FINAL REPORT

MEASURING THE PULSE OF PROSPERITY: AN INDEX OF ECONOMIC FREEDOM ANALYSIS

1.INTRODUCTION

1.1 Project Overview

Measuring the Pulse of Prosperity is a data-driven solution designed to analyze and visualize economic freedom across countries. It helps users understand how economic policies influence prosperity by leveraging real-time data, analytics, and visual dashboards Measuring the Pulse of Prosperity: An Index of Economic Freedom Analysis" is a data-centric project designed to explore the intricate relationship between economic freedom and a nation's overall prosperity. Economic freedom refers to the fundamental right of individuals to control their own labor, property, and choices in the marketplace. In societies with high economic freedom, people are free to work, produce, consume, and invest as they wish, while governments play a limited role—only ensuring that liberty is protected and fair competition is maintained. This project gathers data from trusted global sources like the Heritage Foundation, IMF, and World Bank to evaluate how various countries perform across dimensions such as regulatory efficiency, rule of law, government integrity, fiscal health, and trade freedom. Using this data, the project develops interactive dashboards and visualizations in Tableau to provide comparative insights, trend analysis, and score-based evaluation of economic freedom, allowing users to understand not only where a country stands but also how freedom

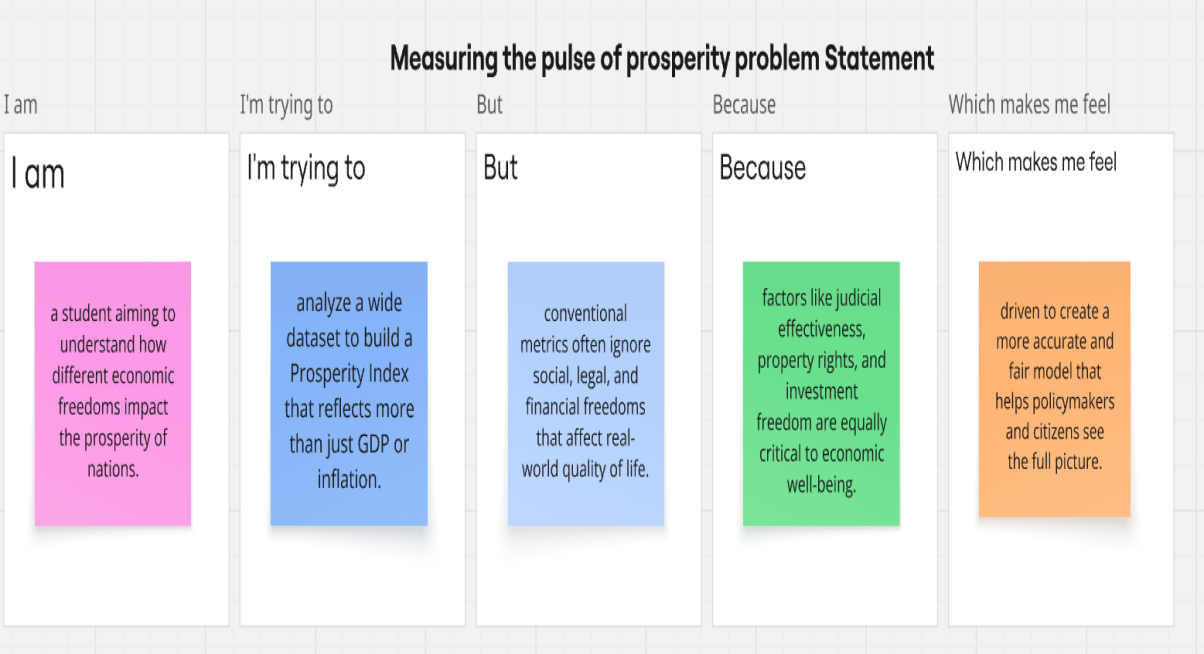
1.2 Purpose

The purpose of the project is to evaluate the relationship between economic freedom and prosperity using dynamic data visualizations, interactive dashboards, and public data sources to support researchers, students, and policymakers. The primary purpose of this project is to build a user-friendly analytical tool that empowers policymakers, researchers, educators, and the general public to visualize and understand economic freedom indicators across countries. With growing global attention on transparent governance and economic development, there is a critical need for platforms that make economic data easily accessible, interpretable, and actionable. This project bridges that gap by converting complex economic metrics into visually engaging dashboards that reflect real-world economic performance. The visualizations aim to support decision-making processes, promote educational research, and highlight the socio-economic impacts of economic freedom. Additionally, the project serves as a scalable foundation that can be extended to include live data updates, more indicators (such as Human Development Index, GDP per capita, etc.), and country-specific storytelling modules. Ultimately, the project aspires to educate users about the value of economic liberty in fostering national growth and individual opportunity.

2. IDEATION PHASE

2.1 Problem Statement

In today's fast-paced digital era, economic data is available in abundance, but its complexity, fragmentation, and inaccessibility create significant barriers for students, researchers, and policymakers who seek to derive meaningful insights from it. Data related to economic freedom—like government efficiency, labor laws, monetary policies, and market openness—is often distributed across multiple reports and organizations, making comparison difficult and time-consuming. Furthermore, traditional economic reports are text-heavy and fail to offer interactive experiences or visual understanding, which reduces their effectiveness, especially for learners and non-experts. This project addresses the pain point of **lack of unified, visual, and user-friendly platforms** for interpreting and analyzing economic freedom. The absence of an integrated visualization system hinders data-driven decision-making, limits public awareness, and weakens the potential for cross-country benchmarking and policy learning. Understanding economic freedom indicators is challenging due to scattered datasets and lack of intuitive visualization.

