Final Report of Global Food Production Trends And Anlysis(1961 -2023)

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1. INTRODUCTION

1.1 Project Overview:

The Global Food Production System aims to optimize food production, reduce wastage, and enhance sustainable practices using advanced AI and IoT technologies. The system addresses critical challenges such as climate change, resource scarcity, supply chain inefficiencies, and the resistance to adopting innovative practices.

1.2 Purpose:

The purpose of this project is to create an intelligent solution that leverages data analytics, IoT integration, and predictive modeling to improve productivity, reduce wastage, and promote sustainable agriculture.

2. IDEATION PHASE

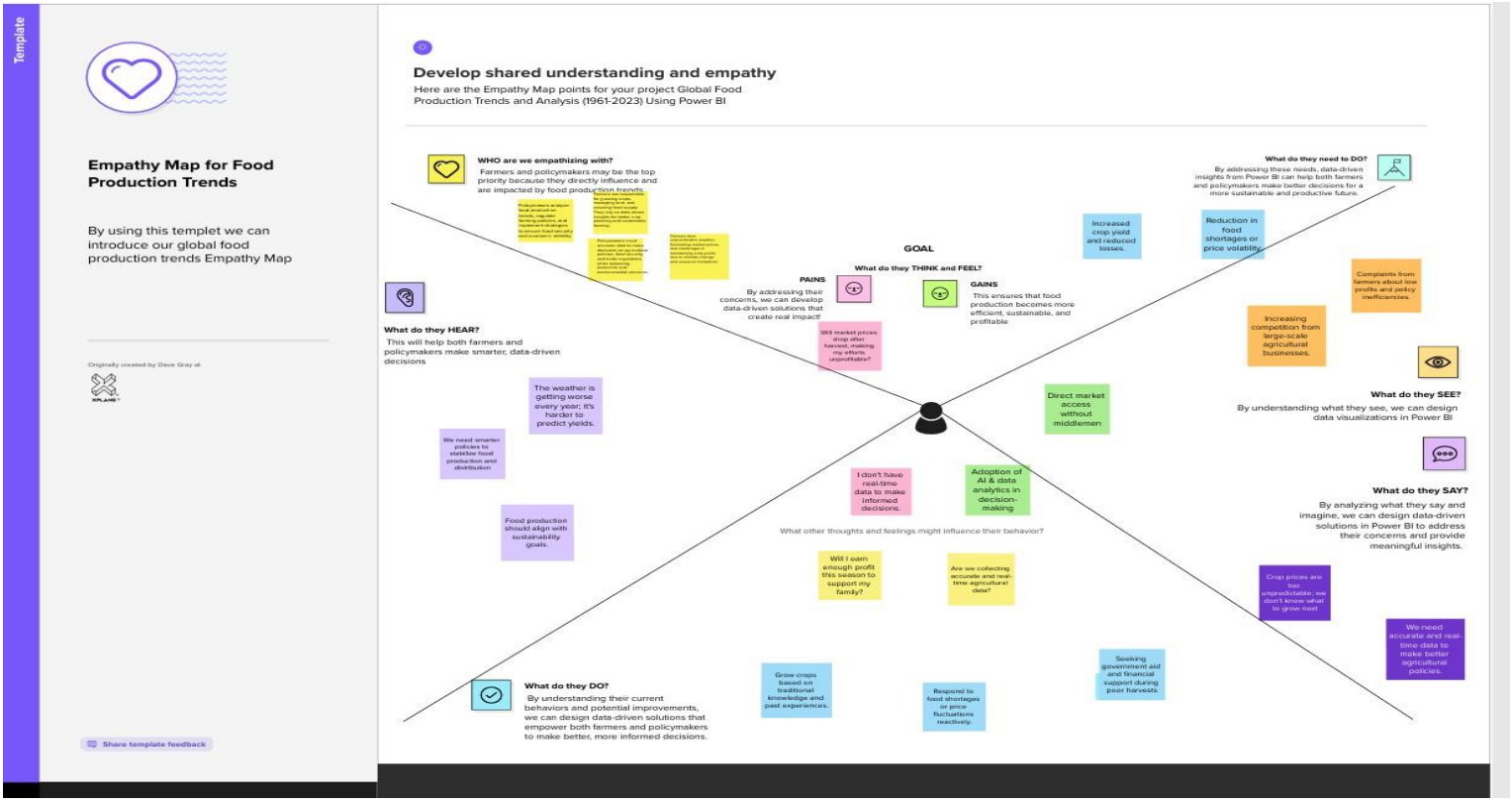
2.1 Problem Statement:

The global food production system is plagued by challenges such as climate change, inefficient resource management, and food wastage. These problems lead to reduced crop yields and significant losses in the supply chain.

