# Introduction

Final Project Report Template

Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites (2019)

is a comprehensive project aimed at exploring the rich dataset of UNESCO World Heritage Sites

using Tableau. This project focuses on visualizing the distribution, trends, and key attributes of

these sites to provide valuable insights. By leveraging the power of data visualization, stakeholders can

gain a deeper understanding of the global heritage landscape, identify patterns, and make informed

decisions to enhance the preservation and promotion of these sites.

* 1. Project overviews

The dataset contains Transformed Heritage data and UNESCO world heritage in 2019

records including states, regions and category. There are a total of 22 columns, out of which Heritage

can be supposedly taken as a variable. This project, " Heritage Treasures: An In-Depth Analysis of

UNESCO World Heritage Sites in Tableau," aims to explore and analyze using the Transformed

Heritage dataset from Kaggle.

By leveraging the power of data visualization, stakeholders can

gain a deeper understanding of the global heritage landscape, identify patterns, and make informed

decisions to enhance the preservation and promotion of these sites. The analysis will help in making

data-driven decisions for stack Holders,.

* 1. Objectives
     + Identify **key factors** influencingHeritage Sites by Country.
     + Analyze the **effect of Sites at risk** on heritage sites .
     + Create **interactive Tableau dashboards** to present findings effectively.

# Project Initialization and Planning Phase

* 1. Define Problem Statement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Problem**  **Statement (PS)** | **I am (Customer)** | **I’m trying to** | **But** | **Because** | **Which makes me feel** |
| PS-1 | The Global Studies Student | Research on Heritage sites | It has interactive Platform | Most academic data is to fragmented or static | Stuck and overwhelmed when i want to be curious and analytics |
| PS-2 | A regional coordinator | Identify which countries and regions need increased support for their at risk- heritage sites | Fail to highlight comparative urgency across the globe. | Limited dashboards-based visibility | Frustrated that resource may not be going where they’re most needed. |
| PS-3 | UX designer | Craft visual stories  That inspire global audience to care | Raw data lacks structure and doesn’t translate easily into engaging visuals | Disconnect between the richness of history and how it’s presented digitally. | Creatively blocked and disconnected from the emotional core of the mission |
| PS-4 | Journalist | Reveal long-term cultural trends | Insights aren’t easily discoverable | Most dashboards aren’t built with storytelling | Missing the chance to turn facts into something impactful |

* 1. Project Proposal (Proposed Solution)

**Project Overview:**

|  |  |
| --- | --- |
| Objective | The primary objective of this project is to analyze and visualize Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites using Tableau. The Project aims to provide insights into Heritage Sites by Country |
| Scope | * **Geographical Coverage:** Focus on specific country, region * **Data Source:** Utilize publicly available dataset (Kaggle) * **Visualization Methods: I**nteractive dashboards, story, pie chart, Bar charts and Histograms |

**Problem Statement:**

|  |  |
| --- | --- |
| Description | The Heritage Tresure is influenced by multiple factors, including countries. interactive representation of heritage treasures. |
| Impact | By leveraging the power of data visualization, stakeholders can gain a deeper understanding of the global heritage landscape, identify patterns, and make informed decisions to enhance the preservation and promotion of these sites. |

**Resource Requirements:**

**Hardware**

|  |  |  |
| --- | --- | --- |
| **Resource Type** | **Description** | **Specification/Allocation** |
| Computing Resources | CPU/GPU specifications | Standard CPU |
| Memory | RAM Specifications | 16GB |
| Storage | Disk space for data, models and logs | ! TB SSD |

**Software**

|  |  |  |
| --- | --- | --- |
| **Resource Type** | **Description** | **Specification/Allocation** |
| Frameworks | Data Visualization Frameworks | Tableau |
| Libraries | Additional libraries | Flask package |
| Development Environment | Visual studio code | Jira, GitHub |

**Data**

|  |  |  |
| --- | --- | --- |
| **Resource Type** | **Description** | **Specification/Allocation** |
| Data | **Source, size, format** | **Kaggle Dataset (Heritage Treasure),10MB** |

