Power Bi Inflation Analysis – Journeying Through Global Economic Terrain

INTRODUCTION

Inflation significantly influences the economic stability of nations and the daily lives of individuals. As economies become increasingly interconnected and exposed to global shocks—such as pandemics, wars, and supply chain disruptions—the need for real-time, data-driven inflation analysis has become more critical than ever. While inflation can be a symptom of growth or instability, understanding its patterns is essential for formulating effective monetary policies, safeguarding purchasing power, and ensuring long-term financial planning. The global inflation landscape is shifting dynamically, making it vital to monitor regional variations and historical trends. In this context, leveraging data visualization tools like Power BI offers immense potential to simplify complex inflation data, highlight macroeconomic insights, and support informed decisionmaking across households, governments, and businesses.

SCENARIOS

Scenario 1:

Scenario 1: Inflation Impact on Household Budgeting – Problem Statement (PS-1)

As a middle-class household member, I am trying to manage monthly expenses efficiently despite rising inflation. But the cost of essential items like food, transport, and healthcare keeps increasing unpredictably. This is because I lack access to reliable tools that help me visualize global inflation trends and plan accordingly. This makes me feel anxious and financially insecure about the future.

Scenario 2:

Policy Making in Emerging Economies – Problem Statement (PS-2)

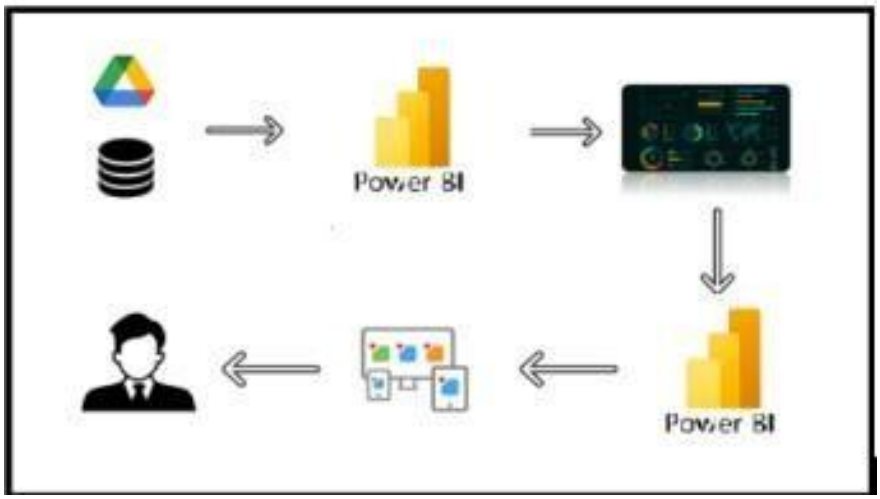
I am a policy advisor in a developing country, working to create strategies that stabilize the economy during inflationary pressures. But I face challenges due to fragmented data and limited analytical resources to compare global inflation patterns. This is because there is no consolidated platform offering comparative insights on inflation trends. This makes me feel constrained in making data-driven policy decisions.

Scenario 3:

Business Forecasting in Global Markets – Problem Statement (PS-3)

As a business analyst in a multinational firm, I'm trying to forecast pricing strategies and product costs across countries. But inflation rates vary greatly across regions and lack real-time comparability. This is because traditional economic reports are not interactive or integrated with visualization tools. This makes me feel uncertain about how to recommend accurate market entry or pricing strategies.

Technical Architecture:



PROJECT FLOW

1. Data Collection
    - Collect the dataset
    - Connect Data to Tableau

2. Data Preparation
    - Prepare the Data for Visualization

3. Data Visualizations
    - Number of Unique Visualizations

4. Dashboard
    - Response and Design of Dashboard

5. Report

- Report Creation

6. Performance Testing

- Utilization of Data Filters
- Number of Calculated Columns/Measures
- Number of Visualizations/Graphs

7. Project Demonstration & Documentation

- Record explanation Video for project end-to-end solution
- Project Documentation - Step by step project development procedure

• Investigate the contribution of various types of sources to the total energy produced.

