Project Report

1. INTRODUCTION

a. Project Overview

This project, "Power BI Inflation Analysis – Journeying Through Global Economic Terrain," analyzes global inflation trends using an interactive Power BI dashboard. It consolidates data from sources like the IMF, World Bank, and OECD, enabling users to track, compare, and forecast inflation. By integrating predictive analytics and visual insights, the project helps policymakers, businesses, and researchers make data-driven economic decisions.
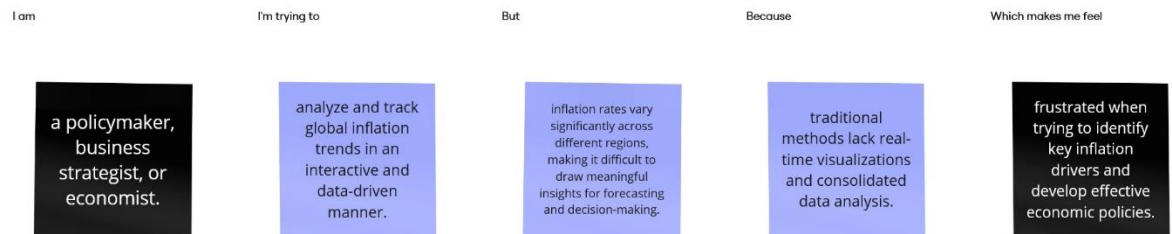
b. Purpose

The project aims to **simplify inflation analysis** by transforming complex economic data into **interactive and accessible insights**. It helps stakeholders understand inflation trends, identify key drivers, and predict future economic conditions. By leveraging **real-time data visualization and forecasting models**, it enhances decision-making for **policymakers, economists, investors, and businesses**, ensuring informed economic planning and stability.

2. <u>IDEATION PHASE</u>

a. Problem Statement

Analyzing inflation trends is difficult due to scattered data and complex reports. This project, **"Power BI Inflation Analysis – Journeying Through Global Economic Terrain,"** develops an interactive Power BI dashboard to consolidate global inflation data, provide real-time insights, and integrate predictive analytics, enabling users to track, compare, and forecast inflation trends effectively.

b. Empathy Map Canvas

WHO are we empathizing with?

- User: Policymakers, Economists, Business Analysts, Researchers, Students
- Needs: Real-time inflation data insights, visual comparisons, and trend analysis.

GOAL

What do they need to DO?

- Use Power BI to consolidate and visualize inflation trends effectively.
- Compare inflation rates across different countries and regions to identify patterns.
- Identify key inflation drivers and correlations with economic events.
- Generate predictive insights for future economic trends.
- Improve policy-making and business strategies based on real-time insights.

What do they THINK and FEEL?

- Are we heading towards a recession or economic recovery?
- How does inflation correlate with policy changes and global events?
- Can we predict future inflation trends based on historical data?

PAINS

- Lack of consolidated and interactive inflation data.
- Rapid inflation fluctuations affecting businesses and policies.
- Difficulty in predicting future trends accurately.
- Scattered data sources make comparison and analysis complex.

- I feel frustrated because inflation is hard to track due to scattered data sources.
- I worry about economic instability and how it affects businesses and policies.
- I hope for a better tool that provides real-time insights and predictive analysis.

GAINS

- A data-driven dashboard can provide clear insights for better forecasting.
- Regional comparisons and predictive insights help in better decision-making.
- Interactive visualizations make inflation analysis easier and faster.
- Policymakers can create better economic strategies based on real-time data.

What do they SEE?

- Data from multiple unreliable sources.
- News on inflation rates affecting global markets.
- Economic crisis reports.
- Financial market trends.

What do they HEAR?

- Discussions from economists & financial experts.
- Global economic summit reports.
- Policy changes from governments & central banks.

What other thoughts and feelings might influence their behavior?

- Concern about economic crises and unexpected inflation surges.
- Fear of making incorrect financial or policy decisions due to lack of accurate data.
- Pressure to provide reliable forecasts to stakeholders and governments.
- Desire for a simple, intuitive dashboard that doesn't require deep technical knowledge.
- Interest in automating data analysis to save time and improve efficiency.

