ELECTRO ZONE

Project report submitted
in partial fulfillment of the requirement for award of the degree of

Bachelor of Technology
in
Computer Science & Engineering

By

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10211CS212 - WEB AND MOBILE APPLICATION DEVELOPMENT

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November,2025

CERTIFICATE

It is certified that the work contained in the project report titled ”Electro Zone” by ”E Bhargav Ganesh (23UECS0171), A Manjunatha Reddy (23UECS0030), V Varun Reddy (23UECS0915), K Vikram Kumar Reddy (23UECS0930)” has been carried out under my supervision and that this work has not been submitted elsewhere for a degree.

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DECLARATION

We declare that this written submission represents my ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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APPROVAL SHEET

This project report entitled ELECTROZONE by E.Bhargav Ganesh (23UECS0171), A.Manjunatha Reddy (23UECS0030), V.Varun Reddy (23UECS0915),K.Vikram Kumar Reddy(23UECS0930) is approved for the degree of B.Tech in Computer Science & Engineering.

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ABSTRACT

Our aim is to design the experience to make the purchasing experience of electronic products fast, simple and secure.The system allows users to browse a wide range of electronic items, such as mobile phones, laptops, and accessories, compare products, add them to a shopping cart, and make secure online payments. It provides an intuitive interface where customers can easily search for products, view detailed specifications, and track their orders in real-time.The purpose of the project is to reduce the gap between electronic retailers and customers by providing a digital marketplace that is accessible anytime and anywhere.On the administrative side, ElectroZone provides a dedicated dashboard for managing products, monitoring inventory levels, processing customer orders, and generating sales reports.

Keywords:

Electrozone

E-commerce

Electronics

Online shopping

Responsive web design

Website performance

Mobile-friendly

Cloud hosting

User experience.

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LIST OF ACRONYMS AND ABBREVIATIONS

API	Application Programming Interface
CSS	Cascading Style Sheets
HTML	HyperText Markup Language
JSON	JavaScript Object Notation
AWS	Amazon Web Services
VS	Visual Studio
SSD	Solid State Drive
UI	User Interface
UPI	Unified Payments Interface
HTTP	HyperText Transfer Protocol

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Chapter 1

INTRODUCTION

1.1 Introduction

The rapid growth of technology and internet connectivity, online shopping has become an essential part of everyday life. The system is designed to offer a smooth and interactive user experience, allowing customers to register easily, search for products, add them to the shopping cart, make online payments, and track their orders in real-time.

To meet this growing need, ElectroZone has been developed as an advanced e-commerce platform dedicated to selling electronic products efficiently and securely.ElectroZone provides customers with a digital marketplace where they can browse, compare, and purchase a wide range of electronic devices such as mobiles, laptops, televisions, and accessories.

1.2 Aim of the Project

The main aim of the ElectroZone project is to develop a user-friendly and secure online platform for purchasing electronic products conveniently from anywhere and at any time. The project seeks to simplify the process of buying and selling electronics by bringing customers and retailers together on a single digital platform.

ElectroZone aims to provide customers with an effortless shopping experience where they can easily browse a wide range of electronic items, compare features, read reviews, and make secure online payments. It also aims to help store administrators manage products, monitor sales, and handle customer orders efficiently through an organized backend system.

1.3 Project Domain

The ElectroZone project belongs to the domain of E-Commerce and Web Application Development. It focuses on creating an online marketplace specifically for electronic products, allowing users to buy and sell items through a secure and user-friendly digital platform.

1.4 Scope of the Project

- The project provides an easy-to-use online system where customers can browse and purchase electronic products conveniently from anywhere.
- Users can explore various categories like mobiles, laptops, televisions, and accessories with detailed specifications and images.
- Customers can register, log in, and manage their profiles securely with encrypted authentication.
- The platform works efficiently on desktops, tablets, and smartphones, ensuring accessibility for all users.
- The admin can generate sales reports and monitor performance for better decision-making.
- uilt using modern web technologies such as HTML, CSS, JavaScript and json.

