Project Report Format

1.INTRODUCTION

1.1 Project Overview

This project provides a comprehensive analysis of UNESCO World Heritage Sites, highlighting their global distribution, inscription trends, and endangered status across countries and regions.
An interactive Tableau dashboard was developed to visually explore cultural and natural heritage, enabling users to filter by country, type, region, and risk level.
The analysis supports a deeper understanding of heritage preservation priorities and regional disparities.
The dataset was cleaned and enriched with calculated fields such as forecast review year and endangered site rankings to enhance insight quality.
The final visual output empowers researchers, students, educators, and policy makers to engage with heritage data through dynamic storytelling and data-driven decision-making.

1.2 Purpose

To visually analyze UNESCO World Heritage Sites across countries and regions, highlight endangered sites, and support cultural preservation through interactive dashboards that aid learning, research, and informed decision-making.

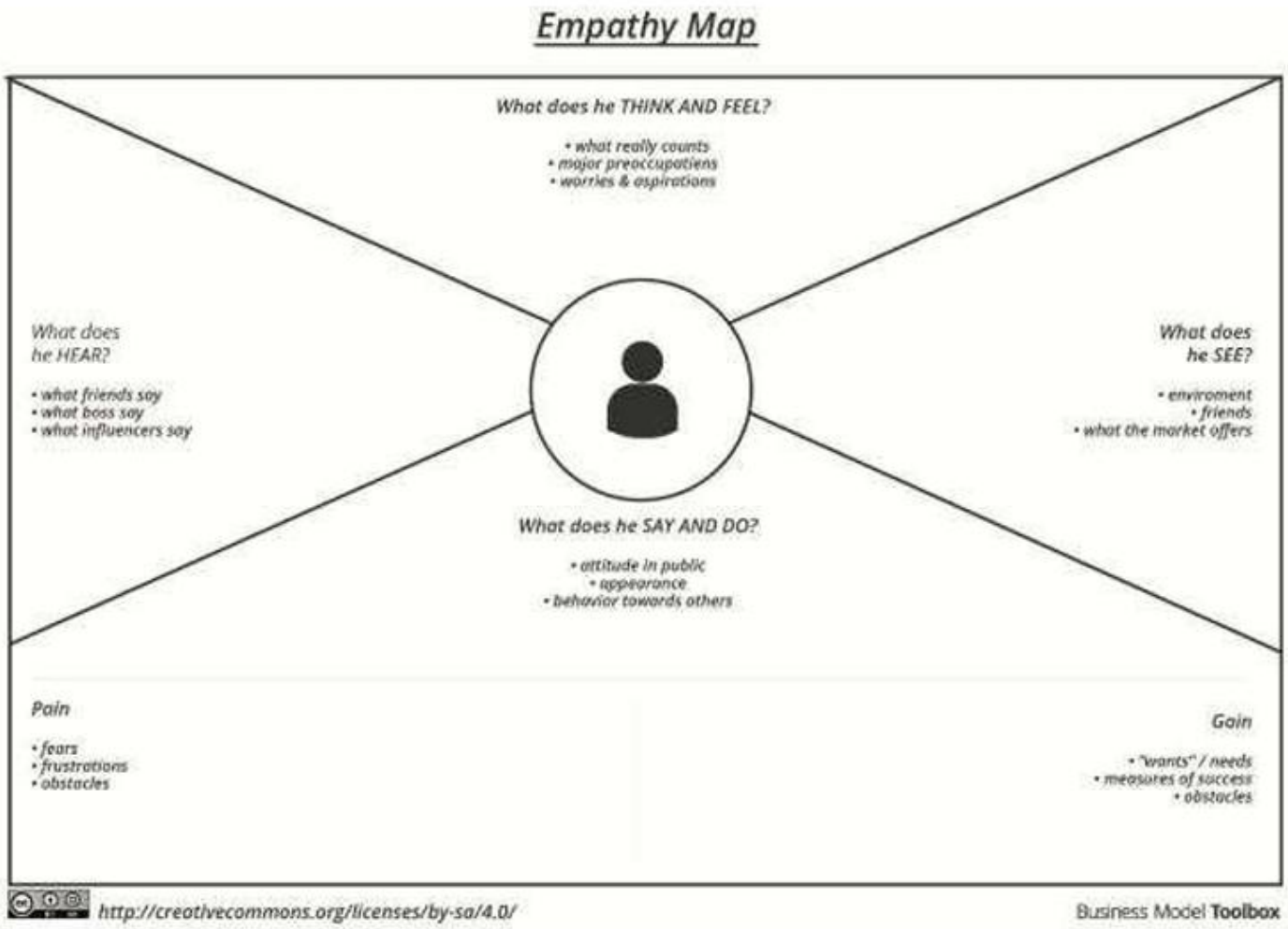
2. IDEATION PHASE: -

2.1Problem Statement

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	a cultural heritage analyst or enthusiast	alyst or enthusiast explore and analyze global UNESCO heritage sites effectively	I can't get all relevant data in one place	The Information is spread across multiple sources and lacks visual context	overwhelmed and uncertain about making insights
PS-2	a student or analyst	explore econom ic trends across countrie s	I can't interac t with compl ete index data easily	the insights are not presente d visually	limited and overwhelmed

I am	I'm trying to	But	Because	Which makes me feel
• a Student or Analyst	• explore economic trends across countries	• I can't interact with complex index data easily	• the insights are not presented visually	• limited and overwhelmed

2.2 Empathy Map Canvas



2.3 Brainstorming: -

Brainstorming – Project:

Heritage Treasures: An In-depth Analysis of UNESCO World Heritage

Step 1: Team Gathering, Collaboration and Problem Selection

Team Member(s):Sappidi Venkata Lavanya

Problem: Analyzing UNESCO World Heritage sites by type, country, region, and year of inscription, using interactive data visualizations to showcase cultural importance, threats, and preservation status.

Step 2: Brainstorming, Idea Listing and Grouping: -

Idea	Group
Categorize heritage sites by Cultural/Natural/Mixed	Data Overview
Map showing distribution by continent or country	Geo Analysis
Analyze year-wise additions to UNESCO list	Timeline Trends
Show endangered vs safe sites status	Risk Analysis
Use interactive filters for site type, country, year	Interactivity
Visualize site density on a heat map	Geo Analysis
Deploy on Tableau Public with interaction options	Deployment

Step 3: Idea Prioritization: -

Idea	Feasibility	Impact	Priority
Type-wise (Cultural/Natural) Analysis	High	High	High
Country-wise and Continent Map	Medium	High	High
Endangered Sites Visualization	High	Medium	High
Filters for site type, year, region	Medium	High	High
UNESCO Criteria tagging	Medium	Medium	Medium
Deployment on Tableau Public	High	Medium	Medium

3.REQUIREMENT ANALYSIS

3.1Customer Journey map

SNO	Perspective	Discover	Explore & Compare	Analyse insights	Decide &Act	Reflect &Reuse
		Sapidicd Venata Lavanya | *Herirage Treosures*: ANIID Tvaro: TMID46808				
1	Goals & Motivations	Help me find a vis way to explore.com pare herltage sites I	Fitter ind interacct explore and compare sites	Use insights in firact with dashboards to explore sinolr, ret) wate	Use naights in track hell agas trends easily in smard-	Revisit & track are- as interest easily
2	Actions/Interactions	Search online for heritage site databa se	Reveal endangered sites and heritage trends	Reveal Insights identify herltage trends	Explore end conaare sites or references easily	Reviset in a school project
3	Touch Points	Google search for heritage site database	Using map"vualiza- tions, or evaplore using sites	Feasing remegaring using map visualiza- tions, & read' charts	Using dashboards or saving visuals, ar	Emails or links to take
4	Positive Moment	Findusconfusion a visual mound avrse /usya ead easy-to useblatform	Fecus informed sites by -type, co country, inscription year	Feeling"informed and better able to talk about risks and preservation	Confidently brodge this into project or preservation	Emails dinks to visual dashboards
5	Pain Points	Confusion due to scattered hentage databases	Feeling informed and better able to talk about risks and preservation	Feeling informs and bettendale to interpret dacden- sity shat ux	Guide userd withlerief summaries like 20 sike endangerment risk" or "AFri .	Emails/ links to take use easy
6	Opportunity'	Create visual maps categorizing sites by continent in a single	Feeling informed by too much text fiiter toggles by the	Feeling confident lv to beundeed and lu- understandable	Emails/links to take user back to visual dashboards	Emails/ links to visual/ore-
6	Opportunity	Create visual map interactivity ssing visual maps etsy	Feel informed and better able to tak about risks and	Make better remi- nder or summary em- all about recent dash-	Emails or links to take user to etua. dashboard of	Emails or links to visual desh

