

# FINAL REPORT TEMPLATE

## **1. INTRODUCTION:**

The year 2019 marked a significant milestone in the preservation and recognition of cultural and natural heritage sites worldwide. The United Nations Educational, Scientific and Cultural Organizations (UNESCO) added 29 new World Heritage Sites to its esteemed list, acknowledging their outstanding universal value. These sites, selected from nominations submitted by countries globally, underwent a rigorous evaluation process to assess their cultural, natural, or mixed heritage significance. The newly inscribed sites, including the Prosecco Hills of Conegliano and Valdobbiadene in Italy, Jaipur City in India, and Vatnajökull National Park in Iceland, join a prestigious list of over 1,100 World Heritage Sites recognized for their exceptional value to humanity. This introduction sets the stage for an in-depth analysis of the 2019 UNESCO World Heritage Sites, exploring their unique characteristics, cultural significance, and the importance of preservation for future generations.

### **1. Project overviews:**

In 2019, the UNESCO World Heritage Committee's session resulted in the inscription of 29 new sites, bringing the total number of World Heritage Sites to 1120. This year showcased a diverse range of cultural and natural treasures, including ancient metallurgical sites in Burkina Faso, the historic city of Babylon in Iraq, the archaeological site of Bagan in Myanmar, and the culturally significant Budj Bim Cultural Landscape in Australia. Notably, the year also saw the inclusion of modern architectural marvels like the Frank Lloyd Wright Buildings in the United States, and sites of natural beauty such as the Vatnajökull National Park in Iceland. The additions of 2019 highlight UNESCO's ongoing efforts to recognize and protect globally significant heritage, reflecting a broad spectrum of human history and natural wonders.

### **1.2 Purpose:**

### **1. Enhance Cultural Understanding:**

Analyze and present the historical, cultural, and architectural significance of UNESCO sites—like the Taj Mahal—through engaging visuals and storytelling.

### **2. Improve Tourist Experience:**

Develop a mobile-based platform offering AR navigation, multilingual audio guides, and real-time crowd insights to make visits more informative and enjoyable.

### **3. Promote Heritage Preservation:**

Raise awareness about conservation by educating tourists, encouraging respectful visitation, and helping local authorities monitor site traffic.

### **4. Deliver Actionable Insights:**

Use dashboards to visualize visitor patterns, language preferences, sentiment feedback, and app usage trends—allowing developers and stakeholders to refine offerings.

### **5. Support Sustainable Tourism:**

Aim for balanced visitation by guiding tourists—especially during peak times—towards lesser-known heritage sites, easing pressure on overcrowded locations.

## **2. IDEATION PHASE:**

During the Ideation Phase, our team transitioned from understanding tourist needs to generating creative solutions to address them. We began by synthesizing insights from empathy mapping and user research—uncovering challenges such as language barriers, overcrowded sites, and limited cultural context. In a series of brainstorming sessions, we explored a wide range of ideas: multilingual audio guides, AR-enhanced navigation, real-time crowd updates, and interactive educational content. Using divergent-convergent thinking, techniques like mind mapping and “How might we...?” questions, we narrowed focus on the most promising concepts. Ultimately, we refined these into a cohesive app concept that combines AR, storytelling, and adaptive navigation—all aligned with tourists’ behaviors and motivational drivers.

## 2.1 Problem Statement:

### Customer Problem Statement Template:

Create a problem statement to understand your customer's point of view. The Customer Problem Statement template helps you focus on what matters to create experiences people will love.

A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

<b>I am</b>	Describe customer with 3-4 key characteristics - who are they?	Describe the customer and their attributes here
<b>I'm trying to</b>	List their outcome or "job" the care about - what are they trying to achieve?	List the thing they are trying to achieve here
<b>but</b>	Describe what problems or barriers stand in the way -- what bothers them most?	Describe the problems or barriers that get in the way here
<b>because</b>	Enter the "root cause" of why the problem or barrier exists -- what needs to be solved?	Describe the reason the problems or barriers exist
<b>which makes me feel</b>	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/app/board/uXjVIndFwzo=](https://miro.com/app/board/uXjVIndFwzo=/)

### Example: Problem Statement-1



## Example: Problem Statement-2



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Africa	In 2019 reveals a complex interplay of preservation, development, and environmental pressures	Sustainable tourism be developed at African World Heritage Sites without compromising	Highlight the multifaceted challenges involved in safeguarding Africa's rich	The compels challenge the preservation of Arab World Hentage Sites. Addressing these osues requires a

			their ecological and cultural integrity	heritage for future generations.	colubercanve effort involving government international orgacions local communities and other stakeholders
PS-2	Arab-Country	particularly concerning their status in and around 2019, several critical problem statements emerge.	Many Arab region World Heritage Sites are located in areas of ongoing or recent armed conflict. This leads to direct destruction, looting, and neglect.	Specifically, the damage to sites like the Ancient City of Aleppo and Palmyra in Syria highlights the vulnerability of these treasures.	The complex challer the preservation of Heritage Sites. Addre issues requires a co effort involving gov international organ local communities' stakeholder.

