

A Report
On
**Power BI Inflation Analysis: Journeying Through Global Economic
Terrain**

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1.INTRODUCTION

1.1 Project Overview

Inflation, the rate at which the general price level of goods and services rises over time, significantly impacts economies worldwide. This Power BI dashboard provides a comprehensive analysis of global inflation trends, offering insights into inflation rates, regional variations, and trends over the years. The dashboard aims to enable data-driven decision-making by visualizing inflationary changes and their economic implications across various regions and countries.

1.2 Purpose

The primary objectives of this project are:

- To analyze the average inflation rate across all countries.
- Identify countries with the highest inflation rates.
- Visualize the number of distinct economic regions.
- Observe inflation rate changes over the years.
- Categorize and distribute inflation rates for better analysis.
- Implement filters for country-wise data analysis.
- Compare inflation and adjusted inflation rates over time.
- Identify top 3 countries with the highest inflation rates

2.IDEATION PHASE

2.1 Problem Statement

I am	Describe customer with 3-4 key characteristics - who are they?	A Business owner
I'm trying to	List their customer or "job" the care about - what are they trying to achieve?	forecast inflation trends to adjust pricing strategies and manage operational costs
But	Describe what problems or barriers stand in the way - what bothers them most?	I lack an intuitive and dynamic tool that allows me to compare inflation rates and their impact on different sectors
Because	Enter the "root cause" of why the problem or barrier exists - what needs to be solved?	existing financial dashboards do not provide comprehensive, real-time visual insights with predictive capabilities
Which makes me feel	Describe the emotions from the customer's point of view - how does it impact them emotionally?	uncertain about financial planning and risk management, leading to potential revenue loss

I am	I'm trying to	But	Because	Which makes me feel
a Business Owner	forecast inflation trends	I lack an intuitive and dynamic tool	existing financial dashboards do not provide capabilities	uncertain

Understanding global inflation trends is crucial for economic planning and decision-making. The challenge is to analyze inflation rates across different countries and time periods to extract meaningful insights.

