

Project Report Format

1.INTRODUCTION:

1.1 Project Overview

Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites (2019) is a data visualization project designed to explore and present insights from the UNESCO World Heritage Sites dataset. The objective is to develop an interactive, cloud-hosted dashboard using Tableau to help heritage officers, researchers, and policy makers gain clear, actionable insights into the distribution, risk status, and inscription trends of heritage sites worldwide.

By transforming complex, static, and text-based data into interactive visualizations like tree maps, pie charts, and line charts, this project enables stakeholders to identify countries with the highest number of heritage sites, monitor endangered sites, and track historical trends across regions efficiently.

1.2 Purpose

The purpose of this project is to provide an intuitive, data-driven decision support system that:

- Simplifies the analysis of global UNESCO World Heritage Sites data
- Highlights sites at risk for targeted preservation efforts
- Reveals historical inscription trends to assist in heritage management policies
- Offers easy access to interactive, cloud-hosted dashboards for global users
- Enables efficient report generation and data export capabilities

This initiative aims to improve the accessibility and usability of heritage data, promoting informed decision-making in global heritage conservation efforts.

2. IDEATION PHASE:

2.1 Problem Statement

Heritage officers, cultural policy makers, and researchers face significant challenges when accessing, analysing, and interpreting UNESCO World Heritage Sites data. The data is typically presented in static, tabular formats, making it difficult to visually understand site distributions, identify endangered heritage sites, and analyse historical trends in site inscriptions.

As a result, prioritizing at-risk sites for preservation and making data-driven policy decisions becomes time-consuming, inefficient, and prone to oversight. There is a clear need for an interactive, cloud-hosted data visualization platform that simplifies complex heritage data into intuitive, actionable visual insights.

This project addresses this problem by developing a user-friendly dashboard using Tableau, enabling stakeholders to quickly explore heritage site distributions, monitor risk status, and track regional inscription trends — improving the effectiveness of global heritage management initiatives.

2.2 Empathy Map Canvas

WHO are we empathizing with: Heritage officers, acrl iere ervches Heritage officers, cultural policy makers, and researchers responsible for analyzing, managing, and preserving UNESCO World Heritage Sites. These professionals rely on accurate, accessible, and clear data insights for make decisions about heritage preservation, risk assessment, and cultural conservation policies.	
What do they SAY? <ul style="list-style-type: none">• "It's hard to track which sites are currently at risk."• "We need easy to understand, visual reports to present to decision-makers"• "Finding trends over time and across regions is too complicated with the'da we have."• "I wish we could get interactive dashboards to explore the data"	What do they THINK? <ul style="list-style-type: none">• "This raw tabular data is hard to analyze and often overwhelming."• "We might be missing important trends or vulnerable sites that nee urgent urgent attention."• "If we had better tools and visualizations, we could it make quicker, moree ffective decisions."• "I'm concerned that seattered data prevents sis from seeing the full picture of heritage preservation."
What do they DO? <ul style="list-style-type: none">• Regularly work with large, complex spreadsheets containing site data.• Review UNESCO reports and manu- identify at-risk sites.• Prepare preservation proposals and cultural conservation plans based onn- incomplete or hard-fo-analyze data.• Attempt to track inscription trends by vear and region using basic tools.	What do they FEEL? <ul style="list-style-type: none">• Overwhelmed by the scattered and non visual nature of existing data.• Frustrated with the inefficiency of current tools for decisionmaking.• Concerned about site loss due to delays or missed priorities in preservation efforts.• Eager for accessible, interactive data visualization solutions to so-

2.3 Brainstorming

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

Problem Statement:

To analyse and visualize the global distribution, risk status, and inscription trends of UNESCO World Heritage Sites using Tableau, providing actionable insights for preservation efforts and policymaking.

Step-2: Brainstorm, Idea Listing and Grouping

The team held a brainstorming session to generate ideas on how to best visualize and analyze the UNESCO World Heritage Sites dataset. Each team member contributed potential visualization ideas

and analysis directions. The ideas were then grouped into relevant categories based on their objectives and themes.

The following ideas were generated:

- Create a tree map visualization to display countries based on the number of heritage sites they possess. This would give a quick, comparative overview of site distribution by country.
- Develop a pie chart to represent the proportion of heritage sites categorized as 'In Danger' and those considered 'Not in Danger'. This would visually communicate the risk status of sites globally.
- Design a line chart to depict the trend of new heritage site inscriptions over the years, segmented by region. This would help identify which regions have shown the most growth and historical patterns in site conservation.
- Consider adding a bar chart to analyse site categories (Cultural, Natural, Mixed) to understand the composition of heritage sites globally.
- Optionally, include a map-based visualization displaying the spatial distribution of all heritage sites to provide a geographical perspective.