## 2.2 Empathy Path Canvas:

### Empathy Map Canvas:

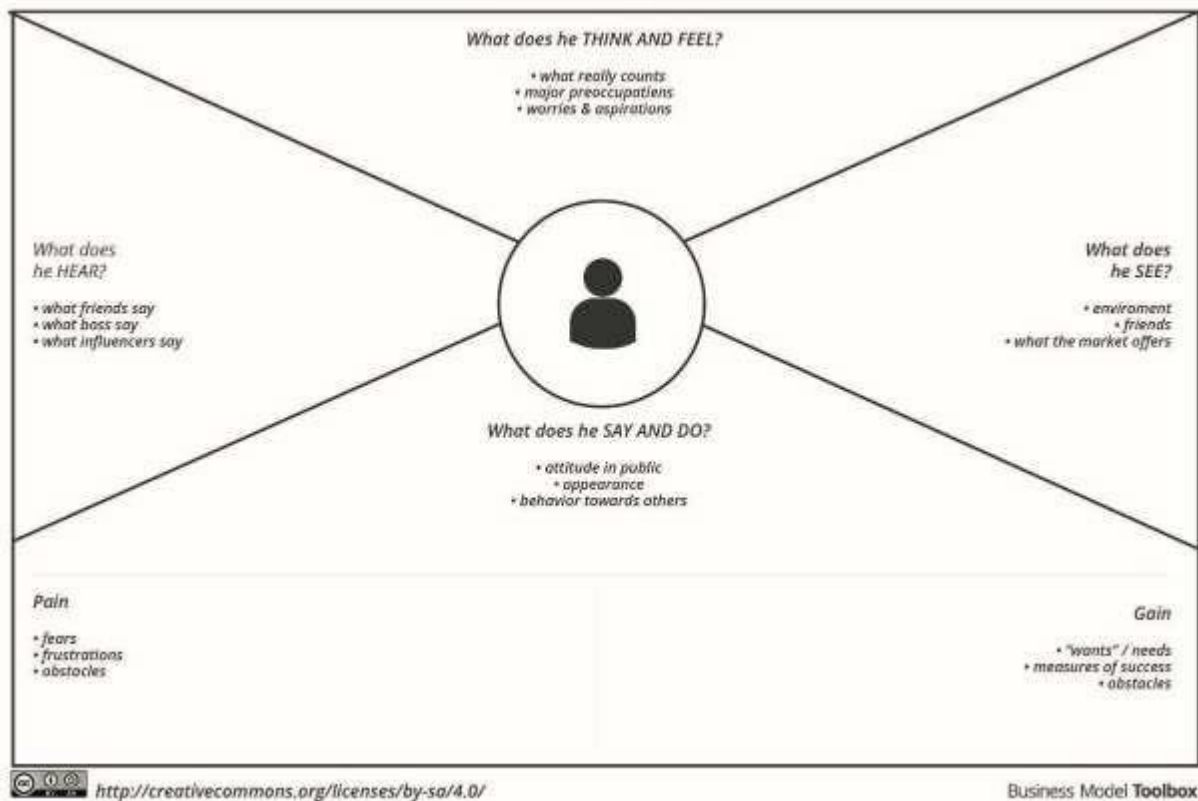
An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

It is a useful tool to helps teams better understand their users.

Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

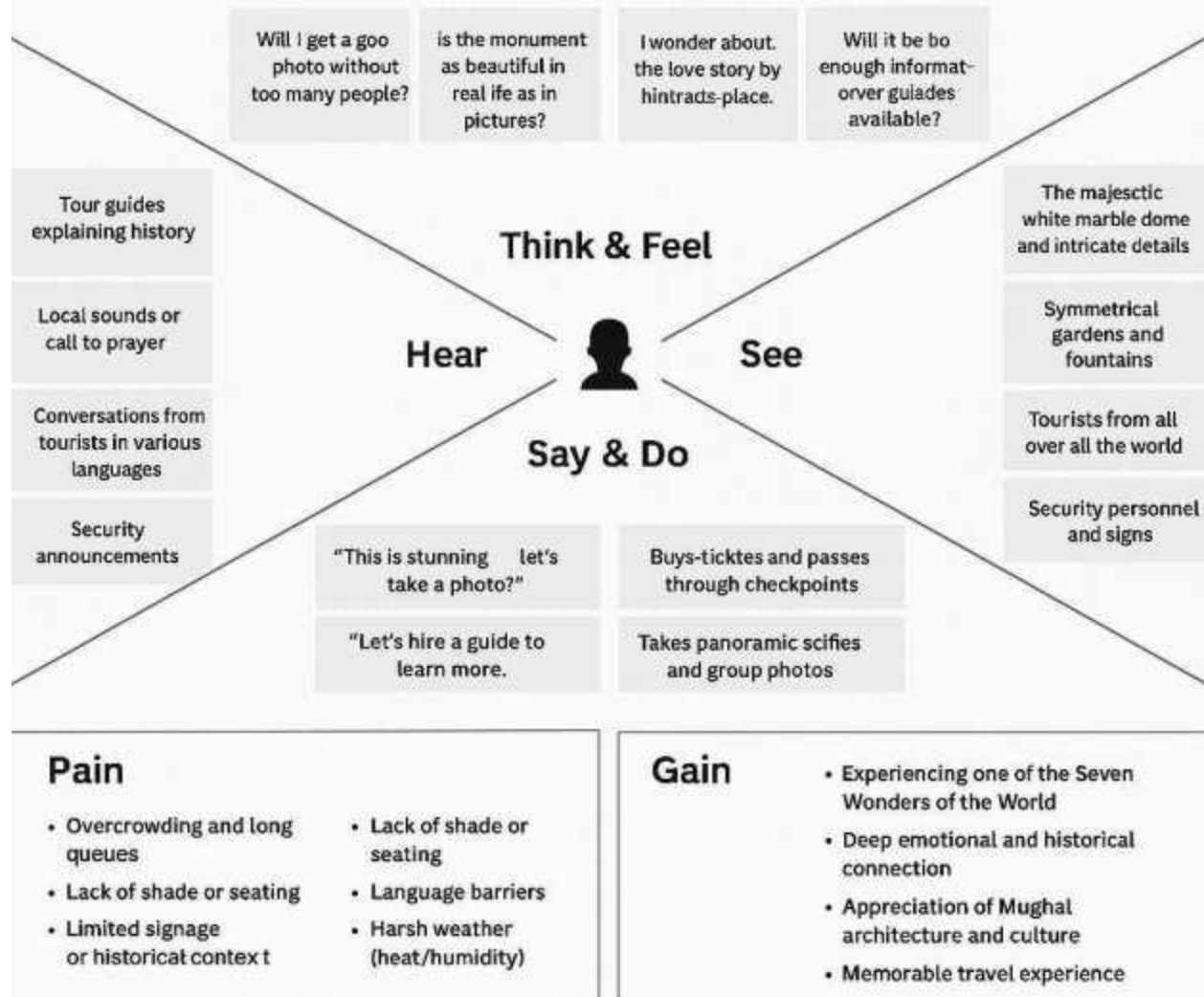
### Example:

