Daffodil International University

PROJECT REPORT ON ECOMMERCE WEBSITE

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APPROVAL

This thesis titled on **"Design and Implementation of an E-Commerce website for Online Shopping"**, submitted by **Md: Hasibul Islam Shaon (ID:193-35-506)** to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to its style and contents.

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DECLARATION

I hereby declare that my project entitled "**Design and Implementation of an ecommerce website**" is the result of my work. I also ensure that it has a lot of unique features like no others. The work has been accepted for the degree of Bachelor of Science in Software Engineering at Daffodil International University (DIU).

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Acknowledgement

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ABSTRACT

This e-commerce business aims to create a comprehensive system that improves customer interaction and provides a unique business experience in the online retail space. The project includes user management, live chat, product catalog, recommendations, and search functions. Users can securely register, log in, and contact customer support via instant messaging. They can browse, search, and filter products, as well as read and write reviews. Recommendations provide suggestions on features based on user behavior and preferences. The search function allows users to find specific products, brands, and categories based on keywords and filters. The system prioritizes security, performance, user-friendly interface, device and browser compatibility, and scalability. It will also use constraints, assumptions, and progress to ensure that planning is effective and successful. Overall, the project aims to provide users with an engaging shopping experience.

Chapter-1 Introduction

1.1 Overview of the Project

The comprehensive e-commerce program is highly beneficial to online trading. This helps in effective communication, sharing of information and a smooth purchasing process. It comes with user administration whereby users can register, login securely and identify themselves. Chat allows instant messaging between customers and customer support. Product catalog enables browsing, product search and product filtering while the reviews and rating section enables reading of comments made by other users about products.The recommendations offer individualized suggestions according to consumer behavior as well as preference. The shopping cart and delivery system facilitate a secure purchase process. Search function offers users an option to look for particular products, brands or categories based on specific criteria. Security measures are combined with performance that is supported by a user-friendly interface, compatibility and scalability in the system. The project aims at creating an easily accessible, efficient and attractive e-commerce platform that will stimulate national economy at large

1.2 Purpose and Goals

The purpose of the project is to develop a functional e-commerce platform that is aimed at giving users a seamless and immersive shopping experience. This system is geared towards convenience, access and a wide range of items for different customers. The point of this eCommerce project is to make users satisfied through technology-driven customer-focused attributes which increase sales for the company and ensure long-term business relationships are formed; hence then retaining more clients who in

turn become loyal customers. Further, the initiative seeks to grow the business, penetrate more markets and maintain competitive advantage in an online retail environment (Dahui et al., 2008). Ultimately, it wants to transform online shopping by becoming a reliable one-stop place for customers' purchases.

1.3 Background and Context

The main idea of the e-commerce project revolves around changing trends in retail as well as consumer habits. This has led to significant changes in digital marketing since online stores have become more popular due to penetration of internet technology. From their homes or while on the move, customers want to browse as well as acquire products and that is why e-commerce has been developed. Customer needs. This transition creates room for entrepreneurs and corporations to leverage on e-commerce power in order to reach out to a wider market, increase convenience and boost revenue by having an assortment of products, smooth processes and individual user interfaces. The thrust of this project is thus geared towards carving a niche amidst the competitive e-commerce world by understanding digital marketing dynamics and contemporary customer preferences, offering buyers and sellers best prices.

1.4 Objective

The goal of e-commerce is to develop a formidable online store that concentrates on the user experience, offers different things and assures interconnectivity. Its strategic recommendation algorithms personalize products and improve sales. In addition, this will implement strict security measures to safeguard user information and create a safe space. Concentrating on generating sales through effective marketing plans and customer service, this position must stay ahead of changes in business practices and technology in order to remain strong amidst the changing e-commerce landscape.

1.5 Scope of the Project

The scope of the e-commerce project includes developing an integrated online shopping platform that could be able to assist both buyers and sellers. It will provide a user-friendly interface for the end-users to browse products and add them to their carts, after which they can make secure transactions. There are going to be various products listed under different categories, and on the side of the sellers, there is ease in managing inventory and listings. Advanced search will enable users to find products based on certain criteria, while the recommendation process will offer personalized recommendations to the customers. User registration, access, and personal information management, as well as order tracking and management, are some of the features that the project will possess. Security measures against users' data insecurity and insecurity of business are also within the scope. This would then need continuous optimization and expansion in the future with growing requirements of the platform.

1.6 Key Deliverables

The project has also packed in a number of features designed to create an online business in harmony with customers. This shall improve the user experience on both web and mobile platforms for better navigation and interaction. It shall also have important features in customer management, product cataloging, search, filtering, and recommendation to make the searching and purchasing easier. It will also provide basic features such as a shopping cart and delivery system, order management, and live chat for customers. Strong security measures would be taken to protect the data of users and ensure business security. Highest emphasis shall be placed on the quality and reinforcement of performance so that the business is efficient and fit for future growth. Effective analysis, information, referrals, and ongoing support will ensure that this e-commerce platform works reliably to serve customers and stakeholders effectively in providing for its growth.

1.7 Benefits and Target Audience

E-commerce platforms have a lot of benefits to stakeholders and customers since they provide a great online sales environment. It brings ease to the customer in that they are able to shop effortlessly from any location, getting access to as many products as they want with personalized recommendations. On the other hand, suppliers increase market access and get simplified operations, increasing sales and efficiency. Managers make use of user data to facilitate decision-making and ensure continuous improvement of the platform. Beyond the individual stakeholder, its impact reaches larger business areas in which business growth happens through increased business, jobs created, and digital entrepreneurship in business. Therefore, e-commerce platforms could be responsible for innovation, connectivity, and business success in a way that works for people.

1.8 Stakeholders

An ecommerce business is characterized by many stakeholders who are responsible and engaged in making sure that everything goes well. First, there are project sponsors and managers at the helm of affairs, who guide the project and ensure its completion within the stipulated time frame and efficiently. Then, there is a hardworking development team comprising the developers, designers, and engineers working to bring the e-commerce platform into existence, while on the other hand, there are business analysts, bringing in valued insight into the business and customer needs. While the marketing team is responsible for engaging customers and popularizing the platform, it is the UX designers who have to provide a frictionless and user-friendly experience. It is the quality assurance team that ensures the reliability, functionality, and security of the platform through testing. Most importantly, the customer support team addresses any customer queries or problems, helping to sustain a good customer experience. At the heart of the user group driving the platform's business and interactions are the merchants and customers. Regulators and third-party service providers play an important role in ensuring compliance and facilitating key activities associated with compliance. These partners come together to realize the vision of a successful and thriving eCommerce platform.

1.9 Project Timeline

The project is going to be finished on time. A detailed plan with specific timelines for each development phase will be developed to ensure effective project management and on-time delivery.