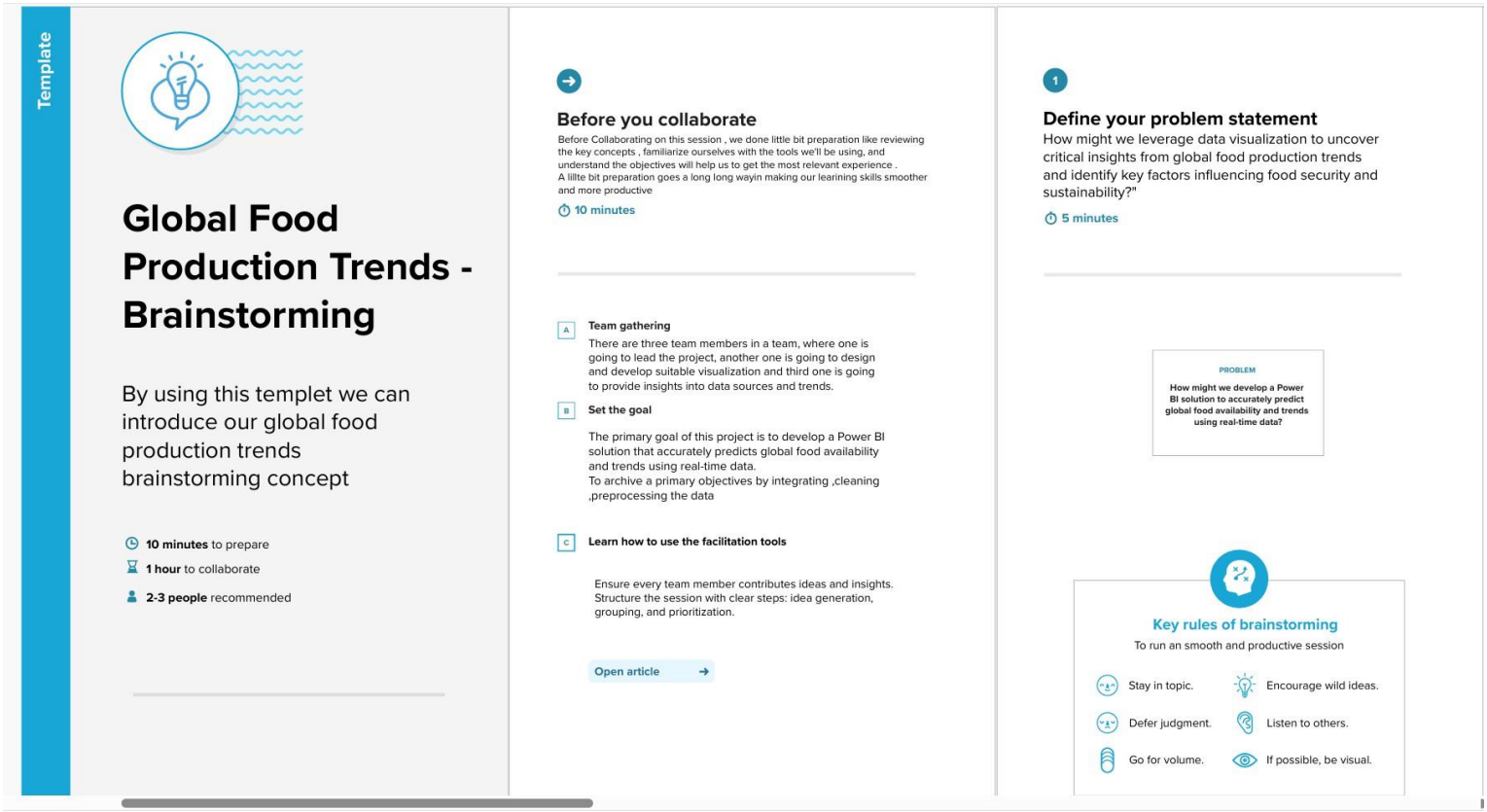
2.2 Empathy Map Canvas:

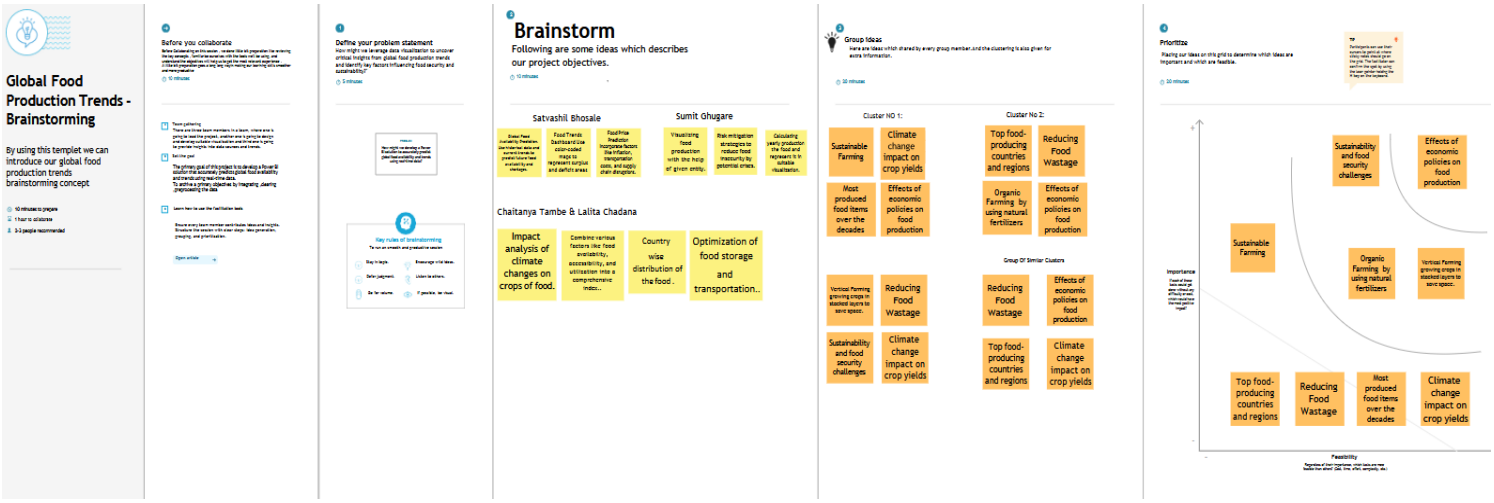
The empathy map highlights stakeholders like farmers, policymakers, agritech innovators, and food distribution managers. Their primary concerns include crop yield, sustainable practices, and resource optimization.

