D Y Patil Agriculture & Technical University

Talsande

Power BI Inflation Analysis : Journeying Through Global Economic Terrain

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1. INTRODUCTION

1.1 Project Overview

This Power BI project aims to analyze and visualize global inflation trends, exploring key economic indicators such as Consumer Price Index (CPI), interest rates, and commodity prices across different countries and regions. The objective is to provide clear insights into inflationary patterns, economic stability, and major driving factors.

The project involves data collection from reliable sources, data transformation, and modeling in Power BI to create interactive dashboards. These dashboards will offer real-time and historical insights, enabling stakeholders to understand global economic shifts and make data-driven decisions.

The outcome will include predictive analytics, regional comparisons, and key economic insights to navigate inflation challenges effectively.

1.2 Purpose

The purpose of this Power BI Inflation Analysis is to provide a comprehensive understanding of global inflation trends and their economic impact across different regions. This project aims to analyze key economic indicators such as Consumer Price Index (CPI), interest rates, and commodity prices to uncover the driving factors behind inflation.

By leveraging Power BI's data visualization capabilities, the project will deliver interactive dashboards that offer clear insights into inflation patterns, economic stability, and future trend predictions. The goal is to empower policymakers, businesses, and economic analysts with data-driven insights to make informed decisions, navigate economic uncertainties, and plan strategically for sustainable growth amidst inflation challenges.

2. IDEATION PHASE

2.1 Problem Statement

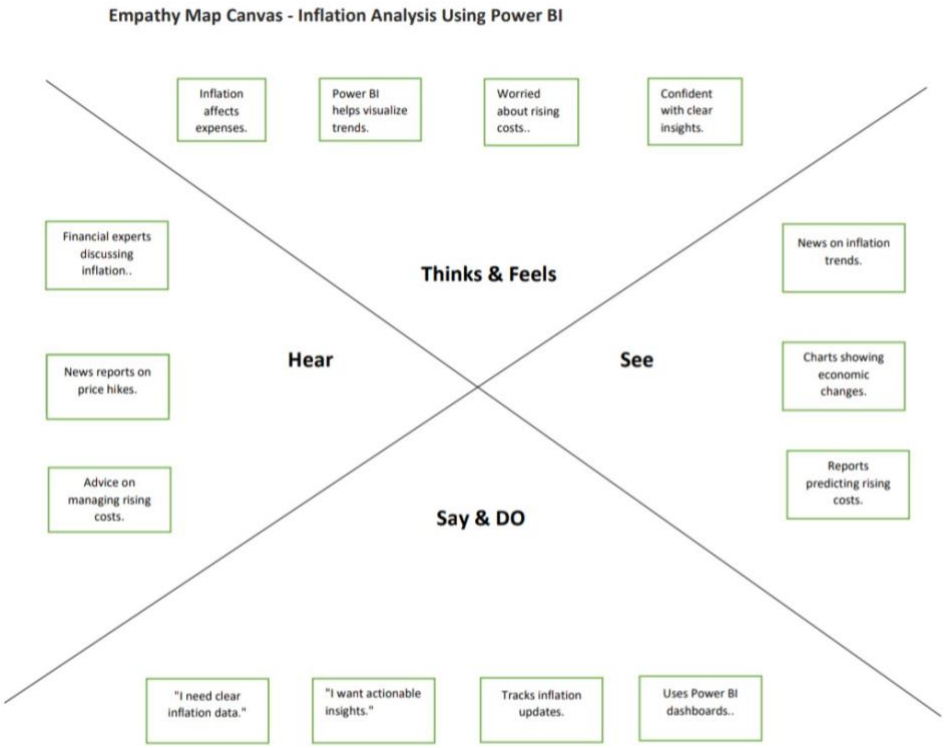
Rising inflation across the globe has significantly impacted economies, affecting the cost of living, purchasing power, and economic stability. However, understanding and analyzing global inflation trends is challenging due to complex and scattered data.

This project aims to solve this problem by using Power BI to transform raw economic data into interactive dashboards, providing clear insights into:

- Global Inflation Trends.
- Key Economic Drivers (CPI, interest rates, commodity prices).
- Regional Comparisons.

- Future Inflation Predictions.

2.2 Empathy Map Canvas



Pain:

Hard to understand data.

Difficult trend identification.

Unclear economic insights.

Gain:

Clear visual trends.

Easy financial planning.

Improved decision-making.