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, evaluate outcomes, and generate insights from the data.

Data was sourced from Kaggle & GitHub

https://www.kaggle.com/datasets/sazidthe1/global-inflation-data https://github.com/dr5hn/countries-states-cities-database/blob/master/csv/countries.csv

Data contains all the meta information regarding the columns described in the Excel files.

Description of the Dataset:

This is the primary dataset for the project and contains **historical inflation rate data from 1960 to 2023** across numerous countries. It provides both raw inflation rates and categorized insights, enabling macroeconomic trend analysis.

Key Columns:

1. Country – Name of the country
2. Year – Year-wise inflation records

3. Inflation Rate – Annual inflation value (%)
4. InflationRateCategory – Grouped into High, Moderate, and Low inflation
5. Adjusted Inflation Rate – Normalized or cleaned rate for comparative analysis This dataset formed the backbone of:

- Time-series visualizations
- Country- and region-level filtering
- Inflation severity categorization
- Calculated KPIs (e.g., average, max inflation)

2. Country Consumption TWH

This dataset provided **metadata about each country**, which was used to enrich the inflation dataset with additional attributes such as region and subregion. It helped in structuring and filtering inflation data by geographic groups.

- **Key Columns Used:**
  - name – Country name (to match with inflation data)
  - region – Continent-level grouping (e.g., Asia, Europe)
  - subregion – Sub-continental classification (e.g., Western Europe, South America) This metadata was joined with the Kaggle inflation data to enable:
- Region-based filtering and drill-downs
- Enhanced dashboard segmentation
- Consistent naming and grouping across visuals

MILESTONE 2: DATA PREPARATION

Preparing the data for visualization is a crucial step that ensures the dataset is clean, structured, and optimized for analytical use in Power BI. This phase involved cleaning inconsistencies, removing missing or irrelevant entries, standardizing formats, and creating support structures like indexes for relationship mapping.

- Null values and blank records were removed from both the inflation and country metadata datasets.
- Data types were verified and corrected:
  - Inflation Rate and Adjusted Inflation Rate converted to float.
  - Year field converted to integer.
  - Country and Region treated as categorical fields.
- Index columns were added to both datasets to enable relationship building in Power BI.

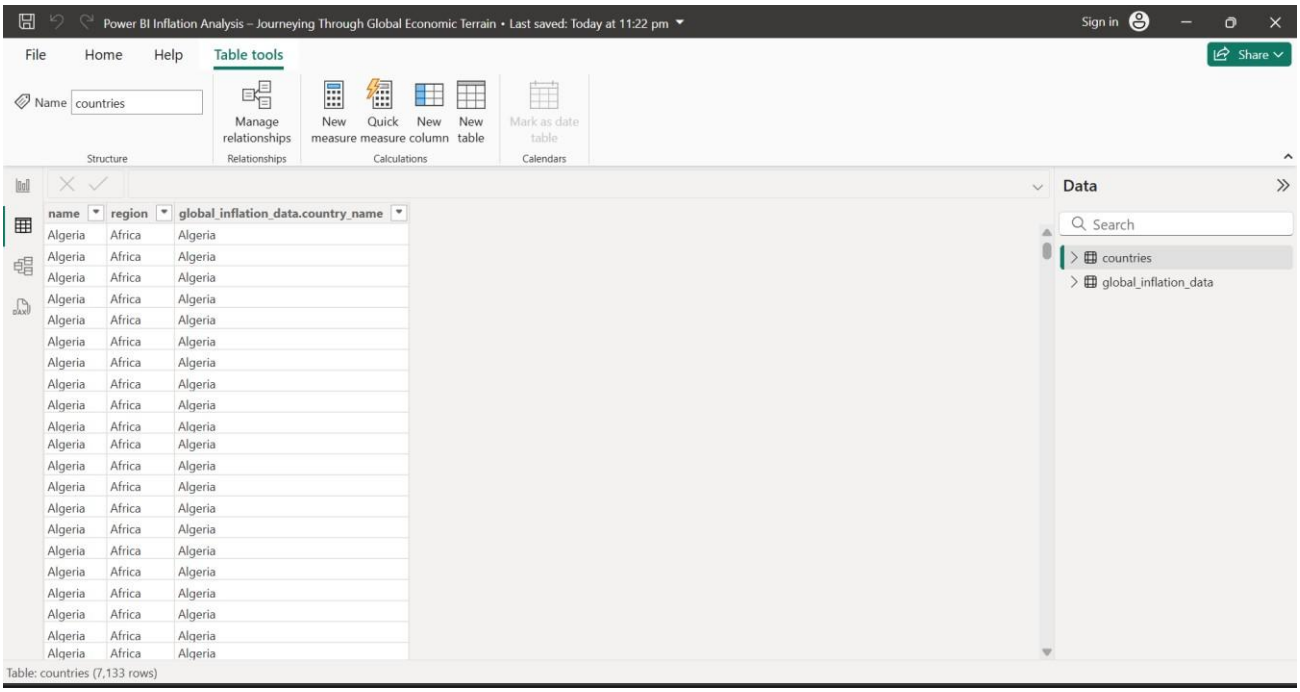
- Inflation rate values with extended decimals were rounded to two decimal places for clarity in visualisation

