Project Report

1. Introduction:

Title: Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites in Tableau

1.1 Project Overview

The *"Heritage Treasures"* project is a comprehensive data visualization initiative aimed at exploring and analyzing the UNESCO World Heritage Sites across the globe. Using Tableau, this project transforms raw heritage data into interactive dashboards that offer insights into the geographical distribution, category breakdowns, inscription trends, and site risk status.

1.2 Purpose

The purpose of the *"Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites"* project is to:

- Provide a visual understanding of global UNESCO World Heritage Sites using interactive dashboards.
- Identify regional patterns and historical trends in site inscriptions from 1979 to recent years.
- Highlight endangered heritage sites and understand their geographical distribution.
- Categorize sites by type — Cultural, Natural, or Mixed — for comparative insights.

2. IDEATION PHASE

2.1 Problem Statement

Despite the existence of over a thousand UNESCO World Heritage Sites worldwide, comprehensive and accessible insights into their distribution, categorization, and conservation status are often lacking or fragmented. Decision-makers, researchers, and the public face challenges in:

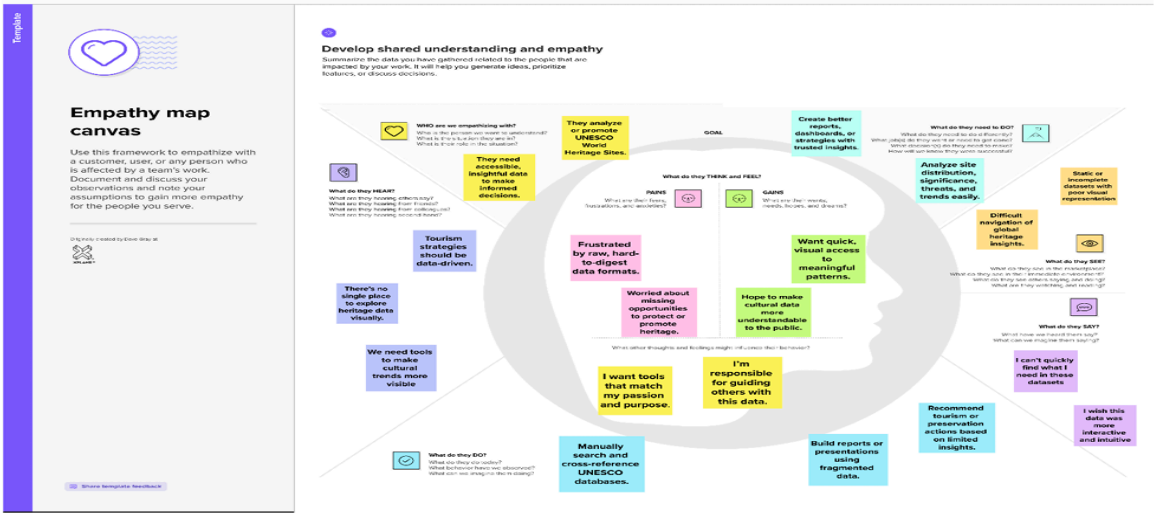
- Understanding regional imbalances in site inscriptions,

- Tracking historical inscription trends across countries and categories,
- Identifying sites at risk or in danger due to various threats, and
- Exploring this information in an interactive, user-friendly format.

