Customer Problem Statement Template

WHO are we empathizing with?

GOVERNMENT
FARMER
REASEACHER
AGRI-BUSINESS
CONSUMER

What do they need to DO?

STAKEHOLDERS NEED TO REASERCH MORE
D PRODUCTION TRENDS.

GOAL

THINK AND FEEL

FARMERS
We feel hopeful when new technologies and innovations are introduced.
CONSUMERS
We think sustainable food production is essential for protecting the environment.
GOVERNMENT
We think sustainable practices are key to preserving natural resources.
RESEARCHERS
We feel optimistic about the potential of genetic research to improve crop yields.

What do they HEAR?

FARMERS
New irrigation techniques can help conserve water and improve productivity.
AGRIBUSINESS
Technological advancements are critical for staying competitive
CONSUMERS
Reducing food waste can help lower costs and support sustainability.
GOVERNMENT
Farmers need more subsidies and support to manage rising costs.
RESEARCHERS
Water scarcity is becoming a critical issue for agriculture.

PAINS

FARMERS
Rising costs of seeds,fertilizers,and machinery.
CONSUMERS
Rising food price impacting household budgects.
RESEARCHERS
Greenhouse gas emissions from agricultural practices.

GAINS

AGRIBUSINESS
Better market access for organic and local product.
FORMERS
Technolgical innovation improving productivity.
CONSUMERS
Increased awareness and adoption of sustainable farming.5

What do they SEE?

FARMERS
We see soil and water resources degrading over time.
AGRIBUSINESS
We see new technologies like AI and automaton transforming production processes.
CONSUMERS
Growing global demand for plant based foods and sustainable practices.
GOVERNMENT
We see the need to ensure national food security and reduce dependency on imports.
RESEARCHERS
We see soil degradation and water scarcity as critical challenges for sustainable faeming.

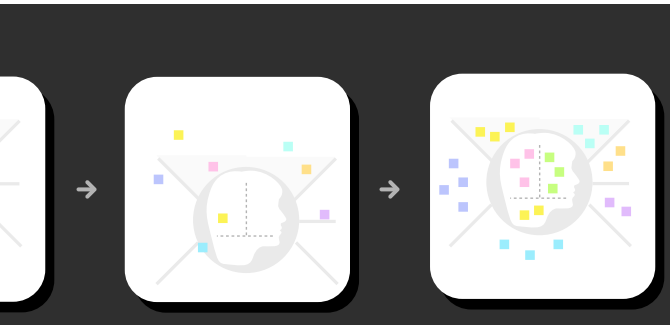
All stakeholders in food production—farmers, policymakers, businesses, researchers, and consumers—are driven by economic, environmental, technological, social, political, and cultural factors that shape their decisions and behaviors.

What do they SAY?

FARMERS
Access to better education and training world help improve our farming practices.
GOVERNMENT
Sustainable farming practices are essential for long term agricultural growth.

What do they DO?

FARMERS
Experiment with alternative crops based on demand trends.
AGRIBUSINESS
Develop data models to predict future agricultural output.
CONSUMERS
Choose brands that prioritize sustainability.



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

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

- **Team gathering**
  Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.
- **Set the goal**
  Think about the problem you'll be focusing on solving in the brainstorming session.
- **Learn how to use the facilitation tools**
  Use the Facilitation Superpowers to run a happy and productive session.

Open article →

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

Brainstorm

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

10 minutes

Group ideas

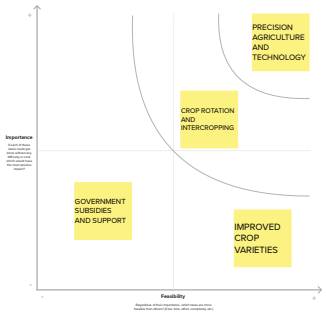
Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

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



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.

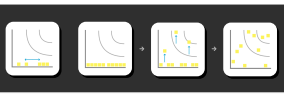
Quick add-ons

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

Need some inspiration?
See a finished version of this template to kickstart your work.
Open example →



Scenario:
[Existing experience through a product or service]

	Entice	Enter	Engage	Exit	Extend
	How does someone become aware of this service?	What do people experience as they begin the process?	In the core moments in the process, what happens?	What do people typically experience as the process finishes?	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?	farmers learn about new seeds,fertilizers,or government schemes through social media, agriculture officers or word-of-mouth.	farmers purchase seeds ,equipment and fertilizers ,apply for loans or subsidies.	farmers activatemoni for growth,and manage pests diseases and weather uncertainties.	farmers harvest and take product to market.	farmer reinvest earnings plan for the next season, or repay loans.
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?	engage with seed suppliers ,government extension officers and fellow farmars	deal with banksargo-dealers, and cooperative societies	consult agricultural experts use mobile apps for weather updates.	engage with traders, middleman, or government procurement programs.	financial advisaors agricultural cooperatives.
Goals & motivations At each step, what is a person's primary goal or motivation? ("Help me..." or "Help me avoid...")	seeds cost-effective high -yeild solutions for better prodoductivity	ensure a good start for the cropping season with quality input.	optimize yield through best practices.	maximize profits while minimizing post-harvest losses.	improve form productivity and financial stability.
Positive moments What steps does a typical person find enjoyable, productive, fun, motivating, delightful, or exciting?	finding a trusted supplier or government subsidy.	quick loan approvals discounts on bulk purchases.	good weather conditions,effective past control measures.	high market demand ,fair pricing.	successful reinvestment in better equipment or land.
Negative moments What steps does a typical person find frustrating, confusing, angering, costly, or time-consuming?	lack of clarity on new policies,misinformation about product effectiveness	high input costdelayed delivery of government subsidized product .	crop diseases ,unexpected weather events .	market price fluctuations, lack of storage facilities.	debtburden uncertainty about future market trends.
Areas of opportunity How might we make each step better? What ideas do we have? What have others suggested?	improve awareness campaigns though digital platforms and training programs	improve awareness campaings though digital plat form and training programs.	enhance access to climate smart agriculture solutions.	create price stabilization schemes, invest in cold storage solution.	proving financial literacy programs encourage saving and insurance adoption.

