Project Report Format

1. INTRODUCTION

1.1 Project Overview

Economic freedom plays a critical role in determining a country's prosperity, competitiveness, and the overall well-being of its citizens. However, while numerous datasets and reports exist, there is a gap in interactive and comparative tools that make this information accessible and actionable for diverse stakeholders.

This project aims to analyse and visualize the Index of Economic Freedom across multiple countries to provide insights into the relationship between economic policies and national prosperity. Using statistical analysis, data visualization techniques, and real-time filtering capabilities, the platform enables policymakers, researchers, investors, and the general public to explore key economic indicators in an intuitive and meaningful way.

The solution integrates data ingestion, processing, and visualization in a modular architecture, offering features like global freedom heatmaps, year-wise trends, top/bottom ranked countries, and correlation analysis with other socio-economic metrics like GDP and unemployment rates. This project bridges the gap between raw data and informed decisionmaking through a transparent, scalable, and user-centric approach.

1.2 Purpose

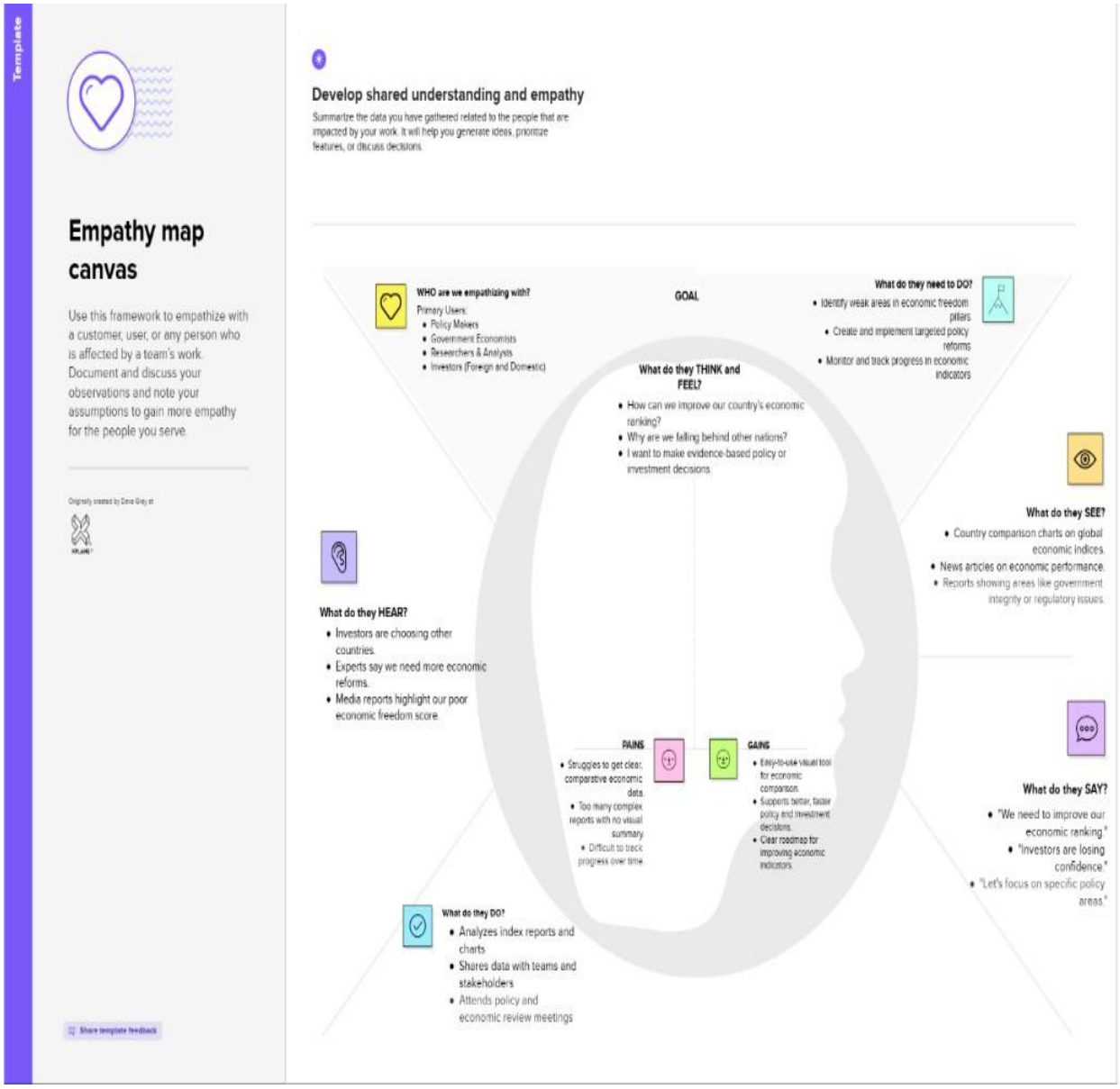
The purpose of this project is to create an accessible, data-driven platform that enables the analysis and visualization of the Index of Economic Freedom across different countries and time periods. This initiative seeks to empower policymakers, researchers, and investors by providing them with actionable insights into how economic freedom influences prosperity, governance, and development. By transforming complex datasets into interactive dashboards and comparative tools, the project promotes informed decision-making, encourages transparency in economic policies, and supports academic and institutional research. Ultimately, the solution aspires to highlight global economic patterns and guide strategic reforms aimed at enhancing economic liberty and growth.

2. IDEATION PHASE

2.1 Problem Statement

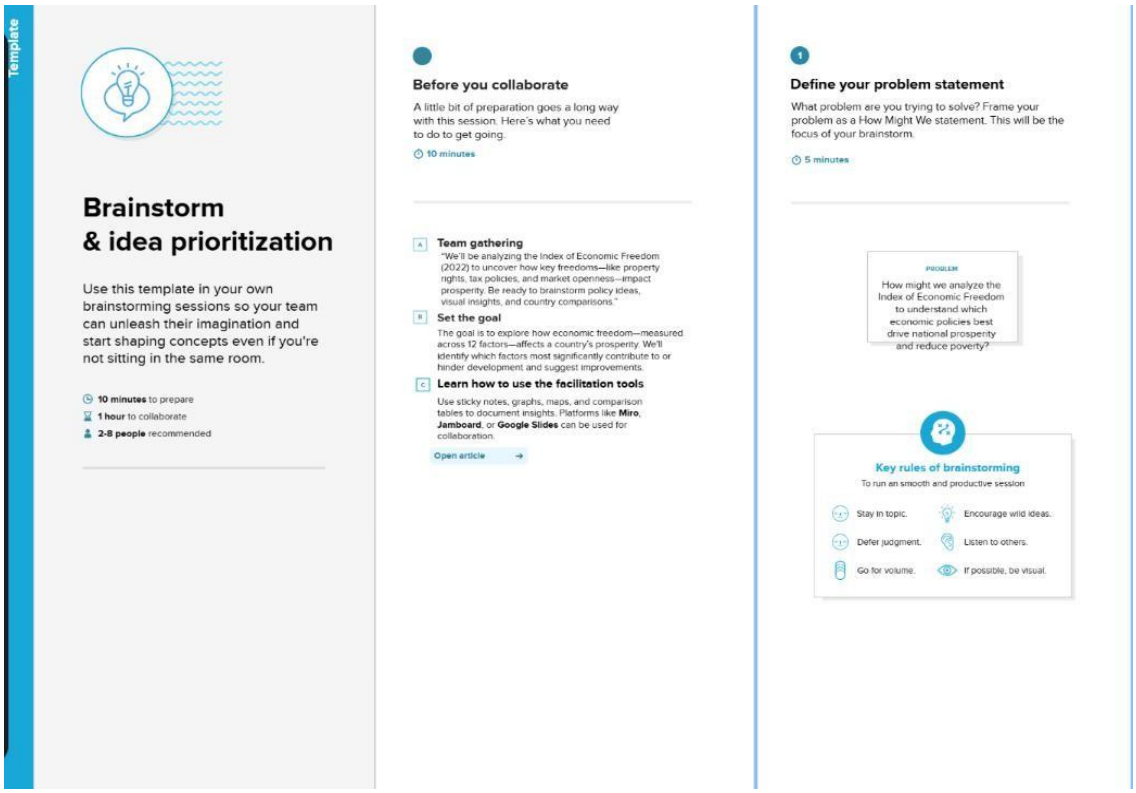
PS-1	Policy maker / Government official	Improve economic policy decisions	Lack of consolidated and easy-tounderstand data on economic freedom pillars	Lack of consolidated and easy-tounderstand data on economic freedom pillars	Frustrated and uncertain
PS-2	Researcher / Economist	Analyze factors affecting economic growth	Data comparison between countries is complex	Economic freedom indicators are scattered and unstandardized	Overwhelmed and delayed

