

SMART INDIA HACKATHON 2025

TITLE PAGE



- ❑ Problem Statement ID – 25010
- ❑ Problem Statement Title - Smart Crop advisory system for small and marginal farmers
- ❑ Theme - Agriculture, Foodtech & Rural Development
- ❑ PS Category- Software
- ❑ Team Name (Registered on portal) - Data Demons





IDEA TITLE

❖ Proposed Solution (Describe your Idea/Solution/Prototype)

- ❑ A multilingual, offline-enabled platform that provides farmers with **personalized crop, soil, weather (with daily best practices), pest, and market insights** through a *simple, voice-enabled chatbot that can both take inputs and give responses in voice.*
- ❑ Helps small and marginal farmers make informed decisions by **offering real-time weather-based advisories (e.g., when to irrigate and how weather affects farming), crop and soil roadmaps, pest/disease detection through image analysis, fertilizer recommendations (what to use and how much), and mandi price tracking (access to multiple market rates beyond the local one—reducing** crop losses and improving income stability.
- ❑ Unlike existing apps, it works **offline**, supports **regional languages**, and integrates **voice-based interaction**. It is an **end-to-end assistant** combining advisory, market insights, and disease detection in a single platform, designed especially for small and marginal farmers.



TECHNICAL APPROACH



TECHNOLOGIES

Frontend:

- HTML5, CSS3, JavaScript (Vanilla JS)
- Progressive Web App (PWA) features

Backend / Data:

- Service Worker API for offline caching (no server required for MVP/offline)
- LocalStorage for user and cache management

APIs and Integrations:

- OpenWeatherMap API (weather and forecast)
- Real-time crop mandi price simulation (API-ready for future integration)
- SpeechSynthesis API for multilingual voice assistant
- Speech Recognition API for voice input
- Multilingual support (EN/HI/PA) via language string

METHODOLOGY

- **Modular web architecture**—separation of HTML, CSS, JS for maintainability
- **Progressive enhancement** for offline/low-connectivity users
- **UI/UX:** Cards and panels for intuitive flow, accessible design



FEASIBILITY AND VIABILITY



- ❑ Proven tech and **real API integration** make the prototype ready for real-world farmer use. Its modular, scalable design ensures **easy adaptation for wider deployment**.
- ❑ In APIs the field mappings may mismatch sometimes, causing blank results. Rural users may face digital and connectivity barriers while adopting new technology.
- ❑ Implement **data caching and smart autofill to handle outages and mismatches**. Use a simple, multilingual UI with voice and onboarding; develop **custom APIs and AI/ML** models for better accuracy and user experience



IMPACT AND BENEFITS



- ❑ Empowers farmers to make **data-driven decisions**, improving yields and income stability. Bridges the digital divide with **real-time, offline, and voice-enabled tools** for rural users. Reduce the dependency of farmers on **locals and on complete prediction of weather, fertilizer, and prices.**
- ❑ Boosts economic well-being and **social equity** by **reducing crop loss** and market exploitation. Promotes **environmentally sustainable farming** through precise advisories and efficient resource use.



RESEARCH AND REFERENCES



- ❑ Government mandi price API: data.gov.in
- ❑ Weather data: [OpenWeatherMap API](#)
- ❑ Pest and disease crop research: [ICAR Publications](#)
- ❑ Soil and fertilizer information: [FAO Soil Database](#)
- ❑ PWA/Offline-first design: [Google Developers - PWA](#)
- ❑ Voice & speech tech: [MDN Web Docs - Speech Synthesis](#), [MDN Web Docs - Speech Recognition](#)
- ❑ "Customized Digital Advice Can Help Farmers Reduce Crop Loss and Manage Weather Shocks" (Precision Development/IFPRI): [Summary/Blog link](#)