TROY UNIVERSITY



Project Global Heritage

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CS370: Natural Programming Language

May 25th, 2025

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Members	Contribution	Responsibilities
`[STUDENT_3]`	25%	1. Backend (PHP): Handle server-side logic in `gallery_class.php`, `database.php`, `about.php`, etc.
`[STUDENT_2]`	19%	2. JS Development: Work on `controler_home.js` and `js_monument.js` to handle client-side logic.
`[STUDENT_1]`	19%	3. Frontend (CSS): Manage and optimize styles in files `about.css`, `gallery.css`, etc.
`[STUDENT_4]`	19%	4. Testing & Debugging: Test and debug all components (CSS, JS, PHP).
`[STUDENT_5]`	18%	5. Integration & Deployment: Integrate all parts and handle system deployment.

I. Abstract

Global Heritage is a dynamic web-based platform designed to promote and educate users about UNESCO World Heritage Sites worldwide. The system offers categorized listings by continent and country, detailed site information, interactive maps, image galleries, and user feedback functionalities. Built using PHP with Object-Oriented Programming (OOP), MySQL, and JavaScript, the website features a responsive interface and a modular, maintainable back-end structure. The platform prioritizes accessibility, educational value, and ease of management through a custom content management system (CMS) for administrators. With a secure, scalable architecture and a strong focus on user experience, Global Heritage aims to raise global awareness of cultural and natural heritage while serving as a learning resource for students, travelers, and the general public.

Keywords:
World Heritage Sites, UNESCO, cultural heritage, natural heritage, web development, PHP, MySQL, interactive map, educational website, responsive design, content management system (CMS), object-oriented programming (OOP), user experience (UX), digital preservation, historical monuments

II. Introduction

1. Acknowledgements

Thank you very much for your interest and support for Global Heritage. This website was created with the aim of providing detailed and accurate information about world heritage sites - works and areas of special cultural, historical and natural value around the world.

We hope that through the content provided, you will have a deeper understanding of these precious heritages, thereby contributing to raising awareness about preserving and promoting their values for future generations.

Thank you and we look forward to continuing to receive your companionship.

2. Background

The World Heritage website provides comprehensive information about UNESCO-recognized world heritage sites. The goal of the website is to help users explore and better understand the cultural, historical and natural values of these sites around the world.

The website provides detailed information about each heritage site, including its history, significance and current conservation efforts. Users can easily search for heritage sites by country, type (cultural, natural or isotopic) and UNESCO recognition criteria. In addition, the website also provides images, videos and analytical articles to enhance the discovery experience for viewers.

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With a friendly and easy-to-use interface, the website is a useful resource for those interested in learning about and preserving world heritage sites.

3. Description

3.1 Home Page:

Header: The website will feature a prominent header with a logo and a carousel or slideshow displaying famous images of historical monuments.

Navigation: A sticky navigation bar with links to different sections of the page (e.g., Home, About, Monuments, Gallery, Contact Us, Feedback) will be included.

Monuments Section:

Zone-Based Categorization: The monuments will be categorized by geographical zones (East, North, West, South). Each category will have expandable sections or cards displaying the monuments within that zone.

Display locations on map for better view.

World Wonders: A special subsection for the Seven Wonders of the World with detailed descriptions and images.

History and Images: Each monument will include a brief history, images, and a ”Read More ” option for detailed information.

Gallery Section:

A visual gallery showcasing images of various historical monuments. Users can click on thumbnails to view larger images in a light box format.

Contact Us:

Company Address: Display the company’s (website development company) address using the Geolocation API (e.g., Google Maps) for visual representation.

Email Link: A mail to link that invokes the user local mail client to send an email directly.

Feedback Section:

An interactive form where users can provide feedback about the website or the monuments. This will be integrated into the same page, allowing users to submit feedback without leaving the page.

3.2 The Proposed System

Improved user interface with modern design and multi-device compatibility, added interactive maps, upgraded content management system (CMS) to automatically update data, the system will also integrates community features such as forums, social sharing and personalized user experiences.

3.3 Boundaries of the System

The system boundary includes the development and deployment of the Global Heritage website, including its front-end and back-end components. Specifically, the system will focus on:

Design and implement intuitive user interfaces for seamless navigation and interaction.

Heritage sites recognized by Unesco,

Integrate multimedia elements such as videos, images, and interactive features to enhance the learning experience and user engagement.

Ensure website scalability and accessibility to accommodate a diverse user base and minimize potential risks.

These boundaries describe the scope of the proposed system, guide its development, and ensure alignment with project goals and user requirements.