1.9.1 Gantt Chart Representation

Activities	week1	week3	week3	week4	week5	week6	week7	week8	week9	week10	week11	week12	week13
Planning													
Design													
Front-end dev													
Back-end Dev													
API Integration													
Testing													
Deployment													
Documentation													

1.9.2 Project Release Timeline and Key Milestones

The release plan and milestones are given below:

ACTIVITIES	PERIODS (WEEK)	TOTAL DAYS
Planning	week1	7
Design	week2, week3	14
Front-end dev	week3, week4	14
Back-end Dev	week5, week6, week7	21
API Integration	week6, week7, week8, week9	28
Testing	week10, week11	14

Deployment	week11, week12	14
Documentation	week12, week13	14

CHAPTER - 2: REQUIRED ENGINEERING

2.1 Functional Requirements

The function of the e-commerce platform is that users can add products to the shopping cart and proceed to the payment process. This allows users to select and list the products they want to purchase from the platform's product catalog and start the transaction process.

Key components of this functional requirement include:

1. Product Selection: Users should be able to browse through the platform's product catalog, view product details, and add desired items to their shopping cart.
2. Shopping Cart Management: Users should have the ability to view and manage the contents of their shopping cart, including adding, removing, or adjusting quantities of items.
3. Price Calculation: The platform should calculate and display the total cost of items in the shopping cart, factoring in any applicable taxes, discounts, or shipping fees.
4. Checkout Process: A step-by-step checkout system should guide users, helping them enter billing and shipping details, choose a payment method, and review the order before finalizing it.
5. Order Confirmation: After completing the checkout, users should receive a confirmation page or email with their order details, such as the order number, purchased items, and estimated delivery time frame.
6. Payment Processing: The platform must securely handle payments through various methods, including credit/debit cards, digital wallets, and other online payment services.
7. Order Management: Once an order is placed, the platform should manage order fulfillment, including inventory updates, order tracking, and communication of shipping and delivery updates to the user.
8. Guest Checkout: The platform also offers customers an option for users who do not want to set up an account, allowing them to complete transactions quickly without having to register.

2.2 Non-functional Requirement

2.2.1 Security

Protection of user data: Ensure that all user information, including personal and login details, is securely stored and shielded from unauthorized access or misuse.
Access control: Implement role-based access control to manage operations and restrict access according to user roles and permissions.

2.2.2 Performance

Responsiveness: Designed to ensure smooth and uninterrupted performance, guaranteeing that the system quickly responds to user interactions.
Scalability: Develop the system to handle increased user loads and growth without sacrificing performance, supporting seamless expansion.

Resource Optimization: Efficiently manage system resources, such as memory and CPU, to maintain optimal performance and reduce response times.

2.2.3 User Interface

User-friendly design: Create a simple, intuitive interface that enhances user experience and reduces the learning curve.

Responsive design: Ensure the interface adapts well across various devices and screen sizes, providing a consistent experience.

2.2.4 Compatibility

Browser Compatibility: Ensure that the system is fully functional across major web browsers, including Chrome, Firefox, Safari, and Edge.

Device Compatibility: Test and optimize the system for compatibility across a wide range of devices and operating systems, such as desktops, laptops, tablets, and smartphones.

Database Scalability: Design the database to handle increasing amounts of data efficiently, ensuring smooth operations as the dataset grows.

System Load Balancing: Implement load balancing solutions to distribute workloads evenly, improving overall performance and reducing the risk of system failures.

Redundancy and Fault Tolerance: Integrate redundancy and fault-tolerant mechanisms to reduce downtime and ensure continuous system availability in case of failures or outages.

CHAPTER 3: TOOLS AND TECHNOLOGIES

3.1 Backend Framework: Django

Django is an advanced web development framework written in Python. It adheres to the Model-View-Template (MVT) architecture, which simplifies building and maintaining web applications. Known for its scalability and robust data handling, Django also offers a flexible URL routing system that ensures efficient application development. Django provides extensive libraries and APIs that make it suitable for complex and customizable applications.

3.2 Frontend Technology: Django Template Engine

The Django template engine is an integral part of the Django framework, enabling the creation of dynamic and reusable HTML templates. It allows developers to separate the presentation layer from the application's logic, enhancing code maintainability and reusability. The template engine supports template inheritance, context variables, conditional rendering, and other features, making it a powerful tool for generating dynamic HTML content.

3.3 Database: SQLite

SQLite is a lightweight, self-contained, and serverless relational database management system (RDBMS) that is widely used in various applications and environments. Its simplicity, reliability, and ease of integration make it a popular choice for embedded systems, mobile applications, and small to medium-scale projects. Unlike traditional RDBMS systems, SQLite operates without the need for a separate server process, storing the entire database in a single file. This zero-configuration approach simplifies deployment and administration, making it suitable for quick prototyping and development. Despite its lightweight nature, SQLite supports ACID transactions, ensuring data integrity and reliability. While not designed for high concurrency or large-scale deployments, SQLite efficiently handles moderate workloads and is well-suited for projects with low to moderate traffic. Its cross-platform compatibility and SQL compatibility further enhance its appeal, making it a versatile and widely adopted database solution.

3.4 System Components and Infrastructure

3.4.1 Cloud Server Setup

The project employs cloud-based server architecture to host applications and handle back-end services, ensuring efficient system operations.

3.4.2 Data Management Server

The project utilizes a dedicated web database for storing and managing application data. The selection of the database server depends on the specific needs, with potential options like MySQL, PostgreSQL, or MongoDB.

3.4.3 Network Communication Setup

Effective communication is achieved between various components and users through strong networking protocols. Technologies such as IP, HTTP, and WebSocket facilitate data exchange between the front-end and back-end systems.

3.4.4 Supported User Devices

This project supports a variety of client devices, including desktops, laptops, smartphones, and tablets. Supported browsers include Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge.

3.4.5 Extra Hardware Components

Additional hardware components such as storage devices, servers, and network equipment will be incorporated based on the project’s requirements.

3.5 Feature Implementation Details

Implementing ecommerce features involves several components, from the frontend user interface to backend databases and payment gateways. Here's an overview:

3.5.1 User Interface (UI):

- Product Listings: Display products with images, descriptions, prices, and other relevant information.
- Search and Filters: Implement search functionality allowing users to find products quickly. Filters can refine search results based on categories, price range, etc.
- Shopping Cart: Allow users to add products to a cart for later purchase.
- Checkout Process: Guide users through the checkout process, collecting shipping and payment information.

3.5.2 Backend:

- Database: Store product information, user profiles, order history, etc. Use a relational database like MySQL or a NoSQL database like MongoDB.
- Server Logic: Implement logic for user authentication, product management, order processing, etc.
- APIs: Expose APIs for frontend to interact with backend services, such as retrieving product information, processing orders, etc.

