Customer Problem Statement Template

WHO are we empathizing with?

FARMERS
AGRI-BUSINESS
CONSUMERS
GOVERNMENT
ENVIRONMENT AND SUSTAINABILITY

GOAL

What do they need to DO?

Stakeholders need to research more on food pro
duction trends

What do they HEAR?

FARMER:
News about changing food pricing and demand.
CONSUMER:
Retailers promoting new food trends.
AGRI-BUSINESS:
Import /Export restrictions are impacting supply chains and pricing.
GOVERNMENT:
Farmers Complaining about inadequate support and subsides.
ENVIRONMENT :
Farmers struggling to adopt eco-friendly practices due to costs.

THINK AND FEEL
FARMERS
How can i maximize my crop yield and profitability.
CONSUMER;
Is my food sourced ethically and sustainably?
AGRI-BUSINESS;
How do food production trends affect our pricing strategies?

PAINS

FARMER;
Climatic changes.
CONSUMER;
Price fluctuations due to inflation
GOVERNMENT;
Ensuring stable food supply for growing population.

GAINS

AGRI-BUSINESS;
Market expansion.
GOVERNMENT;
Government incentives and for farmers.
FARMER;
Organic and sustainable food production.

What do they SEE?

FARMERS:
Rising production costs for seeds, fertilizers and water.
CONSUMER:
Increased marketing of organic and sustainable food products.
AGRI-BUSINESS:
Rising consumer demand for ethically sourced products.
GOVERNMENT;
Rising demand for staple crops like wheat, rice and maize.

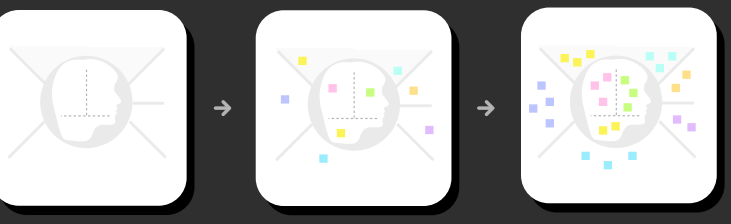
All stakeholders in food production—farmers, policymakers, businesses, researchers, and consumers—are driven by economic, environmental, technological, social, political, and cultural factors that shape their decisions and behaviors.

What do they SAY?

CONSUMER;
Support policies that promote responsible food productions.
ENVIRONMENT;
Conduct research for eco-friendly practices.

What do they DO?

FARMER;
Adopt Technology for efficient forming.
AGRI-BUSINESS;
Invest in sustainable sourcing and supplier.
GOVERNMENT;
Implement measures to stabilize food production.
ENVIRONEMTN;
Collaborate with farmers, government and agri-business for green solutions.



Template

Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

- **10 minutes** to prepare
- **1 hour** to collaborate
- **2-8 people** recommended

Need some inspiration?

See a finished version of this template to kickstart your work.

Open example →

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A. **Team gathering**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B. **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

C. **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

1 Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM

How can the challenges in food production be effectively solved

Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

2 Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP
You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Person 1

Person 2

Person 3

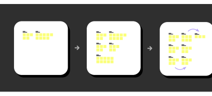
Person 4

3 Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

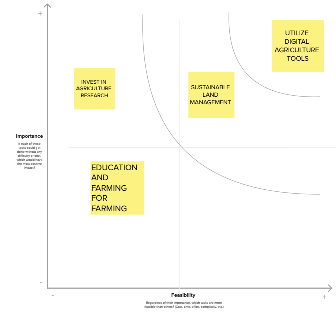


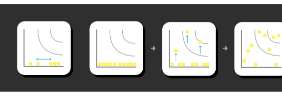
4 Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

TIP
Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the **H key** on the keyboard.





After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

A. **Share the mural**
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B. **Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.
Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

Scenario: [Existing experience through a product or service]	**Entice** How does someone become aware of this service?	**Enter** What do people experience as they begin the process?	**Engage** In the core moments in the process, what happens?	**Exit** What do people typically experience as the process finishes?	**Extend** What happens after the experience is over?
Experience steps What does the person (or people) at the center of this scenario typically experience in each step?	At this stage,stakeholders such as farmers, policymakers, business, and consumers become aware of global food production challenges.	once aware, stakeholders take their fast step to address the challenges. Farmers start adopting new farming techniques, such as precision agriculture and organic farmer.	Stakeholders actively engage with fodd production. Farmers: implement climate - resilient crops, manage supply chain disruption, and deal with unpredictable weather condition.	As the food production cycle reaches completion, stakeholders assess the results of their efforts.	Beyond the immediate process, stakeholders look long-term sustainability.
Interactions What interactions do they have at each step along the way? ▪ **People:** Who do they see or talk to? ▪ **Places:** Where are they? ▪ **Things:** What digital touchpoints or physical objects do they use?	Farmers: Exposure through agricultural training, news, and government policies.	Farmers: Adopting of new techniques (precision farming organic, methods)	Farmers: Implementing climate - resilient crops, managing risks .	Farmers: Harvest market sales, profits or losses.	Farmers: Learning from paste cycles, improving future startegies.
Goals & motivations At each step, what is a person's primary goal or motivation? ("Help me..." or "Help me avoid...")	Farmers: Increase productivity, reduce risks, ensure sustainability.	Famers: Access to technology, founding, better marketing prices.	Farmers: Higher yield, reduced risks, better profits.	Farmers: Profitability, reinvestment in farming.	Farmers: long term financial stability, improved technology.
Positive moments What steps does a typical person find enjoyable, productive, fun, motivating, delightful, or exciting?	Access to new solutions, government support, funding opportunities.	Adopting of better farming practices, regulatory support.	Success story, financial support, improved supply chains.	Stable production, profitable returns, reduced waste .	Continuous improvement, technological advancements.
Negative moments What steps does a typical person find frustrating, confusing, angering, costly, or time-consuming?	lack of awareness, misinformation, resistance to change.	High costs, lack of infrastructure, resistence to change.	Climate disasters, supply chain disruptions, regulatory challenges.	Food shortages, losses, policy failures.	Food crises, unpredictable climate impacts.
Areas of opportunity How might we make each step better? What ideas do we have? What have others suggested?	Stronger global campaigns, education, policy incentives.	Access to founding, better marketing linkages, education.	AI- driven farming, better disruption networks, policy incentives.	Efficient shortage, better price regulations, reducing food waste.	Stronger collaborations, data-driven decision-making.

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	31 January 2025
Team ID	LTVIP2025TMID21364
Project Name	GLOBAL FOOD PRODUCTION TRENDS AND ANALYSIS: A COMPREHENSIVE STUDY FROM 1961 TO 2023 USING POWER BI.
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data collection &Integration	Import datasets from various sources data must be CSV, Excel and SQL format.
FR-2	Data cleaning & processing	Handling missing values perform data transformation.
FR-3	Data visualization	Creating interactive dashboards in power B. Provide graphical insights, drill-down and filtering options.
FR-4	Trend Analysis	Identify production trends.
FR-5	Report creation	Generate automated reports with insights.
FR-6	Data export	Export reports in pdf, excel format

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Ensure user-friendly interface, easy navigation and interactive elements.
NFR-2	**Security**	Implement data encryption and access control.
NFR-3	**Reliability**	Ensure data accuracy and consistency auto mated data backups to prevent loss.
NFR-4	**Performance**	Optimize data queries for faster loading. Handling large datasets efficiently.
NFR-5	**Availability**	Ensure and support multiple users accessing simultaneously.
NFR-6	**Scalability**	Allow integration of new datasets without affecting performance adapts to increasing data volumes over time.

