Abstract

"Fun Store" (Smart E-Shopping System), is a PHP project, that allows users to shop conveniently from anywhere. Users can register, log in, browse products, add items to their cart, and make purchases. On the other hand, admins have the ability to manage the platform by listing new products, editing existing ones, or removing items no longer available. Admins also have secure login and registration functionalities.

The front-end of the portal is developed using HTML, CSS, JavaScript, and Bootstrap, ensuring a responsive and user-friendly interface. The back-end is built with PHP and MySQL, enabling dynamic data handling and secure database management. The main objective of this project is to offer a seamless shopping experience for users while providing efficient management tools for admins.

The project was implemented following best practices in web development and was thoroughly tested to ensure all functionalities work smoothly. The system proved to be effective in achieving its goals of creating an intuitive and scalable e-commerce platform.

Table of Content:

Introduction

Background and Context:

- In today's digital age, online shopping has become increasingly popular.
- E-commerce platforms provide a convenient and accessible way for businesses to reach a wider audience and for customers to purchase goods and services from the comfort of their homes.
- This project aims to develop a user-friendly and efficient online e-commerce portal.

Problem Statement:

- Traditional brick-and-mortar stores often face limitations in terms of reach and customer engagement.
- Setting up and maintaining a physical store can be costly and time-consuming.
- This project addresses these challenges by providing a digital platform for businesses to showcase and sell their products online.

Objectives:

For Users:

- Enable users to easily register and log in to the platform.
- Allow users to browse and search for products.
- Provide a seamless shopping experience with features like adding items to the cart and checking out.
- Ensure secure and convenient payment options.
- Offer a user-friendly interface with intuitive navigation.

For Admins:

- Provide an interface for admins to efficiently manage product listings.
- Enable admins to easily add, edit, and delete products.
- Allow admins to track orders and manage customer inquiries.
- Provide tools for analyzing sales data and customer behavior.
- Ensure the security and integrity of the platform and its data.

Literature Review

- **User Experience:** Many are difficult to navigate and use, leading to frustration and lost sales.
- **Personalization:** They often recommend products based on limited data, leading to irrelevant suggestions.
- **Focus on Price:** The main focus is often on the lowest price, ignoring other important factors like quality and sustainability.
- **Environmental Impact:** The environmental impact of online shopping is often overlooked.
- **Data Privacy:** User data is not always handled securely or transparently.

Gaps in Existing Solutions:

- **Limited Personalization:** Many platforms rely on basic browsing history to recommend products. This often leads to irrelevant suggestions and a less satisfying user experience.
- **Focus on Price over Value:** The emphasis on price often overshadows other important factors like product quality, sustainability, and customer service.
- **Lack of Transparency:** Users often lack transparency into how their data is used, raising concerns about privacy and security.
- **Environmental Impact:** Many platforms overlook the environmental impact of packaging, shipping, and returns, contributing to a growing ecological footprint.
- **Poor User Experience:** Many platforms are difficult to navigate, slow to load, and lack features that enhance the overall shopping experience.

System Analysis

Existing System

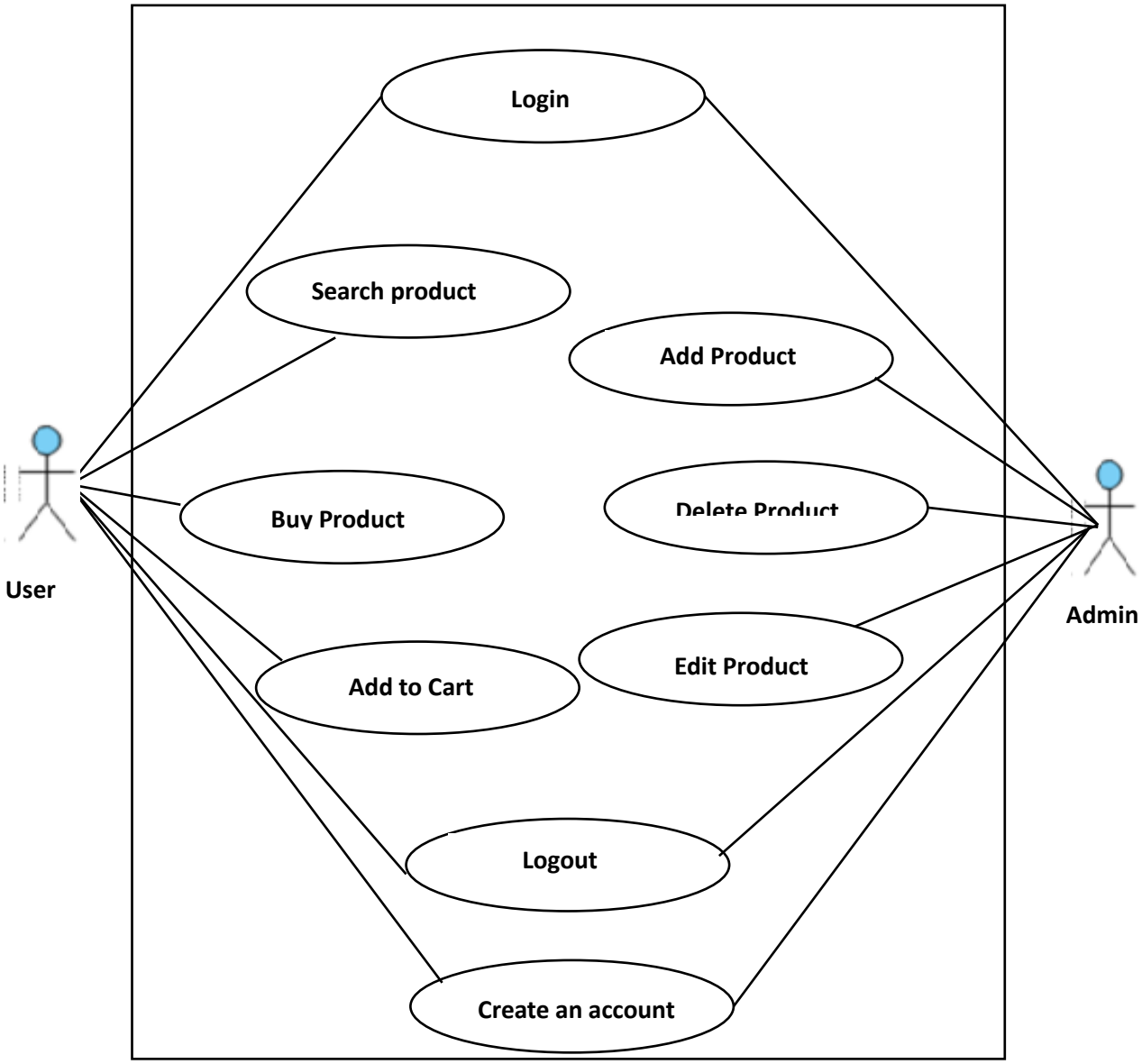
- **Description:** Traditional e-commerce often involves physical stores or basic online platforms with limited functionality.
    - **Manual Processes:** Many tasks, such as inventory management and order processing, may involve manual data entry and paper-based systems.
    - **Limited Reach:** Physical stores have geographical limitations, while basic online platforms may not reach a wide audience.
    - **Poor Customer Experience:** Limited personalization, slow loading times, and difficult navigation can lead to a poor user experience.
    - **Lack of Data Analysis:** Limited data collection and analysis can hinder businesses from understanding customer behavior and making informed decisions.
- **Limitations:**
    - **Inefficiency:** Manual processes can be time-consuming and prone to errors.
    - **Limited Scalability:** Difficulty in expanding operations to reach a larger customer base.
    - **Reduced Competitiveness:** Difficulty in competing with established online retailers with advanced features.
    - **Poor Customer Satisfaction:** Frustrating user experience can lead to lost sales and negative reviews..