These ideas were then grouped under categories such as **Distribution Analysis, Risk Status Visualization, Historical Trend Analysis**, and **Optional Enhancements** for better organization.

Step-3: Idea Prioritization

Once the ideas were listed and grouped, the team prioritized them based on their relevance to the problem statement, feasibility within the dataset and Tableau, and the value they would offer to stakeholders.

The prioritization was as follows:

- **High Priority:**
 - Tree map visualization showing the number of heritage sites per country. This idea was prioritized because it directly addresses the need to understand global distribution and provides a clear, visually appealing comparison.
 - Pie chart displaying the proportion of 'In Danger' vs. 'Not in Danger' sites. This was considered essential as it highlights vulnerable sites requiring urgent attention.
 - Line chart illustrating inscription trends over the years by region. This was prioritized for its ability to show historical and regional conservation efforts over time.
- **Medium Priority:**
 - Bar chart analyzing site categories (Cultural, Natural, Mixed). While valuable, this was considered supplementary to the primary insights.

- World map visualization displaying the locations of all heritage sites. This was deemed useful for a visual overview but secondary to analytical visualizations.

Final Selected Ideas for Implementation:

1. Tree map: Heritage Sites by Country
2. Pie Chart: Heritage Sites at Risk
3. Line Chart: Regional Inscription Trends

These visualizations were selected as they best aligned with the problem statement, offered significant analytical value, and were achievable within the project timeline and dataset.

3.REQUIREMENT ANALYSIS:

3.1 Customer Journey map

SCENARIO:

using a Tableau dashboard to explore UNESCO World Heritage Sites data, analyze site distribution by country, monitor endangered sites, and track inscription trends across different regions and years for informed heritage preservation decision-making.

Step	What does the user typically experience?	Goals & Motivations	Interactions	Positive Moments	Negative Moments	Areas of Opportunity
1. Enter the Dashboard	User accesses the cloud-based heritage dashboard	Help me explore heritage site data visually	Tableau dashboard, web interface	Clean layout, easy filter access	May feel overwhelmed by multiple graphs at once	Add a brief dashboard guide or pop-up tooltips
2. Apply Data Filters	User applies country, region, and year filters to narrow down site data	Help me focus on relevant data	Filter controls, search fields	Quick response and interactive filtering	Lack of advanced multi-criteria filtering (e.g. category + status)	Introduce advanced multi-filter combinations
3. View Tree map Visualization	User views a tree map showing number of sites per country	Help me see which countries have the most sites	Tree map graph	Visual size comparison is intuitive	May not easily identify smaller countries' site counts	Add value labels and tooltips on tree map blocks
4. Check 'In Danger' Sites	User reviews a pie chart showing 'In Danger' vs 'Not in Danger' site status	Help me identify at-risk sites	Pie chart visualization	Immediate clarity of risk proportions	No details on why a site is at risk	Add drill-down option with risk reasons per site
5. Track Inscription Trends	User explores line charts showing site inscriptions	Help me spot growth trends and history	Line chart visualization	Easy to see trends and compare regions	Difficult to trace exact years or peaks	Add highlight-on-hover or tooltips on key data points

Step	What does the user typically experience?	Goals & Motivations	Interactions	Positive Moments	Negative Moments	Areas of Opportunity
	over years by region					
6. Download Reports	User exports visual reports in PDF or image formats	Help me share insights or document findings	Export button	Simple one-click download feature	No option for custom report layouts	Provide export customization (e.g. select charts to include)
7. Summarize Insights	User forms conclusions from visual insights and recommends actions	Help me make preservation and policy decisions	Visual highlights, annotations, dashboard notes	Easy to compare and present insights	Data limitations (outdated or static data)	Future integration with live UNESCO data via API

3.2 Solution Requirement

Functional Requirements:

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Access	Login through system dashboard Logout functionality
FR-2	Data Visualization	View tree map of heritage sites by country View pie chart for 'In Danger' vs 'Not in Danger' sites View line chart of inscription trends by region and year
FR-3	Data Filtering	Filter data by year Filter data by region Filter data by site category (optional)
FR-4	Data Export	Export visualizations in PDF format Export visualizations in PNG format