Project Design Phase-II
Data Flow Diagram & User Stories

Date	31 January 2025
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Maximum Marks	4 Marks

Data Flow Diagrams: A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

Data Collection

↓

Data Cleaning

↓

Data Visualization

↓

Trends Analysis

↓

Report Creation

↓

Data Export

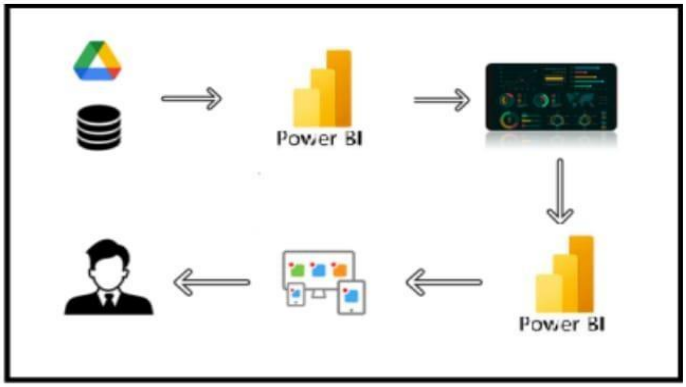
User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Data analyst	Data Collection	USN-1	As a data analyst, I want to collect food production data from reliable sources.	Data is collected from FAO, USDA, and other sources	high	Sprint-1
Data analyst	Data Cleaning	USN-2	As a data analyst, I want to clean the collected data by removing duplicates and handling missing values so that I can ensure consistency and accuracy in the dataset.	Duplicate records are removed.	medium	Sprint-1
Data analyst	Data Visualization	USN-3	As a data analyst, I want to visualize food production trends using Power BI so that I can generate meaningful insights.	Power BI dashboards include charts for wheat, rice, maize, and fruits.	high	Sprint-2
Farmer	Trend analysis	USN-4	As a farmer, I want to analyse the historical trends of food production so that I can predict plant growth.	Reports highlight production trends for key commodities.	high	Sprint-2
Agri-Business	Report Creation	USN-5	As an agri-business, I want to create reports for stable supply chain optimization.	I can create reports.	medium	Sprint-2
Researcher	Data Export	USN-6	As a researcher, want to export analysed data and reports so that I can share insights with stakeholders and use them for further research.	Users can export data in CSV, PDF, and Excel formats.	medium	Sprint-2

Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	31 January 3035
Team ID	LTVIP2025TMID21364
Project Name	GLOBAL FOOD PRODUCTION TRENDS AND ANALYSIS: A COMPREHENSIVE STUDY FROM 1961 TO 2023 USING POWER BI
Maximum Marks	4 Marks



Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Table-1: Components & Technologies:

S. No	Component	Description	Technology
1.	Data Collection	Gathering global food production data from sources.	Power BI, Excel
2.	Data Loading	Importing data into the analysis environment	Power BI
3.	Data Cleaning	Removing inconsistencies, handling missing values	Power BI
4.	Data Visualization	Creating charts, graphs, and dashboards.	Power BI
5.	Scenario-1	Sum of Rice Production (tonnes)	Power BI Visualization(KPI Card)
6.	Scenario-2	Sum of Wheat Production (tonnes)	Power BI Visualization(KPI Card)
7.	Scenario-3	Sum of Tea Production (tonnes)	Power BI Visualization(Gauge)
8.	Scenario-4	Sum of Coffee, Green Production (tonnes) by Entity	Power BI Visualization(Clustered Column Chart)
9.	Scenario-5	Sum of Wheat, Maize, and Rice Production (tonnes) by Year	Power BI Visualization(Stacked Area Chart)
10.	Scenario-6	Sum of Apples, Avocados, Bananas, and Oranges Production (tonnes) by Entity	Power BI Visualization(Ribbon Chart)
11.	Scenario-7	Sum of Maize Production (tonnes) by Year	Power BI Visualization(Donut Chart)
12.	Scenario-8	Sum of Grapes, Apples, Bananas, and Oranges Production (tonnes)	Power BI Visualization(funnel Chart)
13.	Report Creation	Generating interactive reports for insights	Power BI
14.	Data Export	Exporting processed data for further use	Power BI, Excel

Table-2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Scalability	Handles large datasets from 1961-2023	Power BI, Excel
2.	Interactivity	Users can interact with filters & drill-through's	Power BI(DAX, Power Query)
3.	performance	Optimized queries for faster analysis	Power BI(DAX)
4.	usability	User-friendly dashboards for stakeholders	Power BI
5.	Automation	Automated data refresh for updated insights.	Power BI

Problem-Solution fit canvas 2.0

Purpose / Vision

Define CS, fit into

1. CUSTOMER SEGMENT(S) — CS

Agricultural policymakers (governments, ministries of agriculture).

Agribusiness companies (food producers, suppliers, exporters).

Farmers & cooperatives (seeking data-driven decisions).

Researchers & analysts (academics, NGOs).

Investors & financial institutions (analysing market trends).

6. CUSTOMER CONSTRAINTS — CC

Limited access to real-time data.

Technical knowledge gap in using advanced analytics tools.

Budget constraints for adopting expensive BI solutions.

Dependence on outdated methods for decision-making.

5. AVAILABLE SOLUTIONS — AS

Traditional reports & statistics (FAO, World Bank, USDA).
Pros: Reliable data.
Cons: Static, lacks visualization, difficult to interpret.
Basic Excel analytics.
Pros: Easily accessible.
Cons: Limited insights, not scalable for large data.
Third-party market reports.
Pros: Industry-specific insights
Cons: Expensive, not customizable
Custom-built BI solutions.
Pros: Highly tailored, real-time insights.
Cons: High implementation costs.

Explore AS,

Focus on J&P, tap into BE, understand

2. JOBS-TO-BE-DONE / PROBLEMS — J&P

Data-driven decision-making in agriculture and food security.

Understanding production trends to forecast demand and supply.

Identifying major contributors to global food production.

Optimizing supply chains based on regional strengths.

Mitigating risks associated with climate change and trade policies

9. PROBLEM ROOT CAUSE — RC

Fragmented data sources make it hard to consolidate insights.

Lack of visual analytics hinders effective communication of trends Slow adoption of technology in traditional agricultural sectors.

7. BEHAVIOUR — BE

Directly related: Searching for agricultural trends, reading reports, attending policy meetings.

Indirectly related: Engaging in discussions on food security, collaborating with international agencies.

Focus on J&P, tap into BE, understand

Identify strong TR & EM

3. TRIGGERS — TR

Food security concerns due to climate change and population growth.

Government policies requiring better agricultural data.

Business expansion into emerging agricultural markets.

Sustainability initiatives in food production Fluctuations in global commodity prices.

4. EMOTIONS: BEFORE / AFTER — EM

. Emotions (Before & After)
Before: Uncertainty, lack of clarity, guesswork in planning
After: Confidence, data-backed strategies, informed decision-making.

10. YOUR SOLUTION — SL

A Power BI dashboard that provides:
Interactive visualizations for food production trends.
Comparative analysis of major commodities over time.
Regional insights on agricultural output
Forecasting capabilities to predict future trends.

8. CHANNELS of BEHAVIOUR — CH

Channels of Behaviour
Online: Government & agribusiness websites, data portals, webinars, LinkedIn groups.

8.2 OFFLINE

Offline: Conferences, trade shows, policy summits, research collaborations.

