SOFTWARE REQUIREMENT SPECIFICATION FOR E-COMMERCE WEB APPLICATION

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1. Introduction

1.1 DOCUMENT PURPOSE

This document outlines the software requirements for developing an ecommerce web application using MERN stack. It serves as a guide for the developer, supervisor, and other involved parties to understand the project's scope, features, and functionalities.

1.2 PRODUCT SCOPE

The Ecommerce Store web application aims to provide a seamless platform for online shopping. The application will cater to two main user roles: clients and store owner.

- Clients will be able to browse, search, filter, and purchase items.
- Store owners will have access to an admin dashboard to manage inventory, orders, and customer data, all without requiring coding skills.

1.3 INTENDED AUDIENCE

The intended audience for this document includes:

- Development team: Student developing the project.
- Project supervisor: Professor overseeing the project.
- End users: Clients who will use the application to purchase products, as well as store owners who will manage their businesses through the platform.

1.4 DEFINITIONS, ACRONYMS, ABBREVIATIONS

Term	Definition
MERN Stack	MongoDB, Express.js, React.js, Node.js - A technology stack used for building full-stack web applications.
JWT	JSON Web Token - A compact, URL-safe means of representing claims to be transferred between two parties
API	Application Programming Interface - A set of rules and protocols for building and interacting with software applications
NoSQL	Non-SQL or non-relational database - A type of database that does not require a fixed schema, allowing for more flexibility in data storage and retrieval

1.5 OVERVIEW / DOCUMENT CONVENTIONS

This document follows a structured format designed to improve readability and comprehension, inspired by industry standards and practices. The conventions

outlined ensure clarity in presenting the functionalities of the Ecommerce Store web application.

1.6 STRUCTURE

The document is organized according to the guidelines established by IEEE, aiming for ease of navigation and understanding as well as providing a comprehensive overview of its functionality and requirements.

2. Overall Description

2.1 DOCUMENT PERSPECTIVE:

The software specification document outlines the functional and nonfunctional requirements of our Ecommerce Store web application, including user pathways and required features that the web application must possess to support these pathways.

2.2 DOCUMENT FUNCTIONS:

This document serves as a guide for both clients and developers. It provides clients with an overview of how users will interact with the web application and offers developers a foundational template for building the platform.

2.3 USER CHARACTERISTICS:

Our project targets online shoppers with basic computer literacy and familiarity with web browsing. The users are expected to be comfortable navigating websites and using common web browser functionalities.

2.4 END-USER OPERATING ENVIRONMENT:

Our project is accessible to anyone with a device equipped with internet connectivity. Users can access the platform from various devices, including computers, tablets, and smartphones. The users can explore listings, initiate purchase transactions, create an account to access additional features.

2.5 DESIGN AND IMPLEMENTATION CONSTRAINTS:

The primary constraint for using our project is the requirement for internet connectivity. Users must have access to the internet to utilize the platform effectively.

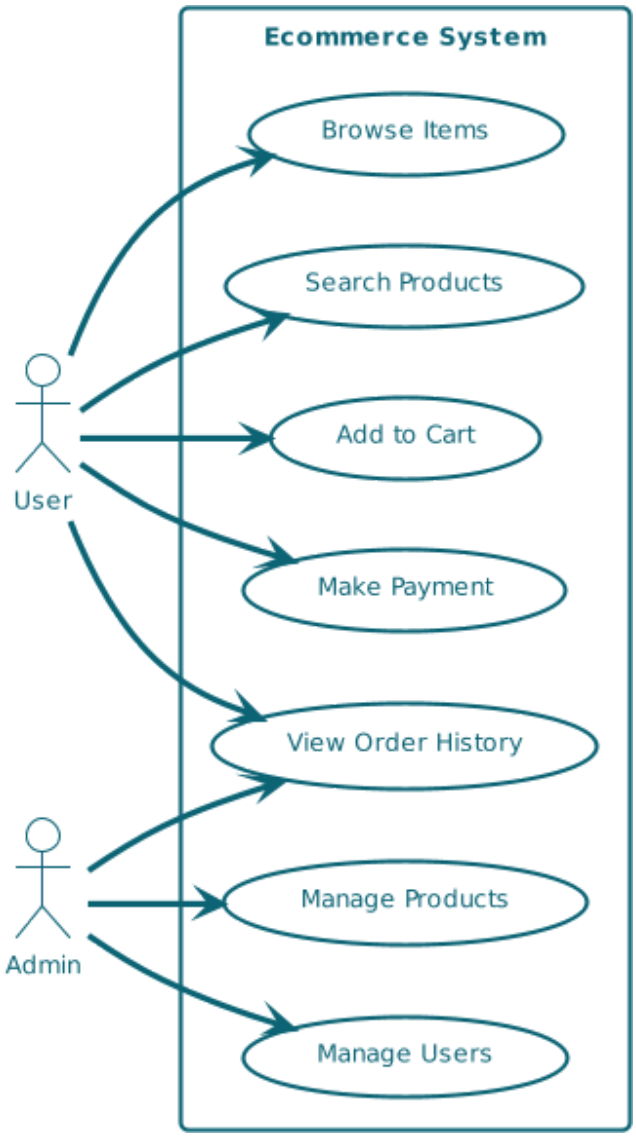
This constraint ensures that the platform's functionalities, such as browsing listings, making purchases, and accessing other features remain accessible and operational.