DATA TRANSFORMATION

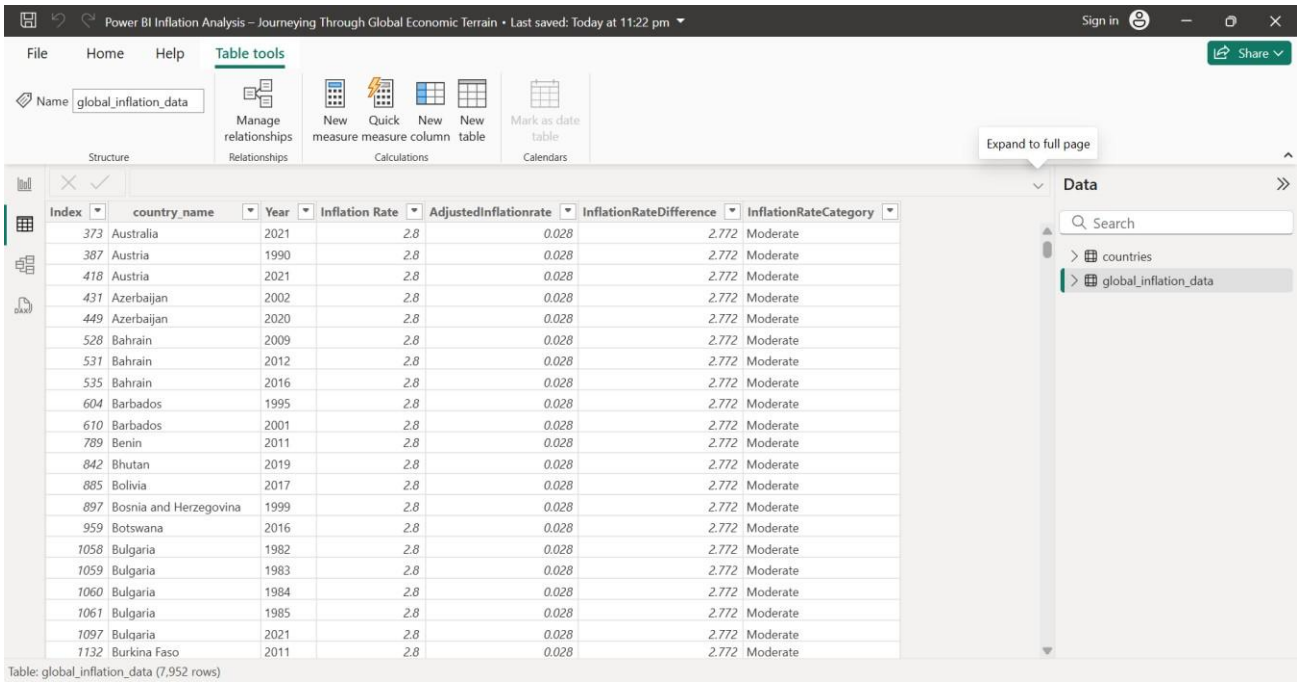
To ensure consistency and analytical compatibility in Power BI, both datasets were transformed and structured into normalized tables, enabling clear relationships and effective filtering. Column names were standardized, and country and region mappings were consolidated to ensure clean joins and accurate insights.