Extract online & offline CH of BE

AMALTAMA

Project Design Phase
Proposed Solution Template

Date	15 February 2025
Team ID	LTVIP2025TMID21364
Project Name	GLOBAL FOOD PRODUCTION TRENDS AND ANALYSIS: A COMPREHENSIVE STUDY FROM 1961 TO 2023 USING POWER BI
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	How can the challenges in food production be effectively solved. This project aims to provide a detailed agricultural commodities from 1961 to 2023, using Power BI for effective visualizations.
2.	Idea / Solution description	This project utilizes power BI to analyse and visualize global food production trends from 1961 to 2023. Interactive dashboards displaying historical and regional production trends. Comparative analysis of commodity production growth over time.
3.	Novelty / Uniqueness	A long-term (1961 to 2023) study integrating multiple data sources. Insights of future food production trends using statistical forecasting techniques.
4.	Social Impact / Customer Satisfaction	Farmers can make data-driven decisions to optimize food production. Government can use the insights to improve food security and sustainable agricultural practices.
5.	Business Model (Revenue Model)	Offering customized analysis for agri-business and government agencies.
6.	Scalability of the Solution	Can support country specific agricultural for government policy makers.

Project Design Phase
Solution Architecture

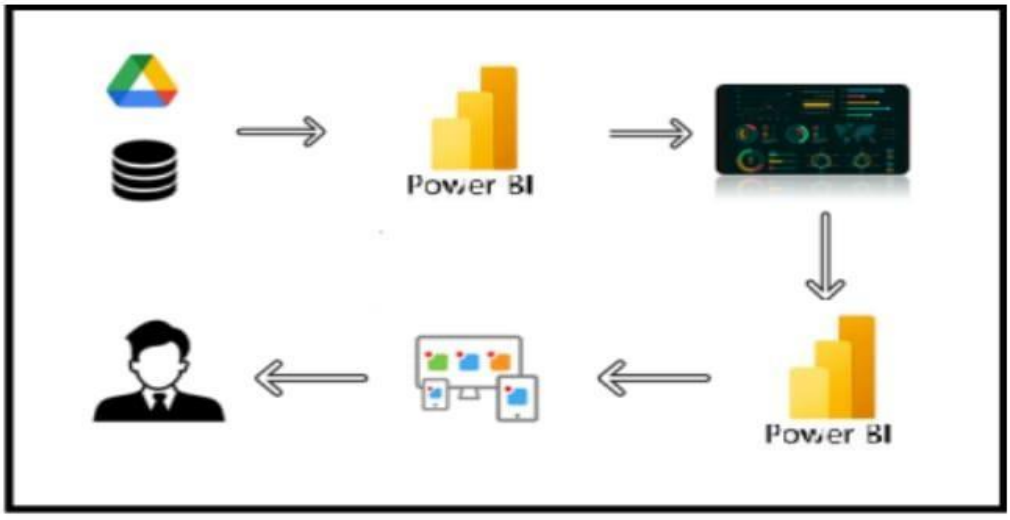
Date	15 February 2025
Team ID	LTVIP2025TMID21364
Project Name	GLOBAL FOOD PRODUCTION TRENDS AND ANALYSIS: A COMPREHENSIVE STUDY FROM 1961 TO 2023 USING POWER BI
Maximum Marks	4 Marks

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behaviour, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

Example - Solution Architecture Diagram:



Project Planning Phase

Project Planning Template (Product Backlog, Sprint Planning, Stories, Story points)

Date	15 February 2025
Team ID	LTVIP2025TMID21364
Project Name	GLOBAL FOOD PRODUCTION TRENDS AND ANALYSIS: A COMPREHENSIVE STUDY FROM 1961 TO 2023 USING POWER BI.
Maximum Marks	5 Marks

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	As a data analyst, I want to collect food production data from reliable sources.	2	High	V. Devi Prasanna
Sprint-1	Data Cleaning	USN-2	As a data analyst, I want to clean and preprocess the collected data so that it is free from errors and ready for visualization.	3	medium	G.parimala
Sprint-2	Data Visualization	USN-3	As a data analyst, I want to visualize food production trends using Power BI so that I can generate meaningful insights.	5	high	P.Mounika
Sprint-2	Trend analysis	USN-4	As a farmer, I want to analyse the historical trends of food production so that I can optimize crop production and yields	3	high	P.Mounika
Sprint-2	Report Creation	USN-5	As an agri-business, I want to create reports for stable supply chain optimization.	3	medium	Y.Rupavathi
Sprint-2	Data Export	USN-6	As an environment, I want to export analysed data so that I can use it for reporting and further studies.	2	low	Y.Rupavathi

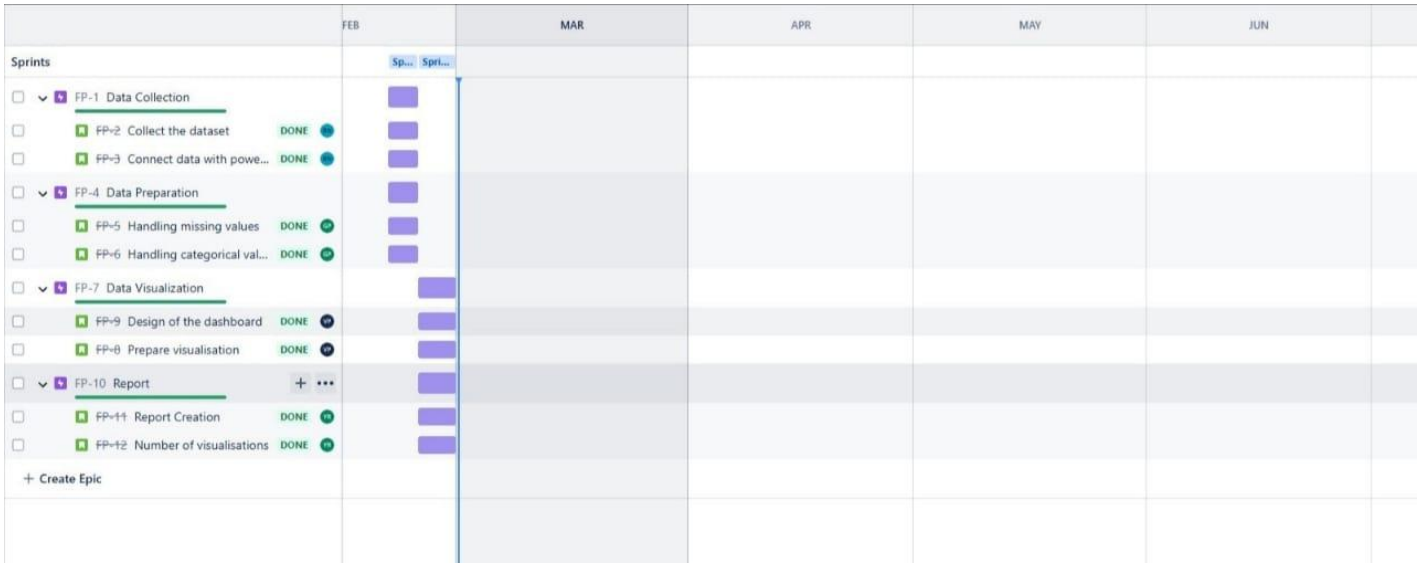
Project Tracker, Velocity & Burndown Chart: (4 Marks)