4. Hardware and Software Requirements

4.1 Minimum Requirements

Hardware	Ram 1GB CPU 2.0 Ghz HDD 80GB Internet & LAN connection	Internet Connection
Software	Operating System: Windows/Mac/Linux Web Server Software: XAMPP Apache Database: MySQL	Operating System: Windows/Mac/Linux Web Browser: IE9+ / Firefox 3.5+/ Google Chrome / Safari 4+/ Opera 10

4.2 Recommended Requirements

	Server	Client
Hardware	Ram 2GB or higher CPU 3.0 Ghz or higher HDD 80 GB or higher Internet & LAN connection	Internet connection
Software	Operating System: Windows/Mac/Linux Web Server Software: XAMPP Apache Database: MySQL	Operating System: Windows/Mac/Linux Web Browser: IE9+ / Firefox 3.5+/ Google Chrome / Safari 4+/ Opera 10

III. Methodology

1. Analysis and related requirements

1.1. Requirements analysis

Objective: Define the scope and specifications of the website project.

Content Requirements:

Name of heritage, country, type of heritage (cultural, natural, mixed). Detailed description of the history, cultural significance, and conservation value of the property..

Functional Requirements: Core functions should include a search engine to find award winners by name, region, gallery or interactive map; and multimedia content

Usability Requirements: The site must be accessible, easy to navigate, and responsive to ensure compatibility with various devices and screen sizes.

Performance Requirements: Fast loading times and efficient data retrieval mechanisms are crucial for user satisfaction.

1.2. User analysis

Objective: Understand the needs and behaviors of the website's target audience.

Audience segmentation: Primary audiences include educators, students, researchers, journalists and the general public interested in world heritage.

User Needs: Access up-to-date and reliable information on world heritage sites, educational resources and multimedia content to gain deeper insights.

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Interactive strategy: Implement interactive elements such as questions about world heritage sites. You can reflect on the information on the website via the report page.

1.3. Business analysis

Objective: Ensure the project aligns with strategic goals and offers value.

Value Proposition: The website serves as a comprehensive and authoritative source for Global Heritage information, promoting education and inspiration across various fields of excellence.

Monetization Strategies: While the primary goal is educational, potential revenue streams could include advertising for scientific and academic products, partnerships with educational institutions, and premium content subscriptions.

Sustainability Plans: Regular updates and maintenance, funded through a mix of advertising, donations, and partnerships, will ensure the website remains relevant and valuable.

1.4. Technical analysis

Objective: Outline the technological requirements and architecture of the website.

Hosting and Scalability: A reliable web hosting service capable of scaling to accommodate traffic spikes, especially during the unveiling of the wonder of the world

Security Measures: Implementation of best practices in web security.