3. Functional Requirement

3.1 SUMMARY:

The web application aims to offer a seamless shopping experience for clients and efficient store management for store owners. It will include a user-friendly interface for browsing and purchasing items, along with an admin dashboard for managing inventory, orders, and customer data.

3.2 USE CASE DIAGRAM:



3.2.1 Use Case: Admin – Admin Management

Name of Use Case	Admin Management - Admin can manage users, update inventory, view orders, and generate sales reports.
Pre-Conditions	Admin accesses the correct webpage.
Post-Conditions	Admin successfully manages store operations.
Events Flow	1. Admin logs in to the admin dashboard. 2. Admin navigates to the "Manage Orders" section. 3. Admin views the list of orders and their details. 4. Admin confirms order information or modify an order if necessary. 5. Admin navigates to the "Manage Inventory" section. 6. Admin adds new items to the inventory or updates existing items. 7. Admin navigates to the "Manage Statistics" section. 8. Admin generates sales reports based on specified criteria.
Alternate Flow and Exceptions	If internet connection is lost, display error message. If admin encounters issues with updating inventory, display error message.

3.2.2 Use Case: Admin – Customer Interaction

Name of Use Case	Customer Interaction - Customers can register, sign in, browse inventory, add items to cart, and proceed to checkout.
Pre-Conditions	Customer accesses the correct webpage.
Post-Conditions	Customer completes a purchase and receives a confirmation email.
Events Flow	1. Customer accesses the website and browses the inventory as a guest. 2. Customer selects items and adds them to the cart. 3. When ready to checkout, customer is prompted to either continue as a guest or register for an account. 4. If customer chooses to register, they fill in the registration form. 5. System verifies the information and creates a new user account. 6. Customer logs in using the newly created account or as a guest. 7. Customer enters shipping and payment information. 8. System processes the payment and completes the purchase. 9. Customer receives a confirmation email.
Alternate Flow and Exceptions	If customer registration fails (e.g., invalid information), display error message. If payment processing fails, customer is prompted to try again or use a different payment method.

