

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

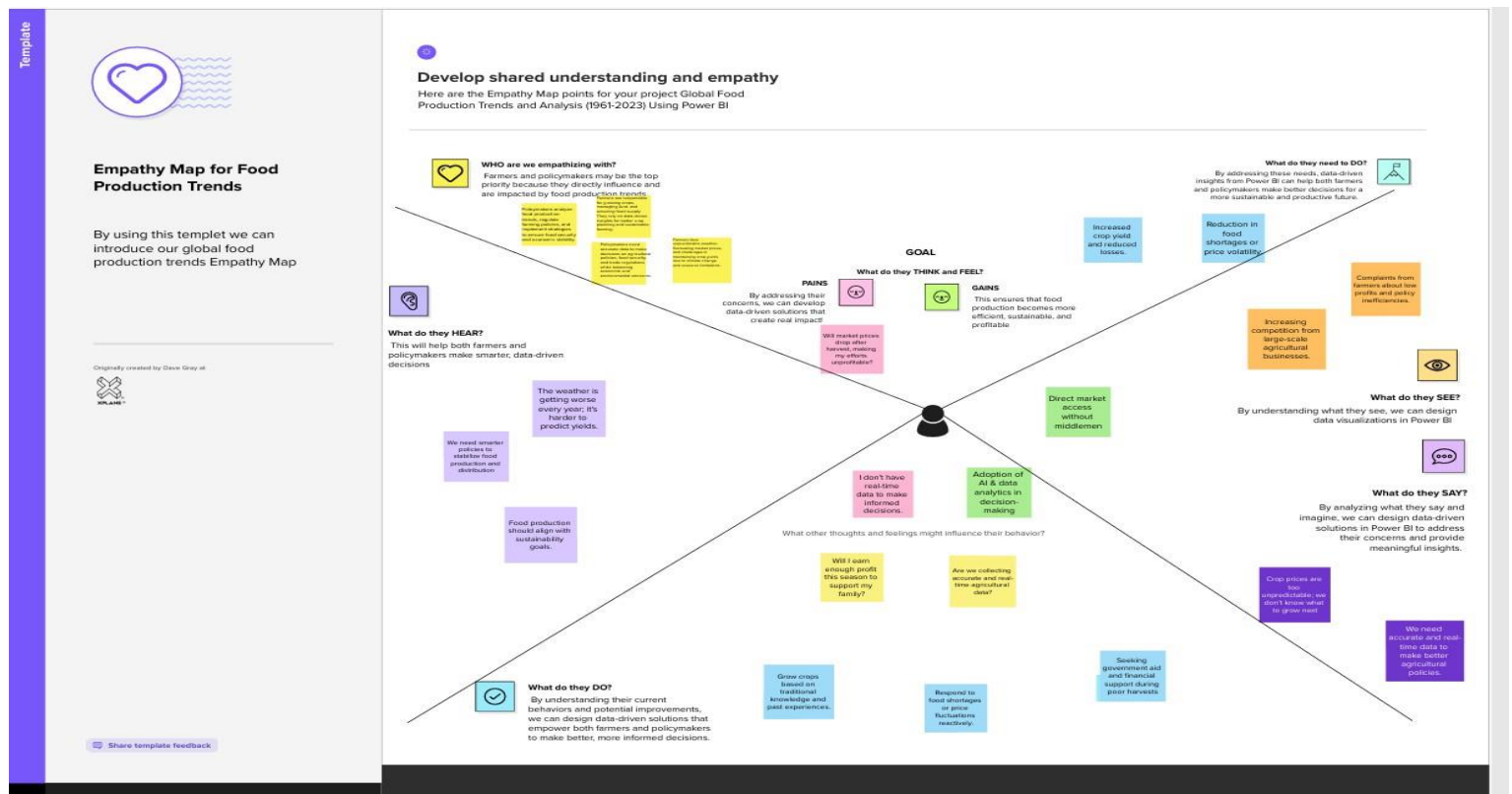
2.1 Problem Statement:

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:

Template



Global Food Production Trends - Brainstorming

By using this templet we can introduce our global food production trends brainstorming concept

10 minutes to prepare

1 hour to collaborate

2-3 people recommended

➔

Before you collaborate

Before Collaborating on this session , we done little bit preparation like reviewing the key concepts , familiarize ourselves with the tools we'll be using, and understand the objectives will help us to get the most relevant experience . A little bit preparation goes a long long way in making our learning skills smoother and more productive

10 minutes

A

Team gathering

There are three team members in a team, where one is going to lead the project, another one is going to design and develop suitable visualization and third one is going to provide insights into data sources and trends.

