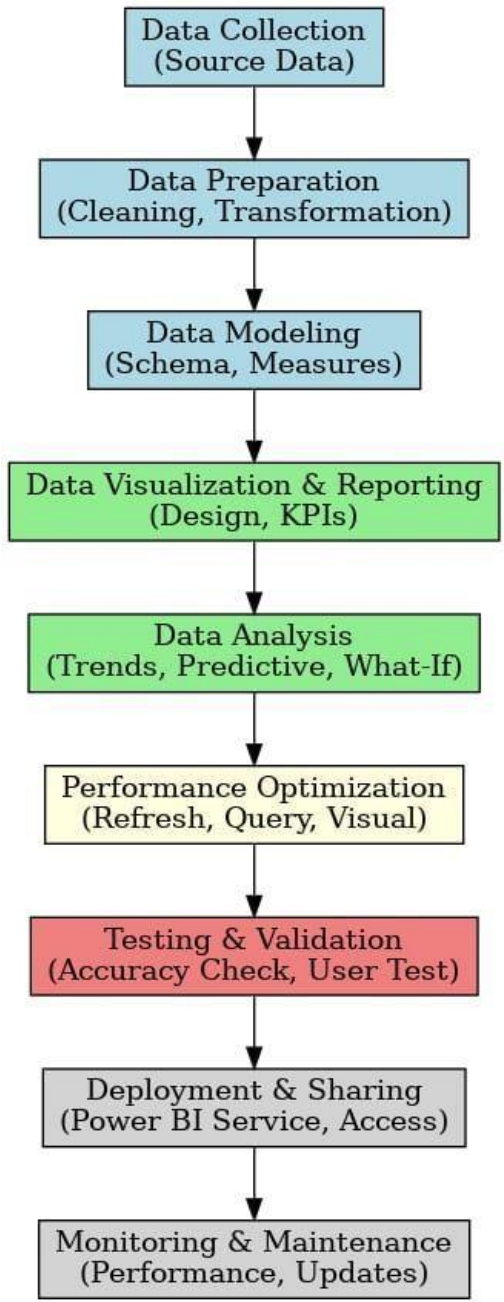


Requirement Analysis

Technology Stack

Date	5 March 2025
Team ID	PNT2025TMID02578
Project Name	Global Food Production and Trend Analysis
Maximum Marks	4



Global Food Production Analytics Technical Architecture

Layer	Components	Description
1. Data Ingestion Layer	- Data Sources: FAO datasets (CSV, Excel, SQL), Public APIs, Manually Processed Datasets	Data Import: Ingest data from different sources (CSV, Excel, SQL databases, and APIs) via Power BI Connectors.
2. Data Processing Layer	- Power Query: Data cleansing, transformation, aggregation, relationship creation	ETL (Extract, Transform, Load): Use Power Query for data transformation, cleaning, and merging datasets. Relationships between tables are set (e.g., commodities, regions, years).
3. Data Modeling Layer	- Power BI VertiPaq In-Memory Engine - DAX (Data Analysis Expressions)	Data Storage & Modeling: Store data in Power BI's in-memory VertiPaq model for high compression. Use DAX for calculated columns, measures (e.g., growth rates, averages).
4. Visualization Layer	- Power BI Dashboards: Gauge, Bar, Stacked, Area, Donut Charts - Interactive Filters (Year, Region, Commodity)	Data Visualization: Design dashboards in Power BI to represent trends and comparisons using interactive charts. Allow dynamic filtering by year, region, commodity.
5. Deployment Layer	- Power BI Service: For real-time access - Power BI Embedded: Embedding into web apps - Power BI Mobile	Access & Deployment: Host reports on Power BI Service for real-time access. Use Power BI Embedded for custom apps and Power BI Mobile for on-the-go access.
6. Scalability & Future Enhancements	- API Integrations: For real-time data - Additional Commodities/Regions	Scalability: Integrate real-time data via APIs for continuous updates. Expand to new commodities/regions without altering the base architecture.