1.5 Methodology

The development of the ElectroZone e-commerce platform follows a systematic approach to ensure that the application is efficient, reliable, and user-friendly.

1. **Requirement Analysis:** In this phase, all the necessary requirements for the system were gathered and analyzed. This included understanding user needs, identifying the types of electronic products to be sold, and determining the functionalities required for customers and administrators.
2. **System Design:** The system architecture and database structure were designed. The front-end layout was created using HTML, CSS, and JavaScript, while the backend design involved setting up Node.js for server-side logic and JSON for data communication.
3. **Speech Output:** The translated text is then converted back into speech using the Speech Synthesis API, allowing the user to hear the output instead of reading it.
4. **Implementation:** During implementation, the actual coding of the project was carried out. The front-end and back-end components were developed and connected through APIs. Each module—such as user registration, product management, and payment gateway—was implemented, tested, and integrated step by step.
5. **Testing:** After development, the system underwent thorough testing to identify and fix any bugs or issues. Different testing methods such as unit testing, integration testing, and user acceptance testing were performed to ensure that all features worked correctly and securely.

Chapter 2

REQUIREMENT SPECIFICATION

2.1 User Characteristics

The requirement specification defines the functional and non-functional needs of the ElectroZone e-commerce platform. It serves as a blueprint for designing, developing, and deploying the system, ensuring that both customers and administrators can use it efficiently and securely.

- **CUSTOMERS**
- Technical Knowledge: Basic to moderate; able to browse websites, search for products, and make online payments.
- Goals: Find products easily, compare prices and specifications, place orders quickly, and track delivery.
- **Administrators**
- Role: Manage product listings, inventory, orders, and customer queries.
- Goals: Maintain accurate product records, track orders, generate sales reports, and ensure smooth operations.

2.2 Dependencies

The system depends on the following:

- HTML, CSS, and JavaScript: Core technologies for building the structure, styling, and interactivity of web pages.
- JSON: For exchanging data between the frontend and backend efficiently.
- Hosting Services: Platforms like AWS, Firebase,to deploy the website online.
- VS Code: Code editor for development

2.3 Hardware Specification

The hardware requirements are minimal due to the web-based nature of the application:

- Processor: Intel i3 or equivalent
- RAM: Minimum 4 GB
- Storage: 512 GB SSD for faster data access and storing project files
- Display: Full HD (1920 x 1080) for better visualization of UI design
- Graphics: Integrated graphics are sufficient for development
- Peripherals: Keyboard, mouse, and touchscreen for testing responsive design

2.4 Software Specification

The software requirements include:

- Web browser: Google Chrome, Firefox, Edge, or Safari, supporting HTML5, CSS3 , JavaScript, Json for proper rendering of the web interface.
- APIs for additional features such as real-time notifications, multi-language translation for accessibility.
- Code editor for development (VS Code, Sublime Text, Atom, etc.)
- Optional: if running any server-side scripts or hosting locally.

2.5 Technologies Used

The ElectroZone is built using web-based technologies. The primary technologies used are:

- **HTML (Hyper Text Markup Language):**
  - Provides the basic structure of the web application.
  - Used to create accessible user interfaces with semantic elements.
  - Ensures compatibility across different browsers and devices.

- **CSS (Cascading Style Sheets):**
  - Used for styling the interface to make it visually appealing.
  - Enables customization of font sizes, colors, and layouts for better accessibility.
  - Supports responsive design to ensure the application works well on desktops, tablets, and mobile devices.
- **JavaScript:**
  - Handles the core functionality of the platform, including dynamic product listing, cart management, and order processing.
  - Connects the user interface with backend APIs for operations like retrieving products, processing orders, and integrating payment gateways.
  - Provides real-time interaction, allowing users to search for products, update carts, and receive order confirmations immediately.
- **JSON (JavaScript Object Notation):**
  - Used for data exchange between the frontend and backend in a lightweight and readable format.
  - Transmits product information, user details, order status, and other dynamic content.
  - Makes API communication faster and easier to manage, ensuring real-time updates and seamless integration.