3.2 Solution Requirement: -

Functional Requirements: -

The following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Import	Load housing dataset from Excel or CSV
FR-2	Filtering & Interaction	Filter by city, price range, property size
FR-3	Visualization Generation	Display bar charts, line graphs, heatmaps
FR-4	Comparison Feature	Allow comparison of multiple cities/areas
FR-5	Export/Download	Enable export of visuals to PDF or image
FR-6	Dynamic Dashboard	Allow saving filter settings for later reuse

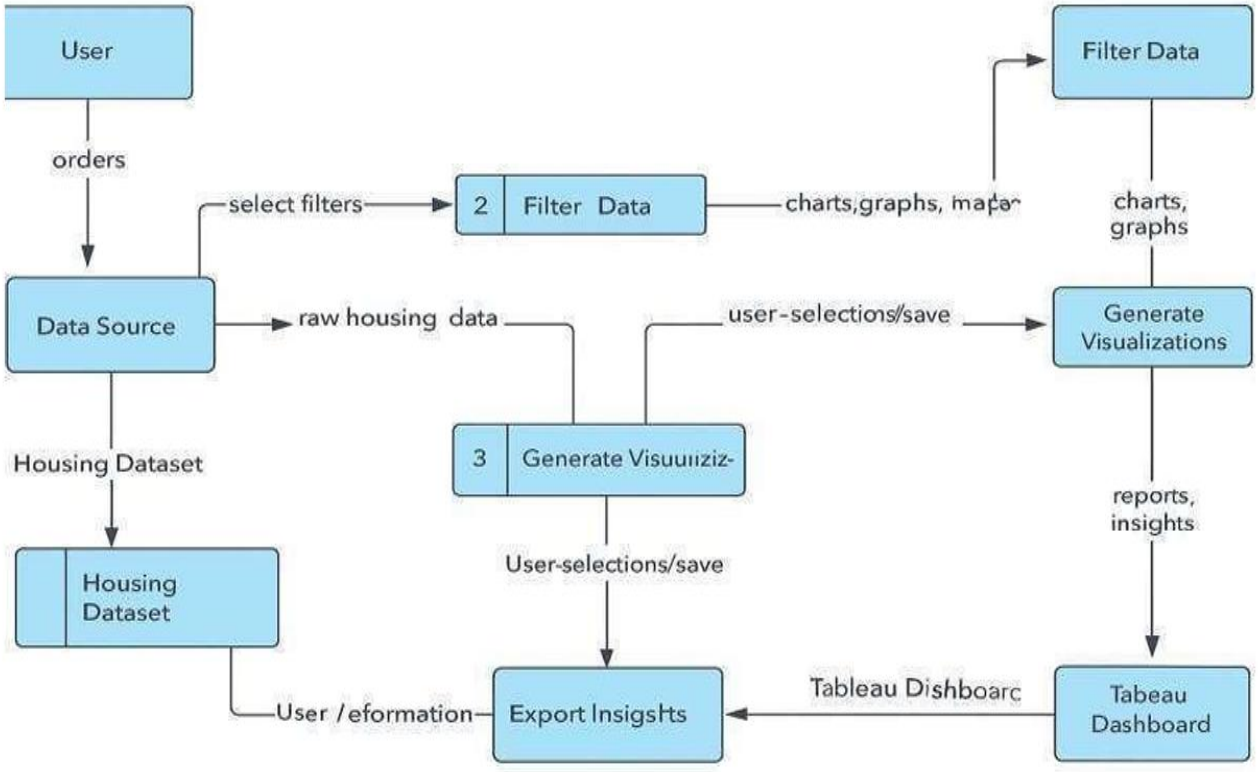
Non-functional Requirements:

The following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The dashboard should be intuitive and easy to use for students, researchers, and heritage enthusiasts with no technical background.

NFR-2	Security	Any user interactions or data (if collected in the future) must be securely managed. Access is provided through Tableau Public with proper sharing settings.
NFR-3	Reliability	The dashboard should maintain 99% uptime to ensure continuous access for research and academic use.
NFR-4	Performance	Heritage visualizations (maps, filters, and charts) should load within 3 seconds for a smooth user experience.
NFR-5	Availability	Published dashboards should be accessible 24/7
NFR-6	Scalability	The system should handle increasing heritage data (more sites, countries, attributes) without performance drops.

3.3 Data Flow Diagram: -



User Stories: -

User Type	Functional Requirement (Epic)	User Story Number	User Story/ Task	Acceptance criteria	Priority	Release

Student / Researcher	Explore UNESCO heritagedata visually	USN-1	As a student, I want to view all heritage sites on an interactive map so I can analyze by region/type	Map is clickable, filterable by region, type, and status	High	Sprint1
Heritage Enthusiast	View endangered sites	USN-2	As a heritage enthusiast, I want to see which sites are endangered so I can understand threat levels	Endangered sites are highlighted with counts and filters available	High	Sprint1
Policy Maker	Identify top countries with endangered sites	USN-3	As a policymaker, I want to see top 10 countries with most endangered sites to support preservation	A KPI section displays ranked list of top endangered countries	High	Sprint2
Public User	Access Dashboards	USN-4	As a public user, I want to access the dashboards on Tableau Public	I can interact with published visuals	Mediu m	Sprint2

3.4 Technology Stack: - Technical Architecture:-

The Deliverable shall include the architectural diagram below and the information as per table 1.

S.No	Component	Description	Technology
1	User Interface	Dashboard view	Tableau Public
2.	Application Logic-1	Data filtering	Tableau filters and parameters
3.	Application Logic-2	Visualization	Tableau dashboards & calculated fields
4.	Application Logic-3	Not used (optional)	—
5.	Database	UNESCO heritage dataset (static CSV)	Excel / CSV
6.	Cloud Database	Hosted data files	Google Drive / Tableau Public
7.	File Storage	Source file storage	Local system / Google Drive
8.	External API-1	World Bank API	Word Bank
9.	External API-2	((Optional) Map service	UNESCO Open Data (if used)

10	Infrastructure	Tableau hosted online	Tableau Public

Table-2: Application Characteristics: -

S.No	Characteristics	Description	Technology
1.	Usability	Easy navigation and interaction for non-technical users	Tableau filters and Dashboards
2.	Performance	Quick loading and smooth interaction of charts	Tableau Engine
3.	Accessibility	Open access to dashboard without login	Excel/CSV + Tableau Refresh
4.	Interactivity	Users can explore sites by filters (region, year, type, status)	Tableau Parameters & Actions

4 .PROJECT DESIGN

4.1 Problem Solution Fit Problem – Solution Fit Template: -

parameter	Details
1. Problem Statement (Problem to be solved)	UNESCO World Heritage data is often unstructured, text-heavy, and spread across multiple sources. It lacks visual representation, making it difficult for students, researchers, and policy makers to explore heritage trends, endangered sites, or cultural distributions effectively. This limits decision-making and awareness.
2 Idea / Solution description	Our solution is an interactive Tableau dashboard that visually presents global UNESCO World Heritage data, including site type (Cultural/Natural), country, region, year of inscription, endangered status, and area size. It enables users to: • Explore heritage sites by region, country, and year • Identify and filter endangered vs non endangered sites • Compare cultural vs natural sites • Visualize trends through maps, bar charts, and timelines This empowers researchers, educators, and heritage enthusiasts with accessible, insightful information.
3.Novelty / Uniqueness	Unlike static lists or raw data sheets, this solution combines multiple heritage indicators in a single, interactive platform. Built entirely with Tableau and an open-source dataset, it enables dynamic exploration with no technical expertise. The visual format makes global trends and threats understandable to all users — from students to policy makers.
4 .Social Impact / Customer Satisfaction	This project supports cultural awareness, education, and preservation by making world heritage data more engaging and usable. It helps researchers save time, enables students to explore global culture easily, and aids stakeholders in spotting

	endangered sites — leading to better conservation strategies and educational outcomes.
5. Business Model (Revenue Model)	The dashboard can be offered as a value-add for academic institutions, cultural NGOs, and government heritage departments. Revenue opportunities include: • Institutional access subscriptions • Customized dashboards for countries or states
6. Scalability of the Solution	The solution is highly scalable: • New datasets (e.g., from other regions or years) can be added easily • Additional filters and visualizations can be implemented without rewriting the logic • It can support multiple use cases like rental trends, commercial real estate, etc.