Proposed System (Smart E-Shopping System)

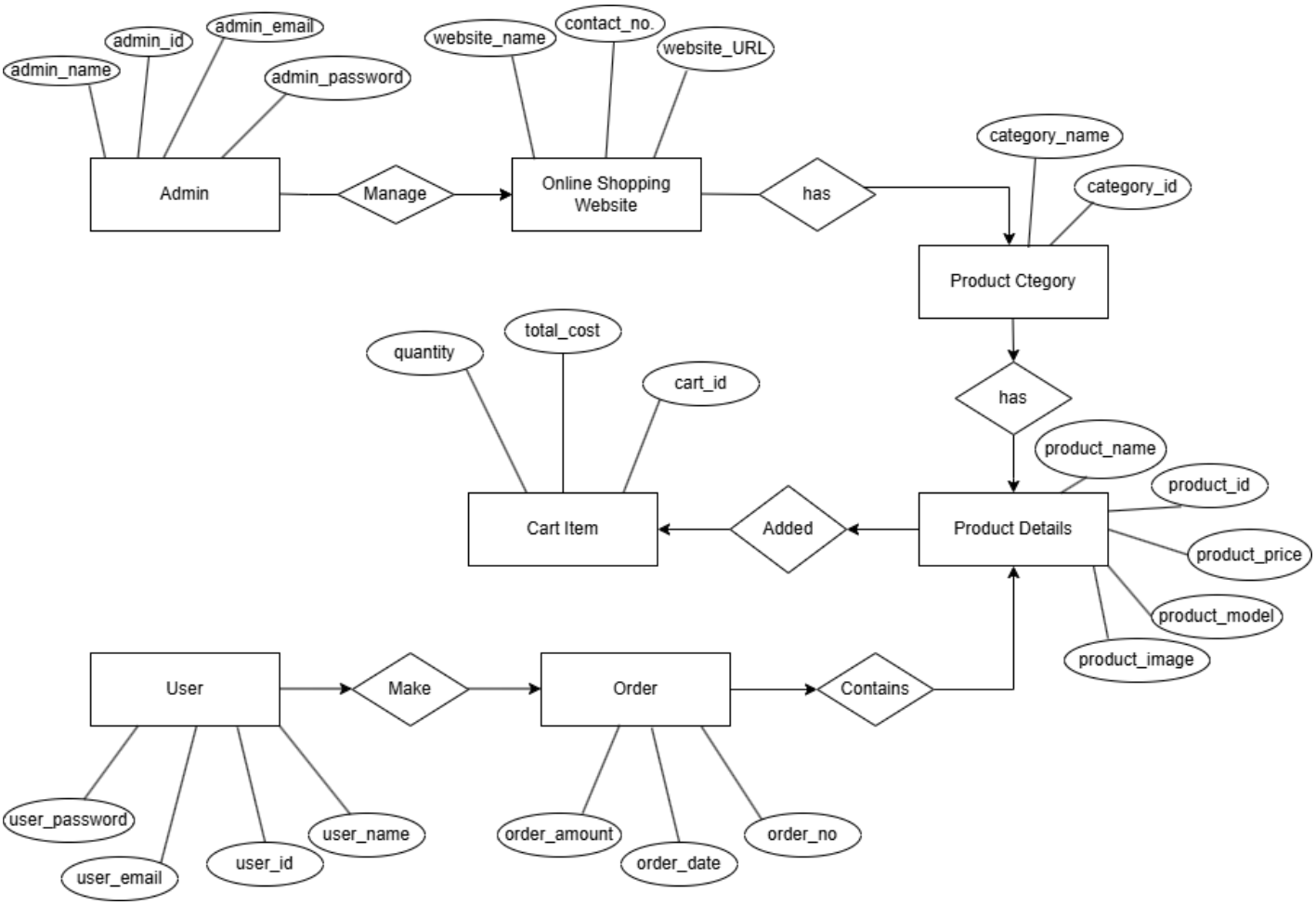
- **Features:**
    - **User-Friendly Interface:** Intuitive design and easy navigation for a seamless shopping experience.
    - **Secure Online Transactions:** Secure payment gateways and data encryption for safe online shopping.
    - **Increased Efficiency:** Automation of tasks leads to faster order processing and reduced operational costs.

