



Tribhuvan University

Faculty of Humanities and Social Sciences

A PROJECT REPORT

“Online Bazar: E-Commerce website”

Submitted to

Department of Computer Application

Hetauda School of Management and Social Science

In partial fulfillment of the requirements for the Bachelor's in Computer Application

Submitted by

Rijan Rai

Under the Supervision of

Mr. Sameer Gautam



Tribhuvan University

Faculty of Humanities and Social Sciences

Hetauda School of Management and Social Science

Supervisor's Recommendation

We hereby recommend that this project prepared under supervision by **Mr. Rijan Rai** entitled “**Online Bazar: E-commerce website**” in partial fulfillment of the requirements of Fourth Semester (Project I) for the degree of Bachelor of Computer Application is recommended for the final evaluation.

.....

SIGNATURE

Mr. Sameer Gautam

SUPERVISOR

Department of Computer Application

Hetauda School of Management and Social Science

Hetauda-4, Makwanpur, Nepal



Tribhuvan University

Faculty of Humanities and Social Sciences

Hetauda School of Management and Social Sciences

LETTER OF APPROVAL

This is to certify that this project prepared by **Mr. Rijan Rai** and entitled **“Online Bazar:E-commerce Site”** in partial fulfillment of the requirements of Fourth Semester (Project I) for the degree of bachelor’s in computer application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

<p>SIGNATURE of Supervisor</p> <p>Mr. Sameer Gautam</p> <p>Department of Computer Application</p> <p>Hetauda-4, Makwanpur, Nepal</p>	<p>SIGNATURE of Coordinator</p>
<p>SIGNATURE of Internal Examiner</p>	<p>SIGNATURE of External Examiner</p>

Acknowledgement

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I owe a profound debt of gratitude to our instructors and mentors. Without their tireless efforts and encouragement, navigating through the complexities of this project would have been an insurmountable challenge. Their steadfast support fueled our determination to strive for excellence.

Lastly, I express our deepest gratitude to our families. Their love, patience, and support sustained us through every stage of this project, giving us the strength to persevere.

In conclusion, we sincerely thank everyone who contributed to this project. Your help and encouragement have been invaluable, and we are truly grateful for this opportunity.

Your Sincerely,

Rijan Rai

Abstract

E-commerce has transformed the way we shop by providing convenience, variety, and accessibility. This project aims to develop a comprehensive e-commerce website designed to streamline the online shopping experience. The platform offers an extensive range of products ensuring that users can find everything they need in one place. With features such as detailed product descriptions, user-friendly navigation, and advanced search and filter options, customers can easily browse and purchase items that suit their preferences. The website enhances the shopping experience by incorporating personalized recommendations and seamless checkout options, including payment gateways. To ensure customer satisfaction, it offers reliable delivery services and detailed order tracking, making the entire process hassle-free. The platform also provides resources, such as product details, to help users make informed purchasing decisions. By combining a wide product selection with exceptional user experience and comprehensive support, the platform aims to redefine online shopping and become a one-stop destination for all consumer needs.

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List of Abbreviations

Keywords

CSS

DFD

ER

HTML

PHP

RAM

SQL

UI

VS

XAMPP

Full Form

Cascading Stylesheet

Data Flow Diagram

Entity Relationship

Hyper Text Markup Language

Hyper Text Preprocessor

Random Access Memory

Structured Query Language

User Interface

Visual Studio

X-operating system, Apache, MySQL, PHP, Perl

Chapter 1: Introduction

1.1 Introduction:

The rapid growth of eCommerce has increased the need for scalable, secure, and efficient online platforms. Addressing these requirements, Online Bazar: E-Commerce Site is designed to provide a seamless and user-friendly shopping experience. Developed using HTML, CSS, and PHP for the front-end and MySQL for the database, the platform ensures efficient and dynamic data management.

Key features include advanced product search functionality, AJAX-based sorting for real-time updates, and secure payment processing. The system incorporates regex for email validation, ensuring the integrity of user data during registration and checkout processes. Additionally, the platform offers detailed product descriptions, intuitive navigation, and a responsive design to enhance the overall user experience.

By integrating modern web technologies and robust database management, Online Bazar delivers a comprehensive solution for eCommerce, catering to the needs of both customers and businesses while prioritizing security, efficiency, and scalability.

1.2 Problem Statement:

The rapid growth of digital technologies has transformed traditional shopping into an online experience, yet many consumers and businesses still face significant challenges in e-commerce platforms. These challenges limit the potential of online shopping and impact customer satisfaction, business efficiency, and profitability. Key problems faced in this space include:

- Limited User Experience and Usability
- Inefficient Order Management and Fulfillment
- Security Concerns
- Payment Processing Limitations
- High Competition and Market Saturation

1.3 Objectives:

The main objectives of our system include:

- To develop a secure, scalable eCommerce platform using Next.js and Django REST Framework.
- To implement REGEX-based authentication for secure user login.
- To integrate secure payment processing and third-party shipping APIs for smooth transactions.
- Optimize performance and user experience for responsive, fast, and seamless interactions.

1.4 Scope and Limitations:

1.4.1 Scopes:

- Development of a web-based eCommerce platform using Next.js (front-end) and Django REST Framework (back-end).
- Implementation of REGEX-based authentication for secure user login and session management.
- Integration of machine learning for product recommendations.
- Focus on delivering a responsive and user-friendly platform across all devices.

1.4.2 Limitations:

- Limited payment gateway
- No support for high-volume traffic handling

1.5 Report Organization:

This report is organized as follows:

- a) Chapter 1: Introduction – Overview of the project, objectives, scope, and methodology.
- b) Chapter 2: Background Study and Literature Review – Overview of e-commerce, technologies, and related literature.
- c) Chapter 3: System Analysis – Detailed requirement analysis, feasibility study, and system modeling.
- d) Chapter 4: System Design – Design of the system including database, interface, and architectural diagrams.
- e) Chapter 5: Implementation and Testing – Implementation details and testing strategies.
- f) Chapter 6: Conclusion and Future Recommendations – Summary of the project and suggestions for future improvements.

Chapter 2: Background Study and Literature Review

2.1 Background Study

The rapid expansion of eCommerce has reshaped the global retail industry, emphasizing the need for platforms that are secure, scalable, and efficient. Traditional eCommerce systems often struggled with performance issues, inadequate security measures, and challenges in handling high traffic and transaction volumes, which highlighted the demand for modern solutions. The Online Bazar eCommerce platform is designed to address these challenges by leveraging advanced web technologies and robust infrastructure. Built with HTML, CSS, and PHP, the platform ensures a user-friendly and dynamic interface, while MySQL provides efficient database management for storing and handling large volumes of user, product, and transaction data. To enhance the browsing experience, AJAX is utilized for real-time sorting and filtering, enabling seamless updates without requiring page reloads. Security is prioritized through features such as regex for validating email inputs, ensuring data accuracy and safeguarding user information. Traditional eCommerce platforms often lacked dynamic personalization and efficient real-time updates, resulting in user dissatisfaction. The Online Bazar platform overcomes these gaps by offering dynamic content updates, secure data handling, and an intuitive user experience tailored to diverse customer needs. By integrating these technologies, the platform delivers a scalable, secure, and efficient solution that caters to the demands of modern online retail.