1.5 Technology Stack

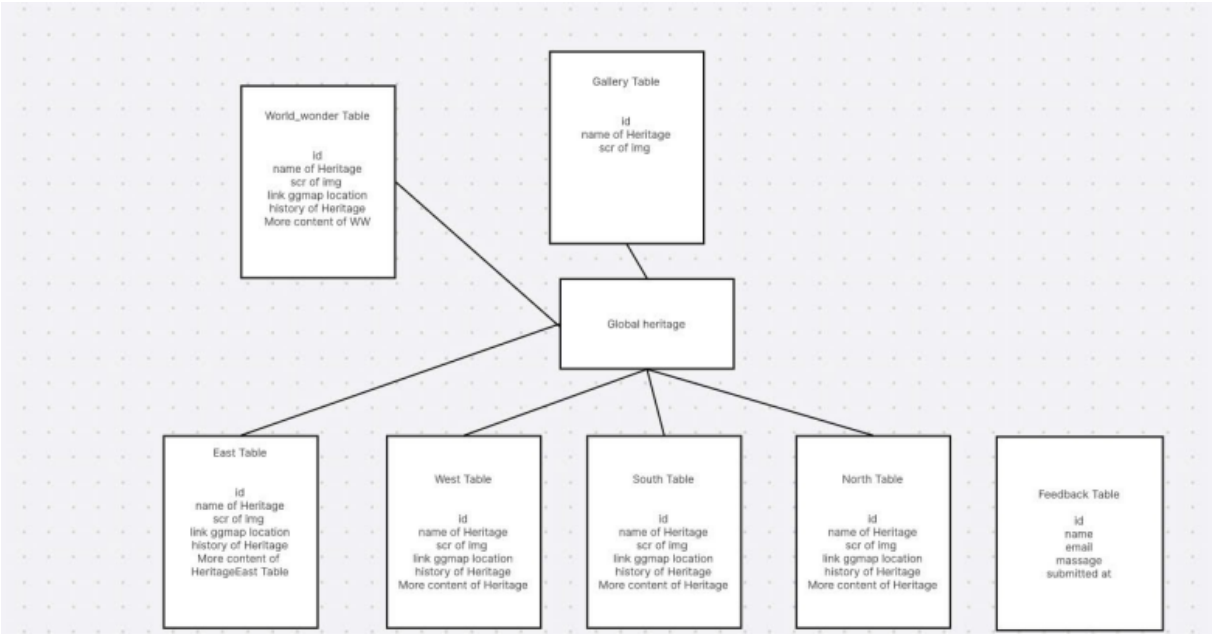
+ FRONT-END: HTML5, CSS, JavaScript

+ BACK-END: PHP

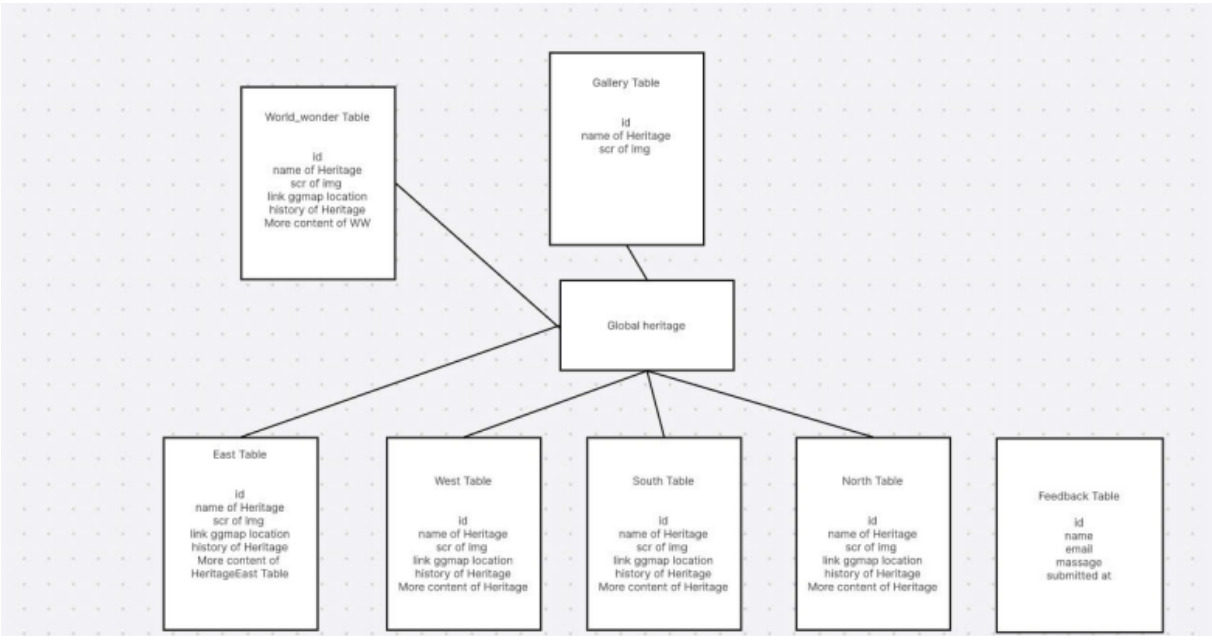
2. Design and Implement

2.1 Design

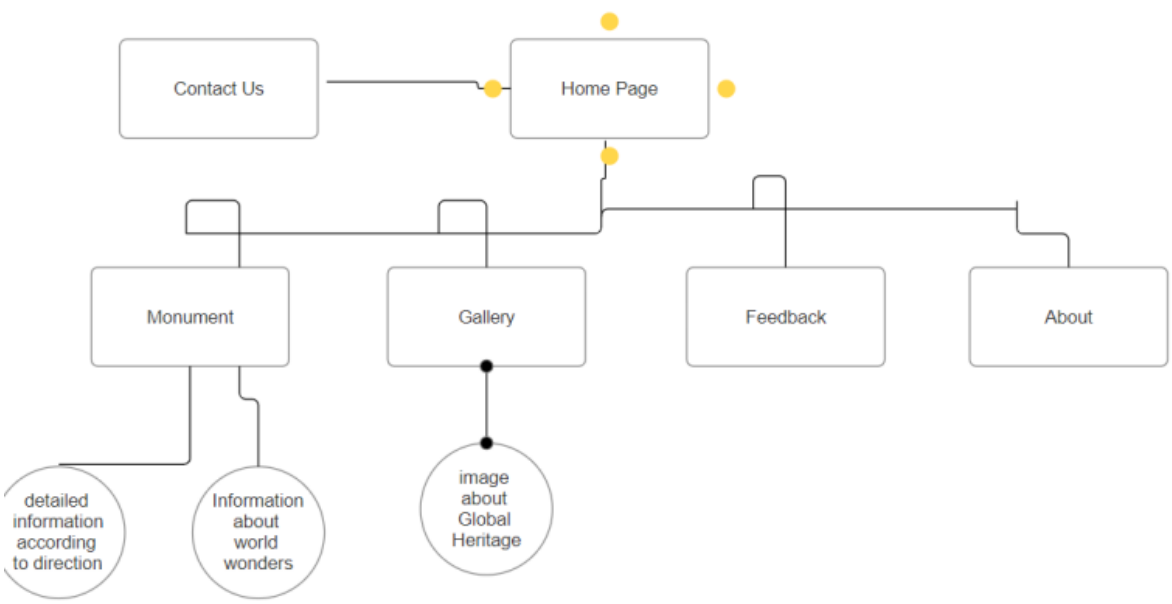
2.1.1 ERD



2.1.2 Database Design / Structure



2.1.3 Flowchat



2.1.4 Video of Website

Link: https://drive.google.com/file/d/1C4gv_5FXDSweMXvbObFJmU6lnxOAsPyK/view

2.2 Implement

2.2.1 User Guide:

Home Page:

Header: The website will feature a prominent header with a logo and a carousel or slideshow displaying famous images of historical monuments.

Navigation: A sticky navigation bar with links to different sections of the page (e.g., Home, About, Monuments, Gallery, Contact Us, Feedback) will be included.

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Feedback Section:

An interactive form where users can provide feedback about the website or the monuments. This will be integrated into the same page, allowing users to submit feedback without leaving the page.

2.2.2 Developer’s Guide:

This guide is intended for web developers and technical teams responsible for maintaining, updating, and ensuring the smooth operation of the Global Heritage website. Here you'll find information on website structure, content management, search functionality, and other development-related details.

Website Structure

Homepage: The landing page that offers a general overview and links to all sections of the site.

Monument: Detail information about all the Global Heritage in the world, also have a special section for World Wonder.

Contact Us: Location where we work and how to contact us.

Gallery: A list of image where user can admire all the view of heritages.

Feedback: a form that user can send us a feed back with their own information.

About: Information about the website.

Content Management

CMS: Utilize the Content Management System (CMS) for updating and managing website content. Make sure you have the necessary permissions and understand the workflow.

Database Management: Regularly update and maintain the database that holds laureate information, event details, and nomination data. Perform backups and ensure data integrity.

Media Files: Organize and manage media files in a structured manner. Use appropriate naming conventions and maintain a repository for easy access and updates.