3.5.3 Product Management:

- CRUD Operations: Implement functionality for creating, reading, updating, and deleting products.
- Inventory Management: Track product quantities and update them as purchases are made.
- Product Reviews: Allow users to leave reviews and ratings for products.

3.5.4 Order Management:

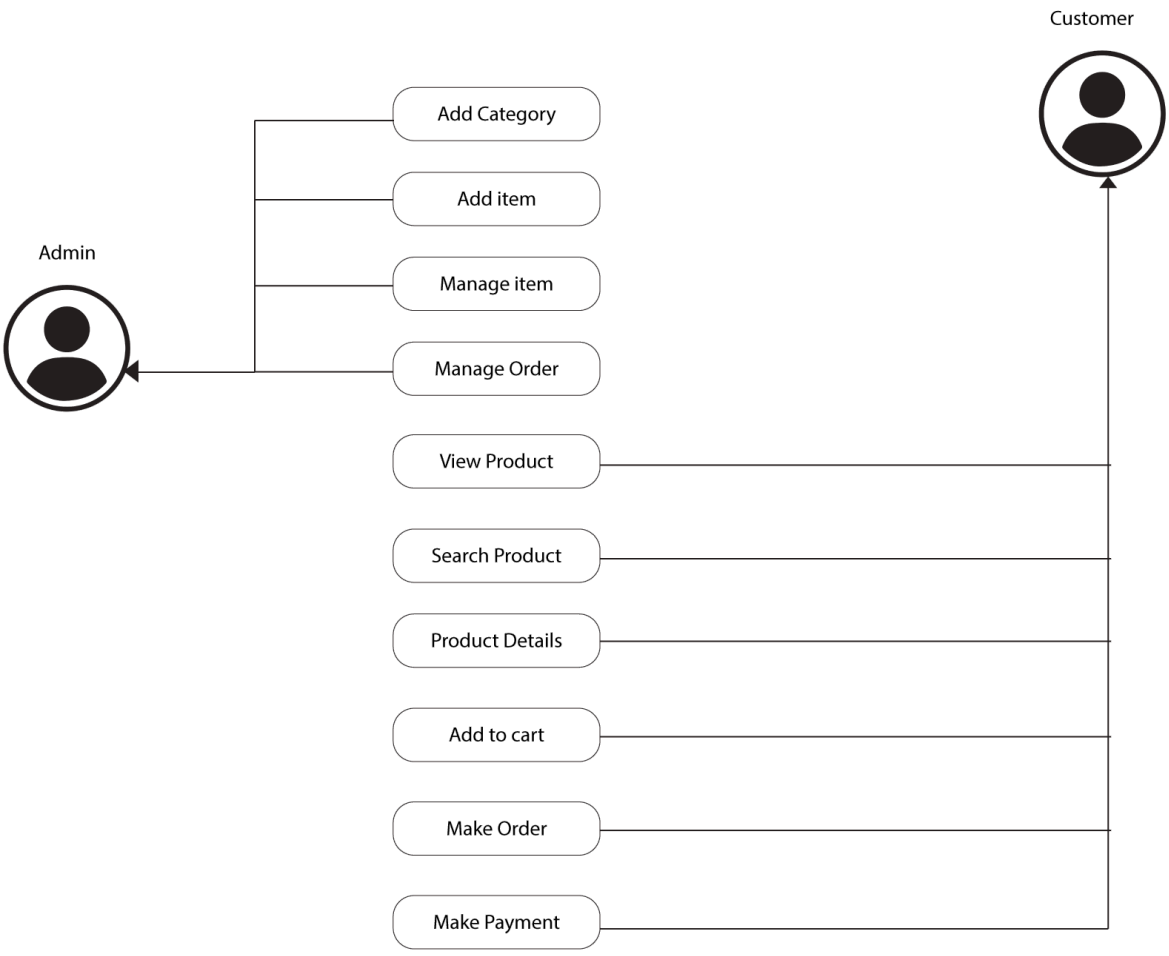
- Order Processing: Handle the checkout process, including calculating totals, applying discounts, and confirming orders.
- Order Tracking: Allow users to track the status of their orders.
- Order History: Store past orders for users to reference.

3.5.5 Payment Integration:

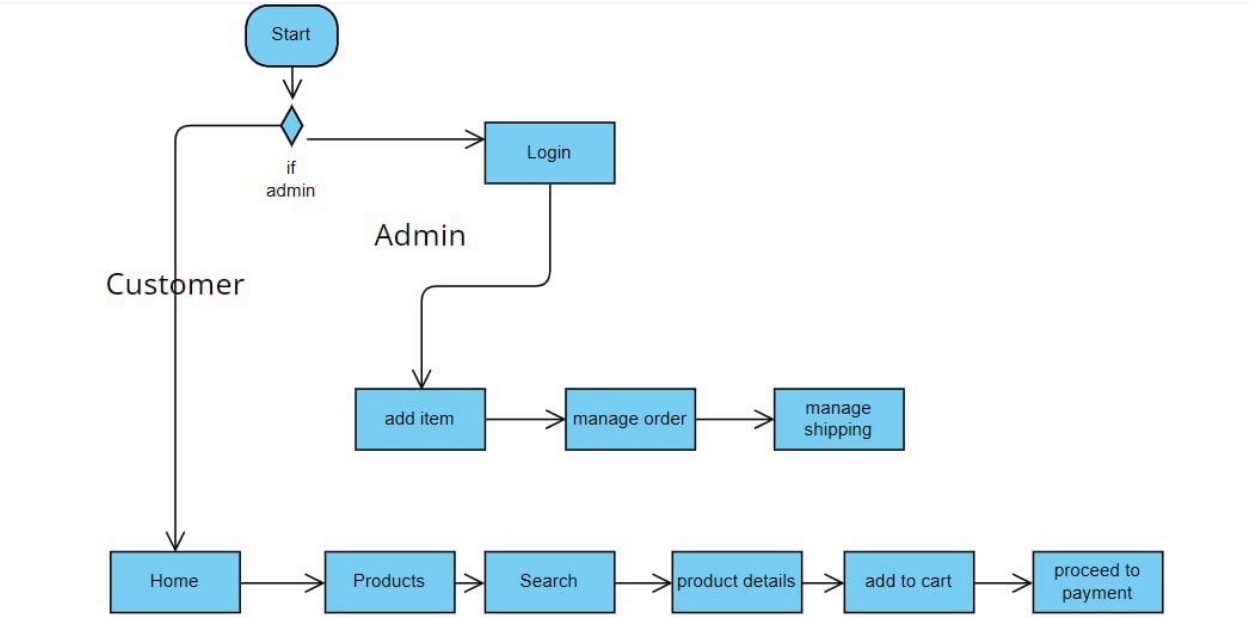
- Payment Gateway**:** Integrate with a payment gateway like PayPal, Stripe, or Authorize.Net to handle secure payment transactions.
- Payment Processing**:** Implement logic for processing payments and handling success/failure responses.