- **Example:**



2.3 Brainstorming:



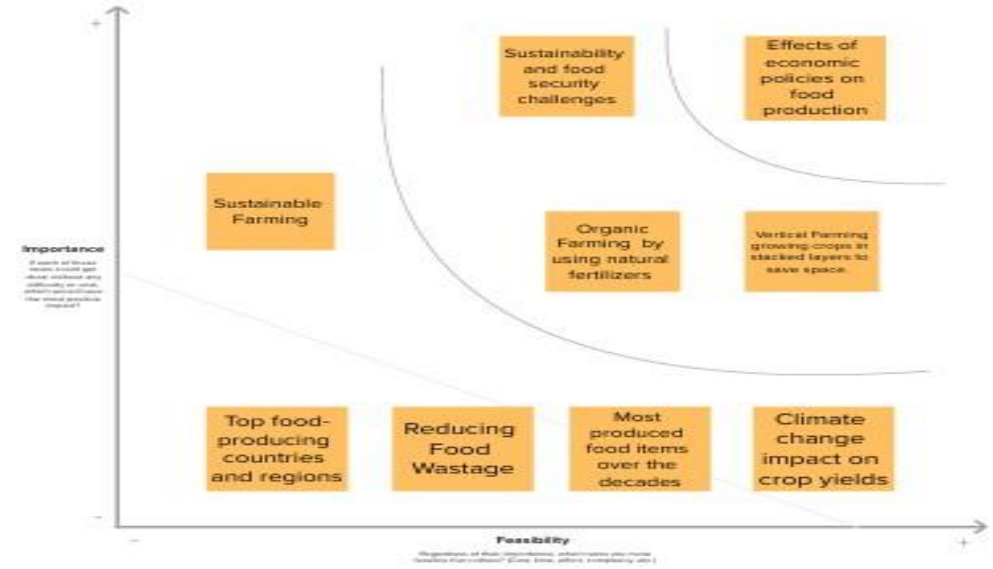


Prioritize

Placing our ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

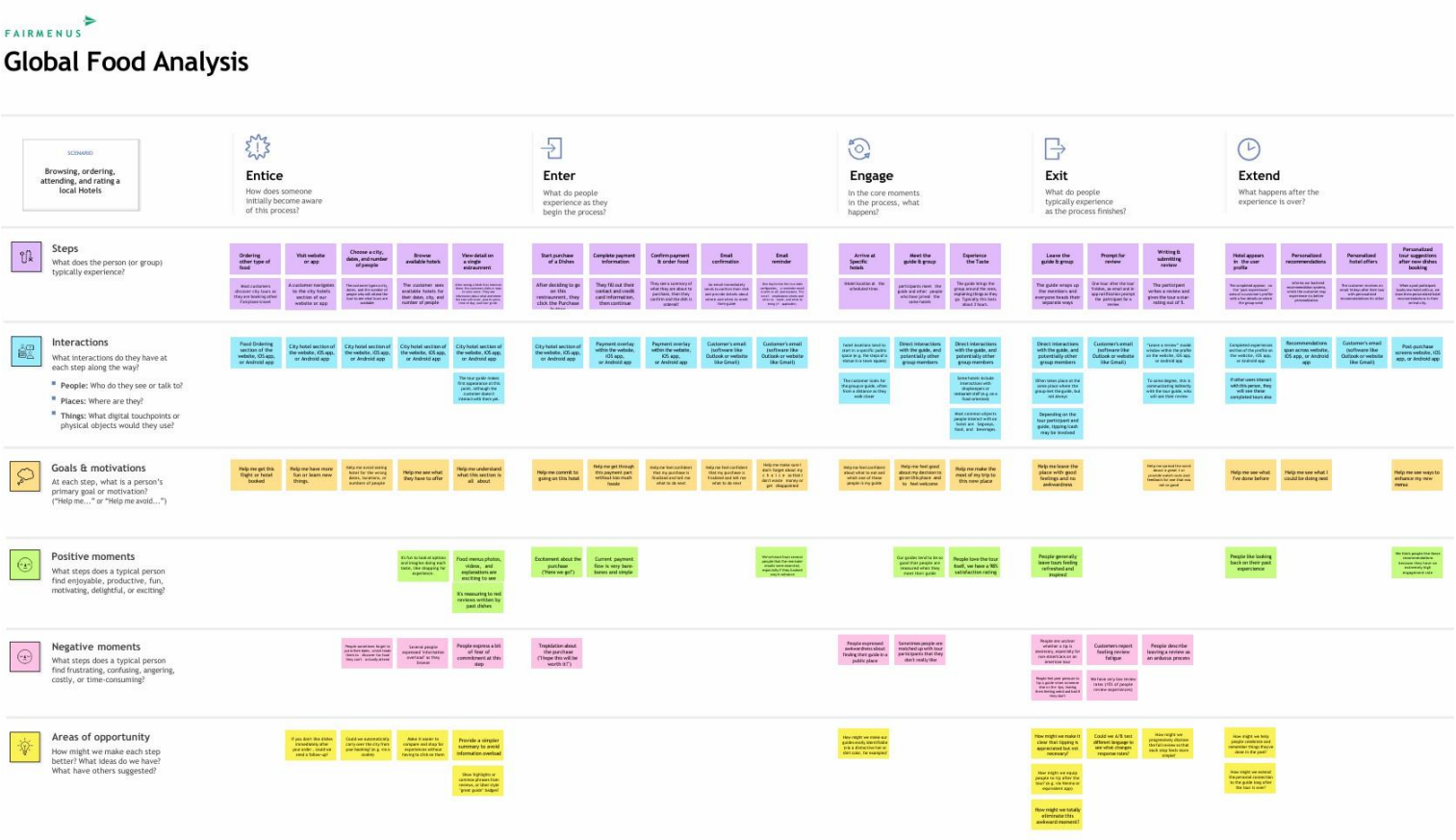
TIP



3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map:

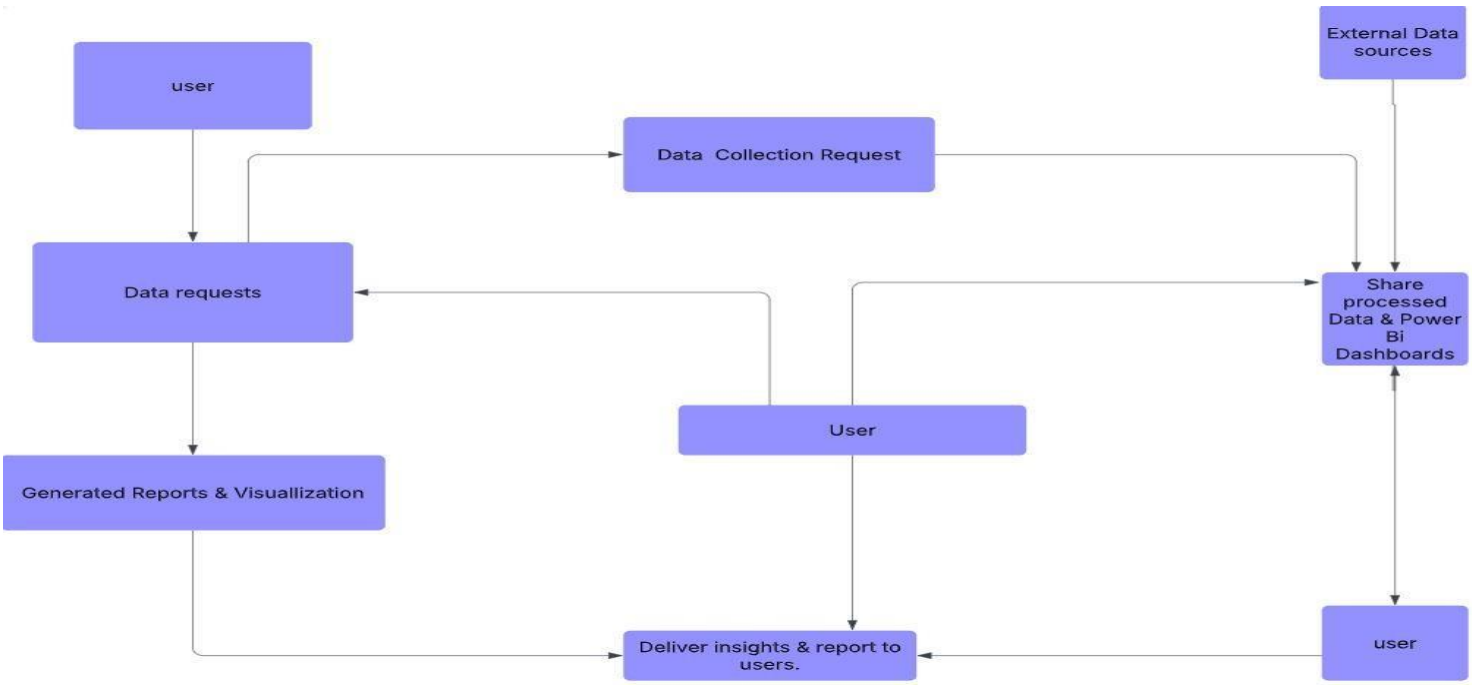
Identifies key stakeholders and their interactions with the system. Includes farmers, agronomists, supply chain managers, and policymakers.



3.2 Solution Requirement:

- Real-time data collection from sensors.
- Predictive analytics for crop yield forecasting.
- Efficient irrigation management using IoT.
- Supply chain transparency with blockchain integration.