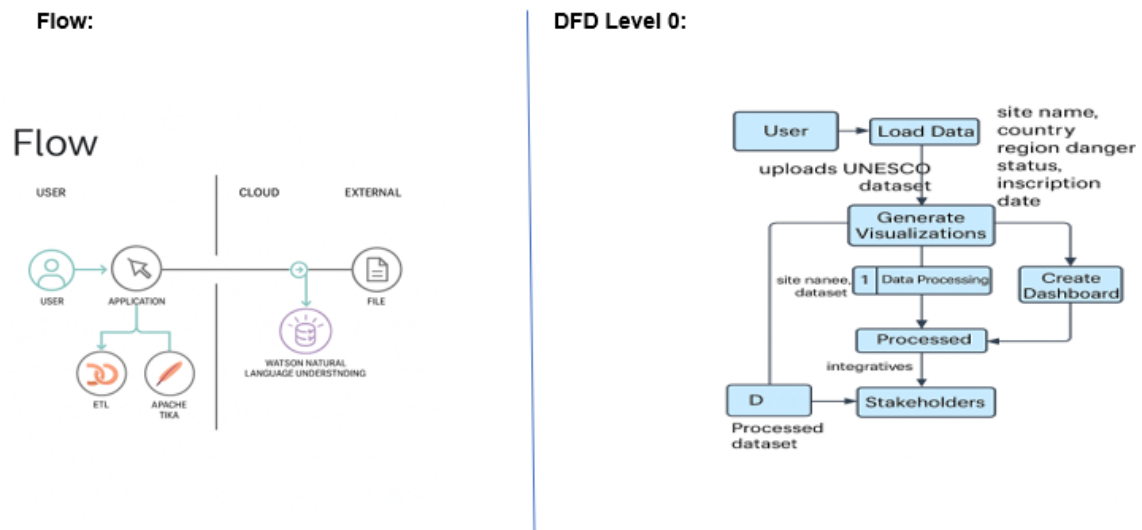
Non-functional Requirements:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The system must have an intuitive, user-friendly dashboard interface that allows users to easily navigate visualizations and filters
NFR-2	Security	The system must secure data access, ensuring only authorized users can access, view, and export visual reports.
NFR-3	Reliability	The system should consistently perform queries and generate visualizations without failures or data loss.
NFR-4	Performance	The system must load visualizations and process data queries within an acceptable time frame (under 3 seconds for standard queries).
NFR-5	Availability	The system should maintain 99% uptime to ensure continuous access for heritage officers, researchers, and decision-makers.
NFR-6	Scalability	The system should be capable of handling additional datasets or increasing data size without affecting performance.

3.3 Data Flow Diagram

Data Flow Diagram (DFD):

A Data Flow Diagram (DFD) is a graphical representation of the flow of data through a system, illustrating how input data is transformed into output results through various processes. The DFD Level 0, also known as the Context Diagram, provides a high-level overview of the entire system as a single process along with its external entities and data stores.



User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Heritage Officer	Site Distribution & Risk Analysis	USN-1	As a heritage officer, I can view a tree map showing the number of heritage sites per country so that I can identify countries with the most heritage sites.	Tree map displays countries proportionally by site count.	High	Sprint-1
		USN-2	As a heritage officer, I can view a pie chart showing the proportion of sites 'In Danger' versus 'Not in Danger' so that I can focus on vulnerable sites.	Pie chart accurately reflects danger status categories.	High	Sprint-1
		USN-3	As a heritage officer, I can view a line chart displaying heritage site inscription trends by region and year so that I can understand historical conservation trends.	Line chart plots inscriptions over years by region.	Low	Sprint-1
Researcher	Historical Data Analysis	USN-4	As a researcher, I can filter inscription data by year and region so that I can analyse specific trends for my studies.	Filters work for year and region, updating charts dynamically.	Medium	Sprint-2
		USN-5	As a researcher, I can export visualization reports so that I can include them in my research documentation.	Data export available in PDF/PNG format.	Medium	Sprint-2
Administrator	Data Management	USN-6	As an administrator, I can upload updated UNESCO heritage datasets so that the visualizations stay <u>current</u> .	Successful upload and automatic update of visualizations	High	Sprint-2