What do they SAY?

- Inflation trends impact global markets and decision-making.
- We need a reliable tool to track inflation fluctuations across different regions.
- Comparing inflation rates between countries is difficult with scattered data sources

What do they DO?

- Collect and analyze inflation reports from various sources.
- Make economic and business decisions based on inflation trends.
- Present insights to stakeholders and policymakers.

c. Brainstorming

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!

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.

Shreeya Mane

| Data Collection & Cleaning | Import dataset into Power BI | Handle missing values & inconsistencies | Format data for analysis | Create line charts for inflation trends | Visualization & Dashboard Design | Add interactive filters for user selection | Design heatmaps for regional variations |

Tanvi Kanase

| Analysis & Insights | Identify key inflation drivers | Compare inflation trends across countries | Evaluate economic crisis impact | Predictive Insights & Documentation | Apply forecasting methods if feasible | Document findings & recommendations | Prepare final report & Power BI presentation |

3. REQUIREMENT ANALYSIS

a. Customer Journey map

Customer Journey Map Example

Scenario: Analyzing, forecasting, and reporting on global inflation trends using Power BI.	1. Entice — How does someone initially become aware of this process?	2. Enter — Looking for product, and assess my options	3. Engage — In the core moments in the process, what happens?	4. Exit — What do people typically experience as the process finishes?	5. Extend — What happens after the experience is over?
Steps: What does the person (or group) typically experience?	Research global inflation trends. / Discover Power BI as a tool for data visualization. / Identify relevant data sources (IMF, World Bank, etc.). / Decide to use Power BI for deeper analysis.	Download or import inflation datasets. / Clean and preprocess the data in Power BI. / Create initial charts and graphs. / Apply filters for country-wise comparisons.	Apply custom filters for inflation trends. / Perform forecasting based on historical data. / Compare inflation rates across countries. / Generate reports and share insights.	Export reports in PDF or Excel format. Sign in really easily. / Share insights with policymakers, economists, and analysts. / Present findings in meetings or conferences.	Monitor inflation trends continuously. / Improve dashboards based on new data. / Automate report generation for periodic insights.
Interactions: What interactions do they have at each step along the way?	Search on Google, forums, or Power BI documentation. / Consult economic analysts or data scientists. / Explore online dashboards or case studies.	Use Power BI's Query Editor for data cleaning. / Explore Power BI forums for guidance. / Discuss data structure with economists.	Use Power BI's AI-driven analytics for predictive modeling. / Collaborate with stakeholders via Power BI Service. / Adjust dashboards based on feedback.	Use Power BI's Export and Share features. / Gather feedback from end-users.	Set up scheduled Power BI data refresh. / Use machine learning models for future forecasting.
Goals & Motivations: At each step, what is a person's primary goal or motivation? ("Help me..." or "Help me avoid...")	Understand how inflation affects economies. / Find a reliable tool for visualization and reporting. / Compare inflation data across countries.	Ensure data is accurate and clean. / Develop an interactive dashboard for deeper insights.	Derive meaningful insights for policy decisions. / Ensure reports are easy to interpret.	Communicate insights in a compelling way. / Ensure data-driven decisions are implemented.	Ensure long-term accuracy of inflation predictions. / Keep stakeholders informed with up-to-date reports.
Positive Moments: What steps does a typical person find enjoyable, productive, fun, motivating, delightful, or exciting?	Excitement about using data-driven insights. / Finding a useful Power BI dashboard template.	Successfully importing and visualizing the first dataset. / Seeing inflation trends come to life in a dashboard.	Successfully forecasting future inflation trends. / Discovering hidden patterns in the data.	Stakeholders find the analysis valuable. / Reports lead to real-world economic policy changes.	Seeing the system evolve with new insights. / Increased confidence in economic decision-making.
Negative Moments: What steps does a typical person find frustrating, confusing,	Struggling to find accurate, structured data. / Overwhelmed by the learning curve of Power BI.	Facing errors while cleaning raw data. / Confusion with DAX formulas and Power Query.	Struggling with performance issues on large datasets. / Data visualization not meeting stakeholder expectations.	Reported insights are misinterpreted due to complex charts. / Struggles with exporting and formatting reports properly.	Difficulty in integrating new data sources. / Lack of automation in report updates.

