

## COMP-1678-M01-2024-25 USER CENTRED WEB ENGINEERING



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27.12.2024

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**Abstract:**

## Abstract

The era of great technological innovations, in which response time, mobility, and access to information are essential in keeping up with society's constant evolution and movement, is the era in which smartphones and tablets have become man's best friend. In this context, mobile-friendly websites are no longer just a trend in the field but rather a way of adapting the online environment to the needs of its consumers.

Exploring the Way Design Interacts with the User is a method of web advancement that is absorbed in understanding and assembling users' requirements, favourites, and behaviours. It mixes user experience (UX) principles into the engineering development by:

- User Participation
- Reiterative Strategy
- Usability Testing
- Concentration on Goals
- Interdisciplinary Method

Web designers often have to pay attention to how the basic principles of psychology can influence the visitor experience of the sites they build because psychological principles are either seen as unnecessary or too complicated. The truth is that they are neither. The concepts associated with the psychological influence of design are pretty few and relatively easy to apply, remember, and implement.

If a professional is in the initial phase of the web design concept, consider what and how visitors want and are on the right track in applying the principles of psychology in web design. The finality of the approach to consider the psychological aspects when creating a website and its web design concept consists of more satisfied visitors, inclined to perform the actions they want: to get in touch with, buy from the products, and recommend to their friends. The purpose of applying the principles of psychology in web design is to stimulate website visitors to take the actions they want them to do.

Along with the elements that they expect to find from the first contact with the page, there are some additional elements that visitors expect to see in websites dedicated to specific business categories. They expect to find articles and discussion topics on the first page if it is a blog. On an e-commerce site, they will expect to find the products offered for sale on the first page, a search engine on the site for those that have more than a few pages and most often, they will expect to find information on the type "about us" and a contact page.

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## Chapter1

### Scenario Overview:

#### Museum Artefacts Selling Website

Now we are just summarizing the aspects of how it should be because we already have the structure of the website through what is required in this work, which is based on point one, which is already imposed by the requirements for creating a website, not on what is based on what is a fairly difficult and sophisticated team work.

#### Website Development

- Understand user needs and modern day-to-day barriers to high-end online shopping.
- Obsessive collectors of art and antiquity.
- High-income stakeholders who see artefacts as a long-term investment.
- Wealthy entities seeking to validate their status through exclusive purchases.
- Assumptions based on the high-end industry:

We have included elements characteristic of premium customers:

- High investment value.
- Expectations of authenticity and exclusivity.
- Requirements for personalized and fast experiences.
- Structure of persona:
- Used the standard structure to cover all aspects:
- Bio: Provides context about who the persona is.
- Goals, Frustrations, Motivations: Reflects the needs, challenges, and motivations identified
- Personality and Technology: Explores how the persona might interact with the online platform.

#### Inspiration from similar examples:

High-end art stores like Phillips were founded in London in 1796 and are now headquartered in New York. The company is known for its contemporary art sales and focuses on emerging artists. "Bonhams was founded in London in 1793 and has since expanded to locations worldwide, including New York, Los Angeles, and Hong Kong. The company specializes in fine art, antiques, and

collectables, focusing on British art and old masters. These stores have a similar audience, which helped to outline the user profile."(Aragon, 2024)



Fig.1.

### High-End Museum Artifact Store Survey:

#### A. Demographics

##### 1. What is your age group?

- Under 25
- 25-35
- 36-45
- 46-60
- Over 60

##### 2. What is your occupation?

- Executive/Manager
- Entrepreneur
- Historian/Archaeologist
- Private Collector

##### 3. What is your annual income?

- Below \$50,000
- \$50,000 - \$100,000
- \$100,000 - \$250,000
- Above \$250,000

##### 4. In which region do you reside?

- North America
- Europe
- Asia

##### Manners and Benefits

##### 5. How frequently do you acquisition artifacts?

- Monthly
- Quarterly
- Annually
- Rarely

##### 6. What types of artifacts interest you.

- Historical artifacts
- Modern art objects
- Religious artifacts

##### 7. What influences your purchase decisions?

- Artifact authenticity
- Rarity of the piece
- Aesthetic value
- Investment value

