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

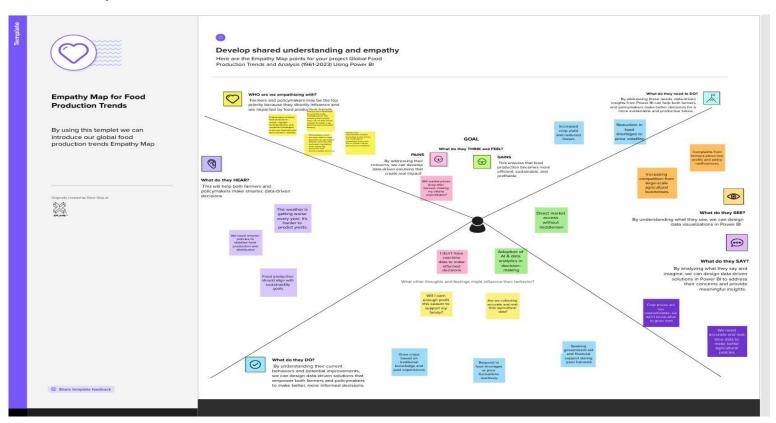
2.1 Problem Statement:

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:





Global Food Production Trends -Brainstorming

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

() 10 minutes to prepare

I hour to collaborate

2-3 people recommended



Before you collaborate

Before Collaborating on this session, we title 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 wayin making our learning skills smoother and more productive

(1) 10 minutes

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.

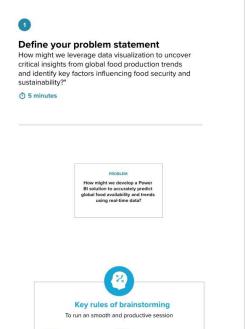
B Set the goal

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 →



Encourage wild ideas. C Listen to others.

If possible, be visual.

Stay in topic.

Defer judgment. Go for volume.

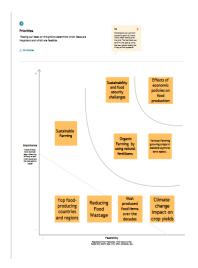


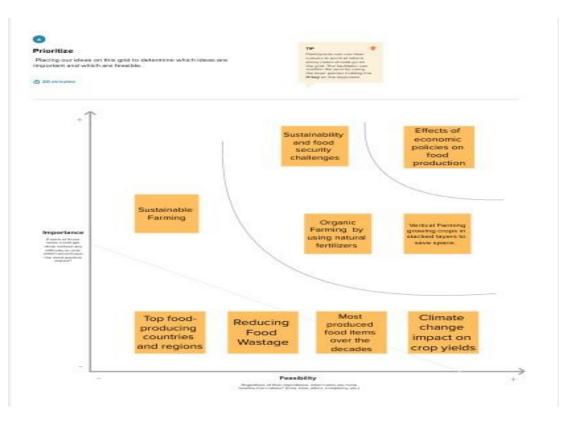












3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map:

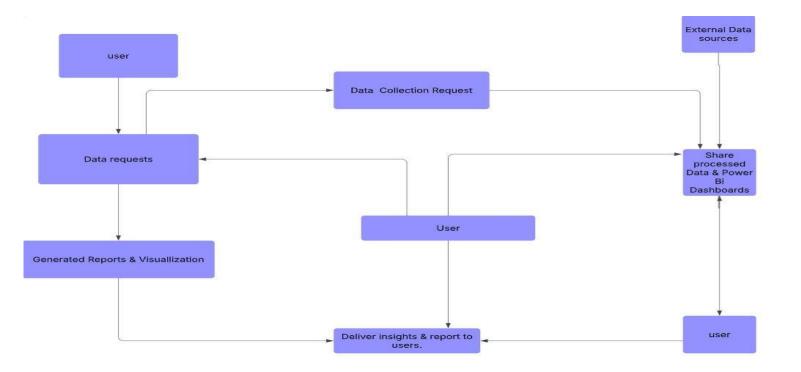
Identifies key stakeholders and their interactions with the system. Includes farmers, agronomists, supply chain managers, and policymakers.



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:

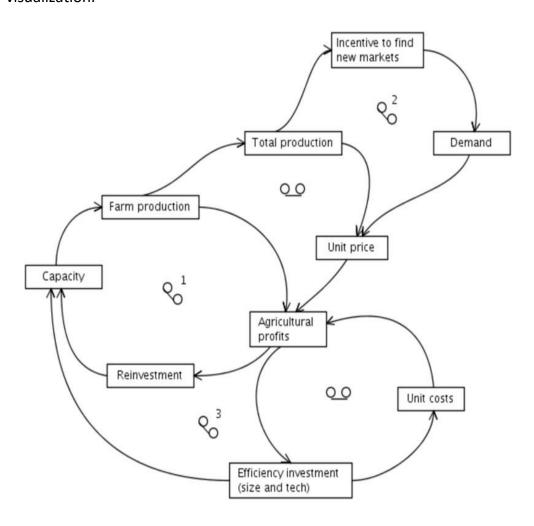
The system aligns with the need for efficient resource management and enhanced agricultural productivity.