2.2 Empathy Map Canvas

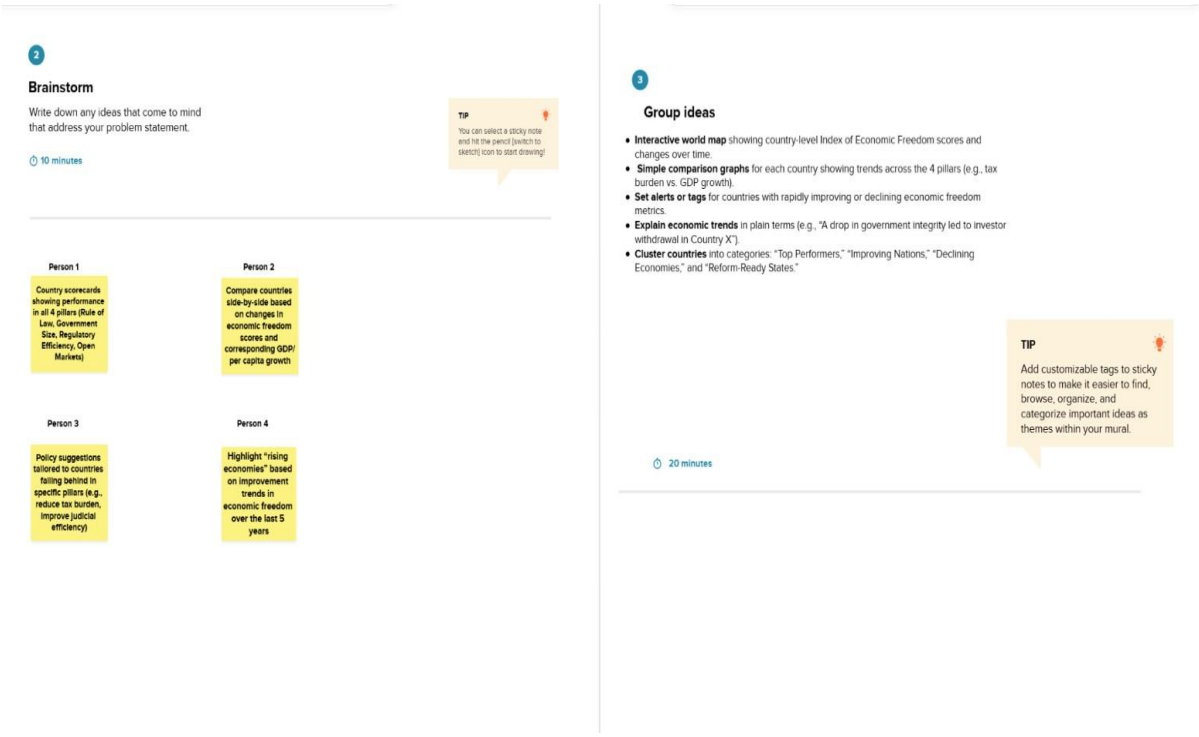


2.3 Brainstorming

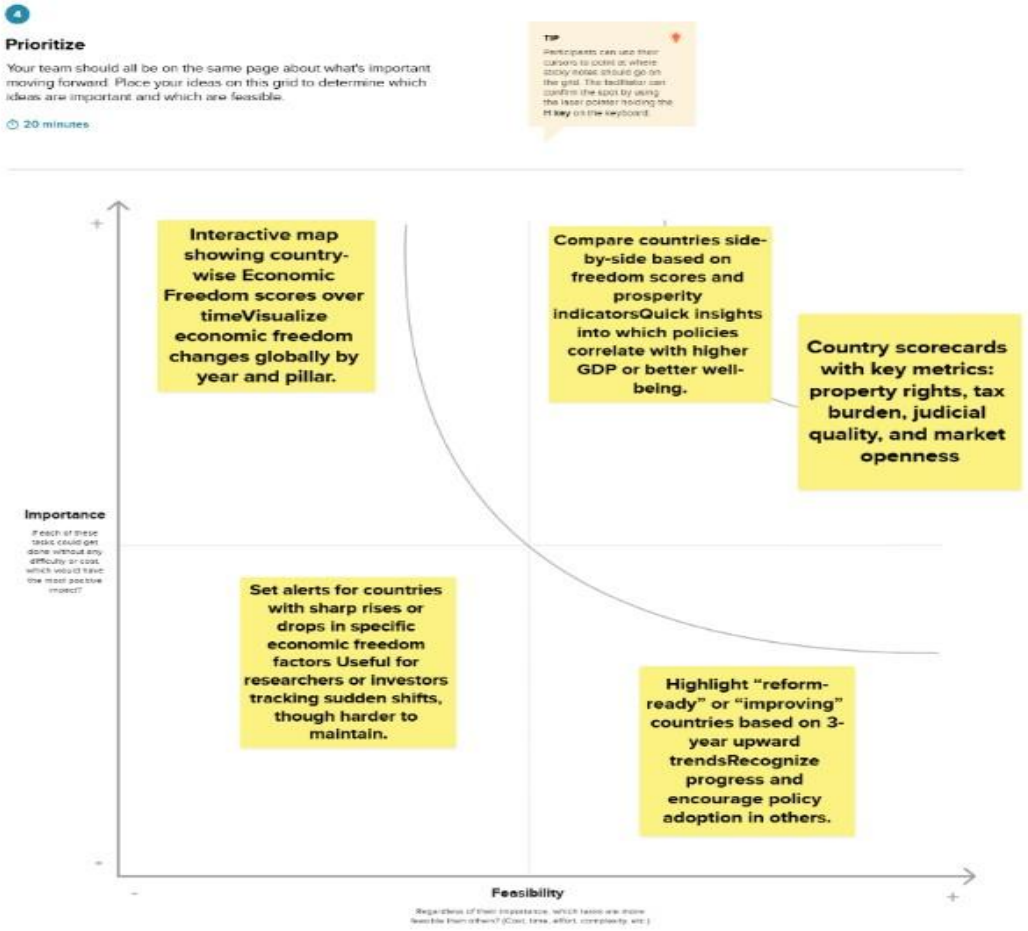
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping

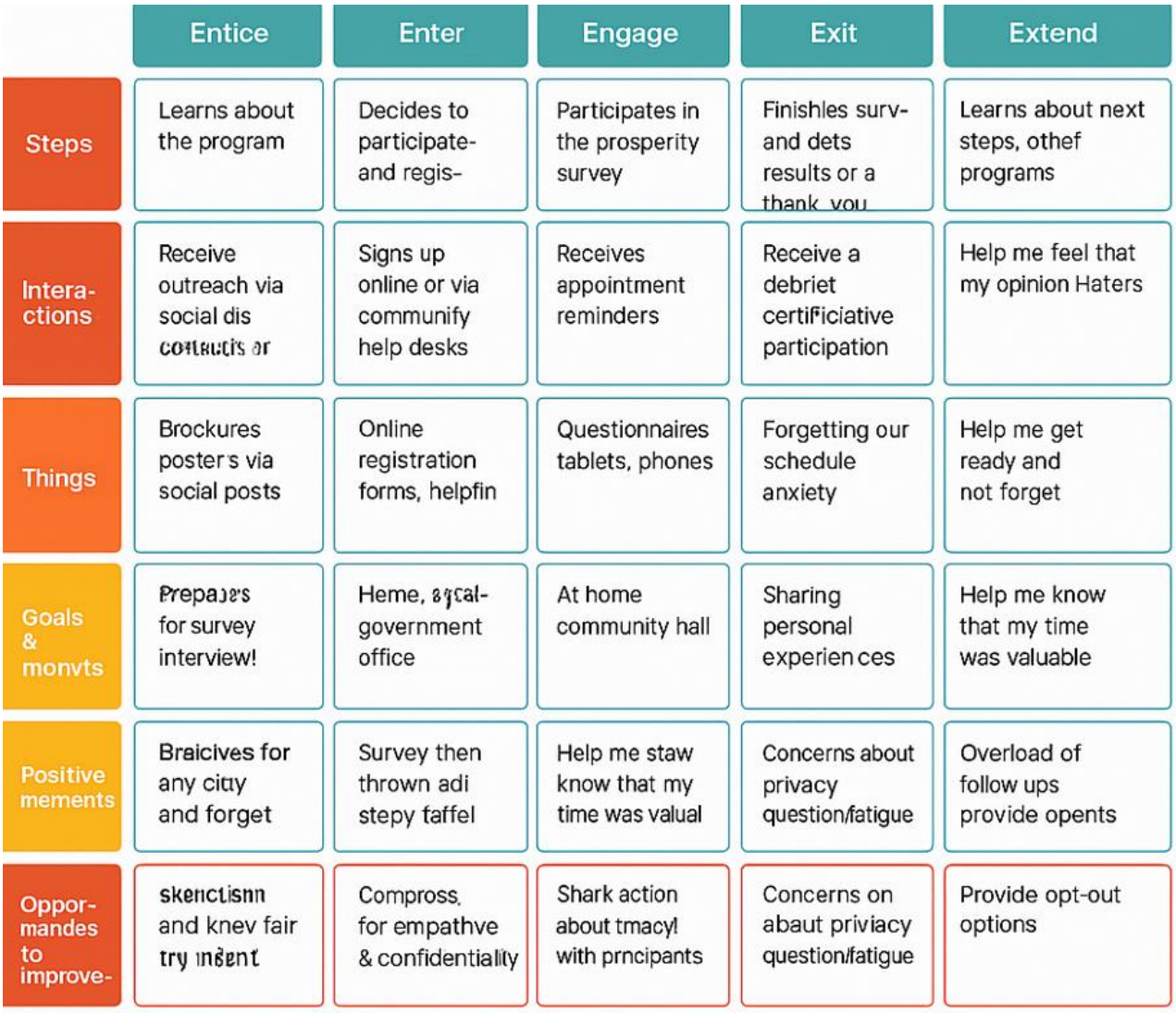


Step-3: Idea Prioritization



3. REQUIREMENT ANALYSIS

3.1 Customer Journey map



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 Upload	Upload Economic Freedom Index CSV files Upload GDP and HDI datasets
FR-2	Data Preprocessing	Data cleaning and formatting using Python Handling missing or null values