Search Functionality

Search Engine Integration: Maintain the search engine that powers the website's search feature. Ensure it is indexing new content correctly and providing relevant search results.

Performance Monitoring: Regularly check the performance of the search function and optimize it for speed and accuracy.

Development and Maintenance

Version Control: Use version control systems to manage changes to the codebase. Ensure proper documentation of changes and updates.

Testing: Implement automated tests for new features, and regularly perform regression testing to catch and fix bugs..

Compliance: Ensure that the website complies with legal requirements, including GDPR for user data, and accessibility standards.

Technical Support and Documentation

Documentation: Keep documentation up-to-date with detailed instructions on codebase, infrastructure, deployment procedures, and rollback plans.

Developer Support: Provide technical support for content managers and non-technical staff. Be available to resolve issues or to make updates that require developer intervention.

Training: Offer training sessions for new developers and staff to familiarize them with the site's technical aspects and CMS.

Future Enhancements

Scalability: Ensure that the website is scalable to handle an increasing number of visitors, especially during World Wonder announcements.

User Experience (UX) Updates: Continuously gather feedback and monitor user behavior to implement UX/UI improvements.

Technology Updates: Stay informed about emerging technologies that could be integrated to enhance website features or performance.

IV. Results and Discussions

1. Results: Language Features Implementation

The implementation demonstrates proficiency in multiple language features including PHP object-oriented programming, secure database interaction patterns, JavaScript DOM manipulation, and cross-language data integration. The architectural choices show understanding of web development best practices, particularly in security implementation and progressive enhancement strategies. The modular design approach facilitates maintainability while the comprehensive documentation in the Technical Implementation wiki page indicates thorough system analysis and documentation practices.