b. Solution Requirement

Solution Requirements (Functional & Non-functional)

Date	13 March 2025
Team ID	PNT2025TMID02756
Project Name	Power BI Inflation Analysis Journeying Through Global Economic Terrain
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 Ingestion	Import global inflation dataset from Kaggle
FR-2	Data Cleaning	Handle missing values, standardize column names, and format data.
FR-3	Data Visualization	Generate Power BI reports (Line Charts, Heatmaps, Bar Graphs)
FR-4	Filtering & Analysis	Provide filtering options (by country, region, year).
FR-5	Predictive Insights	Use machine learning to forecast inflation trends (if applicable).

Non-functional Requirements:
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The dashboard should be user-friendly and interactive.
NFR-2	Security	Ensure data integrity and restrict unauthorized modifications.
NFR-3	Reliability	Ensure consistent and accurate results across multiple executions.
NFR-4	Performance	Optimize Power BI queries to ensure fast rendering of reports.
NFR-5	Availability	The system should be accessible 24/7 with minimal downtime.
NFR-6	Scalability	Ensure the system can handle additional datasets in the future.

c. Data Flow Diagram

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.

Logical Data Flow Diagram (DFD) - Power BI Inflation Analysis
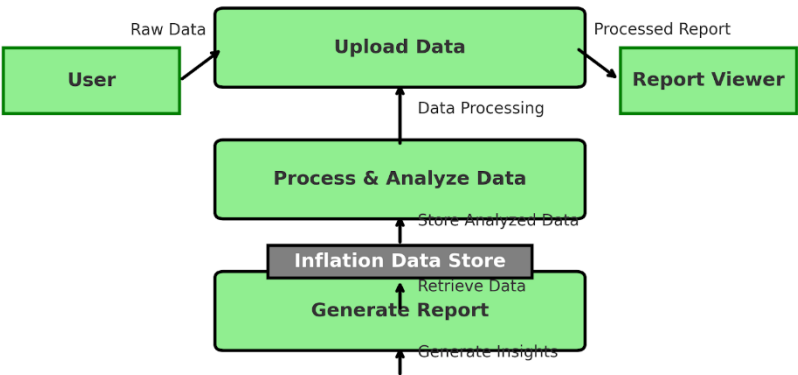
d. Technology Stack

Technical Architecture:

This document outlines the technology stack used for the Power BI Inflation Analysis project. The system is built on Power BI Desktop and follows a structured data workflow from raw dataset ingestion to visualization and reporting. The entire process is conducted offline, without cloud deployment.

System Architecture Diagram - Power BI Inflation Analysis
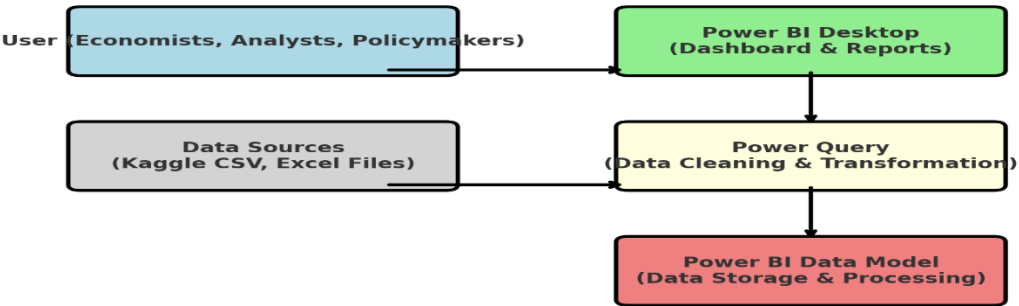
Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Power BI Desktop	Allows users to interact with dashboards and reports.
2.	Data Import	CSV/Excel Files (Kaggle Dataset)	Provides raw inflation data for analysis.
3.	Data Processing	Power Query (M Language)	Cleans, transforms, and prepares data.
4.	Data Storage	Power BI Data Model	Stores structured data for visualization.
5.	Visualization	Power BI Charts & Reports	Generates insights through graphs and tables.
6.	Interactivity	Power BI Slicers & Filters	Enables users to explore data dynamically.
7.	Export & Sharing	Power BI PDF, PPT	Allows sharing of reports in standard formats.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Power BI uses open-source connectors for data import.	Power Query, DAX
2.	Security Implementations	Local access control and dataset encryption.	Role-Based Access Control (RBAC)
3.	Scalable Architecture	Handles large datasets with optimized queries.	Power BI Data Model
4.	Availability	Works offline with Power BI Desktop, ensuring constant access.	Local Deployment
5.	Performance	Optimized using DAX calculations and indexing.	Power BI Engine