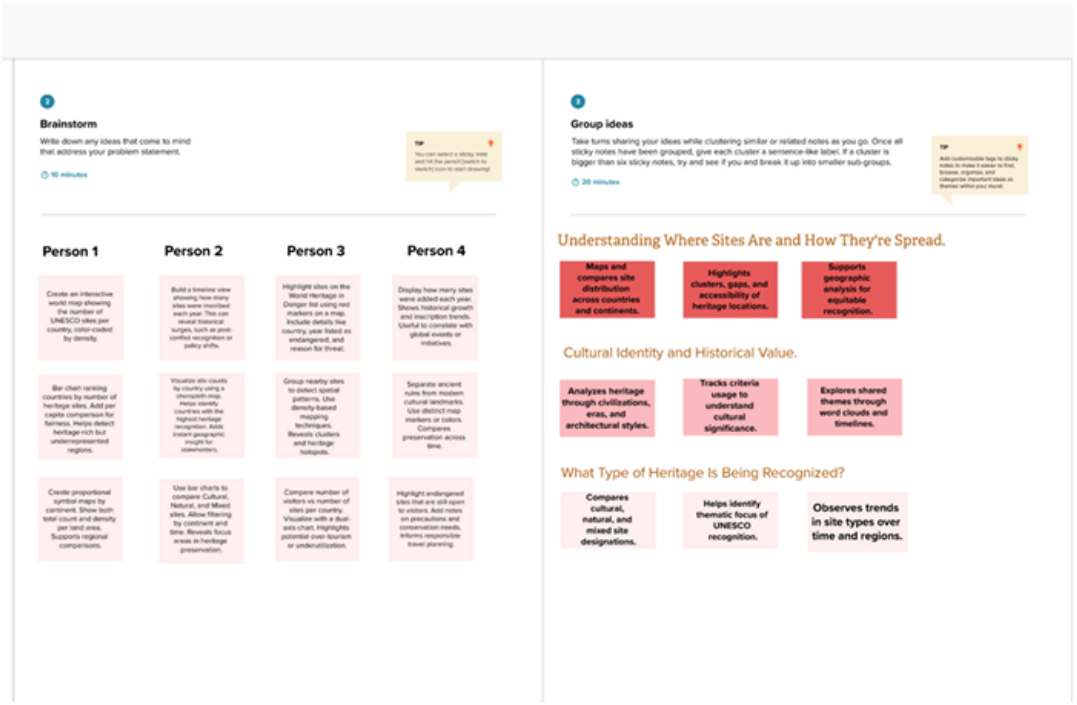
There is a clear need for a centralized, visual platform that allows users to explore, compare, and analyze World Heritage data in an engaging and informative way.

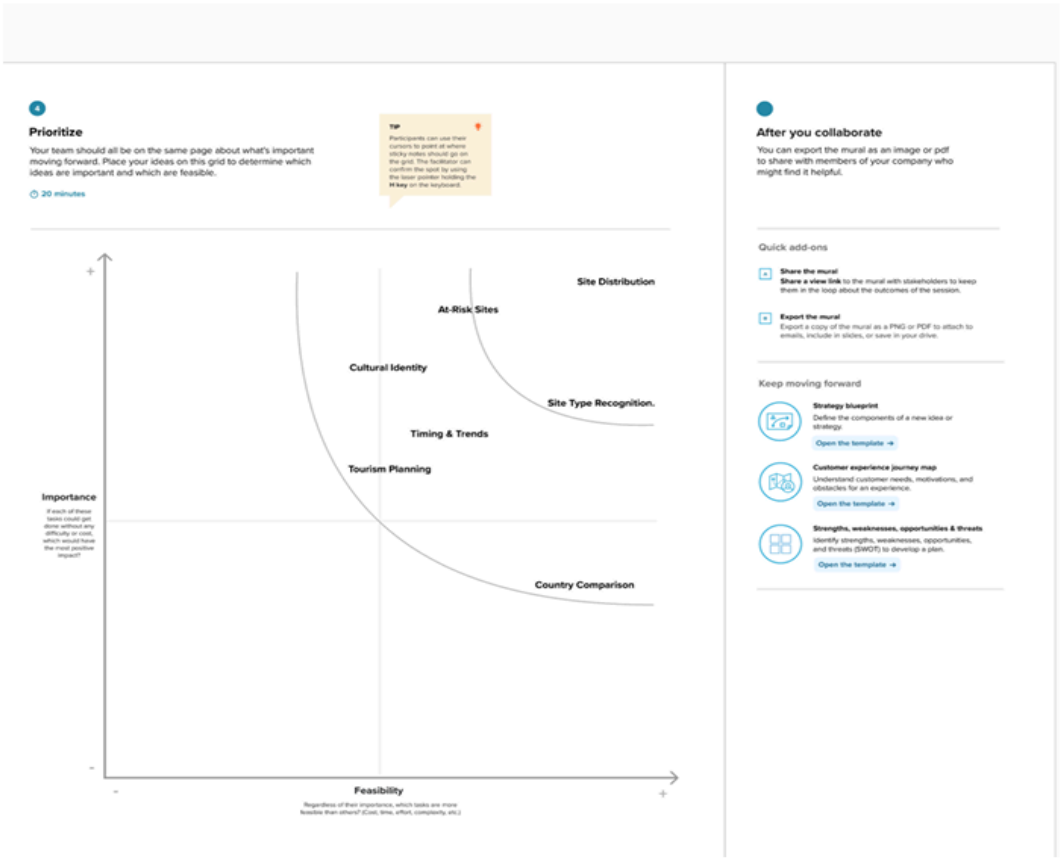
This project addresses this gap through data visualization using Tableau, enabling meaningful exploration of UNESCO heritage insights.