System Design

Use Case Diagram



Entity-Relationship Diagrams (ERD)



Methodology

1. Tools and Technologies

Hardware Specifications:

Name of Component	Specification
Processor	Core 2 Duo processor and above
Memory (Primary)	4 GB RAM and above
Hard Disk	Greater than 500 GB
SSD	120 GB and above

Software Specifications:

Name of Component	Specification
User Interface	HTML, CSS
Back End	PHP
Database	MY SQL
Text Editor	Visual Studio Code
Server	XAMPP
Operating System	Windows (7/10/11)
Web Browser	Microsoft Edge, Google Chrome, Fire Fox, etc.

2. Algorithms and Frameworks

- **User Authentication:** Implement secure user authentication using techniques like password hashing (e.g., bcrypt) and session management.

- **Product Search and Filtering:** Utilize search algorithms (e.g., full-text search) and filtering options (e.g. category) to help users find products quickly.
- **Shopping Cart and Checkout:** Implement a robust shopping cart system with features like adding/removing items, calculating total cost

3. Step-by-Step Approach

1. **Requirement Gathering and Analysis:**
    - Define user requirements and system functionalities.
    - Create detailed use cases and user stories.
2. **Database Design:**
    - Design the database schema, including tables for users, products, orders, categories, and other relevant entities.
    - Establish relationships between tables using appropriate constraints.
3. **Front-end Development:**
    - Develop the user interface using HTML, CSS, and JavaScript.
    - Integrate Bootstrap for responsive design and a user-friendly experience.
    - Implement user registration, login, and profile management functionalities.
4. **Back-end Development:**
    - Develop PHP scripts for server-side logic, including user authentication, product management
5. **Database Integration:**
    - Connect the front-end and back-end to the MySQL database.
    - Implement data insertion, retrieval, and update operations using SQL queries.
6. **Testing and Debugging:**
    - Conduct thorough testing, including unit testing, integration testing, and user acceptance testing.
    - Debug and fix any issues that arise during testing.

Implementation

Index.php

```
<?php
session_start();
if (!isset($_SESSION['username'])) {
   header("Location: login.php"); // Redirect to login page if user is not logged in
   exit();
}

// Function to calculate total items in cart
function getCartItemCount() {
   $total_items = 0;
   if (isset($_SESSION['cart'])) {
      foreach ($_SESSION['cart'] as $item) {
         $total_items += $item['quantity'];
      }
   }
   return $total_items;
}

$cart_item_count = getCartItemCount();
?>

<!DOCTYPE html>
<html lang="en">
<head>
```

```
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
    <meta name="description" content="" />
    <meta name="author" content="" />
    <title>Shop Homepage</title>
    <!-- Bootstrap icons-->
    <link href="https://cdn.jsdelivr.net/npm/bootstrap-icons@1.5.0/font/bootstrap-icons.css" rel="stylesheet" />
    <!-- Core theme CSS (includes Bootstrap)-->
    <link href="css/styles.css" rel="stylesheet" />
</head>
<body>
    <!-- Navigation-->
    <nav class="navbar navbar-expand-lg navbar-light bg-light d-flex border align-items-center fw-bold " style="height:70px; font-family: Poppins, serif;">
        <div class="container px-4 px-lg-5">
            <a class="navbar-brand" href="#"><img src="./assets/logo-Photoroom.png" alt="" style="width:100px;">Fun Store</a>
            <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-target="#navbarSupportedContent" aria-controls="navbarSupportedContent" aria-expanded="false" aria-label="Toggle navigation"><span class="navbar-toggler-icon"></span></button>
            <div class="collapse navbar-collapse" id="navbarSupportedContent">
                <ul class="navbar-nav me-auto mb-2 mb-lg-0 ms-lg-4">
                    <li class="nav-item"><a class="nav-link" href="index.php">Home</a></li>
                    <li class="nav-item"><a class="nav-link" href="#">About</a></li>
                    <!-- Categories Dropdown -->
```

```
                <li class="nav-item dropdown">
                    <a class="nav-link dropdown-toggle" id="navbarDropdown"
href="#" role="button" data-bs-toggle="dropdown" aria-
expanded="false">Category</a>
                    <ul class="dropdown-menu" aria-
labelledby="navbarDropdown">
                        <li><a class="dropdown-item"
href="index.php?category=home">All Products</a></li>
                        <li><a class="dropdown-item"
href="index.php?category=bag">Bag</a></li>
                        <li><a class="dropdown-item"
href="index.php?category=mobile">Mobiles</a></li>
                        <li><a class="dropdown-item"
href="index.php?category=laptop">Laptops</a></li>
                    </ul>
                </li>
            </ul>
            <form class="d-flex align-items-center" style="gap: 15px;">


                <?php if (isset($_SESSION['username'])): ?>
                    <h6>Hello <?php echo $_SESSION['username']; ?></h6>
                    <a href="logout.php" class="btn btn-danger px-3">Logout</a>
                <?php else: ?>
                    <a href="login.php" class="btn btn-success px-3">Login</a>
                <?php endif; ?>


                <!-- Update the cart badge dynamically with the total items in the
cart -->
                <a href="cart.php" class="btn btn-outline-dark">
```

```
                    <i class="bi-cart-fill me-1"></i>
                    Cart
                    <span class="badge bg-dark text-white ms-1 rounded-pill">
                        <?php echo $cart_item_count; ?>
                    </span>
                </a>

            </form>
        </div>
    </div>
</nav>

<!-- Header -->
<header class="bg-dark py-5 mt-2" style="background-image: url('./assets/banner.jpg'); background-size: cover; background-position: center; height: 45vh;">
    <div class="container px-4 px-lg-5 my-5">
        <!-- Optional header content -->
    </div>
</header>

<!-- Section -->
<section class="py-5">
    <div class="container px-4 px-lg-5 mt-5">
        <div class="row gx-4 gx-lg-5 row-cols-2 row-cols-md-3 row-cols-xl-4 justify-content-center">
            <?php
            // Database connection
```

```
include "../db.php";

// Handle category filter from URL parameters
$category = isset($_GET['category']) ? $_GET['category'] : 'home';

// Build SQL query based on the selected category
if ($category == 'home') {
    $sql = "SELECT * FROM product";
} else {
    $sql = "SELECT * FROM product WHERE pcategory = '" . mysqli_real_escape_string($conn, $category) . "'";
}

// Execute the query
$result = mysqli_query($conn, $sql);

// Check if any products exist
if (mysqli_num_rows($result) > 0) {
    while ($row = mysqli_fetch_assoc($result)) {
        $image = !empty($row["pimage"]) ? '../admin/product/' . $row["pimage"] : 'path/to/placeholder.jpg';

        echo '<div class="col mb-5">';
        echo '    <div class="card h-100">';
        echo '        <img class="card-img-top" src="' . $image . '" alt="Product Image" />';
        echo '        <div class="card-body p-4">';
        echo '            <div class="text-center">';
```

