WEB FRAMEWORK PROJECT REPORT

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Abstract

This report details the design, development, and implementation of **ShopLine**, a dynamic and responsive e-commerce web application. The primary objective of this project was to create a feature-rich online store using modern front-end technologies to solve the problem of providing a seamless and interactive user shopping experience. The application was built using **HTML5**, **CSS3**, and **JavaScript**, with the **Bootstrap 5** framework serving as the foundation for its responsive design.

Key functionalities implemented include a dynamic product catalog with category filtering, comprehensive client-side cart management using localStorage for state persistence, and a simulated checkout process. A notable feature is the asynchronous promotional code validation, which was developed using JavaScript **Promises** and async/await to mimic real-world server-side verification. The project successfully demonstrates the practical application of core web development principles, including DOM manipulation, event handling, and client-side state management, resulting in a polished and functional prototype of a modern e-commerce platform.

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1. Introduction & Problem Statement

The goal of this project was to design and develop a responsive, web-based e-commerce store for gadgets, fashion, furniture, and skincare products. The application, named **ShopLine**, needed to provide a seamless user experience, allowing users to browse products, add items to a shopping cart, and apply promotional codes for discounts.

The core problem was to create a dynamic and interactive front-end experience using modern web technologies. This involved building a product catalog that could be filtered by category, managing the state of a shopping cart across the user's session, and simulating asynchronous backend processes like promo code validation. The project aimed to replicate the essential functionalities of a real-world online store.

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2. Learning Objectives

This project served as a practical application of several key web development concepts. The primary learning objectives included:

- **Front-end Framework Implementation:** Utilizing the **Bootstrap 5** framework to create a responsive and visually appealing user interface that works across various devices.

- **Dynamic Content Rendering:** Using **JavaScript** to dynamically generate and display product listings from a data source, allowing for features like category filtering without reloading the page.
- **Client-Side State Management:** Implementing a JavaScript-based cart system to manage the state of the shopping cart (adding, removing, and updating items) directly within the browser using localStorage.
- **Asynchronous JavaScript:** Applying async/await and Promises to simulate real-world asynchronous operations, specifically for verifying promotional codes with a delay to mimic a server request.
- **DOM Manipulation and Event Handling:** Gaining hands-on experience with manipulating the Document Object Model (DOM) to update UI elements like the cart count badge and respond to user events like button clicks.
- **Form Handling and Validation:** Building and validating a checkout form to ensure all necessary user information (name, address, etc.) is captured before an order is placed.

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3. Milestone Progress

The development of ShopLine was broken down into the following key milestones:

1. **Project Setup and UI Scaffolding:**
    - The initial phase involved setting up the HTML structure for the main index.html and product.html pages.
    - Bootstrap 5 was integrated to create a responsive navigation bar, footer, product grid, and modals for login, signup, and the shopping cart.
2. **Product Catalog and Dynamic Rendering:**
    - A product data structure was created in script.js containing information about various products across different categories (Electronics, Fashion, Furniture, SkinCare).
    - JavaScript functions were written to dynamically render the product cards on the homepage and implement the category filtering logic.
3. **Shopping Cart Functionality:**

- The core logic for the shopping cart was developed. This included functions to addToCart, removeFromCart, and render Cart.
- local Storage was used to persist the cart's state, ensuring that items remain in the cart even if the user refreshes the page.
- The cart icon in the navigation bar was updated dynamically to reflect the number of items in the cart.

4. **Promo Code and Checkout Simulation:**
   - An asynchronous function verify Promocode was created using Promises and a set Timeout to simulate the delay of a server call for validating promo codes like "SAVE10" and "SAVE20".
   - The checkout process was implemented with a form that captures user details. Upon successful submission, the cart is cleared, and a success message is displayed.

