TITLE PAGE
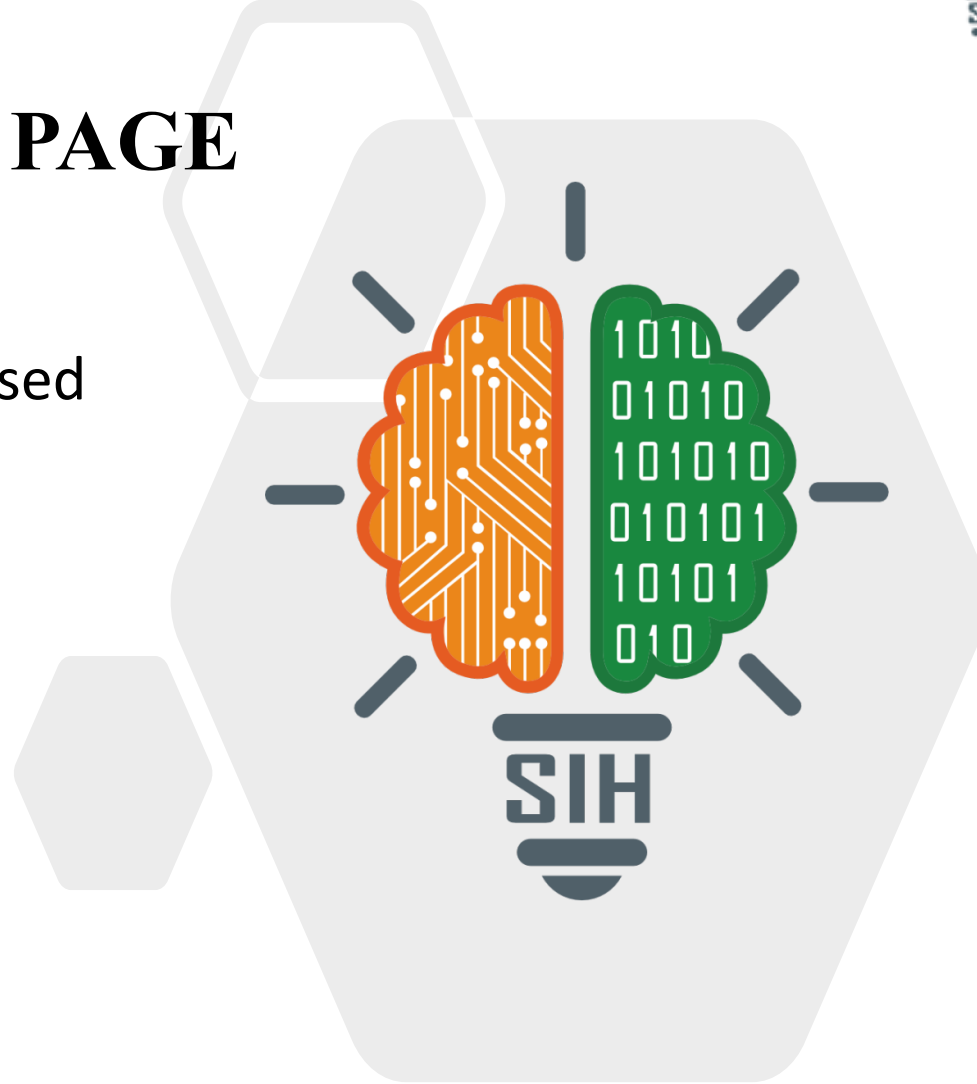
- **Problem Statement ID –** 25052

- **Problem Statement Title-** AR-Based

  Cultural Heritage Preservation Platform

- **Theme-** Heritage & Culture

- **PS Category-** Software

- **Team ID-**

- **Team Name -** Ctrl + Elite

HeritageAR
Digital Preservation & AR Tours of India's Heritage

SMART INDIA HACKATHON 2025

❖ <u>**Proposed Solution (Describe your Idea/Solution/Prototype)**</u>

A **web-based AR platform** to explore India's heritage sites through **3D models and guided virtual tours**. The website is **lightweight, multilingual, and interactive**.

Core Features

- **3D AR Monuments** – View and explore sites in detail.
- **Low-Bandwidth Mode** – Optimized 3D + cloud streaming.
- **Multilingual Narratives** – Regional + English storytelling.
- **Gamified Learning** – Quizzes, treasure hunts, badges.