Chapter 3

WEBSITE DESIGN

3.1 Sitemap

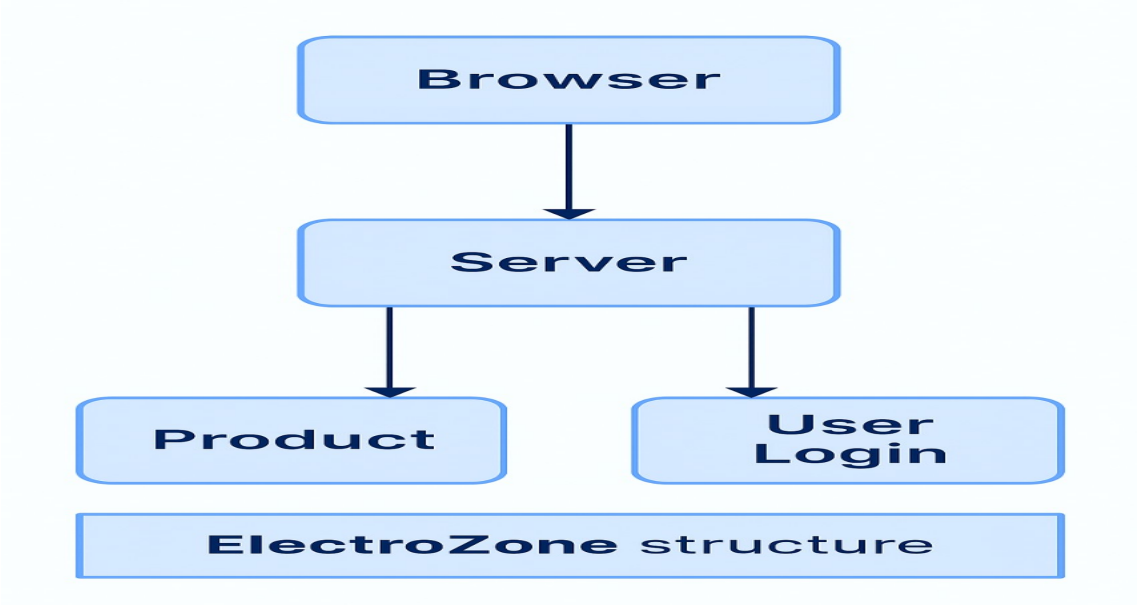

Figure 3.1: Architecture Diagram

Description

The Electrozone Web Development Architecture is designed to deliver seamless, high-performance web experiences that combine user-centric design, robust backend functionality, and modern technological frameworks. At the heart of the system is a dynamic user interface (UI) built with HTML, CSS, and JavaScript, ensuring that users interact with an intuitive and responsive platform. The UI serves as the entry point, offering an accessible and visually appealing layout that adjusts perfectly across devices and platforms.

Once the user interacts with the interface, the frontend of the application, powered by advanced frameworks like React or Vue.js, takes over. This part of the system is responsible for providing a fluid and engaging experience, with real-time interactions and data updates. It communicates directly with the backend through APIs, pulling data dynamically to ensure that users always see up-to-date content and have an interactive experience.

3.2 Design Phase

The design phase of the Electrozone Web Development Project focuses on creating a clear system architecture that ensures smooth interaction between frontend, backend, and database components. The frontend, built with HTML, CSS, and JavaScript, communicates with the backend, which handles business logic and data processing. A Database Layer manages data storage and retrieval, ensuring scalability and efficiency. The design also includes API integrations for external services, and modular architecture to allow easy maintenance and future expansion. Diagrams such as architecture and data flow diagrams help visualize the system's workflow, ensuring a logical flow of data. This phase lays the foundation for a scalable, high-performance, and user-friendly web application

