

Project Report

Measuring the Pulse of Prosperity: An Index of Economic Freedom Analysis

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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.

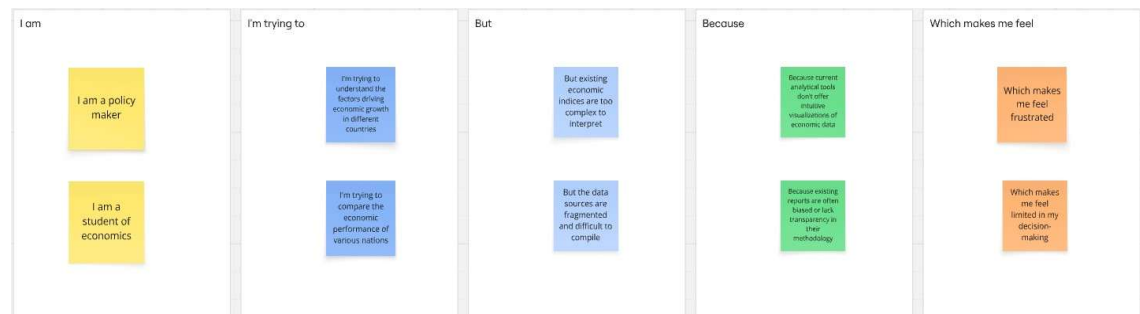
The solution integrates data ingestion, processing, and visualization in a modular architecture, offering features like global freedom heatmaps, year-wise trends, top/bottom ranked countries, and correlation analysis with other socio-economic metrics like GDP and unemployment rates. This project bridges 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

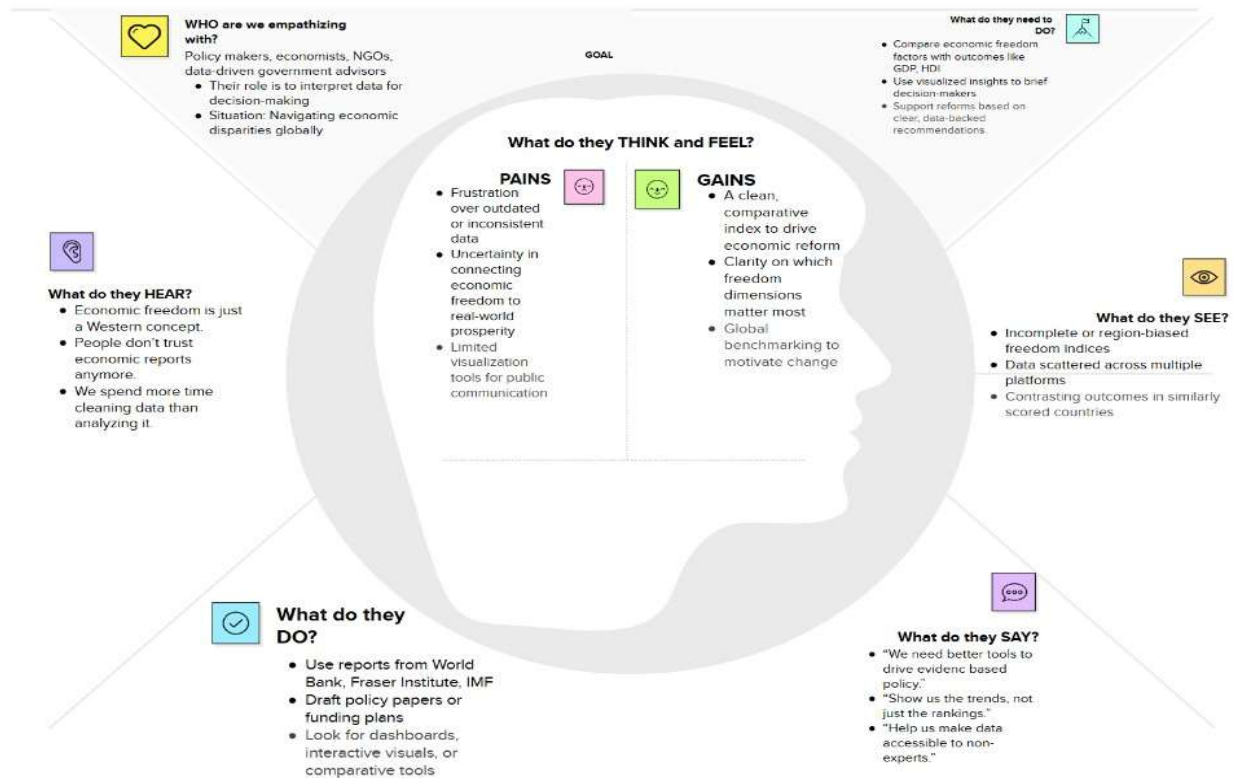
2.1 Problem Statement



| Problem Statement (PS) | I am (Customer) | I’m trying to | But | Because | Which makes me feel |
|------------------------|------------------|---------------|-----|---------|---------------------|
| | | | | | |