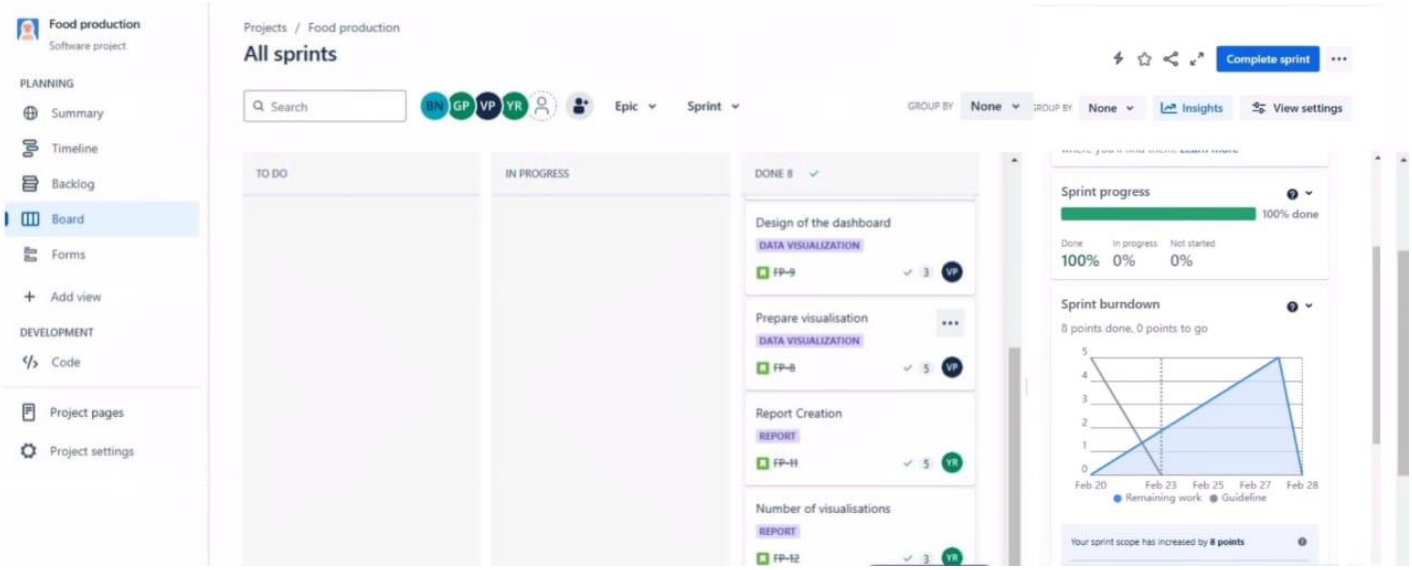
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	24	2 Days	20 FEB 2025	21FEB 2025	24	21 FEB 2025
Sprint-2	24	2 Days	22 FEB 2025	23 FEB 2025	24	23 FEB 2025
Sprint-3	24	2 Days	24 FEB 2025	26 FEB 2025	24	26 FEB 2025
Sprint-4	24	2 Days	27 FEB 2025	28 FEB 2025	24	28 FEB 2025

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let’s calculate the team’s average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$



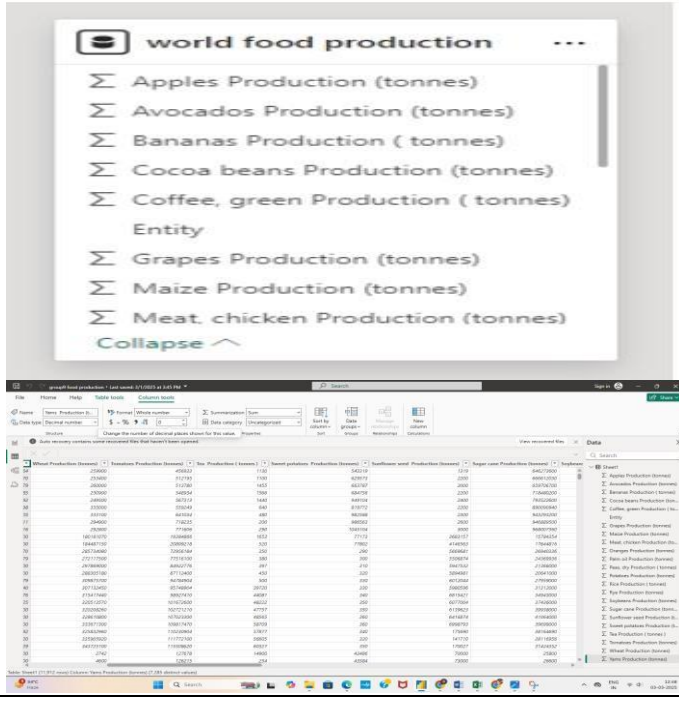

Food production
Software project
PLANNING
Summary
Timeline
Backlog
Board
Forms
Add view
DEVELOPMENT
Code
Project pages
Project settings
Projects / Food production
All sprints
Complete sprint
Search
Epic
Sprint
GROUP BY None
None
Insights
View settings
TO DO
IN PROGRESS
DONE 8
Design of the dashboard
DATA VISUALIZATION
FP-9
3
Prepare visualisation
DATA VISUALIZATION
FP-8
5
Report Creation
REPORT
FP-11
5
Number of visualisations
REPORT
FP-12
3
Sprint progress
100% done
Done
In progress
Not started
100%
0%
0%
Sprint burndown
8 points done, 0 points to go
5
4
3
2
1
0
Feb 20
Feb 23
Feb 25
Feb 27
Feb 28
Remaining work
Guideline
Your sprint scope has increased by 8 points

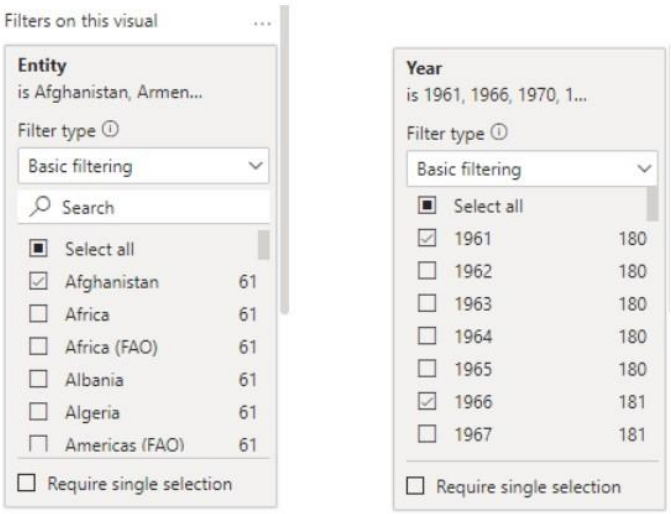
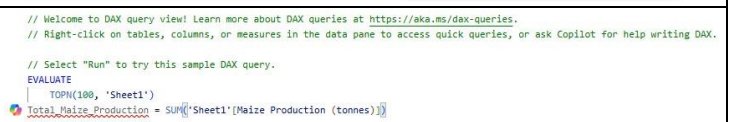
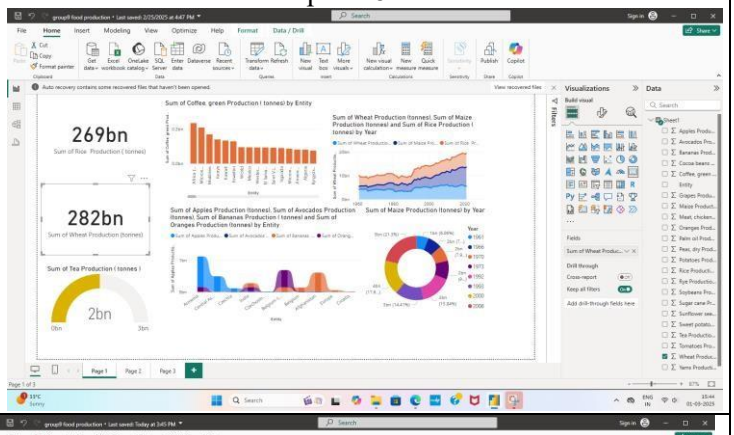
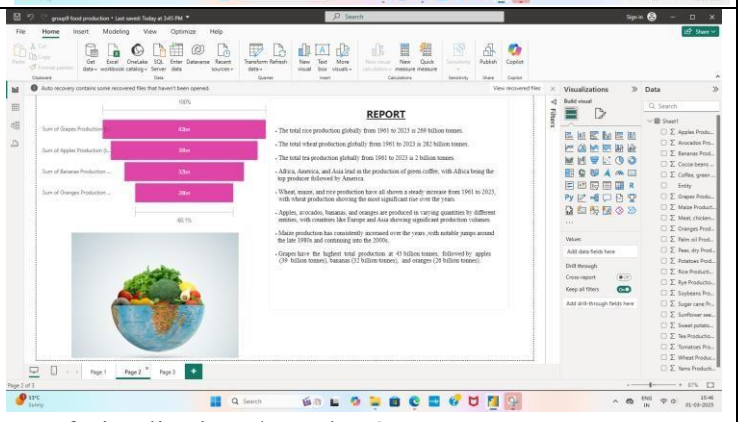
Project Development Phase
Model Performance Test

