Project Report

Team ID	LTVIP2025TMID51597
Project Name	Measuring the Pulse of Prosperity: An
	Index of Economic Freedom Analysis

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- Source Code (if any)
- Dataset Link
- GitHub & Project Demo Link

♦ 1. INTRODUCTION

★ 1.1 Project Overview

The project titled:

"Measuring The Pulse Of Prosperity: An Index Of Economic Freedom Analysis" aims to convert raw economic freedom data into insightful, interactive visuals for global policy and development analysis.

This project explores:

- Teconomic Freedom Index Scores across countries
- 44 Rule of Law indicators
- m Government Size measures
- Regulatory Efficiency
- Open Markets indicators
- In Year-over-Year Changes in Economic Freedom
- The tool of choice is Tableau, supported optionally by Excel or Python for data preparation. Using Tableau dashboards and storytelling features, the system delivers clear, interactive insights that help users make informed decisions about economic freedom trends and their impacts on prosperity.

The output includes:

- Interactive dashboards
- Story-based narratives
- Dynamic filters and charts
- Visual exploration of economic policy impacts and development patterns

★ 1.2 Purpose

The purpose of this project is to:

- ✓ Provide an engaging visual interface to explore economic freedom data
- ✓ Identify how various pillars (Rule of Law, Government Size, etc.) influence a country's economic freedom
- ✓ Visualize year-over-year changes and regional distributions
- ✓ Deliver clear, impactful insights using Tableau dashboards and stories

By turning complex economic data into understandable visuals, the project enhances decision-making for:

- Policy analysts
- Government officials
- Development agencies
- Economic researchers

♦ 2. IDEATION PHASE

2.1 Problem Statement

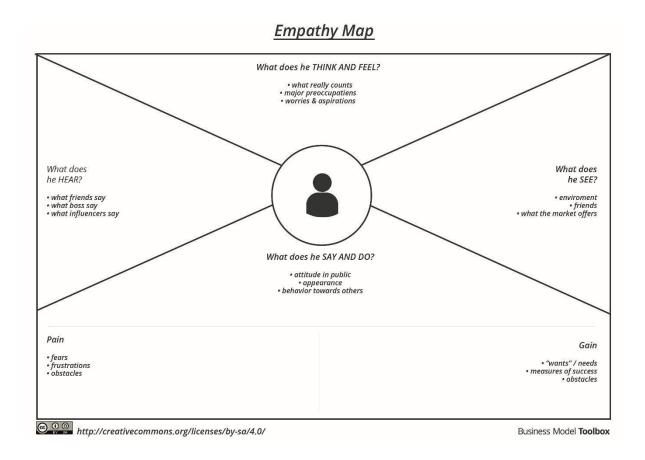
l am	Describe customer with 3-4 key characteristics - who are they?	Describe the customer and their attributes here
I'm trying to	List their outcome or "Job" the care about - what are they trying to achieve?	List the thing they are trying to achieve here
but	Describe what problems or barriers stand in the way – what bothers them most?	Describe the problems or barriers that get in the way here
because	Enter the "root cause" of why the problem or barrier exists – what needs to be solved?	Describe the reason the problems or barriers exist
which makes me feel	Describe the emotions from the customer's point of view – how does it impact them emotionally?	Describe the emotions the result from experiencing the problems or barriers

Reference: https://miro.com/templates/customer-problem-statement/ **Example:**



Problem Statement (PS)	I am (Customer)	l'm trying to	But	Because	Which makes me feel
PS-1	a policy research intern	understand how economic freedom affects national prosperity	the data is complex and hard to interpret manually	I don't have an interactive or visual tool to explore it	confused and overwhelmed with static spreadsheets
PS-2	an economics student preparing a report	compare freedom indicators between countries and regions	the raw data lacks clear comparis on tools	there's no visualizatio n or dashboard to help me understand trends	stuck and uncertain how to present my analysis clearly

2.2 Empathy map:

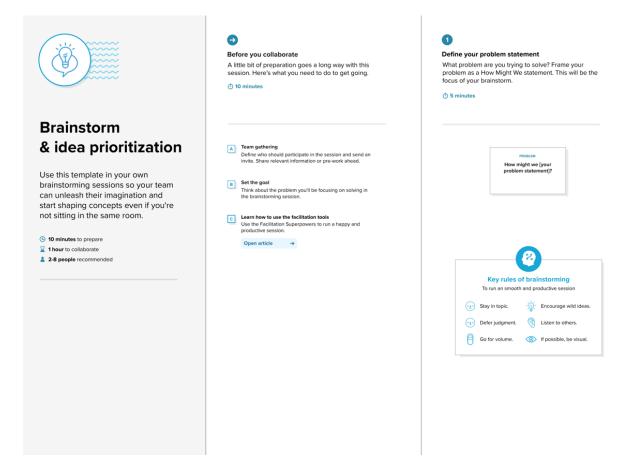


primary user: The primary user is an **economics student or policy analyst** seeking to visually explore and understand how economic freedom influences national prosperity.