CHAPTER - 4: SYSTEM ANALYSIS, DESIGN & SPECIFICATION

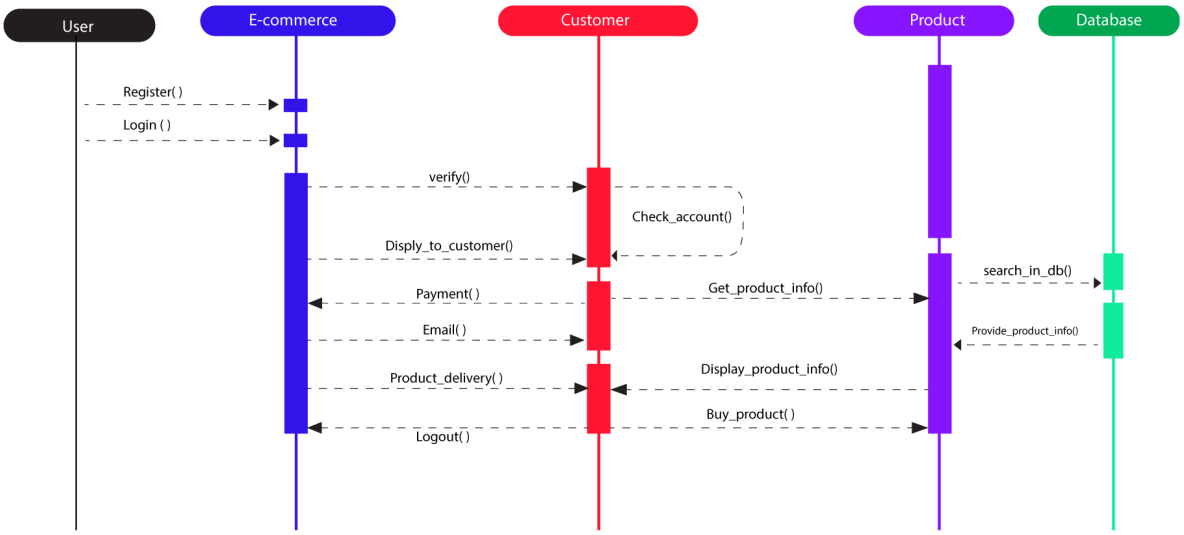
4.1 Use Case Diagram



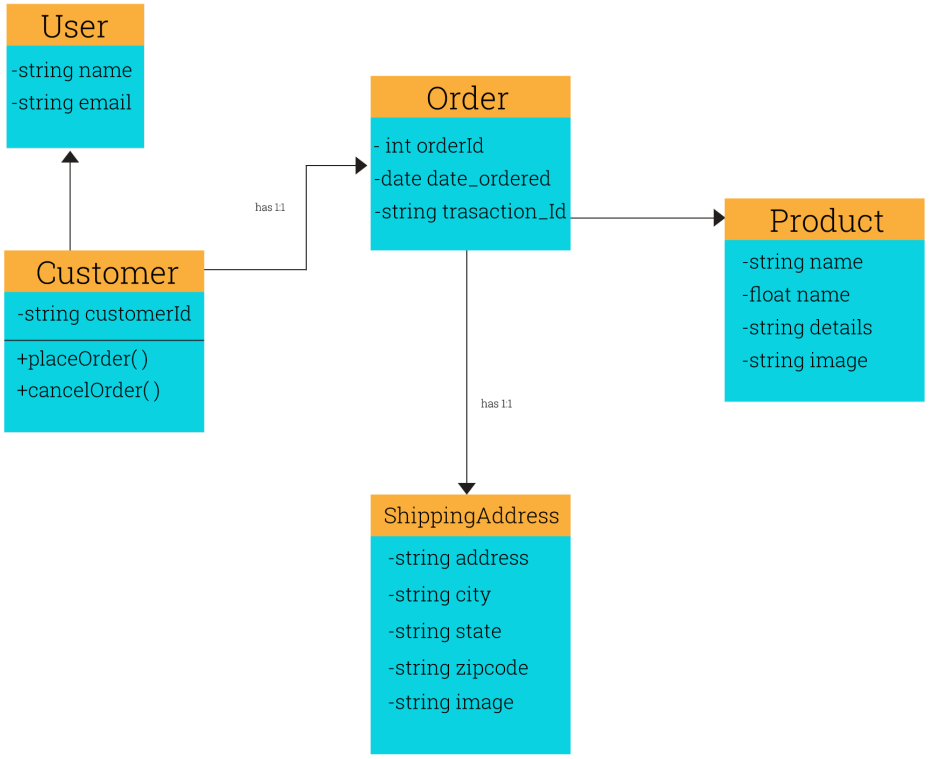
4.2 Activity Diagram



4.3 Sequence Diagram



4.4 Class Diagram



CHAPTER - 5: System Validation

5.1 Testing Framework

Creating a comprehensive test plan for an e-commerce website involves several steps to ensure that all aspects of the site, from functionality to security, are thoroughly tested.

5.1.1 Testing Goals and Scope

- Specify the goals of testing (e.g., functionality, usability, security, performance).
- Define what constitutes a successful test outcome.

5.1.2 Testing Approach and Techniques

Define the overall approach to testing (e.g., manual, automated, combination).
Determine testing techniques (e.g., black-box, white-box, usability testing).
Identify any third-party tools or frameworks to be used.

5.1.3 Scenario Design and Execution

List the high-level scenarios to be tested (e.g., user registration, product search, checkout process).
Include both positive and negative test scenarios.
Prioritize scenarios based on criticality and frequency of use.

CHAPTER - 6: Deployment and Maintenance

6.1 Deployment Setup

Server : A server with at least 4 CPU cores, 8GB RAM, and 100GB storage is recommended for maximum performance.

Web Server: It is recommended to use Apache Web Server 2.4 or later to host the system. and the system installation lite requires version 5.7 or later.