FR-3	Visualization	Create country-wise comparative dashboards Implement correlation visualizations between freedom & GDP Add dynamic filters for year, region, and economic tier
FR-4	Insight Extraction	Identify top/bottom performing nations Show pattern-based insights via story dashboards
FR-5	Export Options	Export dashboards to PDF or PNG Allow download of filtered datasets

Non-functional Requirements:

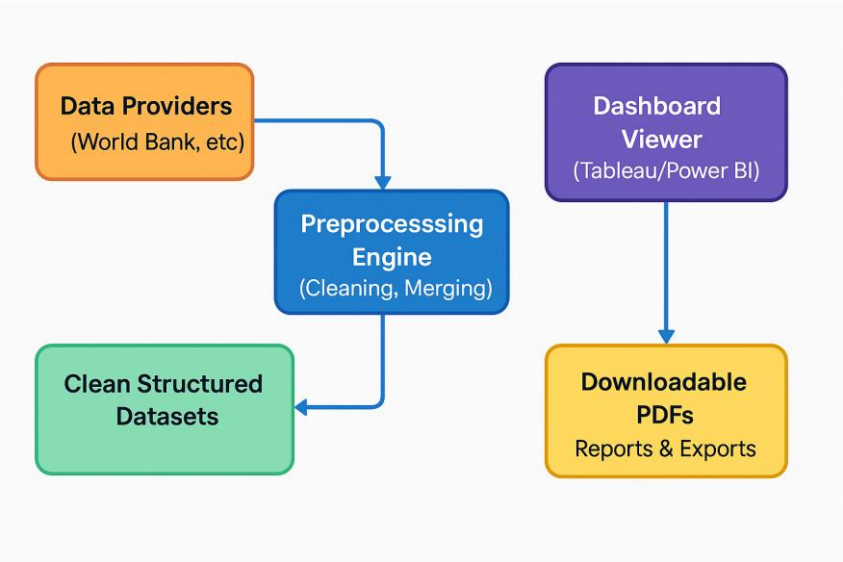
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Dashboards should be intuitive and easy to interpret for all stakeholders
NFR-2	Security	File upload/download permissions, view-only access on dashboards
NFR-3	Reliability	Data visualizations should render correctly across all filters
NFR-4	Performance	Dashboards should load within 3 seconds on average
NFR-5	Availability	Published dashboards must be accessible 24/7

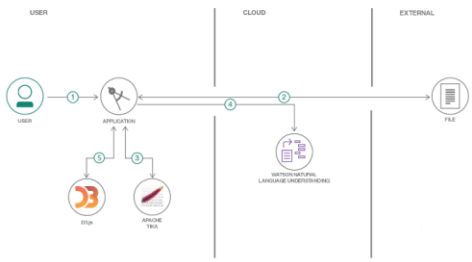
NFR-6	Scalability	New datasets should be easily ingestible without structural changes

3.3 Data Flow Diagram

User Stories



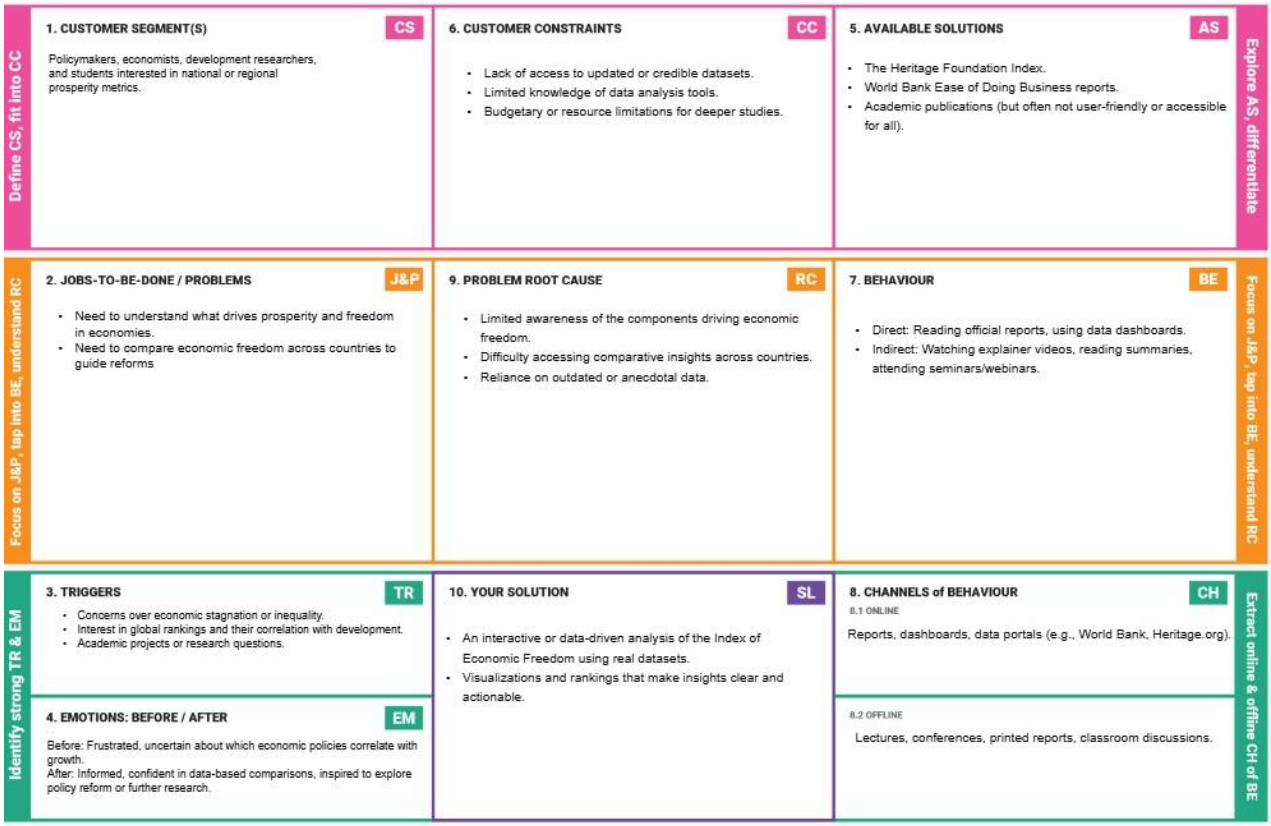
Flow



1. User configures credentials for the Watson Natural Language Understanding service and starts the app.
2. User selects data file to process and load.
3. Apache Tika extracts text from the data file.
4. Extracted text is passed to Watson NLU for enrichment.
5. Enriched data is visualized in the UI using the D3.js library.

4. PROJECT DESIGN

4.1 Problem Solution Fit



4.2 Proposed Solution

Proposed Solution Template:

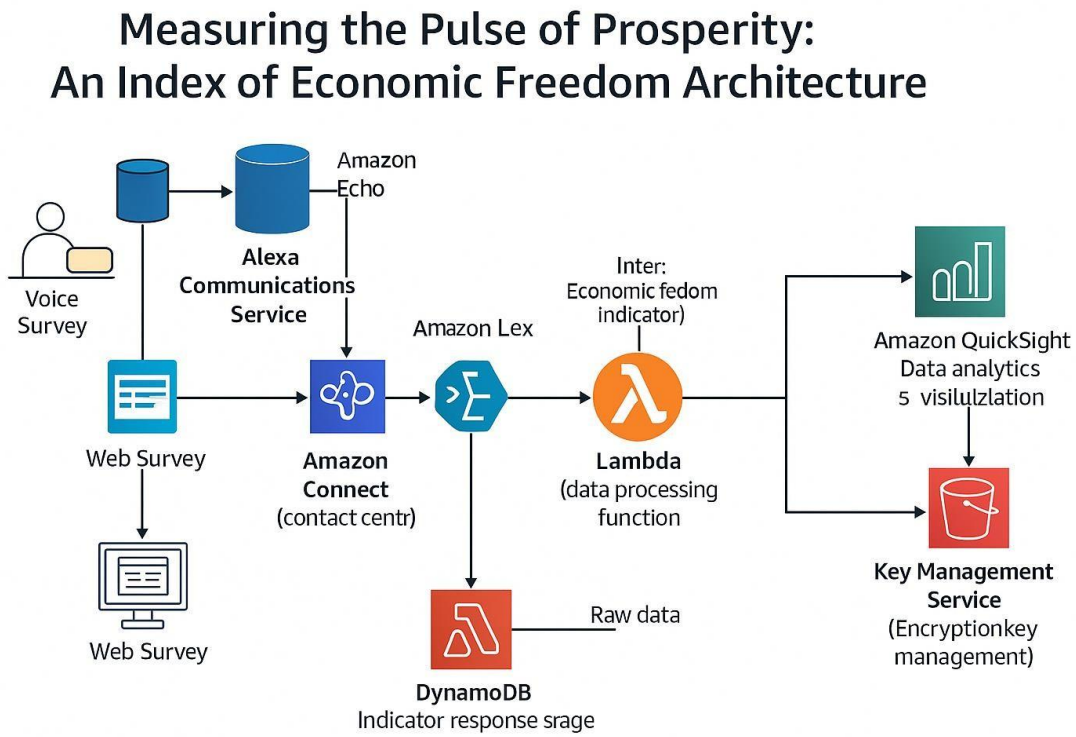
Project team shall fill the following information in the proposed solution template