Section	Description
Think & Feel	"I need to understand how economic freedom affects national prosperity.""I wish I could clearly see which freedom indicators matter most for growth."
Hear	"Professors and policymakers want clear visual insights." "There's pressure to use data in a more insightful way for economic research."
See	"Raw spreadsheets and lengthy country rankings." "Complicated tables with too many variables."
Say & Do	"Let's try to visualize global trends using Tableau." "We need interactive dashboards to compare countries and regions."
Pain	"Difficult to make meaningful comparisons using static reports." Manual analysis is time-consuming and overwhelming."
Gain	"Better understanding of how freedom influences prosperity." "Interactive dashboards help identify patterns across countries and pillars."

2.3 Brainstorming & Idea Prioritization

Step 1 – Team Gathering & Problem Selection



Step-2: Brainstorm, Idea Listing and Grouping

During our brainstorming session, we explored the following ideas:

Raw Ideas:

- Compare overall economic freedom scores of all countries
- Visualize top 10 and bottom 10 countries in economic freedom
- Show regional performance based on average scores (e.g., Asia vs. Europe)
- Group indicators under the four pillars: Rule of Law, Government Size, Regulatory Efficiency, Open Markets

- Use a map chart to visualize scores across the world
- Use bar graphs to compare pillar-wise scores of selected countries
- Analyze correlation between GDP per Capita and Economic Freedom score
- Compare investment freedom vs. FDI inflows

Grouped into Categories:

1. The Economic Dimensions

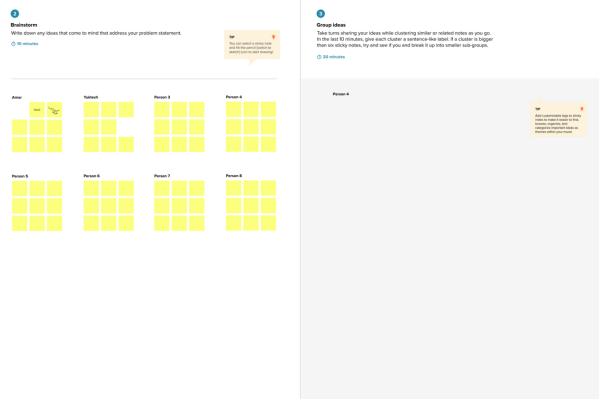
- Country ranking and scores
- o Regional comparisons
- o Indicator-level analysis under 4 main pillars

2. **M** Visualization Techniques

- Summary overview dashboard
- World map for overall scores
- o Bar/column charts for pillar-wise comparison
- o Line graphs for GDP growth correlation
- o Bubble charts for multidimensional views (e.g., score vs GDP vs FDI)

3. Analytica Insights

- o Impact of high/low freedom scores on prosperity
- o Trends in investment, inflation, and unemployment across regions
- o Policy-level patterns among top-performing countries
- Visual storytelling: which factors drive freedom most strongly?



Step-3: Idea Prioritization

We used a simple prioritization method based on two criteria:

- **Yalue to stakeholders** (students, researchers, policymakers, economists)
- Feasibility in Tableau (ease of building charts, availability of data fields)

Top Prioritized Ideas:

- **Choropleth map** showing overall Economic Freedom Score by country
- **Bar chart** comparing top 10 and bottom 10 countries based on 2022 scores.
- **Grouped bar chart** displaying pillar-wise scores (Rule of Law, Gov. Size, etc.) for selected countries.
- Scatter plot of Economic Freedom Score vs GDP per Capita
- **Dashboard with filters** for region, score range, and individual indicators

These ideas were selected because they provide **clear**, **actionable insights** into the nature of economic freedom worldwide while being **fully implementable in Tableau**, aligned with the project's educational and analytical goals.

♦ 3. REQUIREMENT ANALYSIS

★ 3.1 Customer Journey Map

Raw Dataset: CSV file is provided (5888 records)

2 Preprocessing: Analyst cleans nulls, formats date columns, derives age & renovation fields

3 Visualization: Charts are created in Tableau (histograms, bar graphs, pie charts, KPIs)

4 Publishing: Dashboards and stories are published to Tableau Public

5 User Access: Stakeholders explore interactive insights, download reports, and use filters

Goal: Enable real estate professionals to explore data visually and answer key questions about renovation impact, house features, and pricing trends.