4. PROJECT DESIGN

a. Problem Solution Fit

Problem-Solution fit canvas 2.0

1. CUSTOMER SEGMENT(S) — CS	6. CUSTOMER CONSTRAINTS — CC	5. AVAILABLE SOLUTIONS — AS
The primary users of this Power BI dashboard include: Economists – To analyze inflation trends and economic conditions. Business Analysts – To assess inflation impact on financial markets and business operations. Policymakers – To use data for economic planning and decision-making. Researchers & Students – To conduct academic research on global inflation trends.	Data Complexity – Requires significant effort to clean and structure data. Technical Expertise – Some users may not be familiar with Power BI tools. Time Constraints – Users need quick and easy-to-interpret insights for decision-making.	Currently, analysts rely on static Excel reports, government websites, and global reports for inflation data. Some organizations use **Python, R, or Tableau**, but these require programming skills or high licensing costs.

2. JOBS-TO-BE-DONE / PROBLEMS — J&P	9. PROBLEM ROOT CAUSE — RC	7. BEHAVIOUR — BE
Users need a comprehensive and interactive way to track and analyze inflation trends across multiple countries. Traditional methods are static, require manual data processing, and do not provide real-time visual insights.	The root cause of the problem is the **lack of an integrated, interactive platform** that consolidates inflation data from multiple sources, allowing easy comparison and analysis.	Users typically spend hours manually gathering, cleaning, and analyzing inflation data. They rely on spreadsheets, external reports, and basic visualization tools to make decisions.

3. TRIGGERS — TR	10. YOUR SOLUTION — SL	8. CHANNELS of BEHAVIOUR — CH
Increasing inflation rates impact economies worldwide. Lack of interactive, real-time data makes forecasting difficult. Policymakers need better tools to make informed decisions on inflation control strategies.	The proposed solution is a Power BI-based interactive dashboard that provides: Real-Time Data Visualization – View inflation trends dynamically. Country-Wise Comparison – Easily analyze inflation across different regions. Forecasting & Insights – Use historical data to predict inflation trends. Automated Reporting – Generate insights in PDF and PPT formats for stakeholders.	Users currently rely on: Government & Financial Websites – World Bank, IMF, OECD, etc. Excel-Based Reports – Manual data collection and analysis. Third-Party Tools – Python, R, or Tableau for custom analysis.

4. EMOTIONS: BEFORE / AFTER — EM

Before using the solution:**
✗ Users feel frustrated due to complex, unstructured data sources and static reports.
✗ Lack of an intuitive tool makes economic forecasting difficult.

After using the solution:
✓ Users feel empowered with interactive dashboards and easy-to-read visual insights.
✓ Enhanced confidence in decision-making due to real-time access to global inflation trends.

b. Proposed Solution

S.No.	Parameter	Description
1	Problem Statement (Problem to be solved)	Inflation analysis is complex due to scattered data sources, lack of interactive tools, and difficulty in forecasting trends. This project addresses these challenges by providing a centralized, interactive, and predictive Power BI dashboard.
2	Idea / Solution Description	The solution is a Power BI-based interactive dashboard that consolidates global inflation data, provides real-time visual insights, and integrates predictive analytics.
3	Novelty / Uniqueness	Unlike traditional methods (spreadsheets, static reports), this dashboard offers real-time data visualization, AI-powered forecasting, and interactive user controls.
4	Social Impact / Customer Satisfaction	Helps policymakers design better economic policies, enables businesses to make informed pricing and investment decisions, and assists researchers and students in understanding economic trends.
5	Business Model (Revenue Model)	If commercialized, revenue can be generated through subscription-based access, premium features (advanced forecasting, data exports), or collaborations with financial institutions, government bodies, and economic research firms.
6	Scalability of the Solution	The solution can be expanded globally by integrating more datasets, enhancing AI-driven analytics, and adding customized