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Despite the availability of macroeconomic data, policymakers and researchers lack a clear, accessible method to evaluate how economic freedom correlates with prosperity.
2.	Idea / Solution description	The project analyses the Economic Freedom Index using data visualization and comparative analysis tools. It offers clear dashboards, insights, and recommendations across countries
3.	Novelty / Uniqueness	While reports exist, this solution provides an interactive, comparative, and visually rich platform combining multiple data dimensions useful for academia and policy

4.	Social Impact / Customer Satisfaction	Informed citizens, better policy decisions, and transparency in economic governance. This tool helps identify reforms needed to enhance freedom and economic performance.
5.	Business Model (Revenue Model)	Can be offered as a freemium tool for students/researchers, with advanced insights and country reports available via subscription for institutions, think tanks, or NGOs.
6.	Scalability of the Solution	Can be extended to include regional/state-level indices, time-series trends, or integration with other indicators (e.g., Human Development Index, Corruption Perception Index).

4.3 Solution Architecture

Example: (Simplified)



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority
Sprint-1	Data Analysis & Visualization	USN-1	As a Policymaker, I want to view a world map showing economic freedom scores by country, so that I can quickly identify regions with high or low economic prosperity and potential policy impact areas.	2	High
Sprint-1	Data Analysis & Visualization	USN-2	As an Economic Researcher, I want to filter economic data by specific years and countries, so that I can conduct in-depth analysis on historical trends and compare performance across different nations.	2	High
Sprint-1	Data Analysis & Visualization	USN-3	As an Investor, I want to see the top 40 and least ranked countries based on their economic index, so that I can identify potential investment opportunities or risks in various markets.	2	High
Sprint-2	Data Ingestion & Management	USN-4	As a User, I want to upload new economic datasets (e.g., CSV, Excel), so that I can incorporate the latest information into the analysis and update the index	3	Medium
Sprint-2	Data Analysis & Visualization	USN-5	As an Economic Researcher, I want to view correlations between economic freedom and indicators like unemployment rate and GDP growth, so that I can understand the multifaceted impacts of economic policies.	4	High
Sprint-3	Reporting & Export	USN-6	As a User, I want to export visualizations (e.g., charts, maps) as image files, so that I can easily include them in presentations or reports.	4	Medium
Sprint-3	User Management & Authorization	USN-7	As an Administrator, I want to manage user accounts and roles, so that I can access levels to sensitive data and functionalities.	3	High

Project Tracker, Velocity & Burndown Chart:

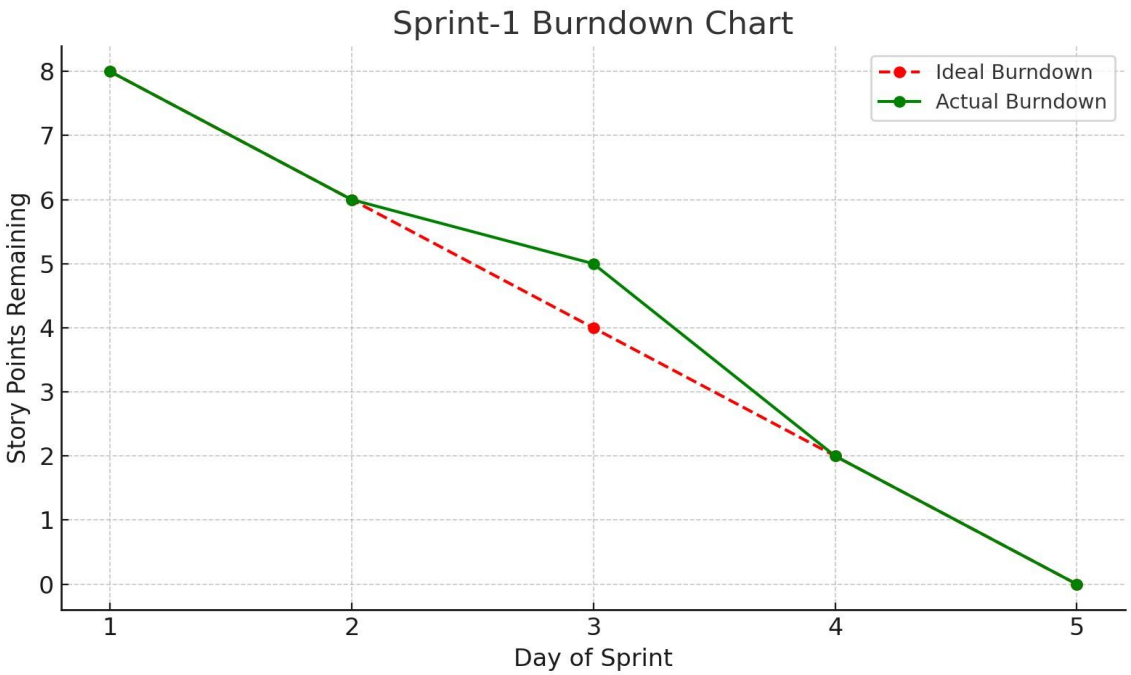
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	6	5 Days	16 June 2025	21June 2025	6	21 June 2025
Sprint-2	7	5 Days	21June 2025	25 June 2025	7	25 June 2025
Sprint-3	7	5 Days	25 June 2025	30 June 2025		

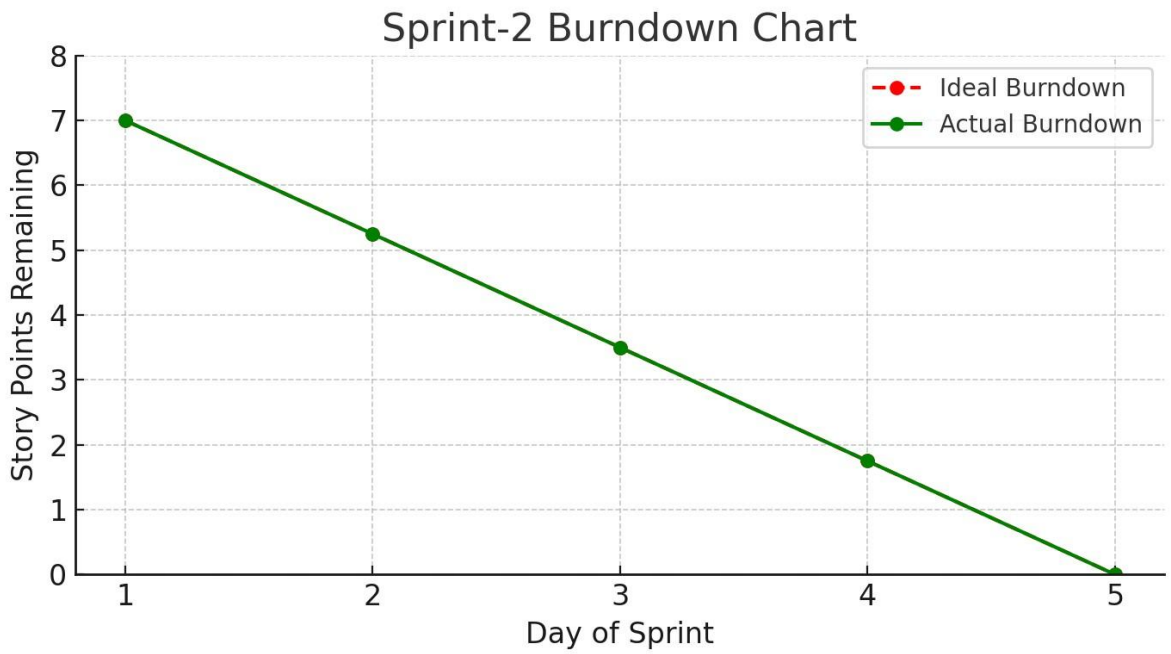
Velocity:

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 = sprint duration/velocity =15/10=1.5

Burndown Chart:





6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

SNO	Parameter	Screenshot / Values
1.	Data Rendered	The dashboard renders comprehensive country-level economic data including: - Economic Score/Index - Country ID and Country Name - 5-Year GDP Growth Rate - Business Freedom, Corporate Tax Rate (%), FDI Inflow (Millions), Financial Freedom, Fiscal Health, GDP (Billions), GDP Growth Rate (%), GDP per Capita (PPP), Government Integrity, Government Expenditure (%) of GDP,