2.3 Brainstorming

Brainstorming: Power BI Inflation Analysis – Journeying Through Global Economic Terrain

The brainstorming phase focuses on generating ideas to develop an interactive Power BI dashboard for analyzing global inflation trends.

Key Ideas:

1. Data Sources: Collect data from World Bank, IMF, Government Portals, and Trading Economics**.**
2. Key Metrics: Analyze Inflation Rate, CPI, Interest Rates, Cost of Living, and Commodity Prices**.**
3. Visualizations: Use line charts, bar graphs, maps, and predictive analytics to show inflation trends and future forecasts.
4. User Experience**:** Design a simple, interactive dashboard with filtering options for region, time, and economic indicators**.**
5. Challenges: Ensure data accuracy, real-time updates, and smooth performance for large datasets.
6. Outcome: Provide clear insights, real-time analysis, and future trend predictions to help stakeholders make informed economic decisions.

3. REQUIREMENT ANALYSIS

1. Overview

The project aims to develop an interactive Power BI dashboard to analyse global inflation trends, factors influencing inflation, and economic impacts.

2. Stakeholders

Economic Analysts, Policy Makers, Investors, Researchers, and General Public.

3. Scope

In-Scope:

- Data from sources like World Bank, IMF, and central banks.

- Interactive visualizations (charts, heatmaps, trends).
- Macroeconomic indicators (GDP, interest rates, exchange rates, etc.).
- Comparisons across regions and time periods.

Out-of-Scope:

- Predictive modeling, real-time trading, and microeconomic industry analysis.

4. Key Functionalities

- Data integration from multiple sources.
- Filtering, drill-down, and comparative analysis.
- Exporting insights to PDF/Excel.

5. Non-Functional Requirements

- Fast performance, scalability, security, and user-friendly design.

6. Risks & Mitigation

Risk	Mitigation Strategy
Data inconsistency	Cross-check multiple sources
Performance issues	Optimize queries & data modeling
Stakeholder adoption	Provide training & documentation

7. Success Criteria

- Accurate data integration, insightful visualizations, and positive user feedback.

8. Next Steps

- Finalize data sources, develop prototype, gather feedback, and refine dashboard.

3.1 Customer Journey map

Empathy Map Canvas: Power BI Inflation Analysis – Journeying Through Global Economic Terrain The **Empathy Map Canvas** helps to understand the needs, feelings, and behaviors of stakeholders (such as policymakers, business leaders, economists, and financial analysts) who will benefit from the Power BI Inflation Analysis.

Empathy Map Section	Description

Who are empathizing wit	Policymakers, Business Leaders, Financial Analysts, Economists, and Decision-makers dealing with global economic challenges.
What do they to do?	Understand inflation trends, analyze key economic drivers, compare regional data, predict future trends, and make data-driven decisions to minimize inflation impact.
What do they se	Increasing prices, economic instability, fluctuating interest rates, rising commodity prices, and global inflation trends.
What do they sa	"We need clear insights to understand inflation patterns," "We must take action to control rising prices," "Data-driven decisions can help us plan better."
What do they d	Analyze economic reports, review financial data, make policy changes, monitor economic trends, and plan budgetary allocations.
What do they h	News about rising inflation, expert opinions on economic instability, and public concerns about increasing costs of living.
Pain P (Challenges)	Difficulty in analyzing vast economic data, lack of clear and real-time insights, inability to predict future trends, and limited visualization tools.
Gains (Solution	Access to clear, interactive dashboards with real-time data, predictive insights, and simplified understanding of global inflation patterns using Power BI.

The **Empathy Map Canvas** ensures that the Power BI Inflation Analysis is designed to address the core challenges faced by stakeholders and provides them with valuable insights for informed decisionmaking.

3.2 Solution Requirement

1. Data Requirements:

- Collect data from World Bank, IMF, Government Portals, and Trading Economics.
- Include Inflation Rate, CPI, Interest Rates, Commodity Prices, and Cost of Living Index.

2. Functional Requirements:

- Create interactive dashboards with charts, maps, and graphs.
- Enable filtering by country, year, and economic indicators.
- Allow report generation (PDF/Excel) for decision-makers.