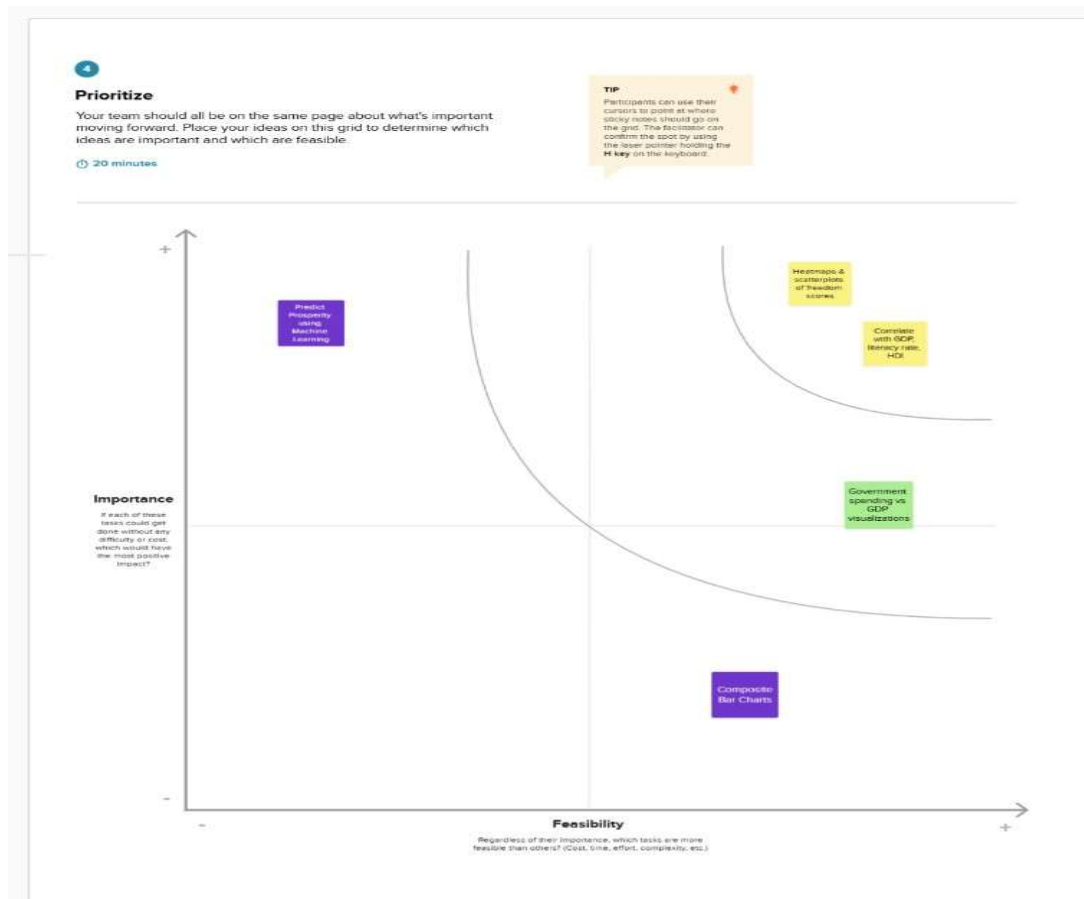
| | | | | | |
|------|------------------------|--|--|---|---|
| PS-1 | a policymaker | understand the drivers of economic prosperity in different nations to formulate effective policies. | existing economic indices are often too complex, lack timely updates. | there's a need for a comprehensive, easily digestible, and regularly updated index that integrates various dimensions of economic freedom. | frustrated and uncertain about the optimal policy choices. |
| PS-2 | an economic researcher | identify clear correlations between economic freedom and socioeconomic outcomes for academic analysis. | current data sources are fragmented , inconsistent , and difficult to compare across different countries and time periods. | there isn't a standardized, reliable, and easily accessible dataset that combines diverse indicators of economic freedom with relevant outcome variables. | overwhelmed by data collection and analysis, and limited in drawing robust conclusions. |

2.2 Empathy Map Canvas



2.3 Brainstorming

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



3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

| Stage | Actions | Thoughts | Touchpoints | Pain Points |
|-------------|--|---|--|---|
| Discovery | Learns about the platform via seminar, academic circles, or reports. | "Is there a tool that shows how economic freedom affects prosperity?" | University portals, policy newsletters, GitHub, search engines | Lack of accessible and reliable visualization tools |
| Access | Visits the platform and browses the landing page. | "Is this data recent? Can I trust the source?" | Web interface, data source links (e.g., Heritage Foundation) | Trust in data, understanding source credibility |
| Interaction | Filters data by year/country, views heatmaps and rankings. | "I want to compare my country with others or across years." | Dashboard, filtering tools, charts, dropdown selectors | Trust in data, understanding source credibility |

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 | User Registration | Registration through Form Registration through Gmail Registration through LinkedIn |
| FR-2 | User Confirmation | Confirmation via Email Confirmation via OTP |
| FR-3 | Data Ingestion & Management | Upload Dataset (e.g., CSV, Excel, from external APIs) Data Validation and Cleaning Data Storage and Organization (e.g., database) |
| FR-4 | Economic Freedom Index Calculation | Define and Configure Index Components Apply Weighting Schemes (configurable by user/admin) Calculate Composite Index Scores for countries/regions |
| FR-5 | Data Analysis & Visualization | Generate Interactive Charts (e.g., Bar, Line, Scatter, Bubble) Create Geographic Visualizations (e.g., Choropleth Maps) Provide Trend Analysis over Time Enable Comparison between Countries/Regions Display Correlation Matrices between indicators |
| FR-6 | Reporting & Export | Generate Customizable Reports (e.g., PDF, HTML) Export Raw and Processed Data (e.g., CSV, Excel) Export Visualizations (e.g., Image formats like PNG, JPEG) |
| FR-7 | User Authentication & Authorization | User Login/Logout Role-based Access Control (e.g., Admin, Analyst, Viewer) |
| FR-8 | Search & Filter Functionality | Search by Country Name, Year, Index Component Filter Data by various criteria (e.g., region, income level) |

Non-functional Requirements:

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

| FR No. | Non-Functional Requirement | Description |
|--------|----------------------------|--|
| NFR-1 | Usability | The system should have an intuitive and userfriendly interface, allowing users to easily navigate, interact with data, and interpret results without extensive training. |
| NFR-2 | Security | The system must protect sensitive user data (if any) and ensure the integrity and confidentiality of the economic data. This includes secure authentication, authorization, and protection against unauthorized access or data breaches. |
| NFR-3 | Reliability | The system should consistently perform its functions accurately and without significant errors. Data calculations, visualizations, and report generation should be reliable and repeatable. |
| NFR-4 | Performance | The system should respond quickly to user requests, especially during data processing, index calculation, and visualization generation, even with large datasets. Data loading and rendering times should be minimal. |
| NFR-5 | Availability | The system should be accessible to authorized users whenever needed, with minimal downtime. This includes considerations for server uptime, data accessibility, and disaster recovery. |
| NFR-6 | Scalability | The system should be able to handle an increasing amount of data (e.g., more countries, more years, new indicators), a growing number of concurrent users, and additional features without significant degradation in performance. |
| NFR-7 | Maintainability | The system's codebase and architecture should be well-documented, modular, and easy to modify or extend to accommodate future enhancements or bug fixes. |
| NFR-8 | Data Accuracy | The system must ensure the highest level of accuracy for all ingested data, calculations, and visualizations to reflect reliable economic insights. |

3.3 Data Flow Diagram

User Stories

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|---------------------|-------------------------------|-------------------|---|---|----------|----------|
| Policymaker | 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. | The map correctly displays economic freedom scores, and I can identify regions visually. | High | Sprint-1 |
| Economic Researcher | 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. | I can apply filters for years and countries, and the data displayed updates accordingly. | High | Sprint-1 |
| Investor | 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. | The list of top and least ranked countries is accurate and easily accessible. | High | Sprint-1 |
| User | 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. | I can successfully upload a dataset, and its data is visible in the system. | Medium | Sprint-2 |
| Economic Researcher | 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. | The system generates a report with selected criteria, and I can download it in my desired format (e.g., PDF). | High | Sprint-2 |

| | | | | | | |
|------------------|--------------------------------------|--------------------------|---|--|-----------------|----------------|
| User | Reporting & Export | USN-6 | As a User, I want to export visualizations (e.g., charts, maps) as image files, so | I can export displayed visualizations | Medium | Sprint-1 |
| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
| | | | that I can easily include them in presentations or reports. | as image files (e.g., PNG, JPEG). | | |
| Administrator | 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. | I can add, edit, and remove users, and assign. | High | Sprint-1 |

4. PROJECT DESIGN

4.1 Problem Solution Fit

| | | | | |
|-------------------------|---|---|---|-----------------------------------|
| Define CS, fit into CC | 1. CUSTOMER SEGMENT(S) CS Policymakers, economists, development researchers, and students interested in national or regional prosperity metrics. | 6. CUSTOMER CONSTRAINTS CC <ul style="list-style-type: none"> Lack of access to updated or credible datasets. Limited knowledge of data analysis tools. Budgetary or resource limitations for deeper studies. | 5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none"> The Heritage Foundation Index. World Bank Ease of Doing Business reports. Academic publications (but often not user-friendly or accessible for all). | Explore AS, differentiate |
| | 2. JOBS-TO-BE-DONE / PROBLEMS J&P <ul style="list-style-type: none"> Need to understand what drives prosperity and freedom in economies. Need to compare economic freedom across countries to guide reforms. | 9. PROBLEM ROOT CAUSE RC <ul style="list-style-type: none"> Limited awareness of the components driving economic freedom. Difficulty accessing comparative insights across countries. Reliance on outdated or anecdotal data. | 7. BEHAVIOUR BE <ul style="list-style-type: none"> Direct: Reading official reports, using data dashboards. Indirect: Watching explainer videos, reading summaries, attending seminars/webinars. | |
| Identify strong TR & EM | 3. TRIGGERS TR <ul style="list-style-type: none"> Concerns over economic stagnation or inequality. Interest in global rankings and their correlation with development. Academic projects or research questions. | 10. YOUR SOLUTION SL <ul style="list-style-type: none"> An interactive or data-driven analysis of the Index of Economic Freedom using real datasets. Visualizations and rankings that make insights clear and actionable. | 8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE Reports, dashboards, data portals (e.g., World Bank, Heritage.org). 8.2 OFFLINE Lectures, conferences, printed reports, classroom discussions. | Extract online & offline CH of BE |
| | 4. EMOTIONS: BEFORE / AFTER EM Before: Frustrated, uncertain about which economic policies correlate with growth. After: Informed, confident in data-based comparisons, inspired to explore policy reform or further research. | | | |

4.2 Proposed Solution

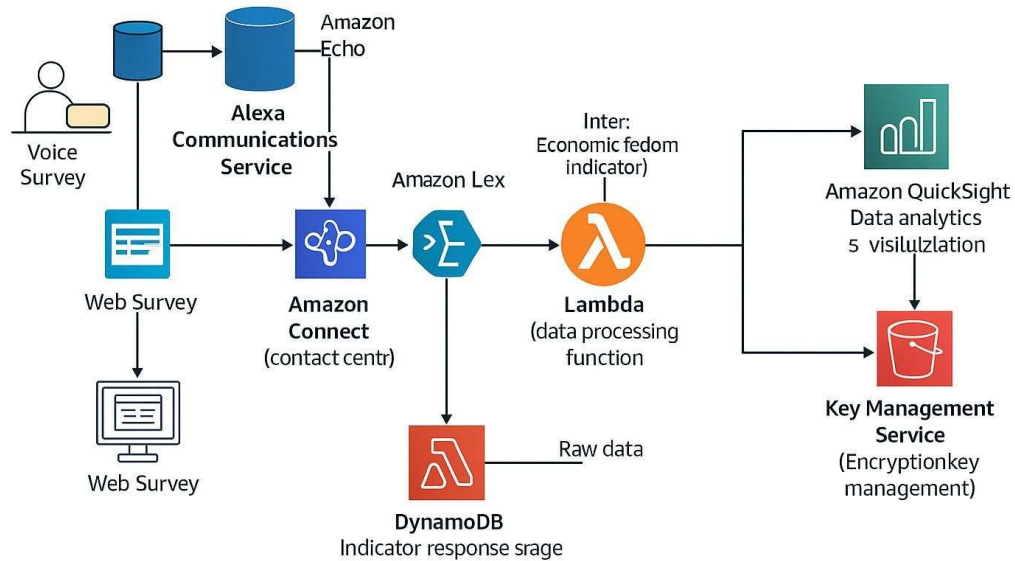
Proposed Solution Template:

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

Measuring the Pulse of Prosperity: An Index of Economic Freedom Architecture



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 | 3 | Medium |

| | | | | | |
|----------|---------------------------------|-------|---|---|--------|
| | | | the latest information into the analysis and update the index | | |
| 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:

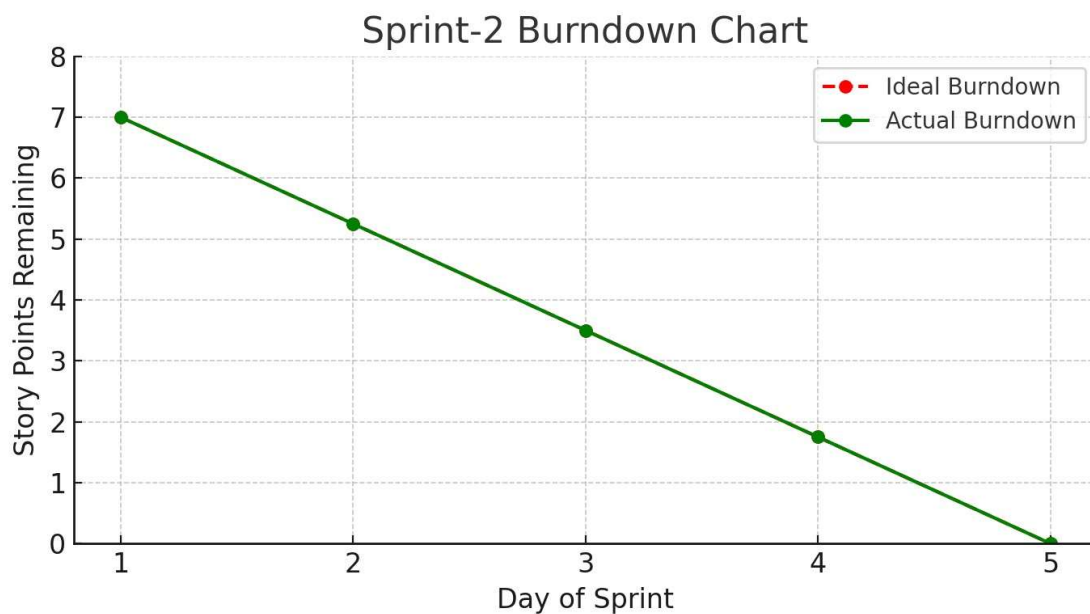
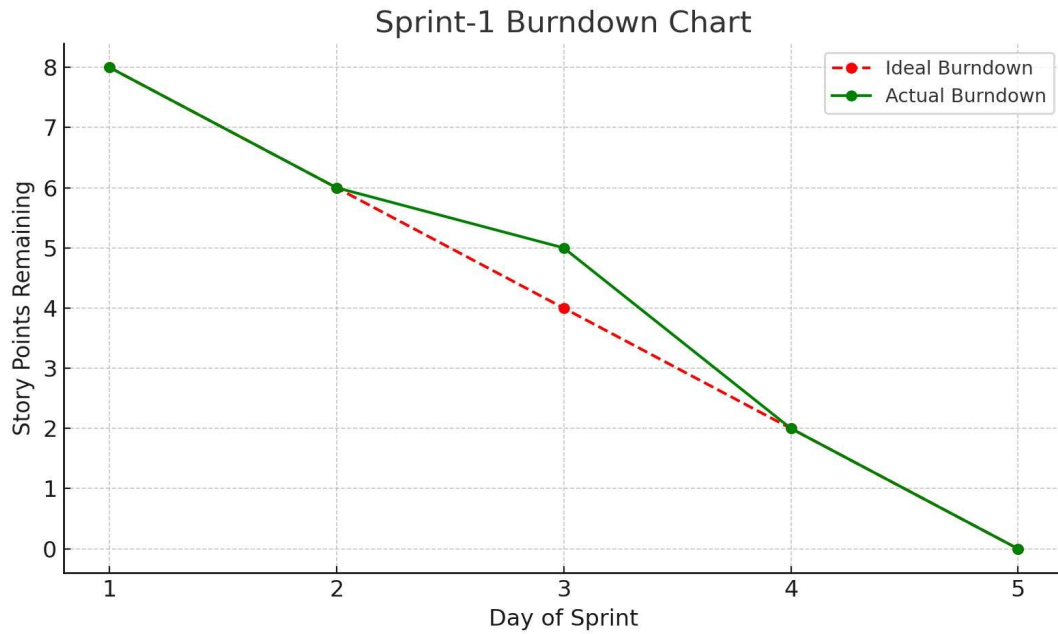
| Sprint | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
|----------|--------------------|----------|-------------------|---------------------------|---|------------------------------|
|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

$$AV = \text{sprint duration} / \text{velocity} = 15 / 10 = 1.5$$

Burndown Chart:



6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

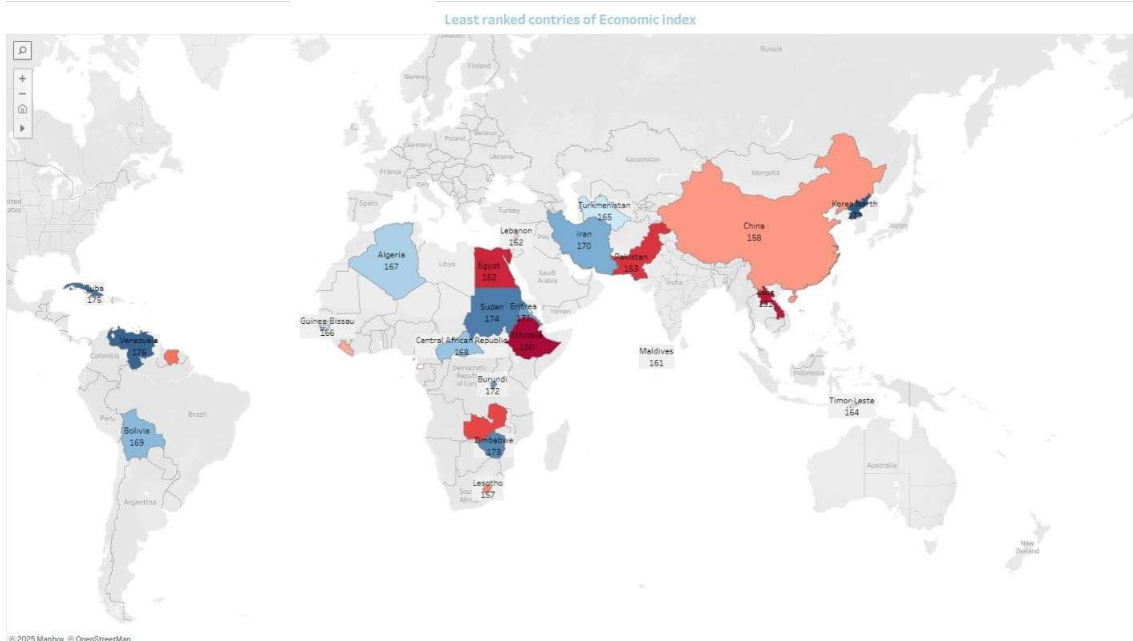
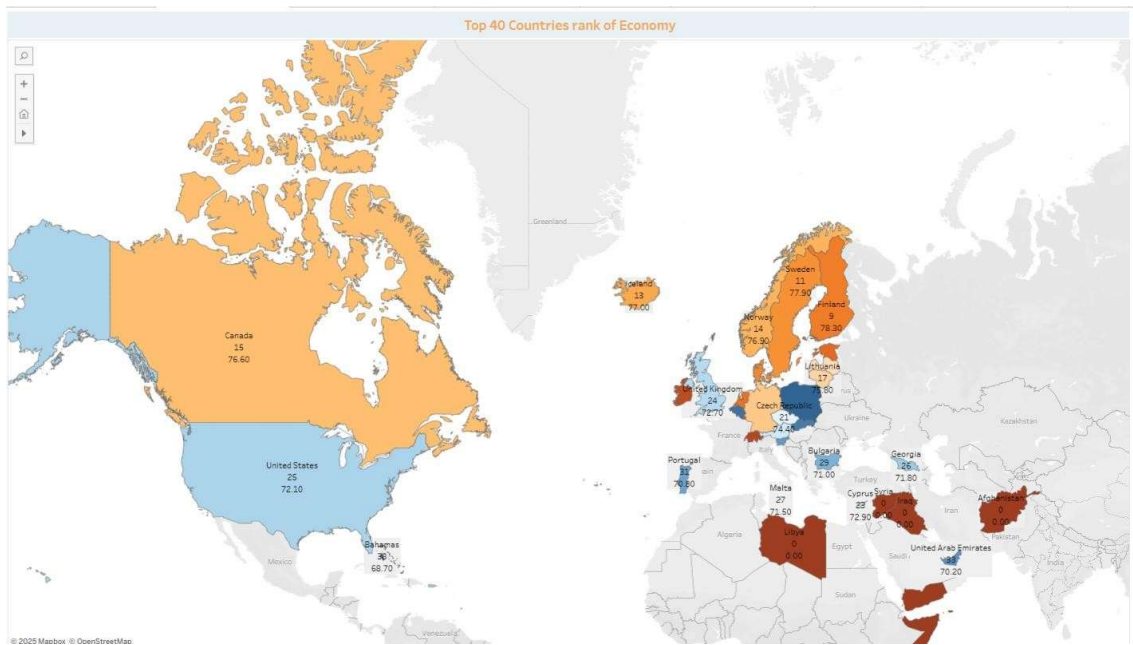
Model Performance Testing:

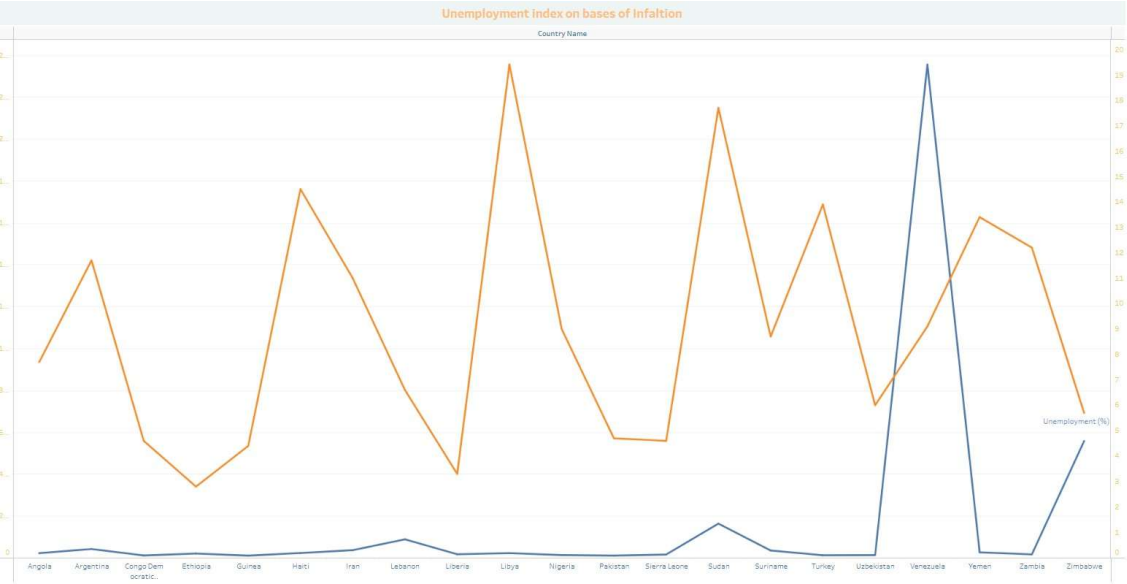
Project team shall fill the following information in model performance testing template.