6.2 Monitoring and Optimization

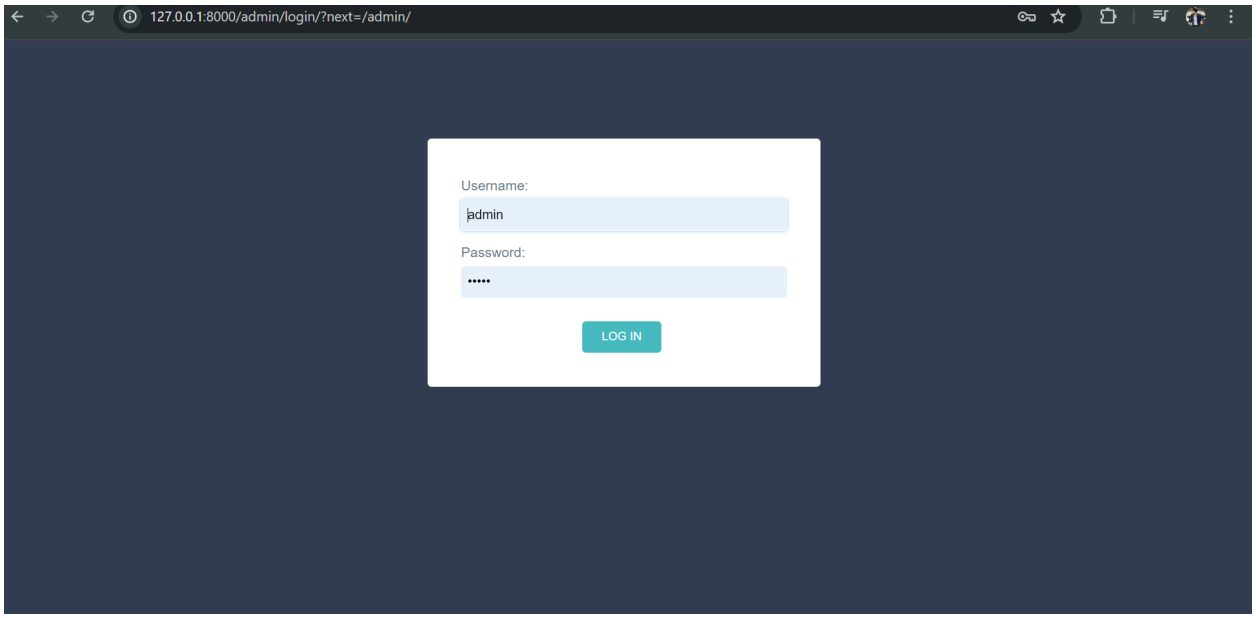
System : Use monitoring tools to track physical activity, resource usage, and user activity. Set alerts to quickly resolve needs or performance issues.

6.3 Data Backup and Restoration

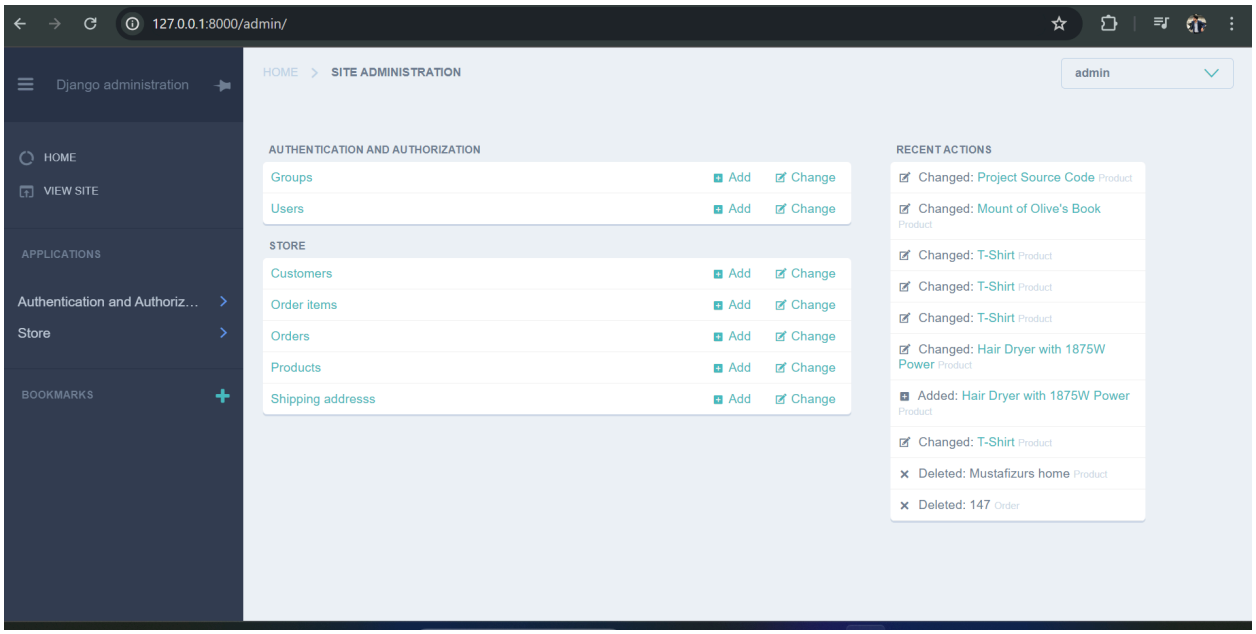
Data Backup: Back up system files and related files regularly to prevent data loss. Consider using an automatic backup system with external storage for additional data protection.