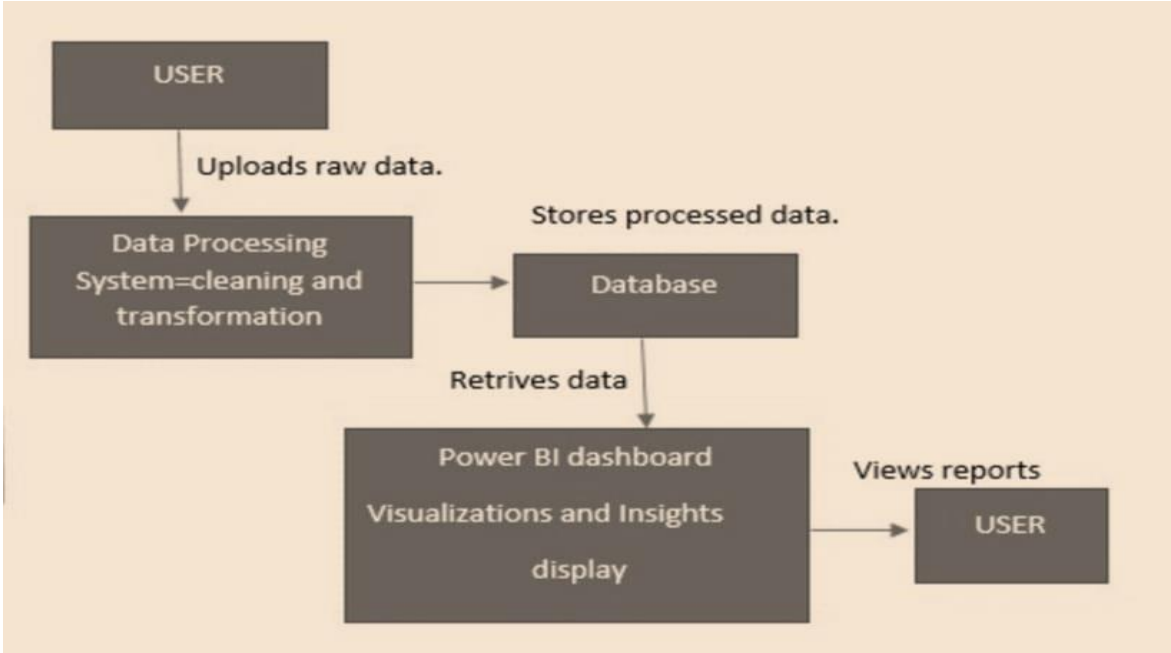
3. Non-Functional Requirements:

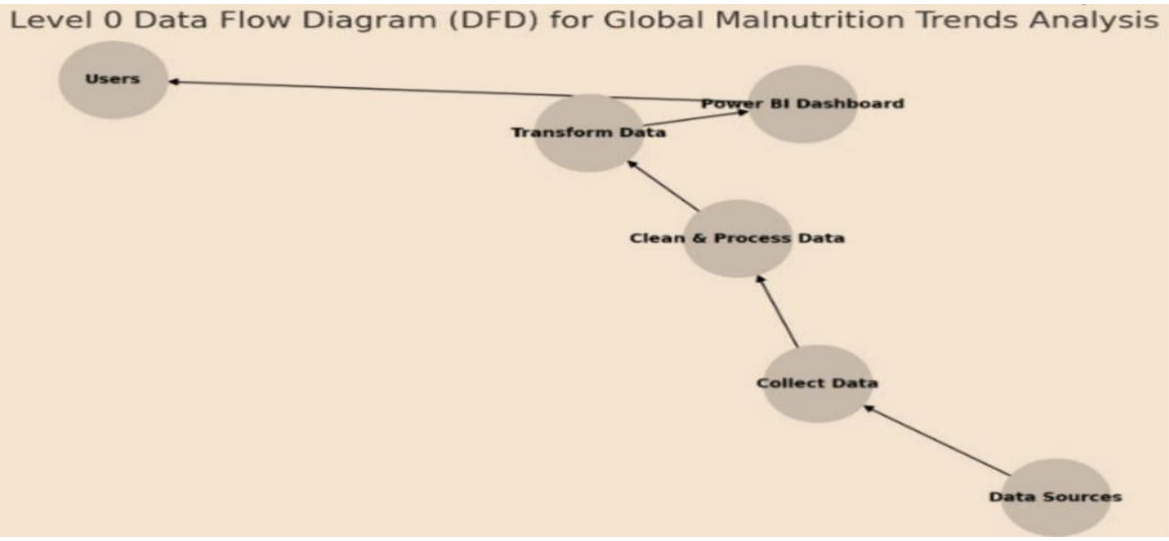
- Ensure fast loading, accurate data, and easy navigation.
- Provide real-time data updates and maintain data security.