##### 8. How do you prefer to purchase artifacts?

- Online
- At physical auctions
- In private galleries

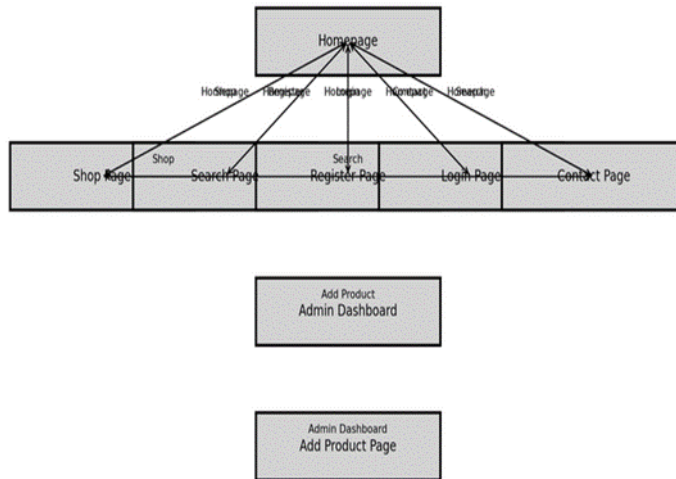


# Chapter2

## System Design

Translate user necessities into design. Create a sitemap for the website structure.

### Low-Fidelity Navigation Prototype



#### PERSONALITY

- Extrovert vs. Introvert:  
■ Balanced
- Sensing vs. Intuition:  
■ Intuition
- Thinking vs. Feeling:  
■ Thinking
- Judging vs. Perceiving:  
■ Judging

#### BIO

Alex is a detail-oriented museum curator who manages both the physical and online inventory of a mid-sized museum in London. While passionate about history and art, Alex struggles to adapt to modern digital platforms but understands their necessity for engaging visitors in a tech-driven world.

Alex's primary role is to ensure the site reflects the museum's prestige while being intuitive for both casual visitors and researchers. They often test new features and gather feedback from colleagues to ensure updates meet expectations. Alex values a design that's minimalistic yet functional, balancing aesthetics with usability.

#### Motivations



#### Goals

- Introduce user focused mentality and methods into traditional company landscape
- Improve usability of bank's customer facing interfaces
- Grow the UX team

#### Frustrations

- Unclear navigation or a confusing interface.
- Technical failures in features like search or item upload.
- Lack of automation for repetitive admin tasks.

#### QUOTE

"A museum's website is as important as its front door. If we can make visitors curious and engaged online, we can bring them through our actual doors."

#### Behavior



#### Influences

- CREDIBILITY
- COLLEAGUES
- TECHNOLOGY
- BLOGS/ FORUMS
- PSYCHOLOGY
- UI TRENDS

#### TECHNOLOGY

IT & Internet: ■ Heavy reliance on website architecture (backend management).  
 Software: ■ Uses CMS and database management for artifacts.  
 Mobile Apps: ■ Moderate interaction to verify user-friendly mobile design.  
 Social Networks: ■ Essential for engaging visitors with upcoming exhibitions or promotions.

