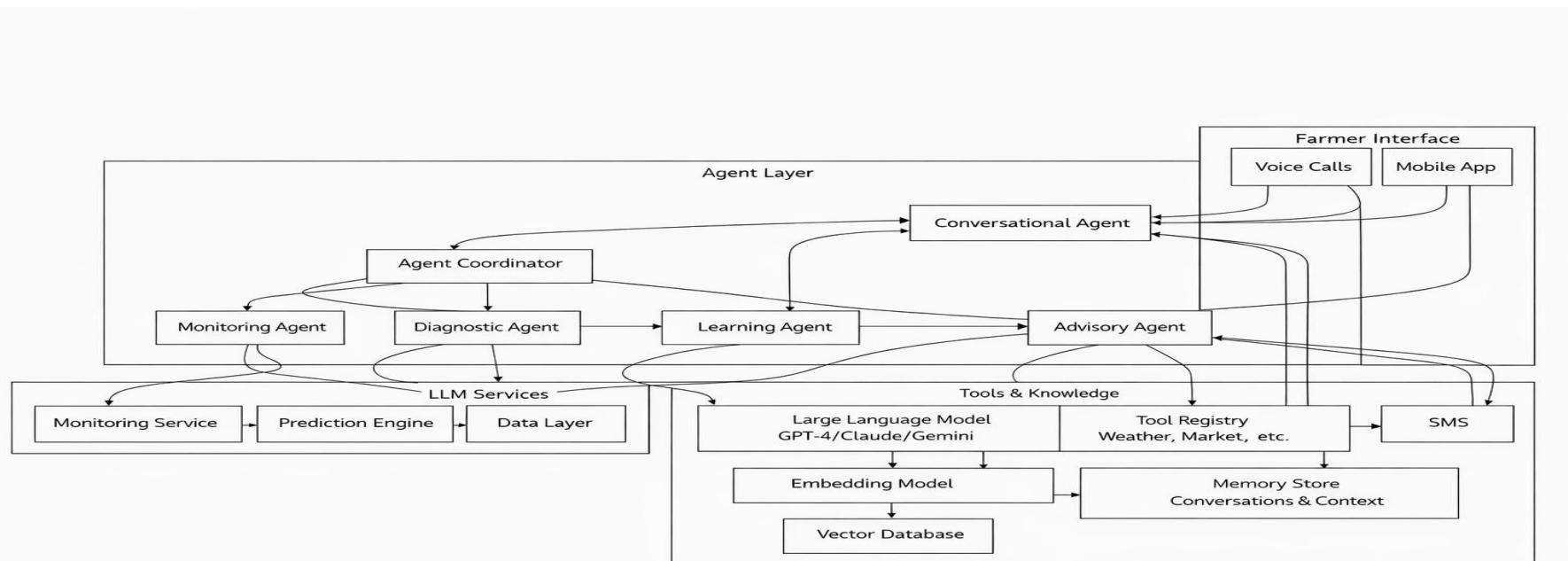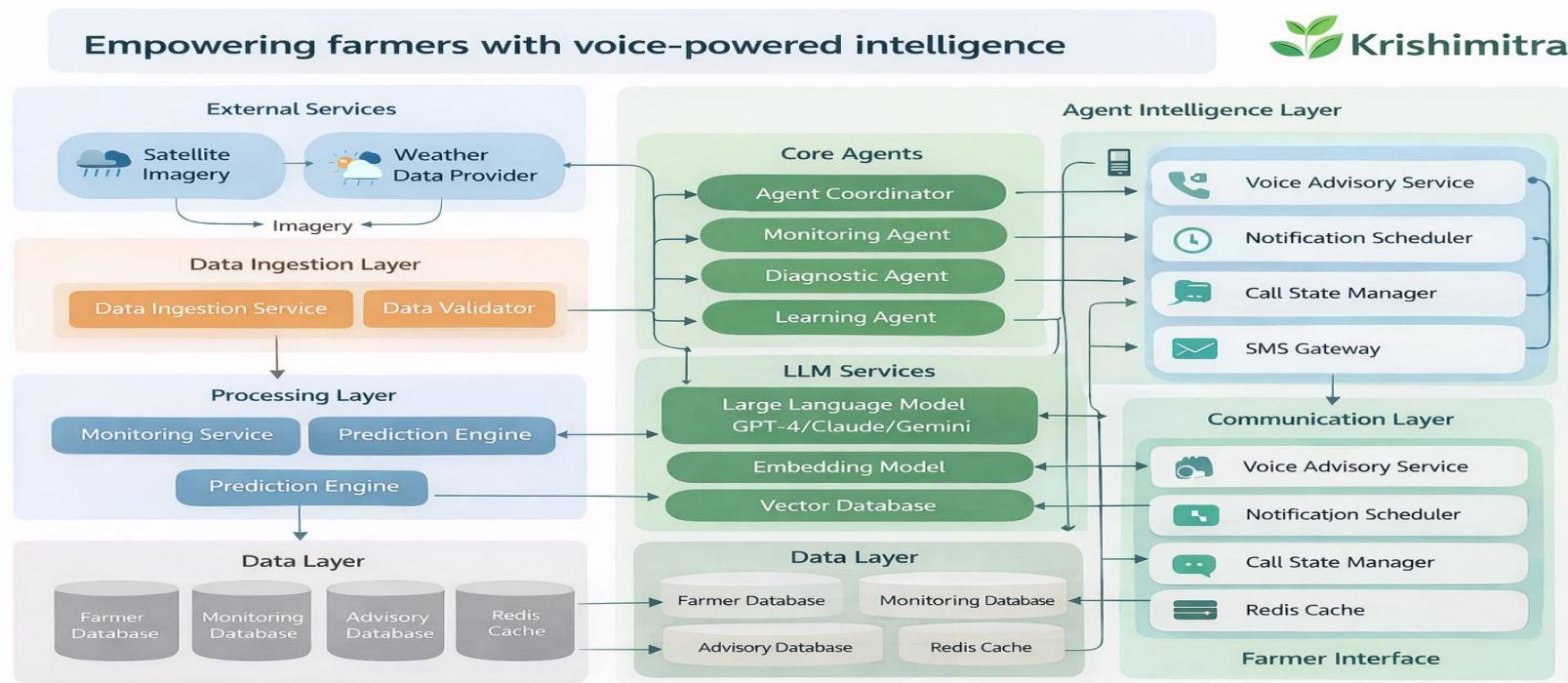
Process flow diagram

