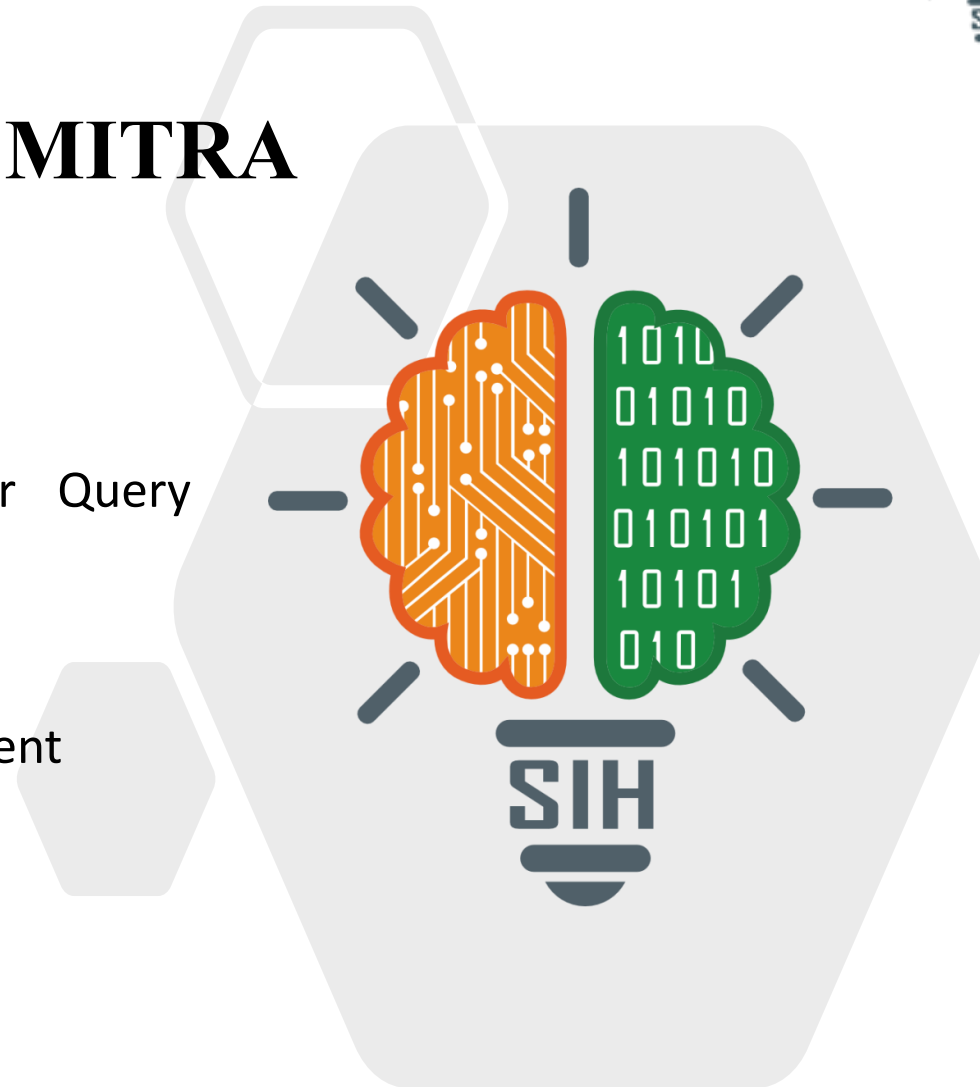


SMART INDIA HACKATHON 2025



KRISHI MITRA

- **Problem Statement ID** – 25076
- **Problem Statement Title-** AI-Based Farmer Query Support and Advisory System
- **Theme-** Agriculture, FoodTech & Rural Development
- **PS Category-** Software
- **Team ID-** DJSW079
- **Team Name (Registered on portal)** – Eclipse Coders



Krishi Mitra: AN AI-BASED FARMER QUERY SUPPORT AND ADVISORY SYSTEM

Idea/Approach:

1. Multilingual Chatbot

- Supports Malayalam, English, Hindi via text, voice, or images
- Learns from farmer queries and expert feedback
- Downloadable chats as PDF

2. Weather and Personalized Alerts

- Farmers are updated with timely weather forecasts & warnings to protect crops. Custom reminders for crop activities with latest agricultural news.
- Weather API's will be used for this purpose.

3. Market Updates

- Shares real-time prices of pesticides, fertilizers, and farm produce to help farmers buy and sell smartly.
- Market Data APIs and News APIs for fetching real time prices.