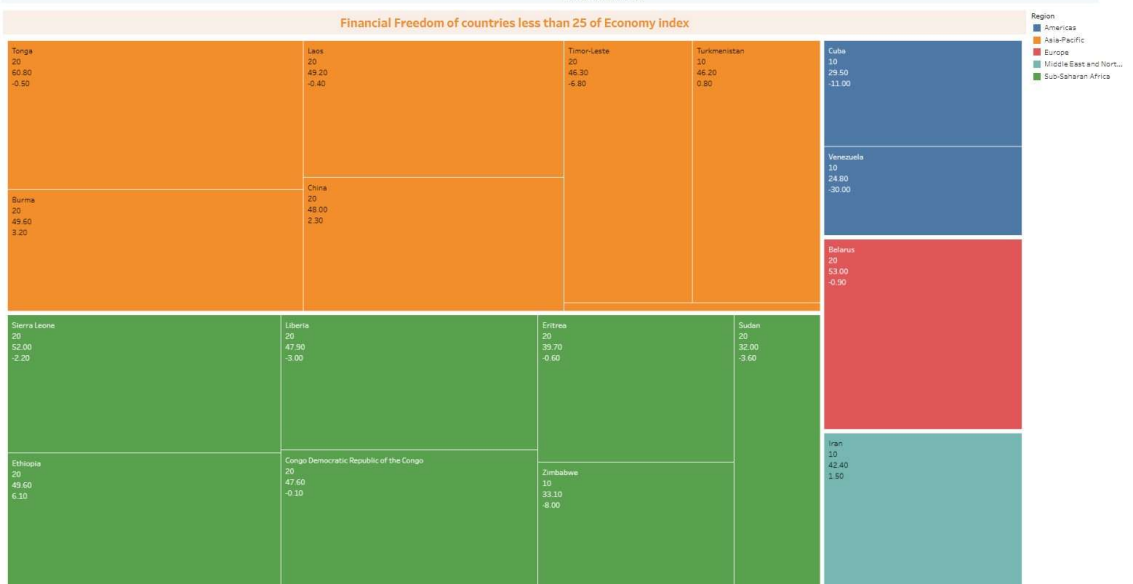
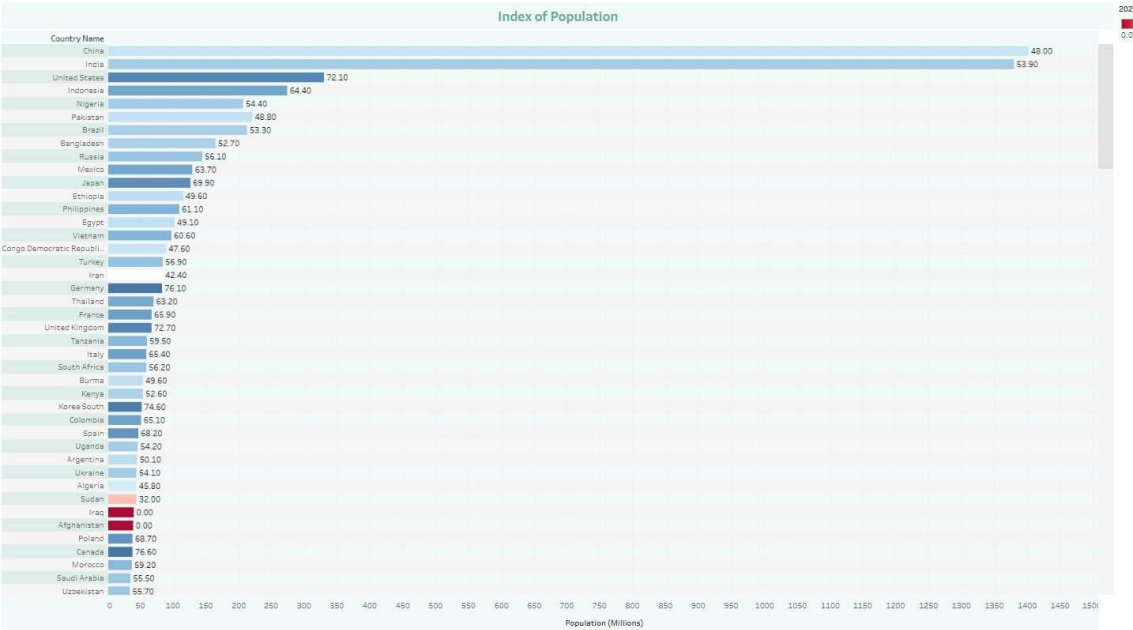
| S.No. | Parameter | Screenshot / Values |
|-------|-----------|---------------------|
| | | |