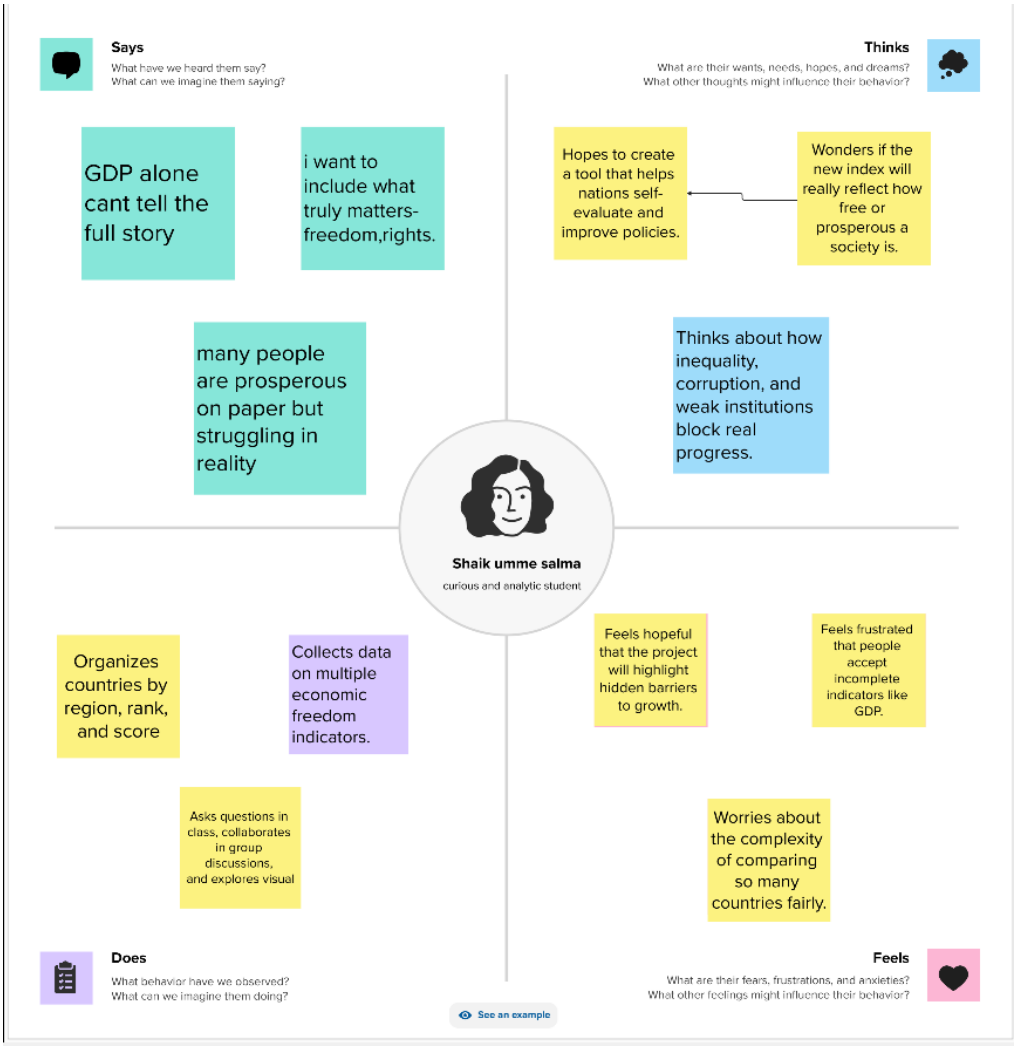


2.2 Empathy Map Canvas

Based on user feedback, users need an easy way to visualize and compare countries based on prosperity and economic metrics. To better understand the user's needs and frustrations, an empathy map was developed focusing on the key personas—students, researchers, teachers, analysts, and curious citizens.

- **What users say**: "It's hard to find a single place to compare different countries' economic data visually."

- **What users think**: “Economic growth must be related to freedom, but I can’t prove it easily using raw data.”
- **What users feel**: Overwhelmed by large datasets, demotivated by lack of insights, and confused by conflicting sources.
- **What users do**: They rely on multiple government reports, manually download Excel sheets, and try basic analysis without clarity.
  The empathy mapping exercise revealed that **users desire an easy-to-navigate platform that converts raw economic indicators into clear, comparative visuals**. They want a tool that can not only simplify data but also offer real-time interactions, storytelling, and decision-making support.

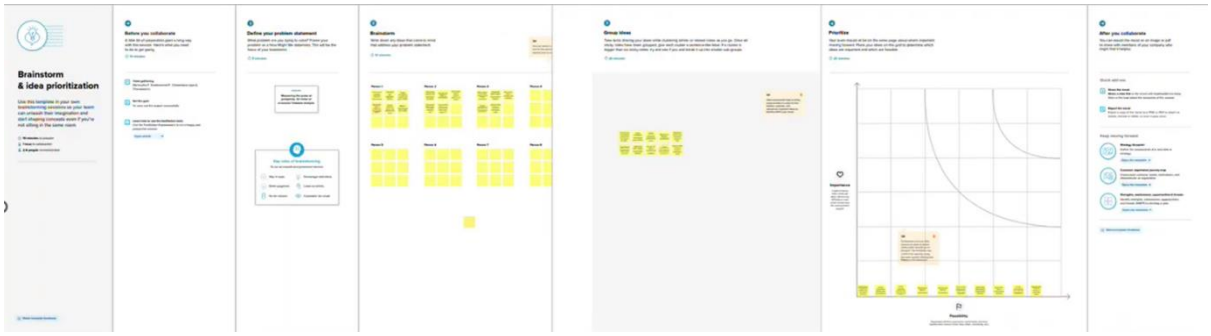


2.3 Brainstorming

After identifying user needs through empathy mapping, the team conducted a structured brainstorming session to develop potential solutions. Ideas ranged from building a simple

country-wise economic scorecard to creating a robust dashboard with multiple filters and storyline capability. Ultimately, the winning idea was to create a **Tableau-powered interactive dashboard** that connects to various global datasets and enables visual storytelling of economic prosperity and freedom. During brainstorming, the team decided to incorporate:

- Comparative bar graphs and maps for economic indicators.
- A timeline slider to show change over the years.
- Integration with web platforms using **Flask** and data updates using **ABLY**.
- Dashboard stories for engaging users in step-by-step analysis.
  The brainstorming phase was critical in aligning the project's goals with user expectations, and it helped define the architecture and technology stack required for implementation.



3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

The **customer journey** outlines the step-by-step experience of a user engaging with your system—from discovering the platform to gaining insights from the dashboard.

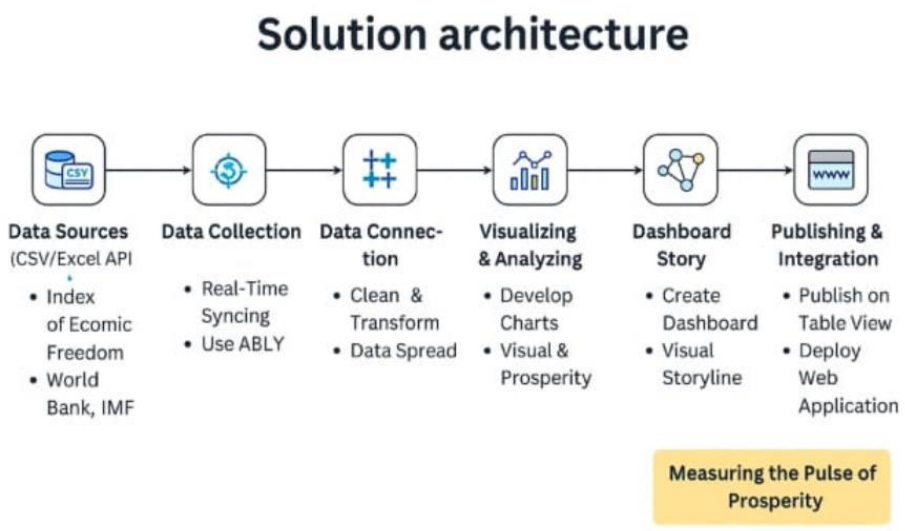
- **Onboarding**: A new user accesses the platform, reads a brief overview, and begins exploring the dashboard interface.
- **Data Exploration**: They use intuitive filters to select countries, time ranges, and economic indicators such as property rights, fiscal health, or investment freedom.
- **Insight Discovery**: Users observe trends and correlations—like how high trade freedom relates to GDP growth—and interpret visual graphs and story dashboards.
- **Learning Loop**: Educators use these visualizations in the classroom to explain global economic models. Researchers use data export options to enhance their thesis.