Purpose: -

- Solve complex economic data challenges in a format accessible to non-technical users.
- Increase understanding of prosperity indicators by connecting them with freedom index data.
- Speed up research and reporting through interactive, visual analytics.
- Strengthen policy recommendations and academic presentations using real-time insights.
- Reduce dependency on static spreadsheets and enhance user confidence with dynamic dashboards.

4.2 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Global economic data is often scattered, non-visual, and hard to interpret. Analysts, researchers, and students face difficulty understanding the impact of economic freedom on national prosperity due to lack of integrated, interactive tools.
2.	Idea / Solution description	- Our solution is an interactive Tableau dashboard that visually presents global UNESCO World Heritage data, including site type (Cultural/Natural), country, region, year of inscription, endangered status, and area size. It enables users to: • Explore heritage sites by region, country, and year • Identify and filter endangered vs non endangered sites • Compare cultural vs natural sites • Visualize trends through maps, bar charts, and timelines This empowers researchers, educators, and heritage enthusiasts with accessible, insightful information.
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		understandable to all users — from students to policy makers.
4.	Social Impact / Customer Satisfaction	This solution enhances economic awareness among students and researchers, assists policy analysts in datadriven decision-making, and promotes transparency. It reduces time and confusion in processing global datasets, improving both accessibility and clarity of complex economic information.
5.	Business Model (Revenue Model)	This dashboard could be monetized as part of consultancy reports, academic dashboards, or educational toolkits. Revenue opportunities include: - Custom dashboards for policy agencies or institutions
		- Freemium model with premium insights - Integration into online research platforms
6.	Scalability of the Solution	The solution is highly scalable: • New datasets (e.g., from other regions or years) can be added easily • Additional filters and visualizations can be implemented without rewriting the logic •It can support multiple use cases like rental trends, commercial real estate, etc.

4.3 Solution Architecture: -

Solution architecture in this project serves as a strategic framework that bridges the gap between the problem of scattered, unstructured heritage data and the need for a clean, visual, and interactive dashboard solution. It ensures the right use of technology and structure to meet both user and project goals.

Key Aspects

- ☑ Identify the best technology setup to organize and visualize UNESCO heritage data effectively.
- ☑ Define the structural flow from raw data to final insights presented through an interactive dashboard.
- ☑ Establish features, stages, and functional requirements of the solution.
- ☑ Set clear specifications for how the solution is developed, maintained, and scaled in the future.

Business Problem

Stakeholders such as cultural researchers, policy makers, and educators struggle to interpret UNESCO heritage data, which is scattered, non-visual, and difficult to compare. There is a need for a centralized, interactive solution that helps analyze site distributions, endangered status, regional patterns, and historical trends to support research, preservation, and public engagement..

Technology Solution

The solution uses Tableau to create an interactive dashboard built from a structured UNESCO World Heritage dataset. The cleaned dataset includes fields such as region, country, site type, year of inscription, area, and endangered status. Users can explore global heritage trends, identify endangered sites, and analyze cultural distributions through dynamic filters, maps, bar charts, KPIs, and timelines—making complex data easy to understand and actionable for researchers, students, and policy makers.

Features

Visualization of heritage sites on a world map
- Distribution analysis by site type, region, and country
- Trend analysis by year of inscription and endangered status
- Comparison of cultural vs natural sites
- Identification of top 10 countries with endangered sites

Solution Delivery

- Tableau Public Dashboard for interactive exploration
- Built using a cleaned, open-source UNESCO heritage CSV dataset
- Dashboard published and shared via public URL
- Visual outputs documented with screenshots for reports and presentations

Example - Solution Architecture Diagram: -

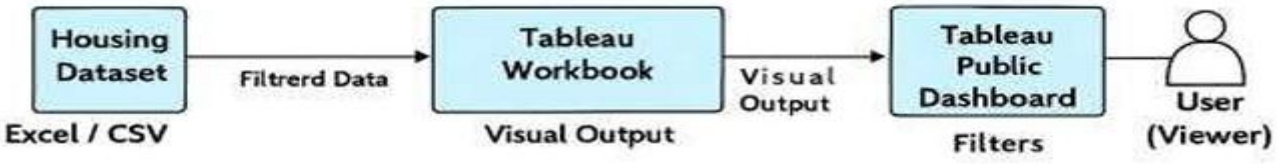


Figure 1: Solution Architecture for Housing Market Visualization using Tableau

5.PROJECT PLANNING & SCHEDULING

5.1Project Planning Product Backlog, Sprint, Schedule & Estimation (4 marks)

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Import & Cleaning	USN-1	As a user, I want to import and clean the heritage dataset in Tableau.	3	High	Lavanya (Self)
Sprint-1	Filter Setup	USN-2	As a user, I want to filter data by country, type, year, and endangered status.	2	High	Lavanya (Self)
Sprint-2	Visualize Trends	USN-3	As a analyst, I want to view heritage site inscription trends over time.	3	High	Lavanya (Self)
Sprint-2	Endangered Site Analysis	USN-4	As a analyst, I want to identify and compare endangered sites by country or region.	3	Medium	Lavanya (Self)
Sprint-3	Dashboard Layout	USN-5	As a analyst , I want to interact with a clean, well-organized dashboard layout.	2	High	Lavanya (Self)
Sprint-3	Export Features	USN-6	As a analyst , I want to export visuals or summary reports from the dashboard	2	Medium	Lavanya (Self)

Sprint-4	Testing & Optimization	USN-7	As a Dash board creator , I want to test dashboard loading speed and improve performance.	2	High	Lavanya (Self)
Sprint-4	Tableau Public Deployment	USN-8	As a user, I want the dashboard to be published to Tableau Public with a share link	1	High	Lavanya (Self)

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

Sprint-1	5	2 Days	20 June 2025	21 June 2025	5	21 June 2025
Sprint-2	5	2 Days	22 June 2025	23 June 2025	5	23 June 2025
Sprint-3	5	2 Days	24 June 2025	25 June 2025	5	25 June 2025
Sprint-4	5	1 Days	26 June 2025	26 June 2025	5	26 June 2025
Sprint-45	5	1 Day	27 June 2025	27 June 2025	5	27 June 2025

Velocity: -

Final Average Team Velocity =

Average Velocity= 5+5+5+5+5/2+2+2+1+1=25/8=3.12 story points/day (rounded)