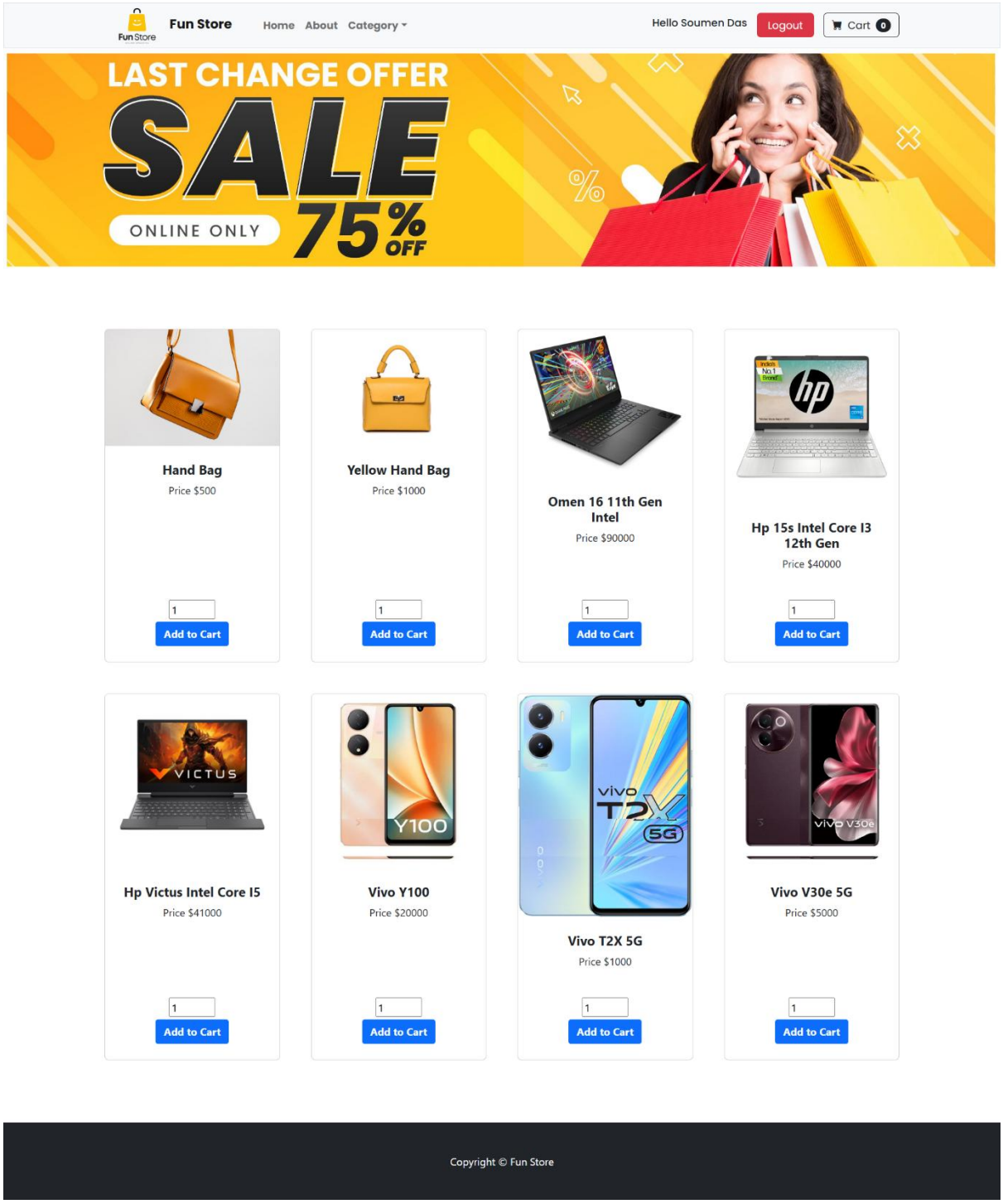
```
                echo '              <h5 class="fw-bolder">' .
ucwords($row["pname"]) . '</h5>';
                echo '              <p>Price $' . $row["pprice"] . '</p>';
                echo '          </div>';
                echo '      </div>';
                echo '      <div class="card-footer p-4 pt-0 border-top-0 bg-
transparent">';
                echo '          <div class="text-center">';
                echo '              <form action="add_to_cart.php"
method="POST">';
                echo '                  <input type="hidden" name="product_id"
value="' . $row["id"] . '">';
                echo '                  <input type="hidden" name="product_name"
value="' . $row["pname"] . '">';
                echo '                  <input type="hidden" name="product_price"
value="' . $row["pprice"] . '">';
                echo '                  <div class="my-1"><input type="number"
name="quantity" min="1" max="10" value="1"/></div>';
                echo '                  <button type="submit" class="btn btn-primary
fw-bolder text-white mt-auto rounded-1">Add to Cart</button>';
                echo '              </form>';
                echo '          </div>';
                echo '      </div>';
                echo '  </div>';
                echo '</div>';
            }
        } else {
            echo '<div class="col-12"><h5 class="text-center card">No
products found in this category.</h5></div>';
        }
```

```
            // Close database connection
            mysqli_close($conn);
            ?>
        </div>
    </div>
</section>

<!-- Footer -->
<footer class="py-5 bg-dark">
    <div class="container">
        <p class="m-0 text-center text-white">Copyright &copy; Fun Store 2024 by Soumen Das</p>
    </div>
</footer>

<!-- Bootstrap core JS -->
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.3/dist/js/bootstrap.bundle.min.js"></script>
<!-- Core theme JS-->
<script src="js/scripts.js"></script>
</body>
</html>
```