3.4 Technology Stack

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

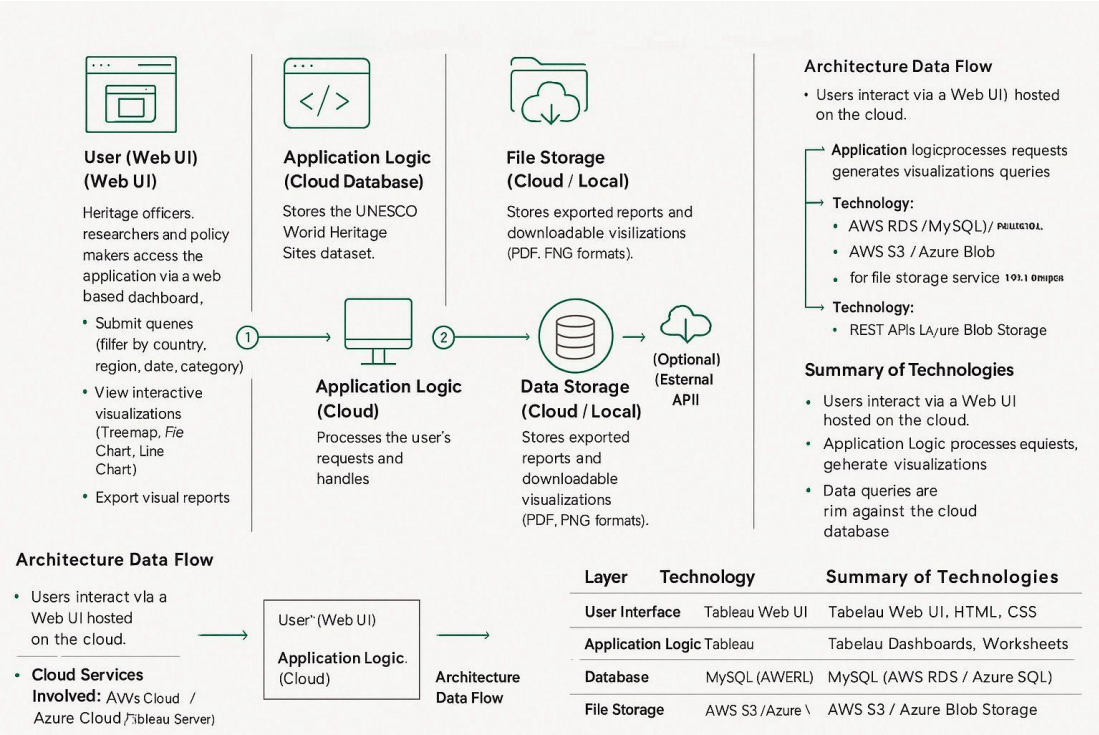


Table-1: Components & Technologies:

S. No	Component	Description	Technology
1.	User Interface	Web-based dashboard to visualize heritage site data	Tableau Web UI, HTML, CSS
2.	Application Logic-1	Data processing and visualization logic	Tableau Worksheets / Calculated Fields
3.	Application Logic-2	Data filtering and parameter controls	Tableau Filters and Parameters
4.	Application Logic-3	future feature: ML-based site risk prediction	Not implemented
5.	Database	Heritage Sites Dataset (structured data)	MySQL / CSV file / Tableau Extract
6.	Cloud Database	Cloud-hosted database service	AWS RDS / Azure SQL Database
7.	File Storage	Storage for exportable reports and dashboards	AWS S3 / Local file system
8.	External API-1	future integration with UNESCO API	UNESCO Data API
9.	External API-2	Not applicable in current scope	N/A
10.	Machine Learning Model	Not applicable in current scope	N/A
11.	Infrastructure (Server / Cloud)	Cloud hosting for Tableau Server or Tableau Public	AWS Cloud / Azure Cloud / Tableau Public

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Use of open-source CSS frameworks for optional custom styling	Bootstrap, Tailwind CSS
2.	Security Implementations	Data encryption, HTTPS, IAM controls for secured user access	SSL, IAM, Tableau Role Permissions
3.	Scalable Architecture	Scalable cloud-hosted architecture (3-tier: UI, Application Logic, Database)	AWS Cloud / Azure Cloud / Tableau Server
4.	Availability	High uptime via cloud infrastructure with distributed access	AWS Elastic Load Balancer / Azure Load Balancer
5.	Performance	Tableau extracts for faster queries, optimized dashboards, optional CDN for caching	Tableau Extracts, AWS CloudFront CDN

4. PROJECT DESIGN:

4.1 Problem Solution Fit

Problem – Solution Fit:

Problem Statement:

There is a lack of accessible and comprehensive insights into the global distribution, risk status, and temporal trends of UNESCO World Heritage Sites. Stakeholders—including conservationists, researchers, policymakers, and cultural institutions—face difficulty in identifying patterns, allocating resources, and prioritizing preservation efforts due to scattered and non-visualized data.