2.2 Empathy Map



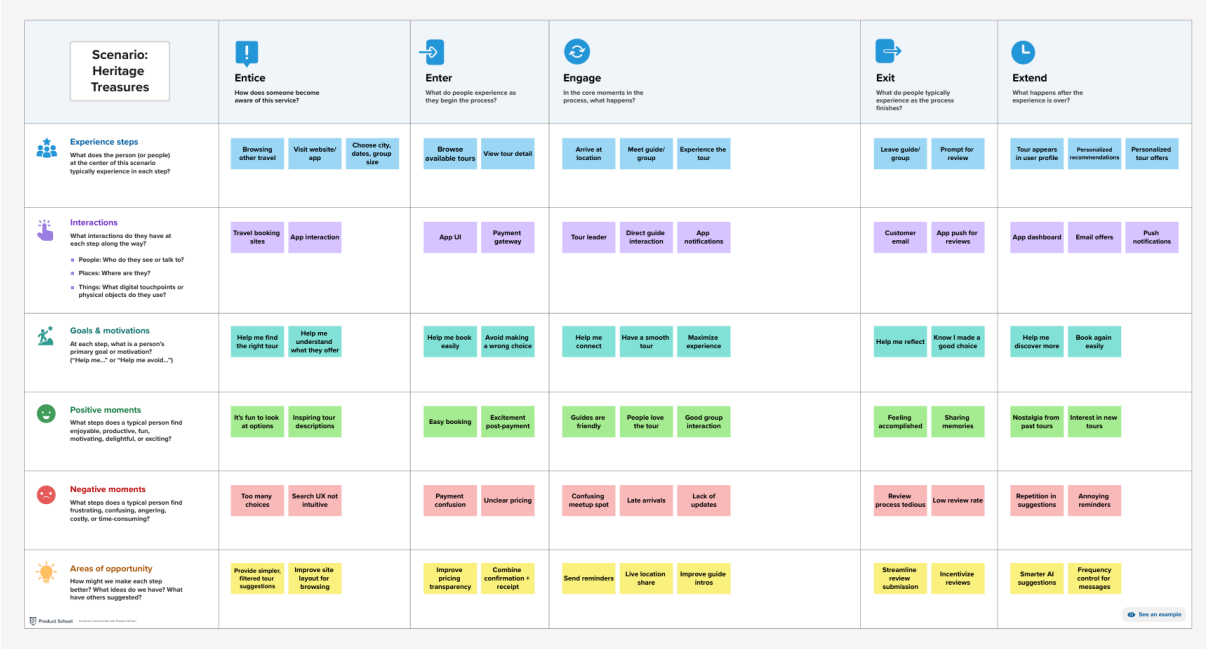
2.3 BrainStorming





3. REQUIREMENT ANALYSIS

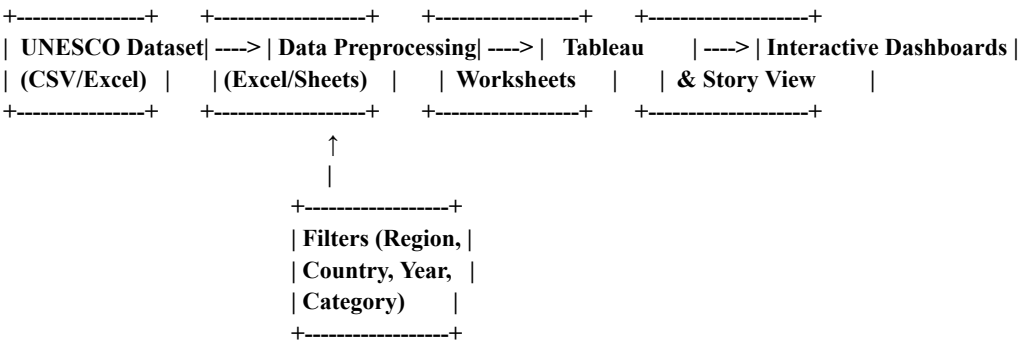
3.1 Customer Journey map



3.2 Solution Requirement

The solution involves collecting and cleaning UNESCO World Heritage Site data for accuracy and consistency. Three interactive dashboards were created in Tableau to visualize site distribution, inscription trends, and endangered sites. Filters by region, country, category, and year enhance user interactivity. A storytelling flow ties the dashboards together for a guided insight experience. The final visualization is published on Tableau Public for easy access.