2.2 Literature Review

E-commerce has revolutionized the global retail landscape, with numerous studies emphasizing the importance of robust technologies and user-centric designs in building efficient platforms. Traditional systems often struggled with scalability, security, and user satisfaction due to limited real-time features and weak data handling capabilities. Technologies such as HTML, CSS, and PHP have been widely adopted for creating dynamic interfaces and facilitating seamless interactions, while MySQL has proven to be a reliable database solution for managing large volumes of user, product, and transaction data. Research highlights the critical role of AJAX in enhancing user experiences through real-time sorting and filtering, making platforms more interactive and responsive. Security concerns, such as input vulnerabilities, are effectively addressed using regular expressions (regex) for validating critical user data, like email formats, during registration and transactions. Despite advancements, traditional platforms often lacked efficient scaling mechanisms and personalized user experiences, leading to dissatisfaction. The Online Bazar eCommerce platform incorporates these insights by integrating modern web technologies, including dynamic sorting, robust database management, and secure validation methods, to deliver a scalable, secure, and user-friendly solution that meets the evolving demands of online shoppers and businesses.

Chapter 3: System Analysis and Design

3.1 System Analysis

3.1.1 Requirement Analysis

The e-commerce website "Online Bazar" requires a robust set of features to ensure seamless functionality. The system begins with user authentication through a user registration and login process, ensuring secure access. Role-based access control is implemented to differentiate between customer and admin functionalities. For efficient management, the platform includes an admin dashboard that allows the addition, editing, and deletion of products and users, providing centralized control over the system. Additionally, a user-friendly shopping cart and checkout process are essential, offering smooth navigation and secure payment options for a seamless user experience. The platform also incorporates efficient order processing to ensure customer satisfaction. The requirement analysis for Online Bazar is divided into functional and non-functional requirements to outline the system's capabilities comprehensively.

i. Functional Requirements

- a) Product Browsing: Users should be able to filter products by category, price, and rating.
- b) Shopping Cart: Users can add, remove, and view items in their cart.
- c) Order Processing: Users can check out their items, enter payment details, and track orders.
- d) Admin Panel: Admins can manage product details, view orders, and monitor stock.

ii. Non-Functional Requirements

- a) Security: All user and payment data must be securely encrypted.
- b) Performance: The system must support up to 1000 concurrent users without slowing down.
- c) Scalability: The system must be scalable to accommodate more users and products over time.

3.1.2 Feasibility Analysis

Feasibility analysis evaluates the potential risks and determines whether the Online Bazar project is viable and worth pursuing. The analysis is conducted across three key areas:

i. Technical Feasibility

The Online Bazar eCommerce platform is designed to be compatible with modern web browsers, ensuring accessibility for a wide range of users. The use of technologies such as HTML, CSS, PHP, MySQL, and AJAX ensures that essential features like search and filter functionality, secure payment processing, and user authentication are effectively implemented. These technologies provide robust security for user data and ensure a responsive and efficient platform, making the project technically feasible.

ii. Operational Feasibility

The project aligns with the operational goals of providing a seamless eCommerce experience for both customers and administrators. Specific operations, such as adhering to project deadlines, meeting milestones, and ensuring effective coordination among various components (e.g., admin dashboard, user interface, and backend), are prioritized. The platform is designed to handle core functionalities like managing users, products, and orders without disrupting workflows at the business or customer level, making it operationally feasible.

iii. Economic Feasibility

The financial analysis for Online Bazar includes assessing the costs of development, hosting, maintenance, and operation against the potential revenue generated through online sales. A cost-benefit analysis indicates that the investment in development and operation is justified by the platform's ability to attract and retain users, drive sales, and generate profits over time.

3.1.3 System Design

System design phase is the crucial stage in the e-commerce application development lifecycle. During this phase, the overall architecture and structure of the application are planned in details. It is required to address the components and modules with functional as well as non-functional requirements of the application. Additionally, the design phase involves defining the data models, outlining system workflows and data protection mechanisms.

3.1.4 Design (Object-Oriented Approach)

Class Diagram:

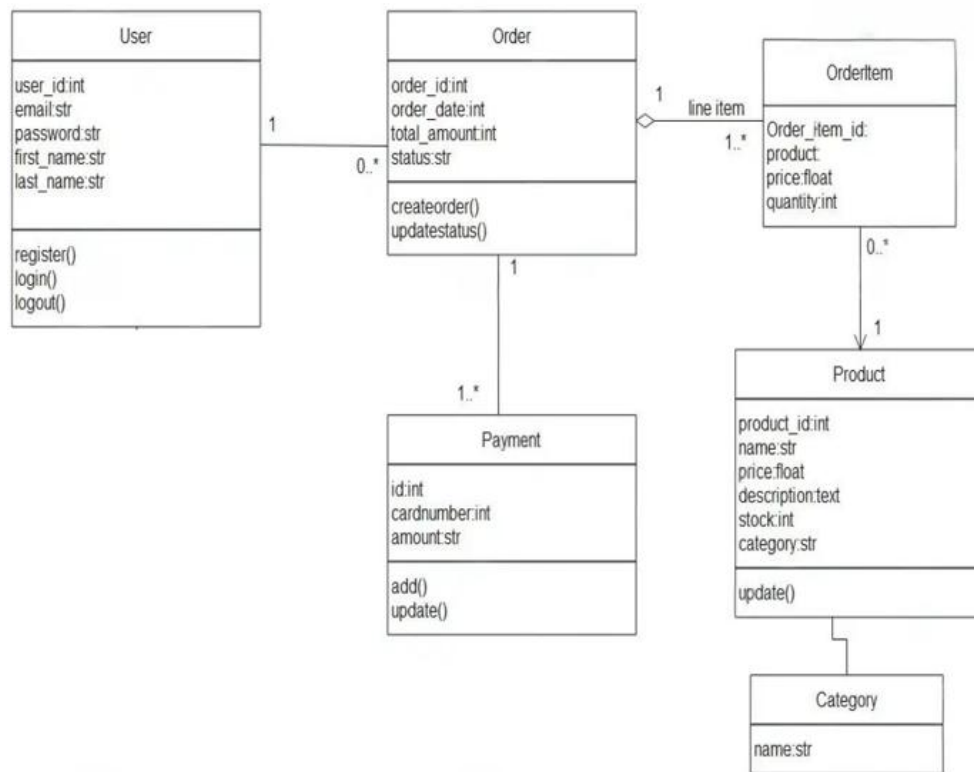


Figure 3. 1: Class Diagram of Online Bazar

Sequence Diagram:

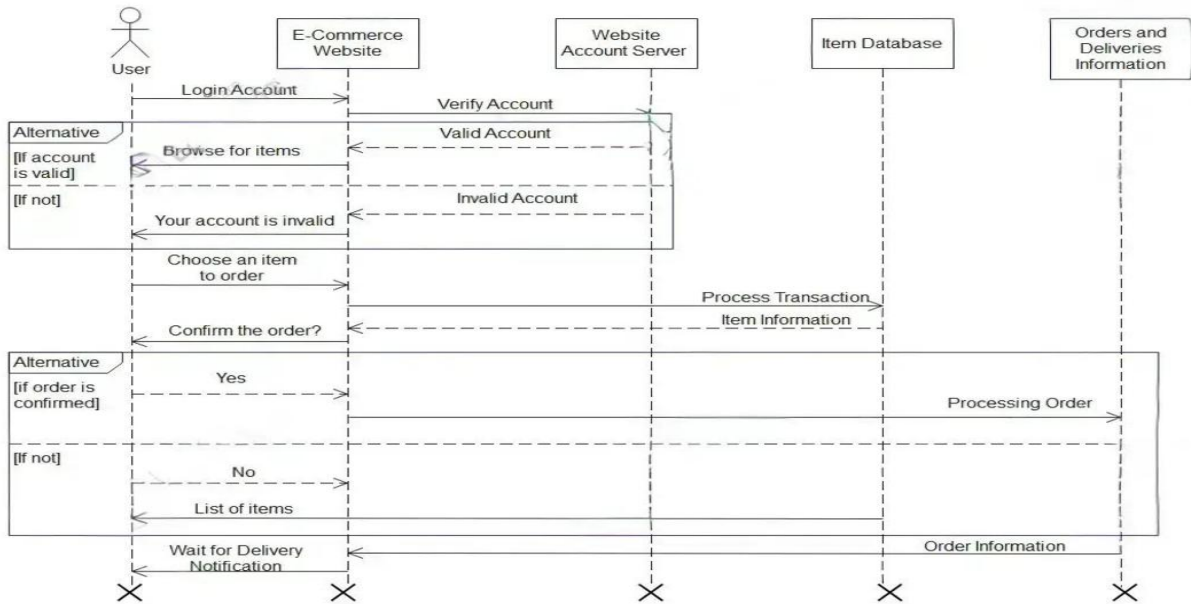


Figure 3. 2: Sequence Diagram of Online Bazar

Use Case Diagram:

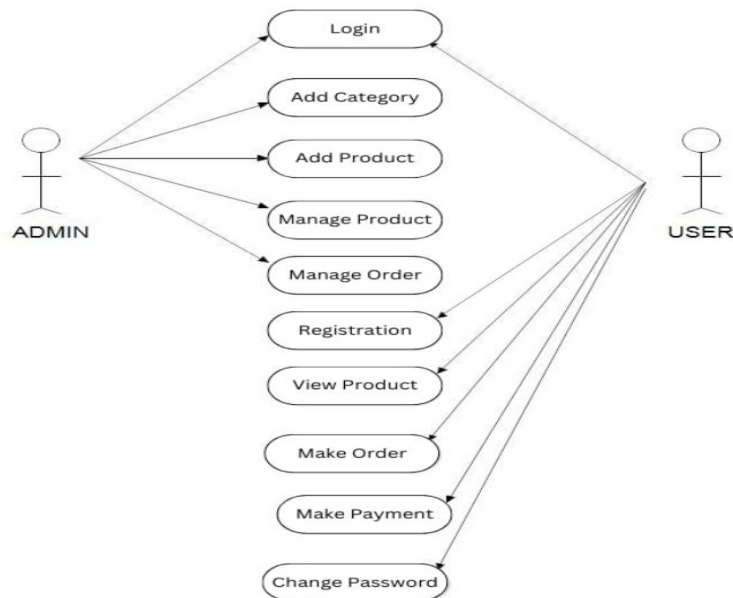
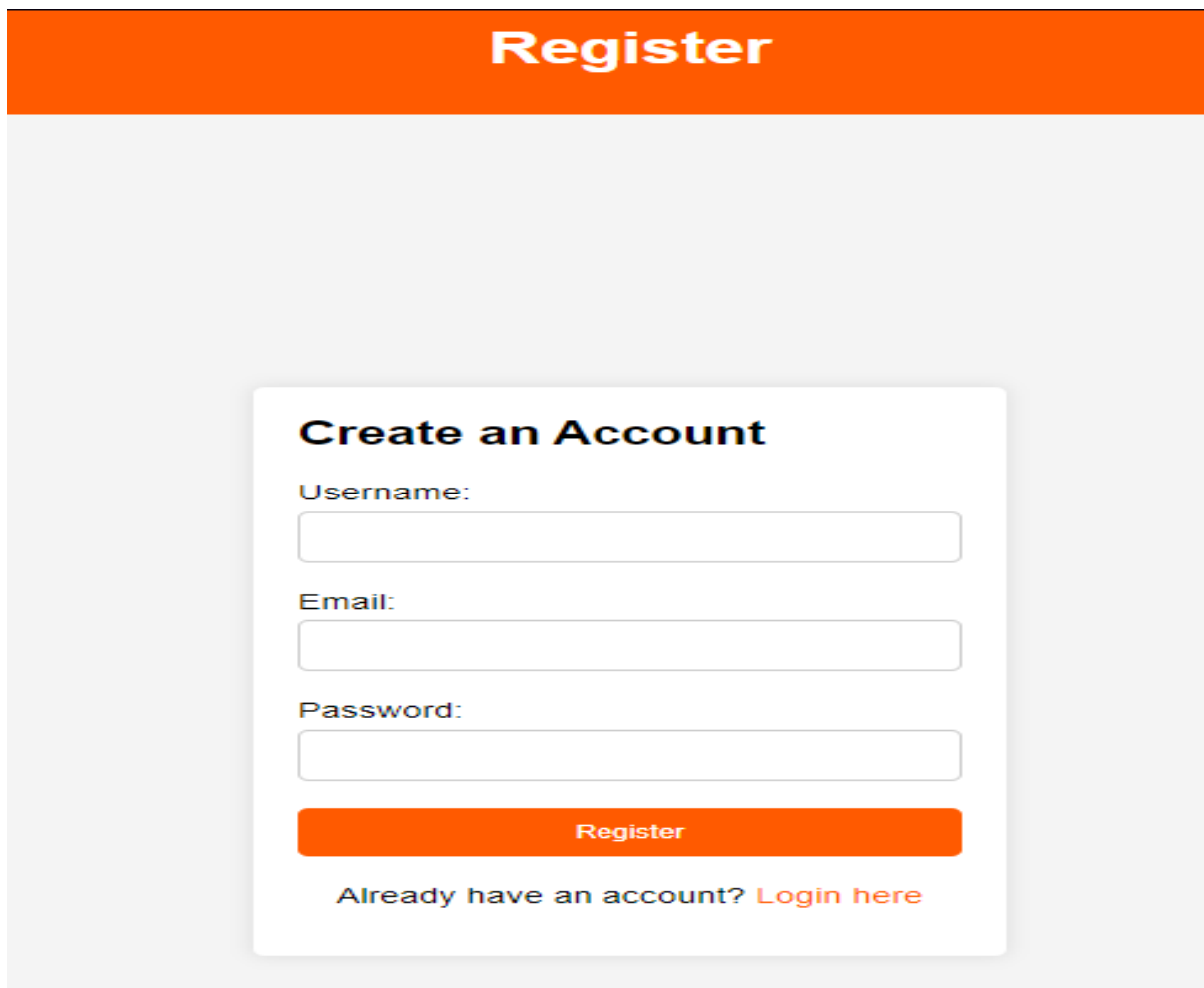


