

E-Commerce Webshop Prototype

Requirements Document

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1 Project Overview

Our e-commerce webshop has a focus on a simple and modern shopping experience. There are the essential shopping features implemented, such as searching for products, filtering by category and adding them to the cart, and we want to include some extras that improve the user experience, like the option to switch between light and dark mode.

The shop should work smoothly on both mobile devices and desktop computers, so users can shop on both devices. Also, we are planning to add user logins so people can sign up and log in.

Our main features will be things like category filtering and a search function, so users can quickly search and find what they're looking for. The user is able to add products to the cart, update the quantities, and remove items. There will also be a checkout page. For better user experience, we will implement a switch where the user can choose between light and dark mode.

Target Users: Our target groups are *regular online shoppers*—people browsing on their laptops or smartphones—and *store administrators* who manage catalog and user data.

Application Goals:

- Build a clean, user-friendly webshop with a modern design.
- Make product search and category filtering fast and intuitive.
- Allow shoppers to create accounts and log in securely.
- Enable full shopping-cart functionality: add, update, and delete items.
- Provide an *admin panel* to create, update, and delete products and to manage (or remove) user accounts.
- Support both light mode and dark mode for better user comfort.
- Ensure a fully responsive design for mobile and desktop views.

2 Key Features

The following features define the core and extended functionality of our webshop. Each feature is marked as either **Must-Have** (essential for MVP) or **Nice-to-Have** (optional improvements).

- **Product Search and Filters (Must-Have):** Users can search for products using keywords and filter by categories, price range, or other attributes.
- **Shopping Cart (Must-Have):** Allows users to add products, update quantities, and remove items. A live total cost is shown and updated dynamically.
- **Checkout Process (Must-Have):** A guided, multi-step form to collect shipping and payment information. Ends with an order confirmation page.
- **Responsive Design (Must-Have):** Full support for both mobile and desktop views, ensuring a smooth and consistent experience across devices.
- **Light/Dark Mode Toggle (Must-Have):** Users can switch between light and dark themes for improved visual comfort.
- **User Authentication (Must-to-Have):** Includes user sign-up, login, and personalized account management.

- **Admin Dashboard (Must-to-Have):** Admins can manage products (CRUD operations).
- **Wishlist / Favorites (Nice-to-Have):** Allows users to save products for later or mark as favorites.
- **Product Reviews and Ratings (Nice-to-Have):** Enables users to leave product reviews and ratings for community feedback.
- **Multi-language Support (Nice-to-Have):** Adds support for multiple languages using localization files..

3 User Roles and Interactions

This section explains the different types of users who interact with our e-commerce webshop, their permissions, and the actions they can typically perform.

Administrator/Admin

The Administrator oversees the overall management of the webshop. This role has the highest level of access and can modify nearly every aspect of the site.

Typical Actions and Expected Outcomes:

- The admin can add, update, and remove products from the catalog, any changes are instantly visible to customers. For example, the admin might add a new product, such as *wireless headphones*, with a price of **129.99 €**.
- The admin can also manage user accounts – such as viewing user information or deleting accounts if it's needed.

Customer (Registered User)

Customers are users who have registered an account on the webshop. They can explore products, place orders, and manage their personal details and order history.

Typical Actions and Expected Outcomes:

- Customers can browse all available products, read detailed descriptions, and check their prices.
- They can also use the search bar or apply filters, such as by category to narrow down the results.
- Add products to the shopping cart for quick purchase.
- Can proceed to checkout, choose a payment method, and complete their order easily.
- Update personal information, including name, email, and password.

Guest User (Unregistered User)

A guest user can browse the webshop without creating an account, though their access is limited.

Typical Actions and Expected Outcomes:

- Can browse the products without logging in.
- Can register or Sign In.
- Can add products to the cart, but the cart will remain active only while they are on the website. Once they leave, everything will be removed. The users must have an account to purchase the products otherwise it will be not possible.

4 User Stories/Use Cases

Use Case 1: Register a New User

Actor(s): Visitor

Description: A visitor creates a new account to access personalized features

Preconditions: The user is not logged in.

Main Flow:

1. The user clicks on the “Sign Up” button.
2. The system presents a registration form.

3. The user enters their username, email, and password.
4. The system validates the data.
5. The system creates a new user account.
6. A confirmation message is sent to the user.

Postconditions: A new user is registered.

Alternative Flows: If the email exists, the system shows an error message.

Use Case 2: Log in to the Account

Actor(s): Registered User

Description: A user logs into their account to access their profile.

Preconditions: User is registered.

Main Flow:

1. The user clicks on the “Login” button.
2. The system displays the login form.
3. The user provides email and password.
4. The system authenticates the user.
5. On success, the user is redirected to the dashboard/homepage.

Postconditions: User is logged in.

Alternative Flows: If login credentials are invalid, an error message is shown.

Use Case 3: Add/Remove Product to/from the Cart

Actor(s): Logged-in or guest user

Description: The user adds/removes a product to/from the shopping cart.

Preconditions: The product needs to exist/needs to be added or removed.