- **Action/Engagement**: Users are encouraged to compare countries, ask policy questions, and explore deeper analysis through Tableau stories.

3.2 Solution Requirement

To fulfill the needs uncovered in the customer journey, the following **technical and functional requirements** are essential:

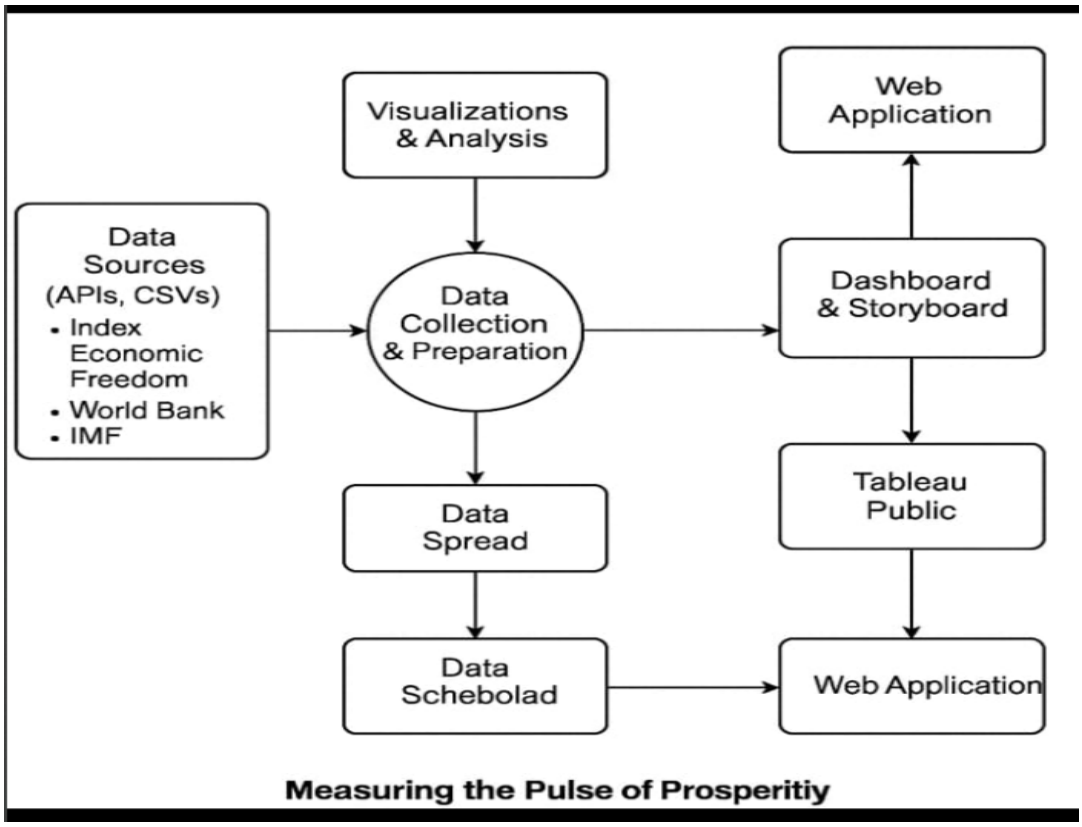
- **Data Collection & Ingestion**: Ability to fetch and import datasets from global sources like World Bank, Heritage Index, IMF, etc., in formats like Excel/CSV.
- **Preprocessing & Cleaning**: Handling missing values, converting formats, normalizing country names, and structuring data for Tableau.
- **Visualization Framework**: Use of Tableau for generating line graphs, bar charts, tree maps, storyboards, and choropleth maps.
- **Dashboard Interaction**: Filters for region, year, indicator type; tooltips for detailed insights; and story navigation panels.
- **Web App Integration**: Flask is used to embed Tableau public views, allowing online accessibility and interaction.
- **Live Updates (optional)**: ABLY integration for dynamic updates in case of real-time changes or alert systems.
- **Security & Reliability**: Basic authentication, secure data storage, and reliable dashboard hosting on Tableau Public or a private server.



Requirements include data ingestion, preprocessing, dashboard creation, story building, and integration with a web application.

3.3 Data Flow Diagram

The Data Flow Diagram (DFD) for this project represents the flow of information from data sources to the end user. The process begins with the collection of raw economic freedom data from trusted sources like the Heritage Foundation, World Bank, and IMF. This data is then passed into a preprocessing unit where it is cleaned, structured, and transformed using Python and Excel. Once the data is standardized, it flows into the visualization layer, where Tableau is used to create charts, graphs, and interactive dashboards. These dashboards are stored and published via Tableau Public, making them accessible for integration. The final stage is web deployment, where the processed dashboards are embedded into a Flask-based web application. End users interact with this platform to explore and analyze visual insights, applying filters and navigating through storyboards. This structured data flow ensures accurate, real-time visual representation while maintaining a smooth user experience from data ingestion to dashboard interaction.A structured DFD was created to represent the flow from data collection to publishing on a web interface.