★ 3.2 Solution Requirements

☐ Functional Requirements

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Upload	Upload housing dataset in CSV format
FR-2	Data Preprocessing	Clean null values, format columns, categorize variables
FR-3	Visualization	Create interactive dashboards using Tableau
FR-4	Filtering & Interactivity	Enable year-based and feature-based filters
FR-5	Dashboard Sharing	Publish dashboards to Tableau Public
FR-6	Report Generation	Export screenshots and insights as PDF

○ Non-Functional Requirements

NFR No.	Requirement	Description
NFR-1	Usability	Dashboards should be intuitive and user-friendly
NFR-2	Security	Protect data by anonymizing and securing links
NFR-3	Reliability	Dashboards must load properly without errors
NFR-4	Performance	Load time should be < 5 seconds
NFR-5	Availability	Dashboards available 24/7 via Tableau Public
NFR-6	Scalability	Should handle larger datasets in the future

★ 3.3 Data Flow Diagram

☐ Flow Summary:

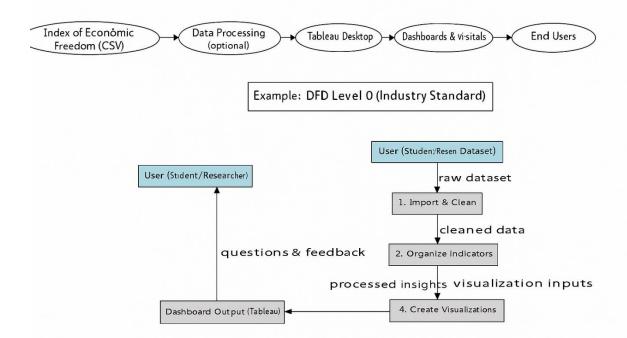
- 1. Raw CSV dataset is uploaded into Tableau
- 2.

 Data is preprocessed: cleaned, transformed, calculated (age, renovation, etc.)
- 3. The Charts and dashboards are created (bar, pie, histogram, etc.)
- 5. Stakeholders explore, filter, and download insights

DFD Entities:

- Source: Housing Sales Dataset (.csv)
- Processing: Excel or Tableau Prep (optional)
- Tool: Tableau Desktop
- Output: Visual Dashboards
- End Users: Analysts, Executives, Marketing

Example: DFD Level 0 (Industry Standard)



User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptanc
Analyst (Dashboard User)	View Global Scores Overview	USN-1	As an analyst, I want to see the overall economic freedom scores by country to compare global trends.	I can view a chordisplaying each of with interactive
Analyst (Dashboard User)	Analyze Pillar- wise Scores	USN-2	As an analyst, I want to break down scores by pillars (Rule of Law, Govt Size, etc.) for comparison.	I can view a grou showing country by pillar.
Research Student	Study Freedom vs GDP Relation	USN-3	As a student, I want to explore the relationship between freedom scores and GDP per capita.	I can use a scatte trendlines and co
Policy Analyst	Filter by Region and Score Range	USN-4	As a policymaker, I want to filter the dashboard by region or score band.	I can apply filters dynamically upd dashboard visua
Admin (Dashboard Publisher)	Publish Dashboard	USN-5	As an admin, I want to publish the dashboard to Tableau Public for wider access.	The workbook is a shareable Tabl is available.
Executive (Stakeholder)	Export Visual Reports	USN-6	As an executive, I want to download visuals to share with decision-makers.	I can export the visuals in PDF or
Research Student	View Indicator Trends over Time	USN-7	As a student, I want to track how freedom indicators change across years for select countries.	A line graph shotime for selected and countries.
			-	

★ 3.4 Technology Stack

☐ Technical Architecture Overview:

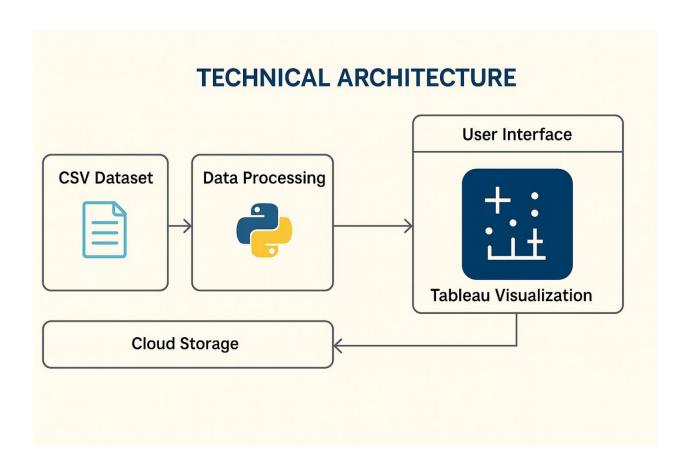


Table-1: Components & Technologies

S.No	Component	Description	Technology
1	User Interface	End users interact with visual	Tableau Public
		dashboards to explore country-wise data	Dashboard (Web UI)
2	Application	Data cleaning and transformation (e.g.,	Python, Pandas
	Logic-1	handling nulls, formatting columns)	
3	Application	Indicator grouping and pillar	Python, Excel
	Logic-2	categorization logic	
4	Application	Prepare datasets for Tableau import	Python, Tableau Prep
	Logic-3	(reshaping, column renaming, etc.)	
5	Database	Temporary storage of processed data	Local CSV file (flat-
			file based)
6	Cloud Database	Not applicable (project handled	
		offline/locally)	
7	File Storage	Stores original and cleaned datasets,	Local file system,
		screenshots of dashboards	Google Drive
8	External API-1	Not used in this project	
9	External API-2	Not used in this project	
10	Machine Learning	Not applicable (project is descriptive	_
	Model	and visual, not predictive)	

11	Infrastructure	Tableau Public for hosting dashboards,	Tableau Public, Python
		local Python for data processing	Environment

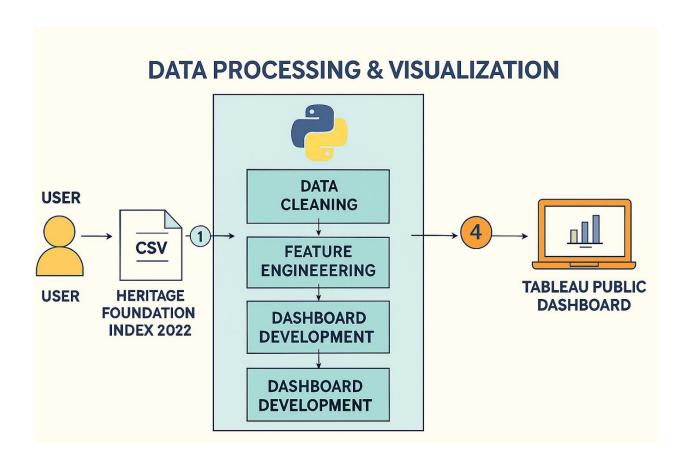


Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology / Tools
			Used
1	Open-Source	Python used for data cleaning and	Python, Pandas
	Frameworks	transformation; supports flexibility	
2	Security	Dataset is anonymized; dashboards are	Tableau Public Link
	Implementations	shared using secure, controlled public	Permissions
		links	
3	Scalable	Supports expansion with future	Tableau's visualization
	Architecture	economic indicators or years via	engine
		modular dashboards	
4	Availability	Dashboards are hosted online and	Tableau Public hosting
		available 24/7 to users	
5	Performance	Optimized dashboard visuals using	Tableau Data Engine,
		filters, drilldowns, and minimal load	Local Preprocessing
		time	

♣ 4. PROJECT DESIGN

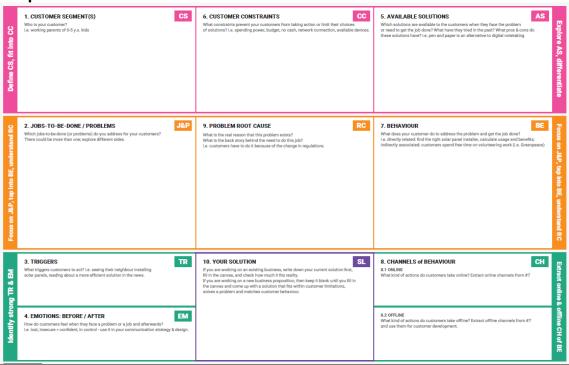
★ 4.1 Problem-Solution Fit

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why

Purpose:

- □ Solve complex problems in a way that fits the state of your customers.
- ☐ Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
- ☐ Sharpen your communication and marketing strategy with the right triggers and messaging.
- ☐ Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.
- ☐ Understand the existing situation in order to improve it for your target group.

Template:



Category	Description
Customer	Economic researchers, policy analysts, academic institutions, think
Segment	tanks

Key	Inability to easily analyze and visualize how different economic
Problem(s)	freedom indicators (like tax burden, property rights, and government
	integrity) influence prosperity across countries
Why it's a	Leads to inefficient policy recommendations and limited
problem	understanding of global economic trends
Existing	Static PDF reports, manual Excel graphs, lack of interactive
Alternatives	comparison tools
Your Solution	Interactive Tableau dashboards that explore country-wise economic
	freedom data, highlight prosperity correlations, and provide
	comparative visual analytics
Main Benefit	Enables data-driven insights for strategic economic decisions and
	academic research
Success	Clear visualization of global patterns, increased stakeholder
Criteria	understanding, ability to drive informed policy proposals

References:

- 1. https://www.ideahackers.network/problem-solution-fit-canvas/
- 2. https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe

★ 4.2 Proposed Solution

To address the data interpretation challenges in the housing industry, we developed a solution based on visual analytics using Tableau.