Uniqueness

Audio Storytelling Mode

- Each heritage site will have **narrated stories, legends, and folklore** in multiple languages.
- Users can **listen while exploring** the 3D/AR model, making the experience more engaging and accessible (like a virtual guide).

TECHNICAL APPROACH

Technologies

- **Frontend** → React.js
- **Backend** → Node.js
- **Database** → Supabase, MongoDB.
- **3D Modeling** → Blender
- **AR Integration** → WebXR
- **Cloud Hosting** → AWS, Google Cloud.
- **AI Layer** → Python (ML Models)
- **Compression** → Draco

Methodology

- **Data Collection** – Photos, LiDAR scans, archives.
- **3D Model Creation** – Build in Blender & export.
- **Website Development** – Frontend + Backend integration.
- **AR Integration** – Unity AR, WebXR.
- **AI Personalization** – Custom tours.
- **Testing** – Performance, bandwidth, accessibility.
- **Deployment** – Cloud-hosted, offline-lite support(for high-end devices).

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Feasibility

- **Low Cost**: Uses free/open-source tools (Blender, Unity free tier).
- **Scalable**: Can expand to 100+ sites.

Challenges

- **Internet Issues:** Many rural users still face weak connectivity.
- **Data Collection:** Getting accurate site photos and scans may take time.
- **User Awareness:** Some users may not be familiar with AR/3D tools.

Strategies

- Use **mesh simplification & compression** for 3D models.
- Provide **offline lightweight packages** for rural users.

IMPACT AND BENEFITS

Impact

- **Tourism Boost** → Engaging AR experiences.
- **Education** → Interactive history lessons for students.
- **Global Reach** → Virtual India for international audiences.

Benefits

- **Social**: Preserves culture for future generations.
- **Economic**: Promotes tourism, handicrafts, local businesses.
- **Environmental**: Reduces footfall pressure on fragile sites.

References

3D Models & AR

- Blender (Open-source 3D tool)
- Maya
- Unreal Engine 5

AR Development

- Unity AR Foundation Docs
- Google ARCore
- ARKit by Apple
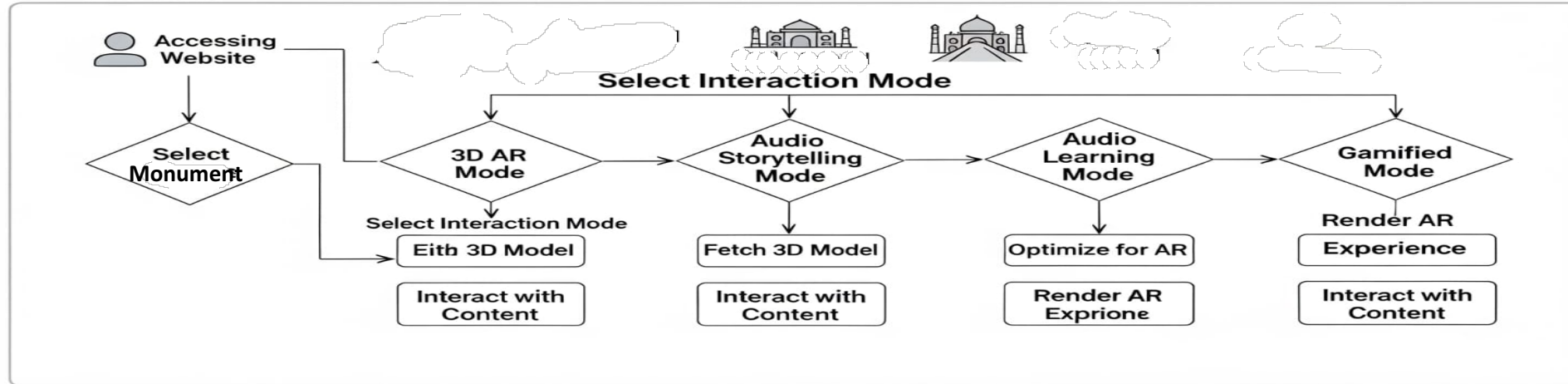
Cultural Heritage Data (India/Odisha)

- ASI Official Website
- Incredible India – Odisha Tourism
- Odisha Tourism Portal

Related GitHub Repositories

- [HeritageAR Sample Project](#)
- [Unity + ARCore Example](#)

FLOWCHART