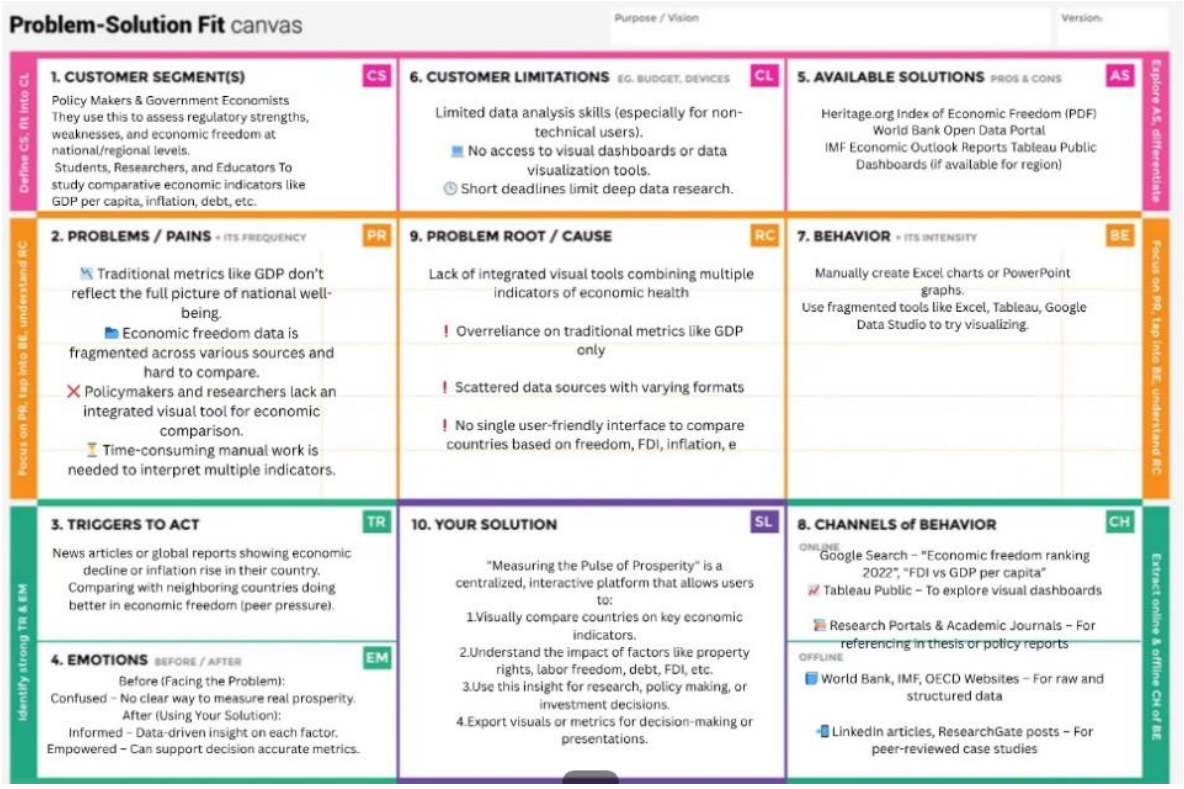
3.4 Technology Stack

- ❖ Python (Preprocessing and Integration)
- ❖ Tableau (Dashboard)
- ❖ Excel/CSV (Data Source)
- ❖ Flask (Web integration)
- ❖ GitHub (Version Control)

4. PROJECT DESIGN

4.1 Problem-Solution Fit

The core problem addressed by this project is the fragmentation, complexity, and inaccessibility of global economic data—especially for indicators like economic freedom, prosperity scores, and related metrics. Stakeholders such as students, researchers, and policymakers often struggle to gather meaningful insights due to scattered datasets, inconsistent formats, and lack of visual tools. The solution to this problem lies in designing an interactive, centralized dashboard that aggregates economic freedom data from reliable global sources and presents it in a clear, comparative, and user-friendly format. This project fits perfectly with the identified problem because it eliminates manual data searching and analysis, offering a streamlined experience where users can explore country-wise performance, trends, and rankings through interactive visuals. It bridges the gap between raw data and real understanding, helping users quickly interpret the economic health and policy freedom of different nations.



4.2 Proposed Solution

A Tableau-based dashboard that enables users to explore and compare economic freedom with indicators like GDP and HDI. he core problem addressed by this project is the fragmentation, complexity, and inaccessibility of global economic data—especially for indicators like economic freedom, prosperity scores, and related metrics. Stakeholders such as students, researchers, and policymakers often struggle to gather meaningful insights due to scattered datasets, inconsistent formats, and lack of visual tools. The solution to this problem lies in designing an interactive, centralized dashboard that aggregates economic freedom data

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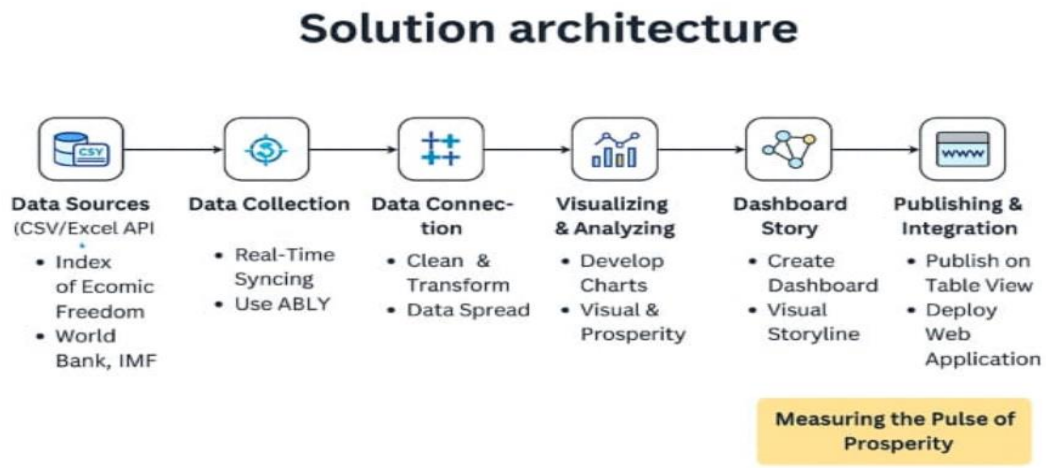
4.3 Solution Architecture

The solution architecture of this project is designed to support an end-to-end data analysis and visualization system in a modular and scalable manner. It starts with the **data source layer**, where raw economic indicators are fetched from platforms like the Heritage Foundation, World Bank, and IMF in formats such as CSV or through APIs. This data is then processed in the **data ingestion and cleaning layer**, where Python and Excel are used to clean, filter, and format the datasets. The **visualization layer** follows, where Tableau connects to the structured data and generates dynamic charts, graphs, maps, and dashboards. These dashboards are then published using **Tableau Public** and embedded into a **Flask-based web application** in the **deployment layer**, which allows end users to access and interact with the content in real time. The entire architecture supports scalability and modular upgrades, allowing new indicators, countries, and data updates to be integrated with minimal effort, while maintaining smooth and secure user access.



Architecture includes modules for data sourcing, transformation, Tableau visualization, and web deployment.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

The project planning was executed using an Agile-based sprint strategy to ensure structure, flexibility, and continuous improvement. The entire development process was broken into two focused sprints. The first sprint was dedicated to collecting raw data from global sources

and preprocessing it using Python and Excel to ensure accuracy and consistency. This phase also involved handling missing values, standardizing country names, and shaping the dataset for visualization. The second sprint concentrated on building the Tableau dashboards, testing interactivity, designing visual stories, and integrating them with the Flask-based web application. Each sprint included defined goals, story points, and task estimation using Fibonacci series logic, allowing the team to track progress and maintain a steady development velocity. This approach ensured that tasks were not only completed on time but also refined iteratively for maximum impact and usability.