Figure 3. 3: Use Case Diagram of Online Bazar

3.1.5 Interface Design

Interface design, commonly known as user interface (UI) design, involves creating the visual layout and interactive elements of digital products such as websites, mobile apps, and software applications. The aim is to optimize the user experience by making interactions with the product intuitive, efficient, and enjoyable.



The image shows a user registration interface. At the top, there is an orange banner with the word "Register" in white. Below this, on a light gray background, is a white card titled "Create an Account". The card contains three input fields labeled "Username:", "Email:", and "Password:". Below the "Password:" field is an orange "Register" button. At the bottom of the card, it says "Already have an account? [Login here](#)".

Fig 3.9: User Login Page

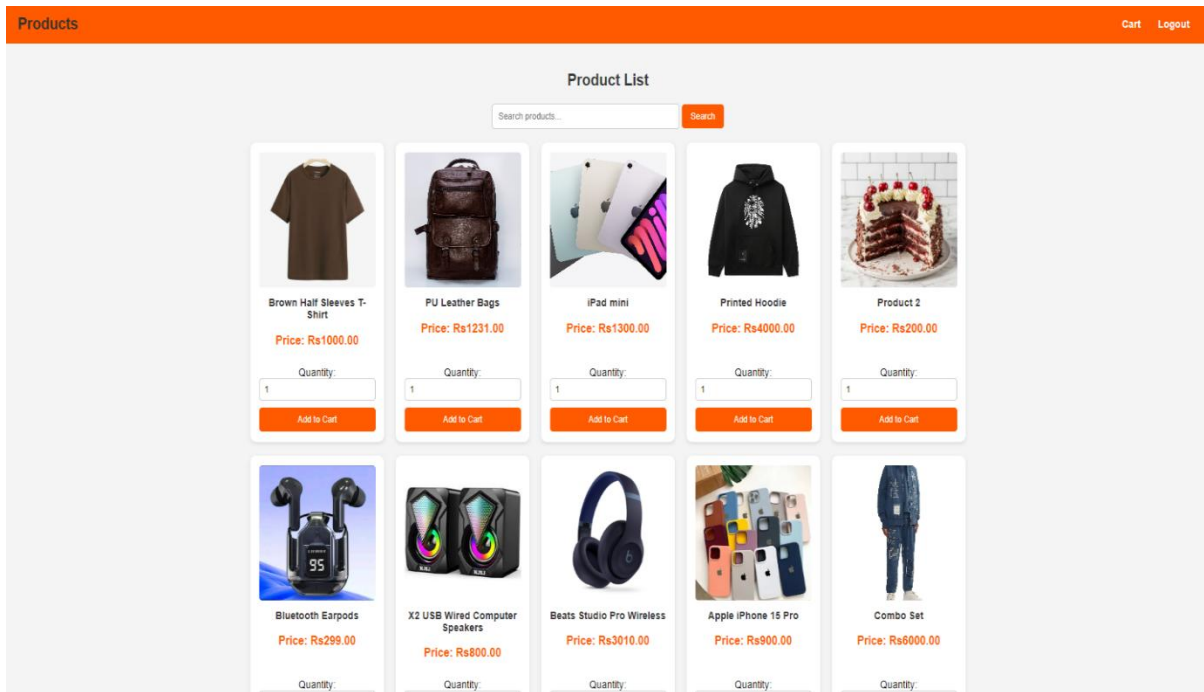


Fig 3.10: Customer Dashboard

Chapter 4: Implementation and Testing

4.1 Implementation

The implementation phase is a crucial stage in the waterfall method, where the planned system or software solution is transformed from a conceptual design into a tangible reality.

4.1.1 Tools Used

A variety system tools have been used in developing both the front-end and back-end of the system. The tools and technologies that we used for developing the system are mentioned below:

i. Programming Languages:

- **HTML (Hyper-Text Markup Language):** HTML is used in our project as HTML is universally supported by all web browsers, ensuring consistent rendering of web pages across different devices and platforms.
- **CSS (Cascading Style Sheets):** CSS is used in our project as CSS enhances the visual appeal and user experience of the web pages by providing a consistent and attractive design.
- **PHP:** We have used PHP for server-side scripting because PHP allows for the creation of dynamic web pages that can display different content based on user interactions or other inputs and can easily integrate with various databases, making it ideal for developing data-driven applications and websites

ii. Integrated Development Environment (IDE):

- **VS Code (Visual Studio Code):** VS Code is used as text-editor in our project because it is a free source code editor with robust features, extensions and a powerful debugger for coding in HTML, CSS, JS and PHP.

iii. Database:

- **MySQL:** We have used MySQL for database as it is an open-source relational database management system used for storing and managing structured data and it is also reliable, scalable and easy to use.

iv. Diagrams:

- **Draw.io:** To create various diagram for documentation we have used draw.io for creating diagrams like Class Diagram and Use case diagrams.