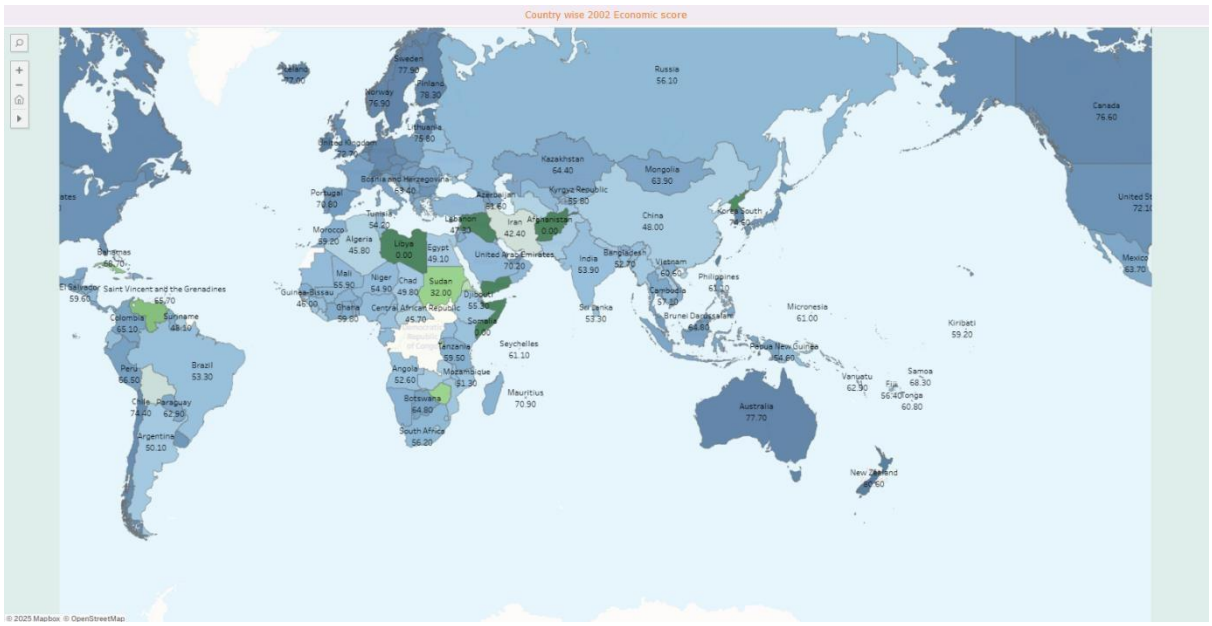
		Government Spending, Income Tax Rate (%), Inflation (%), Index of Population, Unemployment (%). -The data appears to cover multiple years, showing trends and comparisons across a wide range of countries.
2.	Data Preprocessing	Preprocessing likely involved: - **Data Cleaning:** Handling missing values, correcting inconsistencies, and standardizing country names. - **Data Transformation:** Aggregating data to specific years or regions, potentially calculating the composite Economic Freedom Index from its constituent components. - **Geographic Data Preparation:** Ensuring country names are recognized by Tableau for mapping. - **Feature Engineering:** Creating calculated fields such as "5 Year GDP Growth Rate" or specific "Economic Score" components if not directly present in the raw data.
3	Utilization of Filters	The dashboard extensively uses filters and interactive elements: - **Country Name Filter:** Allows users to select specific countries for focused analysis. - **Measures Filter:** To select different economic indicators (e.g., Inflation, Unemployment, GDP) for visualization and Correlation **Year Slider/Filter:** To change the year for which the data is displayed on the map and other charts.

		- **Interactive Map Selection:** Clicking on countries on the map appears to filter other related views
4	Calculation fields Used	Based on the metrics and visualizations, the following calculated fields are likely used: - **Economic Score/Index:** A composite score derived from various sub-indicators of economic freedom. - **5 Year GDP Growth Rate:** Likely a calculation based on GDP values over a five-year period. - **Rankings:** Calculated fields to determine and display the "Top 40 countries rank of Economy" and "Least ranked countries of economic index." - **Region Groupings:** Possibly a calculated field to group countries into broader regions for high-level analysis.
5	Dashboard design	No of Visualizations / Graphs – The primary dashboard ("Dashboard 1" / "Global Rankings & Financial Freedom Impact Dashboard") contains at least 5 distinct visualizations/sections - Choropleth Map (e.g., "Visualizing Economic Freedom and Instability Around the World") - Correlation Chart (e.g., "Correlation of Countries Based on Inflation & Unemployment") - Horizontal Bar Chart (e.g., "Index of Population") - "Insights Overview" Text Box - "Top 40 Countries rank of Economy" bar/map chart -"Countries Less Than 25 of Economy Index" (potentially a tree map or similar chart)
6	Story Design	No of Visualizations / Graphs –

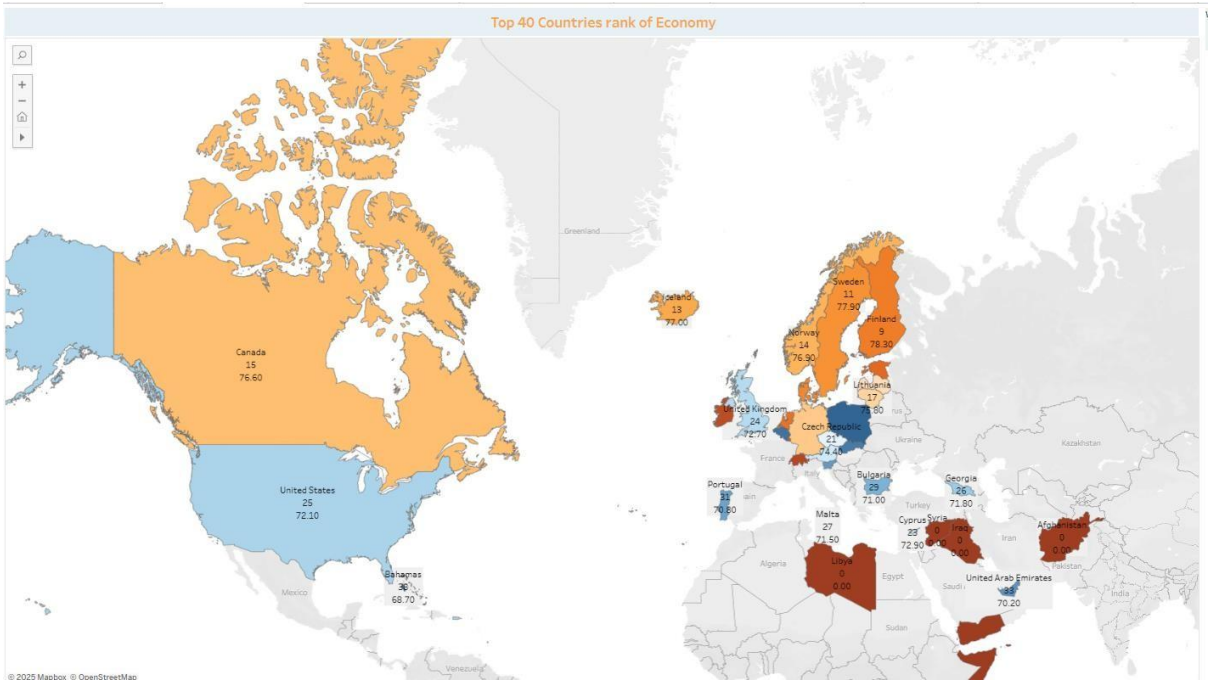
		The "Story" section ("Journey Through the 2002 Global Economy") explicitly shows 5 story points/pages, each potentially containing one or more visualizations: - Story Point 1: World Map of Economic Score. - Story Point 2: Top 40 Countries Rank. - Story Point 3: Least Ranked Countries. - Story Point 4: Correlation of Countries Based on Inflation & Unemployment. - Story Point 5: Index of Population. - Story Point 6: Financial Freedom of Countries. Story Point 7: Index of 5 yrs GDP Rate.