4. Business Requirements:

- Deliver clear insights into global inflation trends.
- Support data-driven decision-making for policymakers and businesses.

3.3 Data Flow Diagram





3.4 **Technology Stack**

The Technology Stack outlines the tools, platforms, and technologies required to develop and deploy the Power BI Inflation Analysis Dashboard.

1. Data Sources:

- World Bank, IMF, Government Portals, Trading Economics, Open Data APIs.
- File Formats: CSV, Excel, API Integration, SQL Databases.

2. Data Processing Tools:

- Power Query (Power BI) – For data cleaning, transformation, and modeling.
- DAX (Data Analysis Expressions) – For creating custom calculations and measures.

3. Visualization Tool:

- Power BI Desktop / Power BI Service – For creating interactive dashboards, visualizations, and reports.

4. Data Storage (Optional):

- SQL Database / Azure SQL / Google BigQuery – For storing large datasets (if required).

5. Deployment Platform:

- Power BI Service (Cloud) – For publishing and sharing dashboards with stakeholders.
- Power BI Mobile App – For mobile access to dashboards.

6. Security:

- Power BI Row-Level Security (RLS) – To control data access based on user roles.
- Azure Active Directory (Optional) – For user authentication and access control.

4. PROJECT DESIGN

4.1 Problem Solution Fit

Problem:

- Difficulty in understanding global inflation trends.
- Lack of real-time data and clear visualizations.
- No easy way to compare inflation across countries/regions.

Solution:

- Develop an interactive Power BI Dashboard with real-time data.
- Provide clear visualizations, comparisons, and predictive insights.
- Help stakeholders make data-driven decisions based on inflation trends.

4.2 Proposed Solution

The proposed solution is to develop an interactive Power BI Dashboard that provides real-time insights into global inflation trends**.** It will help policymakers, businesses, and analysts to:

1. **Track inflation rates** across different countries.
2. **Visualize data** using charts, graphs, and maps.
3. **Compare and filter data** by region, time, and economic factors.
4. **Predict future trends** based on historical data.
5. **Generate reports** for easy decision-making.

4.3 Solution Architecture

The Solution Architecture outlines the flow of data and components involved in building the Power BI Inflation Analysis Dashboard. It ensures seamless data integration, processing, visualization, and reporting.

1. Data Sources:

- Collect data from World Bank, IMF, Government Portals, and Trading Economics.
- Data formats: CSV, Excel, API, SQL Database.

2. Data Ingestion:

- Import data into Power BI using Power Query for data transformation.
- Clean and organize data for analysis.

3. Data Processing:

- Use DAX (Data Analysis Expressions) to create measures, calculations, and KPIs.
- Perform data modeling for efficient analysis.

4.Data Visualization:

- Design interactive dashboards with charts, graphs, maps, and filters.
- Provide insights into inflation rates, CPI, interest rates, and commodity prices.

5. Data Output:

- Generate real-time reports (PDF/Excel) for stakeholders.
- Enable real-time data updates and future trend predictions.

6. Deployment:

- Publish the dashboard on Power BI Service (Cloud) for sharing and access.
- Provide mobile access through the Power BI Mobile App.

6. PROJECT PLANNING & SCHEDULING

6.1 Project Planning

The project planning outlines the key steps to develop the Power BI Inflation Analysis Dashboard:

1. Requirement Gathering (Week 1): Identify goals, data sources, and key metrics.
2. Data Collection (Week 2-3): Gather and clean data from reliable sources.
3. Dashboard Design (Week 4-5): Create interactive dashboards with charts, maps, and filters.
4. Testing (Week 6): Test data accuracy, performance, and visualizations.
5. Deployment (Week 7): Publish the dashboard on Power BI Service.
6. Review (Week 8): Collect feedback and make improvements.

7. FUNCTIONAL AND PERFORMANCE TESTING

7.1 Performance Testing

Performance Testing ensures that the Power BI Dashboard works efficiently with large datasets and provides fast, accurate insights without delays.