Date	10 February 2025
Team ID	LTVIP2025TMID21364
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	Data contains all the Meta information regarding the columns described in the CSV files Entity: Represents the country or region where the food production data is recorded. Code: A unique identifier or code for each entity (country or region). Year: The specific year for which the data is recorded, ranging from 1961 to 2023. Apples Production (tonnes): The total annual production of apples measured in tonnes. Avocados Production (tonnes): The total annual production of avocados measured in tonnes. Bananas Production (tonnes): The total annual production of bananas measured in tonnes. Coffee_green_Production (tonnes): The total annual production of green coffee measured in tonne Grapes Production (tonnes): The total annual production of grapes measured in tonnes. Maize Production (tonnes): The total annual production of maize measured in tonnes. Oranges Production (tonnes): The total annual production of oranges measured in tonnes. Rice Production (tonnes): The total annual production of rice measured in tonnes. Tea Production (tonnes): The total annual production of tea measured in tonnes. Wheat_Production (tonnes): The total annual production of wheat measured in tonnes.
2.	Data Preprocessing	

3.	Utilization of Data Filters	
4.	DAX Queries Used	
5.	Dashboard design	No of Visualizations / Graphs - 8 
6	Report Design	 No of Visualizations / Graphs -8

GLOBAL FOOD PRODUCTION TRENDS AND ANALYSIS: A COMPREHENSIVE STUDY FROM 1961 – 2023 USING POWER BI

Introduction:

ABC Company undertook a comprehensive study of global food production trends from 1961 to 2023, leveraging Power BI for insightful visualizations. The analysis encompassed key agricultural commodities, revealing that total rice production amounted to 269 billion tonnes, while wheat production reached 282 billion tonnes. The study highlighted that tea production stood at 2 billion tonnes, with Africa emerging as the leading producer of green coffee. Additionally, the research underscored a steady rise in wheat, maize, and rice production over the years, with wheat showing the most significant increase.

The project also explored the production volumes of apples, avocados, bananas, and oranges by different regions, identifying Europe and Asia as significant contributors. Maize production demonstrated consistent growth, particularly from the late 1980s onward. The study further indicated that grapes had the highest total production among fruits at 43 billion tonnes, followed by apples, bananas, and oranges. This comprehensive analysis equips ABC Company with valuable insights to better understand global food production trends, aiding strategic decision-making in the agricultural sector.

Scenario 1: Sum of Rice Production (tonnes)
This section prominently displays the total global rice production, amounting to 269 billion tonnes over the period from 1961 to 2023. It highlights the significant volume of rice produced, emphasizing its importance as a staple food crop worldwide.

Scenario 2: Sum of Wheat Production (tonnes)
Highlighting the global wheat production, this section shows a total of 282 billion tonnes produced between 1961 and 2023. This underscores wheat's crucial role in global food security and its widespread cultivation.

Scenario 3: Sum of Tea Production (tonnes)
This section shows a gauge chart illustrating the total tea production, amounting to 2 billion tonnes. The visual emphasizes the scale of tea production compared to other major crops.

Scenario 4: Sum of Coffee, Green Production (tonnes) by Entity
A bar chart depicting the distribution of green coffee production among various entities. Africa, Asia, and America are leading producers, reflecting regional contributions to global coffee supply.

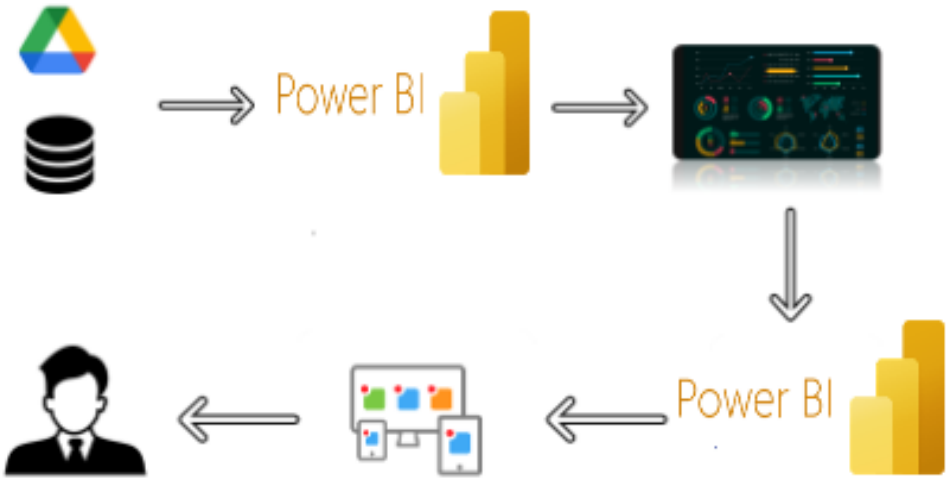
Scenario 5: Sum of Wheat, Maize, and Rice Production (tonnes) by Year an area chart showing the annual production trends of wheat, maize, and rice from 1961 to 2023. It highlights the growth trajectories and fluctuations of these essential crops over the years.

Scenario 6: Sum of Apples, Avocados, Bananas, and Oranges Production (tonnes) by Entity: This stacked bar chart illustrates the production volumes of apples, avocados, bananas, and oranges by different entities. It highlights the diverse contributions to global fruit production.

Scenario 7: Sum of Maize Production (tonnes) by Year. A donut chart depicting the yearly maize production distribution across different years. It shows how maize production has evolved, with specific years highlighted for their significant contributions.

Scenario 8: Sum of Grapes, Apples, Bananas, and Oranges Production (tonnes) : This bar chart compares the total production volumes of grapes (43 billion tonnes), apples (39 billion tonnes), bananas (32 billion tonnes), and oranges (26 billion tonnes). It provides a comparative view of the global production scales of these popular fruits.