Description:

- ✓ Import housing sales data (CSV format)
- \vee Clean and prepare the dataset (Excel, Tableau Prep, Python optional)
- ullet Design a suite of visualizations: bar charts, histograms, KPIs, pie charts
- W Build interactive dashboards for executives and analysts
- \checkmark Create a story flow that captures renovation, pricing, and age distribution insights
- Publish all results to Tableau Public for universal access

The proposed solution combines business value with technical feasibility, emphasizing usability and clarity for all non-technical stakeholders.

Solution architecture in this project helps bridge the gap between global economic challenges and data-driven insights. It provides the foundation for collecting, processing, and visualizing Economic Freedom Index data to empower decision-makers and researchers.

∅ Objectives:

- Identify the optimal tech stack to analyze and visualize global economic freedom indicators.
- Define the end-to-end data flow from raw data ingestion to dashboard deployment.
- List the tools and platforms used (e.g., Python, Excel, Tableau Public).
- Offer a clear visual overview to stakeholders on how insights are derived and shared.

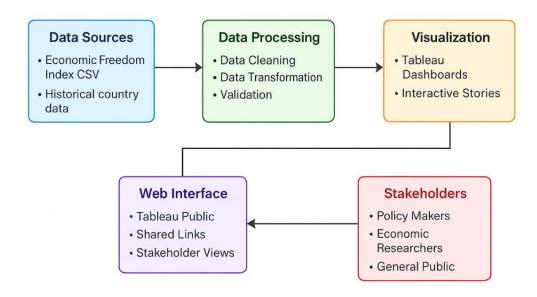
✔ Description of Solution Architecture:

This solution is centered around transforming static economic data into interactive visualizations through Tableau. The architecture includes the following stages:

- 1. **Data Collection**: Economic Freedom Index data for 2022 is collected in CSV format from The Heritage Foundation.
- 2. Data Preparation (Optional): Data cleaning, formatting, and categorization are done using Excel or Python (Pandas), including grouping indicators under four main pillars.
- 3. **Tableau Processing**: The cleaned dataset is imported into Tableau. Various visualizations like choropleth maps, bar charts, and scatter plots are created.
- 4. **Dashboard Compilation**: Visualizations are organized into an interactive dashboard and a narrative story to aid exploration and comparison.
- 5. **Publication**: Dashboards are published on Tableau Public for global access via shareable URLs.
- 6. **Stakeholder Access**: Students, policymakers, and economic researchers use these dashboards to explore trends and make informed, data-backed decisions.

Example - Solution Architecture Diagram:

Economic Freedom Index Analysis - Solution Architecture



♦ 5. PROJECT PLANNING & SCHEDULING

★ 5.1 Project Planning

➡ Product Backlog, Sprint Schedule & Estimation

Sprint	Functional Requirement	User Story	User Story / Task	Story Points	Priority	Assigned To
	(Epic)	Number				
Sprint-	Data	USN-1	Upload Economic	3	High	TL
1	Preparation		Freedom dataset			
			in CSV format			
Sprint-	Data Cleaning	USN-2	Handle missing	4	High	M2
1			values and			
			standardize			
			country codes			

Sprint- 1	Data Validation	USN-3	Verify data consistency and column mapping	5	High	M3
Sprint-2	Dashboard Development	USN-4	Build Tableau visuals for the 4 pillars of economic freedom	5	High	M2
Sprint- 2	Filter Integration	USN-5	Apply country, year, and pillar filters in dashboard	4	Medium	M3
Sprint- 2	Dashboard Publishing	USN-6	Publish the interactive dashboard to Tableau Public	3	High	TL
Sprint-3	Performance Testing	USN-7	Test dashboard responsiveness and filter performance	4	Medium	TL
Sprint-3	Screenshot & Documentation	USN-8	Capture dashboard screenshots and summarize insights	4	Medium	M2
Sprint-3	Folder Structure Setup	USN-9	Organize files and upload to required folder structure	4	High	М3
Sprint-4	Final Review	USN-10	Validate dashboard, data, and reports before submission	6	High	All 3
Sprint- 4	Video Demo	USN-11	Record project walkthrough demo and upload	6	High	TL + M3

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total	Duration	Start	End	Story Points	Sprint
	Story		Date	Date	Completed	Release
	Points					Date

Sprint-	8 SP	5 Days	20 June	24 June	8 SP	24 June 2025
1			2025	2025		
Sprint-	16 SP	5 Days	25 June	29 June	16 SP	29 June 2025
2			2025	2025		
Sprint-	12 SP	5 Days	30 June	4 July	-	-
3			2025	2025		
Sprint-	12 SP	5 Days	5 July	9 July	-	-
4			2025	2025		