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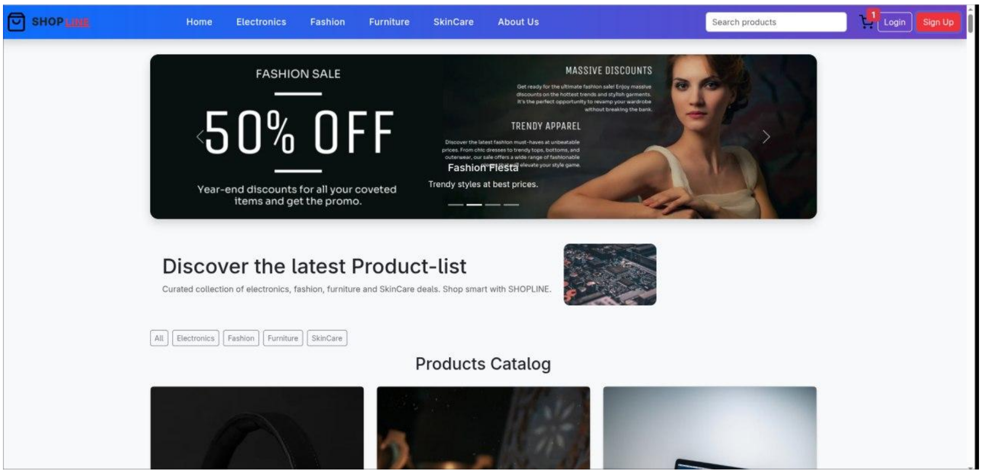
4. Screenshots of Key Features

Figure 1: Homepage with Banner Carousel and Product Catalog The main landing page featuring a promotional carousel and a grid of products.



FASHION SALE

50% OFF

Year-end discounts for all your coveted items and get the promo.

MASSIVE DISCOUNTS

Get ready for the ultimate fashion sale! Enjoy massive discounts on the hottest trends and stylish garments. It's the perfect opportunity to revamp your wardrobe without breaking the bank.

TRENDY APPAREL

Discover the latest fashion must-haves at unbeatable prices. From chic dresses to trendy tops, bottoms, and outerwear, our sale offers a wide range of fashionable [illegible] elevate your style game.

Fashion Fiesta

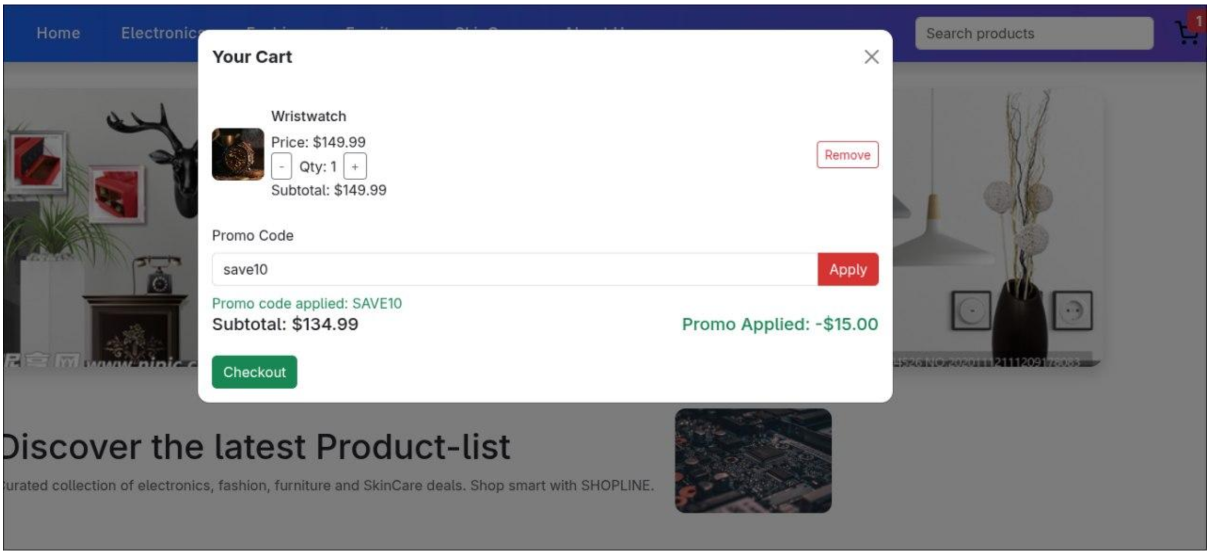
Trendy styles at best prices.

Discover the latest Product-list

Curated collection of electronics, fashion, furniture and SkinCare deals. Shop smart with SHOPLINE.

Products Catalog

<u>Figure 2: Shopping Cart Modal</u> The cart modal showing items added by the user, with options to remove items and apply a promo code.