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

Date	31 January 2025
Team ID	LTVIP2025TMID21352
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	The system should be able to collect and integrate data from various sources.
FR-2	Data cleaning and processing	The system should be able to clean, transform, and process the collected data for analysis.
FR-3	Data visualization	The system should be able to visualize the data using various charts, graphs, and maps to illustrate trends and patterns.
FR-4	Inflation analysis	The system should be to perform trend analysis on the data identity patterns.
FR-5	Report Creation	Generate automated reports with insights.
FR-6	Data export	Export reports in PDF, Excel formats.

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Design an intuitive and user-friendly interface, with clear navigation and minimal cognitive load.
NFR-2	**Security**	Implement proper security measures to protect sensitive economic data.
NFR-3	**Reliability**	Ensure the dashboard provides accurate and reliable data with proper data validation.
NFR-4	**Performance**	Ensure the dashboard responds quickly to user interactions, with a maximum load time of 5 seconds.
NFR-5	**Availability**	Ensure and support multiple users accessing simultaneously.
NFR-6	**Scalability**	Ensure the dashboard can handle large datasets and scale up or down as needed to accommodate changing data volumes.

Project Design Phase-II
Data Flow Diagram & User Stories

Date	31 January 2025
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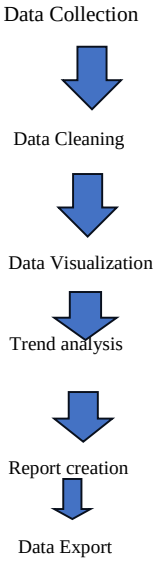
Maximum Marks	4 Marks

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.



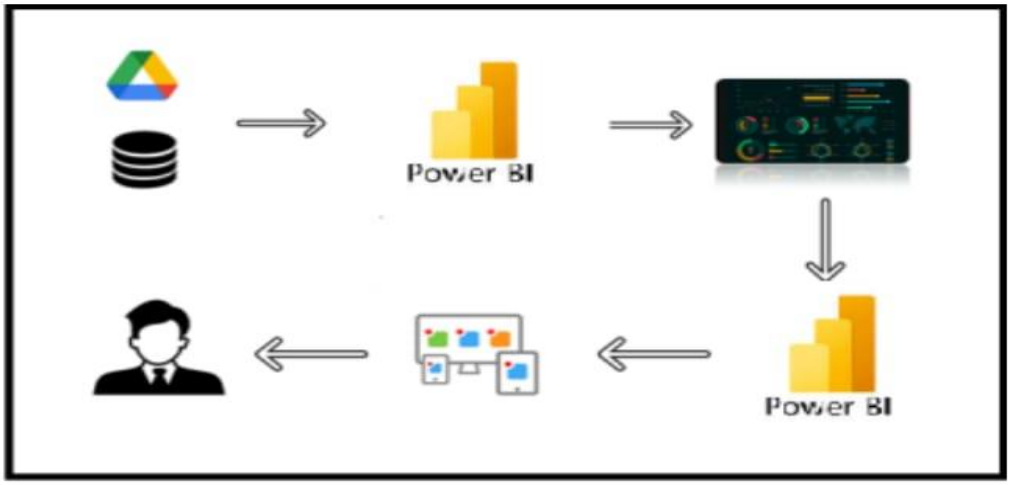
User Stories **Data export**

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 Create	USN-5	As an agri-business, I want to create reports for ensure supply chain profits.	Charts update dynamically based on selections.	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	LTVIP2025TMID21352
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 CC

1.CUSTOMER SEGMENTS

CS

Customer Segments
Agricultural policymakers
Food production companies
Farmers and cooperatives
Food supply chain managers
Investors in the agricultural sector
Research institutions studying food security.

6. CUSTOMER

CC

Limited access to comprehensive, real-time agricultural data.

Budget constraints for small-scale farmers and researchers.

Need for user-friendly tools for non-technical users.

5. AVAILABLE SOLUTIONS

AS

Traditional market reports
Government agricultural databases
Research papers and industry studies
Private consultancy reports
Pros & Cons:
Market reports: Data-heavy but lack visualization
Government databases: Limited to national statistics
Consultancy reports: Expensive and sometimes outdated.

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS

J&P

Jobs:
Analyze global food production trends for better planning
Identify key commodities and regions contributing to food production
Forecast future agricultural needs and supply chain adjustments
Optimize resource allocation in food production.

Problems:
Lack of centralized, visualized data for global food trends
Difficulty in identifying high-growth regions and commodities
Challenges in predicting future food supply demands.

9. PROBLEM ROOT CAUSE

RC

Lack of accessible, interactive data visualization tools for global food production.

Fragmented data sources across different regions and organizations

Difficulty in understanding long-term trends without expert analysis.

7. BEHAVIOUR

BE

Direct Actions:
Researching food production trends
Consulting industry reports
Using agricultural databases
Indirect Actions:
Engaging in policy discussions
Attending agricultural conferences and forums.

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS

Rising global food demand due to population growth
Climate change affecting agricultural yields
Government regulations on food security and trade
Market volatility in agricultural commodities.

4. EMOTIONS: BEFORE / AFTER

Before: Uncertainty, lack of clarity, reliance on fragmented data sources.
After: Confidence in decision-making, better strategic planning, data-driven insights.

10. YOUR SOLUTION

ABC Company developed an interactive Power BI dashboard to visualize and analyze food production trends from 1961 to 2023. This tool:

Consolidates data on key commodities like wheat, rice, maize, and fruits

Highlights regional contributions to food production

Enables better strategic decision-making for policymakers and businesses.