### ALEX WALKER

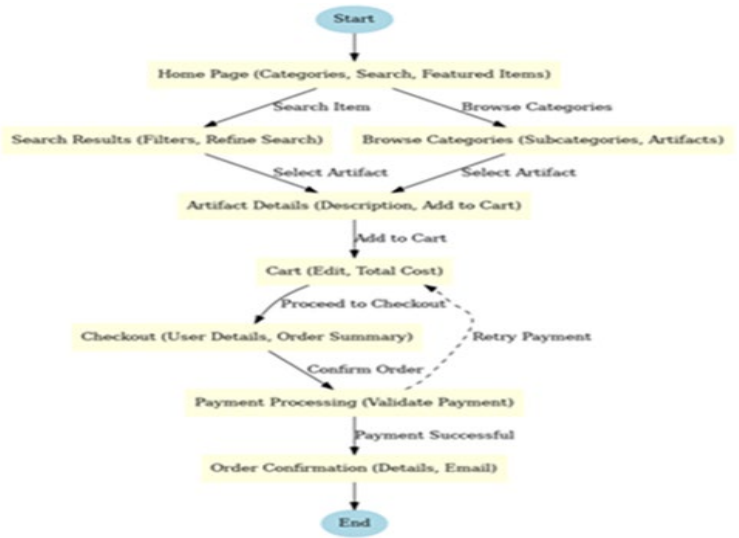
Location: London, UK

Museum Curator & Manager

- STATUS: SINGLE
- SALARY: \$50K
- TIER: Professional User
- ARCHETYPE: PERFECTIONIST

```

├─ css/           # Stylesheet and Images Directory
|  └─ style.css   # Main CSS file for styles
|  └─ images/     # Image assets
|     └─ index.jpg # Background for index
├─ includes/     # Shared Includes for Database and Utilities
|  └─ db.php      # Database connection file
├─ uploads/     # Uploads Directory for Artifact Images
├─ admin/       # Admin Login-Specific Pages
|  └─ dashboard.php # Admin dashboard
|  └─ add_item.php # Form to add new artifacts
|  └─ update_inventory.php # Update inventory functionality
|  └─ register.php # Registration page
|  └─ login.php   # Login page
|  └─ index.php   # Homepage
|  └─ search.php  # Search functionality page
|  └─ shop.php    # Shop page for browsing artifacts
|  └─ contact.php # Contact page
|  └─ review.php  # Review page
|  └─ about.php   # About us page
|  └─ gdpr.php    # GDPR/Privacy policy page
├─ js/          # JavaScript Files
|  └─ carousel.js # JavaScript for carousel functionality
|  └─ search.js   # JavaScript for enhancing search functionality
├─ zoom effect.html # Visual Impare
└─ README.md     # Documentation for your project
    
```



### Storyboard: Visitor Searching for an Artifact

<p><b>Step 1: Navigate to Homepage</b></p> <p>The visitor opens the website and sees the homepage with a prominent search bar.</p>
<p><b>Step 2: Use the Search Bar</b></p> <p>The visitor types 'ancient vase' into the search bar and presses enter.</p>
<p><b>Step 3: View Search Results</b></p> <p>A list of artifacts matching the query appears. The visitor scrolls through the results.</p>
<p><b>Step 4: Select Artifact</b></p> <p>The visitor clicks on the desired artifact to view detailed information.</p>
<p><b>Step 5: View Artifact Details</b></p> <p>The artifact page displays images, descriptions, and historical context.</p>

### Construction of a Flowchart Begin

The user goes to the museum's website or app for artefact shopping.

#### 1. Homepage

Showcase artefact categories, such as historical, cultural, and modern art.

Incorporate highlighted artefacts and a search bar.

Choice: Is the user interested in looking for a certain artefact?

Indeed → Navigate to the Search Results.

Not at all Look through featured products or categories..

### Results of the Search

Display results that are relevant to the search term.

Offer filters (e.g., material, period, price, kind).

Conclusion: Did the user locate the artefact they were looking for?

Yes, view the details of the artefact.

Not at all prompts you to go back to the site or narrow down your search.

#### Examine the Categories

Show artefact lists and subcategories.

Permit users to do more exploring.

Conclusion: Did the user select an artefact by clicking on it?

Indeed → View the details of the artefact.

Not at all Go back to the homepage or go on surfing.

### Details of the Artefact Page

Display comprehensive details, the product's description, cost, background, and availability.

Give choices:

Put in your cart.

Put on your wish list.

Distribute.

Decision:

Does the user want to add it to the cart?

Yes → Add to Cart.

No → Continue browsing or return to the homepage.

#### 2. Cart

Display all selected artifacts.

Allow editing (e.g., remove items, adjust quantities).

Show total cost and shipping details.

Decision:

Proceed to checkout?

Yes → Checkout Page.

No → Return to browsing or refine the cart.

#### Checkout Page

Collect user details (e.g., name, address, payment method).

Provide a summary of the order.

Decision:

Confirm payment?

Yes → Payment Processing.

No → Return to cart.



#### Payment Processing

- Validate payment details.
- Complete the transaction.

#### Decision:

- Was the payment successful?
  - Yes → Show Order Confirmation.
  - No → Retry Payment or Cancel Order.

#### Order Confirmation

- Display order details (e.g., order ID, expected delivery date).
- Send confirmation email or message.

#### End

- User exits the platform or continues shopping.

### 3. Front-End Development (SDLC: Implementation)

Objective: Code the front end using HTML5, CSS, JavaScript/jQuery, and Bootstrap.