3.3 Data Flow Diagram:



3.4 Technology Stack:

- Power BI
- SQL/Azure
- DAX(Power BI)
- Power BI Service

4. PROJECT DESIGN

4.1 Problem Solution Fit:

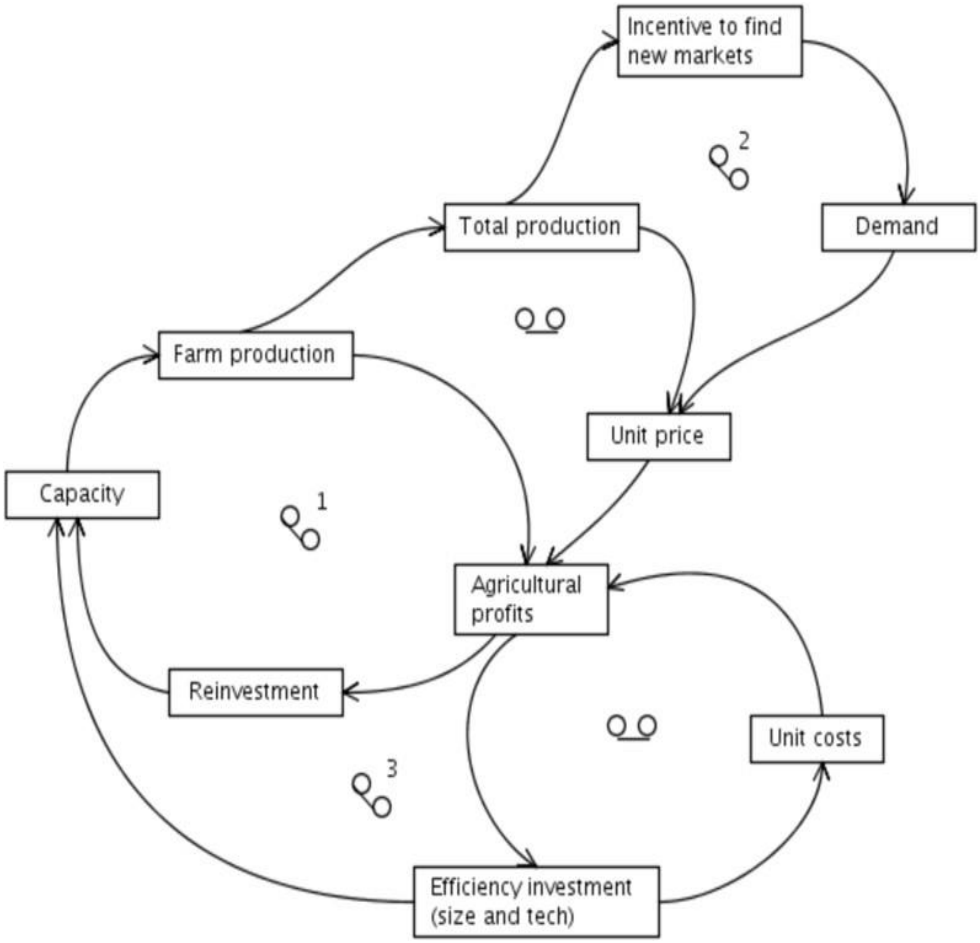
The system aligns with the need for efficient resource management and enhanced agricultural productivity.

4.2 Proposed Solution:

A comprehensive system that monitors soil moisture, climate conditions, and crop health using IoT and AI. Predictive analytics will forecast yields and suggest optimal resource allocation.

4.3 Solution Architecture:

A multi-layered architecture that includes data acquisition, data processing, analytics, and dashboard visualization.



5. PROJECT PLANNING & SCHEDULING

Phase 1: Requirements Gathering and Analysis
Phase 2: System Design and Architecture
Phase 3: Development and Integration
Phase 4: Testing and Validation
Phase 5: Deployment and Maintenance

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	5	7 Days	11 Feb 2025	17Feb 2025	5	17Feb 2025
Sprint-2	6	7 Days	18 Feb 2025	25 Feb 2025	6	25 Feb 2025
Sprint-3	9	7 Days	25 Feb 2025	2 Mar 2025	9	2 Mar 2025
Sprint-4	7	7 Days	5 Mar 2025	11 Mar 2025	7	11 Mar 2025