8. CHANNELS of BEHAVIOUR

CH

Online: Power BI dashboards
Research portals
Webinars and online reports
Social media discussions
Offline: Industry conferences
Government policy meetings
Farmer cooperatives and trade expos.

Extract online & offline CH of BE

Project Design Phase
Proposed Solution Template

Date	15 February 2025
Team ID	LTVIP2025TMID21352
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)	What factors have driven the significant increase in wheat production compared to other staple crops? This project aims to provide a detailed agricultural commodities from 1961 to 2023, using Power BI for effective visualizations.
2.	Idea / Solution description	Predictive analytics for future agricultural trends. Identification of leading production regions and market dynamics
3.	Novelty / Uniqueness	Power BI's dynamic dashboards enhance accessibility and understanding. Identification of leading producers and shifting trends.
4.	Social Impact / Customer Satisfaction	Customers benefit from improved forecasting, reducing food shortages and price fluctuations.
5.	Business Model (Revenue Model)	Offering customized analysis for businesses and government agencies.
6.	Scalability of the Solution	Can be expanded to include climate impact analysis and economic factors affecting food production.

Project Design Phase
Solution Architecture

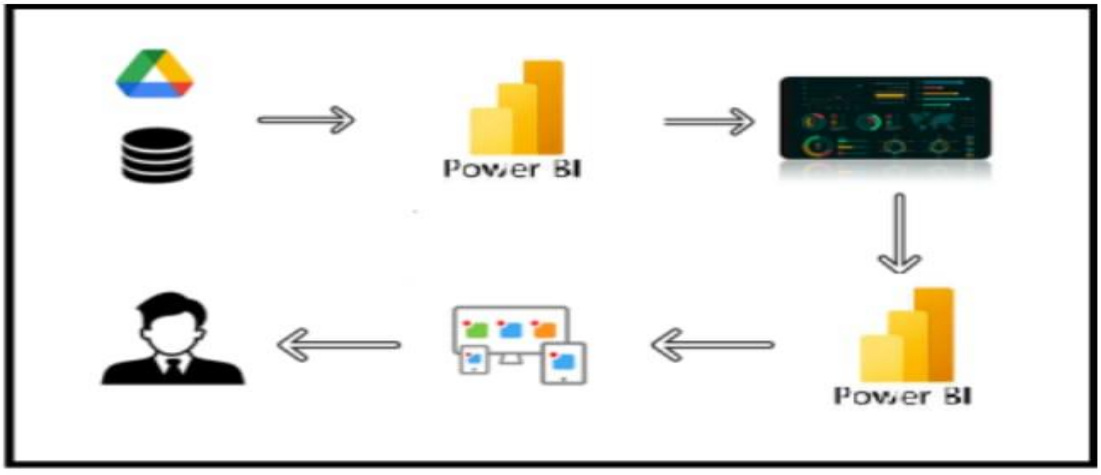
Date	15 February 2025
Team ID	LTVIP2025TMID21352
Project Name	Global Food Production Trends And Analysis: A Comprehensive Study from 1961 to 2023 Using Power BI.
Maximum Marks	4 Marks

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, behavior, 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, Storypoints)

Date	15 February 2025
Team ID	LTVIP2025TMID21352
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

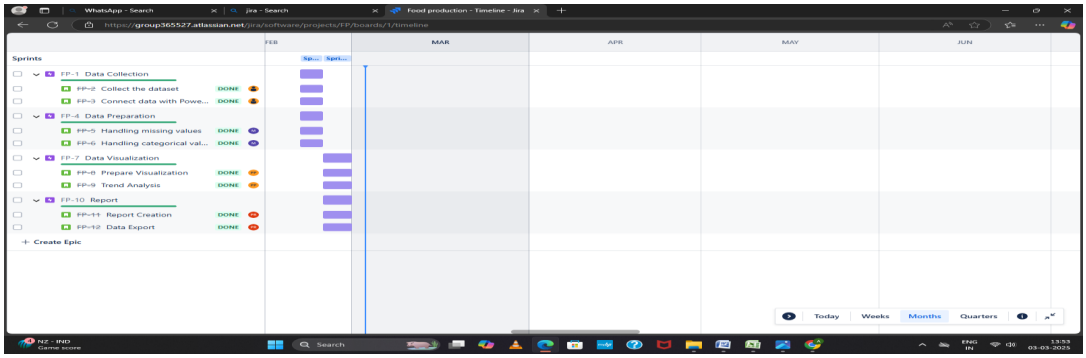
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	As a data analyst, I want to collect food production data from reliable sources.	2	High	N. Yamuna
Sprint-1	Data Cleaning	USN-2	As a data analyst, I want to clean the collected data by removing duplicates and handling missing values so that I can ensure consistency and accuracy in the dataset.	3	medium	M. Gowri
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. Pavithra
Sprint-2	Trend analysis	USN-4	As a farmer, I want to analyse the historical trends of food production so that I can predict plant growth.	3	high	P. Pavithra
Sprint-2	Report creation	USN-5	As an agri-business, I want an interactive Power BI dashboard so that I can explore food production trends based on different parameters such as year, region, and commodity.	3	medium	P.Rusti
Sprint-2	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.	2	low	P.Rusti