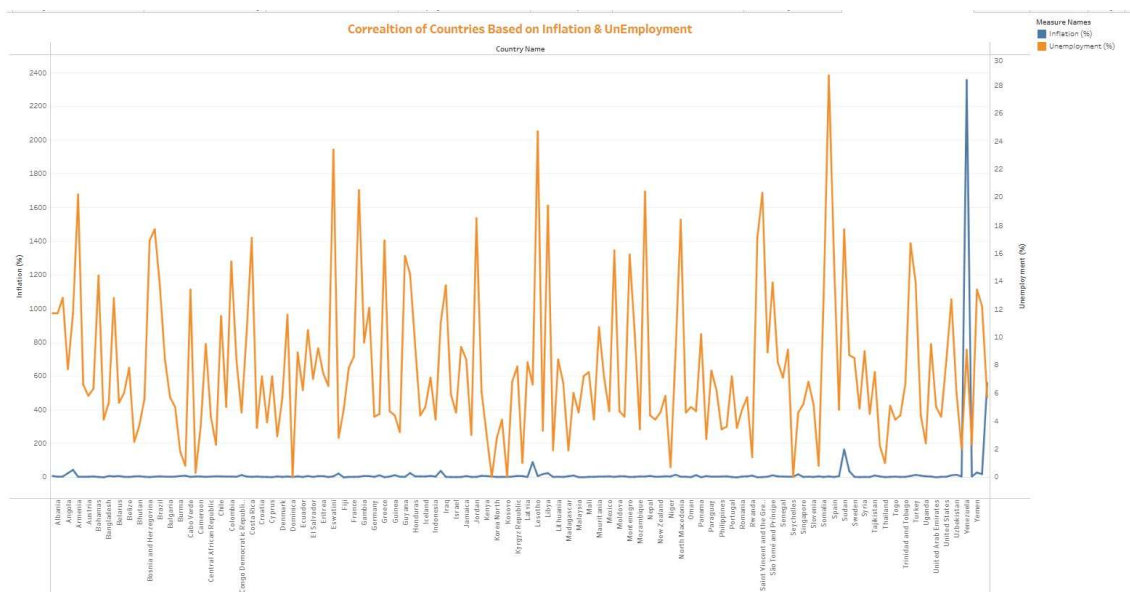
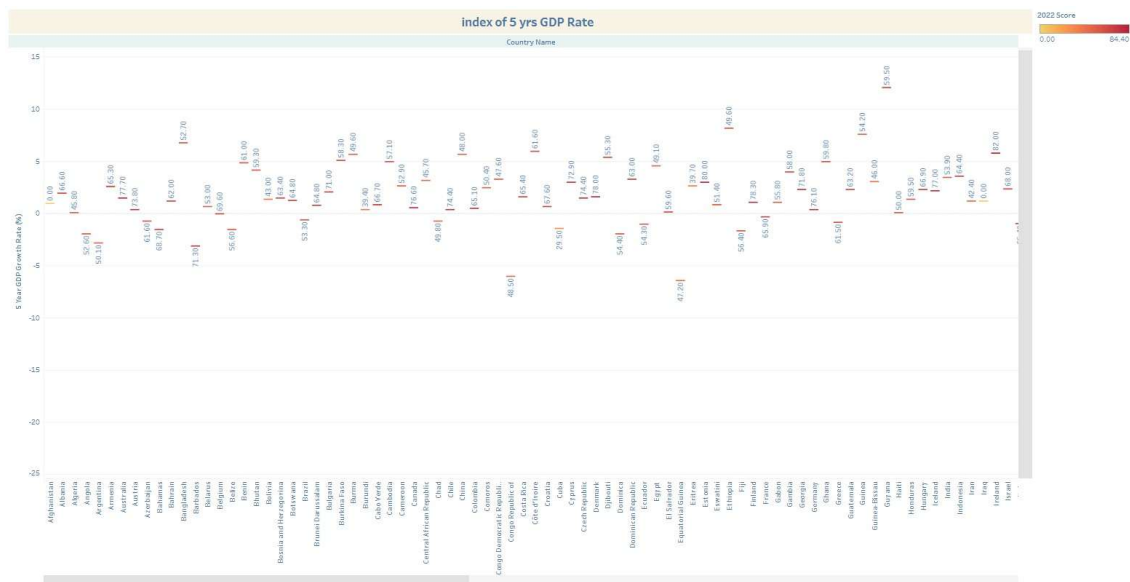
| | | |
|----|------------------------|--|
| 1. | Data Rendered | <p>The dashboard renders comprehensive country-level economic data including:</p> <ul style="list-style-type: none"> - Economic Score/Index - Country ID and Country Name - 5-Year GDP Growth Rate - Business Freedom, Corporate Tax Rate (%), 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 | <p>Preprocessing likely involved:</p> <ul style="list-style-type: none"> - 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 | <p>The dashboard extensively uses filters and interactive elements:</p> <ul style="list-style-type: none"> - 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 | <p>Based on the metrics and visualizations, the following calculated fields are likely used:</p> <ul style="list-style-type: none"> - 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 | <p>No of Visualizations / Graphs –</p> <p>The primary dashboard ("Dashboard 1" / "Global Rankings & Financial Freedom Impact Dashboard") contains at least 5 distinct visualizations/sections</p> |
| | | <ul style="list-style-type: none"> - 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) |









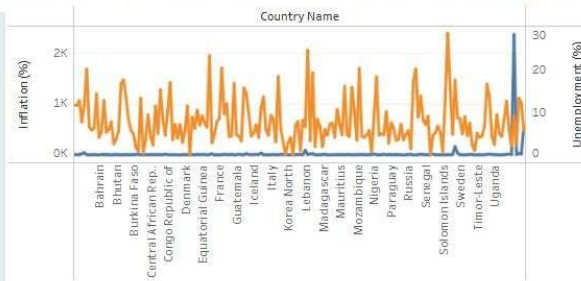
Visualizing Economic Freedom and Instability Around the World

NXT DASBO...