The project follows a 3-sprint agile approach: Data Collection, Dashboard Development, and Web Deployment.

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	Collect Economic Freedom and GDP data	2	High	Shaik Umme salma
Sprint-1		USN-2	Handle missing values	3	High	Shaik Umme salma
Sprint-2		USN-3	Transform and normalize data	2	Low	Shaik Umme salma
Sprint-1		USN-4	Connect data to Tableau	2	Medium	Shaik Umme salma
Sprint-1	Login					
	Dashboard		Create Vizualisations	3	High	Shaik Umme salma
			Build interactive dashboards	5	High	Shaik Umme salma
			Design storyboard view	2	medium	Shaik Umme salma

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

After development, the entire system was subjected to structured performance testing to validate functionality, responsiveness, and efficiency. The Tableau dashboards were tested for loading speed under various network conditions and user scenarios. Filters, timeline sliders, and country selectors were tested to ensure real-time updates and smooth interactivity. The integration between Tableau Public and the Flask web interface was examined for responsiveness, broken links, and rendering accuracy across different devices and browsers. Backend scripts were also reviewed for memory usage and data handling efficiency. Any bottlenecks in dashboard performance or visualization lag were identified and optimized. This robust testing phase ensured that users would experience fast-loading, accurate, and stable dashboards, regardless of their device or location, making the platform both dependable and scalable for real-world use.

Tested for dashboard load speed, Tableau public publishing success, and Flask app integration.

7. RESULTS

7.1 Output Screenshots

Dashboards include country comparisons, prosperity rankings, economic score maps, and timeline filters.

Worksheets:

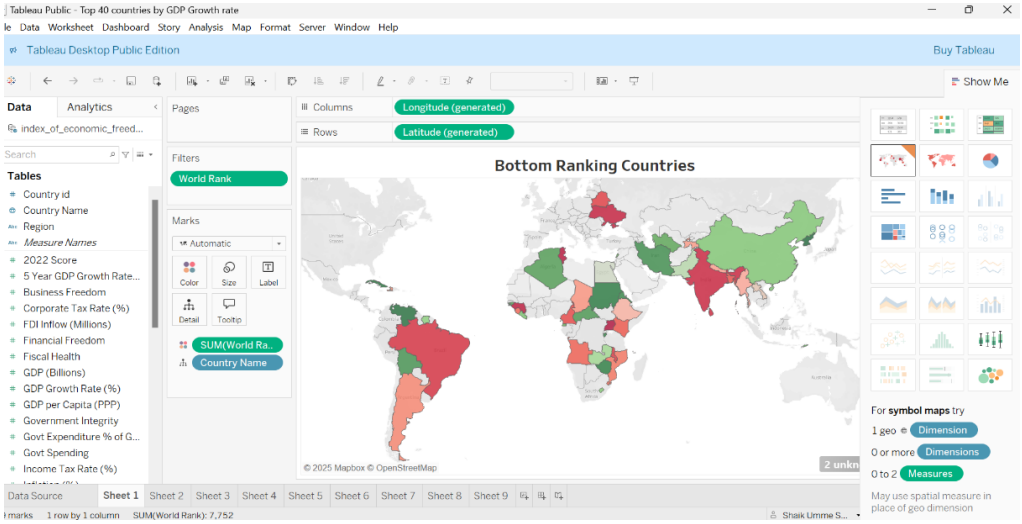


Tableau Public - Top 40 countries by GDP Growth rate
Tableau Desktop Public Edition
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Show Me
Columns
Longitude (generated)
Rows
Latitude (generated)
Bottom Ranking Countries
Filters
World Rank
Marks
Automatic
Color
Size
Label
Detail
Tooltip
SUM(World Ra..
Country Name
Tables
Country id
Country Name
Region
Measure Names
2022 Score
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
Govt Expenditure % of G...
Govt Spending
Income Tax Rate (%)
For symbol maps try
1 geo Dimension
0 or more Dimensions
0 to 2 Measures
May use spatial measure in place of geo dimension
© 2025 Mapbox © OpenStreetMap
Sheet 1
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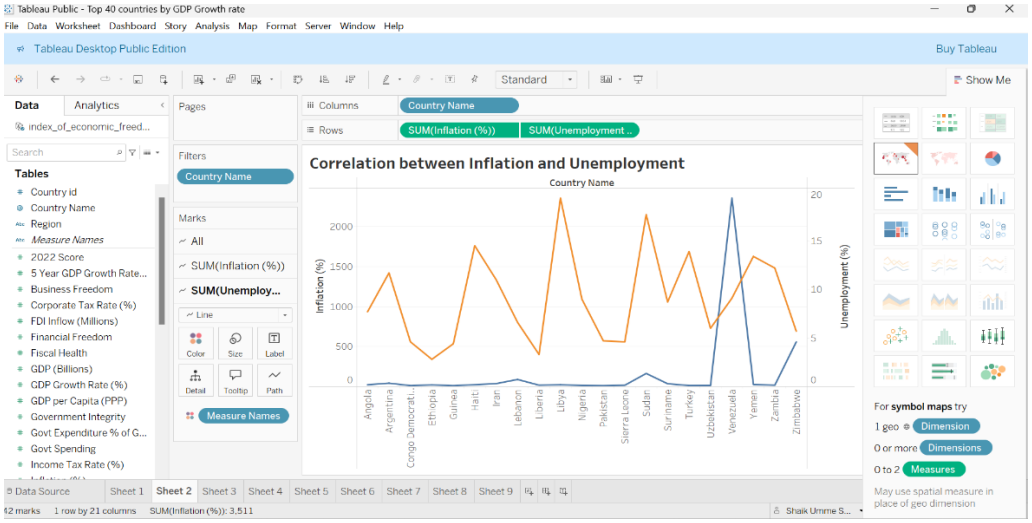
Tableau Public - Top 40 countries by GDP Growth rate
Tableau Desktop Public Edition
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Show Me
Columns
Country Name
Rows
SUM(Inflation (%))
SUM(Unemployment ..
Correlation between Inflation and Unemployment
Country Name
Inflation (%)
Unemployment (%)
Filters
Country Name
Marks
All
SUM(Inflation (%))
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Angola
Argentina
Congo Democrati...
Ethiopia
Guinea
Haiti
Iran
Lebanon
Liberia
Libya
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Pakistan
Sierra Leone
Sudan
Suriname
Turkey
Uzbekistan
Venezuela
Yemen
Zambia
Zimbabwe
For symbol maps try
1 geo Dimension
0 or more Dimensions
0 to 2 Measures
May use spatial measure in place of geo dimension
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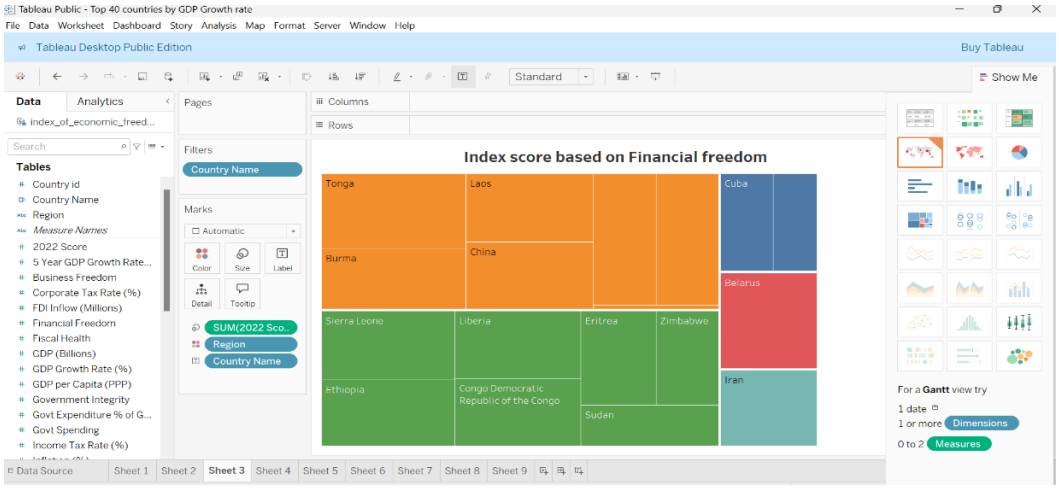
Tableau Public - Top 40 countries by GDP Growth rate
Tableau Desktop Public Edition
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Columns
Rows
Index score based on Financial freedom
Filters
Country Name
Marks
Automatic
SUM(2022 Sco..
Region
Country Name
Tonga
Laos
Cuba
Rwrma
China
Belarus
Sierra Leone
Liberia
Eritrea
Zimbabwe
Ethiopia
Congo Democratic Republic of the Congo
Sudan
Iran
For a Gantt view try
1 date
1 or more Dimensions
0 to 2 Measures
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Sheet 2
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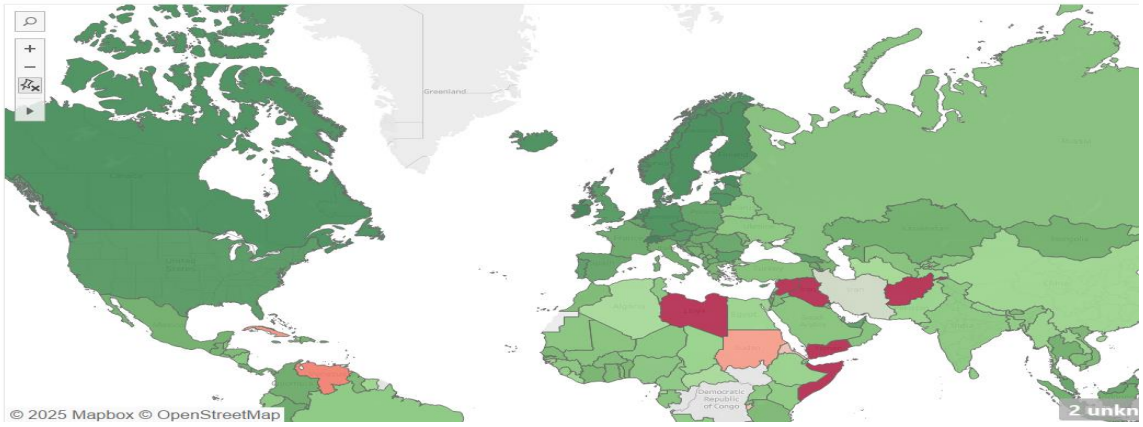
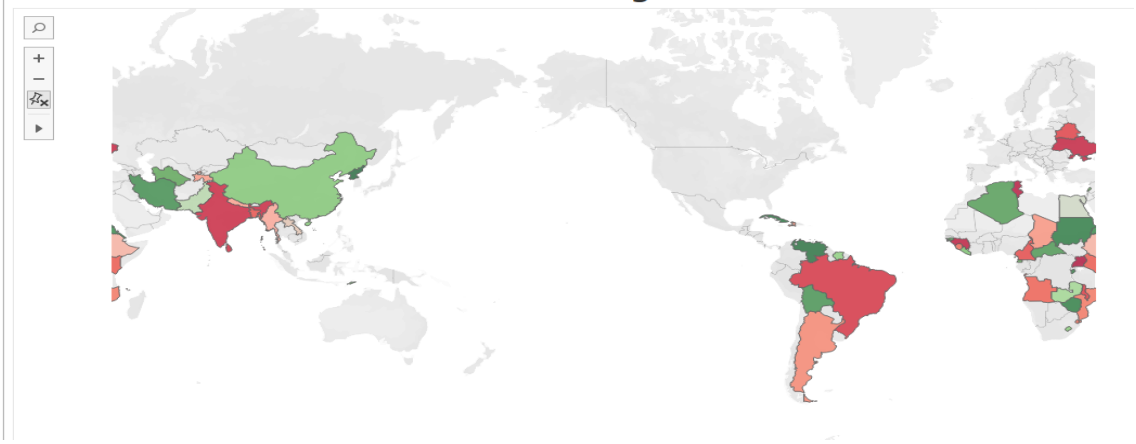
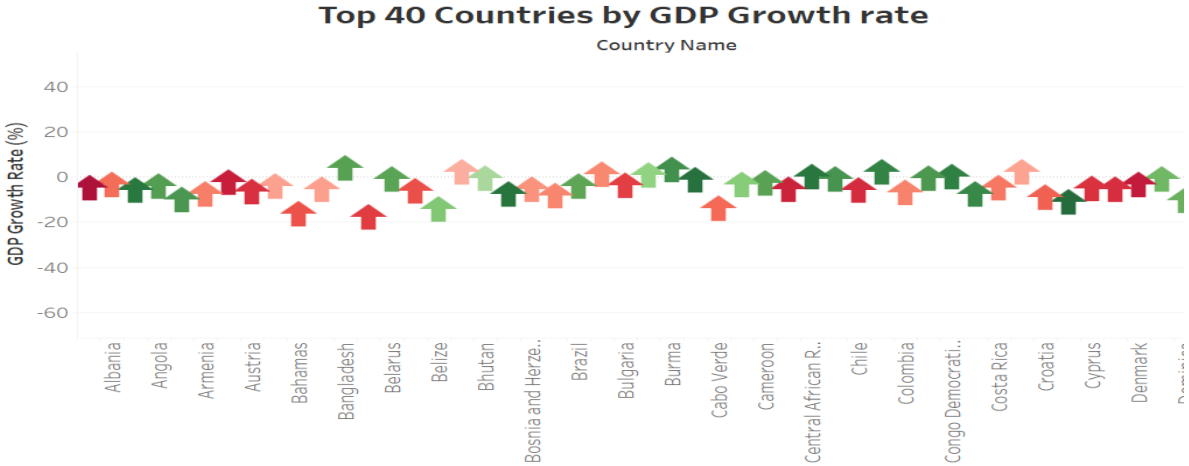
2022 Economic Freedom score