4.1.2 Implementation of Module

Incorporating a module into the web application entails the process of designing and seamlessly integrating distinct features and capabilities into the digital platform. This section outlines various modules of our project:

- Users Module:** The user module is essential to deliver a streamlined experience for user to engage in various features of ecommerce through our web application. It includes features such as:
 - **Registration Process:** Users when first try to buy or sell products they have to create an account with personal credentials which are later used to log in to the system. Users can sign up using sign up page with the right credentials.
 - **Login Process:** Uses user's credentials like username and password to authenticate the user or they can simply login from their google-account and redirect to the home page.
 - **Cart Process:** User can add the desired product to cart, delete the products from the cart.
 - **Checkout Process:** Provide a "Checkout" button that leads to a checkout page/form.
 - **Cancel Order Process:** Allows users to cancel their order if they decide not to proceed with the purchase.
 - **Logout Process:** On the navbar, there is a logout button when

clicked it destroys the session and then redirect the user to the home page.

ii. Admin Module: The admin module focuses on providing a seamless experience and functionality to the admin.

- **Login Process:** Uses credentials like username and password to authenticate the admin and redirect them to the dashboard.
- **Product Process:** In this module the admin can manage operation related to the product.
- **Order Process:** In this module operation related to the order like accepting or rejecting the order or delivered takes place.
- **Logout Process:** On the navbar, there is a logout button when clicked it destroys the session and redirects to the login page

4.2 Testing

Testing is an essential phase in software development that entails the assessment and verification of a software application to guarantee it aligns with its specified requirements, operates as intended, and remains devoid of defects or glitches.

4.2.1 Unit Testing

Unit testing is a foundational practice within software development, focusing on the examination of discrete code components or units in isolation to confirm their proper operation.

S.N.	Test Cases	Input Credentials	Expected Results	Actual Output
1.	All input fields <u>remains</u> empty.	Username: ---- Email: --- Password: ---	All fields are empty.	All fields are empty.
2.	Enter the accurate data for email, username and password.	Username: Test124 Email: test@gmail.com Password: user@123	Successfully Registered as user.	Successfully registered as user.
3.	Provide the valid email and username but keep the password field empty.	Username: test123 Email: test2@gmail.com Password: ----	Password field is empty.	Password field is empty.
4.	Enter badly formatted Email.	Username: test Email: test23gmail.com Password: test123	Email is badly formatted. Invalid email	Email is badly formatted. Invalid email

Table 1: Test Case for User SignUp

S.N.	Test Cases	Input Credentials	Expected Results	Actual Output
1.	Keep Email and Password field empty	Email: --- Password: ---	Please fill out the fields	Please fill out the both fields
2.	Enter the valid email and password	Email: test@gmail.com Password: manish234	Navigate to Admin dashboard	Redirect to admin dashboard
3.	Enter the valid email and invalid password.	Email: test@gmail.com Password: qwertyu12	Display error. Incorrect password	Incorrect password.
4.	Enter invalid email	Email: testgmail.com Password: abcd234	Invalid email	Badly formatted email

Table 2: Test cases for User System Testing

4.2.2 Test Case for System Testing

System testing is the crucial phase in the software development life cycle where the entire application is tested as a whole. The primary goal is to validate the behavior, functionality, performance and reliability of the software system before it is released to the end users.

S.N.	Operations Performed	Expected Outcome	Actual Outcome	Test Output
1.	Tap on Product view	Navigate <u>to</u> the specific product details page	Redirected to the single product details screen	Passed
2.	Add-to-cart Action	Products to be added to the cart screen	The <u>users</u> products gets added to the cart page	Passed
3.	Checkout Action performed	Required to navigate <u>to</u> the payment screen	Get redirected <u>to</u> the payment page	Passed
4.	Tap on Order Bottom Navigation bar	Must navigate to order Screen	Gets Redirected to Order Screen showing order details	Passed

Table 3: Test cases for User System Testing

S.N.	Operations Performed	Expected Outcome	Actual Outcome	Test Output
1.	Tap on the User Portal	To be navigated to user details page	Redirected to user details page product details screen	Passed
2.	Adding the products and categories	Products and Categories to be added	The products and categories are added	Passed
3.	Update the products and categories	The products and categories info to be updated.	The products and categories information <u>are</u> updated successfully.	Passed
4.	Delete products and categories	The specific product and categories are to be deleted	The particular products and categories are deleted	Passed

Table 4: Test cases for Admin System Testing

4.2.3 Result Analysis

The results from both unit and system testing were carefully analyzed to evaluate the system's performance and functionality. Any identified issues were categorized and prioritized for resolution. Overall, the system performed as expected in most scenarios, but a few minor issues were detected in areas such as email notification delays and minor UI glitches. These issues were promptly fixed, and the system was retested to ensure all functionalities worked as intended.