7. RESULTS

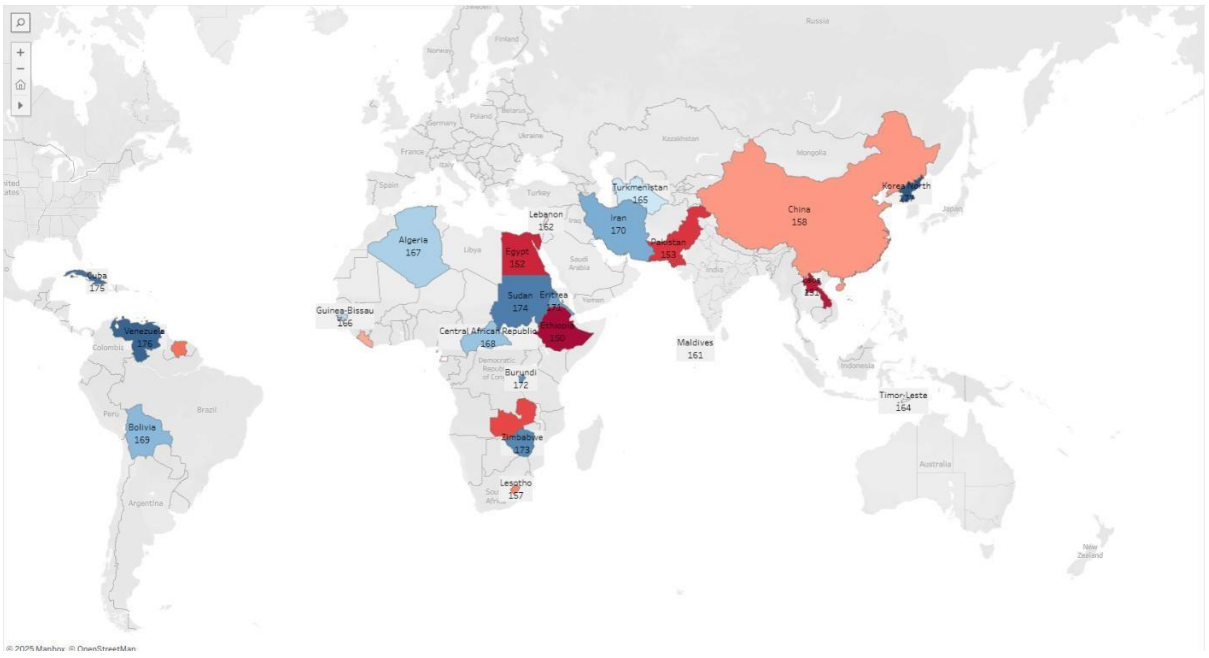
7.1 Output Screenshots

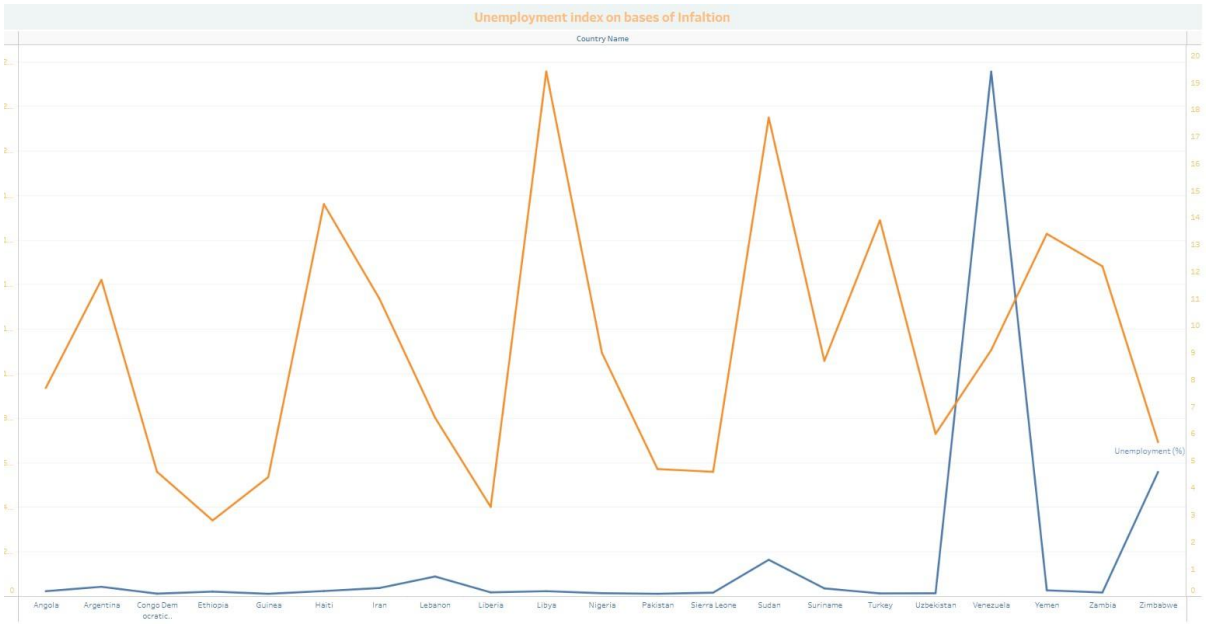


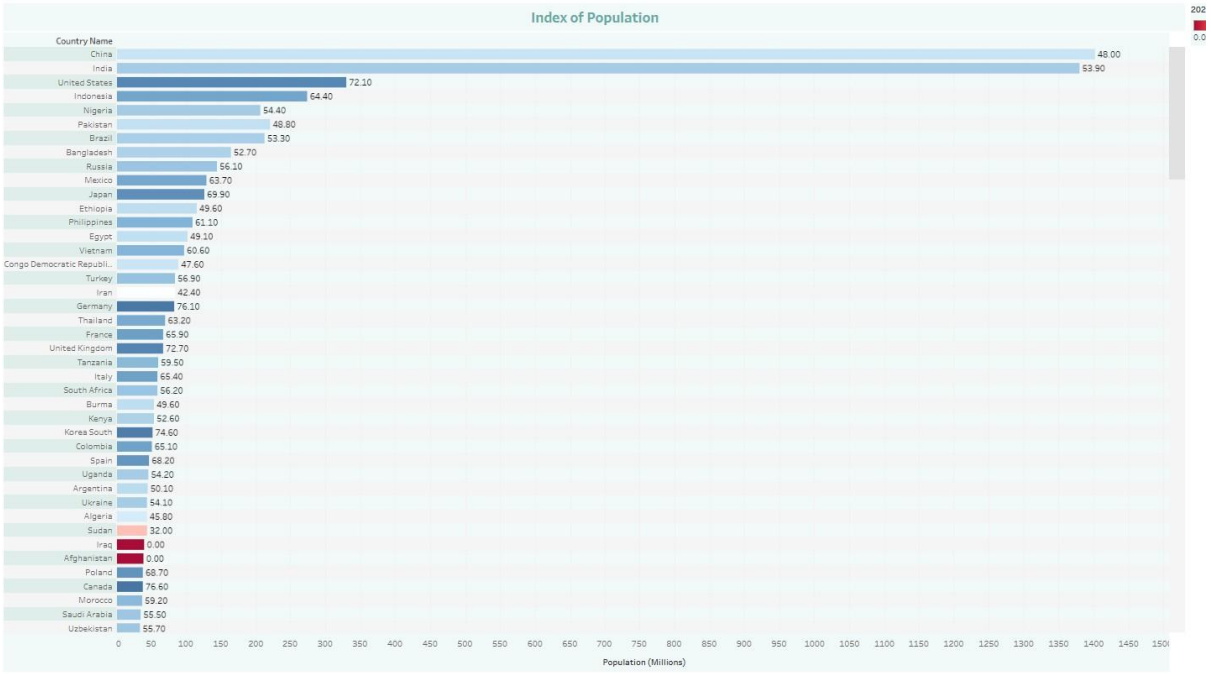
Top 40 Countries rank of Economy

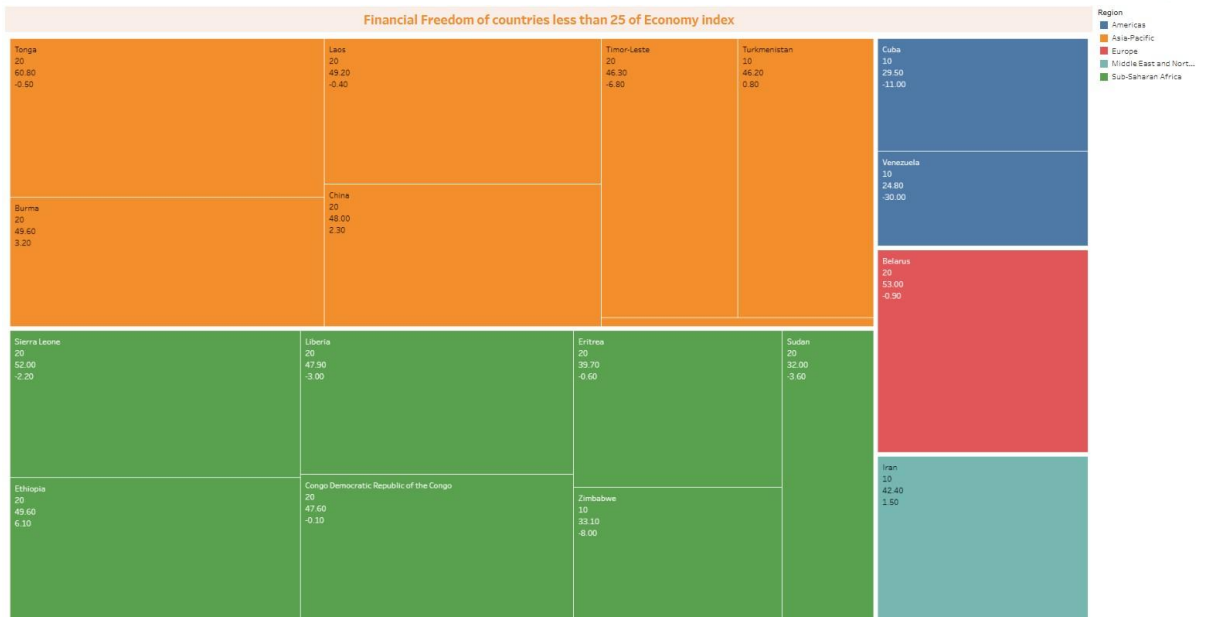


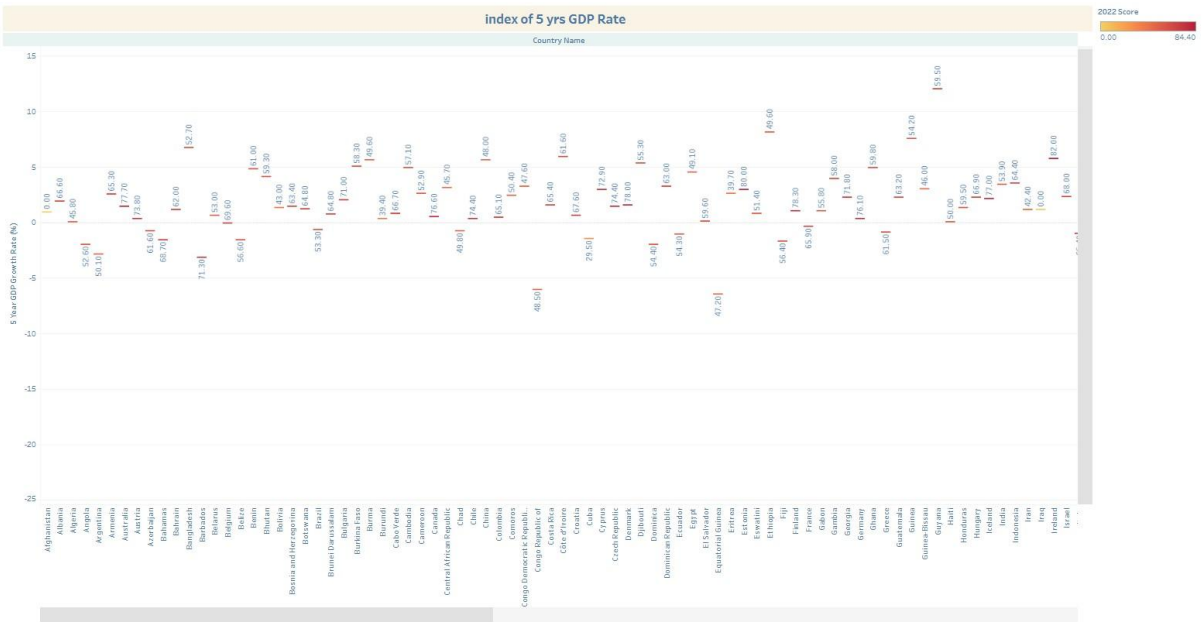
Least ranked contries of Economic index

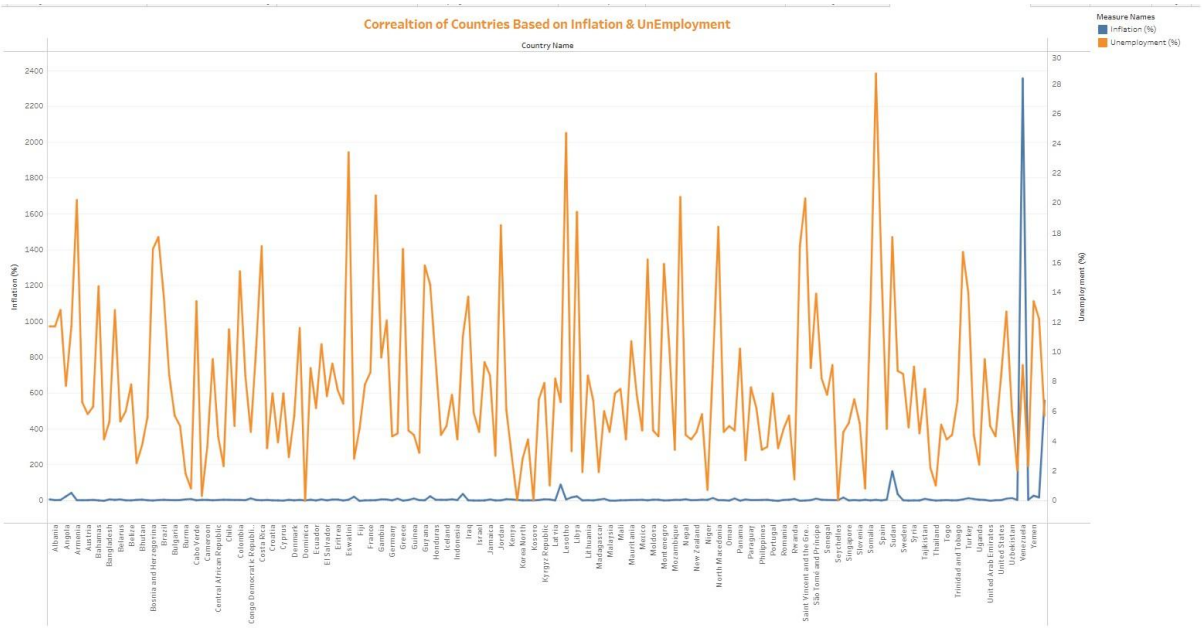



Unemployment index on bases of Infaltion
Country Name
Unemployment (%)
Angola
Argentina
Congo Dem ocratic..
Ethiopia
Guinea
Haiti
Iran
Lebanon
Liberia
Libya
Nigeria
Pakistan
Sierra Leone
Sudan
Suriname
Turkey
Uzbekistan
Venezuela
Yemen
Zambia
Zimbabwe


Index of Population
Country Name
China 48.00
India 53.90
United States 72.10
Indonesia 64.40
Nigeria 54.40
Pakistan 48.80
Brazil 53.30
Bangladesh 52.70
Russia 56.10
Mexico 63.70
Japan 69.90
Ethiopia 49.60
Philippines 61.10
Egypt 49.10
Vietnam 60.60
Congo Democratic Republi.. 47.60
Turkey 56.90
Iran 42.40
Germany 76.10
Thailand 63.20
France 65.90
United Kingdom 72.70
Tanzania 59.50
Italy 65.40
South Africa 56.20
Burma 49.60
Kenya 52.60
Korea South 74.60
Colombia 65.10
Spain 68.20
Uganda 54.20
Argentina 50.10
Ukraine 54.10
Algeria 45.80