B

Set the goal

The primary goal of this project is to develop a Power BI solution that accurately predicts global food availability and trends using real-time data. To archive a primary objectives by integrating ,cleaning ,preprocessing the data

C

Learn how to use the facilitation tools

Ensure every team member contributes ideas and insights. Structure the session with clear steps: idea generation ,grouping, and prioritization.

Open article ➔

1

Define your problem statement

How might we leverage data visualization to uncover critical insights from global food production trends and identify key factors influencing food security and sustainability?"

5 minutes

PROBLEM

How might we develop a Power BI solution to accurately predict global food availability and trends using real-time data?

Key rules of brainstorming

To run an smooth and productive session

Stay in topic.


Defer judgment.

Go for volume.

Encourage wild ideas.

Listen to others.

If possible, be visual.



Global Food Production Trends - Brainstorming

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Open article ➔

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3

Brainstorm

Following are some ideas which describes our project objectives.

10 minutes

Satvashil Bhosale

Sumit Ohugare

Chaitanya Tambe & Lalita Chadana

Brainstorming ideas

Brainstorming ideas

Brainstorming ideas

Brainstorming ideas

Brainstorming ideas

Brainstorming ideas

Brainstorming ideas

Brainstorming ideas

Brainstorming ideas

4

Group Ideas

Here are ideas which are shared by every group member and the clustering is done group for each brainstorming.

10 minutes

Cluster No 1:

Cluster No 2:

Group Of Similar Clusters

Sustainable Farming

Climate change impact on crop yields

Most produced food items over the decades

Sustainable and food security challenges

Top food-producing countries and regions

Reducing Food Wastage

Effects of economic policies on food production

Climate change impact on crop yields

Top food-producing countries and regions

Reducing Food Wastage

Most produced food items over the decades

Climate change impact on crop yields

Organic Farming by using natural fertilizers

Effects of economic policies on food production

Climate change impact on crop yields

Top food-producing countries and regions

Reducing Food Wastage

Most produced food items over the decades

Climate change impact on crop yields

5

Priorities

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

10 minutes

Importance

Feasibility

Sustainable Farming

Top food-producing countries and regions

Reducing Food Wastage

Most produced food items over the decades

Climate change impact on crop yields

Organic Farming by using natural fertilizers

Effects of economic policies on food production

Climate change impact on crop yields

Sustainable and food security challenges

Effects of economic policies on food production

Climate change impact on crop yields



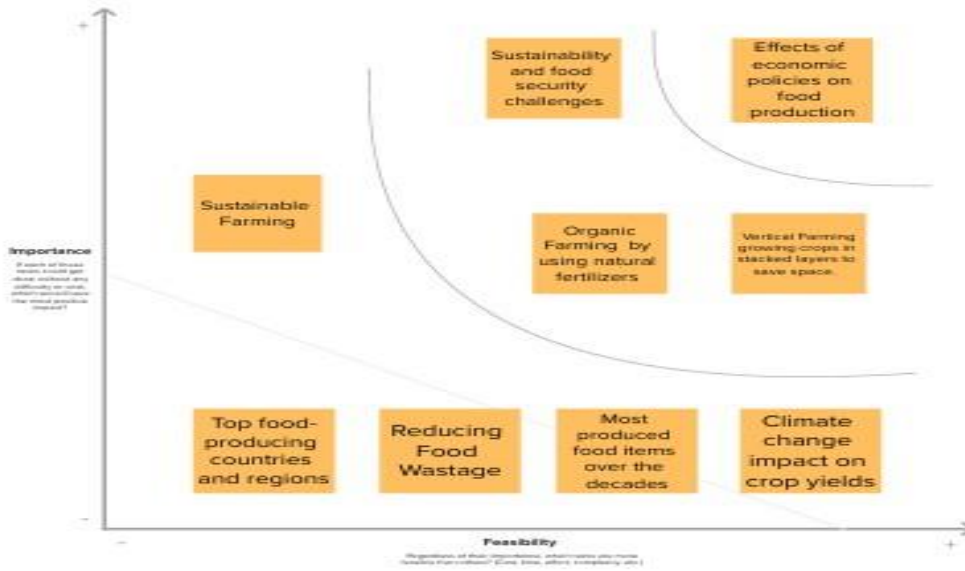
Prioritize

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

20 years later

TIP

Remember to think about the impact of your ideas on the environment. This is a key factor in determining the feasibility of your ideas. Think about the impact of your ideas on the environment. This is a key factor in determining the feasibility of your ideas.