Output:


Fun Store
Home
About
Category
Hello Soumen Das
Logout
Cart 0
LAST CHANGE OFFER
SALE
ONLINE ONLY
75% OFF
Hand Bag
Price $500
Add to Cart
Yellow Hand Bag
Price $1000
Add to Cart
Omen 16 11th Gen Intel
Price $90000
Add to Cart
Hp 15s Intel Core I3 12th Gen
Price $40000
Add to Cart
Hp Victus Intel Core I5
Price $41000
Add to Cart
Vivo Y100
Price $20000
Add to Cart
Vivo T2X 5G
Price $1000
Add to Cart
Vivo V30e 5G
Price $5000
Add to Cart
Copyright © Fun Store

Testing

1. Testing Methods

- **Unit Testing:**
  - Individual components (e.g., user authentication, product search, cart functionality) were tested independently to ensure they function as expected.
  - Used unit testing frameworks (e.g., PHPUnit for PHP) to write and execute automated tests.
- **Integration Testing:**
  - Tested the interaction between different modules (e.g., user module, product module, order module) to ensure they work together seamlessly.
- **System Testing:**
  - Tested the entire system end-to-end to ensure it meets the specified requirements and user expectations.

2. Test Cases and Results

- **User Registration and Login:**
  - Test Case 1: Verify successful registration with valid credentials.
    - Result: Passed.
  - Test Case 2: Verify unsuccessful registration with invalid credentials (e.g., missing fields, invalid email).
    - Result: Passed.
  - Test Case 3: Verify successful login with valid credentials.
    - Result: Passed.
  - Test Case 4: Verify unsuccessful login with invalid credentials.
    - Result: Passed.
- **Product Browsing and Search:**
  - Test Case 1: Verify successful product display on the homepage.
    - Result: Passed.

- Test Case 2: Verify successful product filtering by category and price.
    - Result: Passed.

Shopping Cart:

- Test Case 1: Verify successful addition of products to the cart.
    - Result: Passed.
- Test Case 2: Verify successful removal of products from the cart.
    - Result: Passed.
- Test Case 3: Verify correct calculation of cart totals (price, taxes, shipping).
    - Result: Passed.

Results and Discussion

Results:

- The implemented "Smart E-Shopping System" successfully provides a user-friendly platform for online shopping.
- Key features such as user registration, product browsing, shopping cart functionality successfully implemented.
- The admin panel provides the necessary tools for managing products, users, and orders.
- Initial user feedback indicates a positive response to the system's usability and features.

Discussion:

- The system demonstrates the effectiveness of using a combination of front-end and back-end technologies (HTML, CSS, JavaScript, PHP, MySQL) for developing a functional Smart E-Shopping System.
- The use of a robust database system ensures data integrity and allows for efficient data retrieval and management.
- The system provides a solid foundation for future enhancements and customization based on user needs and market trends.