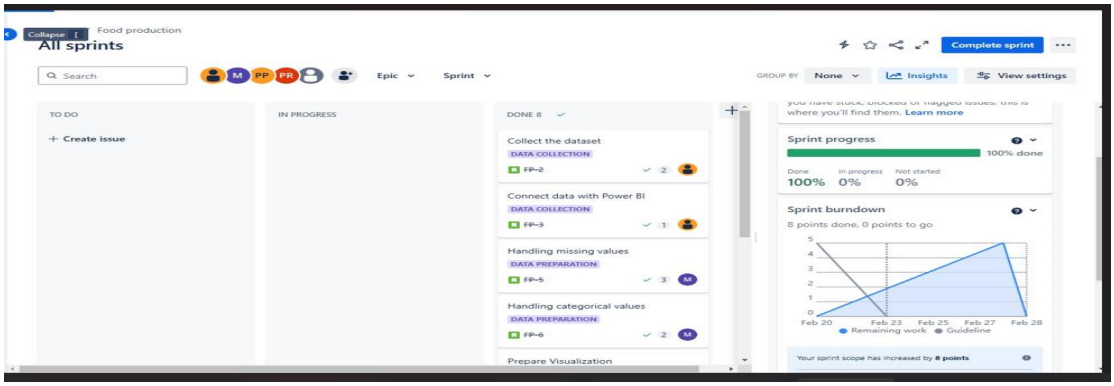
Project Tracker, Velocity & Burndown Chart: (4 Marks)

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	20FEB 2025	21FEB 2025	24	21 FEB 2025
Sprint-2	24	2 Days	22FEB 2025	23FEB 2025	24	23FEB 2025
Sprint-3	24	2 Days	24FEB 2025	26FEB 2025	24	26FEB 2025
Sprint-4	24	2 Days	27FEB 2025	28 FEB 2025	24	28FEB 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)

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


Sprints
FP-1 Data Collection
FP-2 Collect the dataset
FP-3 Connect data with Powe...
FP-4 Data Preparation
FP-5 Handling missing values
FP-6 Handling categorical val...
FP-7 Data Visualization
FP-8 Prepare Visualization
FP-9 Trend Analysis
FP-10 Report
FP-11 Report Creation
FP-12 Data Export
Create Epic
FEB
MAR
APR
MAY
JUN
Today
Weeks
Months
Quarters

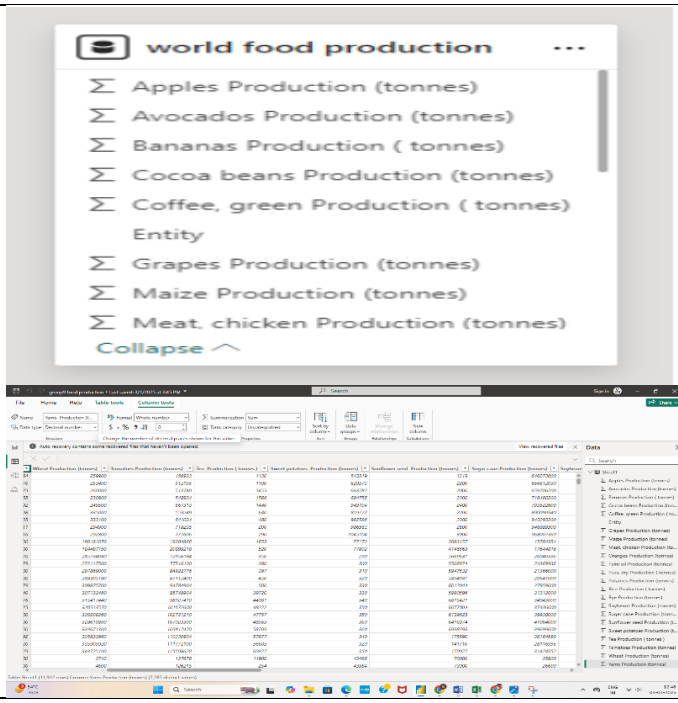

Collapse
Food production
All sprints
Search
Epic
Sprint
Complete sprint
GROUP BY
None
Insights
View settings
TO DO
Create issue
IN PROGRESS
DONE 8
Collect the dataset
DATA COLLECTION
FP-2
Connect data with Power BI
DATA COLLECTION
FP-3
Handling missing values
DATA PREPARATION
FP-5
Handling categorical values
DATA PREPARATION
FP-6
Prepare Visualization
where you'll find them. Learn more
Sprint progress
100% done
Done
100%
In progress
0%
Not started
0%
Sprint burndown
8 points done, 0 points to go
Feb 20
Feb 23
Feb 25
Feb 27
Feb 28
Remaining work
Guideline
Your sprint scope has increased by 8 points

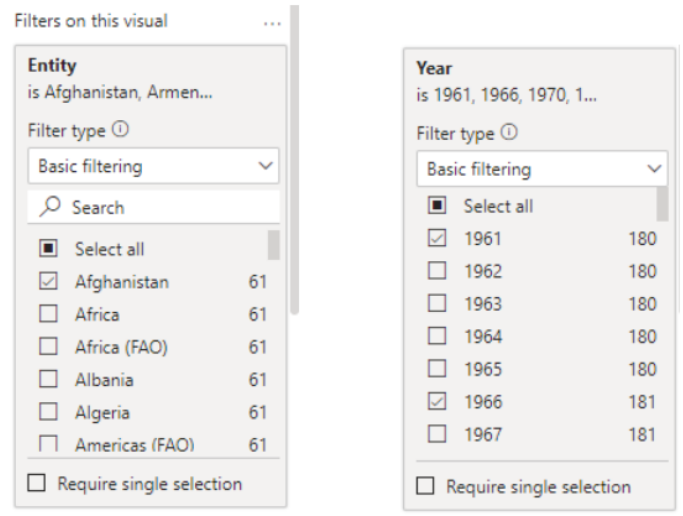
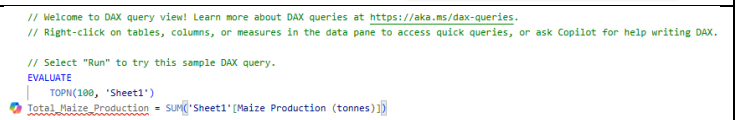
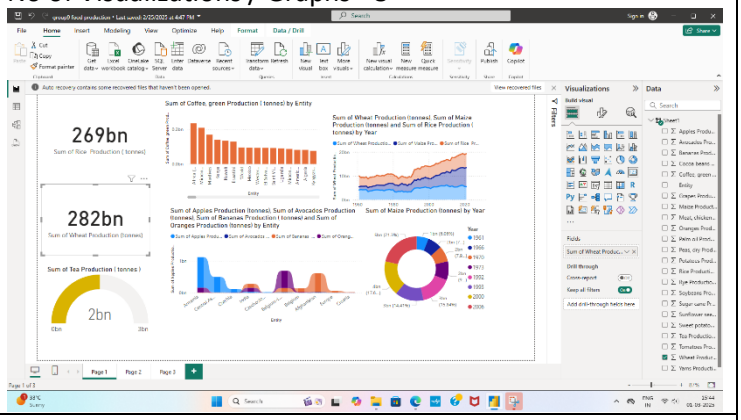
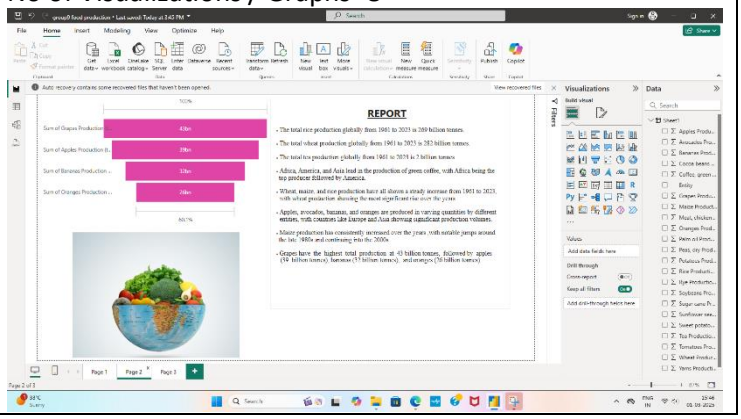
Project Development Phase
Model Performance Test