## Empathy Map



**Example: UNESCO World Heritage Site-Taj Mahal (Tourists)**

## Example: UNESCO World Heritage Site – Taj Mahal (Tourists)



## 2.3 Brainstorming:

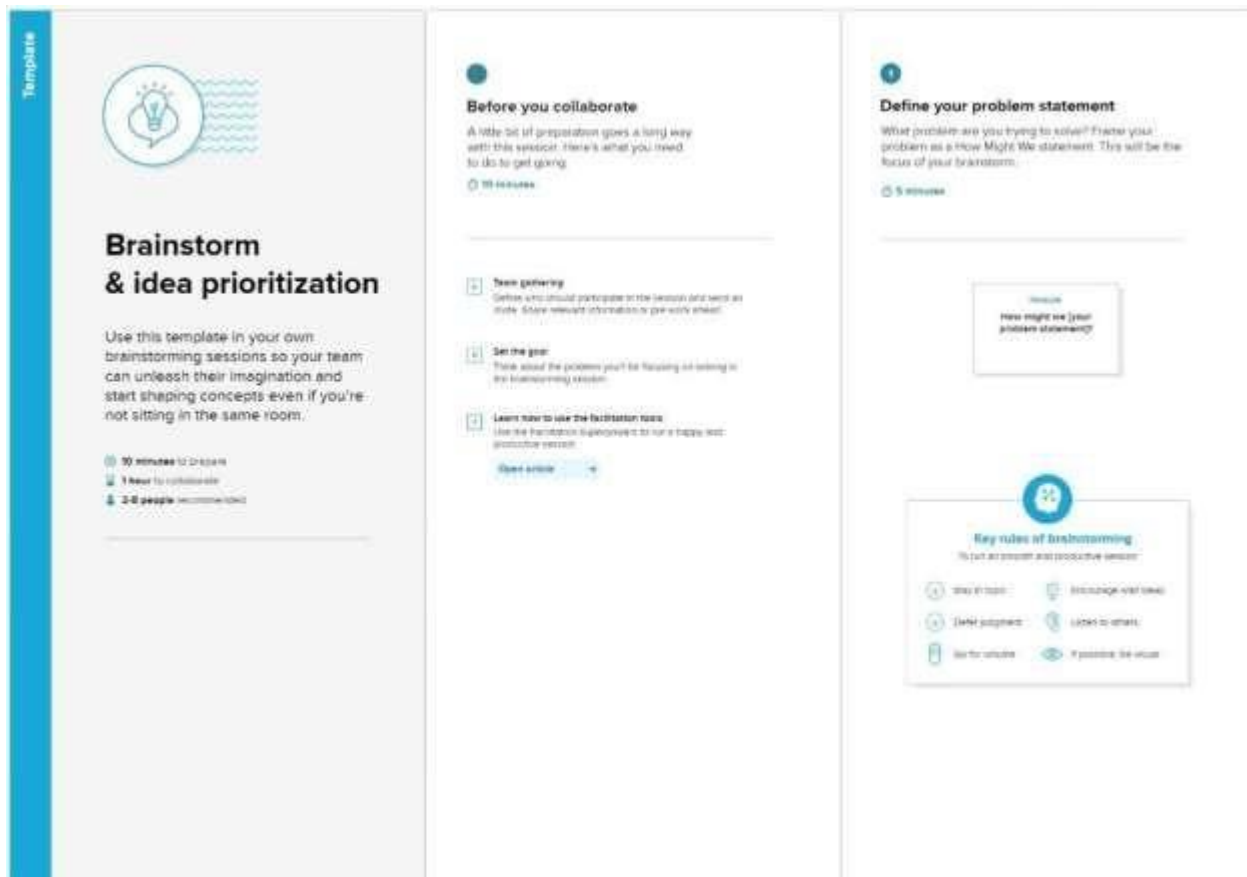
### Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and

built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Reference: <https://app.mural.co/t/heritagetreasure4734/m/heritagetreasure4734/1750304173624/3ec6cbe4f3bf410d437284cac344560abd71ecbb>

## Step-1: Team Gathering, collaboration and select the problem statement



## Step-2: Brainstorm, Idea Listing and Grouping



1

### Brainstorm

Get by down any ideas that come to mind that address your problem statement.