Solution Overview:

This project uses Tableau to explore and visualize the UNESCO World Heritage Sites dataset from 2019. Through interactive dashboards and insightful visualizations, the project aims to reveal trends, regional dynamics, and at-risk heritage zones. The solution helps stakeholders better understand the heritage landscape, allowing them to make data-driven decisions for safeguarding global cultural and natural heritage.

PROBLEM-SOLUTION FIT CANVAS

1. CUSTOMER SEGMENT[S] CS UNESCO analysts, cultural conservation organizations, tourism policymakers, NGOs, educators, heritage researchers interested in exploring and preserving global heritage sites	6. CUSTOMER CONSTRAINT CC <ul style="list-style-type: none"> Lack of technical skills to analyze large datasets Limited access to intuitive tools Budget constraints in conservation groups Time limitations to annual data processing
2. JOBS-TO-BE-DONE / PROBLEM J&P Identify which countries and regions have the most heritage sites <ul style="list-style-type: none"> Recognize sites at "risk" Monitor inscription trends over time by region Prioritize resource allocation to decision-makers or public 	5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none"> Static PDF reports from UNESCO Excel-based tables or databases Manual GIS mapping tools Academic literature and journal data not interactive or visual
3. TRIGGERS TR <ul style="list-style-type: none"> Seeing media coverage on endangered world heritage sites Internal deadlines for preservation planning and policy-making Need to report or present heritage trends in global conferences Increased risk reports from UNESCO 	8. CHANNELS OF BEHAVIOUR BE <ul style="list-style-type: none"> ONLINE (including) <ul style="list-style-type: none"> UNESCO WHC database Tableau Public dashboards Data repositories and research portals 6.2 OFFLINE <ul style="list-style-type: none"> Heritage conservation conferences Policy meetings Cultural workshops and NGO strategy sessions
4. EMOTIONS: BEFORE / AFTER AFTER <ul style="list-style-type: none"> Downloading UNESCO data unwieldy Read articles or government reports Reliving past trends/ anecdotal 	10. YOUR SOLUTION SL An interactive Tableau dashboard project visualizing: <ul style="list-style-type: none"> Distribution of sites by country Sites at risk "In Danger" vs "Not in

4.2 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Despite the global importance of UNESCO World Heritage Sites, stakeholders lack an intuitive and comprehensive visualization platform that reveals insights into site distribution, risk factors, and historical trends. This hampers effective decision-making in heritage preservation and awareness.
2.	Idea / Solution description	<p>This project explores the 2019 UNESCO World Heritage Sites dataset using Tableau. It focuses on visualizing various aspects such as:</p> <ul style="list-style-type: none">• Heritage Sites by Country using a block chart based on Country and Name_en.• Heritage Sites at Risk using a pie chart segmented by Danger and Name_en.• Regional Inscription Trends using a line chart based on Date_inscribed and Region. <p>These visuals provide a powerful and user-friendly interface for analyzing global heritage data, identifying trends, and highlighting areas needing attention.</p>
3.	Novelty / Uniqueness	While datasets on UNESCO heritage sites are publicly available, this project stands out by offering a deeply interactive and multi-perspective visualization experience through Tableau. It merges geographical, historical, and risk-based views into one unified dashboard that is both informative and engaging.
4.	Social Impact / Customer Satisfaction	The project contributes to the preservation of cultural and natural heritage by raising awareness about endangered sites and regional trends. It empowers NGOs, policymakers, educators, and the general public to understand the global heritage landscape better and make informed contributions to its conservation.
5.	Business Model (Revenue Model)	Although this project is academic in nature, a potential business model includes offering data visualization services to heritage organizations , museums, tourism boards, and academic institutions. Subscription-based access to interactive dashboards or licensing the visualizations for exhibitions can be monetized.
6.	Scalability of the Solution	The solution is scalable as it can incorporate updated datasets from future years and integrate other global heritage databases . Additional features like interactive maps , predictive analytics for risk , and multi-lingual dashboards can further enhance its impact and reach.