6. FUNCTIONAL AND PERFORMANCE TESTING

Project Development Phase
Model Performance Test

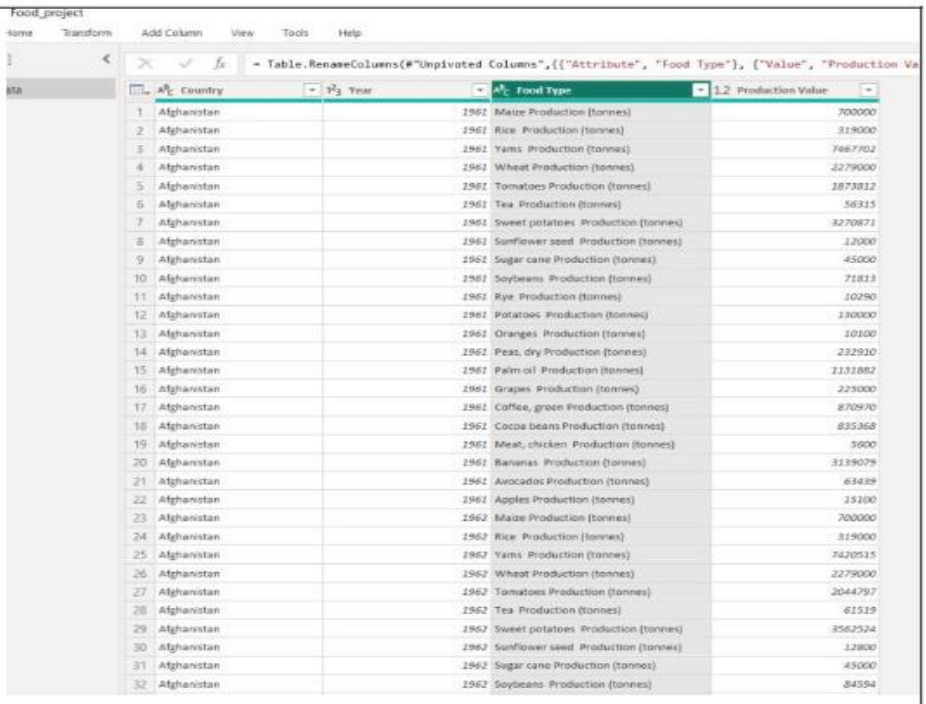
Date	10 February 2025
Team ID	PNT2025TMID02533
Project Name	Global Food Production trends and Analysis:A Comprehensive Study from 1961 to 2023 Using Power BI
Maximum Marks	

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values

1.	Data Rendered	The dataset has **11,912 entries** with **24 columns**.
		Columns include:
		• **Entity** (Country or region)
		• **Year** (1961 to 2023)
		• Production quantities for various crops and food products, such as:
		  ○ **Maize, Rice, Wheat, Tomatoes, Tea, Sweet potatoes, Sunflower seeds**
		  ○ **Sugar cane, Soybeans, Rye, Potatoes, Oranges, Peas**
		  ○ **Palm oil, Grapes, Coffee, Cocoa beans, Chicken meat, Bananas, Avocados, Apples**