Main Flow:

1. The user clicks on a product.
2. The system shows product details.
3. The user selects size/quantity if applicable.
4. The user clicks “Add to Cart” or “Remove from Cart”.
5. The system adds or removes the item from the cart accordingly.

Postconditions: Product is either added or removed from the cart.

Use Case 4: Checkout and Place Order

Actor(s): Logged-in user

Description: The user completes the purchase of products in their cart.

Preconditions: User has one or more items in the cart and is logged in.

Main Flow:

1. The user views the cart and clicks “Checkout.”
2. The user waits for 5 seconds while the system processes the order.
3. An order confirmation page is displayed.

Postconditions: The order is saved, and confirmation message is sent to the user.

Use Case 5: Manage Product Catalog

Actor(s): Admin

Description: The admin can add new products to the catalog or remove existing ones.

Preconditions: The admin is logged in and has the necessary permissions to manage products.

Main Flow:

1. The admin navigates to the “Product Management” section in the admin dashboard.

2. To add a product, the admin clicks on “Add New Product,” fills in the product details (such as name, price, description, and category), and submits the form.
3. To remove a product, the admin selects an existing product from the list, clicks on “Delete,” and confirms the action.
4. The system updates the product catalog, reflecting the changes immediately on the customer facing site.

Postconditions: New products are added to the catalog or existing products are removed, and changes are visible to customers.

Use Case 6: Search for a Product

Actor(s): Any user (guest or registered)

Description: The user searches for a specific product using a search bar.

Preconditions: None

Main Flow:

1. The user types a keyword in the search bar.
2. The system displays matching products.
3. The user clicks on one to see details.

Postconditions: Matching products are shown.

Alternative Flows: If no matches are found, the system displays the message: “No products found.”

Use Case 7: Update User Profile

Actor(s): Logged-in user

Description: The user updates their account information such as name, email, or password.

Preconditions: The user is logged in.

Main Flow:

1. The user navigates to the ‘My Account’ or ‘Profile’ section.
2. The user clicks on ‘Edit Profile.’
3. The user updates the necessary fields (e.g., name, email, password).
4. The user clicks ‘Save Changes.’
5. The system saves the updated details and confirms the changes.

Postconditions: The user’s profile is updated with new information.

5 Non-Functional Requirements

Our E-Commerce WebShop is designed to offer a stable, secure, and user-friendly experience. The following non-functional requirements describe the quality standards we aim to follow throughout the development:

- **Usability:**
 - **Intuitive Navigation:** We want users to find their way around easily. That’s why we’re going for clear and consistent menus.
 - **User-Friendly Design:** The design will be clean and modern, with a focus on readability. We’ll stick to a consistent color scheme, readable fonts, and buttons that look and feel familiar, so users don’t have to think twice about how to interact with the site.
- **Responsiveness:** It doesn’t matter if users are shopping on a desktop, tablet, or phone, the webshop should feel natural to use. Everything should adapt cleanly to different screen sizes without breaking the layout.
- **Response Time:** The system shall respond to 95% of user requests within 2 seconds under normal load.
- **Maintainability:** We’re keeping things modular and organized. Reusable components and a clean file structure will make it easier to make changes later or onboard new team members if needed.
- **Error Handling:** When something goes wrong, we’ll show helpful messages like “Item out of stock—try similar products” instead of confusing errors.

6 Technology Assumptions

To build a responsive, maintainable, and feature-rich e-commerce application, we adopt a modern React-based stack that balances developer productivity, performance, and industry best practices. The key technologies are:

- **React + TypeScript** – modern SPA framework with compile-time type safety
- **Vite** – fast dev server and lightweight production builds
- **Tailwind CSS + React-Bootstrap** – utility-first styling combined with ready made, accessible components
- **Lucide icons** (a versatile icon library) and **Recharts** (a charting library for React) for consistent and accessible visual design.
- **Axios** over HTTPS REST-JSON – promise-based HTTP client

7 Project Constraints

- **Time Constraint:** The project must be completed by the end of the semester. Because of the limited time, we'll focus on implementing the core features first. If there's still time left, we can start working on optional features.
- **Resource Constraint:** Small team size, limited development hours per week.
- **Technical Constraint:** The front-end of the application must be developed using **React.js**, as per course guidelines. The back-end technology stack choice is flexible.
- **Knowledge Constraint:** Team members are still in the learning phase for some technologies, which may impact the speed of implementation and require additional time for research and troubleshooting.
- **Open Questions:**
 - Will we integrate a real payment gateway (e.g., Stripe, PayPal) or simulate payments for the purpose of the project?
 - Should we implement a loyalty program where users can earn points for each purchase that can later be redeemed for discounts, exclusive offers, or early access to sales?

- Should we integrate an AI chatbot to guide users through the shopping process, offer product recommendations, or help with issues like order tracking, or should we rely on traditional customer service?

8 Acknowledgment of AI Technologies

This document was drafted and refined using GPT-4o based on an outline containing related information. The authors reviewed, revised, and enhanced the GPT-4o output with additional content. The document was then edited for improved readability and active tense, partially using Grammarly.