3.3 Data Flow Diagram



Description of the Flow: The data flow begins with importing the UNESCO World Heritage Sites dataset (in CSV or Excel format). This raw data is first

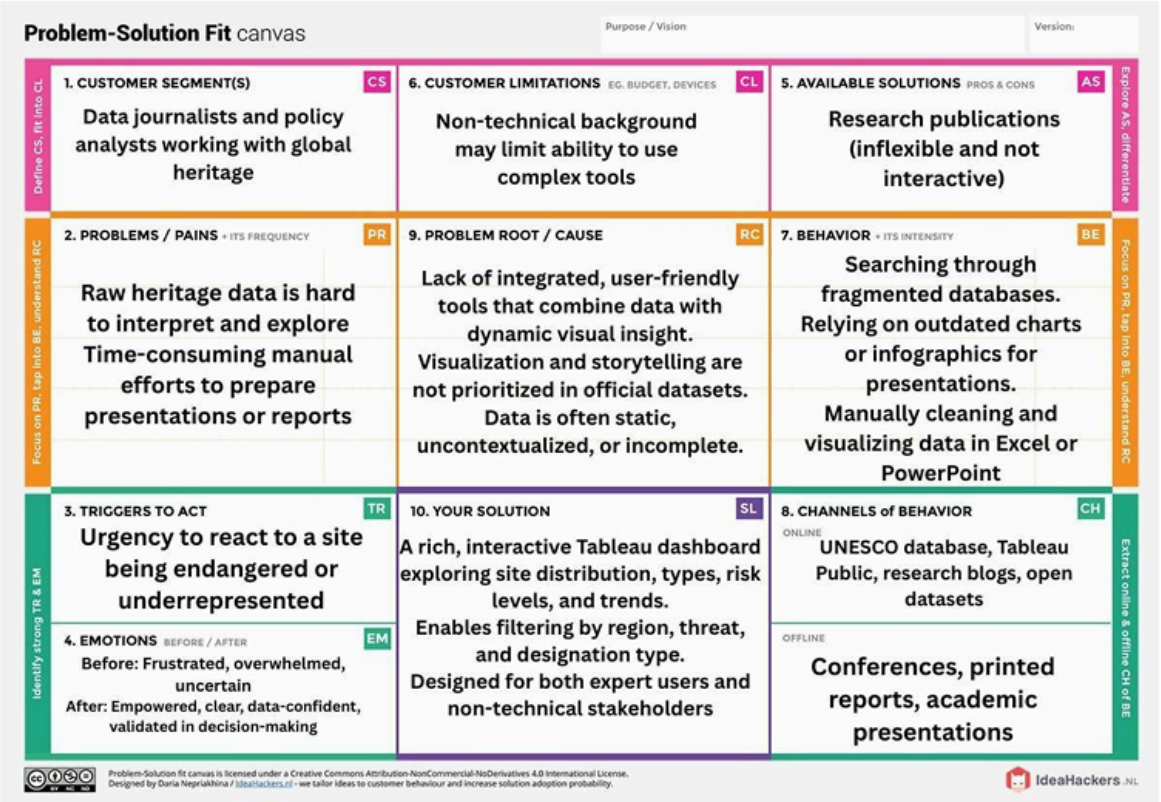
cleaned and preprocessed using tools like Excel or Google Sheets to ensure consistency and accuracy. The cleaned dataset is then loaded into Tableau, where multiple interactive visualizations are created. Filters such as region, category, year, and country are applied to enhance interactivity. Finally, all charts and insights are combined into user-friendly dashboards and presented as a structured story using Tableau's Story feature.

3.4 Technology Stack

This project uses the UNESCO World Heritage Sites dataset in CSV/Excel format as the primary data source. Data cleaning and preprocessing were done using Microsoft Excel and Google Sheets to remove nulls, format fields, and create calculated columns. Tableau Public was used for building interactive charts, dashboards, and the overall story narrative. Filters and parameters were added within Tableau to allow dynamic data exploration by region, category, year, and country. The final dashboards were published on Tableau Public for open access. Team collaboration and documentation were managed using Google Docs and Microsoft Teams.

