

Software Requirements Specification

MERN E-Commerce Application

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December 29, 2024

Version 1.0

1 Introduction

1.1 Purpose

This document specifies the requirements for the MERN-based e-commerce application. It outlines the functionalities, performance criteria, and design constraints necessary for developing the system. This document is intended for all stakeholders involved in the development process, including the project manager, developers, and testers.

1.2 Scope

This application will enable customers to browse products, add items to a cart, place orders, manage their accounts, and view order history. Additionally, administrators will have the capability to manage products, orders, and users. The core technologies will be MongoDB, Express.js, React.js, and Node.js.

1.3 Definitions, Acronyms, and Abbreviations

- **MERN:** MongoDB, Express.js, React.js, Node.js
- **SRS:** Software Requirements Specification
- **API:** Application Programming Interface

1.4 References

- ERD Diagram
- Initial Project Proposal Document

2 Overall Description

2.1 Product Perspective

This is a web application accessible through standard web browsers. It will be a stand-alone product but can be expanded in the future. It will provide a seamless e-commerce experience.

2.2 Product Features

- **User Authentication and Authorization:** Secure registration, login, and role-based access (customer and admin).
- **Product Browsing:** Ability to view a list of products with filtering and searching options.
- **Shopping Cart:** Add, remove, and manage products in a shopping cart.
- **Order Processing:** Place orders, manage payment processing, and view order history.
- **User Account Management:** Manage user profiles and address details.
- **Admin Panel:**
 - **Product Management:** Add, edit, and delete products.
 - **Order Management:** View and manage all orders.
 - **User Management:** View and manage all users.
 - **Coupon Management:** Create, edit, activate, and deactivate coupons.
- **Payment Integration:** Integrated with a payment gateway to process transactions (e.g., Stripe).
- **Coupon Application:** Apply coupons to order

2.3 User Classes and Characteristics

- **Customer:** Users who browse products and place orders.
- **Admin:** Users with administrative privileges to manage the application.

2.4 Operating Environment

- Web application will be hosted on cloud servers.
- Web browser support includes modern browsers like Chrome, Firefox, and Safari.
- Client devices include laptops, desktops, tablets, and smartphones.

2.5 Design and Implementation Constraints

- The application must be responsive across various screen sizes.
- The database must be scalable and capable of handling a large number of users and products.
- Security measures should be implemented to prevent unauthorized access.
- The application should adhere to industry best practices for web security.

3 Specific Requirements

3.1 Functional Requirements

3.1.1 User Module

- **FR_USER_001:** Users shall be able to register a new account with a valid email address, a name, and password.
- **FR_USER_002:** Registered users shall be able to log in securely with their credentials.
- **FR_USER_003:** Users shall be able to log out from their session.
- **FR_USER_004:** Users shall be able to update their profile information.
- **FR_USER_005:** Users can view, add, update and remove products from the cart

3.1.2 Product Module

- **FR_PROD_001:** Users shall be able to browse products by category.
- **FR_PROD_002:** Users shall be able to search for products by name.
- **FR_PROD_003:** Users shall be able to view detailed product information.

3.1.3 Order Module

- **FR_ORDER_001:** Users shall be able to add products to their shopping cart.
- **FR_ORDER_002:** Users shall be able to view their shopping cart with product details and total amount.
- **FR_ORDER_003:** Users shall be able to update and remove items from the cart.
- **FR_ORDER_004:** Users should be able to apply valid coupons to the order
- **FR_ORDER_005:** Users shall be able to place an order using a secured payment gateway.
- **FR_ORDER_006:** Users shall be able to view their order history with details.

3.1.4 Admin Module

- **FR_ADMIN_001:** Admin users shall be able to log in with their credentials.
- **FR_ADMIN_002:** Admin users shall be able to add new products with name, description, image, price, stock count, and category.
- **FR_ADMIN_003:** Admin users shall be able to edit and delete product details.
- **FR_ADMIN_004:** Admin users shall be able to view and manage all placed orders.
- **FR_ADMIN_005:** Admin users shall be able to view and manage all users.
- **FR_ADMIN_006:** Admin users shall be able to create, edit, and delete coupons

3.2 Non-Functional Requirements

3.2.1 Performance

- **NFR_PERF_001:** The application should load pages in under 3 seconds.
- **NFR_PERF_002:** The application should handle 1000 concurrent users without performance degradation.

3.2.2 Security

- **NFR_SEC_001:** User passwords must be securely stored using hashing and salting techniques.
- **NFR_SEC_002:** The application must protect against common web vulnerabilities such as SQL injection and Cross-Site Scripting (XSS).
- **NFR_SEC_003:** All payment transactions must be securely processed by third-party payment gateways.
- **NFR_SEC_004:** Only admin users shall have access to admin-specific functionalities.

3.2.3 Usability

- **NFR_USA_001:** The application should have a user-friendly interface that is easy to navigate and understand.
- **NFR_USA_002:** The application should provide clear feedback to user actions.
- **NFR_USA_003:** The application should be responsive on all types of devices (desktops, tablets, smartphones).

3.2.4 Scalability

- **NFR_SCA_001:** The system should be scalable to handle an increasing number of users, products, and transactions.

4 Future Enhancements

- Implement wish list functionality.
- Add customer reviews and ratings for products.
- Integrate customer support system using chatbot or ticketing system.
- Personalized recommendations based on user activity.
- Implement product stock notifications.