☐ No answers

**Tip**  
 You can remove sticky notes and re-use them as needed to clarify your brainstorming.

Person 1

Person 2

Person 3

Person 4

Person 5

Person 6

Person 7

Person 8

2

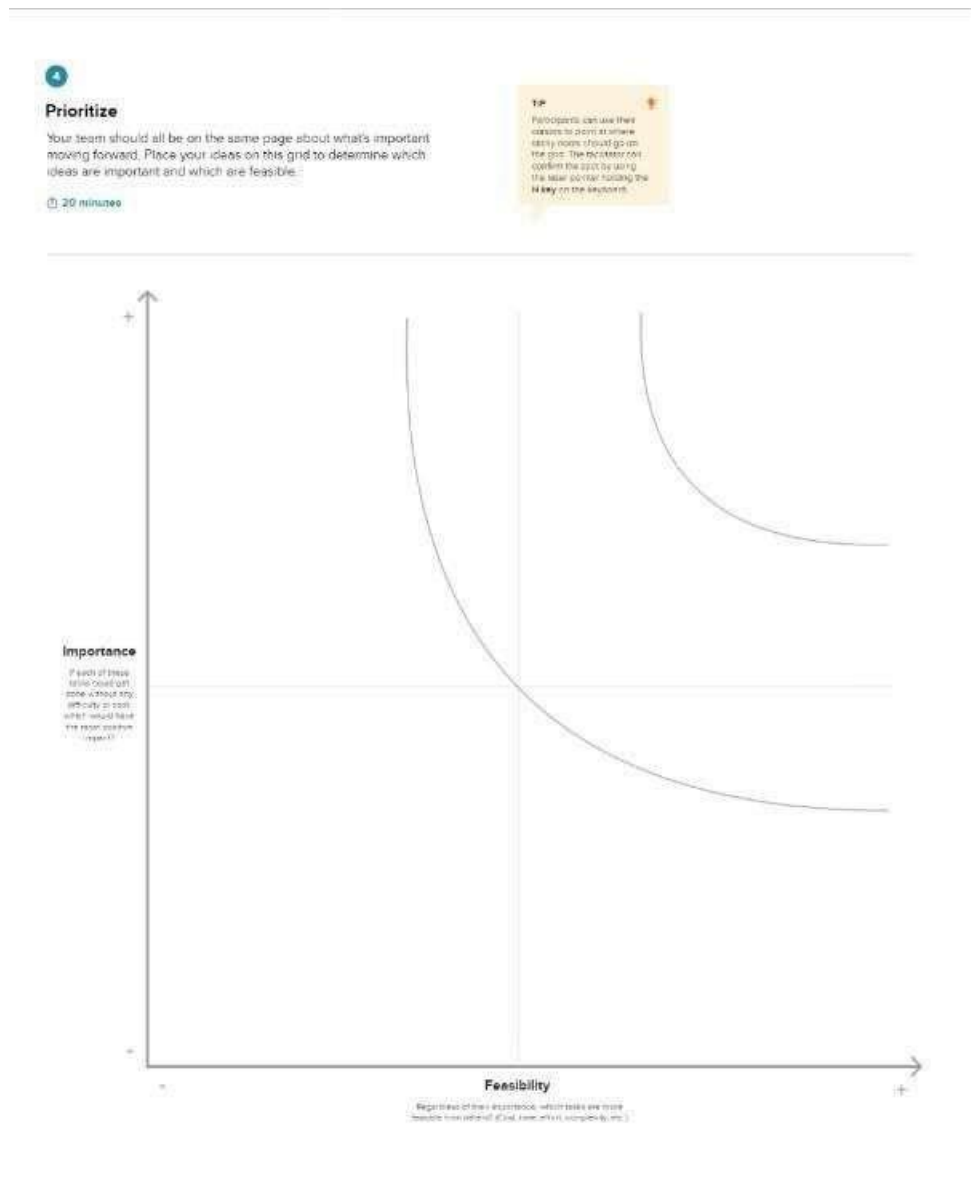
### Group Ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Circle all sticky notes from each group, give each cluster a sentence like "Idea: It is a cluster is bigger than all sticky notes, try and see if you can break it up into smaller sub-groups."

☐ No answers

**Tip**  
 You can remove sticky notes and re-use them as needed to clarify your brainstorming.

## Step-3: Idea Prioritization



### 3. REQUIEMENT ANALYSIS:

To ensure the proposed mobile AR heritage app effectively meets user expectations, our requirements analysis drew upon user-centered design studies of AR tourism tools. Research such as ToARist demonstrates that tourists value intuitive AR navigation, immersive POI annotations, and multilingual support—while being sensitive to usability challenges outdoors. Further design guidelines for mobile heritage apps emphasize clear interface layouts, context-aware AR features, offline map access, and user comfort to prevent cognitive overload .

Consequently, the app’s functional requirements include AR waypoint navigation, multilingual audio narration, filterable map views, and real-time crowd monitoring. Non-functional requirements address limited network connectivity, battery preservation, responsive UI design, and multilingual localization—ensuring a seamless and culturally-rich experience for tourists on-site.

## 3.1 Customer Journey Map



## 3.2 Solution Requirement

### Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP

FR-3	Search Heritage Sites	By region, name, country, or type
FR-4	Explore Site Details	View images, maps, descriptions, & criteria
FR-5	Interactive Experience	Access quizzes, 3D models, or AR views
FR-6	AI Site Recommendation	Suggest similar sites based on interaction history

### Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

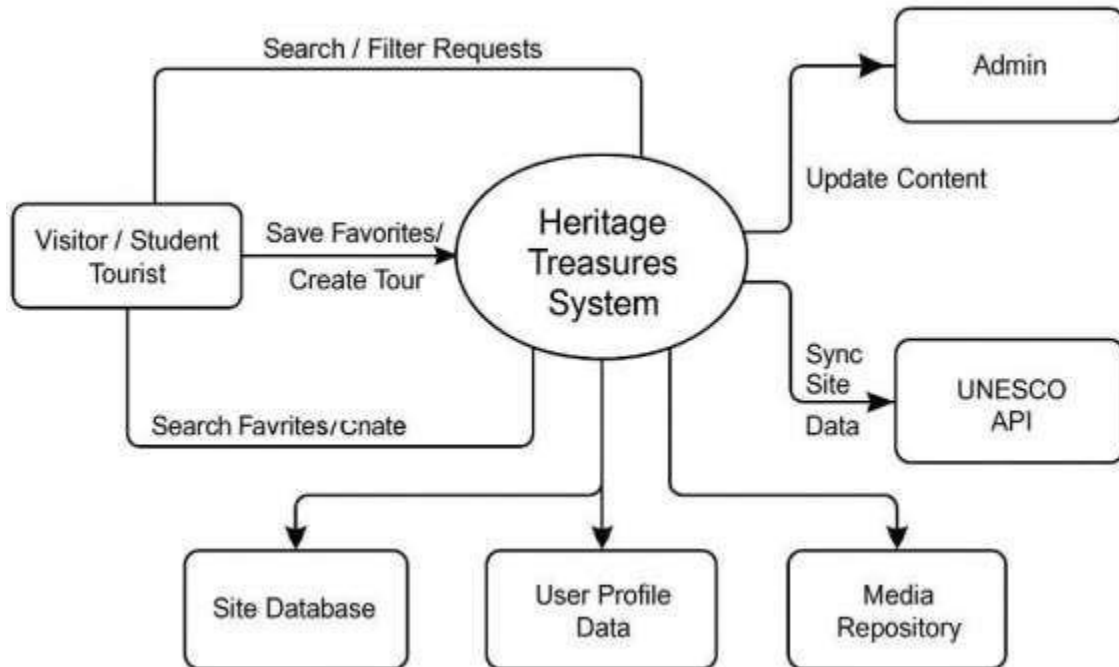
FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	Interface must be user-friendly for tourists and Students.
NFR-2	<b>Security</b>	Use HTTPS, JWT, and role-based access control
NFR-3	<b>Reliability</b>	Ensure consistent data availability from cloud services.
NFR-4	<b>Performance</b>	Quick loading via CDN;Optimize image & queries.
NFR-5	<b>Availability</b>	24x7 uptime using distributedcloud infrastructure.
NFR-6	<b>Scalability</b>	Support increasing data, users, & interactive modules.