Date	10 February 2025
Team ID	LTVIP2025TMID21352
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.

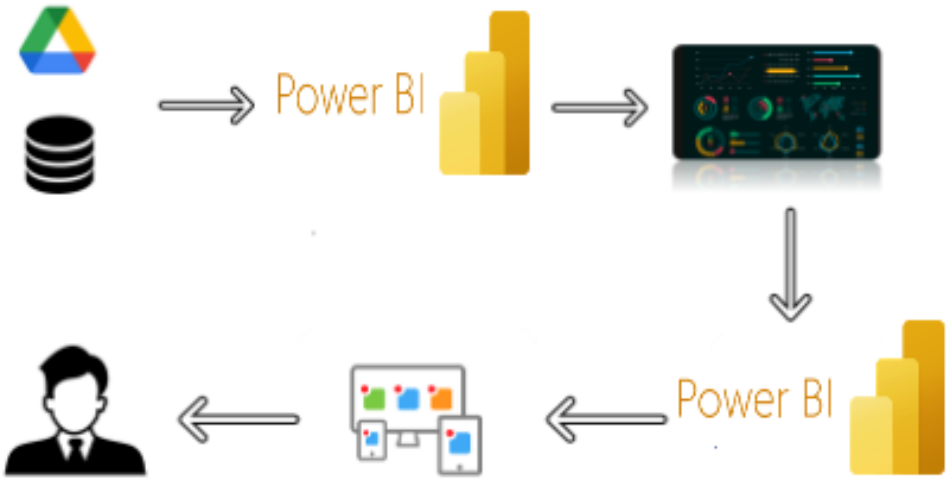
Scenario 5: Sum of Wheat, Maize, and Rice Production (tonnes) by Year an area chart showing the annual production trends of wheat, maize, and rice from 1961 to 2023. It highlights the growth trajectories and fluctuations of these essential crops over the years.

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/file/d/1G2qTQN5ltgyhptCH64h6XL6C27cUs0BB/view?usp=drivesdk
3.2 **Data Cleaning:**
https://drive.google.com/file/d/1GEJwiabJIaDzsSzqHitWL8zyqc4ij2Ky/view?usp=drivesdk

Milestone 3: Data Visualization

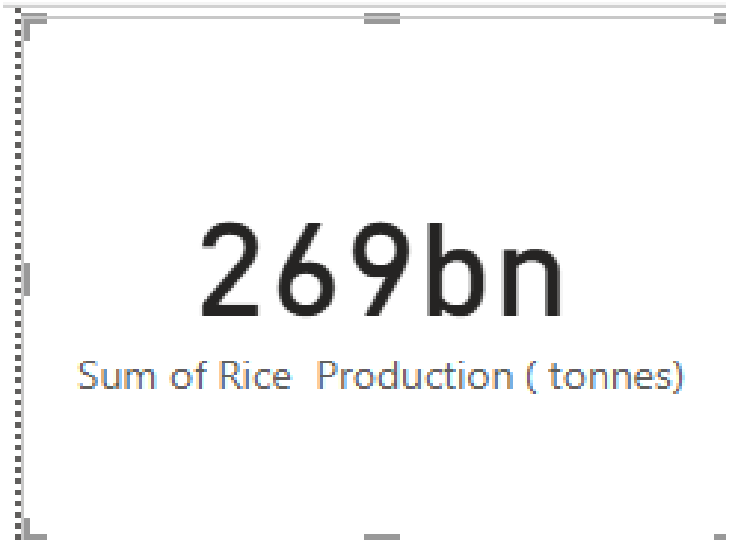
Data Visualization:

https://drive.google.com/file/d/1GUiA82Pnpxk5VXAXVaSWGiDKmz2igcKy/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.