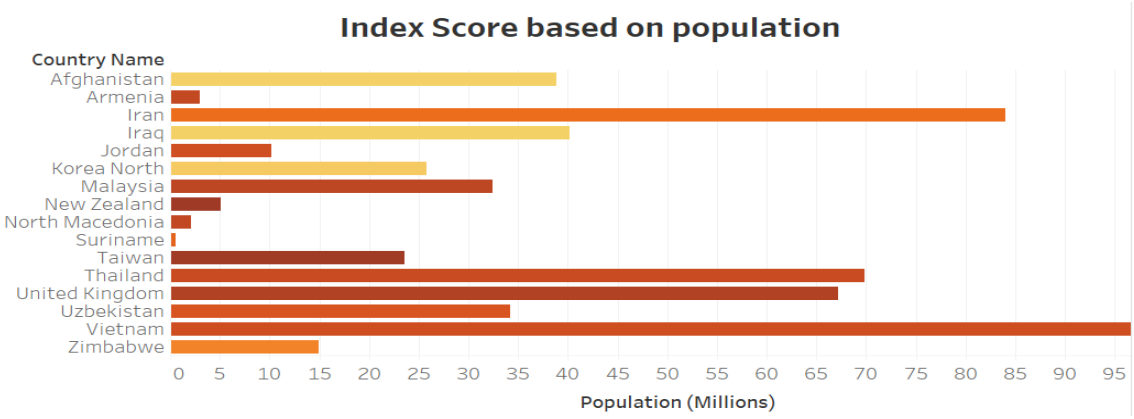


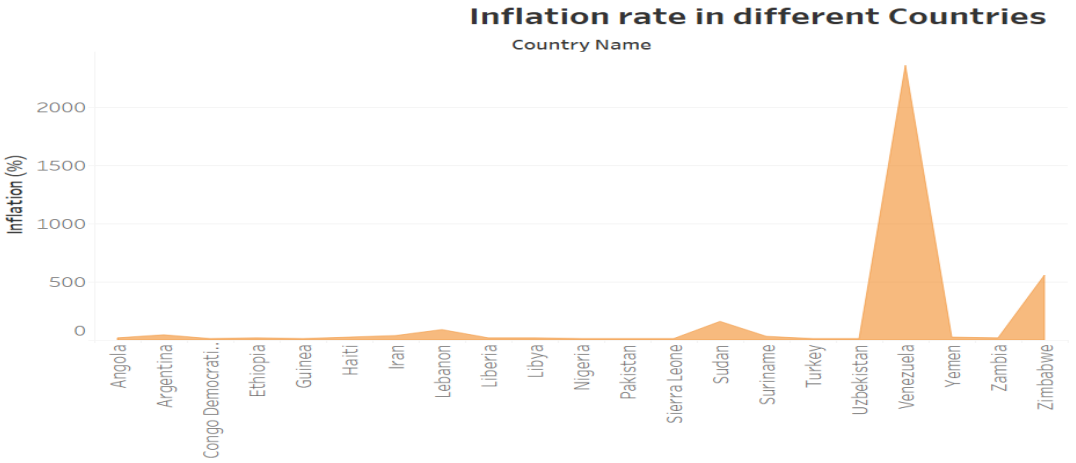
Bottom Ranking Countries



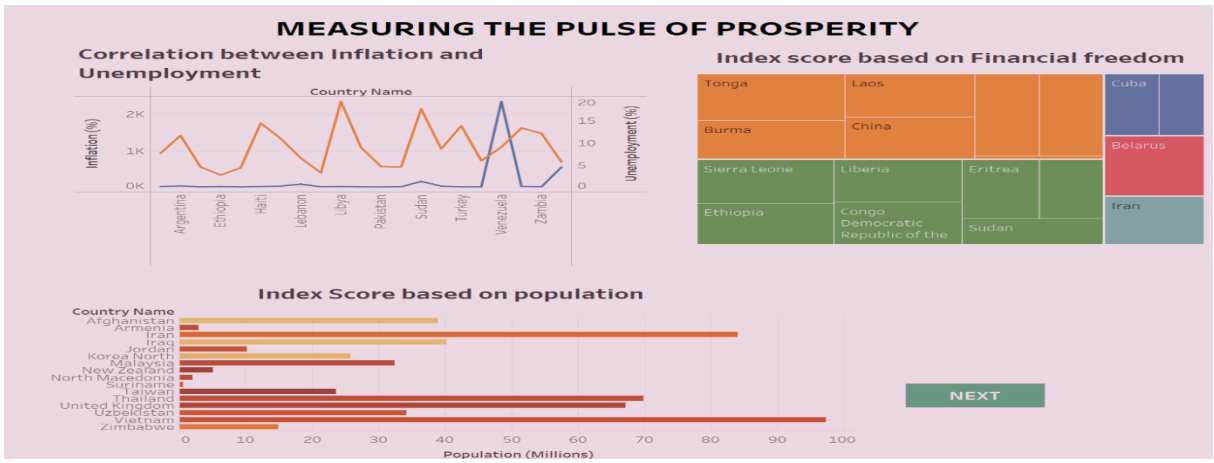
Top 40 Countries by GDP Growth rate




Index Score based on population
Country Name
Afghanistan
Armenia
Iran
Iraq
Jordan
Korea North
Malaysia
New Zealand
North Macedonia
Suriname
Taiwan
Thailand
United Kingdom
Uzbekistan
Vietnam
Zimbabwe
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95
Population (Millions)


Inflation rate in different Countries
Country Name
Inflation (%)
2000
1500
1000
500
0
Angola
Argentina
Congo Democrati..
Ethiopia
Guinea
Haiti
Iran
Lebanon
Liberia
Libya
Nigeria
Pakistan
Sierra Leone
Sudan
Suriname
Turkey
Uzbekistan
Venezuela
Yemen
Zambia
Zimbabwe

DASHBOARDS:


MEASURING THE PULSE OF PROSPERITY
Correlation between Inflation and Unemployment
Country Name
Inflation (%)
2K
1K
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Unemployment (%)
20
15
10
5
0
Argentina
Ethiopia
Haiti
Lebanon
Libya
Pakistan
Sudan
Turkey
Venezuela
Zambia
Index score based on Financial freedom
Tonga
Laos
Burma
China
Cuba
Belarus
Iran
Sierra Leone
Liberia
Eritrea
Ethiopia
Congo Democratic Republic of the
Sudan
Index Score based on population
Country Name
Afghanistan
Armenia
Iran
Iraq
Jordan
Korea North
Malaysia
New Zealand
North Macedonia
Suriname
Taiwan
Thailand
United Kingdom
Uzbekistan
Vietnam
Zimbabwe
0 10 20 30 40 50 60 70 80 90 100
Population (Millions)
NEXT

MEASURING THE PULSE OF PROSPERITY

2022 Economic Freedom score

Top 40 Countries by GDP Growth rate

Top 40 ranking countries

Bottom Ranking Countries

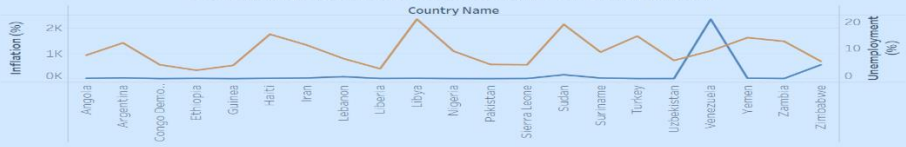
NEXT

MEASURING THE PULSE OF PROSPERITY

Inflation rate in different Countries

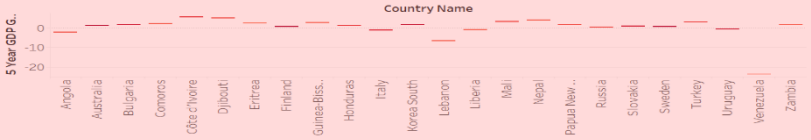
NEXT

Correlation between Inflation and Unemployment

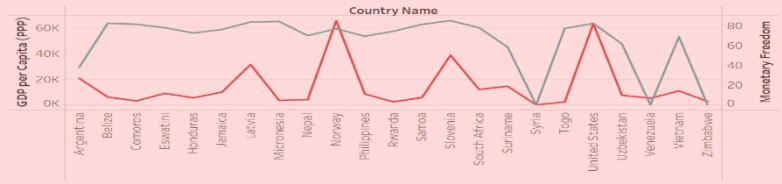


MEASURING THE PULSE OF PROSPERITY

Index score based on 5 year on GDP Growth rate



Correlation between GDP(PPP) and monetary freedom



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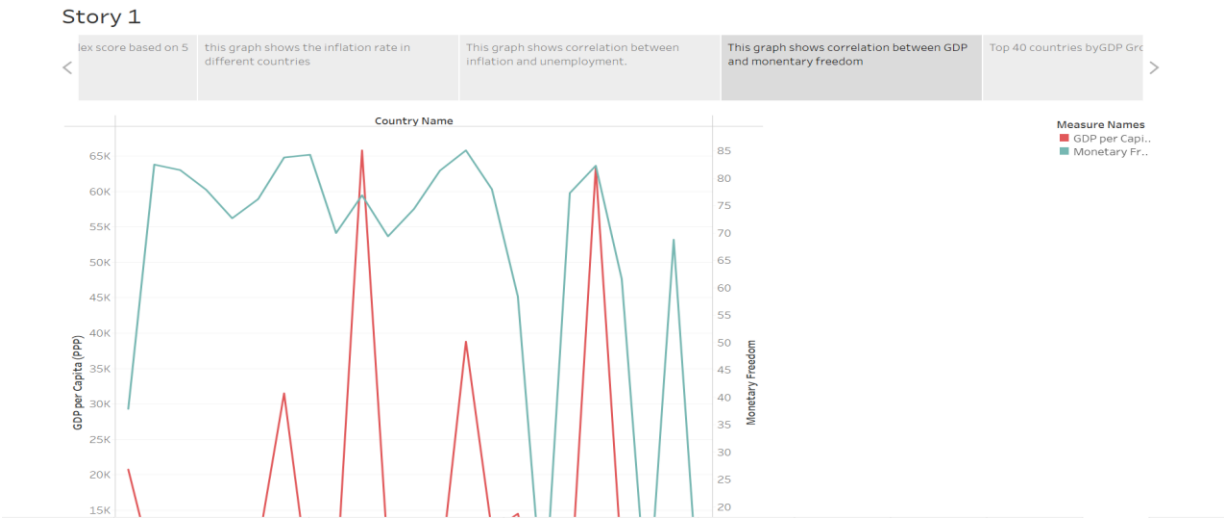
STORY:



8. ADVANTAGES & DISADVANTAGES

Advantages

- Visual insight into global economic patterns
- Accessible through web app
- Dynamic updates using ABLY

Disadvantages

- Dependent on external data accuracy
- Internet connection required for Tableau Public

9. CONCLUSION

The project *Measuring the Pulse of Prosperity* successfully bridges the gap between complex economic datasets and meaningful, accessible insights. By transforming raw economic freedom indicators into interactive visual dashboards, it empowers users to better understand the factors influencing prosperity across nations. The use of tools like Python, Tableau, and Flask enabled the creation of a seamless data pipeline from collection to visualization. Through thoughtful design and strategic architecture, the platform provides users with an engaging, informative, and easy-to-use experience. It not only promotes data-driven decision-making but also encourages broader awareness of global economic conditions and how policy decisions impact individual freedom and national progress. Overall, the project demonstrates a powerful fusion of technology and purpose, translating abstract economic metrics into a dynamic storytelling platform.

10. FUTURE SCOPE

Looking forward, this project holds vast potential for expansion and innovation. Future improvements could include integrating machine learning models to forecast economic trends based on historical data, enhancing personalization through user-specific dashboards, and incorporating mobile responsiveness for access on smartphones and tablets. Additionally, expanding the dataset to include socio-political indicators such as education index, corruption perception, or quality of governance could offer a more holistic view of prosperity. Real-time data streaming through advanced APIs or platforms like ABLY could enable continuous updates and timely insights. There is also scope to develop a country-specific drill-down feature that provides deeper narratives, comparisons, and policy tracking. With these advancements, the platform can evolve into a comprehensive, intelligent system for economic insight and strategic planning.

Future plans include mobile app integration, more interactive filters, adding yearly comparisons, and country-specific reports.

11. APPENDIX

Dataset Link:

https://docs.google.com/spreadsheets/d/1o4kRBiMDBtnFYebjkAjUp0quDvXXFoEw/edit?usp=drive_link&ouid=114095414718961222457&rtpof=true&sd=true

GitHub & Project Demo Link:

https://github.com/ummesalma28/Measuring-the-pulse-of-prosperity-An-index-of-economic-freedom-analysis