4. PROJECT DESIGN

4.1 Problem Solution Fit



4.2 Proposed Solution

To effectively analyze and present insights from the UNESCO World Heritage dataset, this project proposes the creation of an interactive data visualization solution using Tableau. The process begins with collecting and cleaning the raw dataset to ensure consistency and accuracy. After preprocessing, the data is imported into Tableau where various visualizations—such as bar charts, treemaps, bubble charts, and timelines—are developed to highlight trends, patterns, and distributions across regions, countries, and site categories.

The dashboards are enhanced with dynamic filters for region, country, inscription year, and category, allowing users to interact with the data based on their specific interests. A storytelling layer is added using Tableau's Story feature to guide viewers through key insights, including endangered site analysis and historical inscription trends. By publishing the dashboards on Tableau Public, the project ensures easy accessibility for researchers, students, and heritage professionals, supporting data-driven awareness and decision-making in heritage conservation.

4.3 Solution Architecture

The architecture of this project follows a simple but effective data visualization pipeline. The process begins with acquiring the UNESCO World Heritage Sites dataset in CSV or Excel format from official sources. This raw data is then cleaned and preprocessed using tools like Microsoft Excel or Google Sheets, where unnecessary columns are removed, null values are handled, and calculated fields (e.g., “Site Status”, “Category”, or “Inscription Year Group”) are created for better analysis.

Once prepared, the clean dataset is imported into Tableau Public, where multiple visualizations are built, including bar charts, treemaps, bubble charts, line graphs, and pie charts. These are grouped into themed dashboards focusing on:

- Regional and Country-wise Distribution
- Endangered Site Analysis
- Temporal Trends of Inscriptions

Interactive filters are implemented (for region, category, country, year) to enhance user engagement. Finally, these dashboards are connected in a structured Tableau Story that presents insights in a logical, narrative-driven flow. The entire solution is published on Tableau Public, making it accessible to anyone via the web.

5. PROJECT PLANNING & SCHEDULING

5.1Project Planning

The project was planned using an **Agile methodology**, divided into **three short sprints** to ensure a focused and iterative development process within the time frame of **23rd June to 1st July 2025**.

- **Sprint 1** (23–25 June): Focused on collecting the UNESCO dataset, performing data cleaning, and preparing calculated fields for analysis.
- **Sprint 2** (26–28 June): Centered around building interactive Tableau worksheets and creating dashboards that display trends, risk analysis, and site categorization.

- **Sprint 3** (29 June–1 July): Finalized dashboard designs, implemented story navigation, performed testing, and deployed the project on Tableau Public.

Each team member — **Joshitha**, **Pooja**, and **Ashraf** — was assigned specific tasks based on their expertise. Progress was tracked through daily updates, and a burndown chart was maintained to monitor task completion and overall velocity. The project was delivered on time, with all planned features implemented successfully.