Chapter 5: Conclusion and Future Recommendation

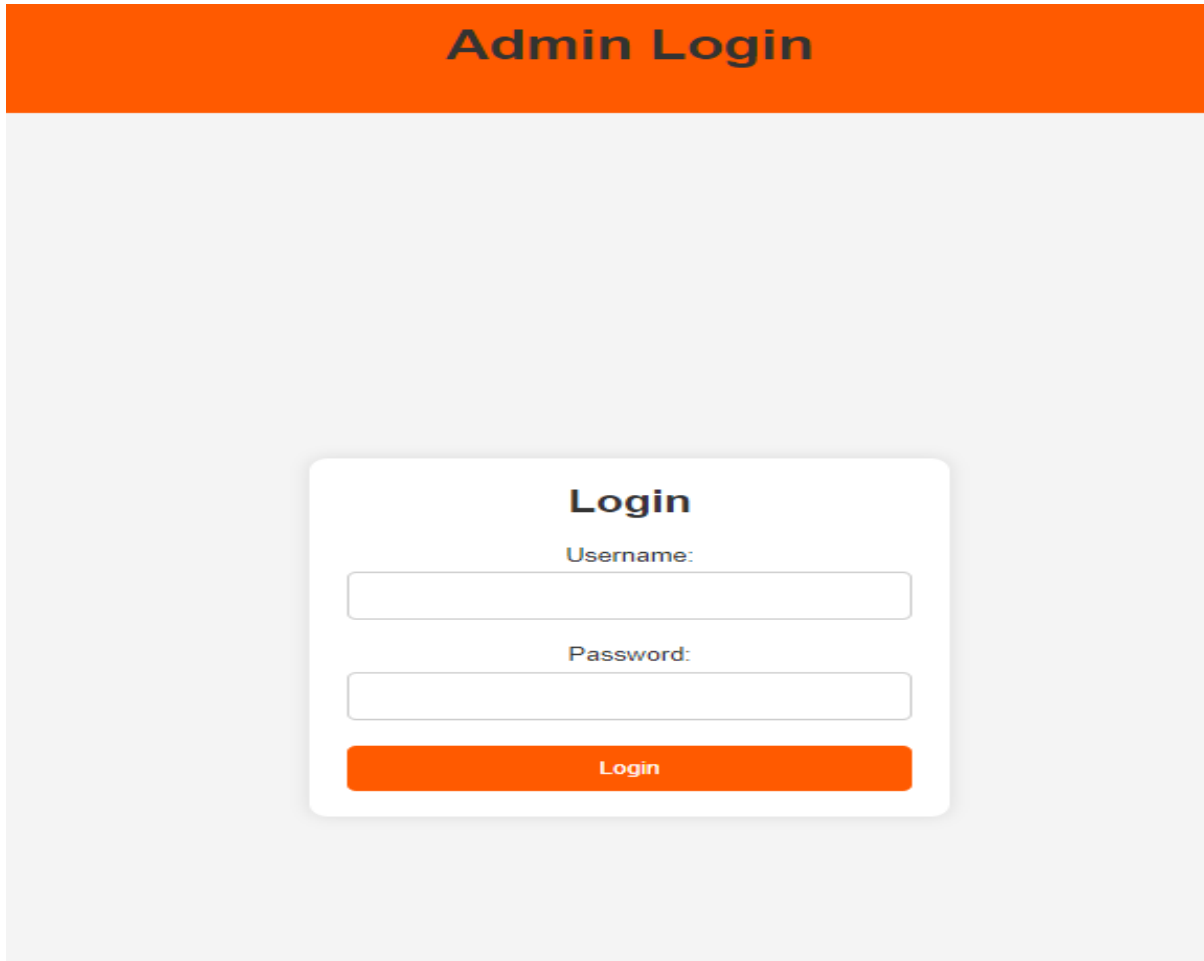
5.1 Conclusion

The developed e-commerce system successfully fulfills the outlined objectives, providing users with a seamless and efficient platform for browsing products, making secure payments, and managing orders effectively. The system has been carefully designed to ensure functionality and reliability, delivering a user-friendly experience that meets both customer and business needs. Additionally, the platform is built with scalability in mind, allowing it to accommodate future growth and the integration of new features or enhancements. This robust foundation ensures the system is well-suited for long-term success and adaptability to changing market demands.

5.2 Future Recommendations

- a) Expand the system to include a mobile app for better accessibility.
- b) Add internationalization and localization.
- c) OTP verification

Appendices



The image shows a web interface for an Admin Login. At the top, there is a solid orange header bar with the text "Admin Login" in white, bold font. Below this header, the background is a light gray. In the center of the page is a white, rounded rectangular login form. The form has a title "Login" in bold black text. Below the title are two input fields: the first is labeled "Username:" and the second is labeled "Password:". Both labels are in a smaller, regular black font. At the bottom of the form is an orange button with the text "Login" in white, bold font.

Admin Login

Login

Username:

Password:

Login

Figure 1: Admin Login

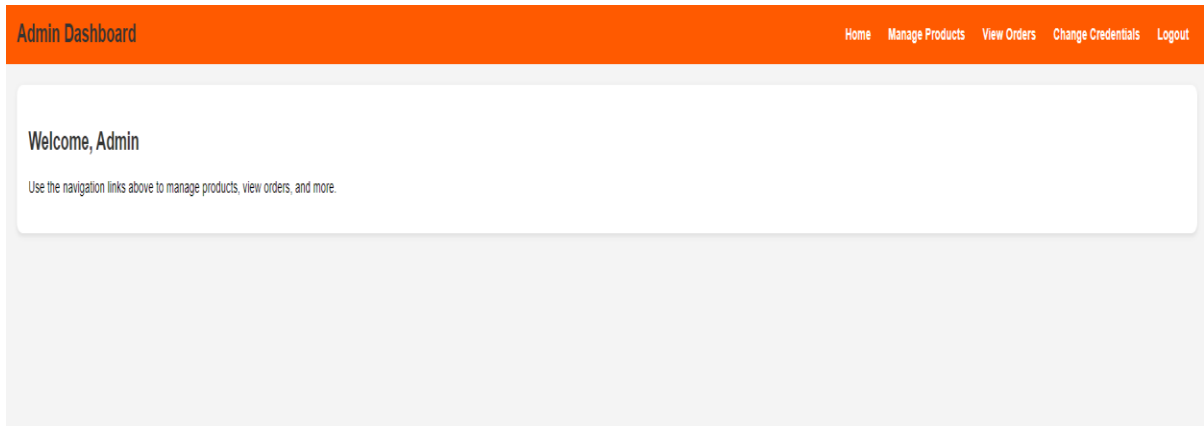


Figure 2: Admin Dashboard

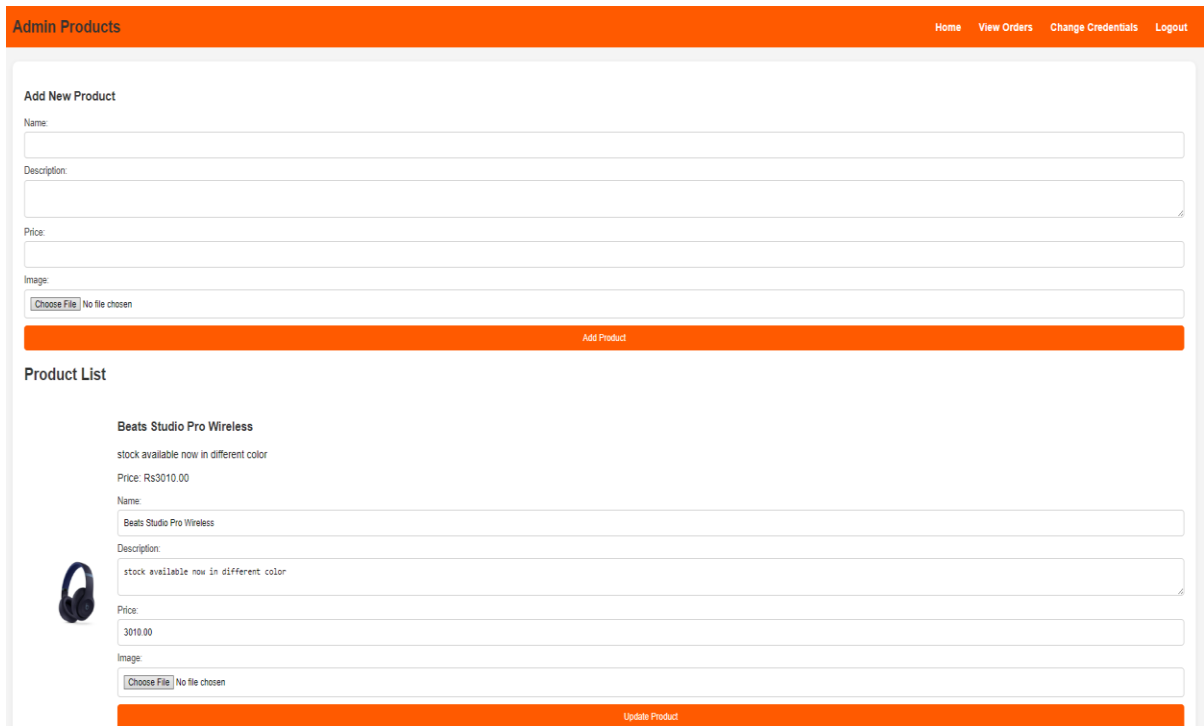


Figure 3: Admin Add page

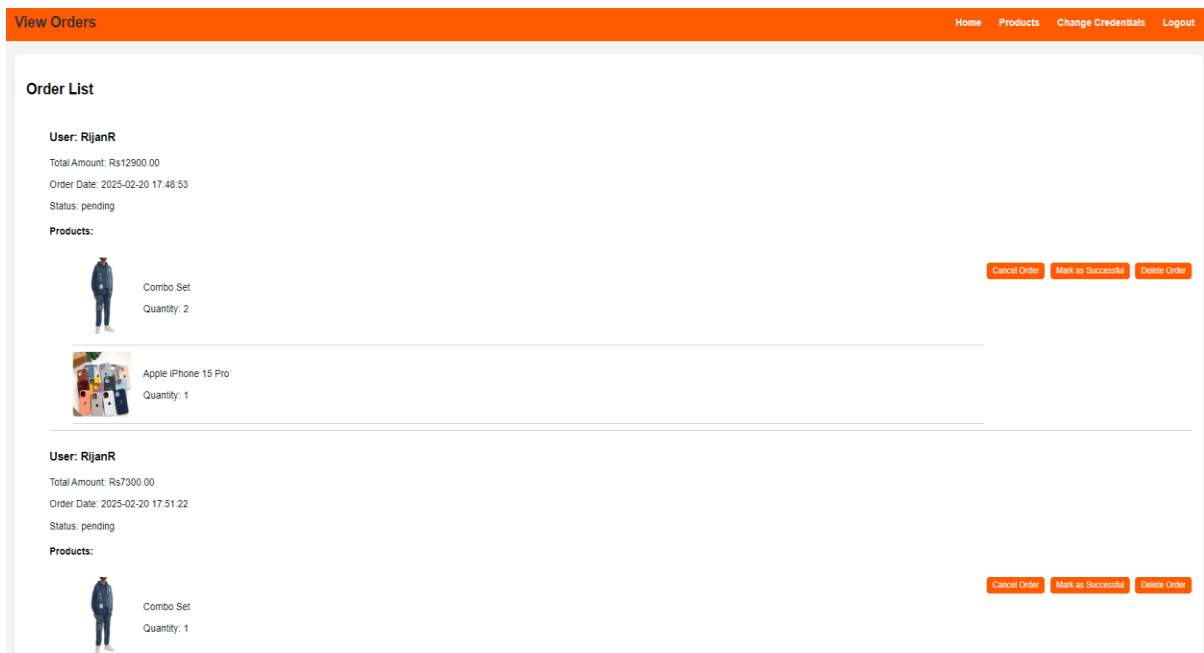


Figure 5: Pending orders Page

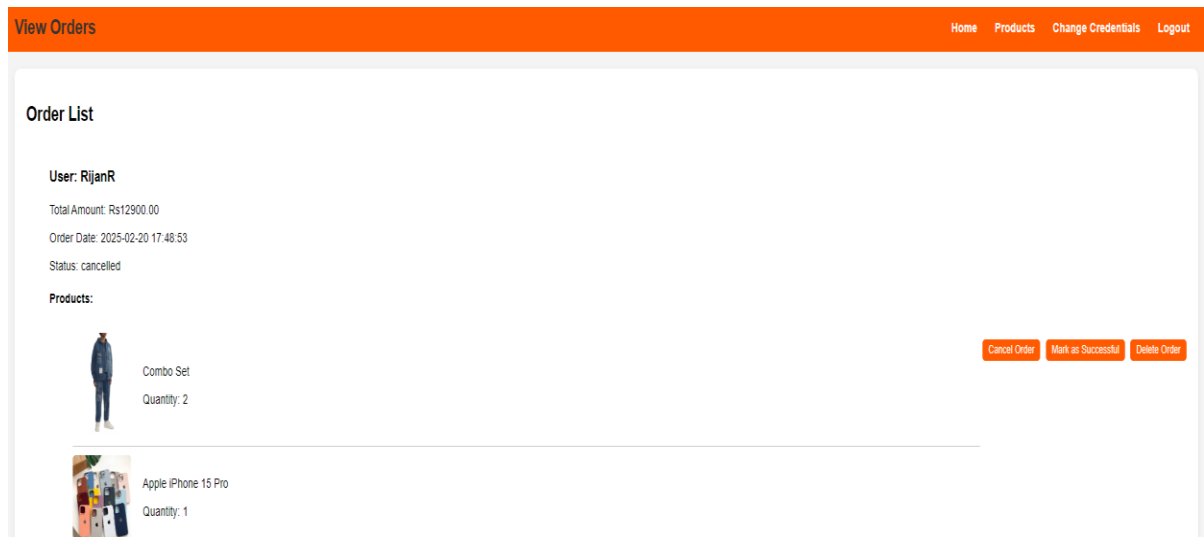