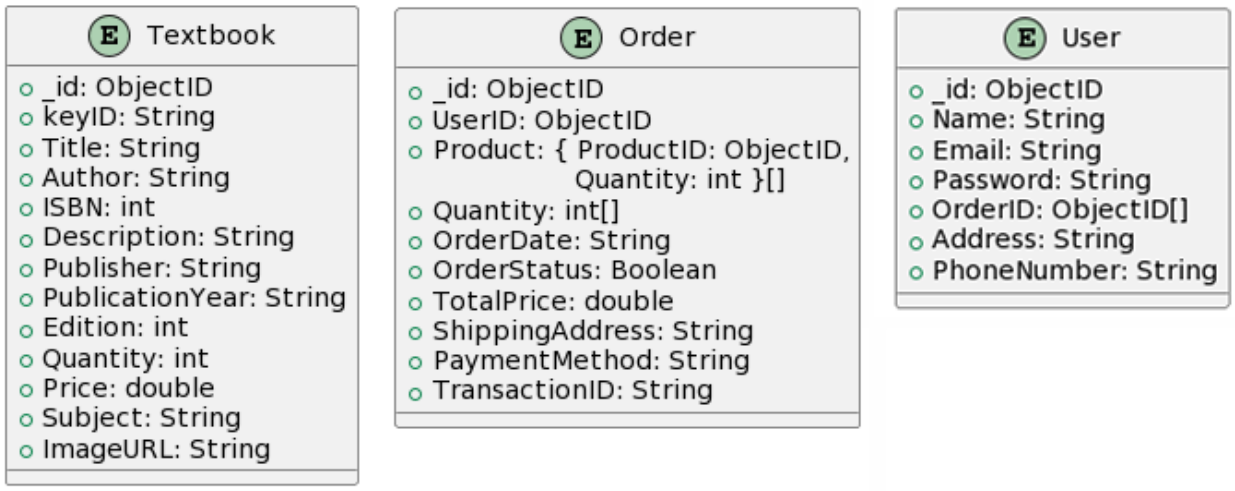
3.2.3 Use Case: Admin – Search And Filter

Name of Use Case	Search and Filter - Customers can search for products by category, brand, or price.
Pre-Conditions	User accesses the correct webpage.
Post-Conditions	User finds desired products based on search criteria.
Events Flow	1. User enters search criteria (e.g., category, brand, price range) in the search bar. 2. System filters the products based on the criteria entered. 3. User views the filtered products and selects a product of interest.
Alternate Flow and Exceptions	If no products match the search criteria, display message indicating that no results are found. If there are issues with filtering the products, display error message.

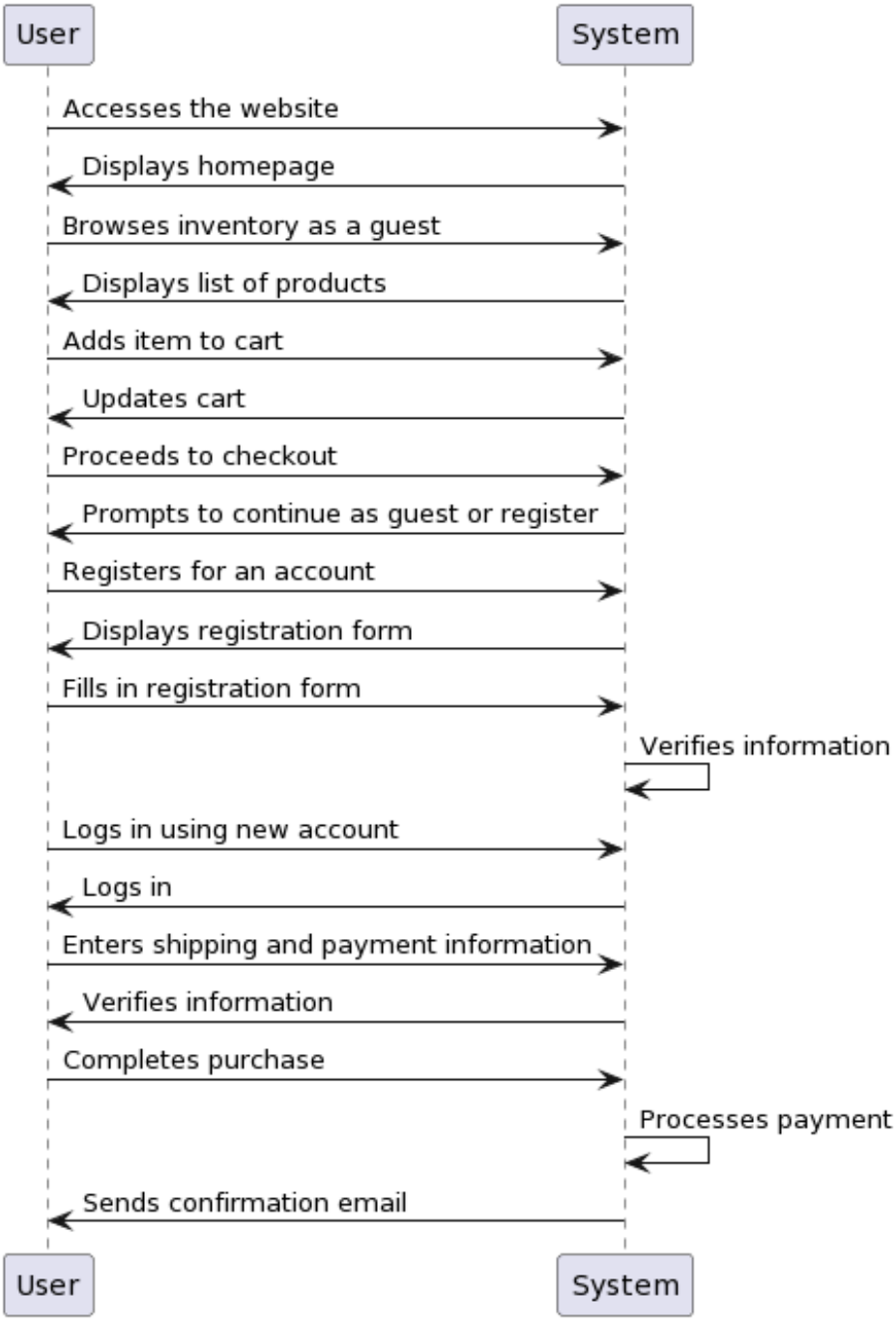
3.2.4 Use Case: Admin – Payment Security

