

**Bangabandhu Sheikh Mujibur Rahman Digital University, Bangladesh**

**Faculty of Cyber Physical Systems**

**Department of Internet of Things and Robotics Engineering**

**B.Sc. in Internet of Things and Robotics Engineering**

Course Title:Software Engineering Lab

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## Project Requirements

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### **Introduction:**

The Online Shop Management System is a web-based platform designed to facilitate the seamless buying and selling of products. It allows users to browse and purchase items, manage their shopping carts, and process payments securely. The system also includes a **user management module** for registration, login, and authentication, ensuring secure transactions.

### **Project Scope:**

* **For Customers**: Users can browse products by category, add items to their shopping cart, review product details, and complete purchases using various payment methods. They can also view their order history and track deliveries.
* **For Admins**: Admins can manage the product catalog, monitor customer orders, and handle user accounts through a dedicated admin interface.
* The system will support secure payments, product reviews, and offer a scalable architecture capable of handling high traffic.

### **1. System Requirements**

#### **Hardware Requirements:**

* **Server-Side**:
  + Processor: Quad-core, 2.4 GHz or higher.
  + RAM: 8 GB or more.
  + Storage: 512 GB SSD for fast product and user data access.
  + Network: High-speed internet for smooth interactions between users and the server.
* **Client-Side**:
  + Device: Any standard PC or mobile device with internet access.
  + Browser: Chrome, Firefox, or any modern browser.

#### **Software Requirements:**

* **Backend**:
  + Web server software .
  + Programming language for backend development.
  + Database system .
* **Frontend**:
  + Frontend framework.
  + HTML, CSS, JavaScript for basic web page design.

#### **Network Requirements:**

* Secure connection with HTTPS to ensure encrypted data transmission.
* Firewalls and Intrusion Detection Systems (IDS) for cybersecurity.

### **2. Functional Requirements**

These describe the behavior and specific functionalities that the system must exhibit.

#### **User Management System:**

* **User Registration**:
  + Users must be able to create accounts by providing details such as name, email, password, and contact information.
  + Email verification should be required for account activation.
* **User Login/Authentication**:
  + Users should log in using their email and password.
  + Implement password reset functionality via email verification.
  + OTP Based authentication (optional).
* **Roles and Permissions**:
  + Admin role to manage products, orders, and users.
  + Customer role to browse products, place orders, and track deliveries.

#### **Product Management:**

* **Product Browsing**:
  + Users should be able to browse products..
* **Product Details**:
  + Each product should have a detailed page showing its price, description, images, and reviews.
* **Shopping Cart**:
  + Users can add products to their cart and update the cart by removing items or changing quantities.
  + The system should show the total price of items in the cart.
* **Checkout**:
  + Users can proceed to checkout to finalize their purchase.
  + Payment gateways such as PayPal, credit cards, and bank transfers should be supported.

#### **Order Management:**

* **Order Placement**:
  + Once the payment is made, an order should be placed, and the user should receive an email confirmation.
* **Order Tracking**:
  + Users should be able to track their orders from dispatch to delivery.

#### **Review and Rating System:**

* Customers can rate and review products after purchase.

#### **Admin Panel:**

* Admins can add, edit, or remove products.
* Admins can view and manage orders, customers, and reviews.

### **3. Non-Functional Requirements**

These describe the quality attributes and performance standards of the system.

#### **Performance:**

* The system must be able to handle a high number of users.
* Pages should load within 2-3 seconds under normal conditions.

#### **Security:**

* Use strong encryption protocols for data transmission.
* Secure password storage using hashing (e.g., bcrypt).
* The system should be protected from common security threats such as SQL injection, XSS (Cross-Site Scripting), and DDoS attacks.

#### **Usability:**

* The interface should be intuitive and easy to navigate, even for first-time users.
* Provide clear feedback on user actions (e.g., successful login, added to cart, etc.).

#### **Reliability:**

* Data backup systems should be in place to recover from potential failures.

#### **Scalability:**

* The system should be able to scale as the user base grows, particularly during sales events or promotions.

#### **Maintainability:**

* The codebase should be modular and well-documented to allow for easy updates and bug fixes.

### **4. User Interface Requirements**

#### **Home Page:**

* The homepage should feature product categories, promotions, and popular items.
* Users should be able to search for products directly from the homepage.

#### **Product Page:**

* Displays detailed product information, pricing, and reviews.
* "Add to Cart" and "Buy Now" buttons should be clearly visible.

#### **Login/Signup Page:**

* Simple and minimalistic design for easy registration and login.
* Password recovery link should be included.

#### **Checkout Page:**

* Should display the summary of the items in the cart, the total price, and available payment options.