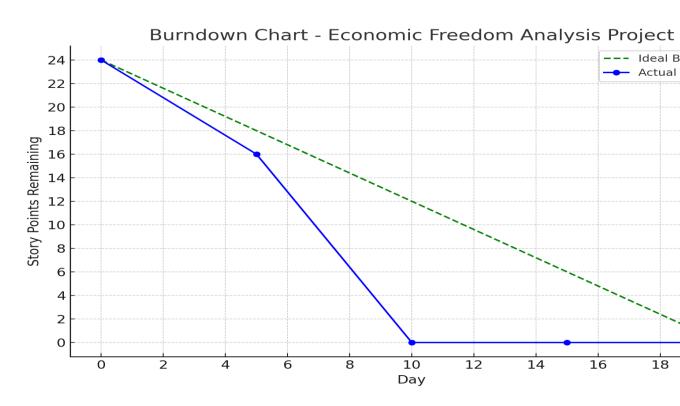
Velocity:

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)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile <u>software development</u> methodologies such as <u>Scrum</u>. However, burn down charts can be applied to any project containing measurable progress over time.



https://www.visual-paradigm.com/scrum/scrum-burndown-chart/https://www.atlassian.com/agile/tutorials/burndown-charts

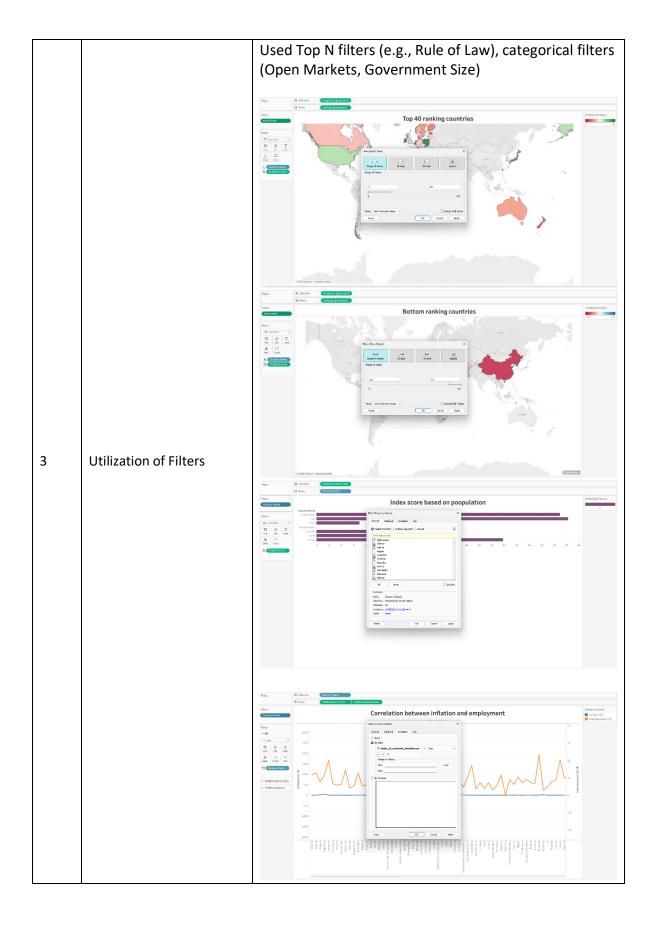
♦ 6. FUNCTIONAL AND PERFORMANCE TESTING

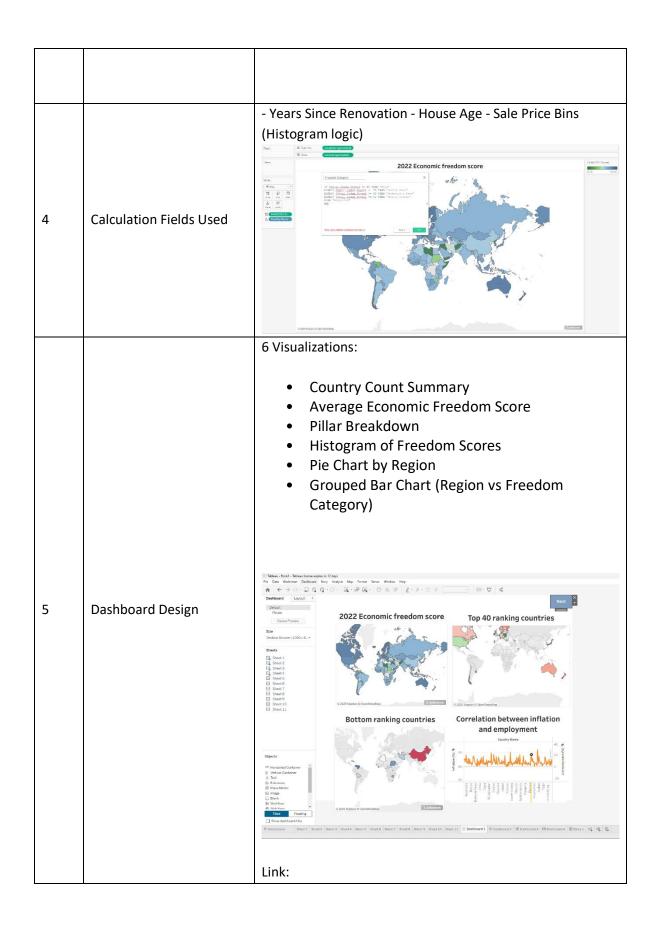
★ 6.1 Model Performance Testing

Model Performance Testing:

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

S.No.	Parameter	Screenshot / Values
1	Data Rendered	Full dataset with 32 columns and 184 rows from index of economic_freedom.csv
2	Data Preprocessing	Handled missing values, converted types (e.g., Tax Burden), created bins





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		/Dashboard1?:language=en-
		US&:sid=&:redirect=auth&:display_count=n&:origin=viz_sh
		are link
		6 Story Scenes (one for each visualization with captions and
		interpretation)
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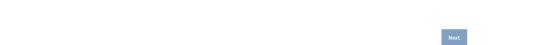