#### Activities:

- Code all pages with functionality:
  - Login/Registration forms with validation.
  - Navigation bar with responsive design.
  - Footer with contact information.
  - Media integration (images/videos).
- Ensure responsive design using Bootstrap grid system.
- Implement accessible features (e.g., alt text for images, keyboard navigation).

#### Deliverables:

- Front-end code (HTML, CSS, JS/jQuery).
- Functional pages:
  - Home, Registration/Login, and additional pages.
- Responsive design and accessibility evidence.

### 4. Testing and Evaluation (SDLC: Testing)

Objective: Test functionality, usability, and adherence to UCD principles.

#### Activities:

- Perform heuristic evaluations with participant feedback.
- Test for:
  - Navigation and responsiveness.
  - Front-end form validation.
  - Accessibility compliance.
- Document identified issues and resolutions.

#### Deliverables:

- Testing screenshots and logs.
- Heuristic evaluation results.
- Accessibility compliance evidence.

### 5. Documentation and Submission (SDLC: Deployment & Maintenance)

Objective: Provide detailed evidence of design and implementation.

#### Activities:

- Create a report including:

Research and requirement-gathering methods.  
 Design rationale with diagrams and explanations.  
 Implementation details (screenshots, code snippets).  
 Testing results and improvements.

Package the project in a zip file:

All website files (HTML, CSS, JS, etc.).  
 Documentation/report.

Deliverables:

Final report.

## Chapter3

Use on the project:

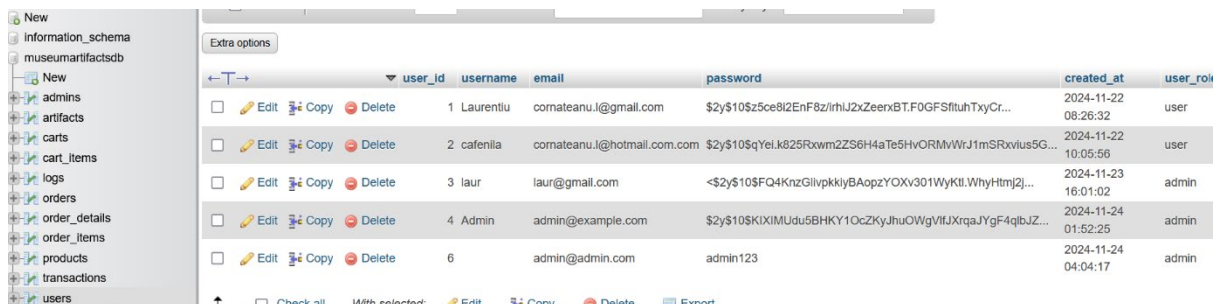
Official Bootstrap Website  
 Template and Snippet Sites  
 General Code Repositories  
 GitHub  
 CodeSandbox  
 W3Schools Bootstrap  
 MDBootstrap  
 Creative Tim

Check Licensing:

Make sure the template/snippet allows commercial use if needed.  
 Look for "MIT License" or "Free for personal/commercial use."

3. The complete URL or (local host) information of the developed prototype. Please provide the login credentials of one pre-registered member. Please provide in the report the member's username and password for testing.