Burndown Chart: -

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

6.FUNCTIONAL AND PERFORMANCE TESTING

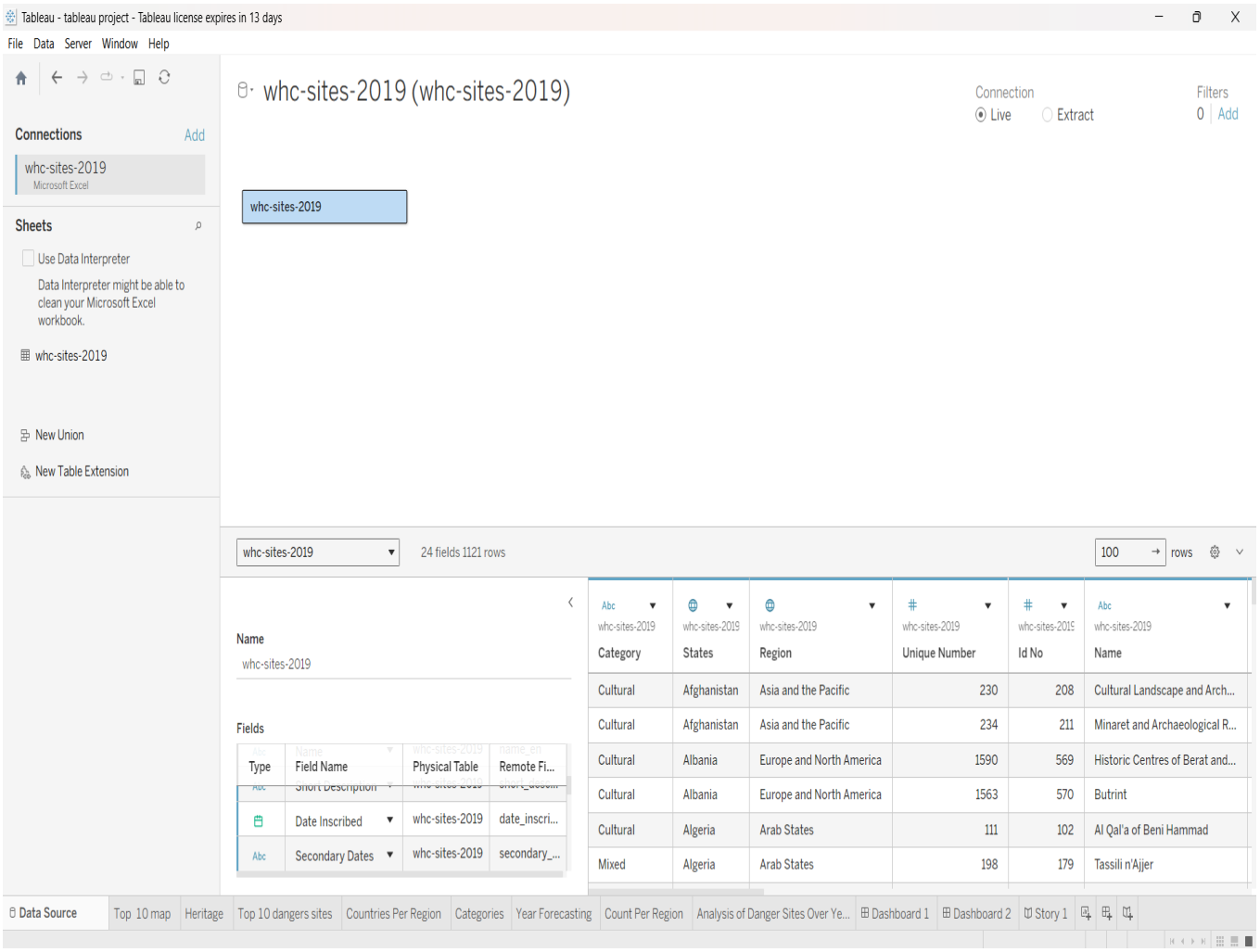
6.1 Performance Testing: -

Model Performance Testing: -

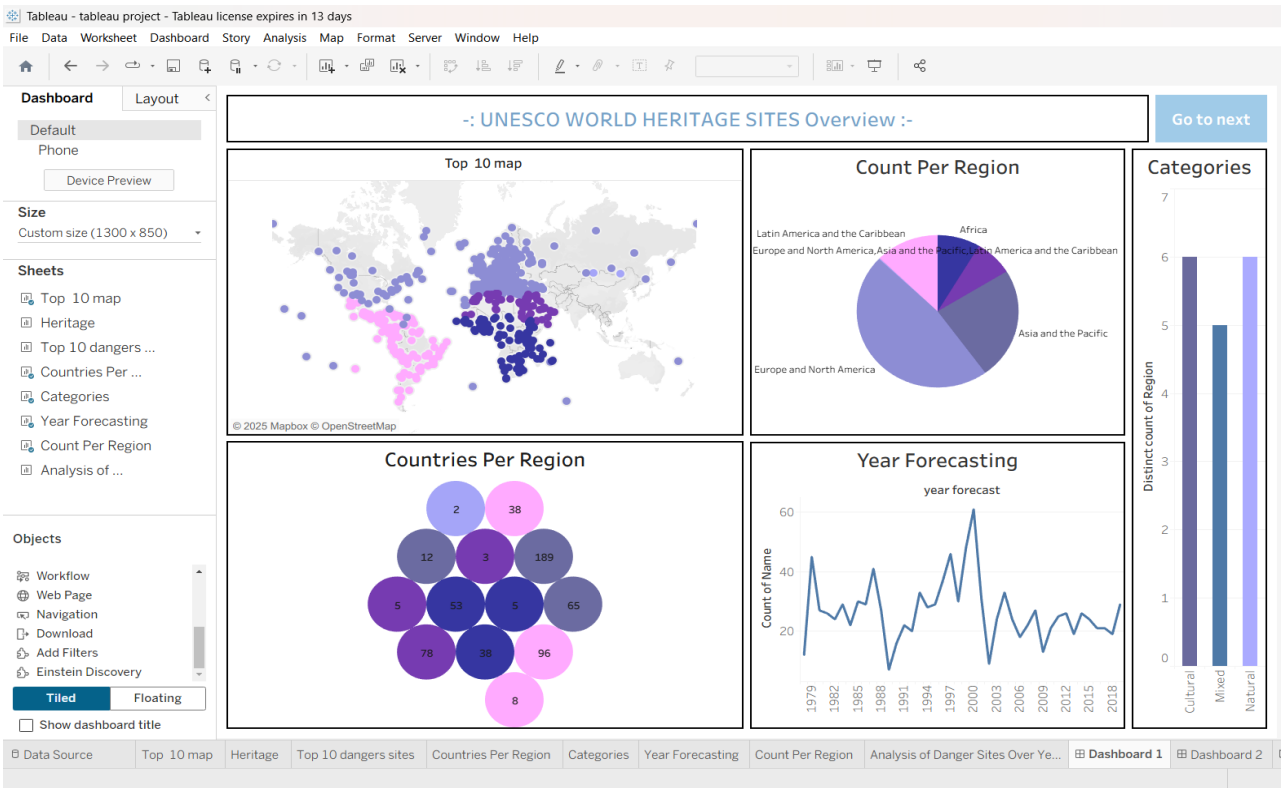
S.No.	Parameter	Screenshot / Values
1.	Data Rendered	- Total Rows: 1121 (from UNESCO dataset) - Columns: 30+ - File Used: whc-sites-2019.xlsx - Rendered via Tableau Data Source tab
2.	Data Preprocessing	Cleaned raw CSV into structured Excel format - Renamed fields (e.g., name_en to Site Name, date_inscribed to Inscription Year) - Created calculated fields (e.g., Year Forecast, Forecast Indicator)
3.	Utilization of Filters	Filters applied to: • Country (states_name_en) • Region • Category (Cultural/Natural) • Danger Status
4.	Calculation fields Used	Is Endangered → IF ISNULL([danger_list]) THEN "No" ELSE "Yes" - Year Forecast → [date_inscribed] + 10 - Forecast Indicator → groups year into Immediate, Upcoming, Long-term - Endangered Rank → RANK_UNIQUE(COUNT([name_en]))
5.	Dashboard design	No. of Visualizations: 5 1. World Map of Sites (Top 10) 2. Count per Region (Pie) 3. Countries per Region (Packed Bubbles) 4. Forecasting Trend (Line Chart) 5. Category Count (Bar Chart)

6	Story Design	Story includes 5 major visual points: • Global Overview • Inscriptions over Time • Forecasting & Summary Each slide has narrative caption guiding user through insights • Endangered Sites • Top 10 Danger Map