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

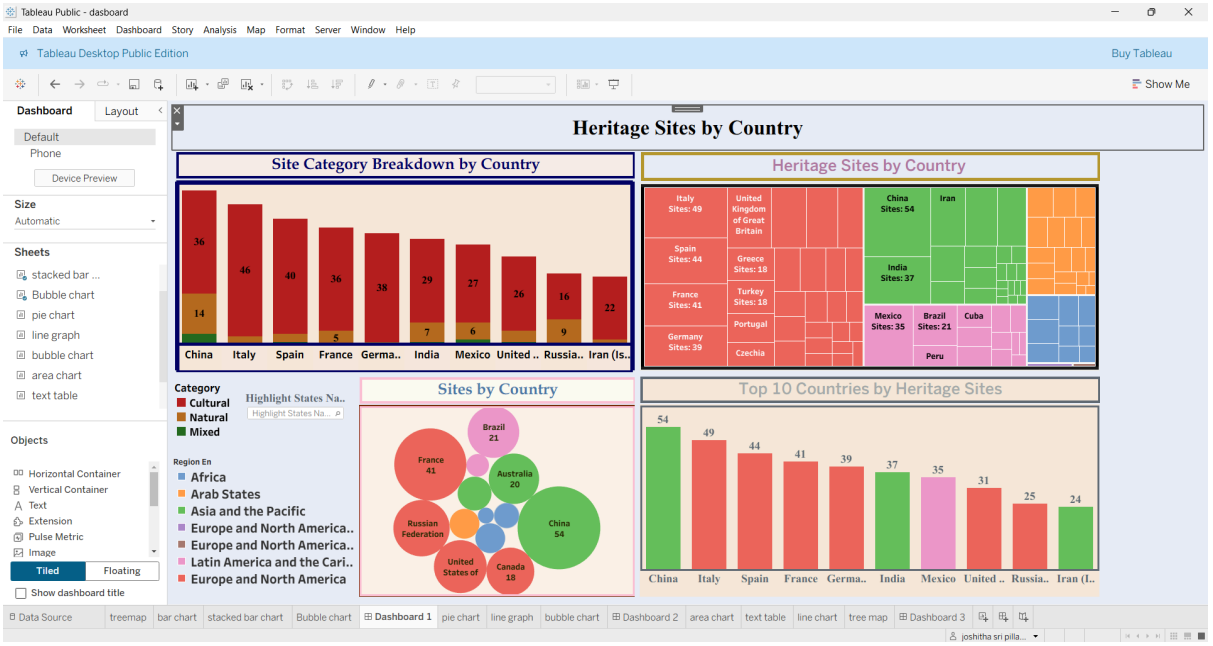
The project was tested for both **functionality** and **efficiency** to ensure a smooth user experience. The dashboards were evaluated for:

1. **Data Accuracy**: All charts and filters were cross-verified with the raw UNESCO dataset to ensure correct values, category counts, and country-wise totals.
2. **Filter Functionality**: Filters for region, country, category, and inscription year were tested to ensure they dynamically update all visualizations in real time.
3. **Dashboard Responsiveness**: The dashboards were tested on various screen sizes to check layout adaptability and responsiveness.
4. **Load Time & Rendering**: Tableau Public was used to host the dashboards, and tests confirmed that all visualizations load quickly without lag or crashes.
5. **Interactivity & Navigation**: The Tableau Story was reviewed to ensure users could seamlessly navigate between dashboards and access tooltips, legends, and filters.

Overall, the project performed well in terms of speed, clarity, and usability. All key visual and interactive elements functioned as expected under real-world usage conditions.