c. **Solution Architecture**

Solution Architecture - Power BI Inflation Analysis
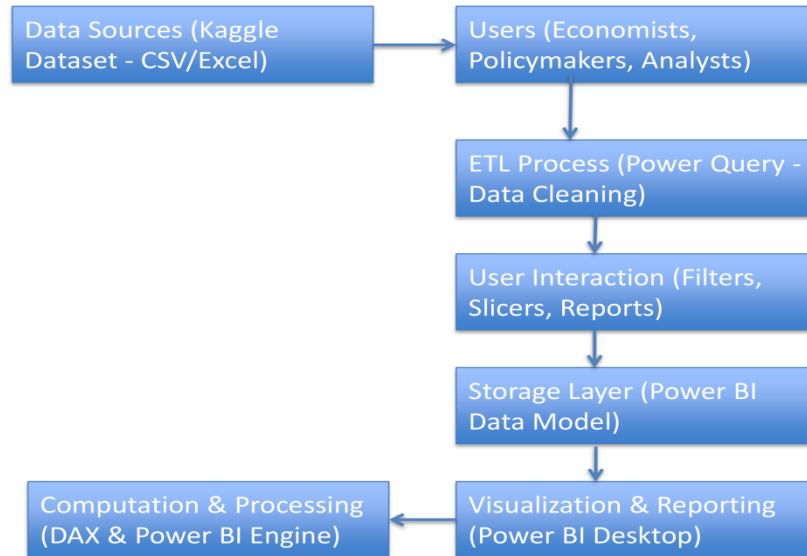
5. **PROJECT PLANNING & SCHEDULING**

   a. **Project Planning**

Sprint	Total Story Points	Duration	Sprint starts date	Sprint end dates(Planned)	Story Points completed(As on planned end date)	Sprint release date (actual)
Sprint 1	5	7 Days	11 Feb 2025	17 Feb 2025	5	17 Feb 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**