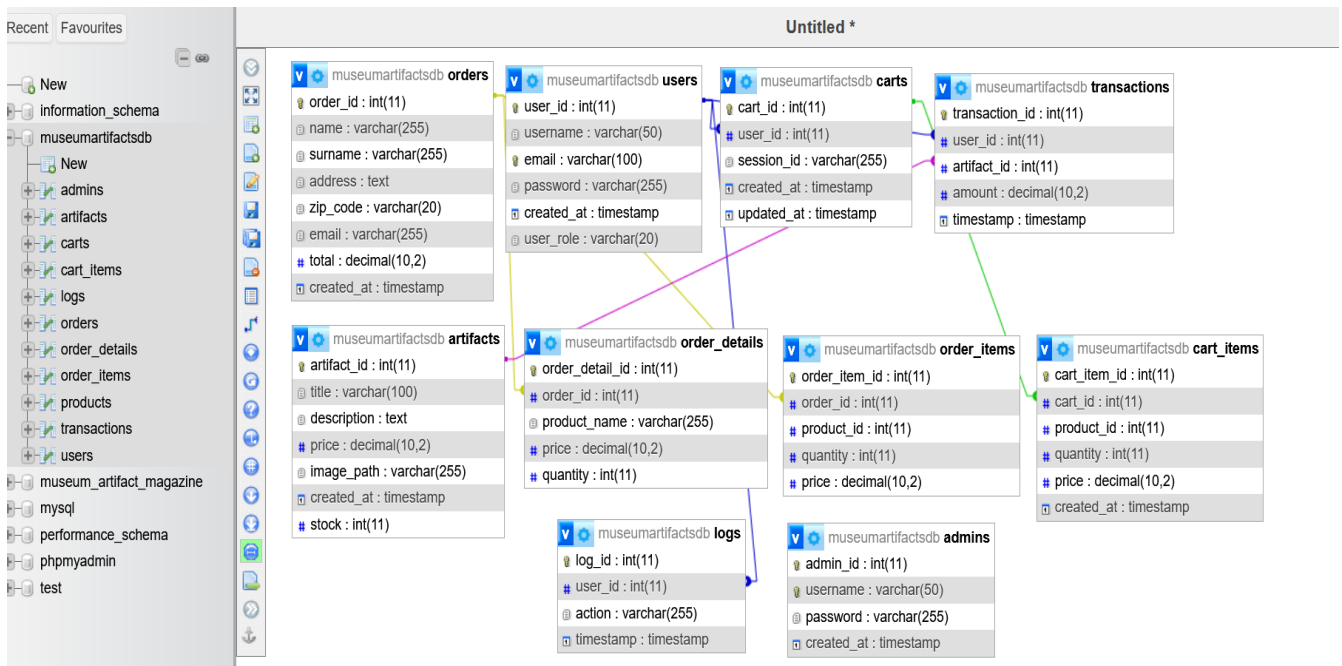
<http://localhost/museumartifactsdb/index.php>



	user_id	username	email	password	created_at	user_role
<input type="checkbox"/>	1	Laurentlu	cornateanu.l@gmail.com	\$2y\$10\$z5ce8l2EnF8z/irhJ2xZeerxBT.F0GFSftiuhTxyCr...	2024-11-22 08:26:32	user
<input type="checkbox"/>	2	cafenila	cornateanu.l@hotmail.com	\$2y\$10\$qYeI.k825Roxwm2ZS6H4aTe5HvORMvWrJ1mSRxvius5G...	2024-11-22 10:05:56	user
<input type="checkbox"/>	3	laur	laur@gmail.com	<\$2y\$10\$FQ4KnzGllvpkklyBAopzYOXV301WykII.WhyHtmj2j...	2024-11-23 16:01:02	admin
<input type="checkbox"/>	4	Admin	admin@example.com	\$2y\$10\$KIXIMUdu5BHKY1OcZKyJhuOWgVlfJXrqaJYgF4qlbJZ...	2024-11-24 01:52:25	admin
<input type="checkbox"/>	6		admin@admin.com	admin123	2024-11-24 04:04:17	admin

ADMIN : [admin@admin.com](mailto:admin@admin.com)  
 Password: admin

User: cornateanu.l@gmail.com  
 Password: Aurelia1



## Chapter 4

### Development

#### A. Project Scope

The Museum Artifacts project is a website dedicated to the administration and display of products from a virtual museum. It is intended for:

- Public visitors who can browse the artefacts, access information and contact the museum.
- Administrators who can manage artifacts through a secure control panel.
- 

#### B. Frontend Features: Contact Page

The contact page allows users to send messages directly to the museum.

Features include:

- A simple form with validation.
- Visual feedback after sending a message.

#### HTML FORM

```
<form method="POST" action="contact.php">
  <label for="name">Your Name:</label>
  <input type="text" id="name" name="name" required>

  <label for="email">Your Email:</label>
  <input type="email" id="email" name="email" required>

  <label for="message">Your Message:</label>
  <textarea id="message" name="message" required></textarea>

  <button type="submit">Send Message</button>
</form>
```

```

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $name = htmlspecialchars($_POST['name']);
    $email = htmlspecialchars($_POST['email']);
    $message = htmlspecialchars($_POST['message']);
    $feedback = "Thank you, $name! Your message has been received.";
}

```

The form sends the data via the POST method to the PHP script which:

- Filter and validate data.
- Display a thank you message to the user.
- 

### C. Backend Features: Admin Dashboard Description

Admin Dashboard is an interface dedicated to administrators, which allows the management of products (artifacts) in the database.