Conclusion and Future Work

Summary:

- This project successfully developed a "Smart E-Shopping System" that addresses many of the limitations of traditional e-commerce platforms.
- The system incorporates key features such as user-friendly interface, personalized recommendations, secure transactions, and efficient inventory management.
- The project demonstrates the feasibility of developing a functional and user-friendly e-commerce platform using a combination of web development technologies**.**

Future Work:

- Enhance Personalization: Implement more sophisticated recommendation algorithms using machine learning techniques.
- Integrate social media: Integrate with social media platforms for marketing, customer engagement, and social login.
- Mobile App Development: Develop a mobile app for a seamless shopping experience on mobile devices.
- Implement Chatbots: Integrate chatbots for customer support and personalized assistance.
- Focus on Sustainability: Implement eco-friendly packaging and shipping options to reduce environmental impact.

References

Textbooks Guide:

- Robbins, J. (2018). *Learning web design: A beginner's guide to HTML, CSS, JavaScript, and web graphics* (5th ed.). O'Reilly Media.
- Software Engineering, N.S. Gill, Khanna Publishing House
- The Unified Modeling Language User Guide, Grady Booch, James Raumbaugh, Ivar Jacobson.

Website Reference:

- W3Schools. (n.d.). *HTML tutorial*. Retrieved from https://www.w3schools.com/html/
- Mozilla Developer Network (MDN). (n.d.). *HTML: HyperText Markup Language*. Retrieved from https://developer.mozilla.org/en-US/docs/Web/HTML
- PHP Documentation. (n.d.). *PHP: Hypertext preprocessor*. Retrieved from https://www.php.net/docs.php
- MySQL Documentation. (n.d.). *MySQL 8.0 reference manual*. Retrieved from https://dev.mysql.com/doc/
- Stack Overflow Insights. (2022). *The state of software engineering*. Retrieved from https://insights.stackoverflow.com/trends

Appendices

Tables Designed

Table	Action	Rows	Type	Collation	Size	Overhead
admin	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	32.0 KiB	-
product	Browse Structure Search Insert Empty Drop	8	InnoDB	utf8mb4_general_ci	16.0 KiB	-
users	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_general_ci	32.0 KiB	-
3 tables	Sum	11	InnoDB	utf8mb4_general_ci	80.0 KiB	0 B

Check all With selected:

Product

	id	pname	pprice	pimage	pcategory
Edit Copy Delete	1	Hand Bag	500	uploadimages/handbag.jpg	bag
Edit Copy Delete	2	yellow hand Bag	1000	uploadimages/pink hand bag.jpg	bag
Edit Copy Delete	5	omen 16 11th Gen Intel	90000	uploadimages/omen 16.png	laptop
Edit Copy Delete	6	Hp 15s Intel Core I3 12th Gen	40000	uploadimages/hp15.jpg	laptop
Edit Copy Delete	7	Hp Victus Intel Core I5	41000	uploadimages/HP-Victus 15.jpg	laptop
Edit Copy Delete	8	Vivo y100	20000	uploadimages/vivo-y100.jpg	mobile
Edit Copy Delete	9	Vivo T2X 5G	1000	uploadimages/Vivo T2X 5G.jpg	mobile
Edit Copy Delete	10	vivo V30e 5G	5000	uploadimages/vivo v30e.jpg	mobile