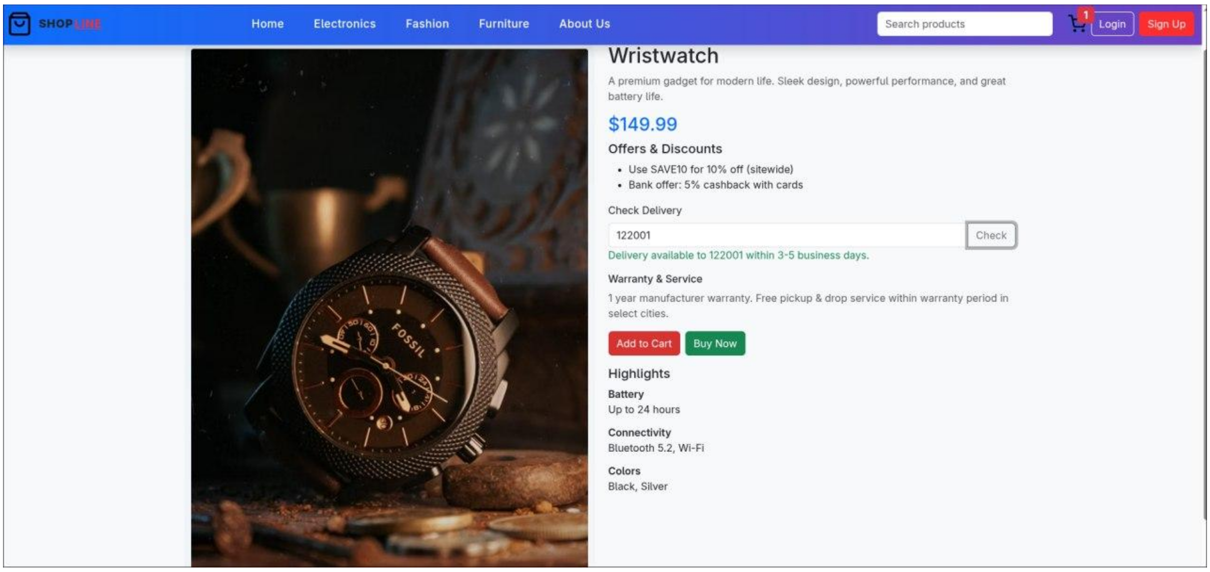
Your Cart

Wristwatch
Price: $149.99
- Qty: 1 +
Subtotal: $149.99

Promo Code
save10
Promo code applied: SAVE10
Subtotal: $134.99
Promo Applied: -$15.00

Discover the latest Product-list
urated collection of electronics, fashion, furniture and SkinCare deals. Shop smart with SHOPLINE.

<u>Figure 3: Product Detail Page</u> A detailed view of a single product with options to add to cart or buy now.



Wristwatch

A premium gadget for modern life. Sleek design, powerful performance, and great battery life.

$149.99

Offers & Discounts

- Use SAVE10 for 10% off (sitewide)
- Bank offer: 5% cashback with cards

Check Delivery
122001
Delivery available to 122001 within 3-5 business days.

Warranty & Service
1 year manufacturer warranty. Free pickup & drop service within warranty period in select cities.