Technical Architecture:



Project Flow

To accomplish this, we have to complete all the activities listed below,

- Data Collection
  - Collect the dataset,
  - Connect Data with Power BI
- Data Preparation
  - Prepare the Data for Visualization
- Data Visualizations
  - Visualizations
- Dashboard
  - Responsive and Design of Dashboard
- Report
  - Report Creation
- Performance Testing
  - Utilization of Data Filters
  - No. of Calculation fields
  - No. of Visualizations/Graphs
- Project Demonstration & Documentation
  - Record explanation Video for project end to end solution
  - Project Documentation-Step by step project development procedure

Milestone 1: Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Activity 1: Collect the dataset

Please use the link to download the dataset: https://www.kaggle.com/datasets/rafsunahmad/world-food-production

Activity 1.1: Understand the data

Data contains all the meta information regarding the columns described in the CSV files

Column Description of the Dataset:

- Entity: Represents the country or region where the food production data is recorded.
- Code: A unique identifier or code for each entity (country or region).
- Year: The specific year for which the data is recorded, ranging from 1961 to 2023.
- Apples_Production (tonnes): The total annual production of apples measured in tonnes.
- Avocados_Production (tonnes): The total annual production of avocados measured in tonnes.
- Bananas_Production (tonnes): The total annual production of bananas measured in tonnes.
- Coffee_green_Production (tonnes): The total annual production of green coffee measured in tonnes.
- Grapes_Production (tonnes): The total annual production of grapes measured in tonnes.
- Maize_Production (tonnes): The total annual production of maize measured in tonnes.
- Oranges_Production (tonnes): The total annual production of oranges measured in tonnes.
- Rice_Production (tonnes): The total annual production of rice measured in tonnes.
- Tea_Production (tonnes): The total annual production of tea measured in tonnes.
- Wheat_Production (tonnes): The total annual production of wheat measured in tonnes.

Milestone 2: Data Preparation

Data preparation is a critical phase in the data lifecycle, encompassing activities that transform raw data into a format suitable for analysis. This multifaceted process involves several steps including data cleaning, integration, transformation, and enrichment. Data cleaning involves identifying and rectifying errors, inconsistencies, and missing values within datasets to ensure accuracy and reliability.

Activity 1: Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for

creating visualizations to gain insights into the performance and efficiency. Since the data is already cleaned, we can move to visualization.

3.1: Data Loading :
https://drive.google.com/drive/folders/14LwKoPshQQSVwGWi2YVbZlk5pYoc-0p0

3.2 Data Cleaning:
https://drive.google.com/file/d/14_bZ8nF7lw7k-KAvhn8DfFJXdJtAS-el/view?usp=drivesdk

Milestone 3: Data Visualization

Data visualization: https://drive.google.com/file/d/156I6I231POdAeKkdB_EBz7O5jac-zjj9/view?usp=drivesdk

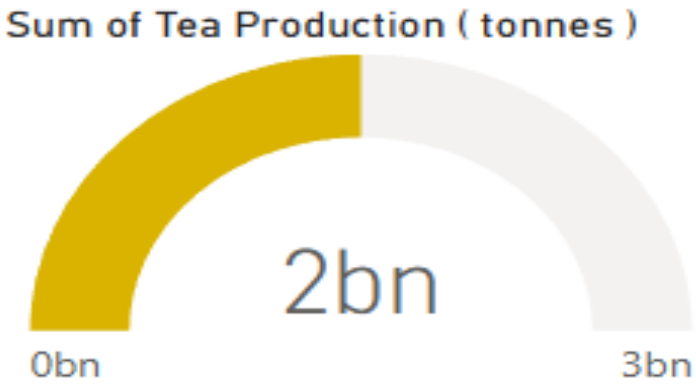
Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

World Food Production (1961-2023)

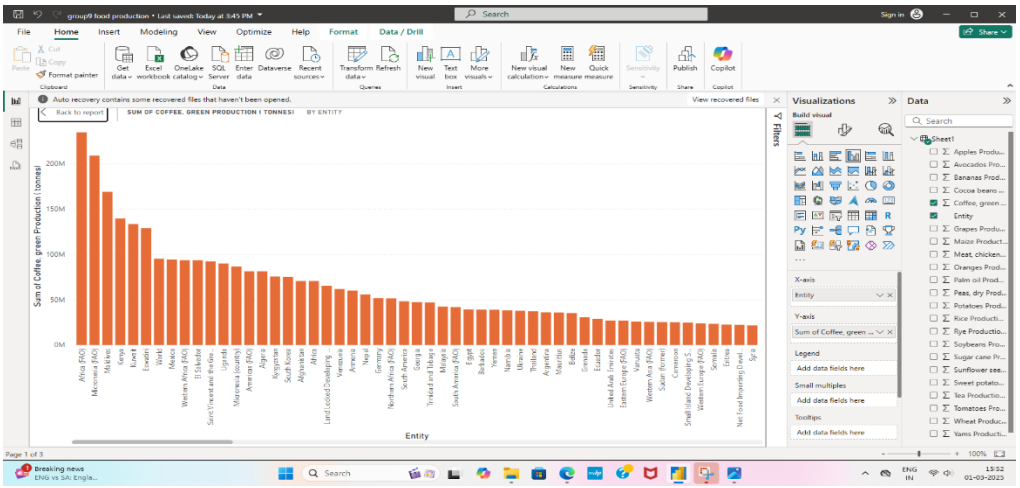
Activity 1.1: Sum of Rice Production (tonnes)

Activity 1.2: Sum of Wheat Production (tonnes)

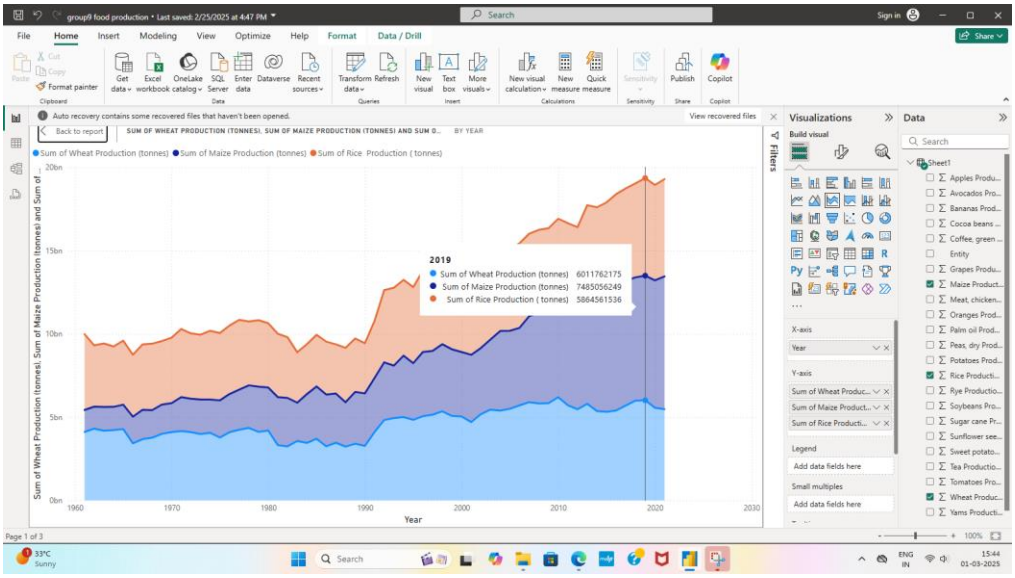
Activity 1.3: Sum of Tea Production (tonnes)