7. RESULTS

7.1 Output Screenshots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File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
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Dashboard
Layout
Default
Phone
Device Preview
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Bubble chart
pie chart
line graph
bubble chart
area chart
text table
Objects
Horizontal Container
Vertical Container
Text
Extension
Pulse Metric
Image
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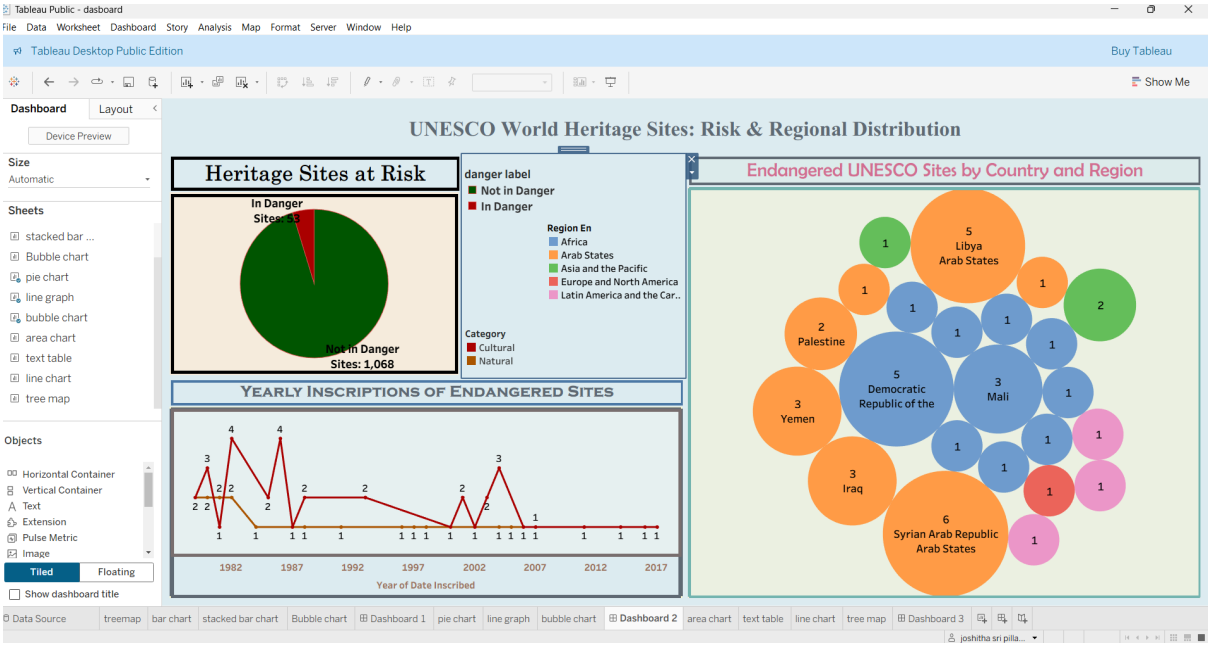
Floating
Show dashboard title
Heritage Sites by Country
Site Category Breakdown by Country
China Italy Spain France Germa.. India Mexico United .. Russia.. Iran (Is..
36 46 40 36 38 29 27 26 16 22
14 5 7 6 9
Heritage Sites by Country
Italy Sites: 49
Spain Sites: 44
France Sites: 41
Germany Sites: 39
United Kingdom of Great Britain
Greece Sites: 18
Turkey Sites: 18
Portugal
Czechia
China Sites: 54
Iran
India Sites: 37
Mexico Sites: 35
Brazil Sites: 21
Cuba
Peru
Category
Cultural
Natural
Mixed
Highlight States Na..
Region En
Africa
Arab States
Asia and the Pacific
Europe and North America..
Europe and North America..
Latin America and the Cari..
Europe and North America
Sites by Country
Brazil 21
France 41
Australia 20
Russian Federation
China 54
United States of
Canada 18
Top 10 Countries by Heritage Sites
54 49 44 41 39 37 35 31 25 24
China Italy Spain France Germa.. India Mexico United .. Russia.. Iran (I..
Data Source
treemap
bar chart
stacked bar chart
Bubble chart
Dashboard 1
pie chart
line graph
bubble chart
Dashboard 2
area chart
text table
line chart
tree map
Dashboard 3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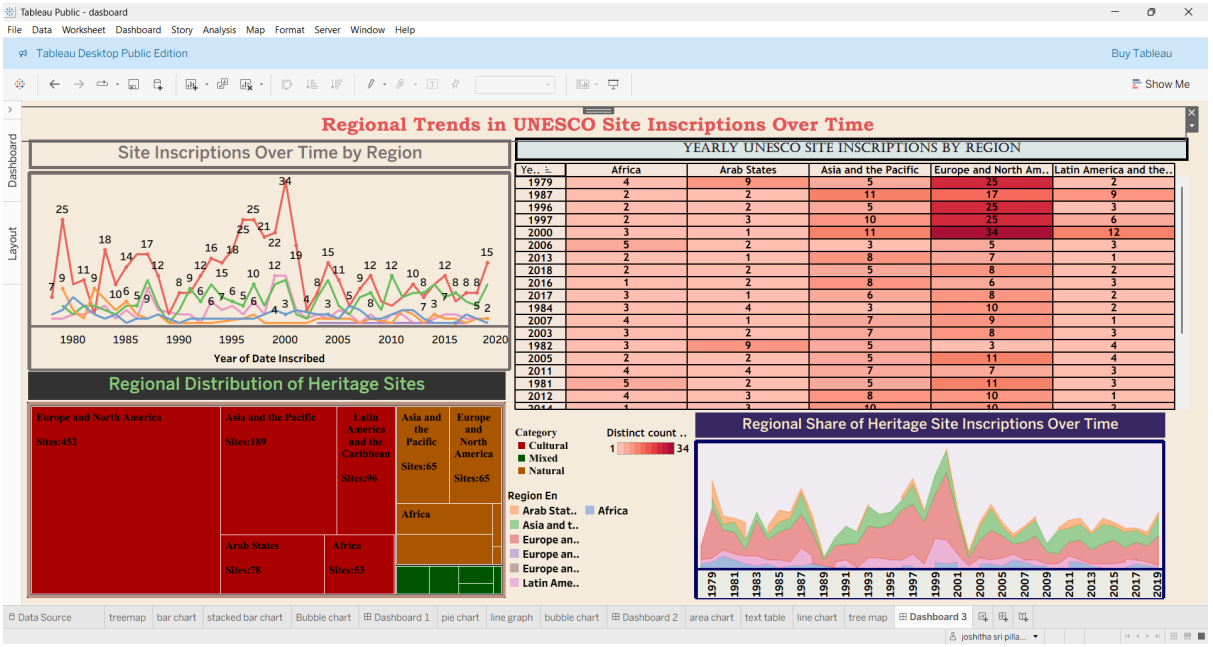
bubble chart
area chart
text table
line chart
tree map
Objects
Horizontal Container
Vertical Container
Text
Extension
Pulse Metric
Image
Tiled
Floating
Show dashboard title
UNESCO World Heritage Sites: Risk & Regional Distribution
Heritage Sites at Risk
In Danger Sites: 53
Not in Danger Sites: 1,068
danger label
Not in Danger
In Danger
Region En
Africa
Arab States
Asia and the Pacific
Europe and North America
Latin America and the Car..
Category
Cultural
Natural
Endangered UNESCO Sites by Country and Region
5 Libya Arab States
2 Palestine
5 Democratic Republic of the
3 Mali
3 Yemen
3 Iraq
6 Syrian Arab Republic Arab States
YEARLY INSCRIPTIONS OF ENDANGERED SITES
1982 1987 1992 1997 2002 2007 2012 2017
Year of Date Inscribed
Data Source
treemap
bar chart
stacked bar chart
Bubble chart
Dashboard 1
pie chart
line graph
bubble chart
Dashboard 2
area chart
text table
line chart
tree map
Dashboard 3