* 1. Initial Project Planning

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Functional Requirement (Epic)** | **User Story Number** | **User Story / Task** | **Story Points** | **Priority** | **Team Members** | **Sprint Start Date** | **Sprint End Date (Planned)** |
| Sprint-1 | Data Collection & Extraction from Database | USN-2 | Downloading the dataset | 2 | High | K. Monasri | 24-6-2025 | 26-6-2025 |
| Sprint-1 | Data Preparation | USN-4 | Explanation video links | 1 | High | K. Monasri | 24-6-2025 | 26-6-2025 |
| Sprint-2 | Data Visualization | USN-6 | No. of Unique Visualizations | 2 | Low | D. Venkata Gopi | 27-6-2025 | 28-6-2025 |
| Sprint-2 | Data Visualization | USN-7 | Visualizations | 2 | High | D. Venkata Gopi | 27-6-2025 | 28-6-2025 |
| Sprint-3 | Dashboard | USN-9 | Responsive and Design of Dashboard | 1 | High | J. Sumasri | 28-6-2025 | 29-6-2025 |
| Sprint-3 | Story | USN-11 | No of Scenes of Story | 2 | High | J. Sumasri | 28-6-2025 | 29-6-2025 |
| Sprint-3 | Story | USN-12 | Utilization of Filters | 1 | Medium | K. Venkata Ganesh Reddy | 28-6-2025 | 29-6-2025 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sprint-4 | Web integration | USN-14 | Go to Dashboard/st ory, click on share button  on the top ribbon | 2 | Medium | K. Venkata Ganesh Reddy | 28-6-2025 | 30-6-2025 |
| Sprint-4 | Web integration | USN-15 | Dashboard and Story embed with  UI With Flask | 2 | High | K. Monasri | 28-6-2025 | 30-6-2025 |

# Data Collection and Preprocessing Phase

* 1. Data Collection Plan and Raw Data Sources Identified

|  |  |
| --- | --- |
| **Section** | **Description** |

|  |  |
| --- | --- |
| Project Overview | **Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites (2019):**  AN In-Depth Analysis of UNESCO World Heritage Sites (2019)  is a comprehensive project aimed at exploring the rich dataset of UNESCO World Heritage Sites using Tableau. This project focuses on visualizing the distribution, trends, and key attributes of these sites to provide valuable insights. By leveraging the power of data visualization, stakeholders can  gain a deeper understanding of the global heritage landscape, identify patterns, and make informed decisions to enhance the preservation and promotion of these sites.   * **Geographical Coverage:** Focus on specific country, region * **Data Source:** Utilize publicly available dataset (Kaggle)   **Visualization Methods: I**nteractive dashboards, story, pie chart, Bar charts and Histograms |
| Data Collection Plan | The Data is collected from the “KAGGLE”  **Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites in Tableau**  [Link:](https://www.kaggle.com/datasets/rituparnaghosh18/transformed-housing-data-2)  <https://www.kaggle.com/datasets/ujwalkandi/unesco-world-heritage-sites/data?select=whc-sites-2019.csv> |

|  |  |
| --- | --- |
| Raw Data Sources Identified | Transformed Heritage sites Data 2 from KAGGLE.  This dataset contains sites records with various attributes such as **category, region, states, unique\_id, longitude, latitude**. The data has been pre-processed and transformed for analytical purposes. There are a total of 22 columns, out of which Sites can be supposedly taken as a dependent variable. The other variables are different features. |

# Raw Data Sources Template

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source Name** | **Description** | **Location/URL** | **Format** | **Size** | **Access Permissions** |
| Transformed Housing Data  2 | This dataset contains  Heritage sites sale records with details such as category, regions,  states, and other property features. | [Kaggle Dataset](https://www.kaggle.com/datasets/rituparnaghosh18/transformed-housing-data-2) [Link](https://www.kaggle.com/datasets/rituparnaghosh18/transformed-housing-data-2) | CSV | 10 MB | Public |

* 1. Data Exploration and Preprocessing

|  |  |
| --- | --- |
| **Section** | **Description** |
| Data Overview | The dataset contains Transformed Heritage data and UNESCO world heritage in 2019 records including states, regions and category. There are a total of 22 columns, out of which Heritage  can be supposedly taken as a variable. This project, " Heritage Treasures: An In-Depth Analysis of UNESCO World Heritage Sites in Tableau," aims to explore and analyze using the Transformed Heritage dataset from Kaggle. |
| Data Transformation | Applied filtering, sorting, pivoting, and created calculated fields such as (Top 25), Inscribed sites(Top 10) and Most Heritage Sites.  Converted multiple binary zip code group columns into a single categorical variable. Removed or adjusted potential outliers. |
| Data Type Conversion | Corrected data types, ensuring numerical fields are properly formatted. Ensured that numerical fields are in the correct format. Converted categorical variables like Zipcode Groups into appropriate data types. |

|  |  |
| --- | --- |
| Data Modeling | Data modeling is a critical step in organizing, cleaning, and structuring the dataset to ensure accurate analysis and seamless visualization in Tableau. For the Heritage Tresure project, the modeling process focused on creating a clean schema that supports filtering, aggregation, and comparison across multiple dimensions. |
| Save Processed Data | - |

# Data Visualization

* 1. Framing Business Questions

1. What is the average year of inscription for UNESCO World Heritage Sites?
2. Which category (Cultural, Natural, Mixed) is associated with the most recently inscribed sites?
3. Which decade had the lowest number of site inscriptions?
4. How many different heritage categories are represented?