Figure 6: Canceled order page

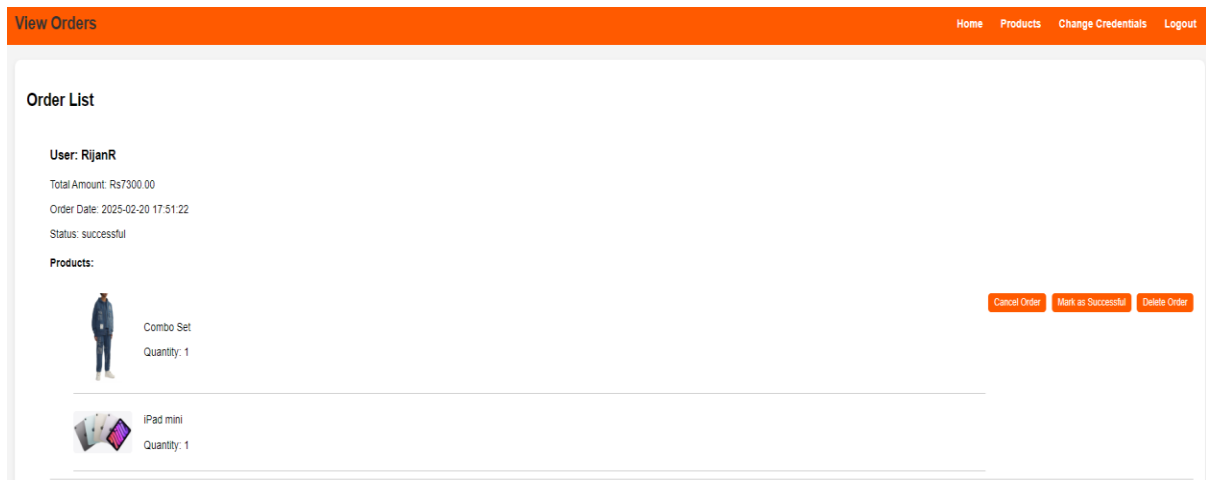


Figure 7: Completed order Page

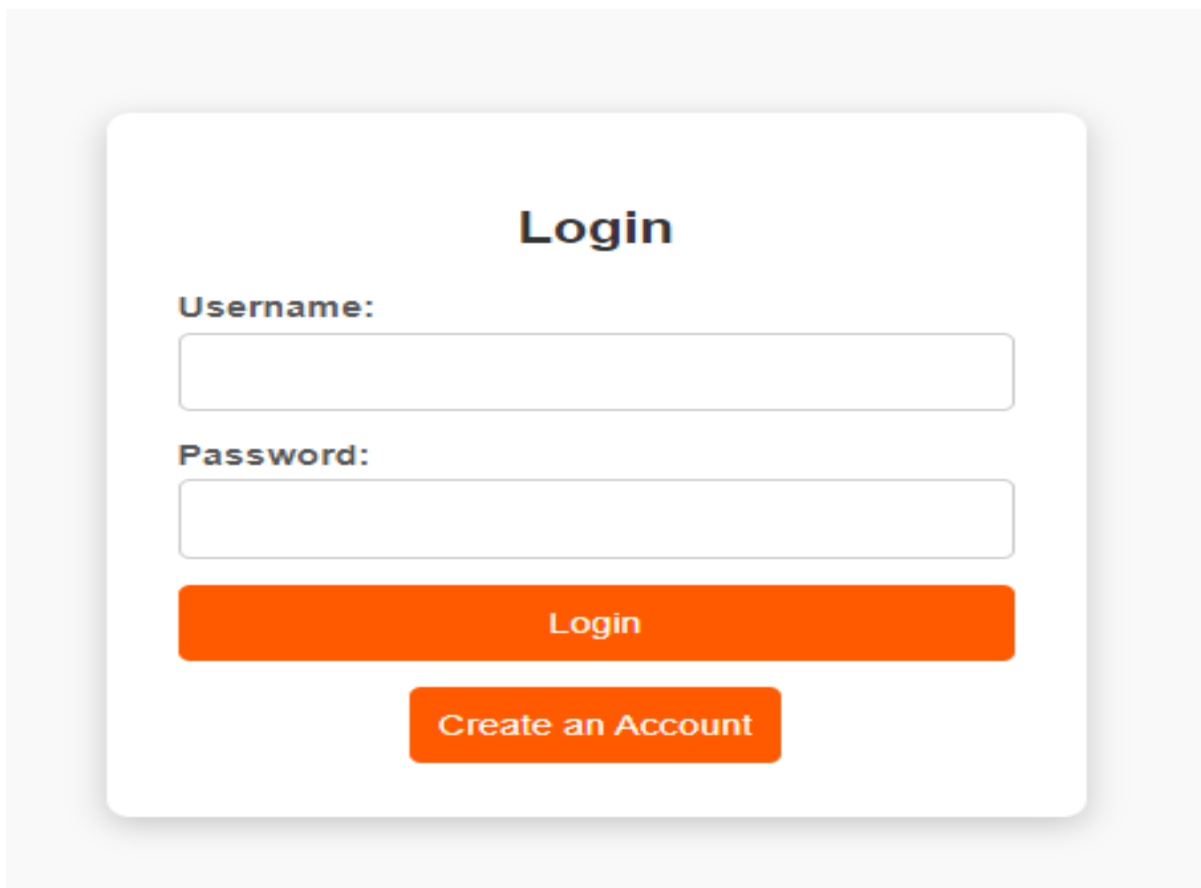


Figure 9: User Login Page

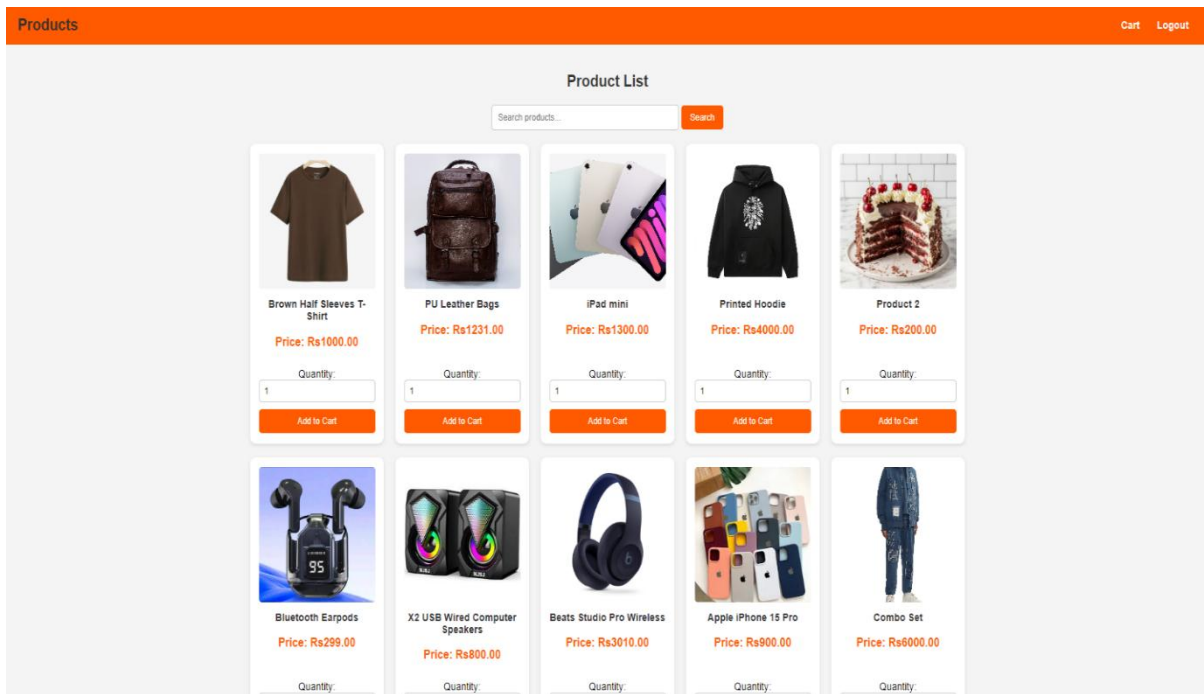


Figure 10: User Dashboard Page

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