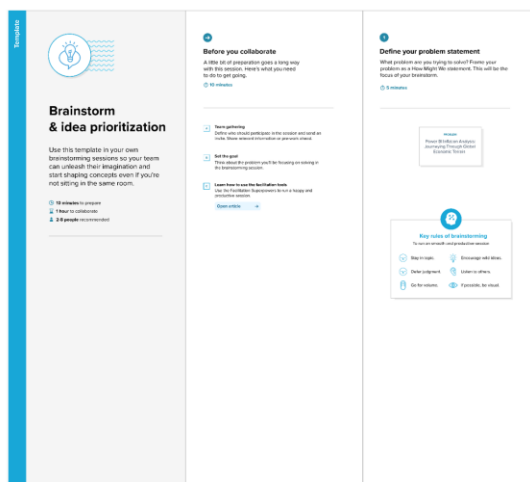
2.2 Empathy Map Canvas

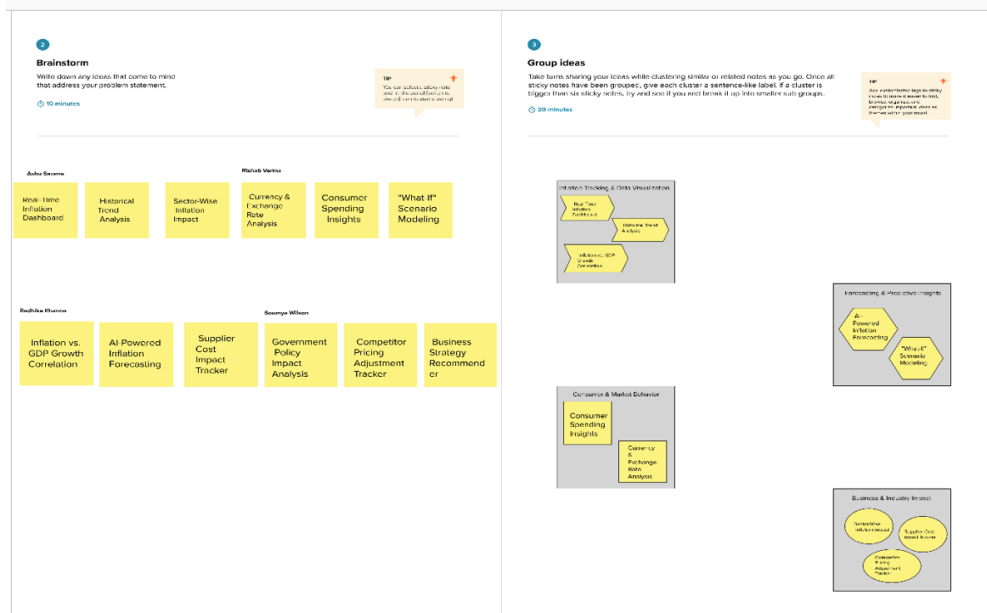
Empathy Map



A structured framework was used to understand the perspective of stakeholders, including economists, policymakers, and financial analysts.

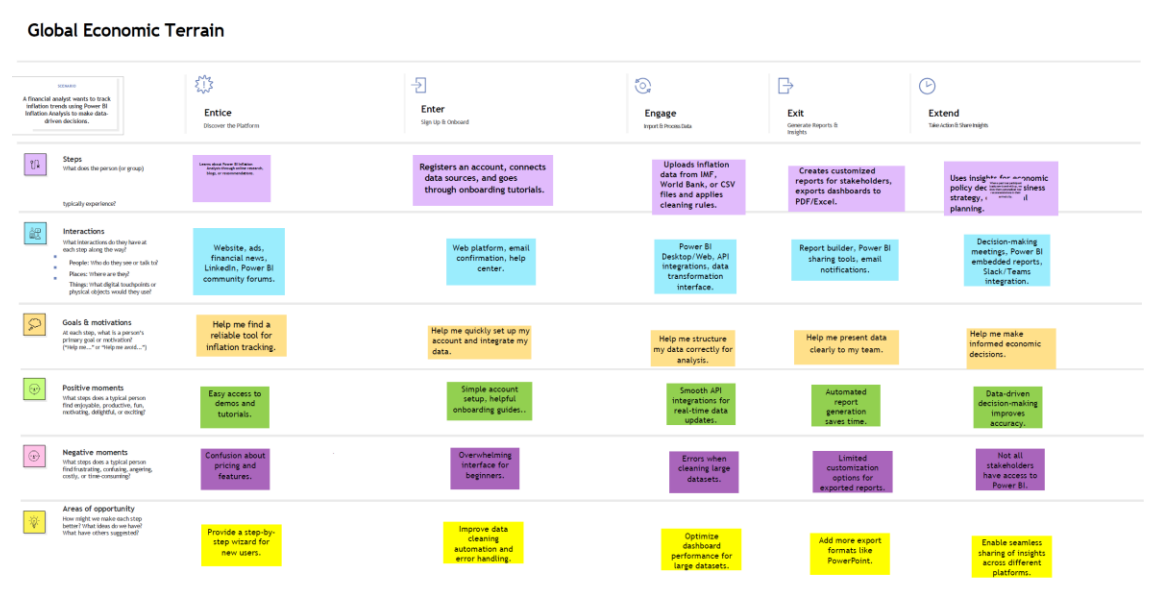
2.1 Brainstorming





3.Requirement Analysis

3.1 Customer Journey Map



Mapping the journey of users interacting with the dashboard, identifying pain points, and improving usability.