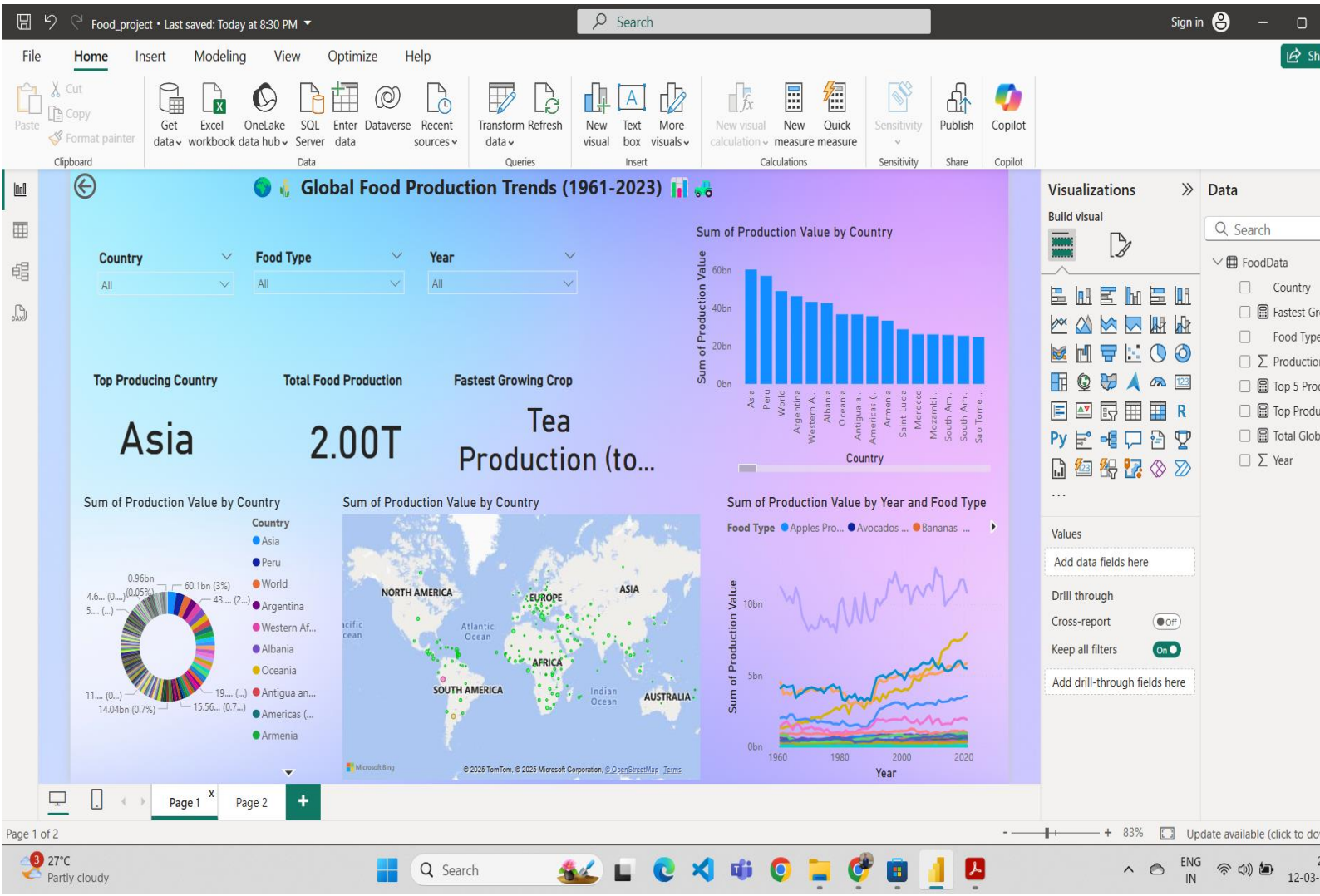
2.	Data Preprocessing	
3.	Utilization of Data Filters	Top 7 Production Values Bottom 7 Production Vlaues
		Top 10 Production value by year
4.	DAX Queries Used	1.Top producing Country = VAR TopCountry =TOPN(1, SUMMARIZE(Data, Data[Entity], "TotalProduction", SUM(Data[Production Value])), [TotalProduction], DESC) RETURN CONCATENATEX(TopCountry, Data[Entity], ", ") 2. TOP 5 countries = VAR Topcountries= TOPN(5, SUMMARIZE(Data.

5.	Dashboard design	

7. RESULTS

7.1 Output:

Report:



8. ADVANTAGES & DISADVANTAGES

8.1 Advantages:

- Reduces food wastage through accurate forecasting
- Enhances crop productivity using AI-driven insights
- Improves decision-making with data-driven analytics

8.2 Disadvantages:

- High initial cost for IoT device setup
- Potential resistance to new technology adoption

9. CONCLUSION

The proposed solution addresses global food production challenges by integrating modern technologies for precision agriculture and supply chain optimization. The system provides valuable insights, reduces wastage, and enhances overall productivity.

Power BI's interactive dashboards enable data-driven decisions, enhancing productivity and sustainability while empowering stakeholders to address agricultural challenges proactively

10. FUTURE SCOPE

1. **Real-Time Monitoring:** Utilize Power BI dashboards to monitor crop health, water usage, and supply chain efficiency in real time.

2. **Predictive Analytics:** Integrate AI and machine learning models to forecast yields, climate patterns, and resource optimization.

3. **Data Integration:** Combine data from IoT sensors, weather forecasts, and agricultural databases for comprehensive analysis.

4. **Customized Dashboards:** Create tailored visualizations for farmers, policymakers, and supply chain managers.

5. **Sustainability Tracking:** Monitor environmental impacts and resource utilization to promote sustainable practices.

11. APPENDIX