Name of Use Case	Payment Security - Customers can securely complete transactions using a payment gateway integration.
Pre-Conditions	Customers have items in their cart.
Post-Conditions	Admin successfully manages store operations.
Events Flow	1. Customer proceeds to checkout with items in the cart. 2. Customer enters shipping and payment information. 3. System validates the payment information and processes the payment. 4. Customer receives a confirmation of the successful payment.
Alternate Flow and Exceptions	If the payment information is invalid, display error message. If the payment gateway is unavailable, customer is prompted to try again later.

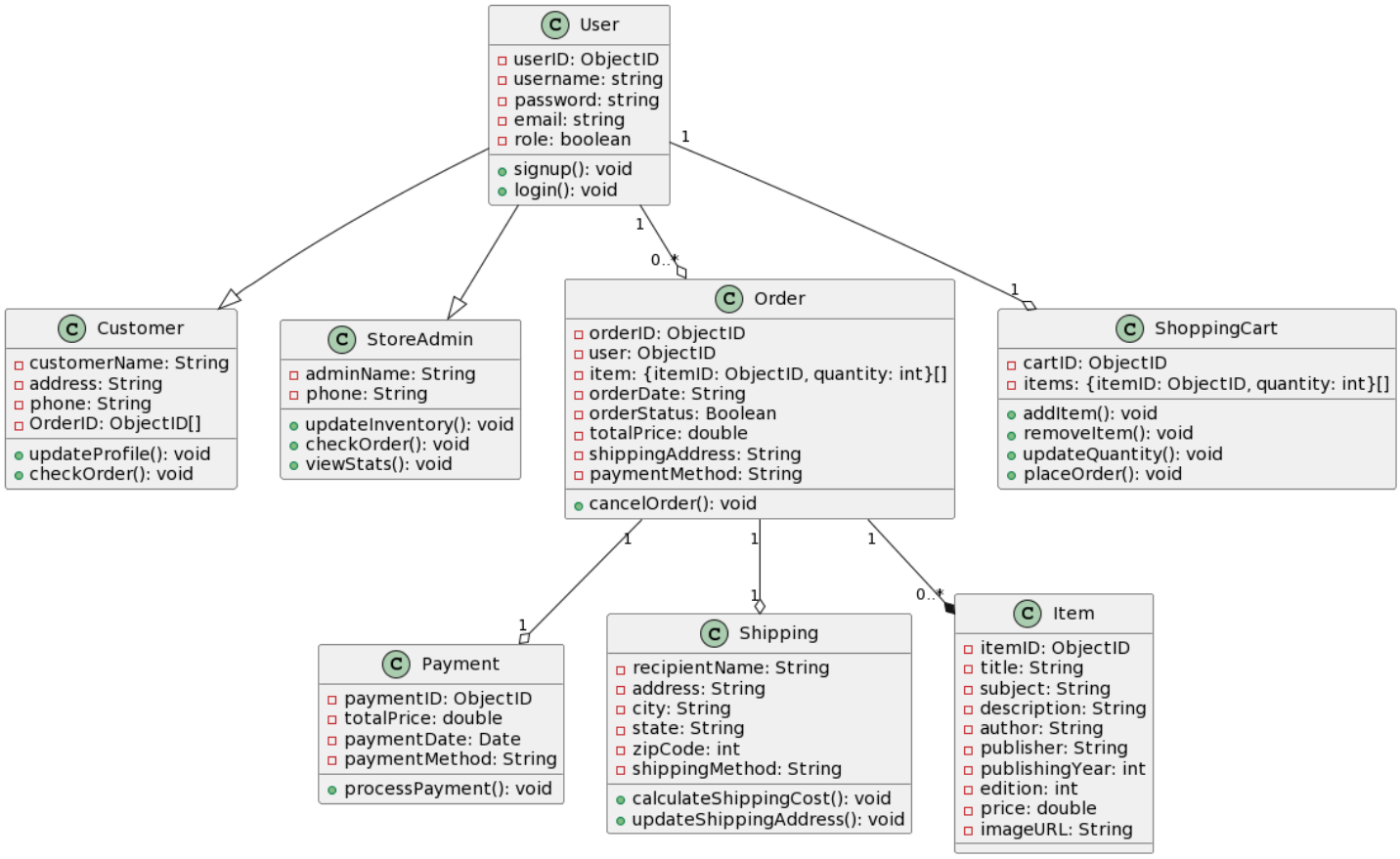
3.4 ENTITY-RELATION DIAGRAM



3.4 SEQUENCE DIAGRAM



3.5 CLASS DIAGRAM



3.6 HARDWARE / SOFTWARE REQUIREMENTS

3.6.1 Hardware Requirements for Customer and Admin:

Users will need a device with internet connectivity to access the ecommerce web application. This device can be a desktop computer, laptop, tablet, or smartphone.

3.6.2 Software Requirements for Customer and Admin:

Users will need a web browser to access the ecommerce web application. The application should be compatible with popular web browsers such as Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge.

3.6.3 Hardware Requirements for Developer:

Developers will require a computer with internet connectivity for development purposes. The computer can be a desktop or laptop with sufficient processing power, memory (RAM), and storage space to run development tools and software.

3.6.4 Software Requirements for Developer:

Developers will need various development tools and software to work on the ecommerce web application. This includes:

- Integrated Development Environment (IDE) such as Visual Studio Code, Atom, or JetBrains WebStorm for writing and editing code.