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

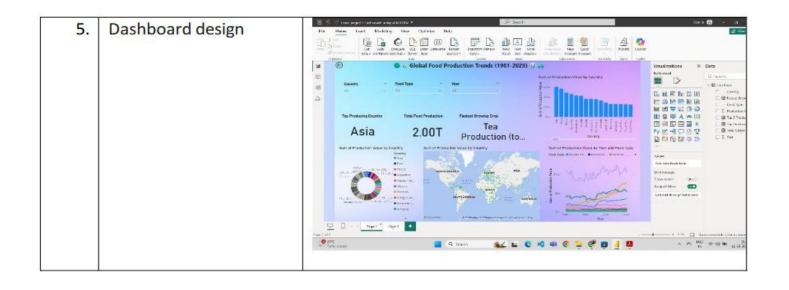
Date	10 February 2025
Team ID	PNT2025TMID02533
Project Name	Global Food Production trends and Analysis:A Comprehensive Study from 1961 to 2023 Using Power BI
Maximum Marks	

Model Performance Testing:

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

Parameter	Screenshot / Values
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

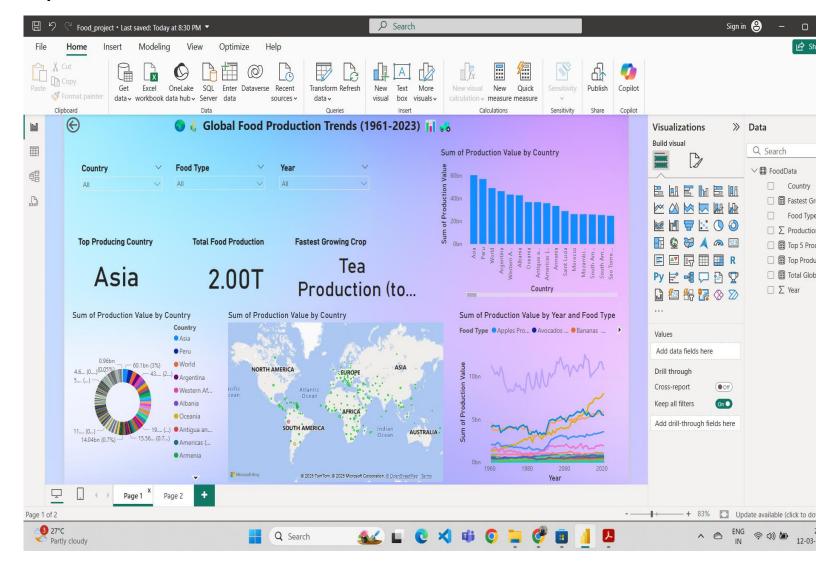
	Data Preprocessing	1					
		X V fs - Table.RenameColumns(#"Unpivoted Columns",{{"Attribute", "Food Type"}, ("Value", "Production					
		sta	The Aft Country	* 1 ² 3 Year		Production Value -	
			1 Afghanistan		2962 Matte Production (tonnes)	700000	
			2 Afghanistan		1961 Rice Production (tonnes)	319000	
			3 Afghanistan		2962 Yams Production (tonnes)	7467702	
			4 Afghanistan		1961 Wheat Production (tonnes)	2279000	
			5 Afghanistan		1961 Tomatoes Production (tonnes)	1873812	
			5 Alghanistan		1961 Tee Production (tonnes)	56315	
			7 Afghanistan		1961 Sweet potatoes Production (tonnes)	3270871	
			8 Afghanistan		1961 Sunflower seed Production (tonnes)	12000	
			9 Afghanistan		1951 Sugar cane Production (tonnes)	45000	
			10 Afghanistan		2967 Soybeans Production (tonnes) 2967 Rive Production (tonnes)	71813	
			11 Alghanistan				
			12 Afghanstan		2962 Potatoes Production (tonnes)	110000	
			13 Afghanistan		2962 Oranges Production (fornes)	10100	
			14 Afghanistan		1961 Peac, dry Production (tonnes)	232910	
- 1			15 Afghanistan		2967 Palm oil Production (tonnes)	1131882	
			16 Afghavistan 17 Afghavistan		1961 Grapes Production (tonnes) 1961 Coffee, green Production (tonnes)	225000 870970	
			16 Afghanistan		1962 Cocoa beans Production (tonnes)	870970	
			19 Afghanistan		2962 Cocoa beans Production (tonnes) 2962 Meat, chicken Production (fonnes)	5600	
			20 Afghanistan		2962 Bananas Production (tonnes)	3139079	
			21 Afghanistan		1961 Avocados Production (tonnes)	63439	
			22 Afghanistan		2962 Apples Production (formes)	15100	
			23 Afehanistan		2962 Maize Production (tonnes)	700000	
			24 Afghanistan		1962 Rice Production (formes)	319000	
			25 Alghanistan		1967 Yams Production (tonnes)	7420515	
			26 Atchanistan		1962 Wheat Production (tonnes)	2279000	
			27 Alghanistan		1962 Tomatoes Production (tonnes)	2044797	
- 1			28 Afghanistan		1962 Tea Production (tonnes)	61519	
			29 Alghanistan		1962 Sweet potatoes Production (tonnes)	3562524	
- 1			30 Afghanistan		1963 Sunflower seed Production (tonnes)	12900	
- 1			31 Afghanistan		2962 Sugar cane Production (tonnes)	45000	
			32 Atghanistan		1962 Soybeans Production (tonnes)	84594	
3.	Utilization of Data Filters	Top 7 Production Values Bottom 7 Production Vlaues Top 10 Production value by year					
4.	DAX Queries Used	 Top producing Country = VAR TopCountry = TOP SUMMARIZE(Data, Data[Entity], "TotalProduction SUM(Data[Production Value])), [TotalProduction], DESC) RETURN CONCATENATEX(TopCountry, Data[Entity], ", ") TOP 5 countries = VAR Topcountries= TOPN(5, SUMMARIZE(tion", on],	
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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 Al-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