Sudan 32.00
Iraq 0.00
Afghanistan 0.00
Poland 68.70
Canada 76.60
Morocco 59.20
Saudi Arabia 55.50
Uzbekistan 55.70
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1450
Population (Millions)


Financial Freedom of countries less than 25 of Economy index
Region
Americas
Asia-Pacific
Europe
Middle East and Nort...
Sub-Saharan Africa
Tonga 20 60.80 -0.50
Laos 20 49.20 -0.40
Timor-Leste 20 46.30 -6.80
Turkmenistan 10 46.20 0.80
Cuba 10 29.50 -11.00
Venezuela 10 24.80 -30.00
Burma 20 49.60 3.20
China 20 48.00 2.30
Belarus 20 53.00 -0.90
Sierra Leone 20 52.00 -2.20
Liberia 20 47.90 -3.00
Eritrea 20 39.70 -0.60
Sudan 20 32.00 -3.60
Iran 10 42.40 1.50
Ethiopia 20 49.60 6.10
Congo Democratic Republic of the Congo 20 47.60 -0.10
Zimbabwe 10 33.10 -8.00

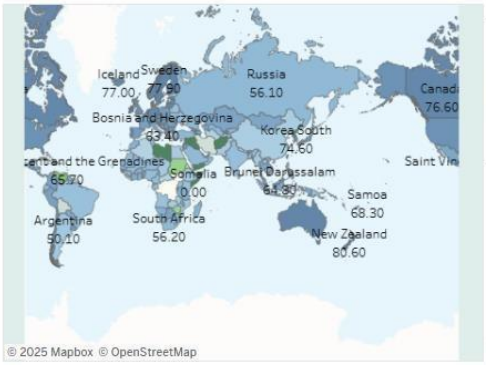

index of 5 yrs GDP Rate
Country Name
2022 Score
0.00
84.40
5 Year GDP Growth Rate (%)


Correaltion of Countries Based on Inflation & UnEmployment
Country Name
Measure Names
Inflation (%)
Unemployment (%)
Inflation (%)
Unemployment (%)

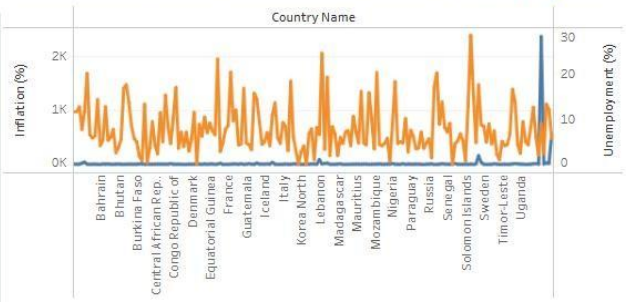
Visualizing Economic Freedom and Instability Around the World

NXT DASBO...