## 3.3 Data Flow Diagram

### Data Flow Diagrams:

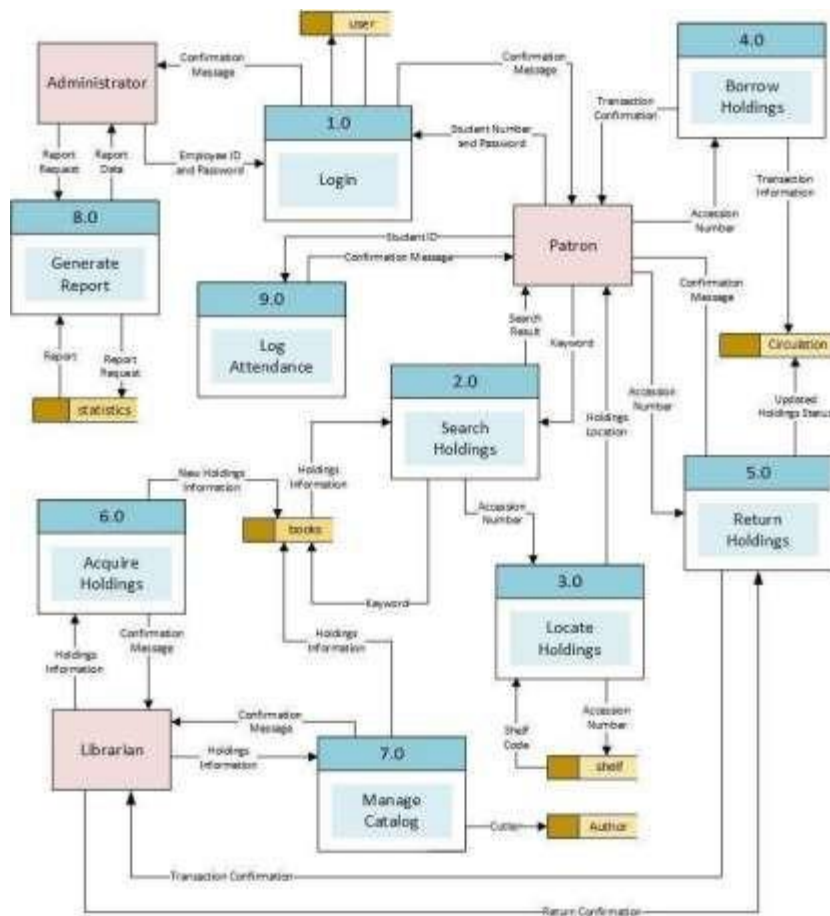
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

**Example:** <https://developer.ibm.com/patterns/visualize-unstructured-text/>



1. Visitor sends a search/ filter request via the UI to the system.
2. The system retrieves relevant data from Site Database and Media Repository to display.
3. The Visitor views site details (maps, images, description).
4. Authenticated users can save favorites or create tour plans, which are saved in user profile data.
5. System periodically syncs with UNESCO API to refresh site content.
6. Admin users can update or add new content, stored back into databases.

Example: DFD Level 0 (Industry Standard)



### User Stories:

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Visitor (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
	Registration	USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
	Registration	USN-3	As a user, I can register for the application through Google	I can register & access the dashboard via Google login	Medium	Sprint-1
	Login	USN-4	As a user, I can log in using email & password	I can securely log into my dashboard	High	Sprint-1
	Explore	USN-5	As a user, I can search for heritage	Relevant search results Are displayed	High	Sprint-2
	View Details	USN-6	As a user, I can view site details	I can access site content And interact	High	Sprint-2
	Save & personalize	USN-7	As a user, I can save favorite sites and create a personalized heritage tour	Favorites and tour plan Are stored & retrievable	Medium	Sprint-2
	Learn & Interact	USN-8	As a user, I can take quizzes about world Heritage sites	I can answer questions And receive feedback	Medium	Sprint-3
	Recommendation	USN-9	As a user, I can get suggestions for sites Based on my interests and saved locations	Recommendations match Preferences and history	Low	Sprint-3
Admin	Manage content	USN-10	As an admin, I can add or edit heritage site content	Updates appear correctly On the platform	High	Sprint-2
System	UNESCO API Integration	USN-11	As a system, I fetch latest data from UNESCO API periodically	Data updates automatically in background	High	Sprint-1

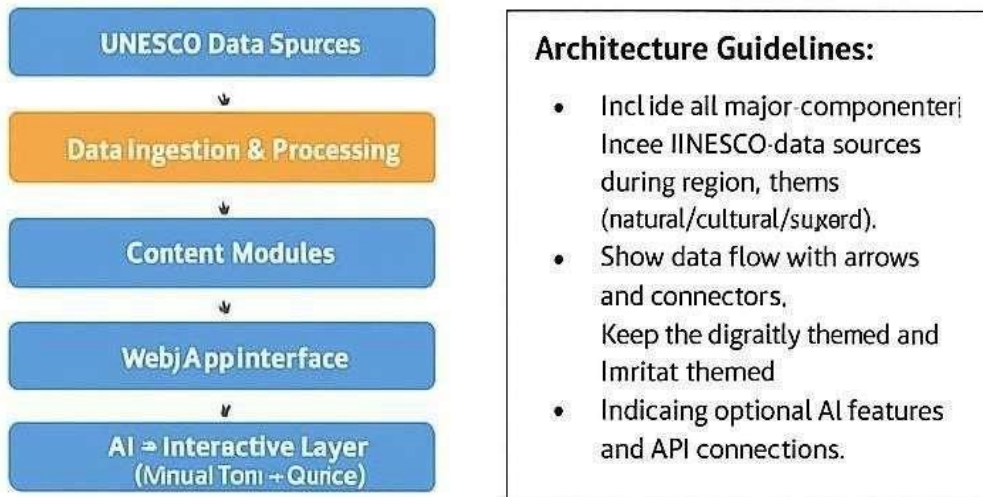
## 3.4 Technology Stack

### Technical Architecture:

The technical architecture of the *Heritage Treasures* project integrates UNESCO data sources, content processing modules, and an interactive web interface to deliver an educational platform that showcases World Heritage Sites through AI-enhanced storytelling and user engagement tools.