4. Government Schemes & Insurance guidance

- Schemes and Insurance guidance through RAG pipeline
- Uses official PDF documents for accurate information
- Farming personalized learning through videos and official sources

5. Expert Escalation

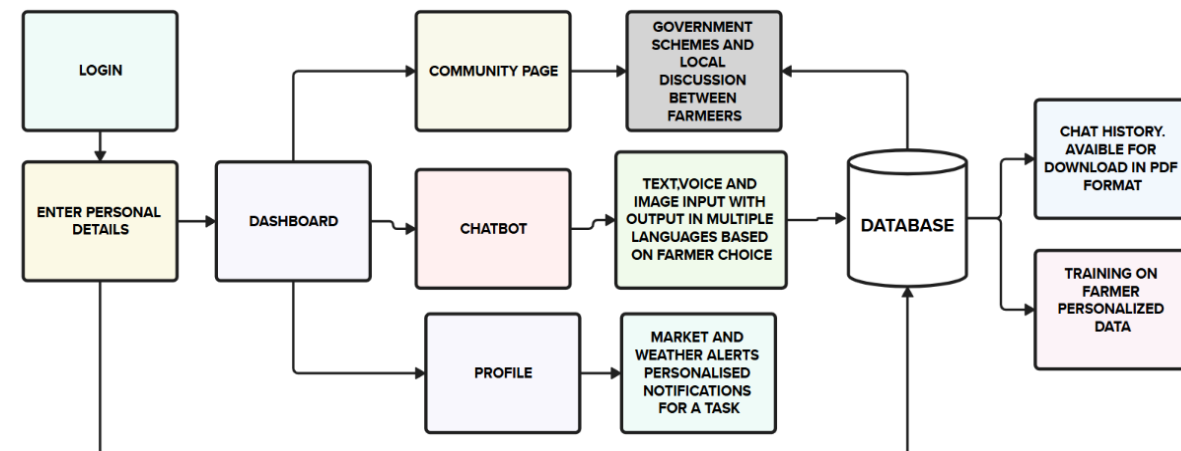
- If the chatbot's confidence level is below a certain percentage, then the query is automatically forwarded to Agro Officers for review.

6. Farmer Community & Support

- Creates a group chat space where farmers can share their problems, exchange ideas, and support each other in real time.

7. Soil Report Analysis

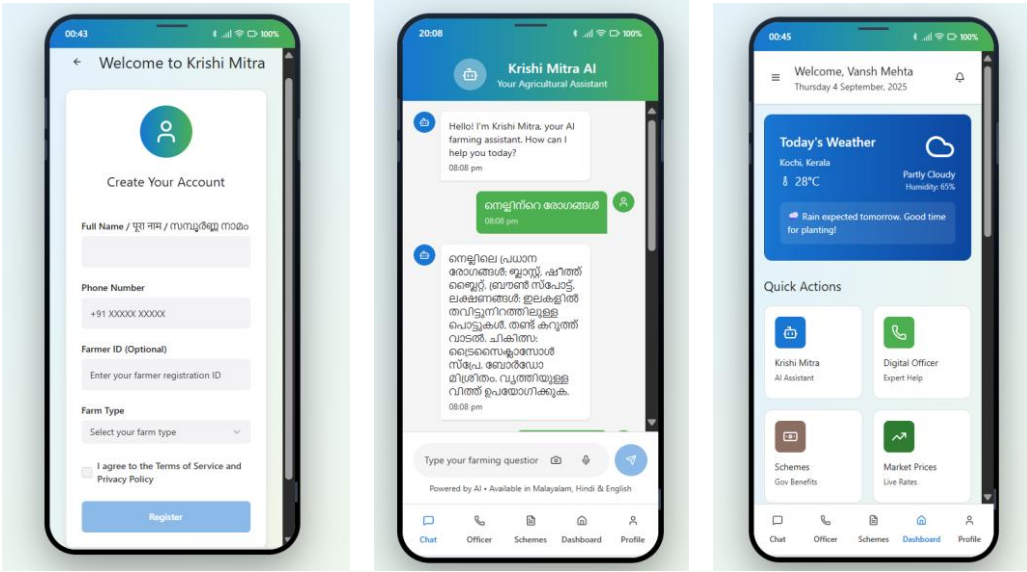
- Upload reports via PDF, images, etc.
- OCR + NLP extract soil value automatically
- AI suggests fertilizers, crop rotations and soil health practices.