CHAPTER 7: Admin manual

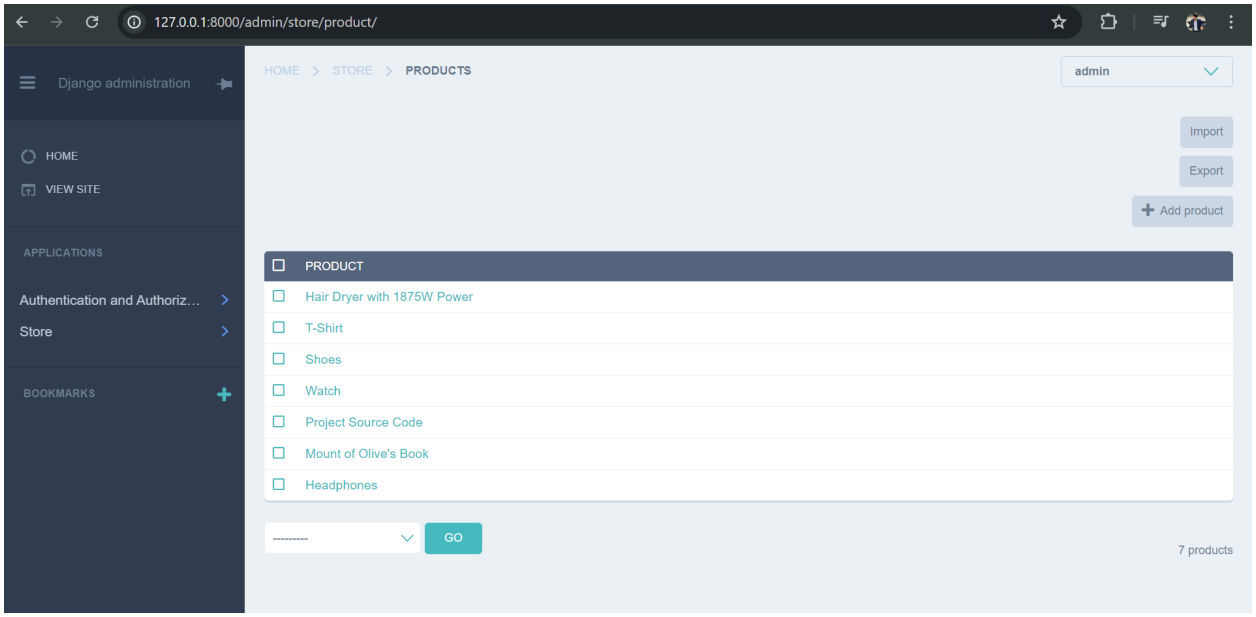
7.1 Admin login page



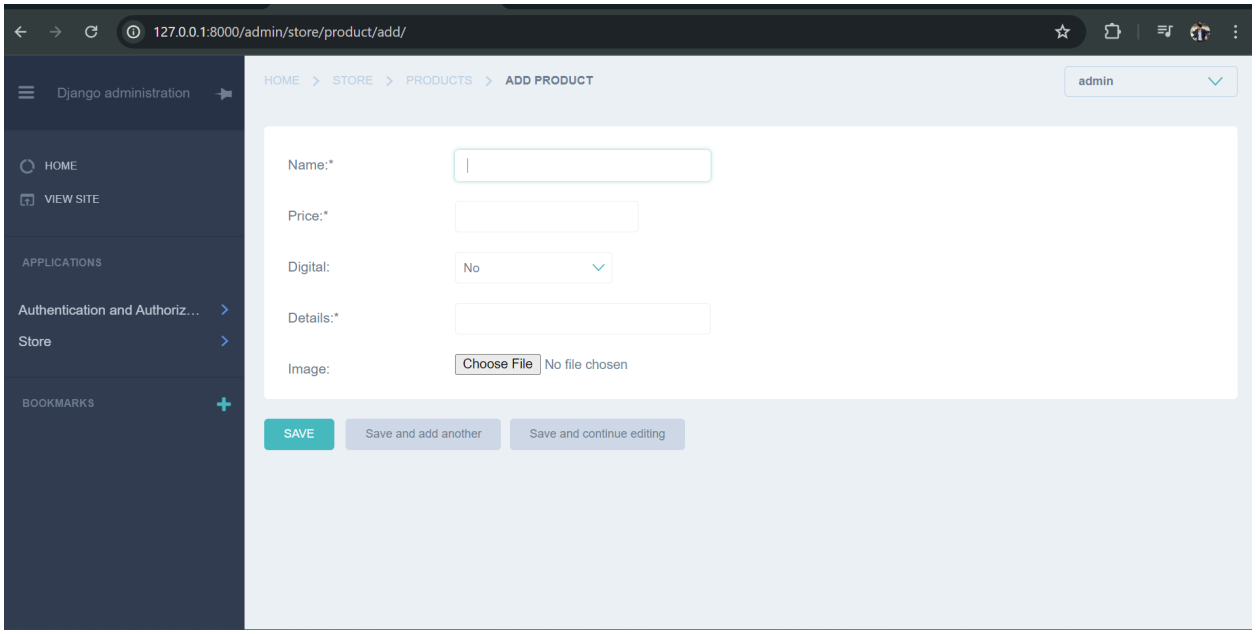
7.2 Admin panel page



7.4 Product add page

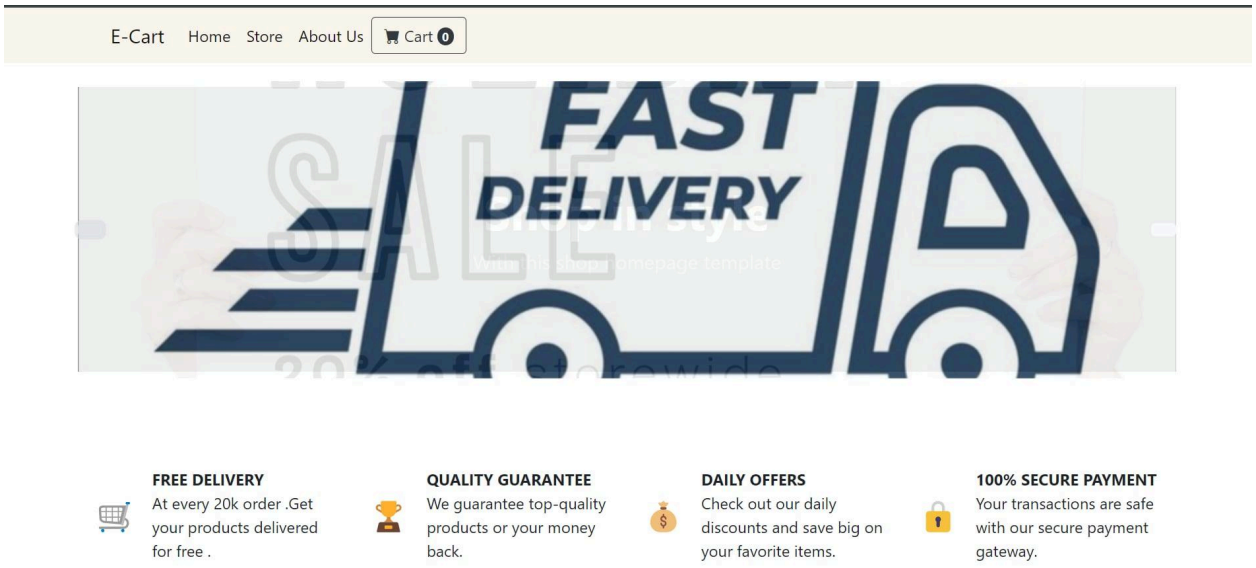


7.5 Product add



CHAPTER 8: User Manual