4.3 Solution Architecture

Solution Architecture:

The solution architecture is developed to visualize and analyze UNESCO World Heritage Sites data using Tableau. It supports the goal of enhancing awareness, preservation, and global insights into heritage distribution and threats by leveraging powerful data visualizations.

Goals of the Architecture:

- Identify the best BI (Business Intelligence) tools to explore UNESCO site data.
- Define the structure and flow of Tableau dashboards focused on site distribution, threats, and inscription trends.
- Describe the processes of data ingestion, cleaning, transformation, and visualization.
- Support interactive and scalable visual exploration for deep analysis of heritage data.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Visualization Dashboard	USN-1	As a user, I can view a tree map showing the number of heritage sites per country	3	High	G Navya Sri Ch Nooka Naveenth
Sprint-1		USN-2	As a user, I can view a pie chart showing 'In Danger' vs 'Not in Danger' sites.	2	High	G Navya Sri Ch Nooka Naveen
Sprint-1		USN-3	As a user, I can view a line chart displaying heritage site inscription trends over the years by region.	3	High	G Navya Sri Ch Nooka Naveen
Sprint-2	Data Filtering	USN-4	As a user, I can filter heritage sites by year and region.	2	High	G Navya Sri Ch Nooka Naveen
		USN-5	As a user, I can download visual reports as PDF or PNG.	2	Medium	G Navya Sri Ch Nooka Naveen
Sprint-3	Data Management (Admin)	USN-6	As an admin, I can upload updated heritage site datasets.	3	Medium	G Navya Sri Ch Nooka Naveen

Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	8	6 Days	24 Feb 2025	29 Feb 2025	8	29 Feb 2025
Sprint-2	4	6 Days	01 Mar 2025	06 Mar 2025	4	06 Mar 2025
Sprint-3	3	6 Days	07 Mar 2025	12 Mar 2025	3	12 Mar 2025

Velocity:

Team's Velocity = Total Story Points completed per Sprint

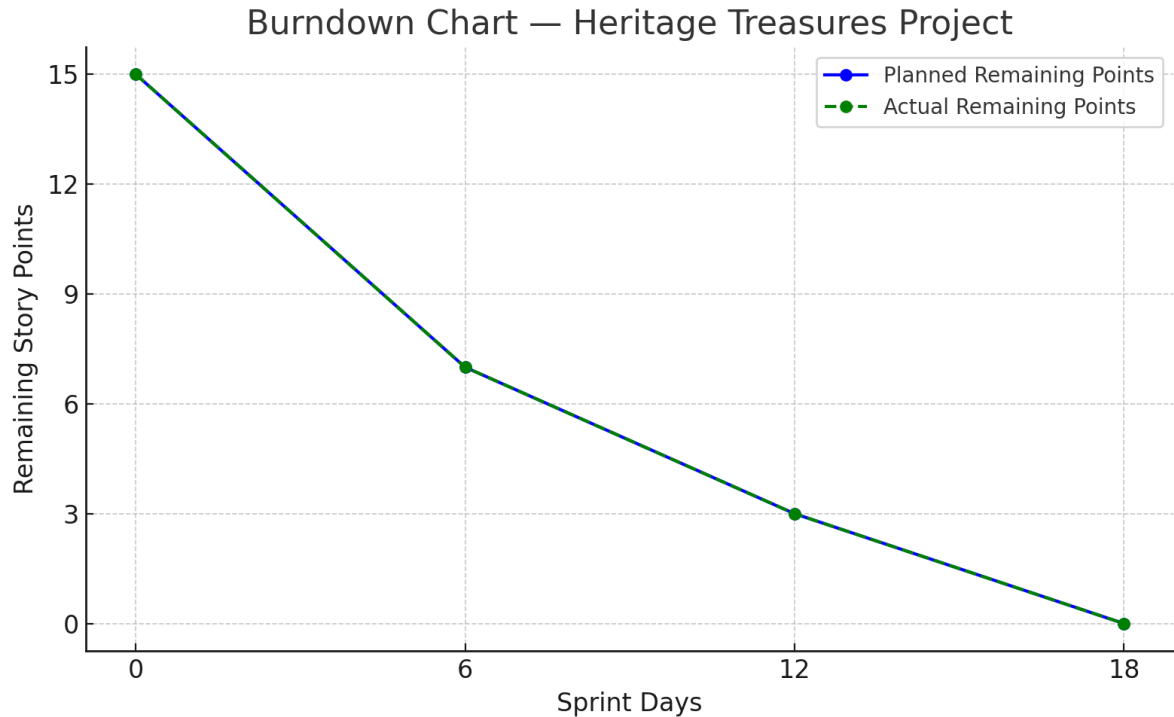
- Sprint-1: 8 points in 6 days
- Sprint-2: 4 points in 6 days
- Sprint-3: 3 points in 6 days