TECHNOLOGY STACK:



WORKING PROTOTYPE:



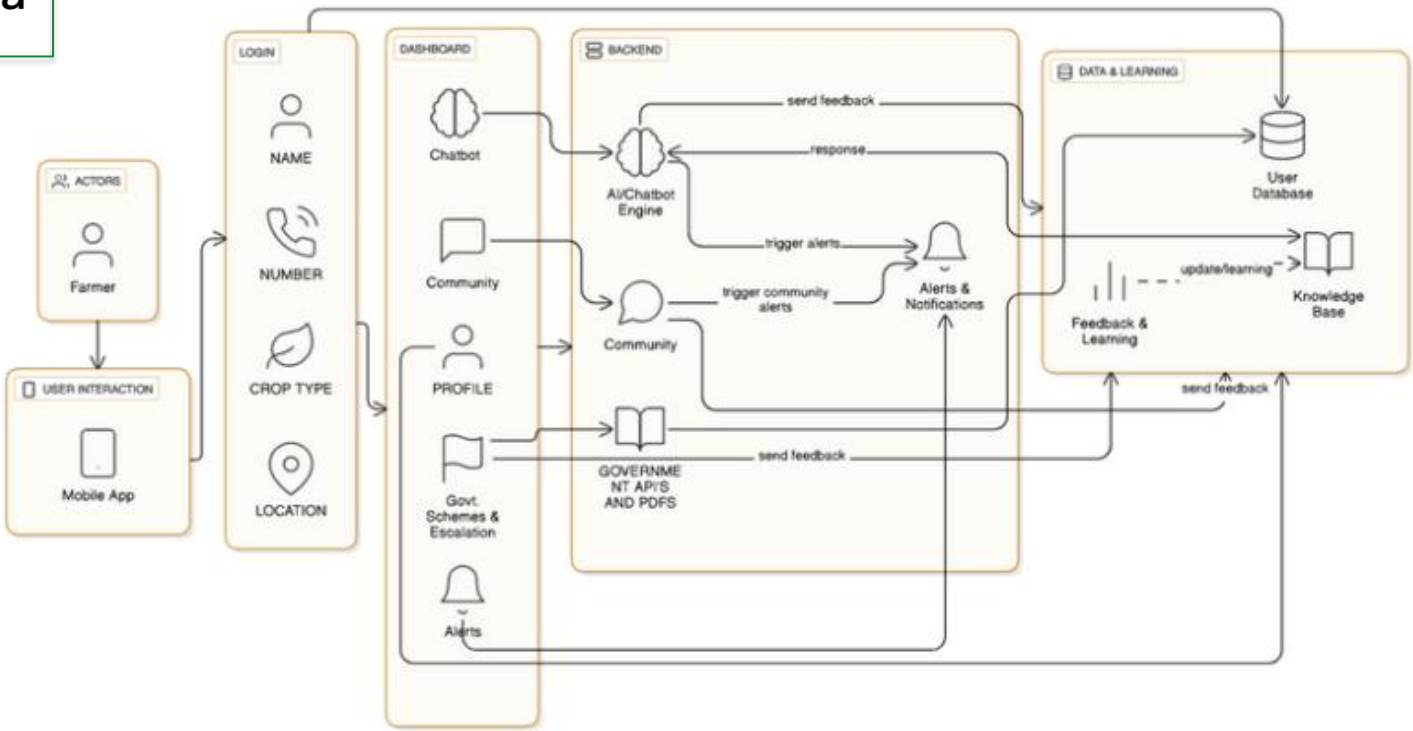
WORKING PROTOTYPE LINKS:

Link for the Figma Design: [Krishi Mitra UI](#)

Link for System Workflow: [System Workflow](#)

Link for Backend Flow Diagram: [Backend Workflow](#)

SYSTEM WORKFLOW / DATA FLOW DIAGRAM:



FEASIBILITY AND VIABILITY

FEASIBILITY

Multilingual Voice & Text Support: Farmers can ask queries in Malayalam (later scale to other languages) via ASR/TTS.

AI-Powered Advisory (RAG + LLM): Provides reliable answers using crop calendars, pest sheets, weather, and schemes.

Image-Based Crop Diagnosis: Farmers upload leaf/disease photos; AI suggests possible issues and remedies.

Smart Context Matching: Tailors advice using farmer's location, crop type, and season.

Market & Weather Integration: Provides mandi prices (Agmarknet/e-NAM) and rain-safe spray windows.

CHALLENGES

Dialect & Language Variation: Malayalam dialects and code-mixing may confuse ASR/LLM.

Connectivity Issues: Rural areas may lack stable internet; need offline/IVR support.

Data Quality & Availability: Local pest/disease datasets may be incomplete or outdated in early stages.

Trust & Adoption: Farmers may hesitate to rely on AI without explainability.

Hallucination & Safety Risks: Wrong pesticide or dosage could harm crops.

Improved Accessibility: Voice-first, IVR, and offline features ensure inclusion of low-literacy farmers.