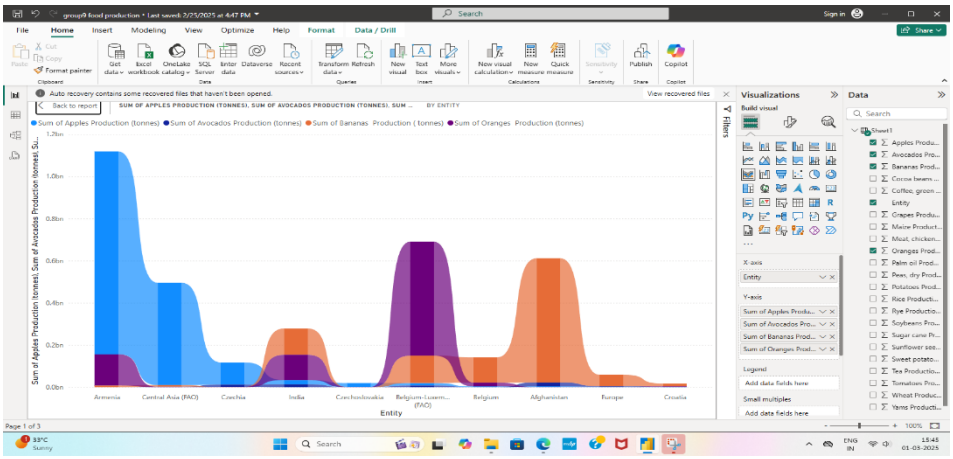
Activity 1.4: **Sum of Coffee, Green Production (tonnes) by Entity**



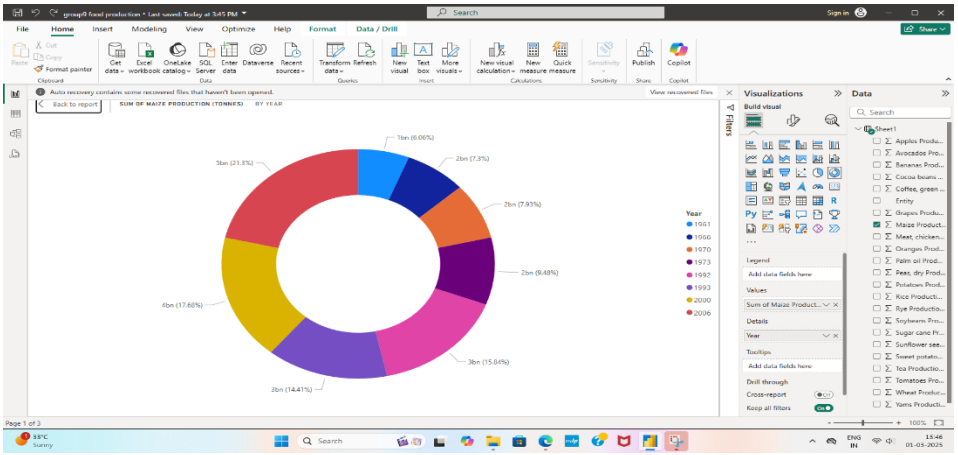
Activity 1.5: Sum of Wheat, Maize, and Rice Production (tonnes) by Year



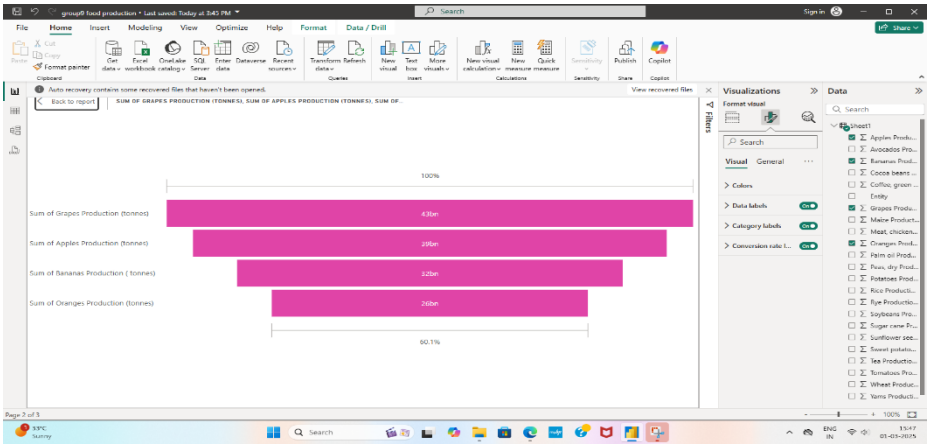
Activity 1.6: Sum of Apples, Avocados, Bananas, and Oranges Production (tonnes) by Entity



Activity 1.7: Sum of Maize Production (tonnes) by Year

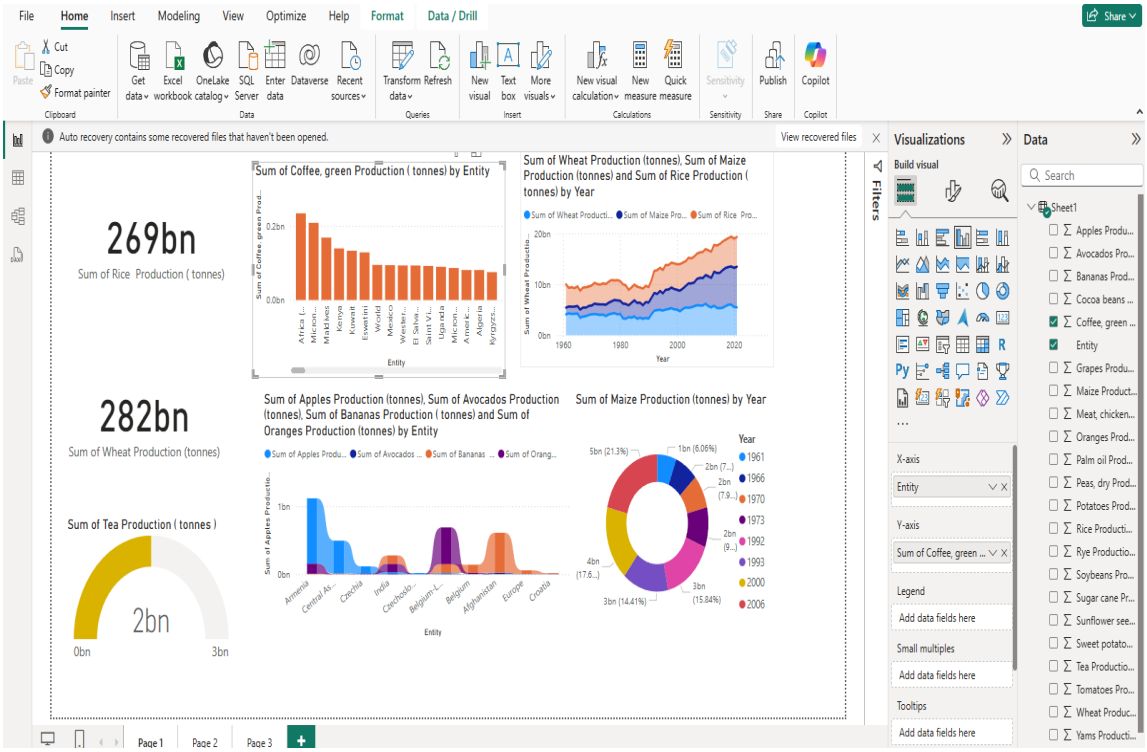


Activity 1.8: Sum of Grapes, Apples, Bananas, and Oranges Production (tonnes)



Milestone 4: Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.



Milestone 5: Report

A report is a comprehensive document that provides a detailed and structured account of data analysis, findings, and insights. It is typically used for in-depth analysis, documentation, and communication of

results. Reports are suitable for a diverse audience, including decision-makers, analysts, and stakeholders who need a comprehensive understanding of the data.