- The inflation dataset was transformed into a **Country_Table**, and the country metadata file into a **Region_Table**.
- Unpivoting operations were applied where necessary to convert wide-format data into a tidy, long-format structure.
- Column headers like InflationRateCategory, Adjusted Inflation Rate, and Country were cleaned and standardized.
- Relationships between the **Country_Table** and **Region_Table** were established using shared country keys and index columns.

Country_Table:



Global_Inflation_Table:



Index	country_name	Year	Inflation Rate	AdjustedInflationrate	InflationRateDifference	InflationRateCategory
373	Australia	2021	2.8	0.028	2.772	Moderate
387	Austria	1990	2.8	0.028	2.772	Moderate
418	Austria	2021	2.8	0.028	2.772	Moderate
431	Azerbaijan	2002	2.8	0.028	2.772	Moderate
449	Azerbaijan	2020	2.8	0.028	2.772	Moderate
528	Bahrain	2009	2.8	0.028	2.772	Moderate
531	Bahrain	2012	2.8	0.028	2.772	Moderate
535	Bahrain	2016	2.8	0.028	2.772	Moderate
604	Barbados	1995	2.8	0.028	2.772	Moderate
610	Barbados	2001	2.8	0.028	2.772	Moderate
789	Benin	2011	2.8	0.028	2.772	Moderate
842	Bhutan	2019	2.8	0.028	2.772	Moderate
885	Bolivia	2017	2.8	0.028	2.772	Moderate
897	Bosnia and Herzegovina	1999	2.8	0.028	2.772	Moderate
959	Botswana	2016	2.8	0.028	2.772	Moderate
1058	Bulgaria	1982	2.8	0.028	2.772	Moderate
1059	Bulgaria	1983	2.8	0.028	2.772	Moderate
1060	Bulgaria	1984	2.8	0.028	2.772	Moderate
1061	Bulgaria	1985	2.8	0.028	2.772	Moderate
1097	Bulgaria	2021	2.8	0.028	2.772	Moderate
1132	Burkina Faso	2011	2.8	0.028	2.772	Moderate

MILESTONE 3: DATA VISUALIZATION

Data visualization is the process of creating graphical representations of data to help people understand 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 visualization can help people identify patterns, trends, and outliers quickly in the data.

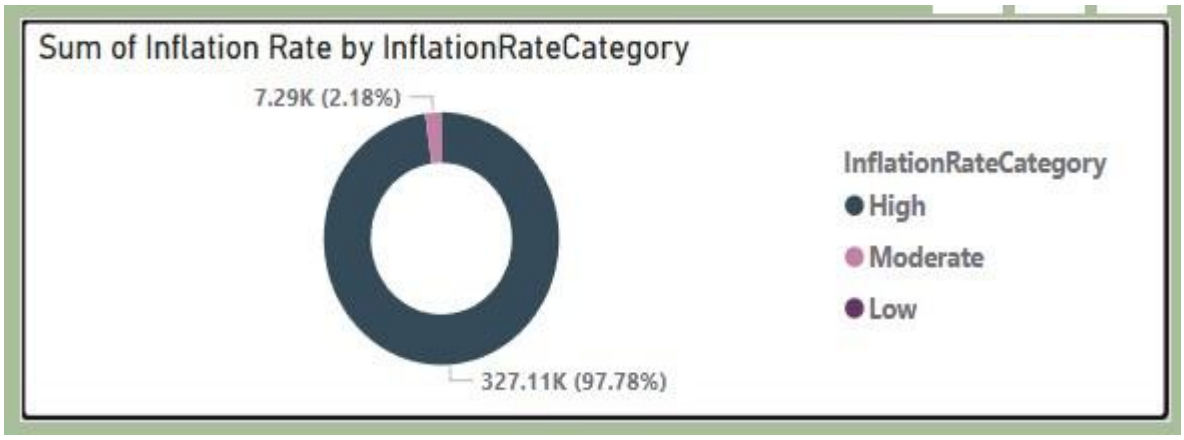
Number of unique visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze include bar charts, line charts, heat maps, scatter plots, pie charts, maps, etc. These visualizations can be used to compare, and track changes over time, show distribution, relationships between variables, breakdown of one category, and much more.