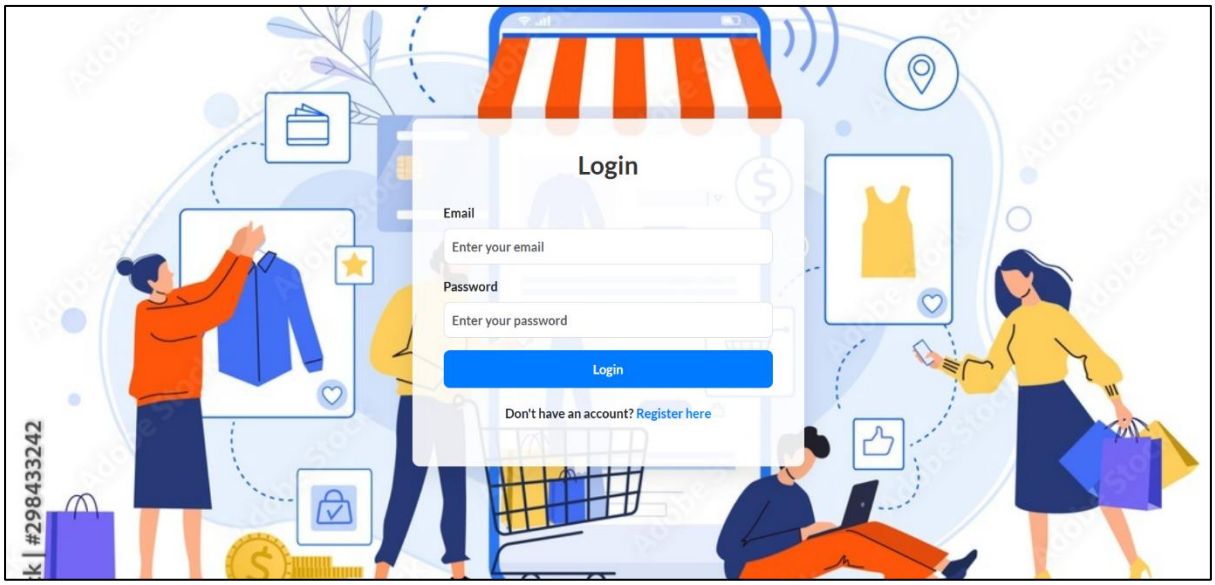
User

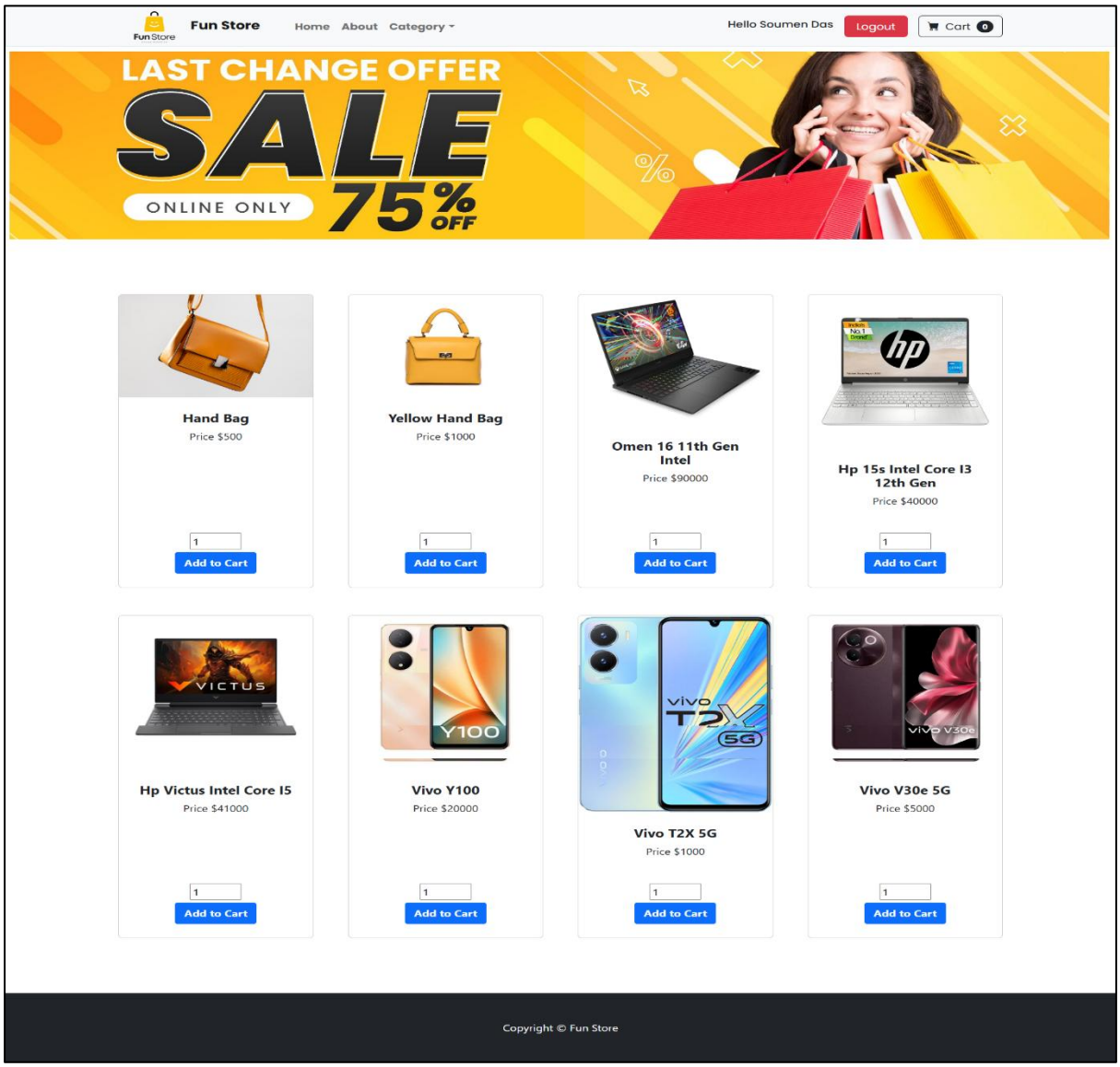
	id	username	email	password	created_at
Edit Copy Delete	1	Soumen Das	soumen@gmail.com	$2y$10$zVeWjKuWpulu7P79eRThi.wbNZJAo05Y3BpVRtHZu36...	2024-10-10 12:07:25
Edit Copy Delete	2	Sanchita Tah	sanchitatah@gmail.com	$2y$10$/UAFleSMLkO4OXLRojqZi.aX/fQMWeqaQtlIAXbxHIT...	2024-10-18 20:25:06

Admin

	id	username	email	password
Edit Copy Delete	1	Soumen Das	soumen@gmail.com	$2y$10$89y5l/FjWvXVZSsRt/ft9ekENlGYy3xqXXlj/QH4Q7E...

Snapshots


Login
Email
Enter your email
Password
Enter your password
Login
Don't have an account? Register here