**Example:** Heritage Exploration Platform

**Reference:** [IBM Cloud Architecture Center](#)



S.NO.	Component	Description	Technonolgy
1.	User Interface	Web- based interaction layer	HTML, CSS, JavaScript, React.js
2.	Application Logic-1	Heritage Site Categorization	Python, Flask
3.	Application Logic-2	Site Recommendation & Storytelling engine	OpenAI, API, GPT
4.	Application Logic-3	Chatbot FAQs and Guidance	Rasa or Diaglogflow
5.	Database	Stores site details, categories, metadata	PostgreSQL/ MYSQL
6.	Cloud Database	Story synced user data And heritage content	Firebase/ AWS RDS
7.	File Storage	Media storage for images , maps	AWS S3/Google Cloud Storage
8.	External API-1	Site geolocation	Google Maps API
9.	External API-2	Heritage data or updates	UNESCO Public APIs
10.	Machine Learning Model	Optional: site recognition/ classification	Scikit-learn/ TensorFlow
11.	Infrastructure	Hosting & Deployment	AWS EC2/ Vercel/ Heroku

**Table-2: Application Characteristics:**



S.NO.	Characteristics	Description	Technology
1.	Open-Source Frameworks	Reusable frameworks and tools	React.js, Flask, Bootstrap
2.	Security Implementations	Data protection and role access	JWT, HTTPS, IAM
3.	Scalable Architecture	Modular microservices for Future expansion	Docker, Kubernetes
4.	Availability	Cloud hosting, backups, Distributed servers	AWS Load Balancer, Cloud DNS
5.	Performance	Caching, fast-loading page Responsive design	Redis, Cloudflare CDN

#### Reference:

<https://whc.unesco.org/en/list/> <https://c4model.com/>  
<https://core.unesco.org/en/unesco-transparency-portal-replaced-core-data-portal>  
<https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d>  
<https://www.ibm.com/architectures>

## 4. PROJECT DESIGN

The design of *Heritage Treasures* follows user-centered, iterative principles inspired by proven successes in cultural heritage and AR tourism apps. Key decisions—like integrating AR waypoint navigation, immersive storytelling, and multilingual support—were based on empirical findings from projects like ToARist and mobile heritage studies, which highlight usability issues such as screen clutter and outdoor engagement. Starting with low-fidelity wireframes, the design process progressed through user testing rounds to refine flow and eliminate cognitive overload. The final design was prototyped in high-fidelity mockups emphasizing clean layout, intuitive AR controls, and consistent performance across devices—ensuring the app is both engaging for tourists and functional in real-world environments.

# 1. Problem Solution Fit

## **Problem – Solution Fit Template:**

The Problem-Solution Fit simply means that you identify the real challenges faced by tourists visiting UNESCO World Heritage Sites, and proposes digital solutions that enhance their culture experience. It ensures that the designed solution such as a multilingual, interactive guide app aligns with the needs, behavior, and environment of heritage tourists.

## **Purpose:**

- ☐ Understand the authentic needs of tourists visiting heritage sites like the Taj Mahal.
- ☐ Solve real-world problems such as overcrowding, lack of cultural context, and language barriers.
- ☐ Increase tourist engagement by tapping into familiar digital behavior (social media, mobile usage).
- ☐ Sharpen communication and cultural messaging to enhance site appreciation and build trust and repeat tourism by addressing both frustrations and motivations.
- ☐ **Improve satisfaction and preserve heritage through responsible and informed visitation.**

## **Template:**

Problem-Solution fit canvas 2.0

Purpose / Vision

Define CS, fit into	<b>1. CUSTOMER SEGMENT(S)</b> <span>CS</span> Who is your customer? (i.e. domestic and international tourists visiting UNESCO world heritage sites, especially culturally rich travellers and free-time visitors)	<b>6. CUSTOMER</b> <span>CC</span> What constraints prevent your customers from taking action or limit their choice of solutions? (i.e. language barriers, limited time, unfamiliarity with the layout, poor mobile connectivity, or budget limitation)	<b>5. AVAILABLE SOLUTIONS</b> <span>AS</span> Which solutions are available to the customer when they face the problem of need to get the job done? What have they tried in the past? What pros & cons do these solutions have? (i.e. printed brochures, local guides (not page-locked), you tube history videos, or their own apps)	Explore AS
	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <span>JMP</span> Which jobs-to-be-done or problems do you address for your customers? (i.e. Tourists seek to explore sites meaningfully, understand cultural significance, and navigate the area easily. Current challenges include lack of multilingual content, crowded spaces, and unclear navigation)	<b>3. PROBLEM ROOT CAUSE</b> <span>RC</span> What is the real reason that this problem exists? What is the back story behind the need to do this job? (i.e. lack of a world-class tourist-friendly digital platform that offers cultural insights, guidance, and real-time updates in multiple languages)	<b>7. BEHAVIOUR</b> <span>BE</span> What does your customer do to address the problem and get the job done? (i.e. use smartphones for navigation, ask locals or fellow tourists, rely on reviews or TripAdvisor, follow tour groups)	
Identify strong TR & EM	<b>3. TRIGGERS</b> <span>TR</span> What triggers customers to act? (i.e. social media influence, travel blogs, recommendations from friends or family, and interest sparked by UNESCO recognition)	<b>10. YOUR SOLUTION</b> <span>SL</span> A mobile app with AR and multilingual audio, real-time cultural guidance, navigation support, and visitor experience personalisation.	<b>8. CHANNELS of BEHAVIOUR</b> <span>CH</span> 8.1 ONLINE What kind of actions do customers take online? Google, Instagram, TripAdvisor 8.2 OFFLINE What kind of actions do customers take offline? Entry gates, on-site kiosk/booking booths, word-of-mouth at site	Extend online & offline CH of BE
	<b>4. EMOTIONS: BEFORE / AFTER</b> <span>EM</span> How do customers feel when they face a problem or a job and afterwards? (i.e. confused, overwhelmed, unsure - informed, inspired, satisfied with a memorable experience)			

Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license. Created by Daria Heydelkova / Amaltama.com

## References:

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

## 4.2 Proposed Solution

### Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.NO.	Parameter	Description
1.	Problem Statement(Problem to be solved)	Sites designated by UNESCO for their “outstanding universal value” to humanity. Encompasses cultural, natural, and mixed sites.

		Aims to preserves and protect these sites for future generations.
<b>2.</b>	Idea/Solution description	Explore the cultural, historical, and environmental significance of each UNESCO site through detailed research and multimedia presentation. It aims to raise awareness about their preservation challenges and remote sustainable conversation efforts to protect these global treasures for future generations.
<b>3.</b>	Novelty/Uniqueness	This project uniquely combines multidisciplinary insights and advanced analytical techniques to deliver a comprehensive, global analysis of UNESCO World Heritage Sites, revealing new connections and supporting innovative heritage preservation and management strategies.
<b>4.</b>	Social Impact/Customer Satisfaction	The project promotes greater cultural awareness and community engagement, enhancing public appreciation and support for heritage preservation, which leads to increased satisfaction among stakeholders and visitors.
<b>5.</b>	Business Model(Revenue Model)	The revenue model leverages digital subscriptions, educational

		partnerships, sponsored content, and heritage tourism collaborations to generate sustainable while supporting ongoing research and conservation efforts.
6.	Scalability of the solution	The solution is highly scalable through digital platforms, enabling easy expansion to include more heritage sites globally and integration of new data sources and user communities.

## 4.3 Solution Architecture

### Solution Architecture:

The solution architecture links front-end user interfaces with back-end data. Tourists interact via a mobile AR app or web portal, sending requests to a REST API layer. The API integrates with an authentication service (to manage logins, supporting OAuth or social logins) and connects to a database for user profiles and preferences. It also fetches site data from a UNESCO data source (e.g. via the World Heritage Centre API) and stores analytics events to a data warehouse (for reporting). An ETL pipeline regularly updates the database with new site information and visitors' language preferences. The architecture may employ cloud-managed services (e.g. AWS or Azure) for scalability. This design bridges business needs and technology solution goals defining the system structure and data flow.

### Example - Solution Architecture Diagram:

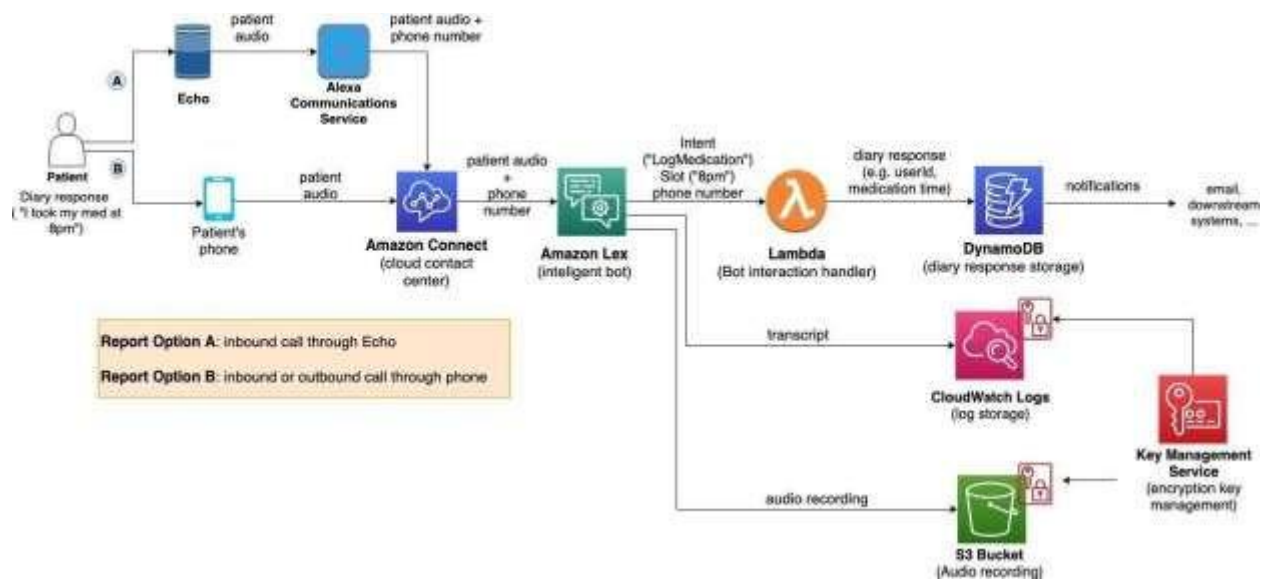


Figure 1: Architecture and data flow of the voice patient diary sample application

Reference: <https://aws.amazon.com/blogs/industries/voice-applications-in-clinical-research-powered-by-ai-on-aws-part-1-architecture-and-design-considerations/>

## 5. PROJECT PLANNING & SCHEDULING

In the *Heritage Treasures* project, planning and scheduling play a vital role in systematically developing the platform to explore UNESCO World Heritage Sites. The project is divided into well-defined phases—such as data collection, interface design, API integration, and testing—each with specific timelines and deliverables. A Gantt chart or sprint-based schedule ensures tasks like content loading, user experience testing, and AI integration are tracked and completed efficiently, enabling timely delivery and optimal resource use throughout the development cycle.