3.2 Solution Requirement

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 & Ingestion	Fetch real-time inflation data from IMF, World Bank, and national statistical agencies.
		Allow manual data uploads for custom datasets.
FR-2	Data Processing & Cleaning	Perform data transformation, handling missing values, and normalizing currency values.
		Store processed data in structured databases.
FR-3	Analytical Insights & Forecasting	Apply statistical and machine learning models for inflation trend prediction.
		Compare inflation trends across different regions and time periods.
FR-4	Data Visualization & Dashboards	Develop Power BI dashboards with dynamic filtering and interactive visuals.
		Provide graphical representations such as line charts, heat maps, and bar charts.
FR-5	User Interaction & customization	Allow users to export reports in Excel, PDF, and PowerPoint formats.
		Enable users to set custom alerts for inflation rate thresholds.

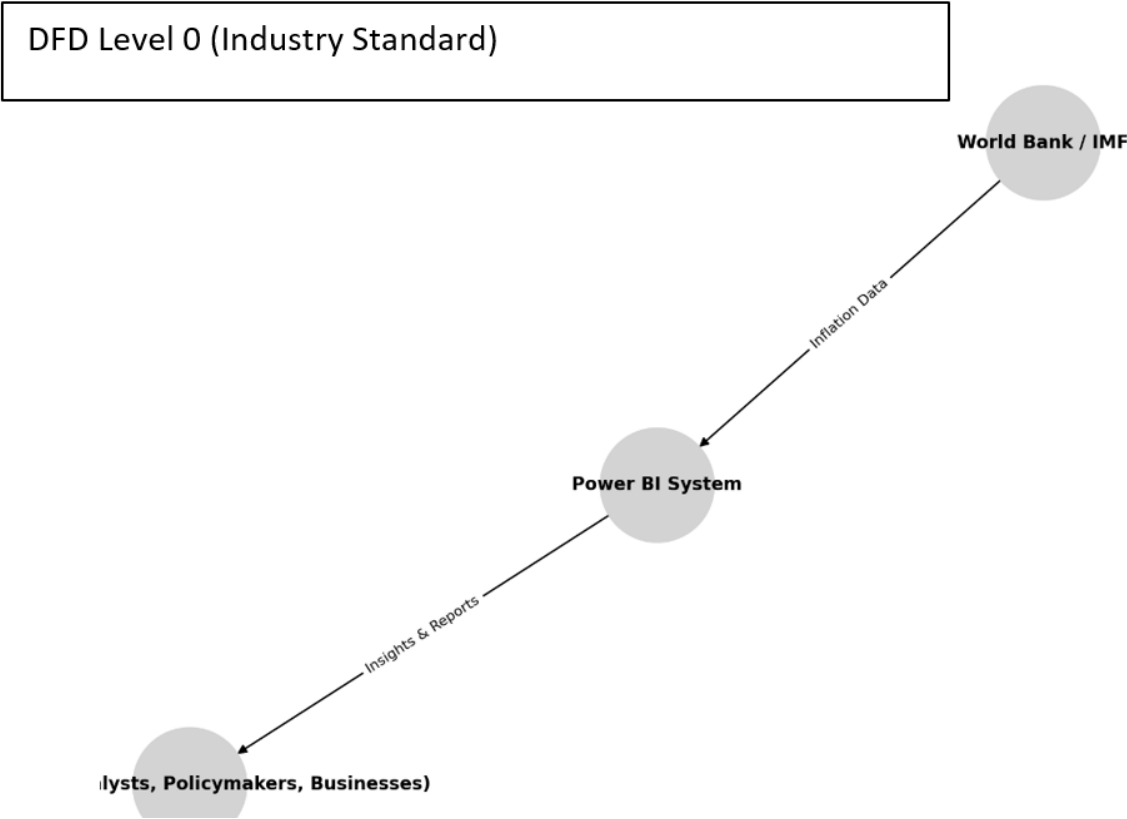
Non-functional Requirements:

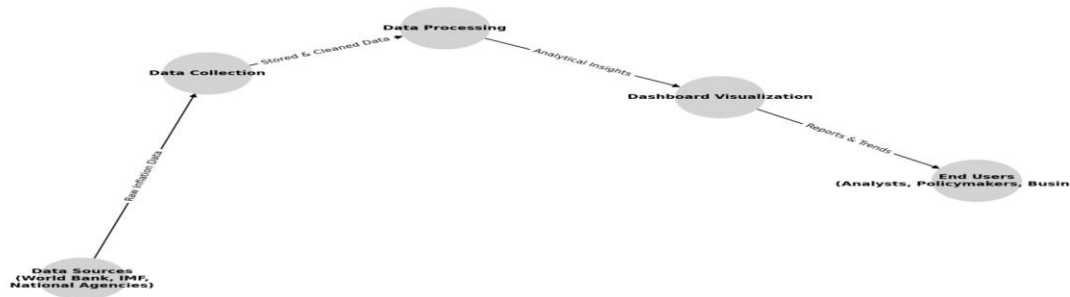
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The dashboard should be user-friendly and provide an intuitive interface for non-technical users.
NFR-2	Security	Data access should be secured using authentication and role-based permissions.
NFR-3	Reliability	The system must ensure accurate and up-to-date inflation data retrieval without downtime.
NFR-4	Performance	Power BI reports should load within 5 seconds for a seamless experience.
NFR-5	Availability	The system should be accessible 24/7 with 99.9% uptime .
NFR-6	Scalability	The solution must handle an increasing volume of data and support new data sources in the future.

Defining the functional and non-functional requirements for the Power BI dashboard.

3.3 Data Flow Diagram





Illustrates the flow of data from raw sources to visualizations, ensuring clarity in processing.

3.4 Technology Stack

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web-based dashboards for inflation insights	HTML, CSS, JavaScript, ReactJS.
2.	Application Logic-1	Data ingestion from external sources (APIs, CSV)	Python, Pandas, Power Query
3.	Application Logic-2	Data cleaning, transformation & storage	SQL, NoSQL, Azure Data Factory
4.	Application Logic-3	Forecasting models for trend analysis	Machine Learning, Python (Scikit-Learn, TensorFlow)
5.	Database	Stores processed inflation data	MySQL, PostgreSQL
6.	Cloud Database	Cloud-hosted database for real-time data	Azure SQL Database, AWS RDS
7.	File Storage	Stores uploaded reports and raw datasets	AWS S3, Azure Blob Storage
8.	External API-1	Fetching inflation data	World Bank API, IMF API
9.	External API-2	Currency exchange rates for normalization	Open Exchange Rates API
10.	Machine Learning Model	Predictive inflation analysis	Scikit-Learn, TensorFlow
11.	Infrastructure (Server / Cloud)	Cloud deployment and data hosting	AWS, Azure, Kubernetes.