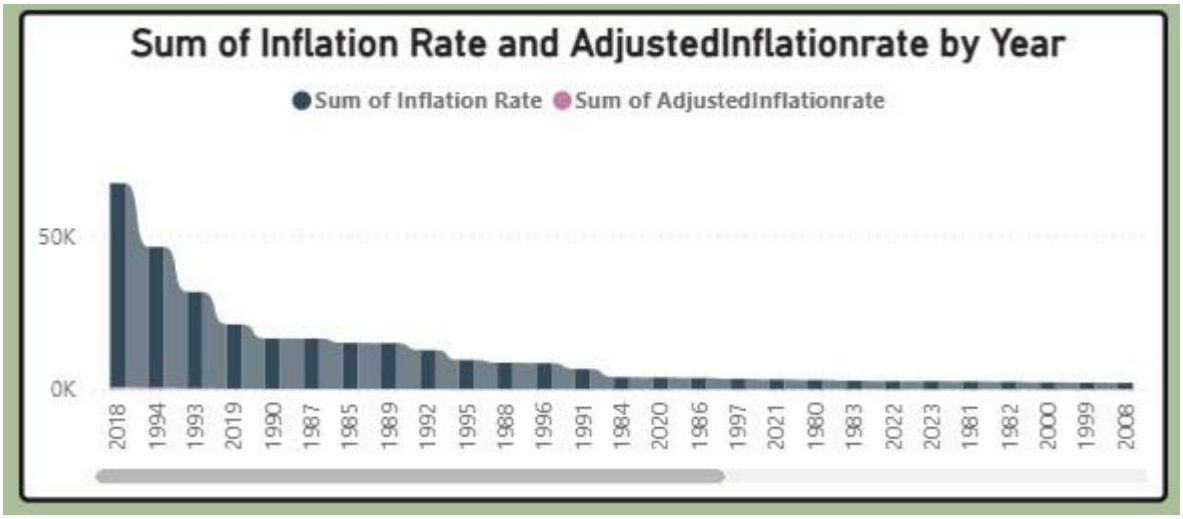
Average Inflation Rate

Maximum Inflation Rate

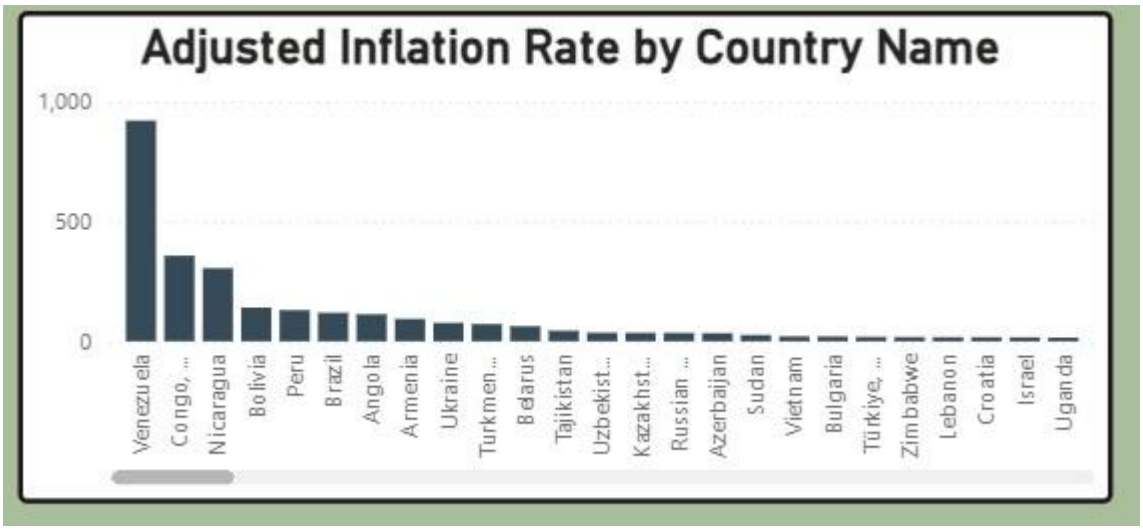
Inflation Rate Category



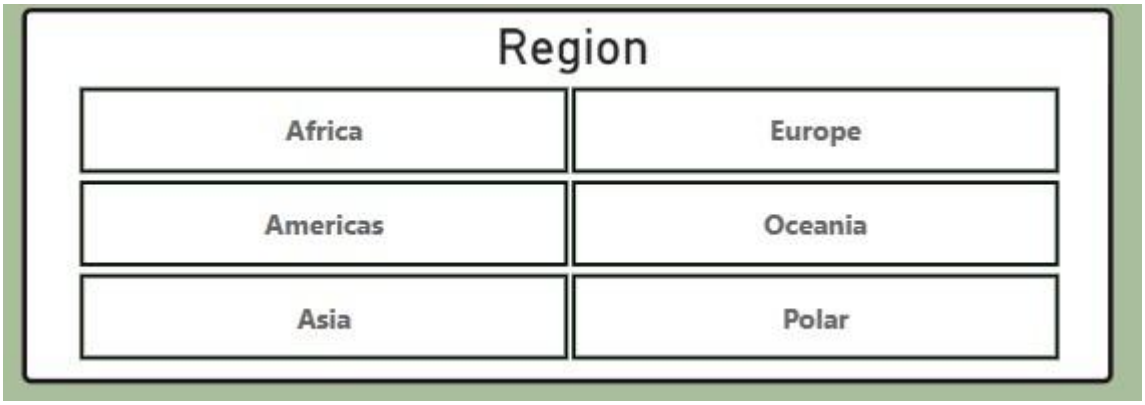
Total & Adjusted Inflation Rate



Adjusted Inflation Rate



Region

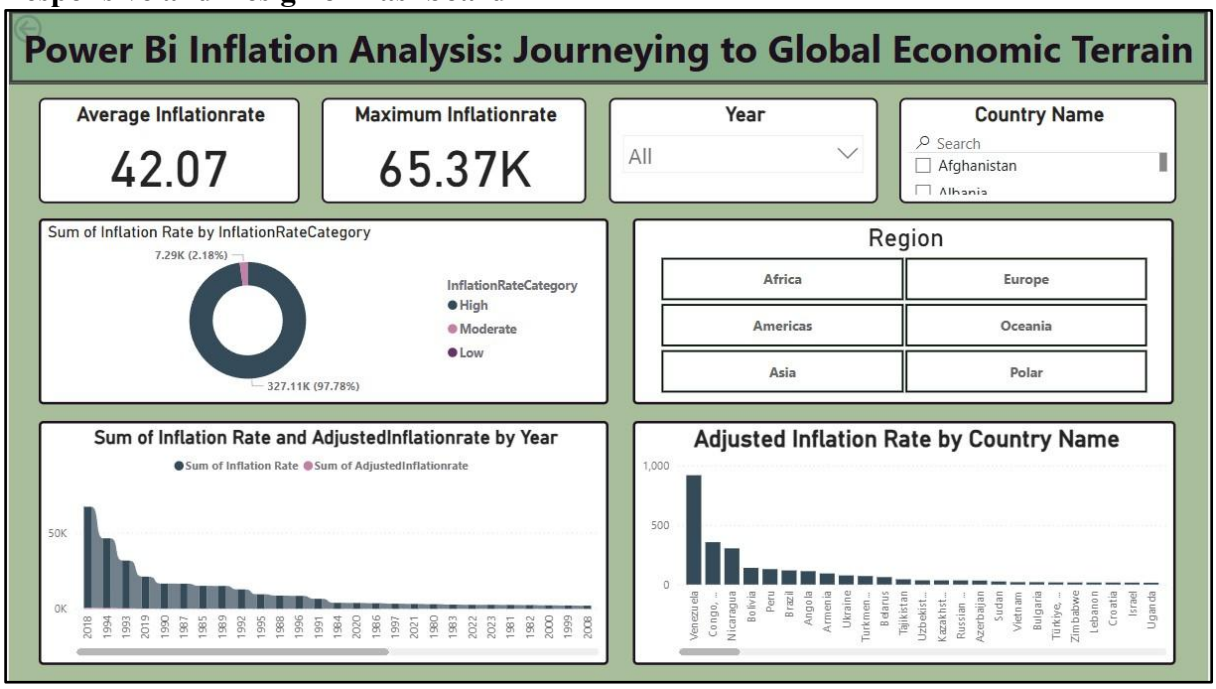


Year

MILESTONE 4: DASHBOARD

A dashboard is a graphical user interface (GUI) that displays information and data in an organized and easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data. They 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.

Responsive and Design of Dashboard



- **Average Inflation Rate: The average inflation rate globally is 42.07, derived from historical CPI data across countries from 1960 to 2023.**

- **Maximum Inflation Rate: The highest recorded inflation rate in the dataset is 65.37K, attributed to countries experiencing hyperinflation episodes such as Venezuela and Zimbabwe.**
- **Category-Wise Breakdown: A donut chart categorizes inflation rates into High, Moderate, and Low, showing that a majority of countries fall under the moderate inflation bracket, indicating a manageable economic environment globally.**