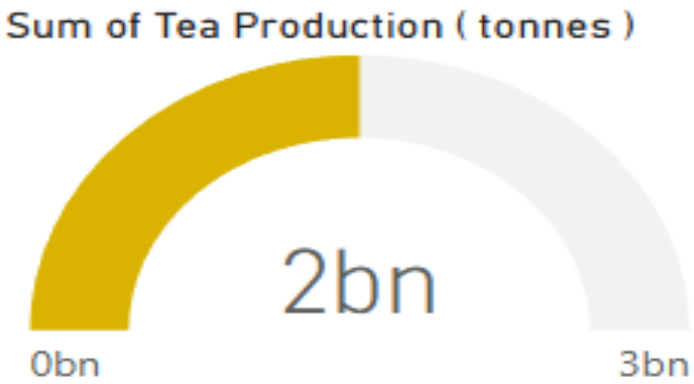
World Food Production (1961-2023)

Activity 1.1: Sum of Rice Production (tonnes)

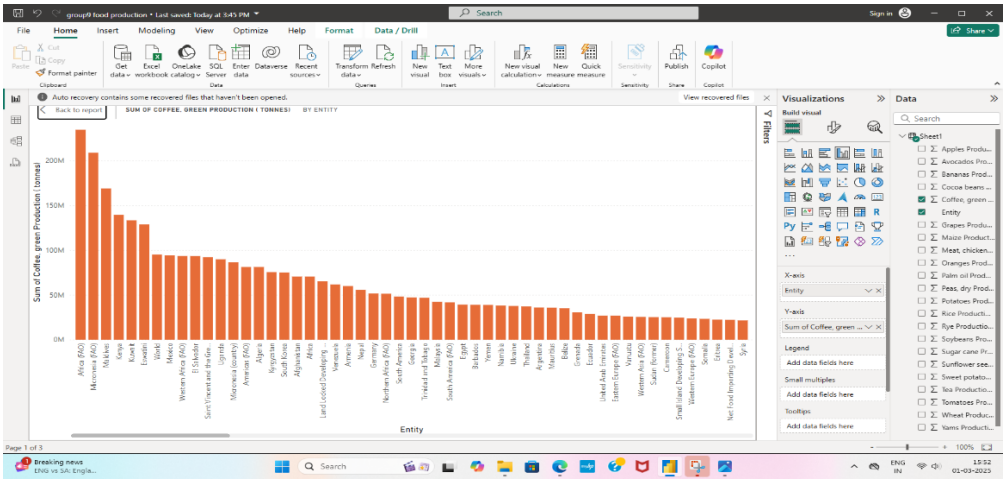


Activity 1.2: Sum of Wheat Production (tonnes)

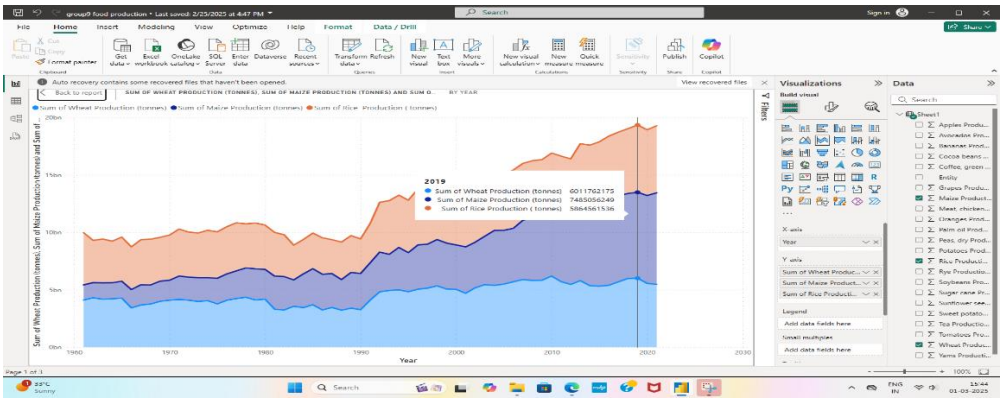
Activity 1.3: Sum of Tea Production (tonnes)



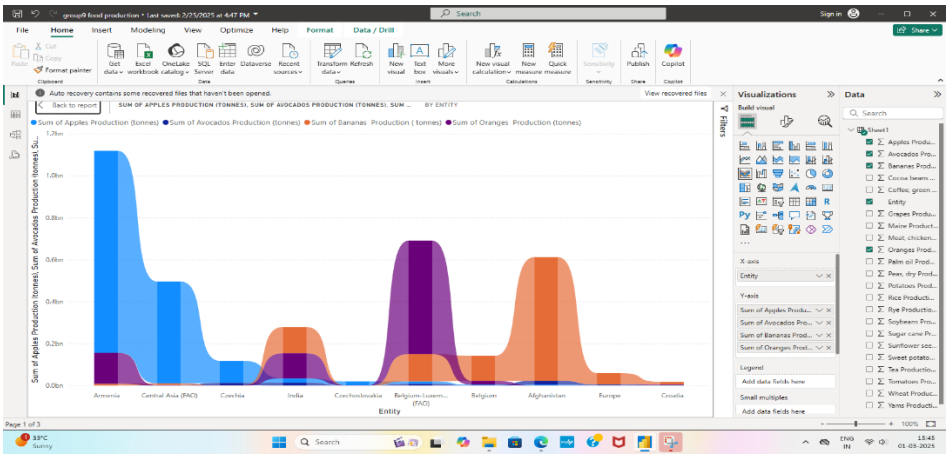
Activity 1.4: **Sum of Coffee, Green Production (tonnes) by Entity**