8. ADVANTAGES & DISADVANTAGES

Advantages

1. Interactive & User-Friendly: Dashboards offer filters and tooltips, making data easy to explore even for non-technical users.
2. Comprehensive Insights: Presents multi-dimensional views — by region, category, and risk status — all in one platform.
3. Data-Driven Awareness: Helps educators, researchers, and policymakers understand global heritage patterns and site vulnerabilities.
4. Public Accessibility: Hosted on Tableau Public, allowing global access without the need for login or software installation.
5. Storytelling Approach: The use of Tableau Story provides a guided flow, improving engagement and understanding.

Disadvantages

1. Static Data: The dataset is not live-linked; updates require manual reprocessing and re-uploading.
2. Limited Mobile Optimization: Some dashboards may not render perfectly on smaller screens.
3. Dependency on Internet: Requires internet access to view the published Tableau dashboards.

4. Scope Limited to Available Data: Analysis is constrained to what's present in the official UNESCO dataset — missing metadata or incomplete entries could affect insights.

9. CONCLUSION

The *"Heritage Treasures"* project successfully transforms UNESCO World Heritage data into an insightful and interactive visual experience. By leveraging Tableau, the project highlights global trends, country-wise distributions, category classifications, and the pressing issue of endangered sites. Through a combination of dynamic filters, engaging charts, and a guided story flow, users can explore the richness and vulnerability of our shared cultural and natural heritage.

This initiative not only improves public understanding but also empowers educators, researchers, and policymakers with accessible, data-driven insights. Ultimately, the project demonstrates how visualization can be a powerful tool in promoting awareness and conservation of the world's most treasured heritage sites.

10. FUTURE SCOPE

While the current project provides valuable insights into UNESCO World Heritage Sites, there is potential for further enhancement:

1. Live Data Integration: Automating data updates by connecting Tableau to a live or API-based UNESCO data feed for real-time insights.
2. Geospatial Mapping: Expanding the use of maps to visualize exact site locations with layered detail (e.g., Google Maps or Mapbox in Tableau).
3. Mobile Optimization: Redesigning dashboards to improve usability and responsiveness on mobile and tablet devices.
4. User Feedback & Ratings: Allowing users to interact further by providing feedback, tagging favorites, or suggesting site additions.
5. Multilingual Support: Offering the dashboard experience in multiple languages to reach a broader global audience.

These enhancements would make the project more dynamic, scalable, and globally impactful in promoting heritage awareness and preservation.

11. APPENDIX

Dataset Link:
https://www.kaggle.com/datasets/ujwalkandi/unesco-world-heritage-sites/data?select=whc-sites-2019.csv

GitHub & Project Demo Link:
https://github.com/joshitha-p/Heritage-Treasures-An-In-Depth-Analysis-of-UNESCO-World-Heritage-Sites-in-Tableau