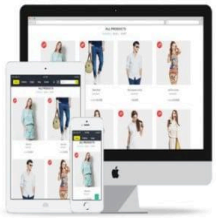
8.1 Home page



8.2 Home page 2

Our Products

Store →



Project Source Code

৳5000.00

View

Watch

৳300.00

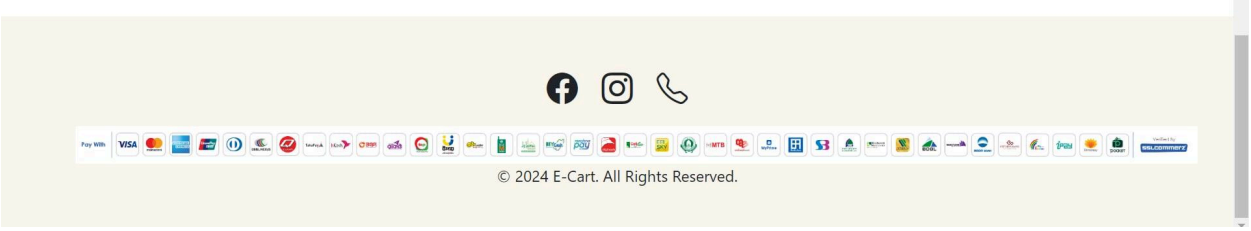
View

Hair Dryer with 1875W

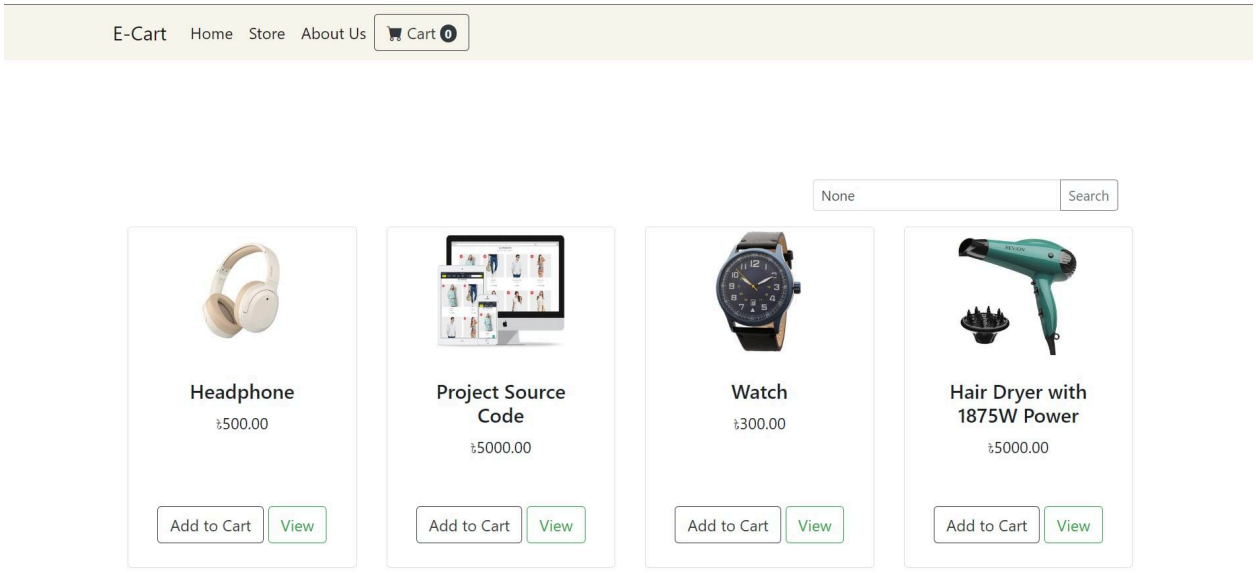
৳5000.00

View