Flow diagram in Detail

Agent Layer

Conversational Agent

Agent Coordinator

Monitoring Agent | Diagnostic Agent | Learning Agent | Advisory Agent

Farmer Interface

Voice Calls | Mobile App

LLM Services

Monitoring Service → Prediction Engine → Data Layer

Tools & Knowledge

Large Language Model GPT-4/Claude/Gemini | Tool Registry Weather, Market, etc. | SMS

Embedding Model → Memory Store Conversations & Context

Vector Database

Architecture diagram of the proposed solution:

AWS Architecture Overview

DATA INGESTION

| Amazon API Gateway | AWS Lambda (Scheduled Polling) | Amazon S3 (Satellite + Weather Data Lake) |

AI & INTELLIGENCE LAYER

| Amazon SageMaker (Stress Prediction Model) | Amazon Bedrock (Agentic AI Advisory + RAG) | Amazon OpenSearch (Knowledge Base Search) |

VOICE & COMMUNICATION

| Amazon Connect (Outbound Voice Calls) | Amazon Lex (Conversational Chatbot) | Amazon Polly (Text-to-Speech) | Amazon SNS (SMS Fallback Alerts) |

DATA STORAGE

| RDS (Farmer DB) • DynamoDB (Sessions) | ElastiCache (Active Alerts) |

MONITORING & SECURITY

CloudWatch • IAM • KMS

Estimated Implementation Cost

For 10,000 farmers (monthly estimate):

Component	Equivalent in INR (@ ₹83/$)
Satellite API	₹8,300
Weather API	₹9,960
Voice Calls	₹66,400
SMS	₹1,660
AWS Infra	₹41,500
Redis + Kafka	₹37,350
Total (approx)	₹165,170 / month

💡 Optimized Cost

Plan	INR
Optimized possible cost	**₹69,720 / month**
Per farmer cost	**₹7–₹17 / month** (approx)