Design of Report

Data report: https://drive.google.com/file/d/14voB-l_yAgyBIunFl9cdFYNpPKf2tKEL/view?usp=drivesdk

Designing a report in Power BI involves connecting to data sources, creating visualizations like charts and graphs, customizing their appearance and interactivity, organizing them logically on the canvas, formatting elements for consistency and clarity, and optionally creating dashboards for a summarized view. Throughout the process, it's essential to consider the audience's needs and ensure the report effectively communicates insights from the data. Finally, iterate based on feedback to continually improve the report's design and usefulness.

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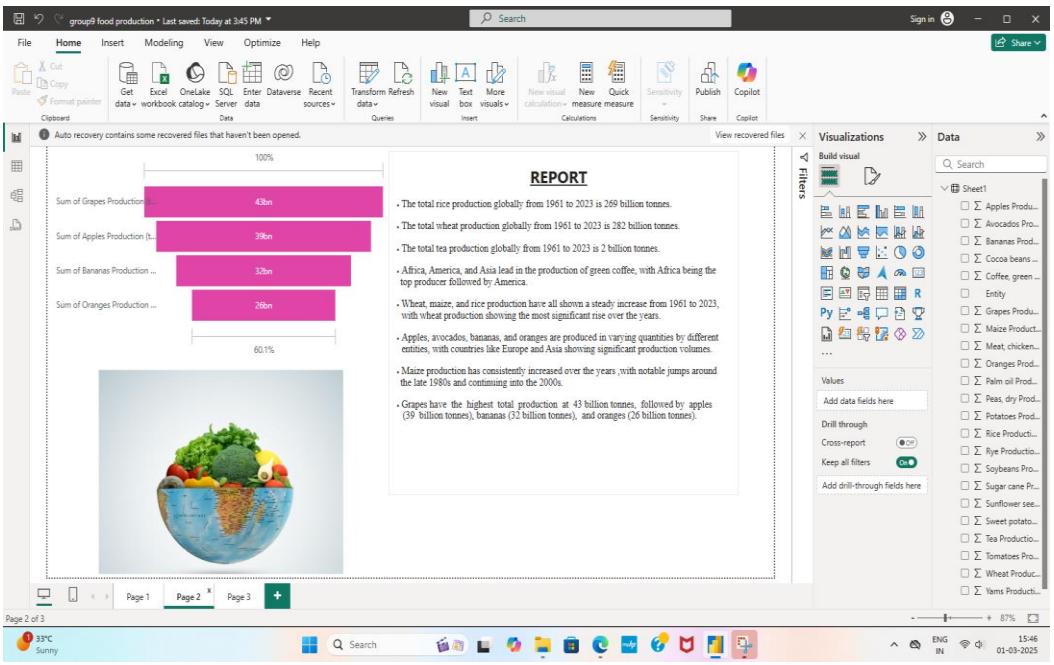
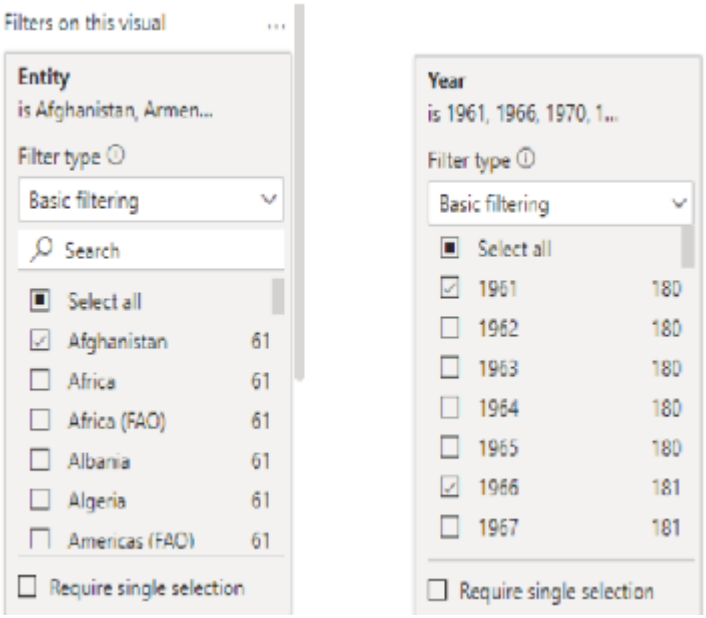


Milestone 6: Performance Testing

Amount of Data Loaded

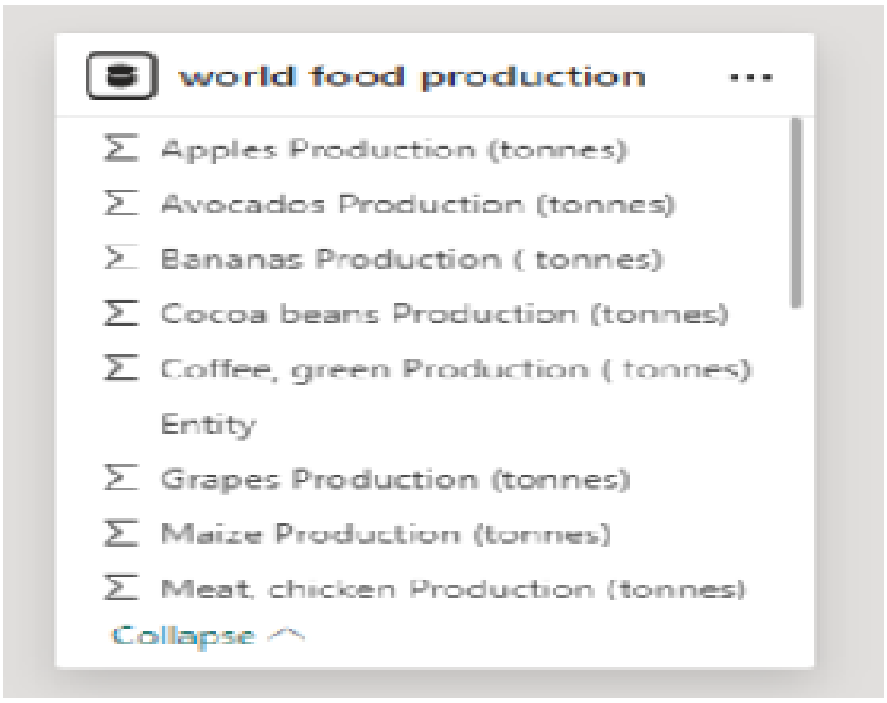
"Amount of Data Loaded" refers to the quantity or volume of data that has been imported, retrieved, or loaded into a system, software application, database, or any other data storage or processing environment. It's a measure of how much data has been successfully processed and made available for analysis, manipulation, or use within the system.



Utilization of Filters

"Utilization of Filters" refers to the application or use of filters within a system, software application, or data processing pipeline to selectively extract, manipulate, or analyse data based on specified criteria or conditions.

Activity 2.1: Selected “Country” as a Filter



Activity 2.2: No of Visualizations/ Graphs

- Sum of Rice Production (tonnes)
- Sum of Wheat Production (tonnes)
- Sum of Tea Production (tonnes)
- Sum of Coffee, Green Production (tonnes) by Entity
- Sum of Wheat Production (tonnes), Maize Production (tonnes), Rice Production (tonnes) by Year
- Sum of Apples, Avocados, Bananas, Oranges Production (tonnes) by Entity
- Sum of Maize Production (tonnes) by Year
- Sum of Grapes, Apples, Bananas, Oranges Production (tonnes)

Milestone 8: Project Demonstration & Documentation

Below mentioned deliverables to be submitted along with other deliverables

Activity 1: - Record explanation Video for the project's end-to-end solution

Activity 2: - Project Documentation-Step by step project development procedure

Create document as per the template provided