   a. Performance Testing

7. **RESULTS**

   a. **Output Screenshots**
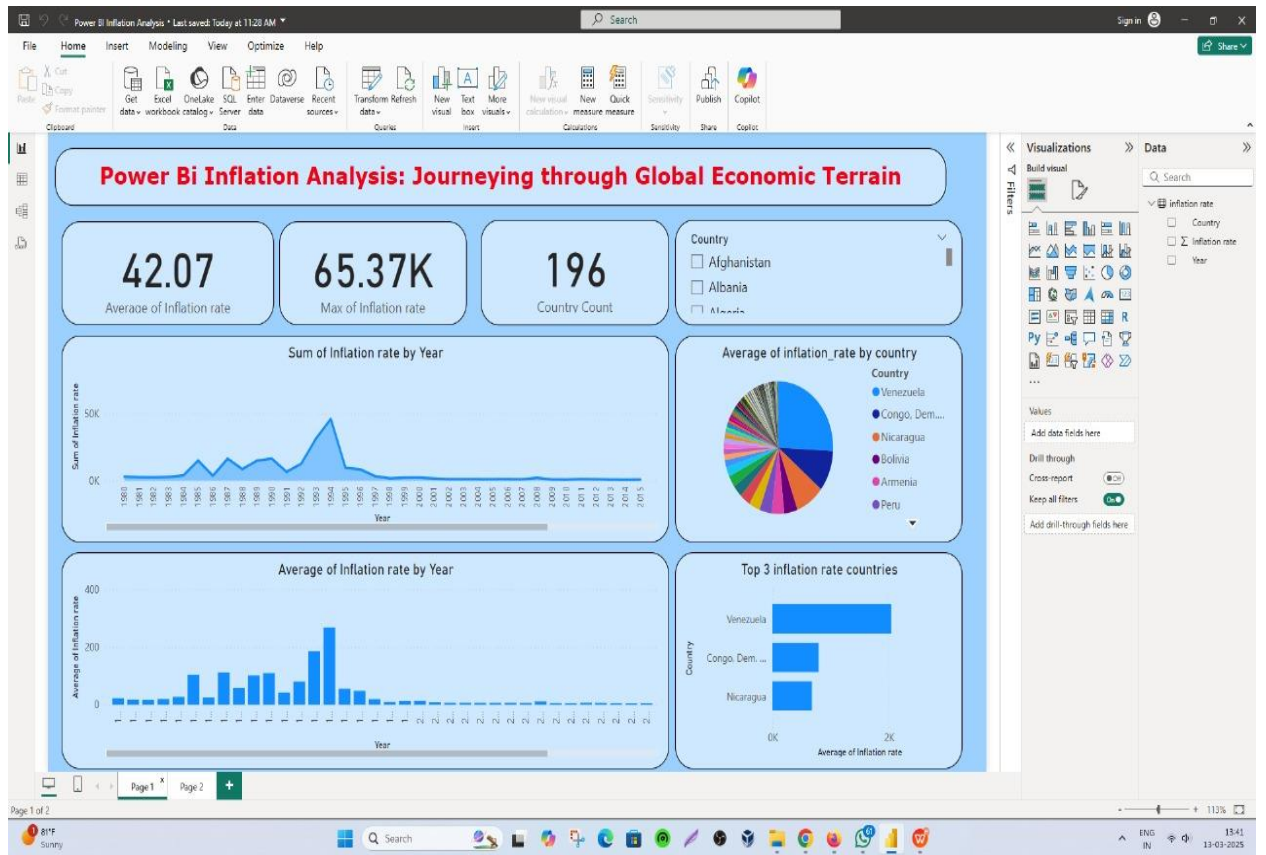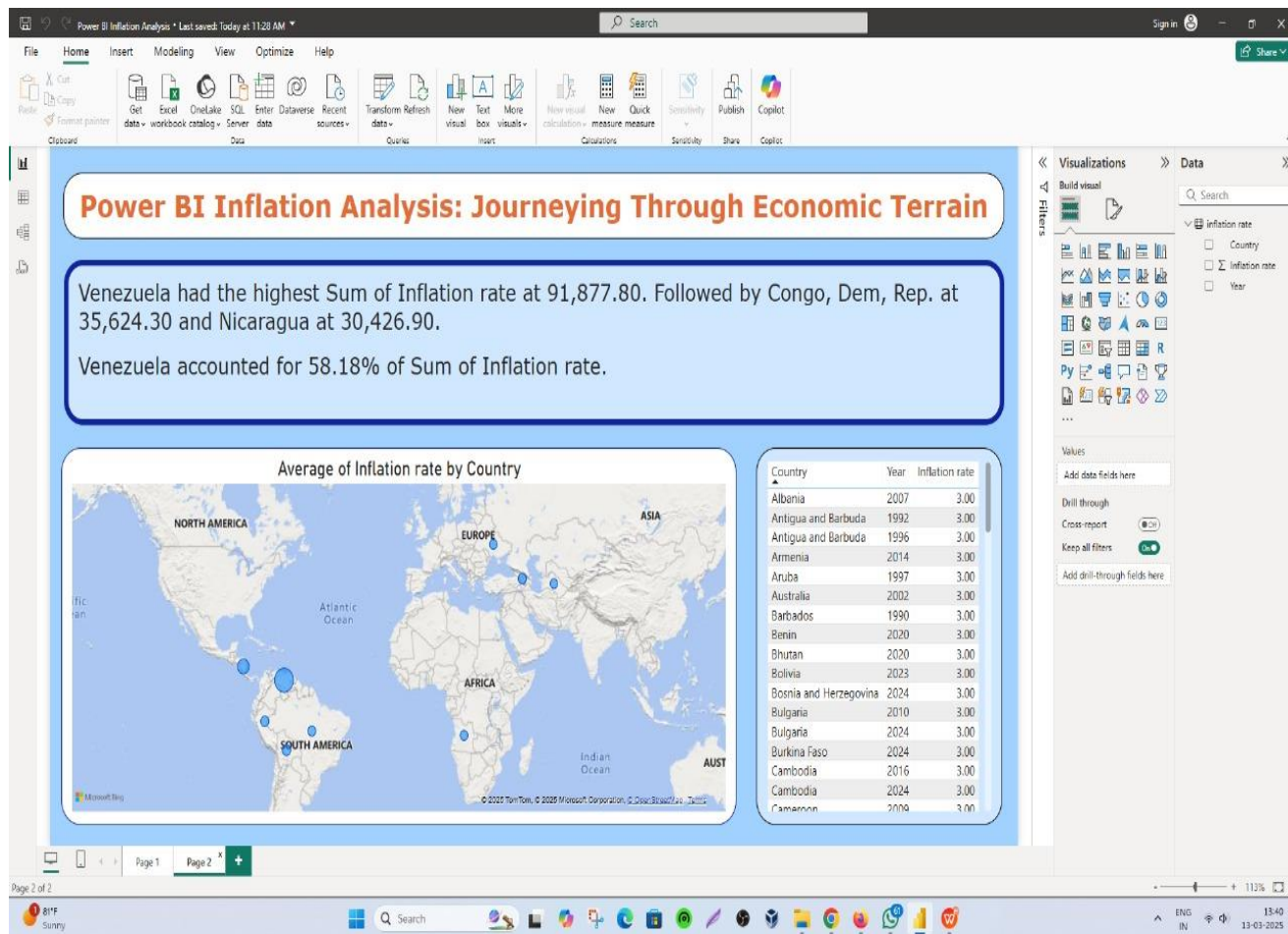
8. ADVANTAGES & DISADVANTAGES

