**SOFTWARE REQUIREMENT SPECIFICATION FOR**

**E-COMMERCE APPLICATION**

**Requirement Analysis:**

1. **User Authentication and Authorization**

**Description**: Users should be able to register, login, and logout securely.

* **Functional Requirements:**
* Registration: Users can create an account with email/password or social media authentication.
* Login: Users should be able to log in securely using their credentials.
* Logout: Users can securely log out of their accounts.
* **Non-functional Requirements:**
* Security: Implement secure authentication mechanisms like bcrypt for password hashing.
* Privacy: Ensure user data privacy and compliance with relevant regulations

1. **Product Browsing and Searching**

**Description**: Users should be able to browse and search for products easily.

* **Functional Requirements:**
  + Product Categories: Products should be organized into categories for easy navigation.
  + Search: Implement a search functionality allowing users to find products by name, category, or attributes.
  + Filtering: Allow users to filter search results based on various criteria (e.g., price, brand).
* **Non-functional Requirements:**
  + Performance: Ensure fast and responsive browsing and searching, minimizing server-side processing time.
  + Accessibility: Design the browsing and search interfaces to be accessible to users with disabilities.

1. **Shopping Cart Management**

**Description**: Users should be able to add/remove products to/from their shopping carts.

* **Functional Requirements:**
  + Add to Cart: Users should be able to add products to their carts from product pages.
  + Remove from Cart: Users should be able to remove products from their carts.
  + Quantity Adjustment: Allow users to change the quantity of products in their carts.
* **Non-functional Requirements:**
  + Persistence: Ensure that shopping cart contents persist across user sessions.
  + Scalability: Design the shopping cart system to handle a large number of concurrent users.

1. **Checkout Process**

**Description**: Streamlined process for users to complete purchases securely.

* **Functional Requirements:** 
  + Payment option: Multiple payment options (credit card, PayPal, etc.).
  + Address : Shipping address and delivery options.
  + Order Summary : Order summary before finalizing purchase.
* **Non-Functional Requirements:**
  + - Security: Secure transmission of payment information using encryption.
    - Esurance : Confirmation email with order details sent to the user.

1. **Order Management**

**Description**: Administrators should be able to manage orders efficiently.

* **Functional Requirements:**
  + Track Order : View and filter orders by status (pending, shipped, delivered).
  + Status : Update order status (e.g., mark as shipped).
  + Billing : Generate invoices and packing slips.
* **Non-Functional Requirements**:
  + Notifications : Notification system for new orders and status updates.
  + Data Management: Data archival and backup mechanisms to prevent data loss.

1. **Payment Processing**

**Description**: Secure processing of payments for orders.

* + Functional Requirements:
  + Payment gateways: Integration with payment gateways (Stripe, PayPal, etc.).
  + Error Handling :Handling of payment failures and retries.
  + Refund : Refund processing for cancelled orders.
  + Non-Functional Requirements:
    - Security: Compliance with PCI DSS standards for payment security.
    - Reliability: Redundant payment gateway integration for reliability.

1. **Performance Optimization**

**Description**: Ensure the application performs efficiently under varying loads.

* + **Functional Requirements**:
    - Performance: Load testing to determine performance thresholds.
    - Accessibility :Caching mechanisms for frequently accessed data.
  + **Non-Functional Requirements**:
    - Response time: Response time targets for different operations.
    - Scalability : Scalability planning for future growth.

1. **Sustainability into Software design and development**

**Description:** Incorporate sustainability principles into software design and development.

* + **Functional Requirements:**
    - Energy-efficient algorithms and data structures.
    - Minimization of server resource usage during idle periods.
    - Carbon footprint tracking and reporting.
  + **Non-Functional Requirements**:
    - Adoption of green hosting solutions (renewable energy sources, energy-efficient data centers).
    - Regular environmental impact assessments and improvement plans.