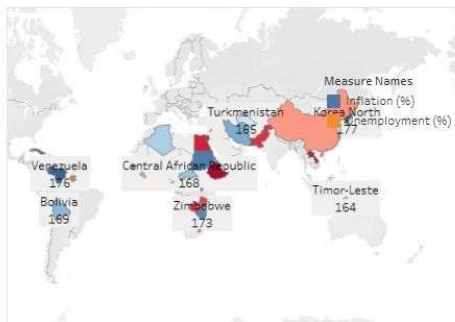
Country wise 2002 Economic score



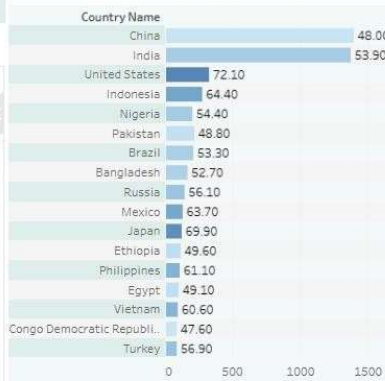
Correlation of Countries Based on Inflation & Unemployment



Least ranked contries of Economic index



Index of Population



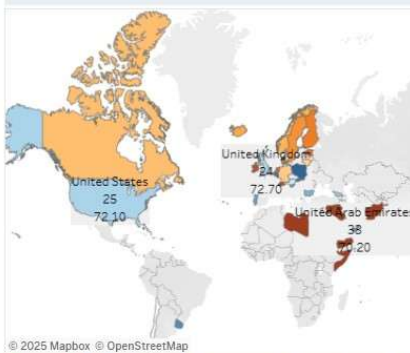
INSIGHTS OVERVIEW :

- [-] 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

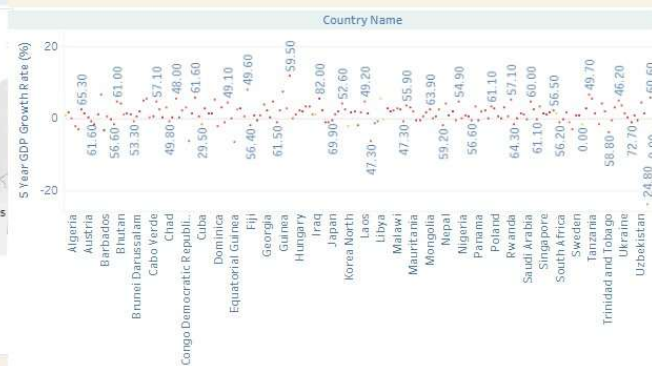
Global Rankings & Financial Freedom Impact Dashboard

TO STORY

Top 40 Countries rank of Economy



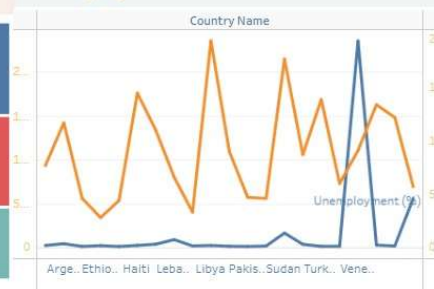
index of 5 yrs GDP Rate



Financial Freedom of countries less than 25 of Economy index



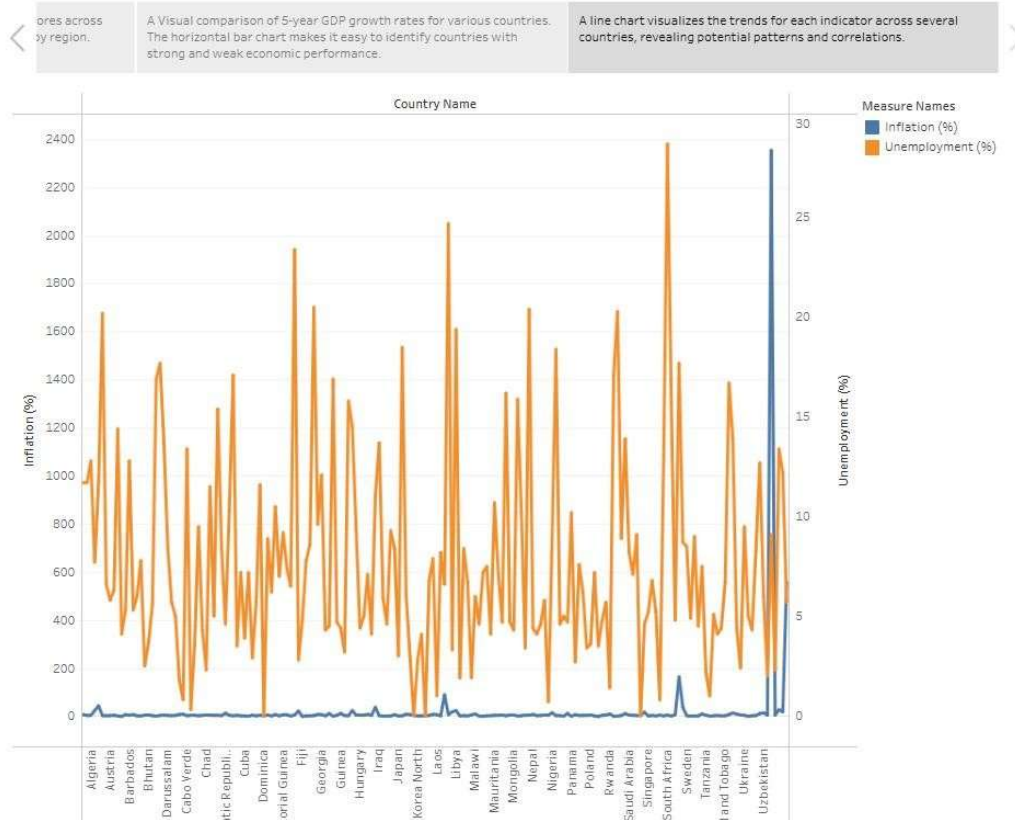
Unemployment index on bases of Inflation



INSIGHTS OVERVIEW :

- [-] 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

Journey Through the 2002 Global Economy



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 userfriendly 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.

11. APPENDIX

Dataset Link:

<https://drive.google.com/file/d/1EBIa1LtM3Ni2Uh3nekLB6wt3263Q3NeX/view>

GitHub & Project Demo Link:

Project Demo Link:

https://drive.google.com/file/d/1mPykltU0Re_wQskX8pLeGzyymVJfxZ2q/view?usp=sharing