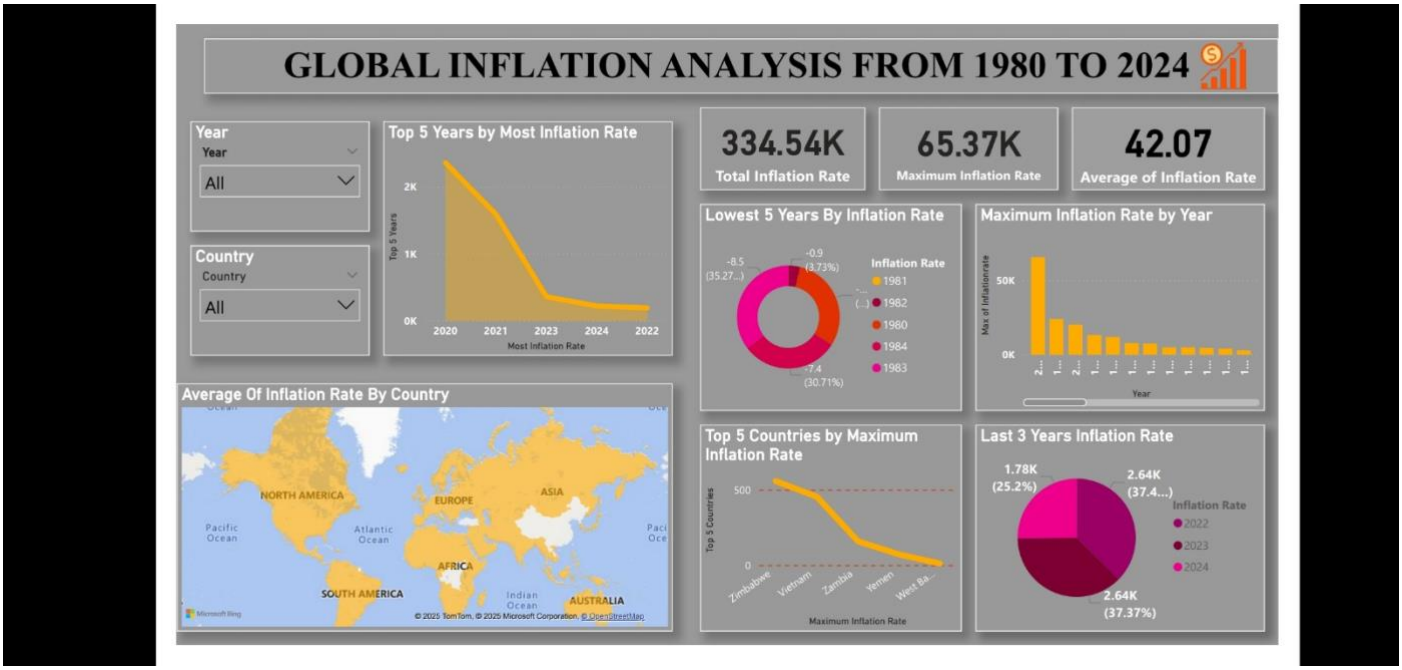
Key Areas Tested:

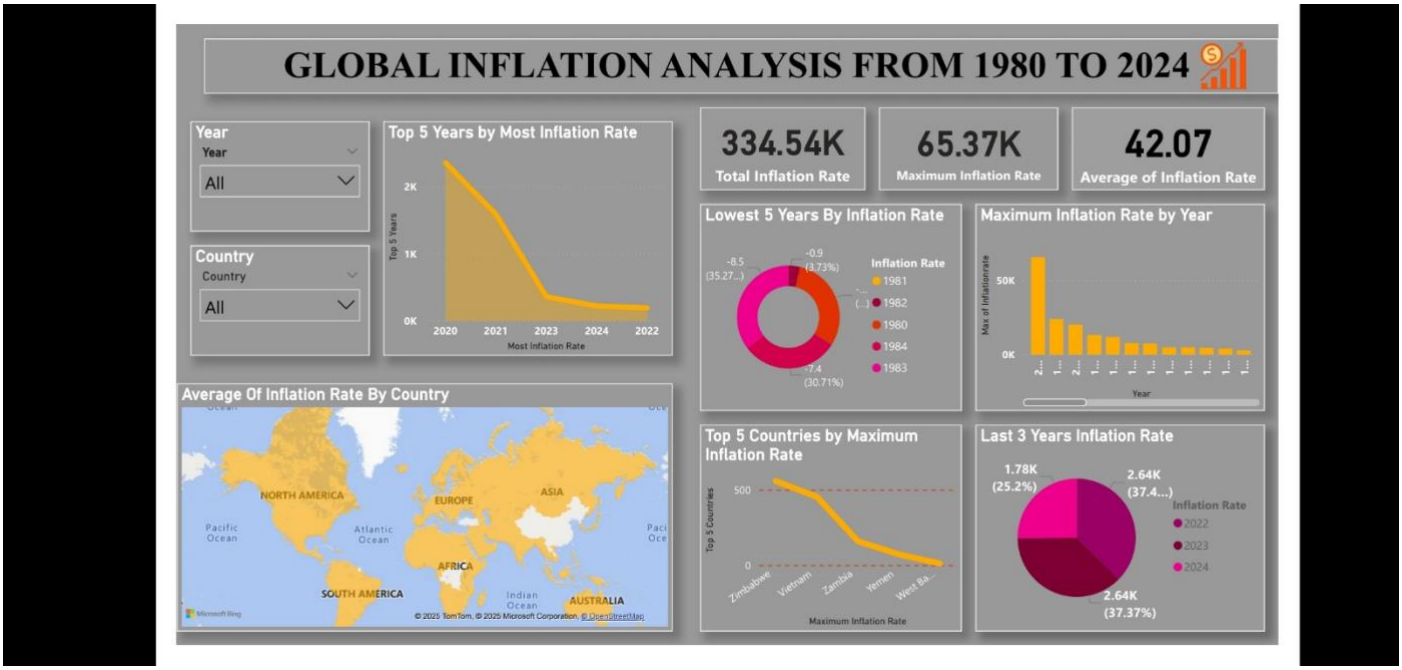
1. **Data Load Time:** Measure how quickly the dashboard loads large datasets.
2. **Refresh Rate:** Test how fast the dashboard updates when new data is added.
3. **Visualization Speed:** Ensure charts, graphs, and maps display data without lag.
4. **Data Processing Time:** Check the time taken for calculations, filters, and comparisons.
5. **User Experience:** Verify smooth navigation and response time during dashboard interaction.

8.

RESULTS

8.1 Output Screenshots





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ADVANTAGES & DISADVANTAGES

Advantages:

1. Real-time Insights: Provides up-to-date inflation data from reliable sources.
2. Data Visualization: Offers clear and interactive charts, graphs, and maps for better understanding.
3. Easy Comparison: Allows comparison of inflation rates, CPI, and economic indicators across countries/regions.
4. Predictive Analysis: Helps forecast future inflation trends for decision-making.
5. User-friendly Interface: Simple navigation and easy access to insights. 6. Report Generation: Allows downloading reports in PDF/Excel format.

Disadvantages:

1. Data Dependency: Relies on external data sources, which may sometimes have delays or inaccuracies.
2. Limited Customization: Customizing the dashboard design or layout may be limited in Power BI.
3. Data Size Limitations: Handling extremely large datasets may slow down performance.
4. Internet Dependency: Requires internet connectivity for real-time data updates and dashboard access.
5. Technical Skills Required: Users may need basic Power BI knowledge to use advanced features effectively.

CONCLUSION

The Power BI Inflation Analysis Dashboard provides a comprehensive and real-time view of global inflation trends, helping policymakers, businesses, and analysts make informed economic decisions. With interactive

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visualizations, predictive analysis, and easy data comparison, users can effectively track inflation rates, CPI, interest rates, and commodity prices across different countries and regions.

Despite minor challenges like data dependency and internet access, the dashboard offers accurate insights, future predictions, and downloadable reports, ensuring better economic planning. This solution plays a crucial role in understanding and analyzing global economic trends.

11. FUTURE SCOPE

The Power BI Inflation Analysis Dashboard has the potential for further improvements to provide more advanced insights and better user experience.

1. AI & Machine Learning Integration: Implement AI models for more accurate inflation trend predictions and future forecasting.
2. Expanded Data Sources: Integrate with more global economic databases for broader and real-time data coverage.
3. Mobile Optimization: Enhance the dashboard's mobile accessibility for easy access on smartphones and tablets.
4. Advanced Analytics: Incorporate what-if analysis and advanced data modeling for better decisionmaking.
5. User Role Access: Provide role-based access control for different user levels like analysts, policymakers, and business leaders.
6. Global Economic Insights: Extend the dashboard to cover other economic factors like unemployment, GDP, exchange rates, etc.

12. APPENDIX

Dataset Link : https://easyupload.io/bzwuaf GitHub

& Project Demo Link :