**4.2 Developing Visualizations**

Visualizations are essential for exploring and communicating insights from UNESCO World Heritage data. They help reveal patterns, regional distributions, category dominance, and other meaningful trends. Below are key types of visualizations used in this project:

* **Bar Charts** – Compare the number of heritage sites by country or region to identify which nations have the highest representation.
* **Scatter Plots** – Explore relationships between year of inscription and number of sites, or between population and heritage site density (when integrated with external datasets).
* **Histograms** – Show the distribution of heritage sites based on their year of inscription, helping to identify periods of increased global recognition.
* **Heatmaps** – Visualize correlations between site categories (Cultural, Natural, Mixed) and other features like site size, risk status, or region.
* **Box Plots** – Detect outliers in site area (hectares), year of inscription, or other numeric fields, offering insights into extreme cases or anomalies.
* **Geospatial Maps** – Display the geographic spread of heritage sites globally, enabling users to explore location-based trends and regional clusters.

# Performance Testing

* 1. Utilization of Data filters

Selected Top (10) Most Heritage Sites Selected Top (10) Inscribed Sites

Selected Top (10) Heritage Sites (by Year of Inscription)

No of Calculation Field

- - -

* 1. No of Visualization
     + Bar Chart
     + Pie Chart
     + Bubble Chart
     + Donut Chart
     + Text Table
     + Word Cloud
     + Horizontal Chart

# Conclusion/Observation

The Heritage Tresure project offers a comprehensive visual analysis of UNESCO World Heritage

Sites, uncovering patterns in their global distribution, classification, and historical trends. The data

highlights the dominance of cultural sites, the regional concentration in Europe and Asia, and the

leadership of countries like Italy and China in heritage recognition. Insights into yearly inscription

trends and endangered sites further emphasize the dynamic nature of heritage conservation and the

need for ongoing global efforts.

By leveraging Tableau’s interactive capabilities, the project makes heritage data more accessible

and engaging for a wide audience, including educators, researchers, and policy-makers. It not only

fosters a deeper appreciation for the world’s cultural and natural assets but also provides a valuable

foundation for future enhancements such as predictive modelling, real-time updates, and integration

with external datasets to support heritage preservation and education.

**7.Observations**

1. **Site Distribution** – UNESCO World Heritage Sites are not evenly distributed across the globe. Regions like Europe and Asia show a higher concentration, reflecting historical and cultural density in these areas.
2. **Category Influence** – Cultural sites dominate the listings, while natural and mixed-category sites are fewer. Cultural heritage appears to be more widely recognized and documented by UNESCO.
3. **Country Trends** – Countries such as Italy, China, and Spain consistently have the highest number of heritage sites, likely due to rich historical legacies and proactive preservation efforts.
4. **Yearly Inscriptions** – The number of sites inscribed each year varies, with noticeable spikes around international heritage conferences or major anniversaries. Recent years show increasing interest in diversifying heritage representation.
5. **Risk and Preservation** – A subset of sites is marked as endangered, indicating threats from urbanization, climate change, or conflict. These outliers highlight the need for urgent conservation action and international support.

**8. Future Scope**

The Heritage Treasures project presents a strong foundation for exploring and understanding UNESCO World Heritage Sites. To further enhance its functionality, user engagement, and analytical depth, several future enhancements can be considered:

1. **Advanced Predictive Analytics**  
   Implementing machine learning models and statistical techniques can enable forecasting and trend analysis. For example, predicting which sites are at risk due to climate change or geopolitical factors could support preservation efforts. Models could also identify patterns in site inscription criteria or forecast future heritage site nominations.
2. **Enhanced Interactive Visualizations**  
   Tableau dashboards can be further enriched with dynamic filters, storyboards, drill-down features, and real-time data updates. User-centric enhancements, such as mobile-optimized dashboards and multilingual tooltips, can improve accessibility and user experience across different audiences.
3. **Integration with External Data Sources**  
   Connecting the Tableau dashboards to external APIs and real-time datasets such as global climate data, tourism statistics, or historical archives can provide deeper insights. This integration allows for contextual analysis, enabling users to compare heritage sites against external variables like visitor footfall, weather patterns, or local economic impact.
4. **Web Application Enhancements**  
   Transforming the Tableau analysis into a fully functional web application can widen its reach. Embedding dashboards within an interactive website, adding user logins, personalized site recommendations, or feedback modules can make the tool more participatory and engaging for educators, researchers, and travellers alike.

**9.Appendix**

* 1. Source Code (if any)

- - -

* 1. GitHub & Project Demo Link

GitHub link:

[MONASRI7/Heritage-treasures-an-in-depth-analysis-of-unesco-world-heritage](https://github.com/MONASRI7/Heritage-treasures-an-in-depth-analysis-of-unesco-world-heritage)