### 1.1 Project Planning:

#### Product Backlog, Sprint Schedule, and Estimation(4 Marks)

Use the below template to create product backlog and sprint schedule

<b>Sprint</b>	<b>Functional Requirement (Epic)</b>	<b>UserStory Number</b>	<b>UserStory / Task</b>	<b>Story Points</b>	<b>Priority</b>	<b>Team Members</b>
Sprint-1	Data Collection	USN-1	Collect data from heritage site APIs	2	High	Shaik Fathimun -Nisa (TL)
Sprint-1	Data Collection	USN-2	Load data into the system	1	Medium	Vejandla Leela Siva Kumari (TM)
Sprint-1	Data Preprocessing	USN-3	Handle missing data in records	3	High	Shaik Umme Salma (TM)
Sprint-1	Data Preprocessing	USN-4	Encode categorical variables	2	Medium	Shaik Fathimun -Nisa (TL)
Sprint-2	Model Building	USN-5	Train machine learning model on data	5	High	Vejandla Leela Siva Kumari (TM)
Sprint-2	Model Testing	USN-6	Test the performance of the model	3	High	Shaik Umme Salma (TM)
Sprint-2	Deployment	USN-7	Build frontend HTML pages	3	Medium	Shaik Fathimun -Nisa (TL)
Sprint-2	Deployment	USD-8	Deploy the system using flask	5	High	Vejandla Leela Siva Kumari (TM)

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

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	5 Days	1 Jun 2025	5 Jun 2025	8	5 Jun 2025
Sprint-2	16	5 Days	6 Jun 2025	10 Jun 2025	16	10 Jun 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)

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

#### Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. 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>

#### Reference:

<https://www.atlassian.com/agile/project-management>

<https://www.atlassian.com/agile/tutorials/how-to-do-scrum-with-jira-software>

<https://www.atlassian.com/agile/tutorials/epics>

<https://www.atlassian.com/agile/tutorials/sprints>

<https://www.atlassian.com/agile/project-management/estimation>

<https://www.atlassian.com/agile/tutorials/burndown-charts>

## 6. FUNCTIONAL AND PERFORMANCE TESTING



For the Heritage Treasures platform, functional testing ensures that all core features—such as site search, filtering, viewing details, saving favorites, and accessing quizzes—work as intended across web and mobile interfaces. Each function is tested against user stories to verify proper input handling, database updates, and external API responses from UNESCO.

Performance testing evaluates the system’s responsiveness and stability under load, ensuring quick page loads for site data, smooth map interactions, and uninterrupted media streaming. It also checks that the platform can scale to support many users simultaneously accessing content or generating personalized tour plans without lag.

## 6.1 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	1,223 values
2.	Data Preprocessing	3 values
3.	Utilization of Filters	4 values
4.	Calculation fields Used	4 values
5.	Dashboard design	No of Visualizations / Graphs -6
6.	Story Design	No of Visualizations / Graphs -3

## 7. RESULTS

### 1.1 Output Screenshots



## 8. ADVANTAGES AND DISADVANTAGES

### Advantages:

#### 1. Preservation & Accessibility:

Digitally archiving UNESCO heritage sites safeguards them against damage or loss and ensures global access via the web.

#### 2. Enhanced Engagement:

Interactive virtual tours, 3D models, quizzes, and multimedia foster user interest and deeper learning.

#### 3. Scalable Content Delivery:

Digital platforms can host thousands of sites, allowing simultaneous access without physical constraints.

#### 4. Cost-Effectiveness Over Time:

While initial setup is expensive, long-term storage, distribution, and scalability make digital platforms more affordable than maintaining physical exhibits.

### Disadvantages:

#### 1. Loss of Physical Experience:

Online views can't fully replicate the immersion of visiting a site in person.

## **2. Technology Obsolescence & Data Risk:**

Digital data formats, platforms, and storage tools can become outdated or fail due to hardware/software changes.

## **3. High Upfront Costs & Technical Needs:**

Digitization requires specialized equipment, expert staff, and robust infrastructure—particularly challenging for smaller heritage organizations.

## **4. Content Authenticity & Ethical Risks:**

Digital copies may be manipulated, misrepresented, or culturally insensitive without proper safeguards and community involvement.

# **9. CONCLUSION**

The Heritage Treasures platform offers a dynamic digital bridge to UNESCO World Heritage Sites, safeguarding their content through interactive multimedia, personalized exploration, and AI-driven recommendations—all while ensuring global accessibility. However, to fulfill UNESCO's principles of digital preservation, it must address challenges like digital inequity, sustainability of formats, and responsible data stewardship to maintain authenticity and inclusivity for future generations.

# **10. FUTURE SCOPE**

As Heritage Treasures evolves, it could incorporate AI-driven digital twins—virtual replicas of heritage sites that enable real-time monitoring, predictive conservation, and interactive visualizations enhancing remote visitor experiences. The platform can also integrate immersive XR technologies (VR/AR) to build multisensory storytelling environments, democratizing access to cultural knowledge and aligning with emerging educational metaverse standards. Finally, deploying community-centered and ethical governance models—such as blockchain for provenance tracking and federally governed

digital twin ecosystems—can ensure cultural authenticity, inclusivity, and sustainability for future expansion.

## **11. APPENDIX**

The appendix in “Heritage Treasures: An In-Depth Analysis Of UNESCO World Heritage Sites In Tableau” typically refers to supplementary materials like source code, GitHub link and Project Demo link.

### **11.1 Source Code (if any)**

#### **11.2 Dataset Link:**

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

#### **11.3 GitHub & Project Demo Link:**

##### **GitHub Link:**

<https://github.com/fathima26-png/Heritage-Treasures-An-In-Depth-Analysis-Of-UNESCO-World-Heritage-Sites-In-Tableau>

##### **Project Demo Link:**

<https://1drv.ms/v/c/9e41dbd06bdec186/ERKjlf0RF5NkZSLKpQShDUBLmMS2zlp2lEYSpQD-FwE6w>