- Version control systems like Git and project management tools like Jira or Trello to track tasks.
- Node.js and npm for server-side development.
- MongoDB for database management.
- Other libraries, frameworks, and tools as required by the project, such as React.js for frontend development, Stripe SDK for payment gateway, and Vercel for deployment.

4. Non-Functional Requirements

4.1 RELIABILITY

The Website will be available 24/7 for users to access as long as they have an internet connection. The system does not use any outside sources that would render it unavailable unless the main website crashes. Additionally, regular maintenance and backups will be performed to ensure data integrity and availability.

4.2 ROBUSTNESS

The website should display errors in the event that the user has an unstable internet connection, ensuring that users are informed of the issue and can attempt to reconnect.

4.3 PERFORMANCE

The system login/logout should take less than 5 seconds, providing a quick and seamless experience for users. The system should also be able to support 1000 concurrent users, ensuring that it can handle peak traffic loads without degradation in performance.

4.4 MAINTAINABILITY

The application will be tested to make sure connectivity to the internet is always in place, and regular updates and maintenance will be performed to address any potential vulnerabilities or issues.

4.5 SECURITY

The website allows anyone to browse, however detailed views of items and sellers will only be allowed to users who create an account on the website. Additionally, user data will be encrypted and stored securely to protect against unauthorized access.

4.6 USABILITY

The website will be user-friendly to all types of people. It will be easy to navigate for any type of user, with intuitive interfaces and clear instructions to guide users through the site's features.