Average Velocity = (8 + 4 + 3) / 3 = 5 story points per sprint

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.FUNCTIONAL AND PERFORMANCE TESTING:

6.1 Performance Testing

Model Performance Testing:

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	<p>The dataset of UNESCO World Heritage Sites (2019) was successfully imported into Tableau, containing attributes such as <u>Name</u>, <u>en</u>, <u>Country</u>, <u>Region</u>, <u>Danger</u>, <u>Date inscribed</u>, and other key columns required for analysis.</p>
2.	Data Preprocessing	<p>Cleaned and transformed the dataset by handling missing values, standardizing country names, and converting Date inscribed to a date type to enable temporal analysis.</p>

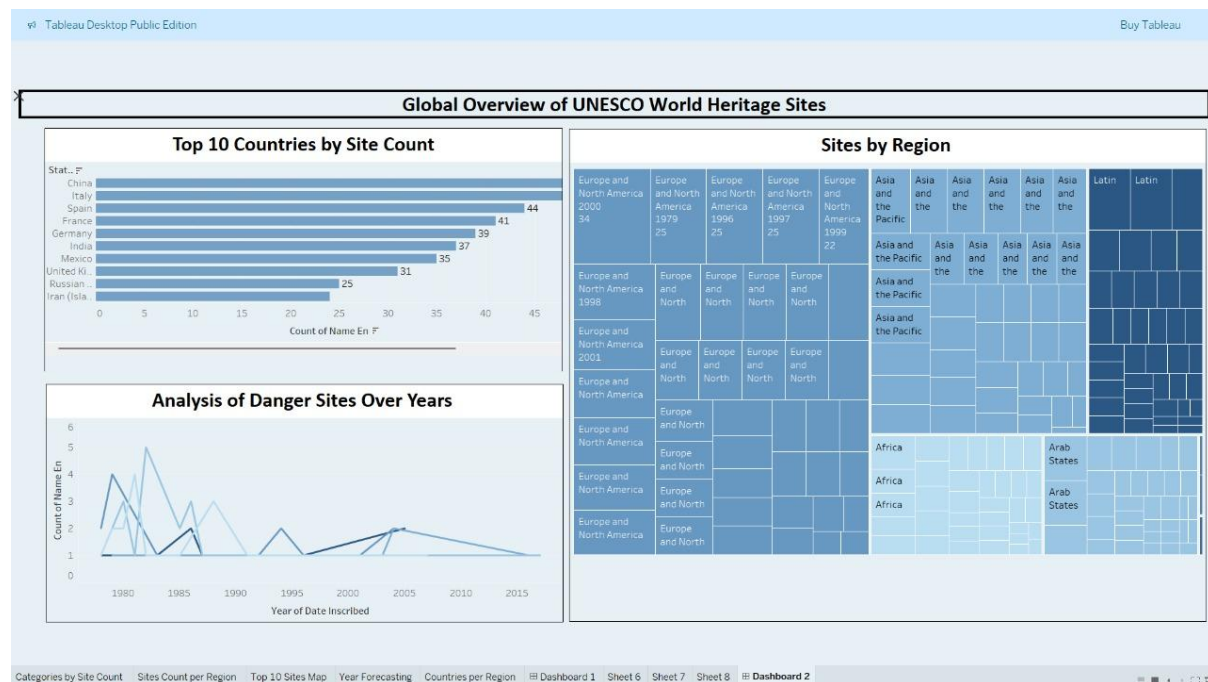
3.	Utilization of Filters	Applied filters on Region, Country, Danger, and <u>Date_inscribed</u> fields to allow interactive exploration of heritage sites by region, country, risk status, and inscription period.
4.	Calculation fields Used	Created calculated fields for aggregating the total number of sites per country, calculating yearly inscriptions, and categorizing sites into 'In Danger' and 'Not in Danger' groups based on the Danger column.
5.	Dashboard design	No of Visualizations / Graphs – 8 - Scenario 1: Tree map showing heritage sites by country. - Scenario 2: Pie chart for 'In Danger' vs 'Not in Danger' sites. - Scenario 3: Line chart for regional inscription trends over years. - Additional visuals: Bar chart for top 10 countries with most sites, map visualization of site distribution, and histogram of inscriptions by decade.
6	Story Design	No of Visualizations / Graphs -8 The story integrates the above dashboards in sequence, narrating the distribution, threats, and trends of UNESCO World Heritage Sites to provide actionable insights for stakeholders.