Screenshot of Data Source: -



Screenshot of Dashboard with Filters: -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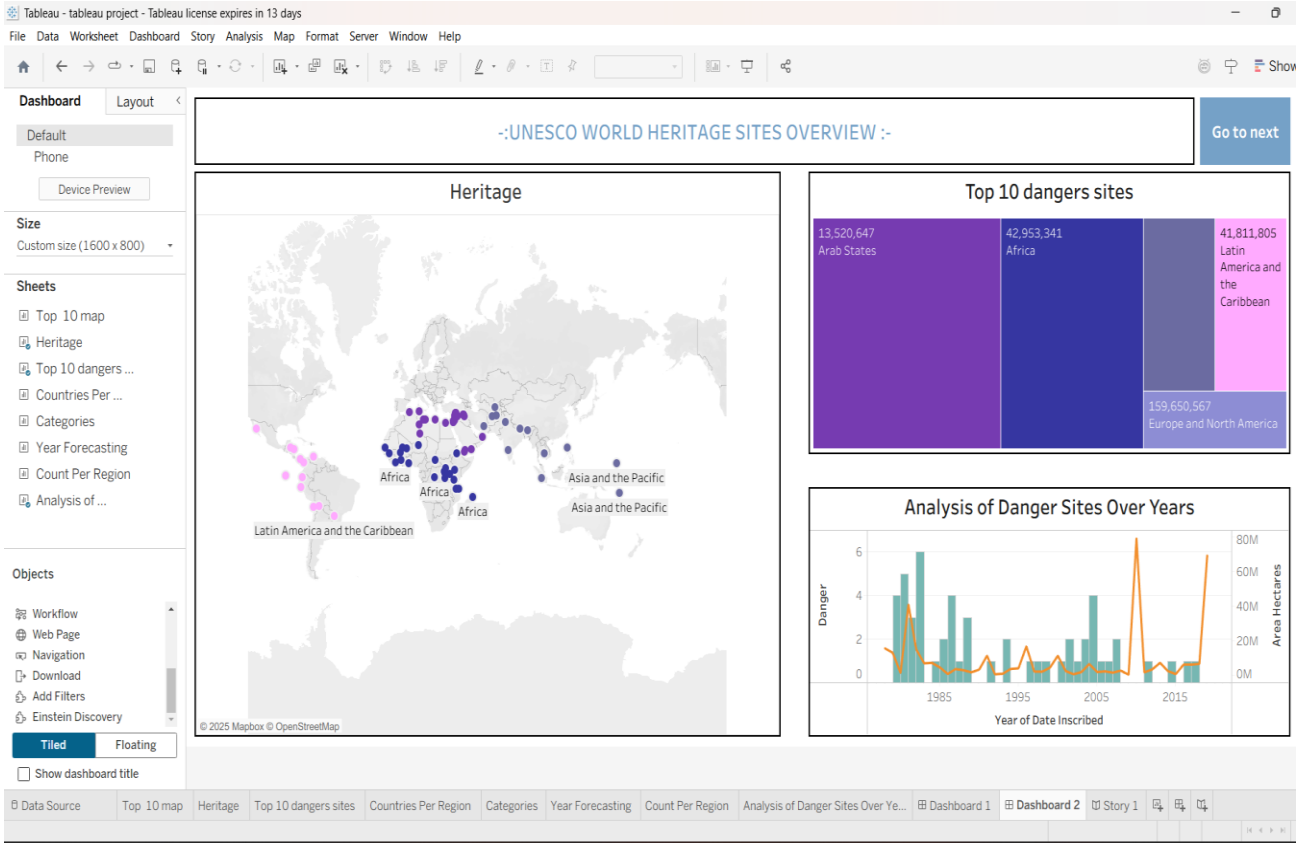
Sheets
Top 10 map
Heritage
Top 10 dangers ...
Countries Per ...
Categories
Year Forecasting
Count Per Region
Analysis of ...
Objects
Workflow
Web Page
Navigation
Download
Add Filters
Einstein Discovery
Tiled
Floating
Show dashboard title
-: UNESCO WORLD HERITAGE SITES Overview :-
Go to next
Top 10 map
© 2025 Mapbox © OpenStreetMap
Count Per Region
Latin America and the Caribbean
Africa
Europe and North America,Asia and the Pacific,Latin America and the Caribbean
Asia and the Pacific
Europe and North America
Categories
Distinct count of Region
Cultural
Mixed
Natural
Countries Per Region
2
38
12
3
189
5
53
5
65
78
38
96
8
Year Forecasting
year forecast
Count of Name
Data Source
Top 10 map
Heritage
Top 10 dangers sites
Countries Per Region
Categories
Year Forecasting
Count Per Region
Analysis of Danger Sites Over Ye...
Dashboard 1
Dashboard 2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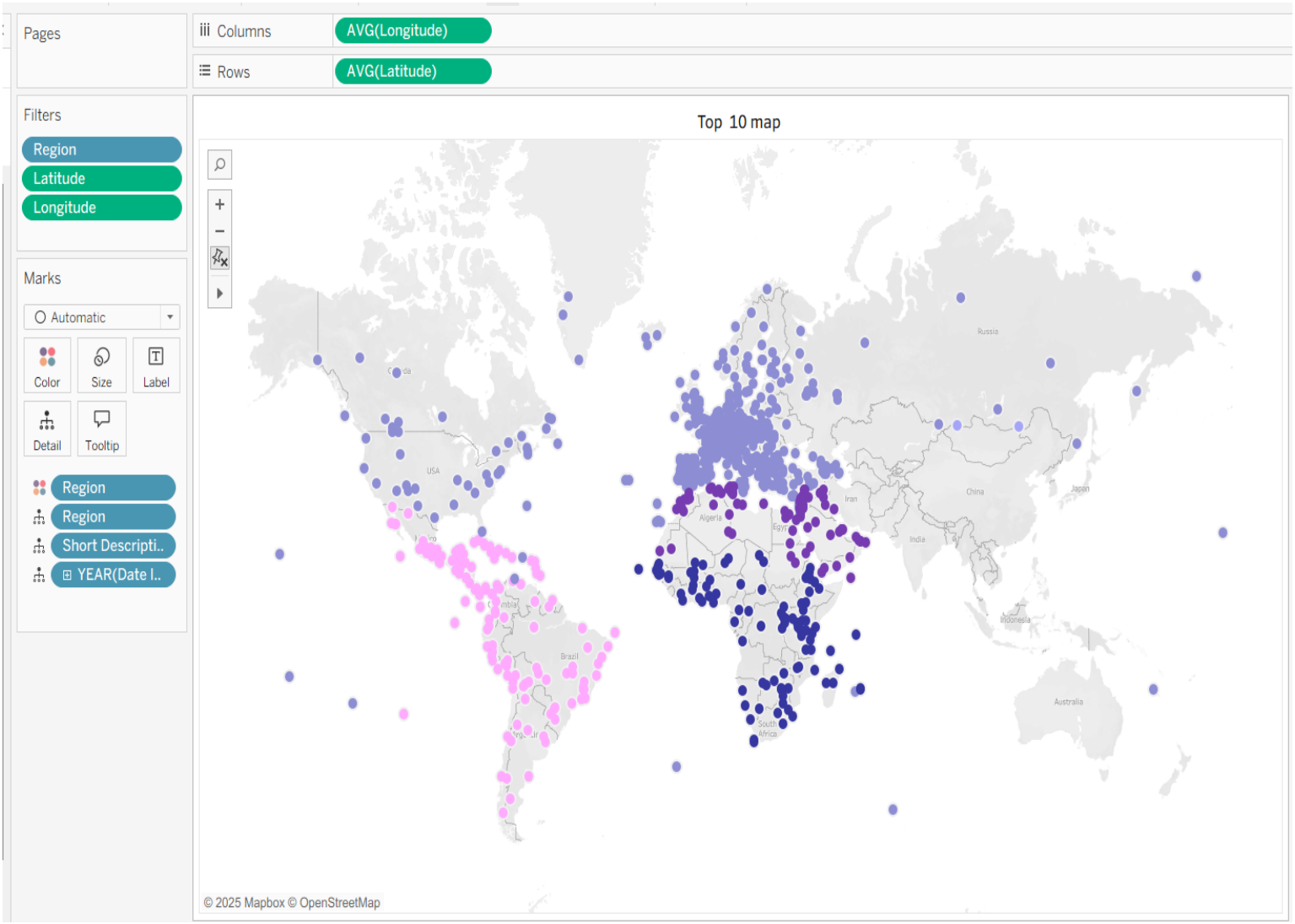
Top 10 dangers ...
Countries Per ...
Categories
Year Forecasting
Count Per Region
Analysis of ...
Objects
Workflow
Web Page
Navigation
Download
Add Filters
Einstein Discovery
Tiled
Floating
Show dashboard title
-:UNESCO WORLD HERITAGE SITES OVERVIEW :-
Go to next
Heritage
Africa
Africa
Africa
Asia and the Pacific
Asia and the Pacific
Latin America and the Caribbean
© 2025 Mapbox © OpenStreetMap
Top 10 dangers sites
13,520,647
Arab States
42,953,341
Africa
41,811,805
Latin America and the Caribbean
159,650,567
Europe and North America
Analysis of Danger Sites Over Years
Danger
Area Hectares
Year of Date Inscribed
Data Source
Top 10 map
Heritage
Top 10 dangers sites
Countries Per Region
Categories
Year Forecasting
Count Per Region
Analysis of Danger Sites Over Ye...
Dashboard 1
Dashboard 2
Story 1