- Power BI
- DAX
- SQL
- data preprocessing tools

4. Project Design

4.1 Problem Solution Fit

Define CS, fit into	<div>1. CUSTOMER SEGMENT(S)</div> <div>Who is your customer?</div> <div><div>Financial analysts</div><div>Policymakers</div><div>Business decision-makers</div></div>	<div>6. CUSTOMER</div> <div>What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.</div> <div><div>Limited technical skills in handling complex BI tools.</div><div>High subscription costs for advanced analytics platforms.</div><div>Lack of integration with their existing workflow.</div></div>	<div>5. AVAILABLE SOLUTIONS</div> <div>Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? i.e. pen and paper is an alternative to digital note-taking.</div> <table><thead><tr><th>Solution</th><th>Pros</th><th>Cons</th></tr></thead><tbody><tr><td>Excel / Manual Processing</td><td>Customizable, widely used</td><td>Time-consuming, prone to errors</td></tr><tr><td>Government Reports (IMF, WB)</td><td>Reliable, official data</td><td>Delayed updates, not real-time</td></tr><tr><td>Standalone BI Tools</td><td>Interactive dashboards, some automation</td><td>Lack of economic-specific forecasting</td></tr></tbody></table>	Solution	Pros	Cons	Excel / Manual Processing	Customizable, widely used	Time-consuming, prone to errors	Government Reports (IMF, WB)	Reliable, official data	Delayed updates, not real-time	Standalone BI Tools	Interactive dashboards, some automation	Lack of economic-specific forecasting
	Solution	Pros	Cons												
Excel / Manual Processing	Customizable, widely used	Time-consuming, prone to errors													
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Standalone BI Tools	Interactive dashboards, some automation	Lack of economic-specific forecasting													
Focus on J&P, tap into BE, understand	<div>2. JOBS-TO-BE-DONE / PROBLEMS</div> <div>Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.</div> <div><div>Tracking inflation trends across multiple regions.</div><div>Time-consuming manual data processing.</div><div>Lack of predictive models for inflation forecasting.</div><div>Difficulty in sharing real-time insights.</div></div>	<div>9. PROBLEM ROOT CAUSE</div> <div>What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.</div> <div><div>Inflation data is scattered across multiple unreliable sources.</div><div>Manual processes are outdated and inefficient.</div><div>Limited access to AI-driven forecasting tools for inflation analysis.</div></div>	<div>7. BEHAVIOUR</div> <div>What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer; calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)</div> <div><div>Search for economic reports from IMF, World Bank, and government websites.</div><div>Manually compile inflation data into Excel spreadsheets.</div><div>Use Power BI or Tableau for basic visualizations without forecasting.</div></div>												
Identify strong IR & EM	<div>3. TRIGGERS</div> <div>What triggers customers to act? i.e. seeing their neighbour installing solar panels; reading about a more efficient solution in the news.</div> <div><div>Economic uncertainty and inflation volatility.</div><div>Regulatory requirements for inflation monitoring.</div><div>Business planning needs (pricing, investments, supply chain).</div><div>Media reports on inflation impacting industries.</div></div>	<div>10. YOUR SOLUTION</div> <div>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.</div> <div><div>Automates data collection from IMF, World Bank, and national agencies.</div><div>Processes and cleans data with Power BI's advanced transformation tools.</div><div>Uses AI-powered models to forecast inflation trends.</div><div>Provides real-time, interactive dashboards for easy sharing and decision-making.</div></div>	<div>8. CHANNELS OF BEHAVIOUR</div> <div>What kind of actions do customers take online? Extract online channels from #7 and use them for customer development.</div> <div><div>Government economic dashboards.</div><div>Business news and financial blogs.</div><div>LinkedIn discussions on economic trends.</div><div>Power BI online training materials.</div></div> <div>What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</div> <div><div>Economic policy meetings.</div><div>Financial analyst conferences.</div><div>Business networking events.</div></div>												

Define CS, fit into

Focus on J&P, tap into BE, understand

Identify strong IR & EM

Explore AS.