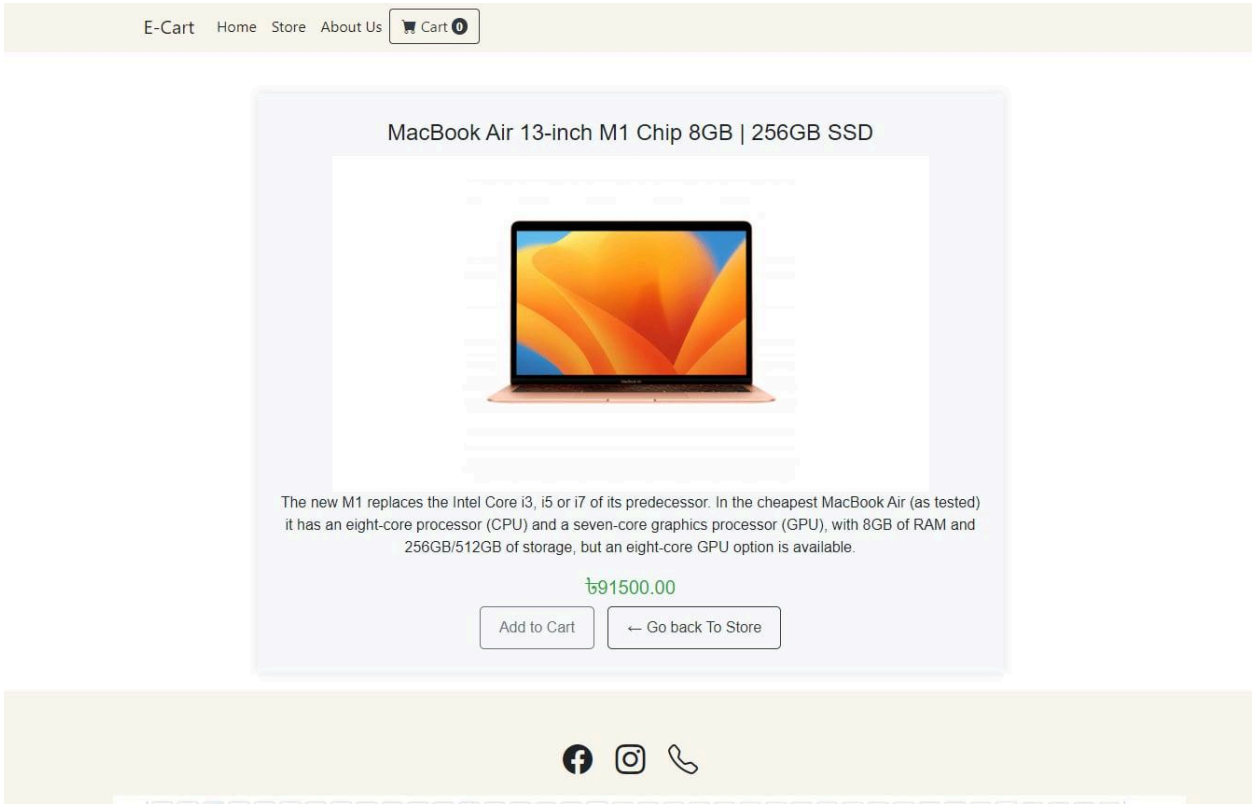
8.3 Footer



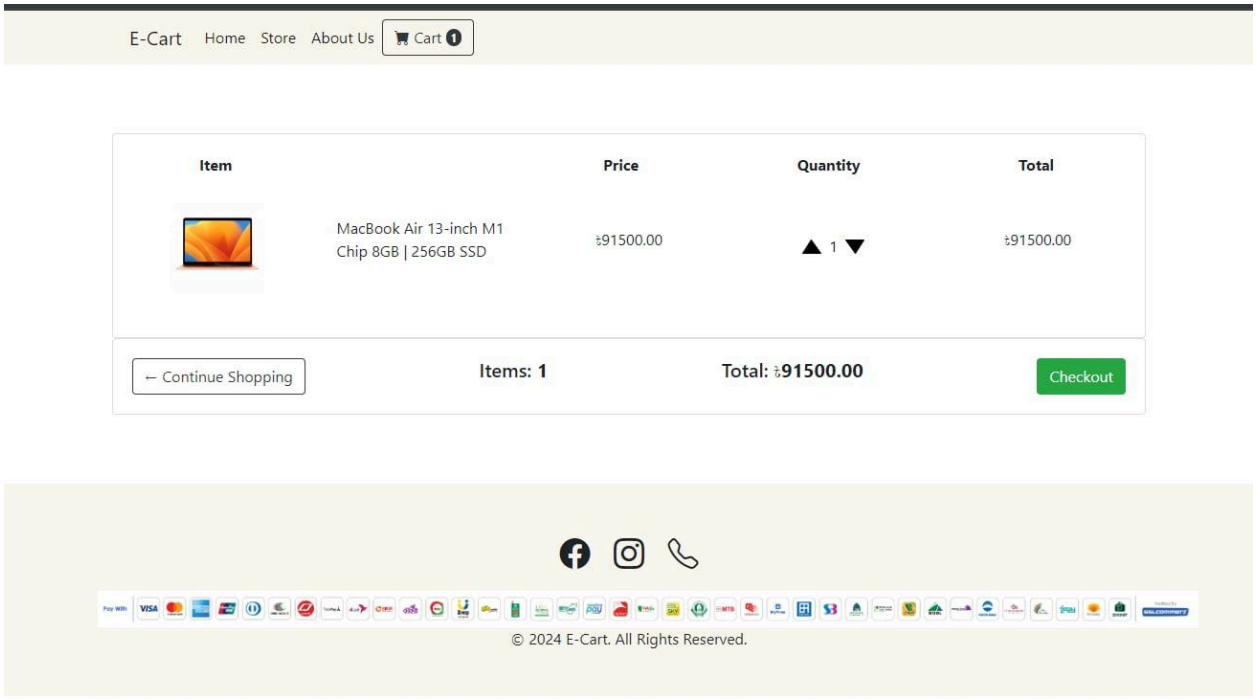
8.4 Store



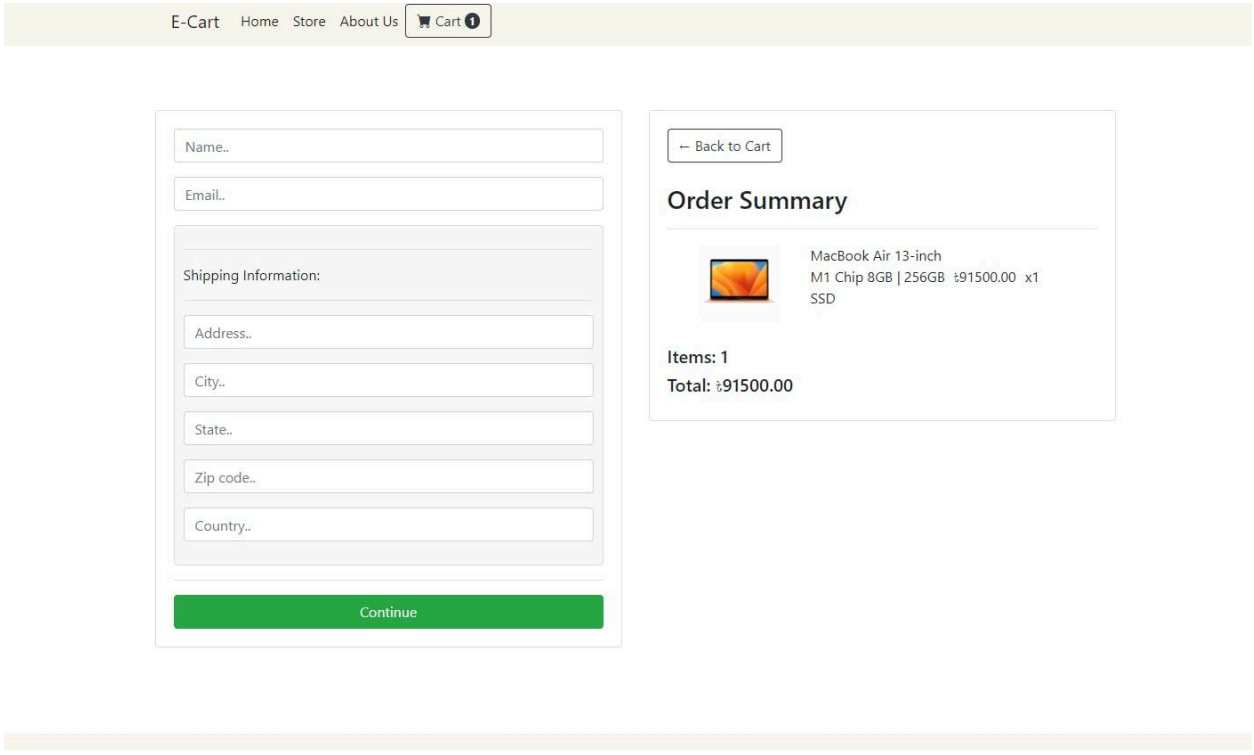
8.5 View page



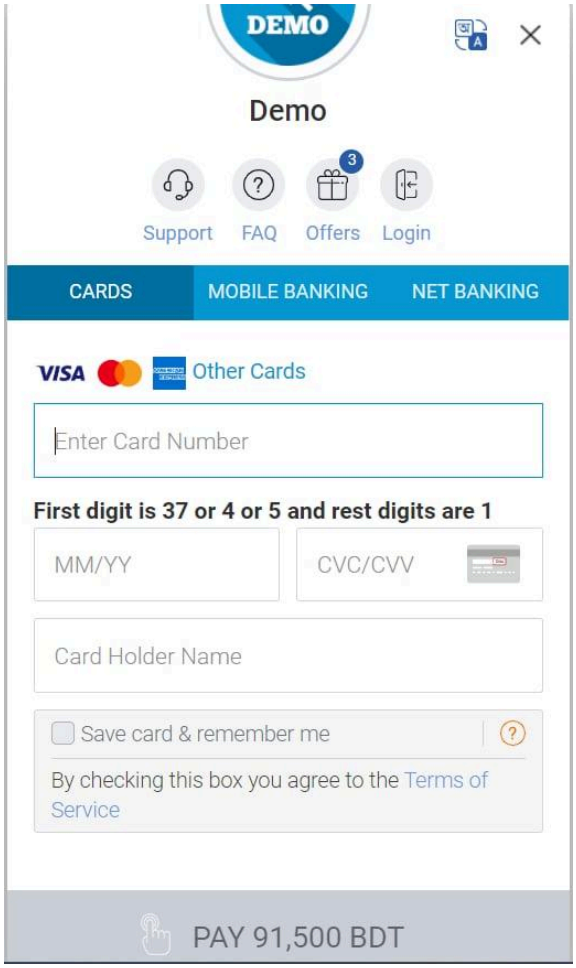
8.6 Cart page



8.7 Checkout page



8.7 Payment page



8.8 about us page