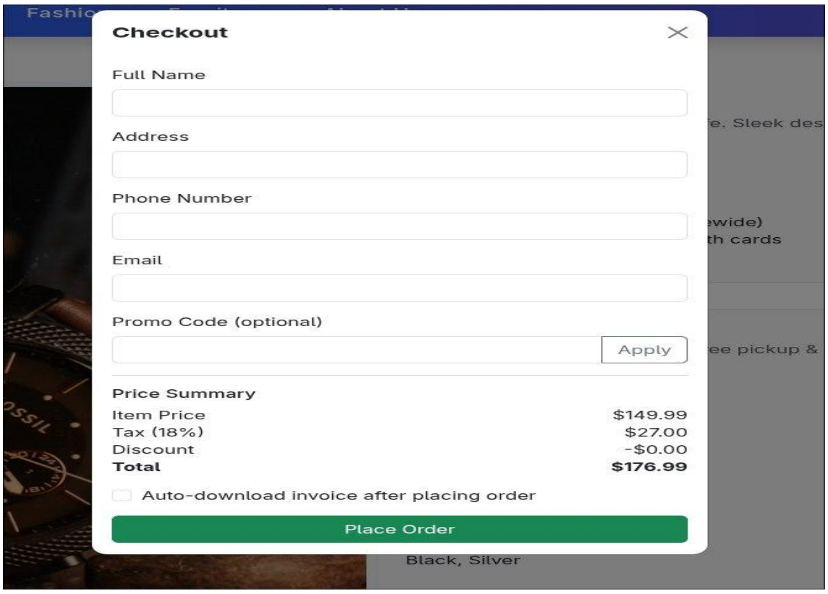
Highlights

Battery
Up to 24 hours

Connectivity
Bluetooth 5.2, Wi-Fi

Colors
Black, Silver

<u>Figure 4: Checkout Form:</u> The checkout modal where users enter their shipping and payment information to complete a purchase.



Checkout

Full Name

Address

Phone Number

Email

Promo Code (optional)

Apply

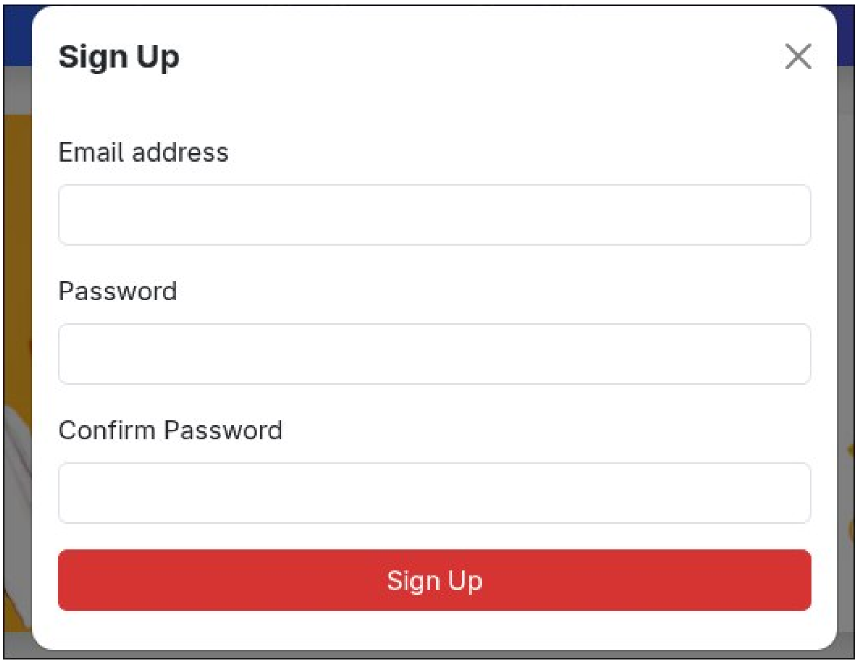
Price Summary

Item Price	$149.99
Tax (18%)	$27.00
Discount	-$0.00
Total	**$176.99**

□ Auto-download invoice after placing order

Place Order

<u>Figure 5: Sign Up Form</u> The registration modal where new users create an account to save their preferences and order history



Sign Up

Email address

Password

Confirm Password

Sign Up

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5. Reflection

Member 1: Sujal Agarwal

- **What I Learned:** I gained a much deeper understanding of how to manipulate the DOM with JavaScript. Implementing the dynamic rendering of products and updating the cart in real-time was a great learning experience. I also learned the importance of using local Storage for persisting data on the client side, which is crucial for a good user experience in e-commerce sites.
- **Challenges Faced:** One of the main challenges was managing the state of the application cleanly. As more features were added, keeping the cart data, promo code status, and UI in sync became complex. Refactoring the code to handle state updates more efficiently was a challenging but rewarding process.

Member 2: Vivek Sharma

- **What I Learned:** This project was my first real dive into using asynchronous JavaScript. Understanding and implementing async/await for the promo code feature was a key takeaway. It taught me how to handle operations that don't complete immediately without freezing the user interface, which is a fundamental concept in modern web development.
- **Challenges Faced:** The initial setup with Bootstrap was tricky, especially ensuring the layout was perfectly responsive across different screen sizes. Customizing Bootstrap's default styles in the style.css file to match our desired branding required careful planning to avoid conflicting CSS rules. It was a good lesson in CSS specificity and organization.