Focus on J&P, tap into BE, understand

Extract online & offline CH of BE

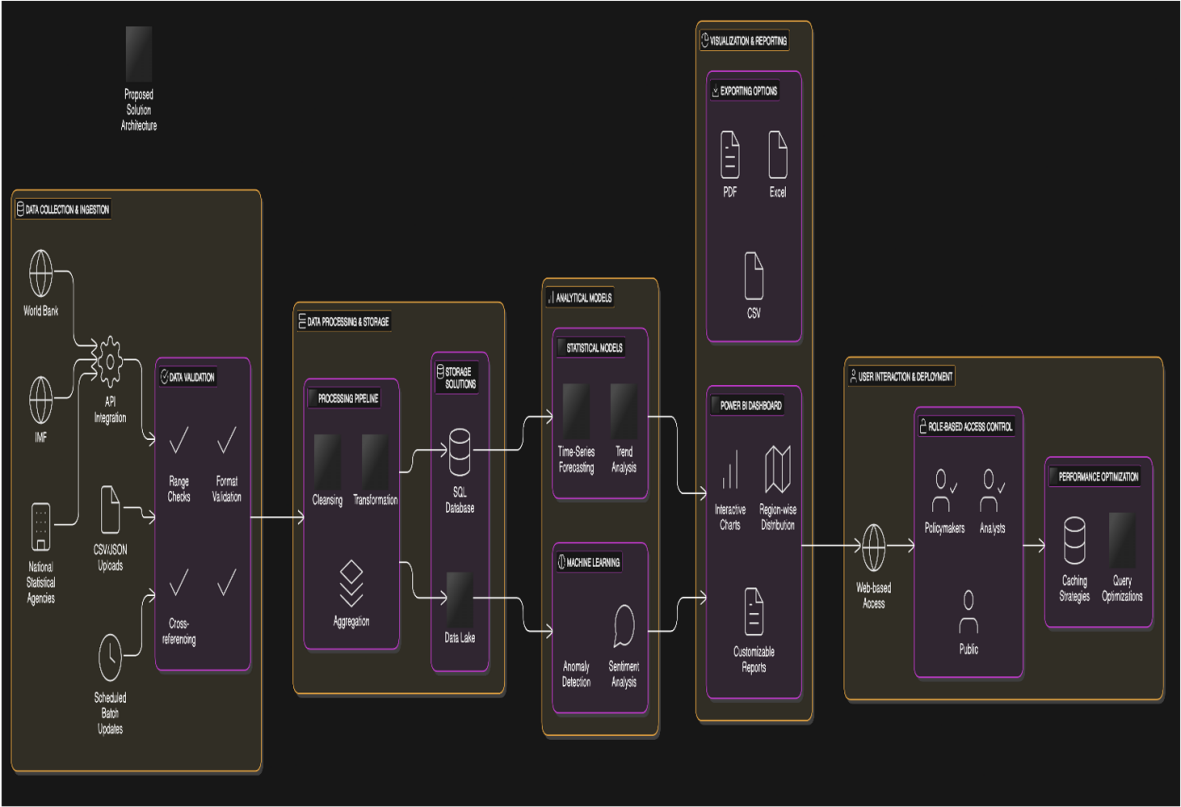
Ensuring the dashboard effectively addresses the problem statement by providing clear and meaningful insights.

4.2 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Financial analysts, policymakers, and businesses struggle to track real-time inflation trends due to scattered data sources , manual data processing , and lack of predictive analytics . This results in delayed economic decisions and inefficient inflation management .
2.	Idea / Solution description	The Power BI Inflation Analysis System is an automated, real-time dashboard that: Integrates multiple data sources (IMF, World Bank, National Agencies). Automates data transformation and visualization in Power BI. Applies predictive models for inflation forecasting. Provides interactive dashboards for real-time insights and decision-making.
3.	Novelty / Uniqueness	Unlike traditional methods, this solution: Automates the entire inflation tracking process. Uses AI-driven forecasting for predictive analytics. Provides real-time collaboration with interactive Power BI dashboards.
4.	Social Impact / Customer Satisfaction	Helps governments & businesses make informed policy & financial decisions. Increases accessibility of inflation insights for economic planning. Reduces time spent on manual data processing , improving efficiency.
5.	Business Model (Revenue Model)	The solution can be monetized through: Subscription-based model for financial institutions & enterprises. Freemium model with basic features and premium analytics for advanced users. Enterprise licensing for government agencies.
6.	Scalability of the Solution	Easily scalable for global economic tracking. Can integrate more financial datasets for deeper insights. Supports future AI enhancements for improved accuracy.

A Power BI dashboard with multiple visualizations for inflation analysis, featuring interactive filters and KPIs.

4.3 Solution Architecture



High-level architecture outlining data sources, transformations, and visualization layers.