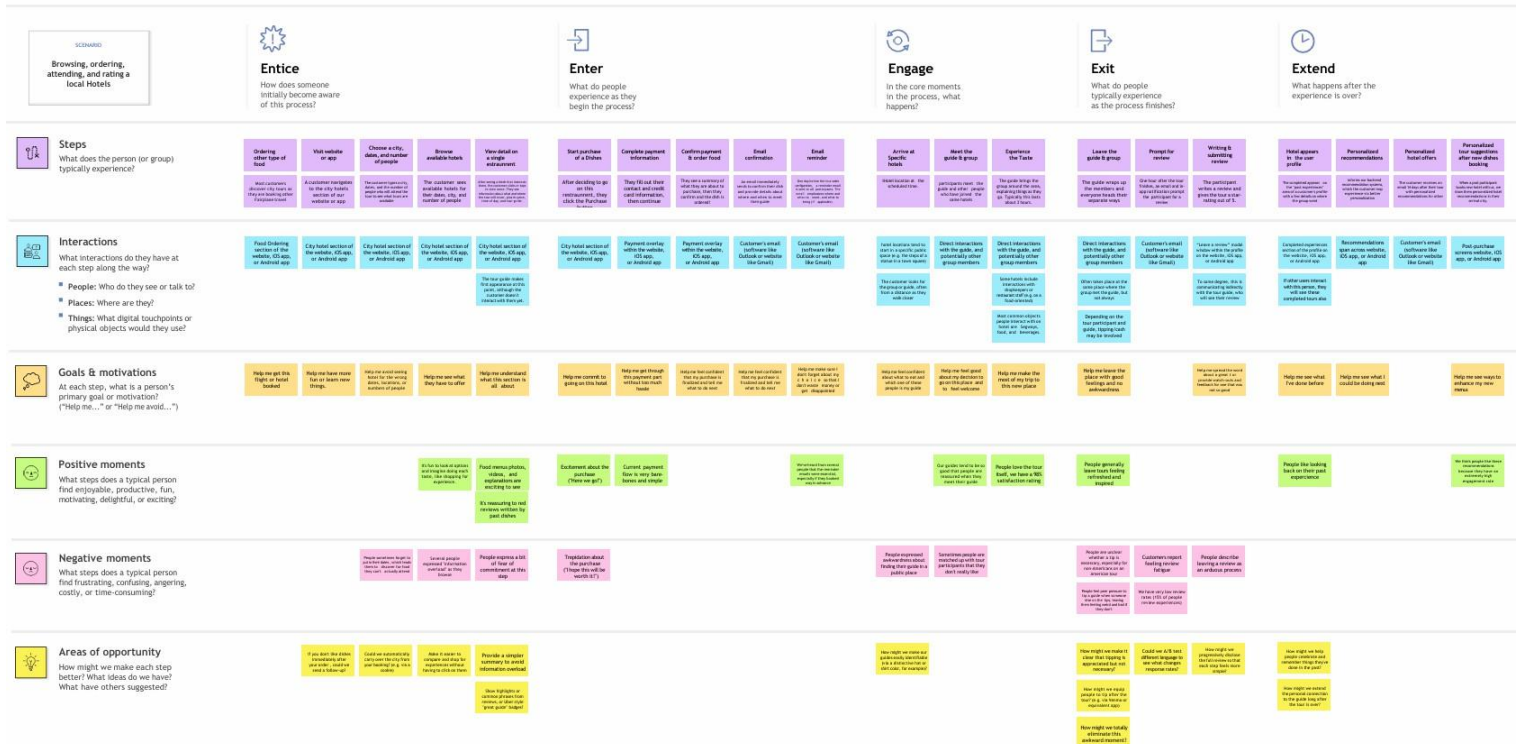


3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map:

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

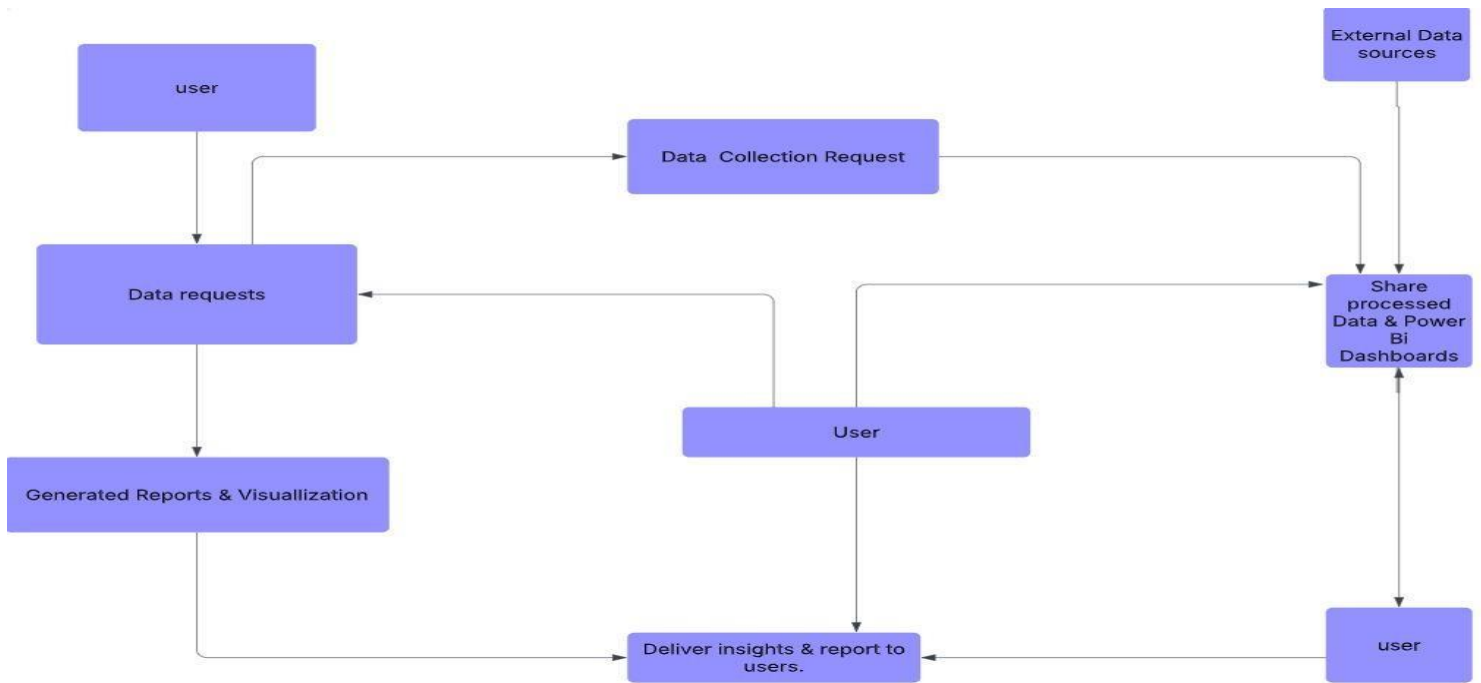
Global Food Analysis



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:

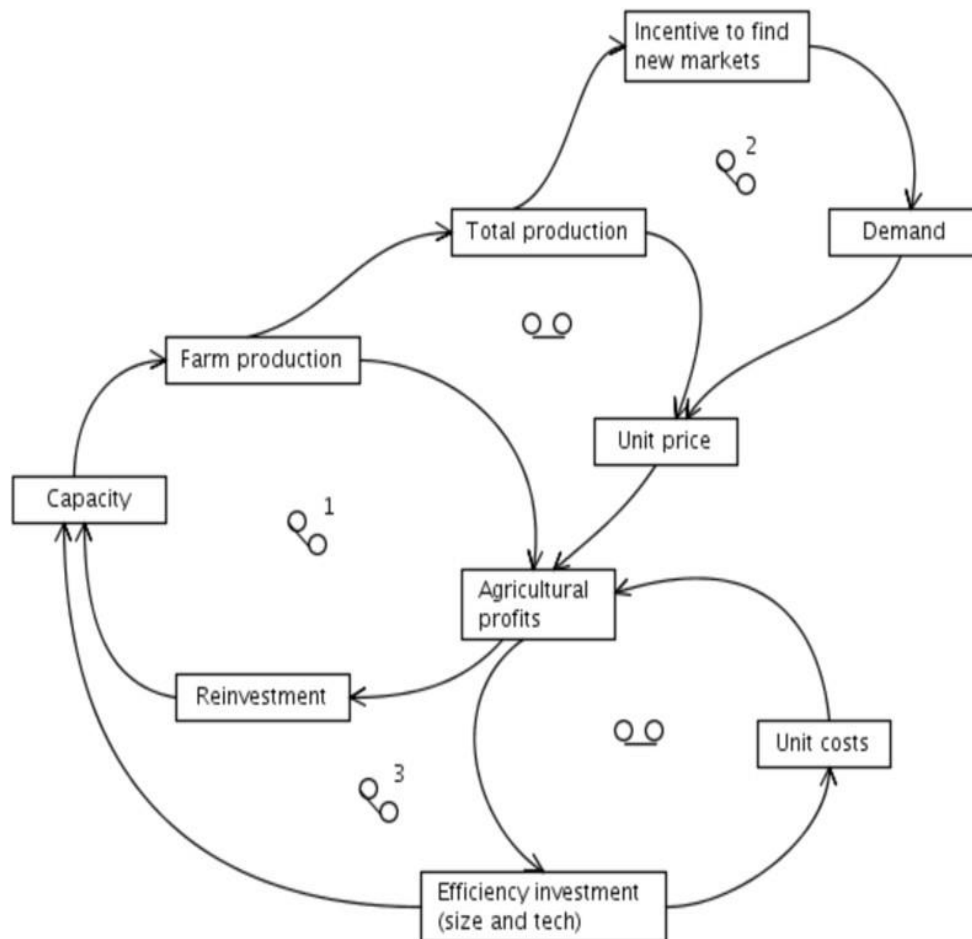
The system aligns with the need for efficient resource management and enhanced agricultural productivity.

