

Project FarmIntel

Title: Offline-First AI Market Intelligence & Buyer-Matching Agent for Farmers

Problem

Small and rural farmers often lack reliable internet access and real-time knowledge of crop market prices, demand trends, and trustworthy buyers. This information asymmetry allows intermediaries to exploit farmers, leading to reduced profits and inefficient supply chains. Existing digital agriculture platforms rely heavily on smartphones and continuous internet connectivity, making them inaccessible to many rural users.

Solution

Build an **offline-first AI agent platform** that provides farmers with **market intelligence, crop advisory, and direct buyer discovery** through **voice calls, SMS, and a lightweight offline mobile app**. The system synchronizes with cloud intelligence when connectivity is available while ensuring continued usability in low-network environments.

User Features

1. Market Intelligence

- Real-time mandi prices via SMS/voice/app
- Price trend prediction (sell now vs later)
- Nearby mandi recommendations with better rates

2. Buyer Matching

- Direct connection to verified dealers/retailers
- Nearby buyer demand alerts
- Suggested best selling location and timing

3. Crop & Fertilizer Advisory

- AI-based crop care guidance
- Fertilizer recommendations based on crop & season
- Pest/disease quick advisory via voice interaction

4. Offline Accessibility

- Missed call → automated voice response
- SMS query → AI-generated response
- Offline mobile app using quantized local AI model

5. Multilingual Support

- Local language voice interface (Hindi + regional languages)
 - Speech-to-text and text-to-speech responses
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Implementation Overview

Data Sources

- Government mandi price APIs
- Weather APIs
- Retailer/dealer databases
- Historical price datasets

AI Layer

- Cloud LLM (Amazon Bedrock / foundation models) for advanced reasoning
- On-device quantized model (TinyLlama / Gemma) for offline inference
- Retrieval Augmented Generation (RAG) using cached local datasets

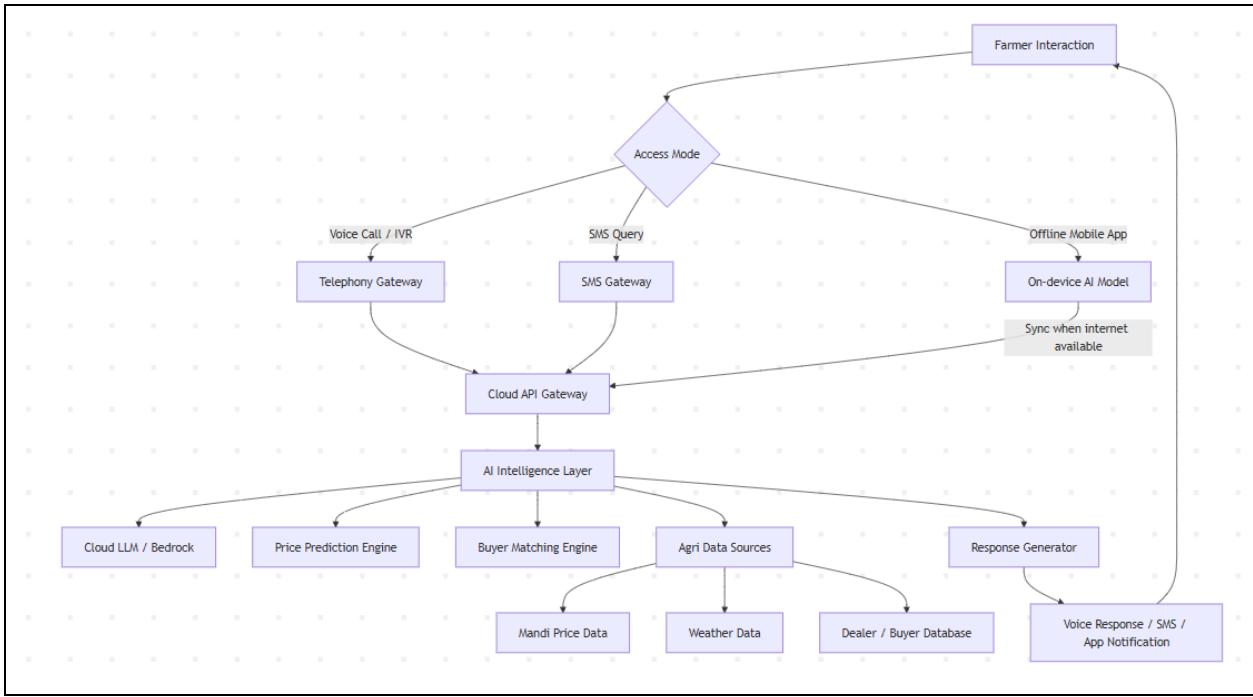
Communication Layer

- IVR telephony integration (voice calls)
- SMS gateway
- Offline-first mobile app with periodic sync

Backend Services

- Market analytics engine (price forecasting)
 - Buyer-matching recommendation engine
 - Data synchronization service for offline devices
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High-Level Architecture (Mermaid)



Why This Stands Out

- Offline-first AI architecture (rare in agri-AI systems)
- Solves **market exploitation + connectivity** simultaneously
- Multi-channel accessibility (voice, SMS, app)
- Clear B2B SaaS scalability with mandi networks and agri-platforms
- Strong alignment with **AI for Rural Innovation & Sustainable Systems**