5. Project Planning & Scheduling

5.1 Project Planning

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register with my email and password in a simple, intuitive form.	2	High	Ashu Saxena
Sprint-1	Registration	USN-2	As a user, I receive a confirmation email after successful registration.	1	High	Rishab Verma
Sprint-2	Registration	USN-3	As a user, I can register using my Facebook account.	2	Medium	Radhika Khanna
Sprint-2	Registration	USN-4	As a user, I can register using my Google account.	2	Medium	Soumya Wilson
Sprint-3	Registration	USN-5	As a user, I see clear error messages if registration fails.	2	High	Ashu Saxena

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	20	6 Days	21 Feb 2025	26 Feb 2025	20	26 Feb 2025
Sprint-2	20	6 Days	27 Feb 2025	04 March 2025	20	[Actual Date]
Sprint-3	20	6 Days	05 March 2025	10 March 2025	20	[Actual Date]

A well-structured plan was followed to ensure smooth execution of the project. The key phases included:

1. Data Collection & Preprocessing

- Gathered inflation data for different countries and years.
- Cleaned the dataset by handling missing values and ensuring data consistency.

2. Data Analysis & Visualization Development

- Created necessary measures and calculated columns using DAX functions.
- Developed multiple visualizations to analyze inflation trends.

3. Dashboard Design & User Experience

- Implemented slicers and filters to allow users to explore different regions and years interactively.
- Integrated KPI cards, line charts, and bar charts for visual insights.

4. Performance Testing

- Ensured smooth performance of the dashboard.
- Analyzed loading times and optimized DAX calculations.

6.Functional and Performance Testing

6.1 Performance Testing

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	<p>The dataset is processed efficiently, with data loading times within acceptable limits.</p> <p>Visuals update dynamically when interacting with slicers.</p>
2.	Data Preprocessing	<p>Data was cleaned and formatted before visualization.</p> <p>Handling of missing or null values was tested.</p>
3.	Utilization of Data Filters	<p>Filters on Country, Region, and Year were tested.</p> <p>Response time for filtering is fast with minor delays when selecting multiple countries.</p>
4.	DAX Queries Used	<pre> VAR TopCountries = TOPN(3, SUMMARIZE('global_inflation_data', 'global_inflation_data'[country_name], "Total Inflation", AVERAGE('global_inflation_data'[Inflation Rate])), [Total Inflation], DESC) RETURN TopCountries AdjustedInflationRate = global_inflation_data[Inflation Rate]*0.01 Inflation Rate Category = IF('global_inflation_data'[Inflation Rate]<2,"Low",IF('global_inflation_data'[Inflation Rate]<5,"Moderate","High")) </pre>

5.	Dashboard design	No of Visualizations / Graphs - <u>11</u>
6	Report Design	No of Visualizations / Graphs - 17

- Evaluated load times for different dataset sizes.
- Optimized DAX queries for efficiency.
- Ensured smooth filtering and interactive elements without lag.

7. Results

7.1 Output ScreenShots



8. Advantage and Disadvantage

8.1 Advantages

- Provides clear visual insights into inflation trends.
- Interactive and filterable for detailed analysis.
- Helps in making data-driven economic decisions.

8.2 Disadvantages

- Requires periodic data updates for accuracy.
- Performance may slow with very large datasets.

9. Conclusion

This Power BI dashboard successfully analyzes global inflation trends, offering valuable insights into economic variations over time. It serves as a powerful tool for policymakers and analysts to make informed decisions.

10.Future Scope

- Integration with live inflation rate updates via APIs.
- Advanced predictive analytics for inflation forecasting.
- Drill-through functionality for deeper analysis by country and time periods.

11.Appendix

Dataset Link

https://drive.google.com/drive/u/0/folders/11Bztc6mg686xjm0qnRm0jq5N4_b-ZjGT

GitHib & Project Demo Link

Project Demo Link

<https://drive.google.com/drive/u/0/folders/1xGuU4Zk0QO3a-OFdxsbrOeG3cZqHdR2F>

GitHib Link

<https://github.com/Saxena-Ashu/Power-BI-Inflation-Analysis-Journeying-Through-Global-Economic-Terrain>