Advantages-

- **Centralized Data Integration** – The project consolidates inflation data from multiple sources like the World Bank, IMF, and OECD, providing a unified platform for analysis.
- **Interactive Visualizations** – Power BI's dynamic charts, heatmaps, and dashboards make complex inflation data more comprehensible.
- **Predictive Analytics** – AI-driven forecasting models help in predicting future inflation trends, assisting in better economic planning.
- **Real-Time Data Analysis** – Users can analyze inflation trends as data updates occur, making insights more relevant and timely.
- **Enhanced Decision-Making** – Policymakers, businesses, and researchers can make data-driven decisions using customized reports and comparative analysis.
- **User-Friendly Interface** – Power BI's drag-and-drop functionality and interactive filters improve accessibility, even for non-technical users.
- **Scalability** – The solution can be expanded globally, integrating more datasets and AI-driven insight.

Disadvantages-g

Data Dependency – The accuracy of insights depends on the quality and availability of data from external sources.

Technical Expertise Required – Users need knowledge of Power BI, DAX, and data modeling to create and customize dashboards.

Limited Real-Time Updates – If data is not linked to live APIs, manual updates are required for the latest information.

Performance Issues with Large Datasets – Processing extensive datasets in Power BI may slow down dashboard performance.

Limited Offline Access – Power BI dashboards require an internet connection for updates and cloud-based features.

Cost Considerations – Advanced features in Power BI Pro or Power BI Premium require paid licenses, which may not be affordable for all users.

9. CONCLUSION

The **Power BI Inflation Analysis** project simplifies inflation trend analysis by integrating global data into an interactive dashboard. It enhances **decision-making** through real-time insights and predictive analytics. Despite challenges like data dependency, its **scalability and usability** make it a valuable tool for policymakers, businesses, and researchers in understanding economic trends.

10. FUTURE SCOPE

The future scope of this project includes automated data integration, AI-driven forecasting, and expanded economic indicators for deeper analysis. Enhancements like cloud deployment, mobile accessibility, and customizable reports will improve usability. Integrating real-time alerts and AI-powered insights can further assist policymakers, businesses, and researchers in economic planning. Scalability across industries will make it a comprehensive, data-driven tool for global inflation analysis.

11. APPENDIX

Dataset Link

Global Inflation Dataset

GitHub & Project Demo Link

https://github.com/shreeyamane/Power-BI-Inflation-Analysis-Journeying-Through-Global-Economic-Terrain.