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

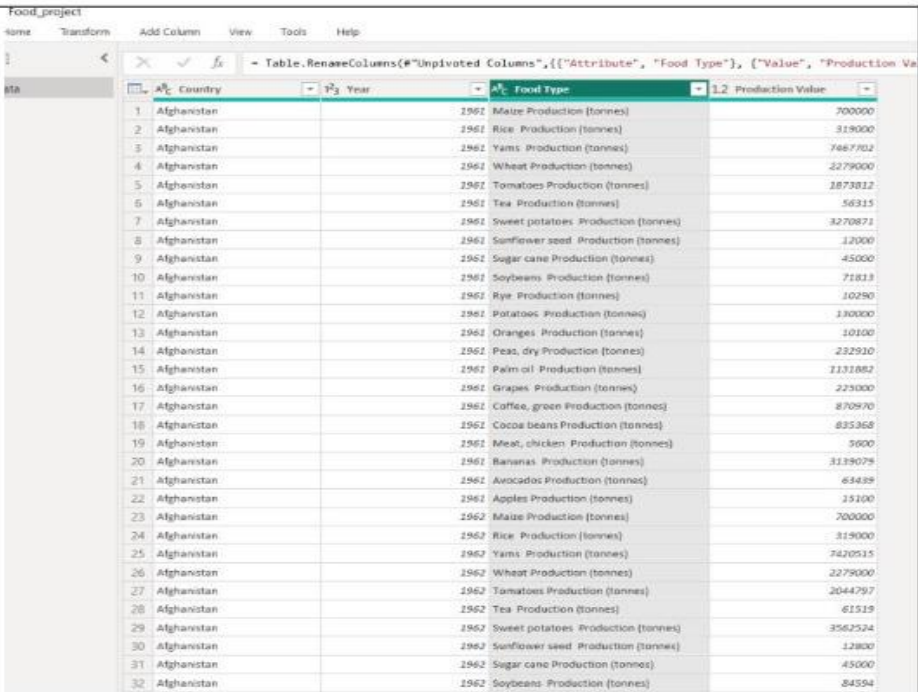
Project Development Phase Model Performance Test

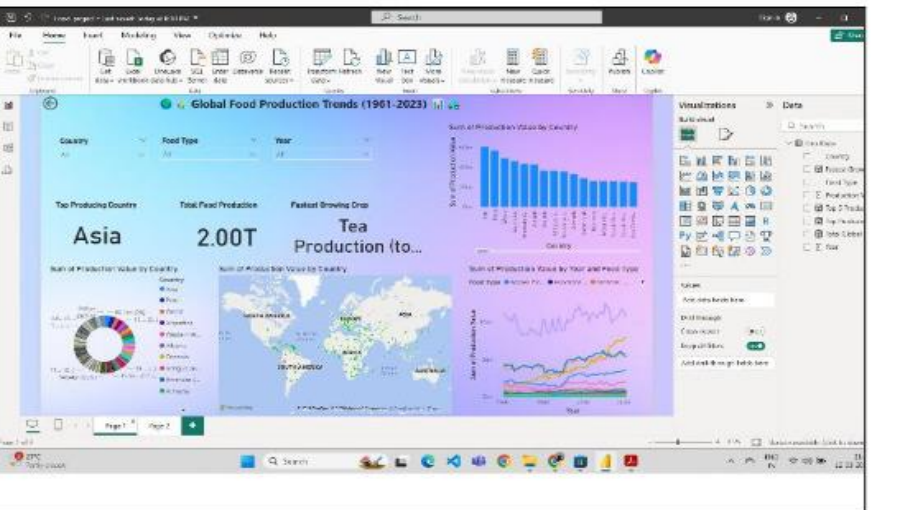
Date	10 February 2025
Team ID	PNT2025TMID02533
Project Name	Global Food Production trends and Analysis:A Comprehensive Study from 1961 to 2023 Using Power BI
Maximum Marks	

Model Performance Testing:

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

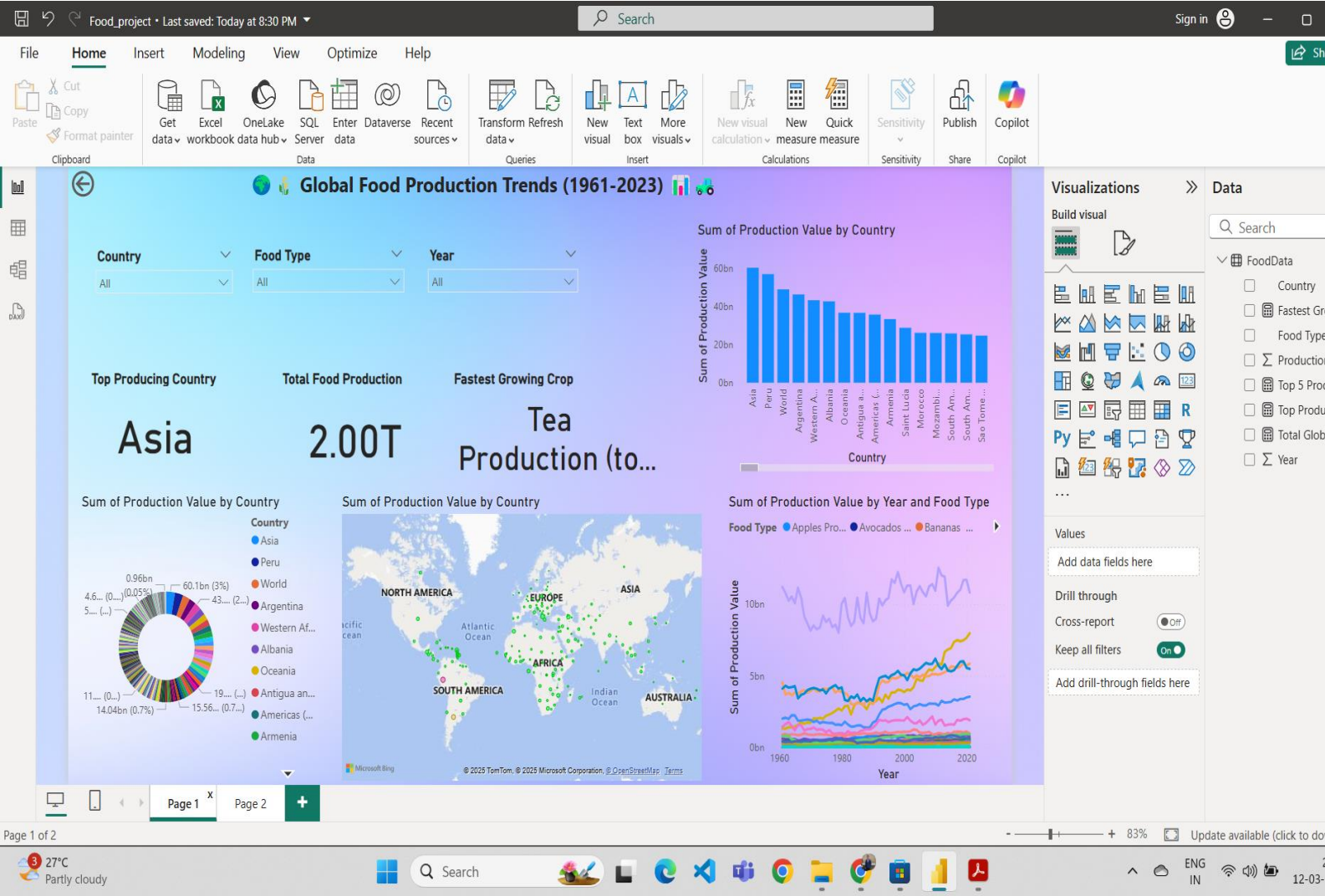
S.No	Parameter	Screenshot / Values
1.	Data Rendered	The dataset has 11,912 entries with 24 columns . Columns include: <ul style="list-style-type: none">• Entity (Country or region)• Year (1961 to 2023)• Production quantities for various crops and food products, such as:<ul style="list-style-type: none">○ 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	<p>Top 7 Production Values</p> <p>Bottom 7 Production Values</p>
		Top 10 Production value by year
4.	DAX Queries Used	<p>1.Top producing Country = VAR TopCountry =TOPN(1, SUMMARIZE(Data, Data[Entity], "TotalProduction", SUM(Data[Production Value])), [TotalProduction], DESC) RETURN CONCATENATEX(TopCountry, Data[Entity], ", ")</p> <p>2. TOP 5 countries = VAR Topcountries= TOPN(5, SUMMARIZE(Data.</p>

5.	Dashboard design	
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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

1. Github link:

<https://github.com/coder-sattu/Food-Production-Project-.git>

2. Dataset link :

https://drive.google.com/file/d/1rY2wsV6A5o7GxdOzdP7dRpKPQ7on9XM-/view?usp=drive_link

3. Demo link:

<https://drive.google.com/file/d/15K75q3VQQQfq2OBqdn3oXC6k9r3J5y-S/view?usp=drivesdk>