♦ 7. RESULTS

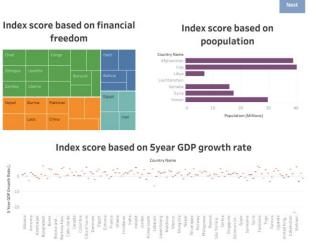
★ 7.1 Output Screenshots

The Tableau dashboard was successfully developed with six distinct visualizations, arranged into both individual views and a cohesive story presentation.

Output Visuals:



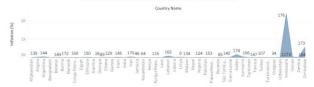




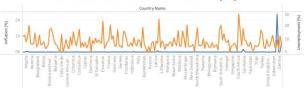
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Next

Inflation rate in different countries



Correlation between inflation and unemployment



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Dash 1

Correlation between GDP(PPP) and monetary freedom



Top 40 countries by GDP growth rate

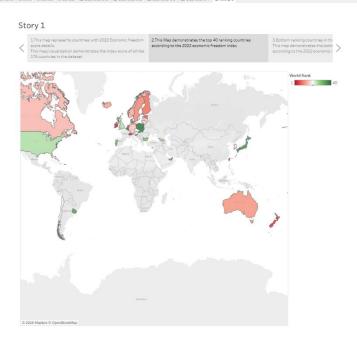


Story ScreenShorts:

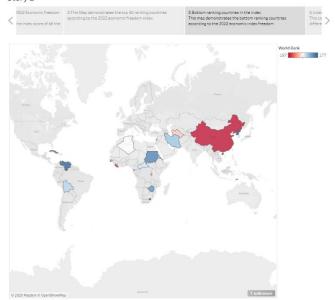


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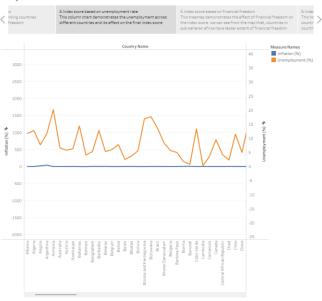


Story 1



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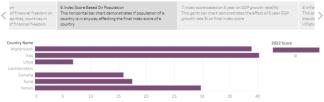


Story 1

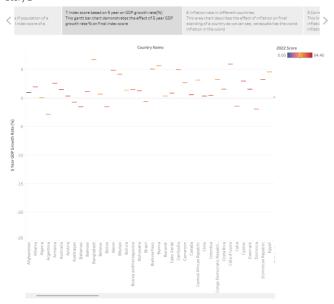




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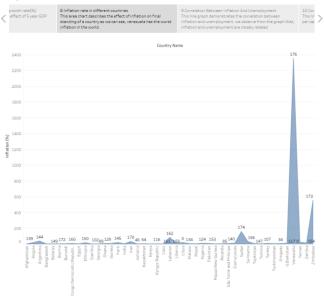


Story 1

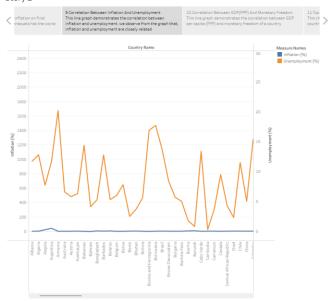


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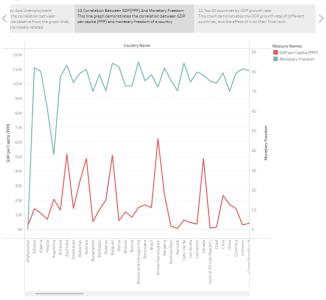