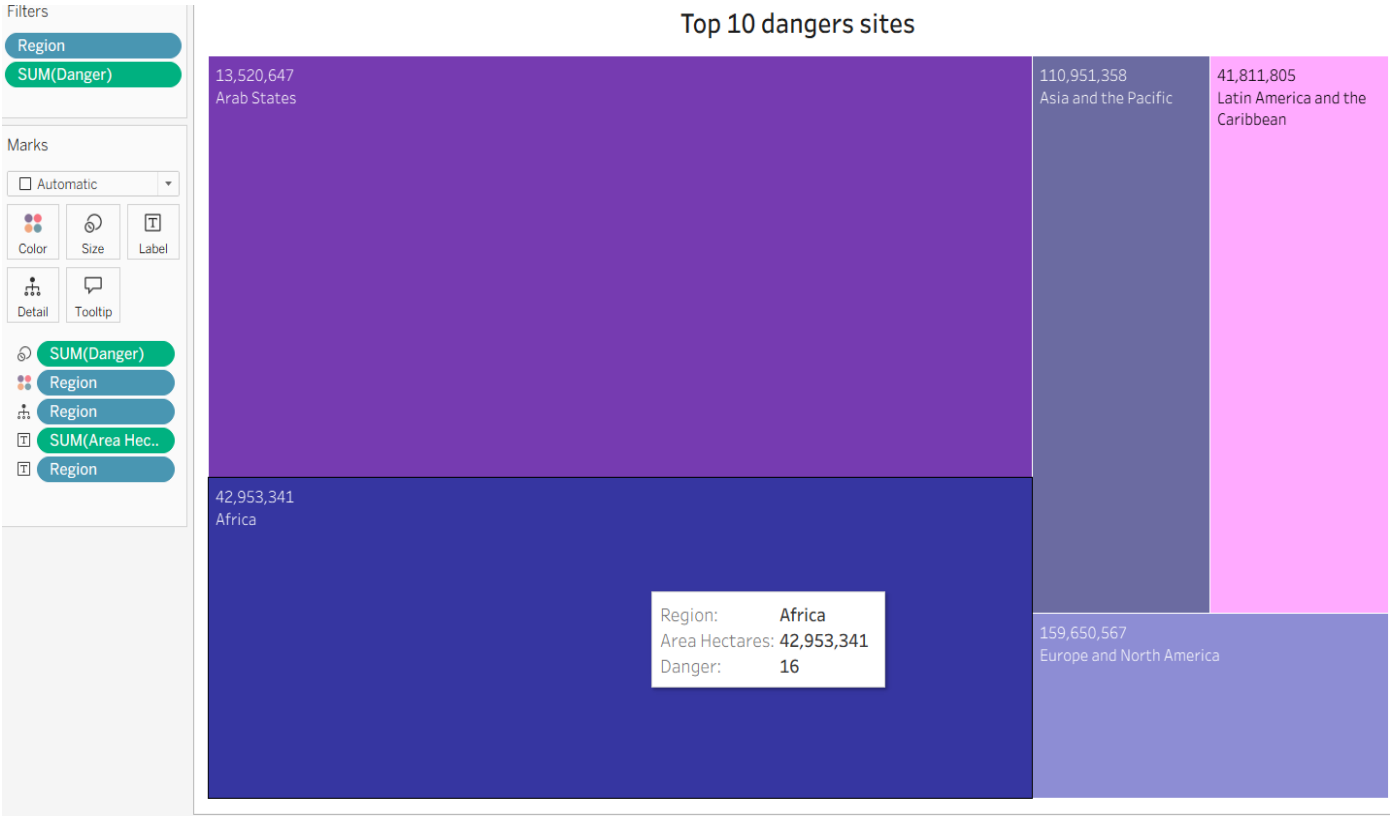
7.Results

Output Screenshots

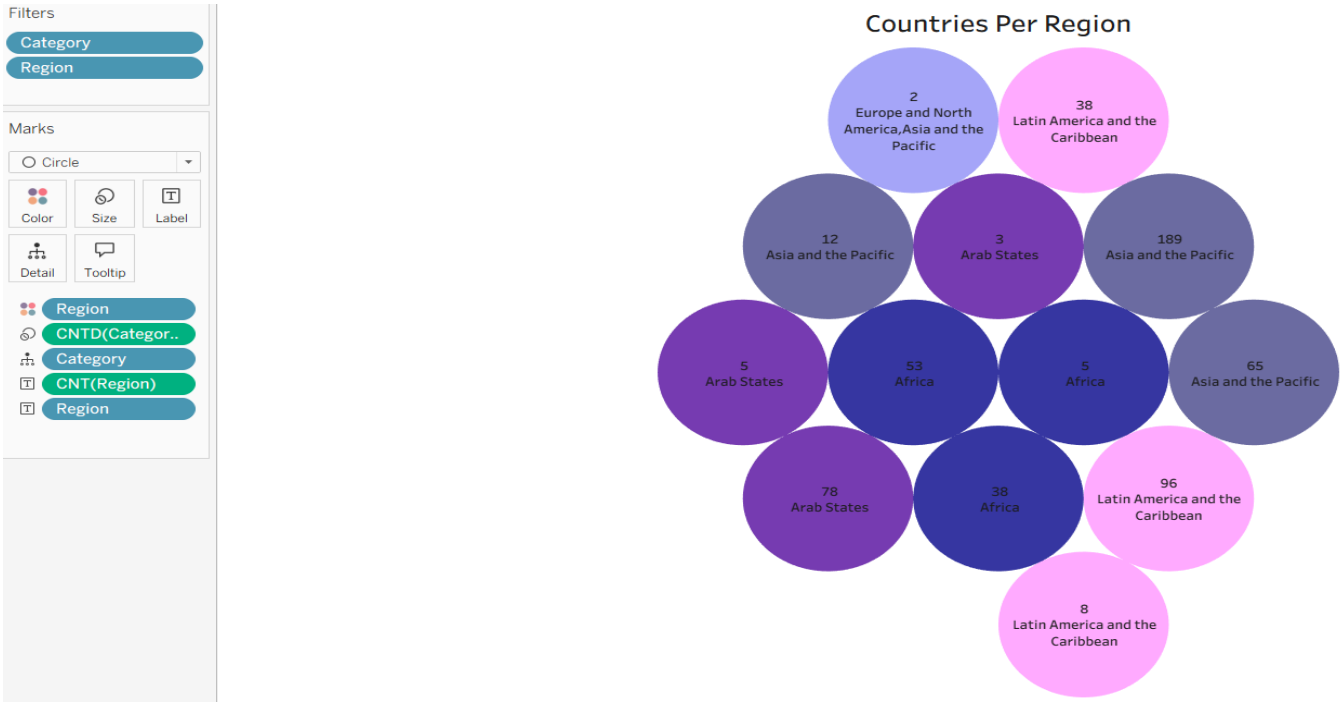
Case 1: Top 10 Map



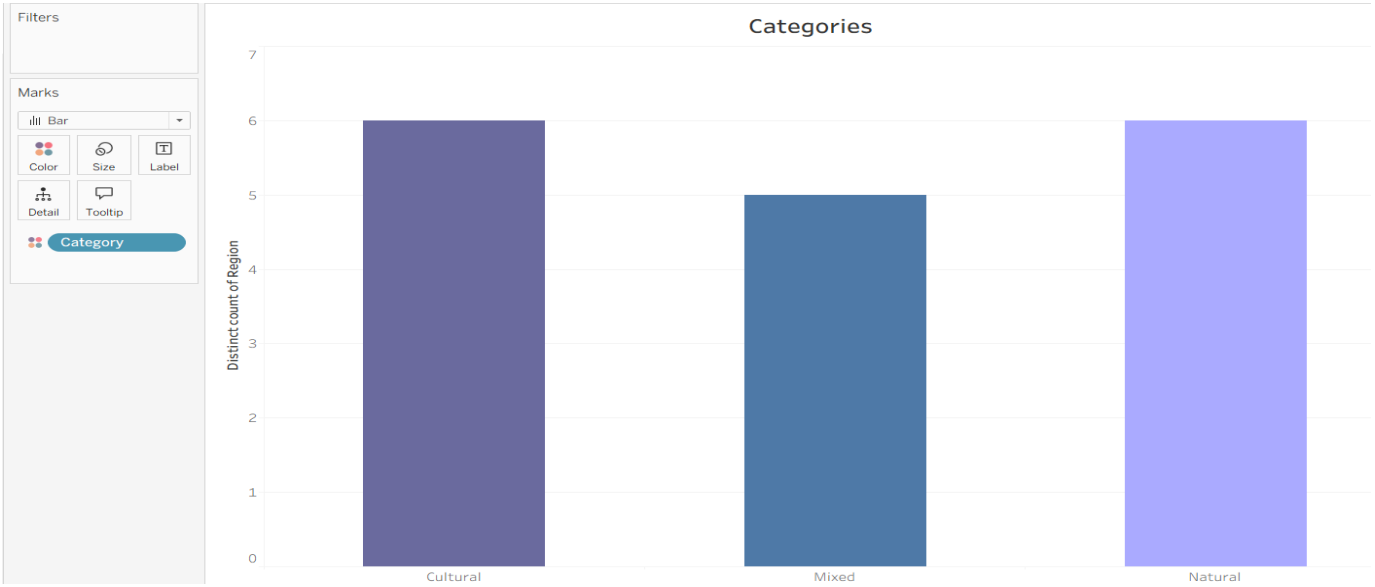
Case 2: Top 10 Dnager Sites



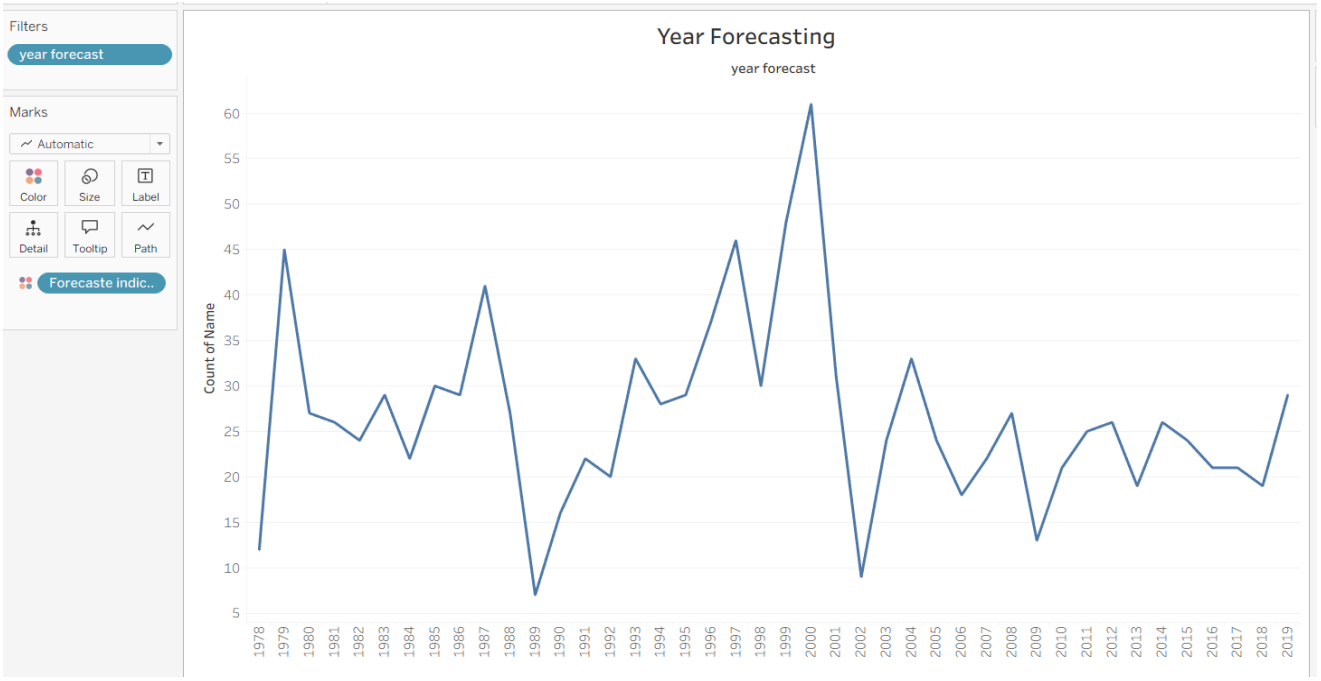
Case 3: Countries Per Region



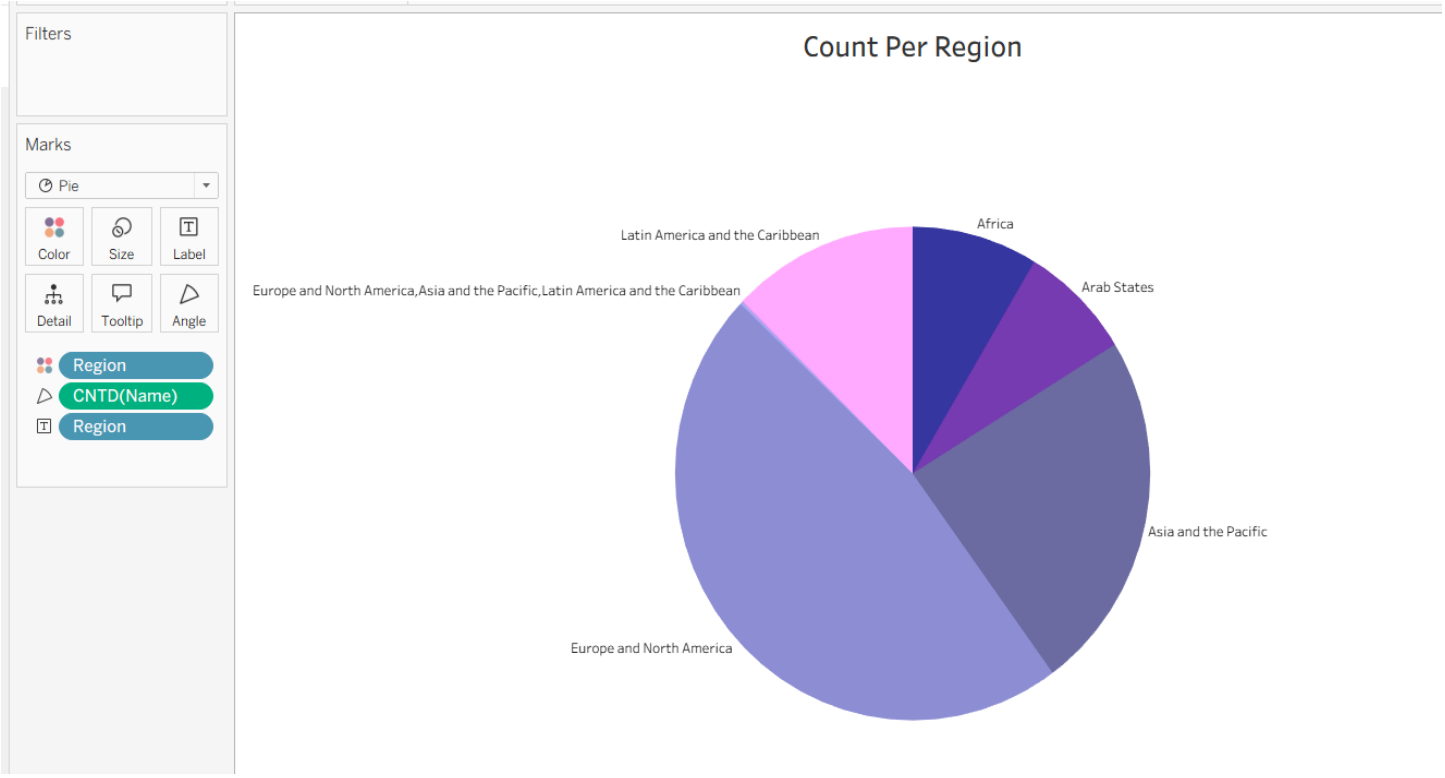
Case 4: Categories



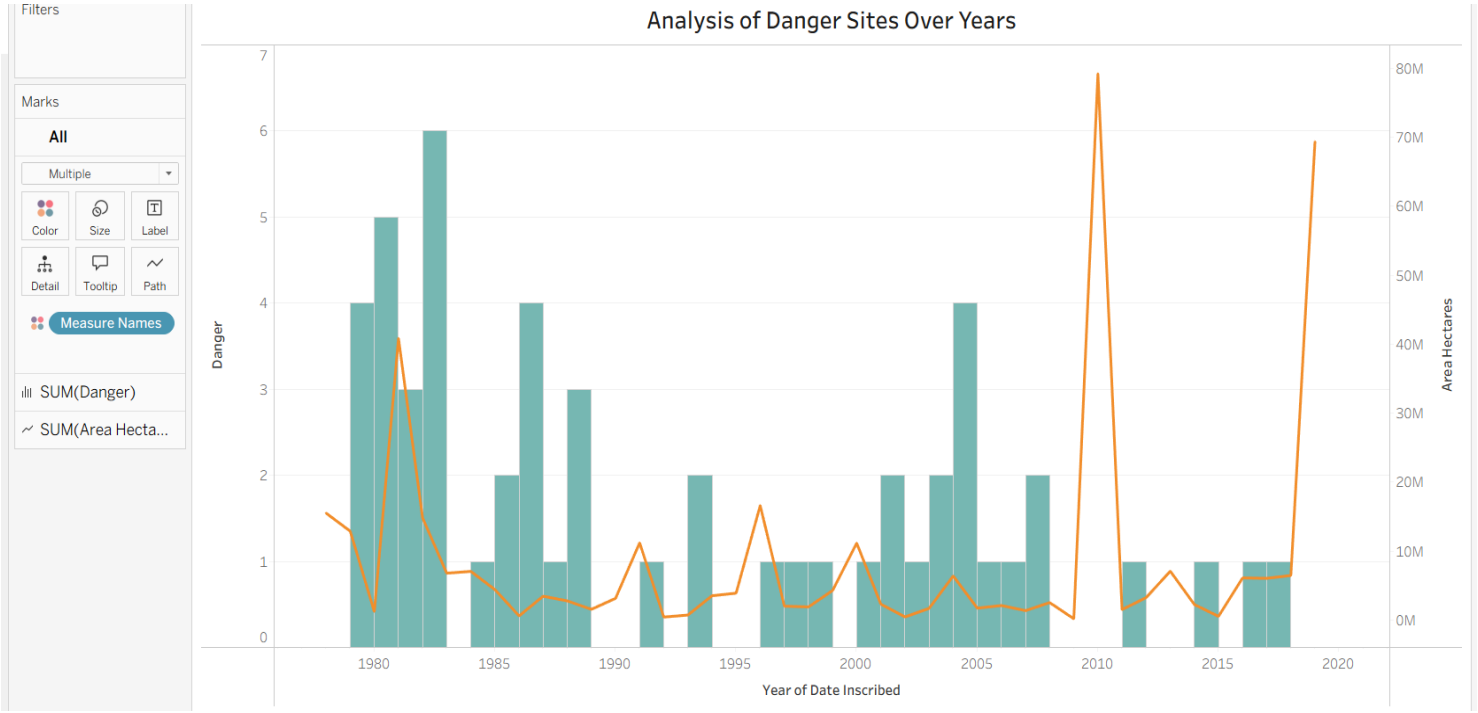
Case 5:Year Forecasting



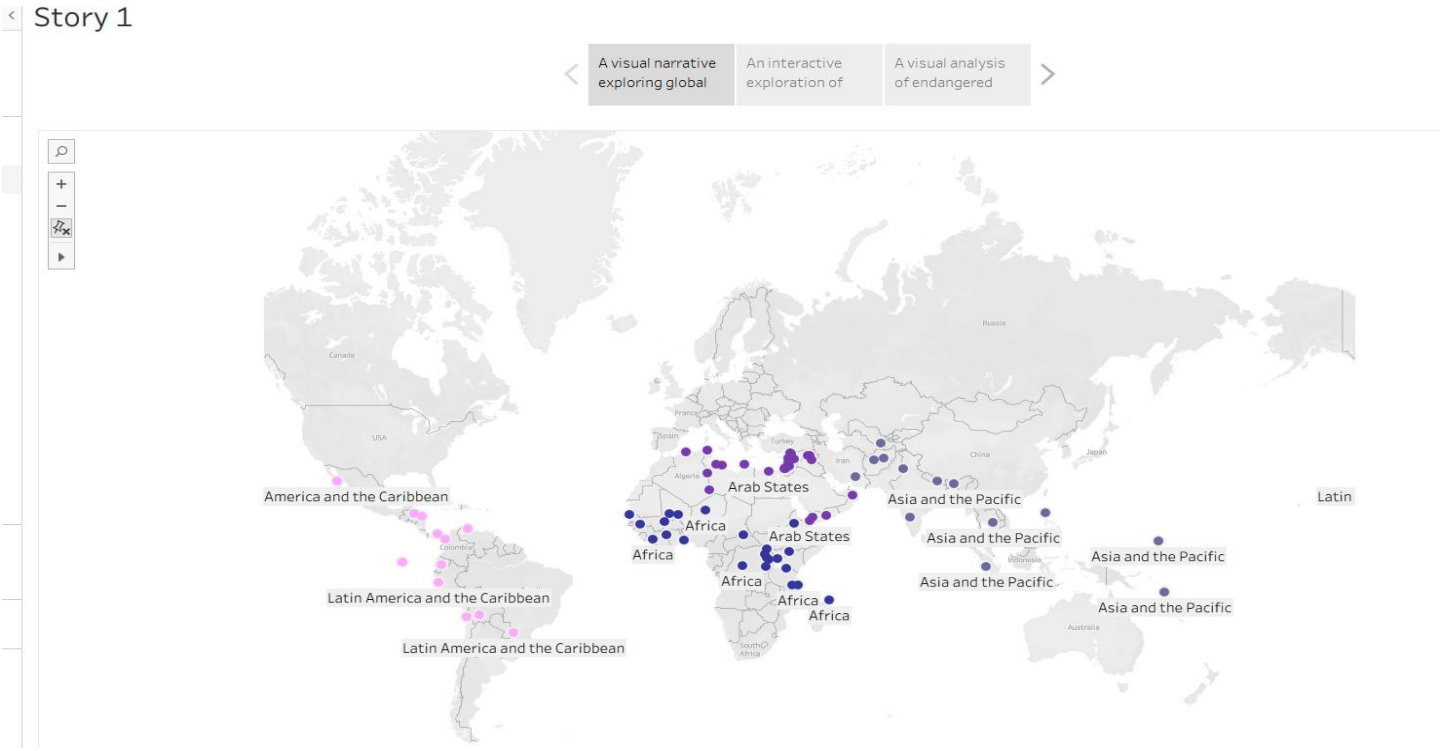
Case 6: Count Per Region



Case 7:Analysis of Danger Sites Over Years



Story:



8. ADVANTAGES & DISADVANTAGES: -

Advantages

Interactive dashboards make it easy to explore heritage data by region, country, and category
- Combines multiple insights—such as site type, danger status, and year trends—into one visual platform
- Supports education, research, and preservation planning with region-wise comparisons
- Built using open-source datasets and free tools (Tableau Public), making it widely accessible