7. RESULTS:

Dashboard 1: UNESCO World Heritage Site Review: Category, Regional Distribution, and Yearly Trends



Dashboard 2: Global Overview of UNESCO World Heritage Sites: Country Rankings, Danger Sites Analysis, and Regional Distribution



8.ADVANTAGES&DISADVANTAGS:

Advantages:

- **Improved Data Accessibility:** Converts complex, tabular UNESCO heritage data into clear, interactive visual dashboards.
- **Faster Decision-Making:** Enables heritage officers and researchers to quickly identify endangered sites and prioritize preservation actions.
- **Historical Trend Analysis:** Provides dynamic tools to track inscription patterns over years and regions.
- **Cloud-Based Availability:** Dashboards are accessible globally via cloud hosting, supporting remote decision-making.
- **Exportable Reports:** Allows users to download visual reports in various formats for presentations and documentation.
- **Scalable & Secure Architecture:** Designed for cloud deployment, ensuring data reliability, security, and system scalability.

Disadvantages:

- **Limited Real-Time Data Updates:** Current solution relies on static datasets and lacks real-time integration with live UNESCO databases.
- **Learning Curve for New Users:** Heritage officers unfamiliar with Tableau or interactive dashboards may require basic training.
- **Cloud Hosting Costs:** Deploying Tableau Server and cloud infrastructure incurs operational expenses for long-term use.

- **Dependency on Data Quality:** Insights are only as reliable as the source dataset; outdated or incomplete data may affect analysis accuracy.
- **Limited Custom User Roles:** Initial version may have limited role-based access control and dashboard customization options for different user groups.

9.CONCLUSION:

The **Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites (2019)** project successfully addresses the challenges faced by heritage officers, researchers, and policy makers in accessing, analysing, and interpreting complex heritage data. By transforming raw, tabular datasets into interactive, cloud-hosted visualizations using Tableau, the project makes it easier for stakeholders to identify endangered sites, monitor distribution trends, and track inscription patterns across regions and years.

The developed dashboards enhance decision-making efficiency, reduce the time required for data analysis, and promote data-driven heritage preservation initiatives. The cloud-based deployment ensures that these visualizations are accessible globally, supporting collaborative and remote heritage management efforts.

This solution not only simplifies complex datasets into intuitive visuals but also lays the groundwork for future enhancements, including real-time data integrations, expanded filtering options, and machine-learning-powered risk predictions — further strengthening global cultural heritage conservation strategies.

10. FUTURE SCOPE:

While the **Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites (2019)** project successfully delivers an interactive, cloud-hosted data visualization platform, several enhancements can be introduced in future iterations to further improve its utility and impact:

- **Real-Time Data Integration:** Integrating live data from the official UNESCO World Heritage Sites API to provide up-to-date information on site status, new inscriptions, and risk levels.
- **Role-Based Dashboard Customization:** Enabling personalized dashboards for different user groups such as heritage officers, researchers, administrators, and policy makers, with access-specific views and features.
- **Advanced Filtering Options:** Adding multi-criteria filtering capabilities including heritage site type (Cultural, Natural, Mixed), country groupings, and inscription criteria for deeper analysis.
- **Machine Learning Models:** Incorporating predictive analytics to forecast site risk levels based on environmental, socio-political, and inscription trends.
- **Mobile Dashboard Access:** Optimizing dashboard layouts for mobile devices and tablets to enable quick access and decision-making on the move.

- **Automated Scheduled Reports:** Enabling automatic generation and emailing of periodic visual reports to registered heritage managers and policy makers.
- **Integration with Geospatial Mapping Tools:** Embedding interactive maps for geographically visualizing site distributions and risk clusters.

These future improvements will enhance the system's flexibility, analytical power, and real-time decision-support capabilities, ensuring it remains a valuable asset for global heritage conservation efforts

11. APPENDIX

Dataset Link:

[Dataset Link](#)

GitHub & Project Demo Link:

[Project Demo Link](#)

[GitHub link](#)