1.1 Object-Oriented Database Architecture

The system demonstrates effective use of PHP's object-oriented features through a zone-based class hierarchy. The implementation creates separate classes for each geographical zone (north, south, east, west, wonder) that extend a base database class, showcasing inheritance and modular design principles.

1.2 Progressive Enhancement Architecture

The monument content system showcases JavaScript progressive enhancement, where content remains functional without JavaScript but gains enhanced interactivity when available. The toggle system uses inline event handlers with dynamically generated content

Cross-Language Data Transfer Patterns

The gallery system demonstrates sophisticated PHP-to-JavaScript data transfer using

j son_encode() to convert server-side arrays into client-side JavaScript constants, enabling seamless data flow between server and client layers.

2. Results:Functional

The Global Heritage website was developed to introduce and promote awareness of UNESCO World Heritage Sites across various regions, specifically categorized by geographic location: Northern, Central,

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and Southern regions. The final implementation was assessed based on the functionality of each core component, and results indicate a high level of alignment with the original design objectives. The following sections provide a detailed evaluation of the site's functionality and its potential effectiveness in real-world applications

2.1 Homepage and Navigation

The homepage was designed to deliver a visually engaging and informative introduction to the project's goals. It features a concise welcome message, thematic imagery, and an intuitive navigation bar that directs users to specific regional sections. The navigation structure is consistent across all pages, promoting a seamless user experience. This approach reflects best practices in web design, which emphasize clarity, consistency, and ease of use (Krug, 2014).

2.2 Regional Categorization and Heritage Listings

Each region—North, Central, and South—includes a collection of UNESCO-recognized heritage sites, curated to reflect geographic and cultural diversity. Each listing displays a representative image, the name of the site, and a brief description. These elements are styled uniformly to enhance readability and maintain aesthetic coherence.

2.3 Detailed Heritage Information Pages

Each heritage site links to a dedicated detail page that includes extended information such as Cultural or historical significance, Date of UNESCO recognition, Geographic location (province or city), Supplementary visuals to enhance engagement. The page design prioritizes accessibility and user comprehension, employing clear headings and legible font choices. Content is written in concise, academic language suitable for both general audiences and educational contexts

2.4 Responsiveness and Cross-Device Compatibility

The website was built with responsive design principles using HTML, CSS, and JavaScript. Through the use of media queries, layouts automatically adjust to various screen sizes and devices, including smartphones, tablets, and desktop monitors. Interactive elements such as image galleries and buttons remain fully functional across platforms.

2.5 Prototype Administrator Interface

A prototype content management system (CMS) was developed to facilitate the addition, editing, and deletion of heritage site information. Although not deployed in a live environment, the admin panel demonstrates the feasibility of future expansion and maintenance by non-technical users.

2.6 Error Handling and User Feedback Preparation

Basic error-handling functions were implemented to manage broken links and invalid page requests (e.g., "404 Not Found" pages). In addition, the current design reserves space for future feedback features such as contact forms or comment sections, aligning with user-centered design principles (Norman, 2013).

3. Discussion: Design Analysis and Judgement

The technical implementation of the *Global Heritage* website reflects a deliberate and well-informed application of modern programming practices across both server-side and client-side environments. This discussion interprets and critically evaluates the design decisions in light of software engineering principles, web development standards, and user-centered design philosophies.

3.1 Architectural Strengths

The use of object-oriented programming (OOP) in PHP to construct a modular, zone-based database access structure demonstrates a strong understanding of software abstraction and scalability. Each geographic zone is encapsulated within its own class, inheriting common functionality from a shared base

class. This design pattern not only adheres to the Single Responsibility Principle—a fundamental concept in clean architecture—but also allows for the system to be easily extended to accommodate new zones or data types in the future (Martin, 2009). Furthermore, this modular architecture simplifies unit testing and maintenance, as each class encapsulates logically coherent behavior and can be verified in isolation.

3.2 JavaScript Integration Excellence

The light-box navigation system showcases advanced JavaScript state management, maintaining slideshow state through DOM attributes and enabling complex cross-gallery navigation with circular array indexing.

3.3 Security Implementation Quality

The three-layer security approach (input sanitation, prepared statements, and parameter binding) demonstrates industry best practices for web application security, effectively preventing common vulnerabilities.

User Experience Design

The combination of HTML5 <details> elements with JavaScript-enhanced content toggles provides both semantic HTML structure and enhanced interactivity, demonstrating thoughtful progressive enhancement principles.

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