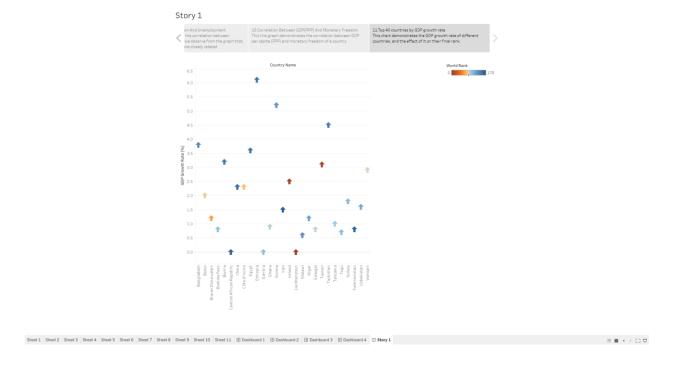
Story 1



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→ Dashboard & Story Link:

View the interactive dashboard and story here:

https://public.tableau.com/views/Book1 17512001266010/Dashboard1?:language=en-US&:sid=&:redirect=auth&:display count=n&:origin=viz share link

♦ 8. ADVANTAGES & DISADVANTAGES

\varnothing Advantages

- In Visual Insights: Complex data is simplified into easy-to-understand dashboards and charts.
- Interactivity: Users can apply filters and explore data dynamically (Top-N, Year, Features).
- Accessibility: Dashboards are hosted on Tableau Public and accessible from anywhere.
- Informed Decisions: Helps analysts and executives make data-driven pricing and renovation strategies.
- U Easy Sharing: Dashboards and stories can be shared instantly via public links.
- \square Time-Saving: Reduces time spent on manual data exploration using spreadsheets.

- Internet Dependency: Requires stable internet to access Tableau Public dashboards.
- Limited Privacy: As dashboards are public, datasets must be anonymized before use.
- Q No Predictive Analysis: Focuses on descriptive analytics only—does not include forecasting or machine learning.
- Static Dataset: Visualizations are based on a fixed dataset and must be manually updated for new data.

9. CONCLUSION

This project effectively showcases how data visualization can be utilized to analyze and interpret the complex dimensions of global economic freedom. Using Tableau, we transformed the 2022 Economic Freedom Index dataset into a dynamic and interactive dashboard that offers clear insights into:

- Country-wise performance across key pillars like Rule of Law, Government Size, Regulatory Efficiency, and Open Markets
- Comparative analysis of economic freedom by region and income level
- Patterns that link economic policies with national prosperity and growth

The final outcome is an intuitive, data-driven tool that enables stakeholders—such as policy analysts, researchers, educators, and economic decision-makers—to explore trends, draw comparisons, and support better-informed policy recommendations through visual storytelling.

♦ 10. FUTURE SCOPE

To further improve and scale the capabilities of this project, the following enhancements are envisioned:

- Add multi-year trend analysis by integrating historical data to observe changes in economic freedom over time.
- **Incorporate global GDP, HDI, and other socioeconomic indicators** to strengthen correlation analysis with freedom scores.
- **Enhance geospatial visualizations** to provide a deeper regional comparison using advanced map layers in Tableau.
- Enable stakeholder-specific dashboards, offering filtered views tailored for policy makers, researchers, or educators.
- Automate data updates by connecting Tableau to live datasets via APIs or scheduled data refresh pipelines.

- Explore advanced analytics and clustering techniques to group countries based on similar economic patterns.
- <u>Lembed the dashboard in educational or governmental portals</u> to promote transparency and public access to economic insights.

♦ 11. APPENDIX

- Dataset Link
- Source: Transformed Housing Data
- https://drive.google.com/file/d/1EBIa1LtM3Ni2Uh3nekLB6wt3263Q3NeX/view?usp=share_lin_k
- Tableau Dashboard Link
- Final Dashboard (Interactive)

https://public.tableau.com/views/Book1_17512001266010/Dashboard1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

- ☐ Tableau Story Link
- **1** Story View with Scenes and Captions
- https://public.tableau.com/views/Tableau_17510313459500/Story1?:language=en_US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link
- Project Demo Link
- U 🕶 Original Link:

https://drive.google.com/file/d/1ZAfE7oJPGSZpS3Y0AadUYbZGrLi1366w/view?usp=drivk

- **d** GitHub Repository
- Full project folder with assignments, documentation, and Tableau files
- ➡ <u>Prabhas9vegi/Measuring-The-Pulse-Of-Prosperity-An-Index-Of-Economic-Freedom-Analysis</u>