Project Design Phase
Solution Architecture

Date	15 February 2025
Team ID	PNT2025TMID04678
Project Name	Global Food Production Trends And Analysis A Comprehensive Study From 1961 To 2023 Using Power BI
Maximum Marks	4 Marks

Solution Architecture:-

1. Data Sources (Input Layer)

- IoT Sensors & Smart Farming Devices – Collect real-time data on soil moisture, temperature, and crop health.
- Satellite & Drone Imagery – Provide insights on large-scale agricultural conditions.
- Supply Chain Data – Track inventory, logistics, and market demand.
- Weather & Climate APIs – Predict environmental impacts on food production.

2. Data Processing & Storage

- Cloud Data Lakes & Warehouses – AWS, Azure, or Google Cloud for storing vast amounts of structured/unstructured data.
- Edge Computing – Process real-time sensor data before sending to the cloud.
- ETL Pipelines – Extract, transform, and load data from various sources for analysis**.**

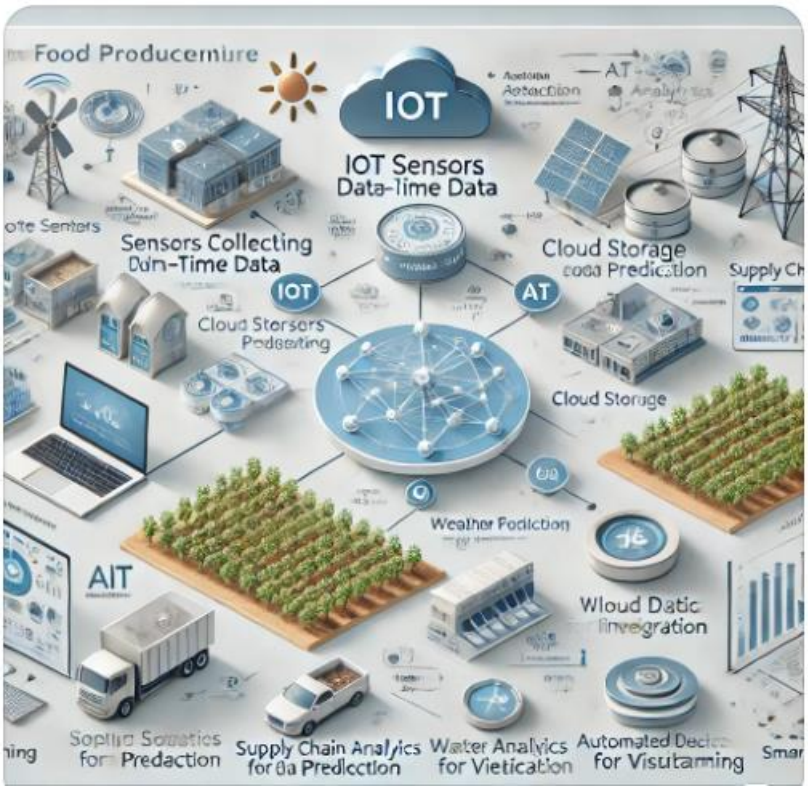
3. AI & Analytics Layer

- Machine Learning Models – Forecast yield, optimize resource use, and detect diseases.
- Computer Vision (YOLO, CNNs) – Identify crop health, food quality, and livestock conditions.
- Big Data Analytics – Process large-scale agricultural and market data for better decision-making.

4. Application & Visualization Layer

- Dashboard & BI Tools – Power BI, Tableau, or custom web dashboards for real-time monitoring.
- Mobile & Web Apps – Provide farmers and businesses with insights on production and logistics.
- Automated Alerts & Notifications – Warn about weather risks, pest infestations, or supply chain delays.

Example - Solution Architecture Diagram:-



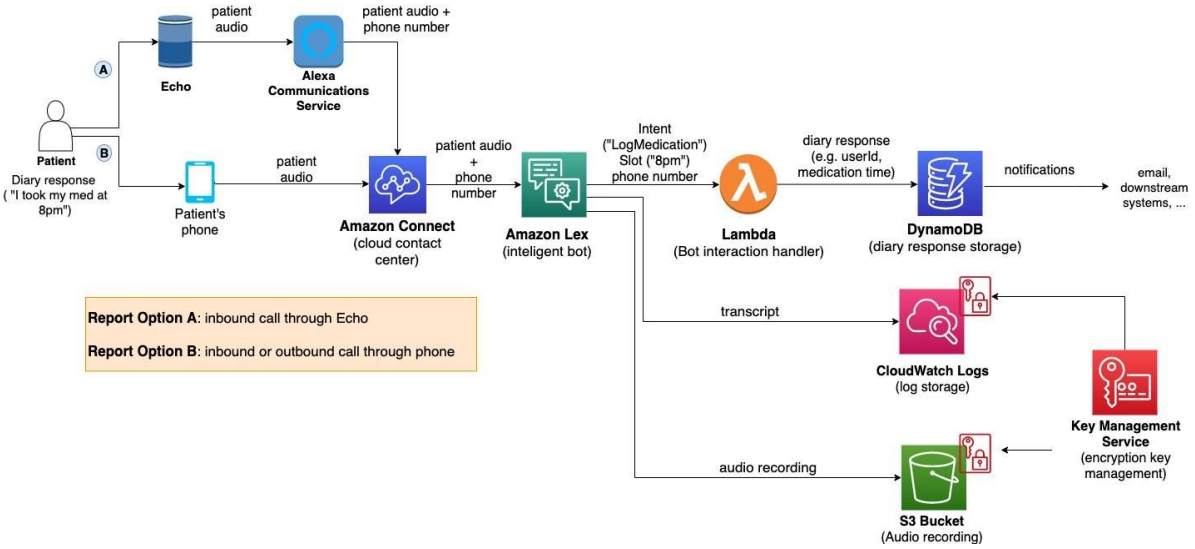


Figure 1: Architecture and data flow of the voice patient diary sample application

Reference: https://aws.amazon.com/blogs/industries/voice-applications-in-clinical-research-powered-by-ai-on-aws-part-1-architecture-and-design-considerations/