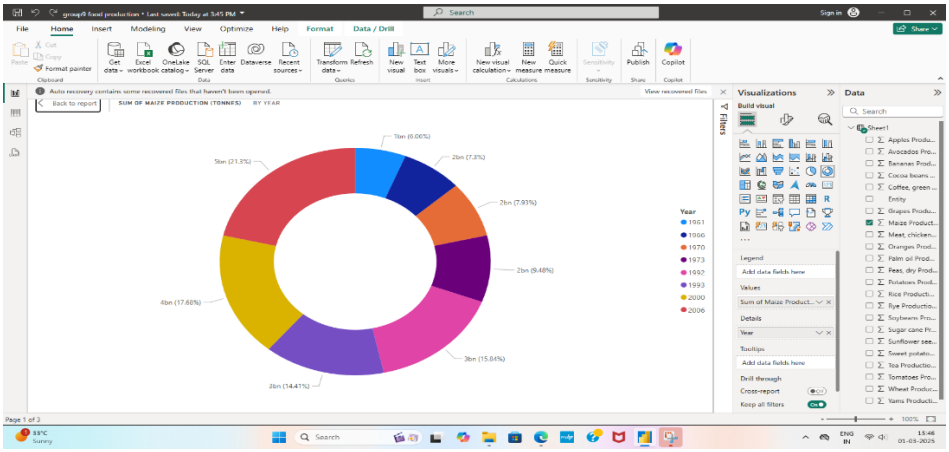
Activity 1.5: Sum of Wheat, Maize, and Rice Production (tonnes) by Year



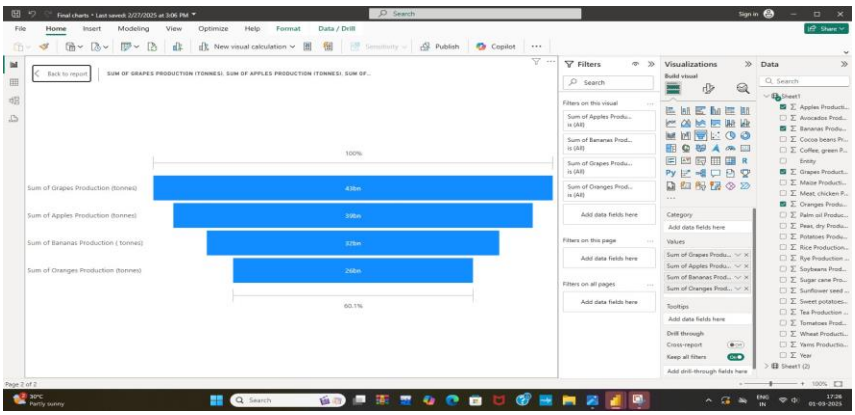
Activity 1.6: Sum of Apples, Avocados, Bananas, and Oranges Production (tonnes) by Entity



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

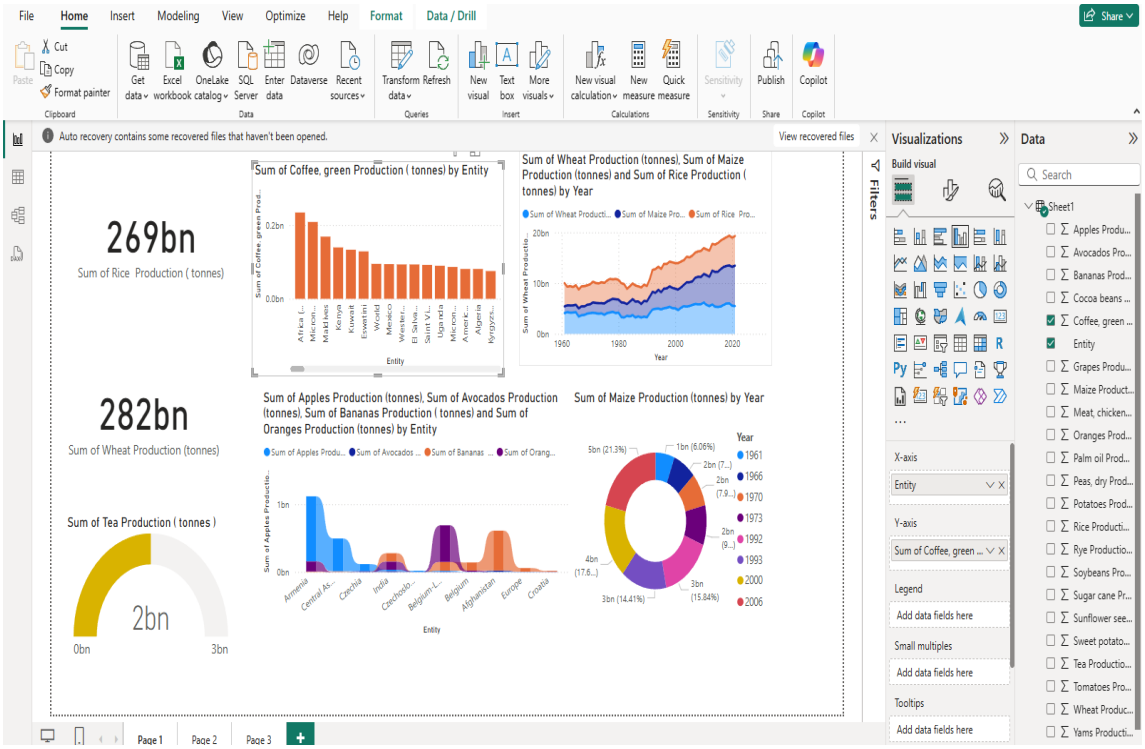


Activity 1.8: Sum of Grapes, Apples, Bananas, and Oranges Production (tonnes)