Efficient Escalation System: Low-confidence queries routed to Agri Officers with auto-translated summaries.

Learning Loop: Continuous improvement from expert validation & farmer feedback

Automated Advisory Updates: Nightly ingestion of district advisories + live market/NDVI feeds ensures fresh data.

VIABILITY

Regional Crop Diversity:

Different districts in Kerala grow different crops, making a one-size-fits-all model inaccurate.

Scheme Awareness Gap:

Farmers often miss out on government schemes/insurance benefits due to lack of awareness.

Farmer Community Engagement:

Current advisory systems lack peer-to-peer interaction for experience sharing.

Use location-awareness

personalization with GPS-based crop calendars and localized advisory models.

Integrate Govt.

Schemes API + personalized notifications in local language to proactively inform eligible farmers.







Build a farmer







community chat/forum within the app to allow discussion, support, and collaborative problem-solving.

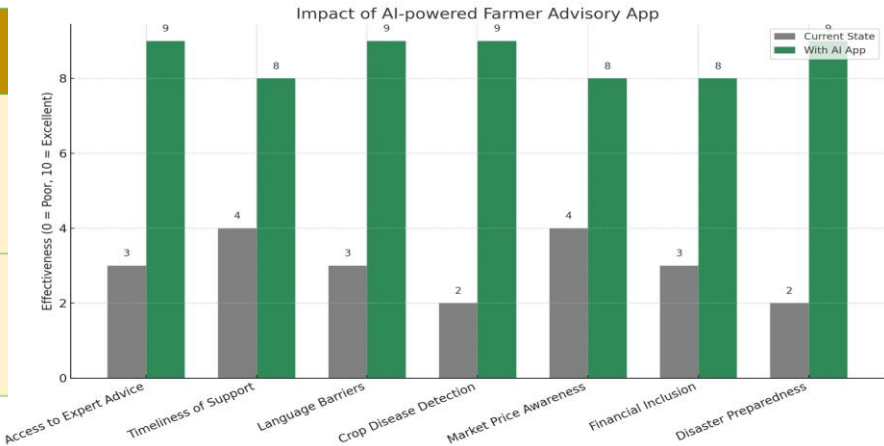


Impact Highlights

- Increase in the yield by 15% through AI precision farming & water use reduction up to 10%.
- Real-time community alerts for pest outbreaks and weather disasters.
- Building trust and accelerating knowledge transfer by directly connecting with farmers.

Potential Impact	Business Potential
 Immediate, expert advice for farmers via AI-powered support in local language	 Reduces support workload for Agri departments and Krishi bhavans through automation
 Personalized guidance on crop seasons, inputs and market access boosts yield and income	 Scalable platform, can be licensed/adapt technology for other states and stakeholders
 Equitable access, like bridging the gap for farmers in remote areas with offline support	 Positions the institute as a tech leader in agri-advisory and rural digital transformation

Social	Environmental	Economical
 Democratizes agricultural knowledge, bridging digital divide in rural areas	 Promotes sustainable farming through precision agriculture guidance	 Increases farmer income through direct market access and better pricing
 Creates farmer community network fostering peer-to-peer learning	 Enables climate smart agriculture with weather linked advisories	 Reduces input costs through precise calculation tools and bulk purchasing



Links of Our Resources:

1. *Large text-based LLM fine-tuned on 342K agricultural QA examples for accurate advisory*
<https://arxiv.org/pdf/2508.08632>
2. *Vision-language model for multimodal crop advisory; fine-tuned on plant disease + agricultural instruction dataset*
<https://arxiv.org/pdf/2410.08405>
3. *The RAG model retrieves the relevant information from a repository of agricultural websites and PDF documents*
<https://github.com/jayeshbhandarkar/AgriGenius>
4. Research Paper : *Extension Officer Shortage in India*
https://www.researchgate.net/publication/333842261_Agriculture_Extension_System_in_India_A_Meta-analysis
5. Research Paper: *Low Farmer Access to Modern Tech Advice*
<https://www.sciencedirect.com/science/article/pii/S2452292917300711>
6. *KisanMandi*
<https://www.kisanmandi.com>
7. *Indic Language and Voice usage*
https://www.iamai.in/sites/default/files/research/Kantar_%20IAMAI%20report_2024_.pdf
8. *AnnamAI:*
<https://annam.ai>
9. *ShizishanGPT: Integrating RAG for Agricultural Question Answering*
<https://arxiv.org/pdf/2409.13537>
10. *Kisan Call Centre (KCC) - Transcripts of farmers queries & answers*
<https://www.data.gov.in/resource/kisan-call-centre-kcc-transcripts-farmers-queries-answers#api>