- View products in a table.
- Adding, editing and deleting products.
- Notification messages for success or failure of operations.

### Display of Products:

```

try {
    $stmt = $pdo->query("SELECT * FROM products");
    $products = $stmt->fetchAll(PDO::FETCH_ASSOC);
} catch (PDOException $e) {
    die("Error in query: " . $e->getMessage());
}

```





HTML interface:

```

<table>
  <thead>
    <tr>
      <th>ID</th>
      <th>Name</th>
      <th>Price</th>
      <th>Image</th>
      <th>Inventory</th>
      <th>Actions</th>
    </tr>
  </thead>
  <tbody>
    <?php foreach ($products as $product): ?>
      <tr>
        <td><?php htmlspecialchars($product['id']) ?></td>
        <td><?php htmlspecialchars($product['name']) ?></td>
        <td><?php htmlspecialchars($product['price']) ?></td>
        <td><?php htmlspecialchars($product['inventory']) ?></td>
        <td>
          <a href="edit_item.php?id=<?php $product['id'] ?>">Edit</a>
          <form method="POST" action="delete_item.php" style="display:inline;">
            <input type="hidden" name="id" value="<?php $product['id'] ?>">
            <button type="submit" onclick="return confirm('Are you sure?');">Delete
          </form>
        </td>
      </tr>
    <?php endforeach; ?>
  </tbody>
</table>

```

The table of products displayed in the Admin Dashboard:

ID	Name	Price	Image	Inventory	Actions
1	Golden Scarab	\$2000.00		2	<a href="#">Edit</a> <a href="#">Delete</a>
2		\$2500.00		0	<a href="#">Edit</a> <a href="#">Delete</a>
3		\$100.00		0	<a href="#">Edit</a> <a href="#">Delete</a>
4	Legal coin	\$2000.00		30	<a href="#">Edit</a> <a href="#">Delete</a>



Form for adding a product:

Notification messages (Product added successfully):

ID	Name	Price	Image	Inventory	Actions
1	Golden Scarab	\$5000.00	Golden Scarab	5	<a href="#">Edit</a> <a href="#">Delete</a>
2		\$7200.00		0	<a href="#">Edit</a> <a href="#">Delete</a>
3		\$700.00		0	<a href="#">Edit</a> <a href="#">Delete</a>
4	regal coin	\$3000.00		350	<a href="#">Edit</a> <a href="#">Delete</a>
5	vase	\$3500.00		6	<a href="#">Edit</a> <a href="#">Delete</a>

The table lists all products in the database, with options to edit and delete.

CRUD operations are implemented via links to the edit\_item.php and delete\_item.php pages.

Security is ensured by checking the admin role when accessing the page.

#### D. Database

The database is called MuseumArtifactsDB and contains tables for managing products, users and contact messages.

Structure of Tables

Field	Type
id	int(11)
name	varchar(255)
price	decimal(10,2)
image	varchar(255)
featured	tinyint(1)
created_at	timestamp
inventory	int(11)
title	varchar(255)
description	text
photo	varchar(255)

## Testing the WebSite

### Test scenarios

#### Frontend navigation:

- Test access to the Home, Contact, Shop pages.

- Checks the functionality of the carousel and the correct display of images.

#### Contact form:

- Enter valid data and submit the form.

- Verify that the confirmation message is displayed.

#### Admin Dashboard:

##### View products:

- Make sure all products in the database appear in the table.

##### Add product:

- Fill in the form with valid data and confirm that the product appears in the list.

##### Edit product:

- Edits a product's details and checks that they are saved correctly.

##### Delete product:

- Delete a product and confirm that it no longer appears in the table.

#### Security:

- Access the Admin Dashboard without being logged in (it should redirect to the login page).

The frontend is fully functional and users can interact with the site without any problems.

The Admin Dashboard provides full control over the products in the database by implementing CRUD operations.

### What Can Be Improved

- Implementation of a more advanced authentication system (eg session tokens).

- Mobile optimization for a better experience on all screens.

### What I Understood

This project provided the opportunity to work with:

- Frontend-backend integration using PHP.

- Secure connection to a database using PDO.

- Creating a secure interface for administrators.