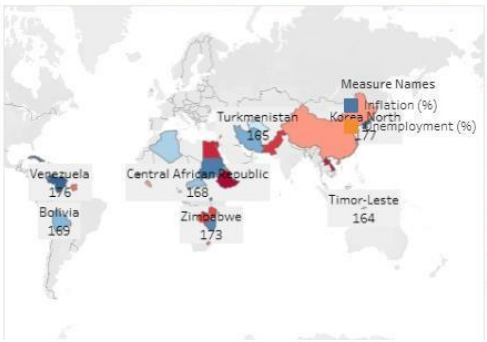
Country wise 2002 Economic score



Correaltion of Countries Based on Inflation & UnEmployment



Least ranked contries of Economic index



Index of Population

INSIGHTS OVERVIEW :

|- Countries like the **United States, Sweden, and Australia** scored high in economic freedom and stability.

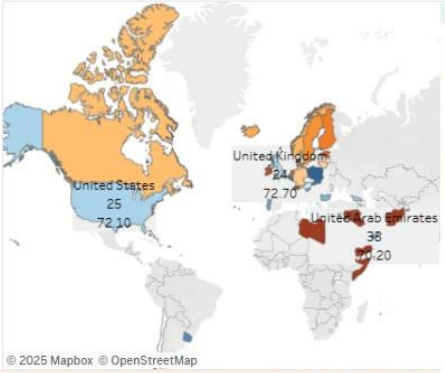
|- **Venezuela, Algeria, and Central African Republic** show poor economic index scores due to high inflation and unemployment rates

|- **China, India, and the U.S.** lead in population, influencing their economic impact and policy priorities

Global Rankings & Financial Freedom Impact Dashboard

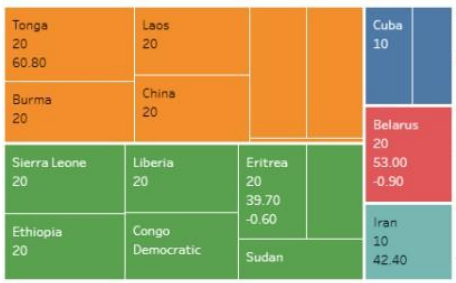
TO STORY

Top 40 Countries rank of Economy

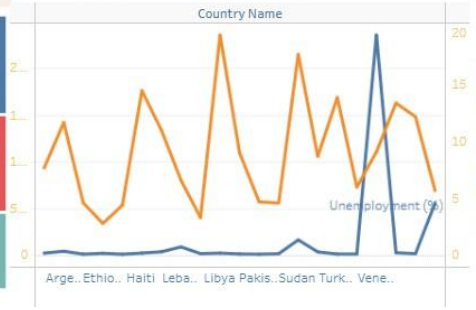


index of 5 yrs GDP Rate

Financial Freedom of countries less than 25 of Economy index



Unemployment index on bases of Infaltion

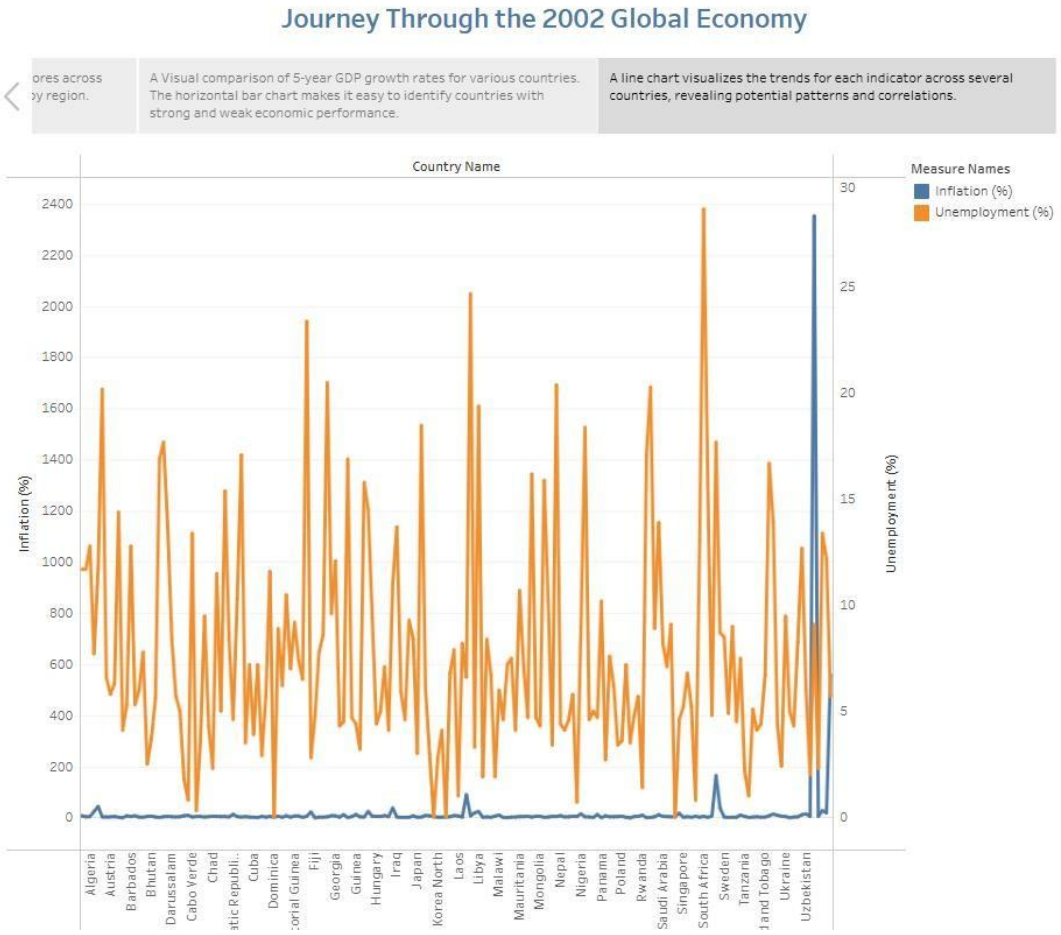


INSIGHTS OVERVEW :

Top 40 countries are identified by economic index, with higher rankings seen in **North America** and parts of **Europe** and **Asia**.

5-year GDP growth trends reveal uneven growth - some nations show strong improvement, while others face economic slowdown.

Inflation and unemployment trends show strong interdependency, especially in countries with economic instability



8. ADVANTAGES & DISADVANTAGES

Advantages

1. Data-Driven Insights
   Empowers users to make informed decisions using real-time, evidence-based economic indicators.

2. Interactive Visualization
   User-friendly dashboards allow for filtering by year, country, and economic subindices, making analysis accessible to non-technical users.

3. Multi-Stakeholder Utility
   Useful to policymakers, researchers, investors, and students alike, each gaining insights specific to their objectives.

4. Customizable & Scalable
   The modular architecture allows easy integration of new datasets, indicators, or visualization layers.

5. Open-Source & Cost-Efficient
   Built using open-source tools like Python, Plotly, and Streamlit, reducing development and deployment costs.

Disadvantages

1. Data Source Dependency
   The analysis is limited to the scope and accuracy of available datasets like those from the Heritage Foundation or World Bank.
2. Limited Real-Time Updates
   Economic freedom indices are not updated frequently, which may affect relevance for real-time policy decisions.
3. Technical Barriers for Non-Digital Users
   Despite being user-friendly, some stakeholders without digital literacy may find the platform less accessible.
4. Infrastructure Limitations
   Hosting and processing large datasets or high user traffic could require scaling the cloud infrastructure, leading to additional costs.

9. CONCLUSION:

The project “Measuring the Pulse of Prosperity: An Index of Economic Freedom Analysis” successfully demonstrates the power of data analytics and visualization in transforming static economic data into meaningful, actionable insights. By leveraging open-source tools and interactive dashboards, the platform bridges the gap between complex economic indicators and user-friendly interpretation.

This solution empowers policymakers, researchers, and investors to explore global economic trends, identify policy gaps, and make evidence-based decisions. The integration of filtering, correlation analysis, and exportable visualizations enhances the usability and adaptability of the system across various domains.

Through this initiative, we’ve laid a scalable foundation for deeper exploration of how economic freedom shapes prosperity—enabling smarter governance, more informed investment, and a clearer understanding of global economic landscapes.

10. FUTURE SCOPE

- Integration of Real-Time Economic Indicators
  Future versions of the platform can incorporate APIs for real-time data (e.g., GDP updates, inflation, employment) to enhance the system's relevance for ongoing policy and market analysis.
- Expanded Dataset Coverage
  The project can be extended to include regional/state-level data, enabling microeconomic analysis within countries and more localized policymaking insights.
- Machine Learning-Based Forecasting
  Implementing predictive models can help forecast future economic freedom scores or prosperity indicators based on historical patterns and current inputs.
- User Personalization and Notifications
  Future iterations could allow user accounts with saved filters, email alerts for new reports, or policy shifts relevant to selected countries.