Fun Store
Home
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Category
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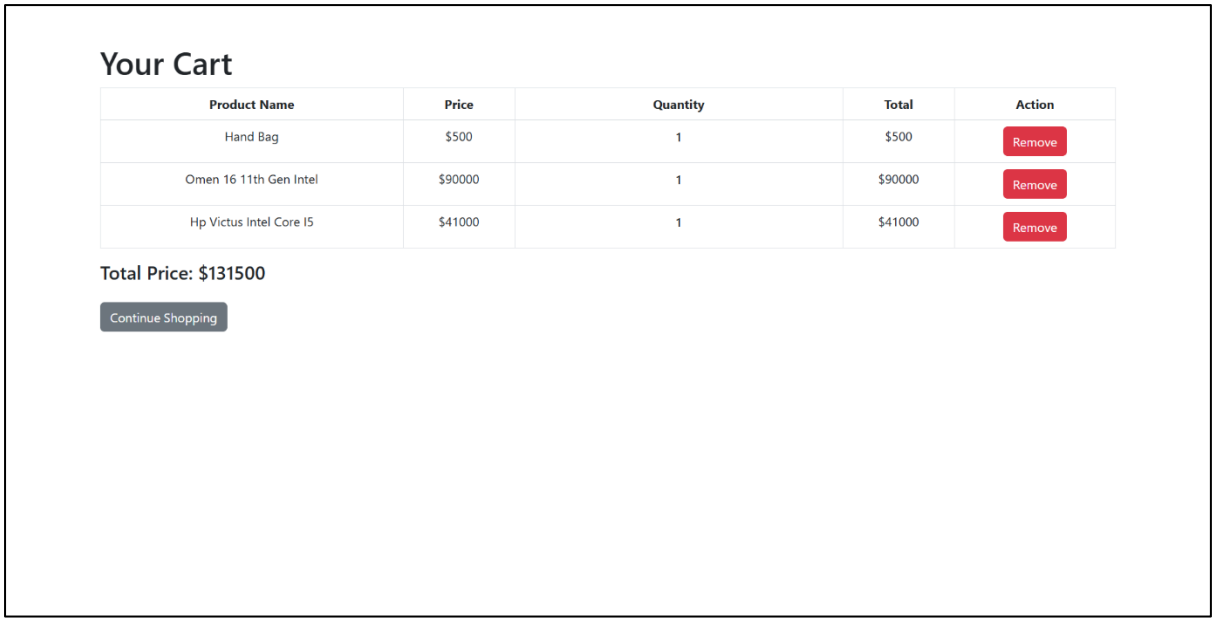
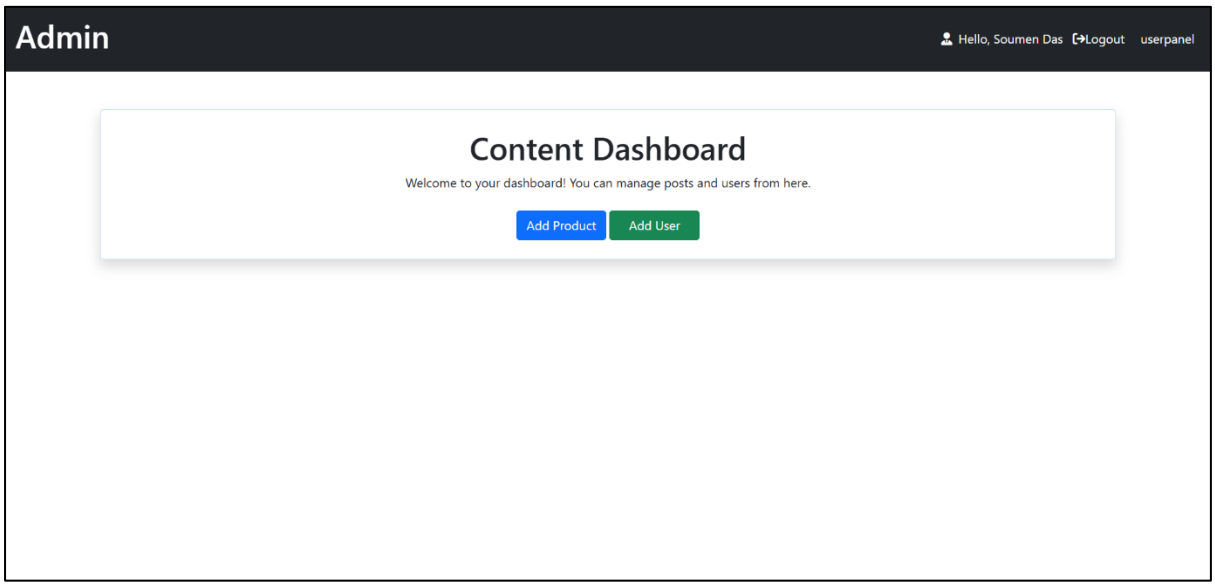
Logout
Cart 0
LAST CHANGE OFFER
SALE
ONLINE ONLY
75% OFF
Hand Bag
Price $500
Add to Cart
Yellow Hand Bag
Price $1000
Add to Cart
Omen 16 11th Gen Intel
Price $90000
Add to Cart
Hp 15s Intel Core I3 12th Gen
Price $40000
Add to Cart
Hp Victus Intel Core I5
Price $41000
Add to Cart
Vivo Y100
Price $20000
Add to Cart
Vivo T2X 5G
Price $1000
Add to Cart
Vivo V30e 5G
Price $5000
Add to Cart
Copyright © Fun Store


Your Cart
Product Name
Price
Quantity
Total
Action
Hand Bag
$500
1
$500
Remove
Omen 16 11th Gen Intel
$90000
1
$90000
Remove
Hp Victus Intel Core I5
$41000
1
$41000
Remove
Total Price: $131500
Continue Shopping


Admin
Hello, Soumen Das
Logout
userpanel
Content Dashboard
Welcome to your dashboard! You can manage posts and users from here.
Add Product
Add User

Product Detail

Product Name:

Enter product name

Product Price:

Enter product price

Add Product Image:

Choose File No file chosen

Select Page Category:

Home

Upload

Product List

ID	Product Name	Price	Category	Picture	Actions
1	Hand Bag	$500	Bag		Update Delete
2	yellow hand Bag	$1000	Bag		Update Delete
5	omen 16 11th Gen Intel	$90000	Laptop		Update Delete
6	Hp 15s Intel Core I3 12th Gen	$40000	Laptop		Update Delete
7	Hp Victus Intel Core I5	$41000	Laptop		Update Delete
8	Vivo y100	$20000	Mobile		Update Delete
9	Vivo T2X 5G	$1000	Mobile		Update Delete
10	vivo V30e 5G	$5000	Mobile		Update Delete