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

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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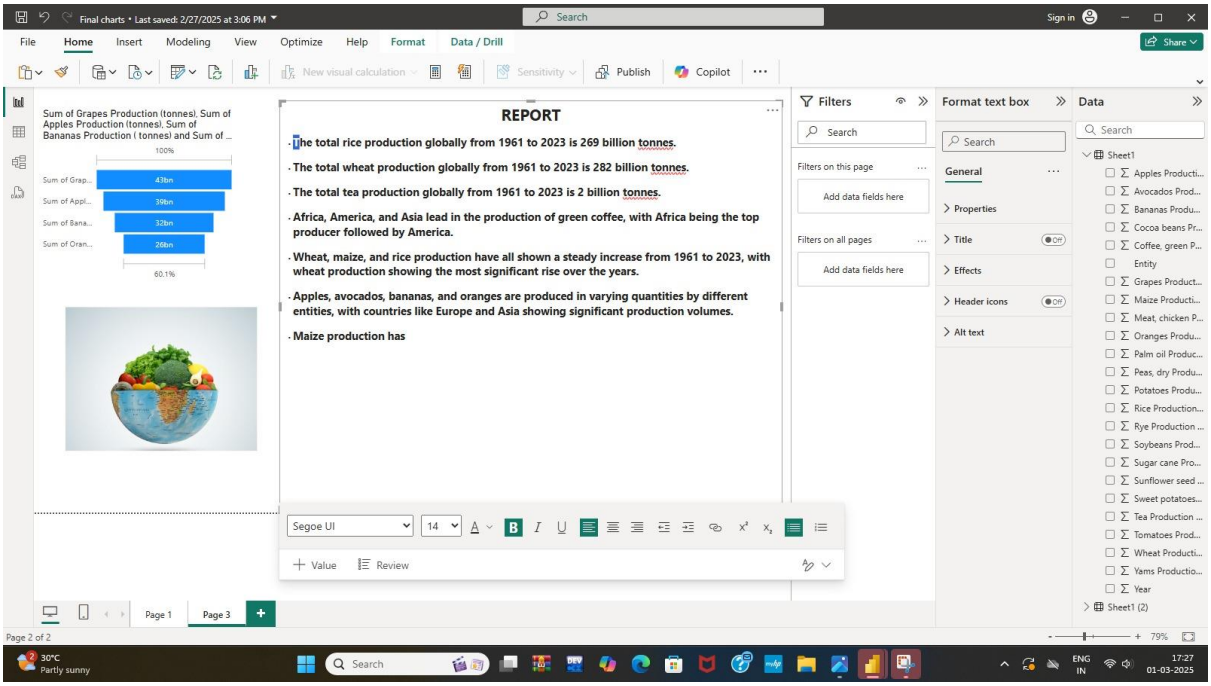
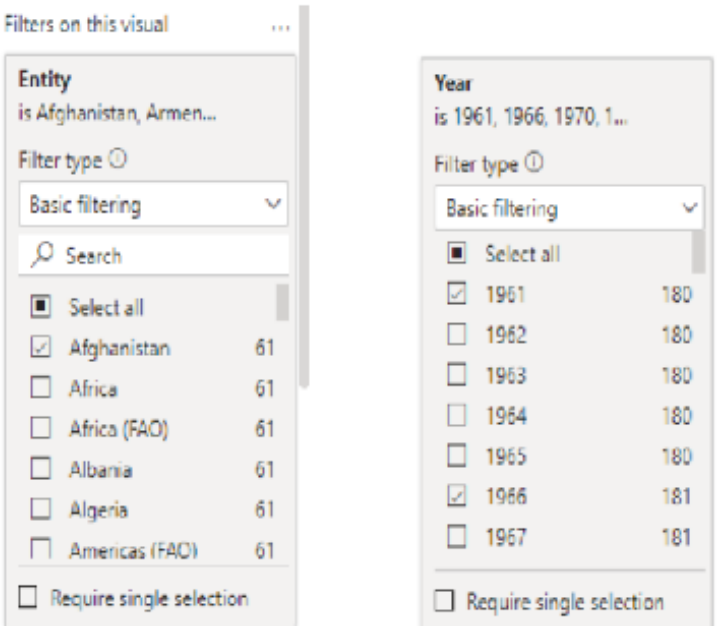
Data Report:
https://drive.google.com/file/d/1GgKraISzpF5vagOzxsd76DKaX6-ngn84/view?usp=drivesdk



Milestone 6: Performance Testing

Amount of Data Loaded

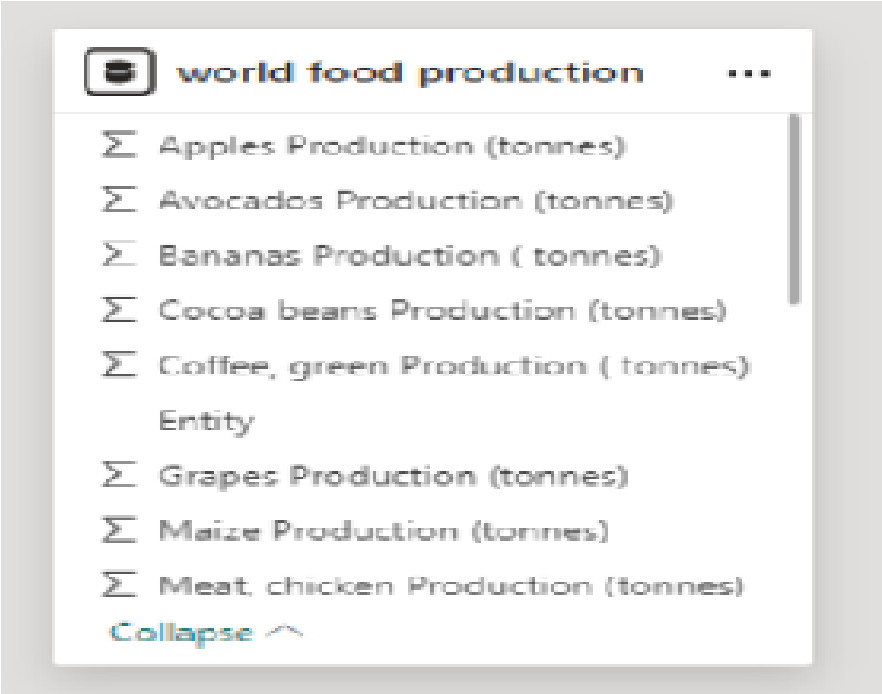
"Amount of Data Loaded" refers to the quantity or volume of data that has been imported, retrieved, or loaded into a system, software application, database, or any other data storage or processing environment. It's a measure of how much data has been successfully processed and made available for analysis,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