- **Time-Based Trends: A column chart shows the sum of inflation rate and adjusted inflation rate over years, highlighting economic crises such as the early 1980s inflation spike, 2008 global recession, and COVID-19 impact in recent years.**

- **Country-Wise Comparison: A bar chart ranks countries by adjusted inflation rate, revealing that Venezuela, Congo, Nicaragua, and Bolivia have had persistently high inflation in the modern period.**

- **Interactive Filtering: Users can interactively filter by Year, Country, and Region (Africa, Asia, Europe, Americas, Oceania, Polar) to examine localized inflation patterns and compare between countries or continents.**

- **User Interface and Layout: The dashboard adopts a clean layout with bold KPIs on the top, category distribution visuals in the center, and trend/deviation charts at the bottom. Buttons and slicers make the experience dynamic and insightful for business users, students, and policymakers.**

Conclusion:

The project *Power BI Inflation Analysis – Journeying Through Global Economic Terrain* successfully leveraged data visualization techniques to decode complex global inflation patterns and trends. By integrating inflation data from Kaggle with country metadata from GitHub, the project enabled a regionally segmented, time-series view of inflation dynamics across decades.

Through the creation of interactive dashboards in Power BI, key economic insights were uncovered—such as countries with the highest inflation volatility, regional trends over time, and the classification of nations based on inflation severity. The use of slicers, KPI cards, time-series charts, and categorical visuals made it possible to draw comparisons and facilitate informed decision-making for diverse user groups including policymakers, analysts, researchers, and students.

The project demonstrated how historical inflation data, when combined with robust visualization tools, can support strategic economic planning and awareness. It highlighted the importance of clean data preparation, effective modelling, and visual storytelling in transforming raw datasets into meaningful insights.

As inflation remains a critical concern in global economic discourse, this analytical framework can serve as a valuable tool for real-time monitoring, economic forecasting, and academic exploration. The methodology used can be extended further with real-time data sources, integration with macroeconomic indicators (GDP, interest rates, unemployment), or country-specific case studies.

MILESTONE 7: PROJECT DEMONSTRATION & DOCUMENTATION