- Custom filters and calculated fields (e.g., danger forecast) allow in-depth exploration

Disadvantages

- Depends on third-party (UNESCO) data that may be incomplete or outdated
- Doesn't support real-time site updates or live changes in site status
- Tableau Public has no data-level security, so sensitive analysis is unsuitable
- Requires stable internet to access published dashboards
- Users unfamiliar with dashboards may need guidance to use filters effectively

9.conclusion

This project successfully demonstrates how data visualization can enhance the understanding of global heritage patterns. By using Tableau, complex information about site distribution, endangered status, and regional trends was transformed into an accessible and interactive format. The analysis not only highlights cultural and natural treasures across the world but also identifies areas needing urgent conservation attention. The dashboard serves as a valuable tool for researchers, educators, and policy makers, promoting data-driven decision-making in heritage preservation. Overall, the project bridges culture and analytics, offering insights that are both informative and impactful.

10.FUTURE SCOPE: -

1.Integrate real-time data from UNESCO APIs to track new site inscriptions and danger status updates
2.Expand analysis to include tourism impact, funding, and visitor statistics for deeper insights
3.Incorporate geospatial analysis using advanced mapping tools for region-specific conservation planning
4.Develop multilingual dashboards to increase accessibility across global user groups
5.Apply machine learning models to predict potential endangered sites based on historical trends

11. APPENDIX • Source Code: N/A

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

  Demo Link:- https://drive.google.com/file/d/19NAu6BmsKE_GLZO2opv8i-AOWb5cP0nO/view?usp=sharing

- **Git Hub Link:** - https://github.com/S-3344/Heritage-Treasures-An-In-depth-Analysis-of-UNESCO-World-Heritage-