3.2.1 Data Flow Diagram

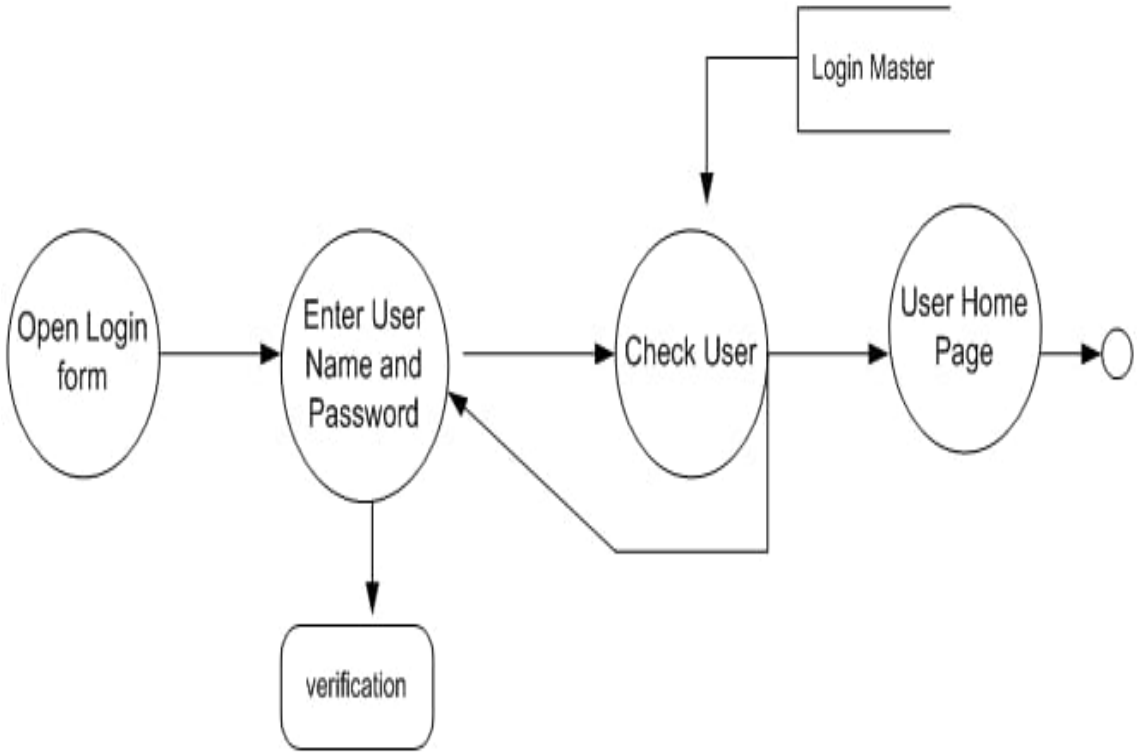

Figure 3.2: Data Flow Diagram

3.3 Front End and Back End Design

3.3.1 Home Page

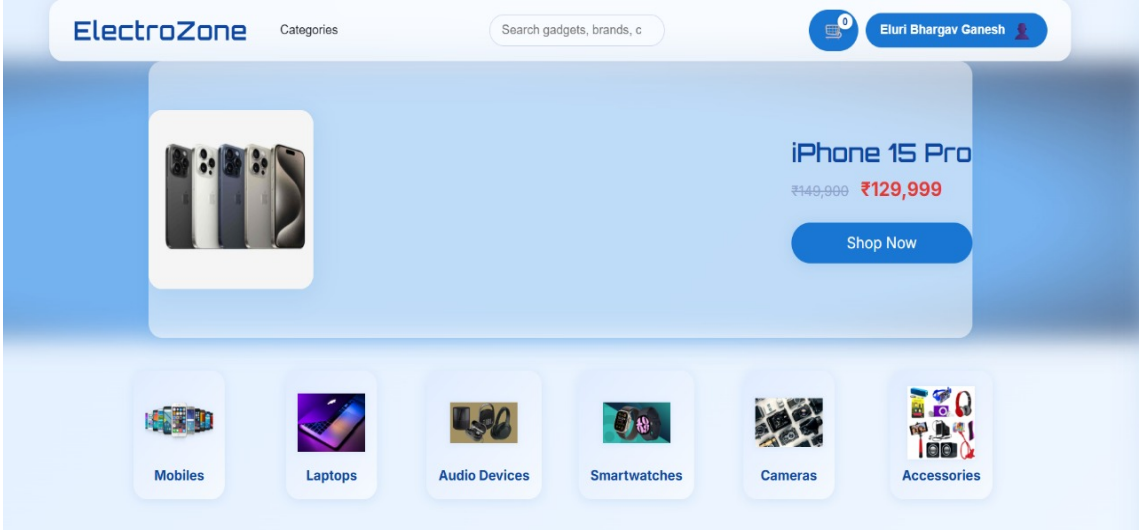

Figure 3.3: Home Page

ElectroZone is a user-friendly online platform that makes shopping for electronics simple and stress-free. Whether you're looking for the latest smartphones, laptops, or accessories, you can explore a wide range of products with ease. Choose from trusted brands, compare features, and check out securely using UPI, cards, or wallets. Once your order is placed, you'll get instant confirmation and real-time delivery updates.

3.3.2 Login Page

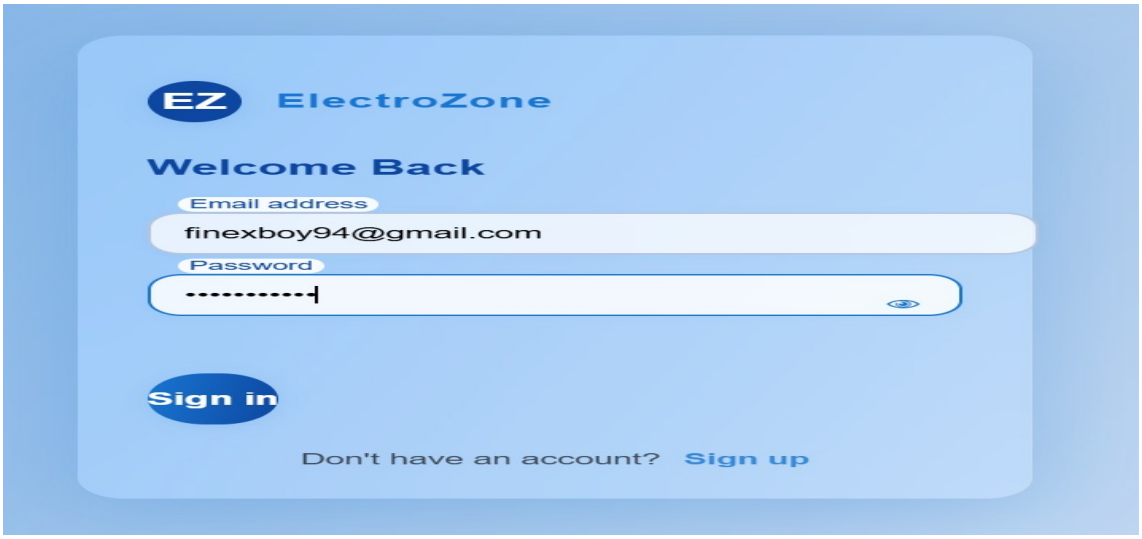

Figure 3.4: Login Page

Welcome back to ElectroZone — your go-to place for all things tech! Log in to your account to enjoy a smoother, more personalized shopping experience. You'll be able to easily track your past orders, save your favorite items, and get quick access to exclusive deals and new product launches. Whether you're hunting for the latest gadgets or just browsing for your next upgrade, your account helps you check out faster and pay securely every time.

- Forgot your password? No worries — just click "Forgot Password" to reset it in seconds.
- New here? It only takes a minute to create an account and start exploring everything ElectroZone has to offer. Tech shopping has never been this easy or this fun.

3.3.3 Form Validation

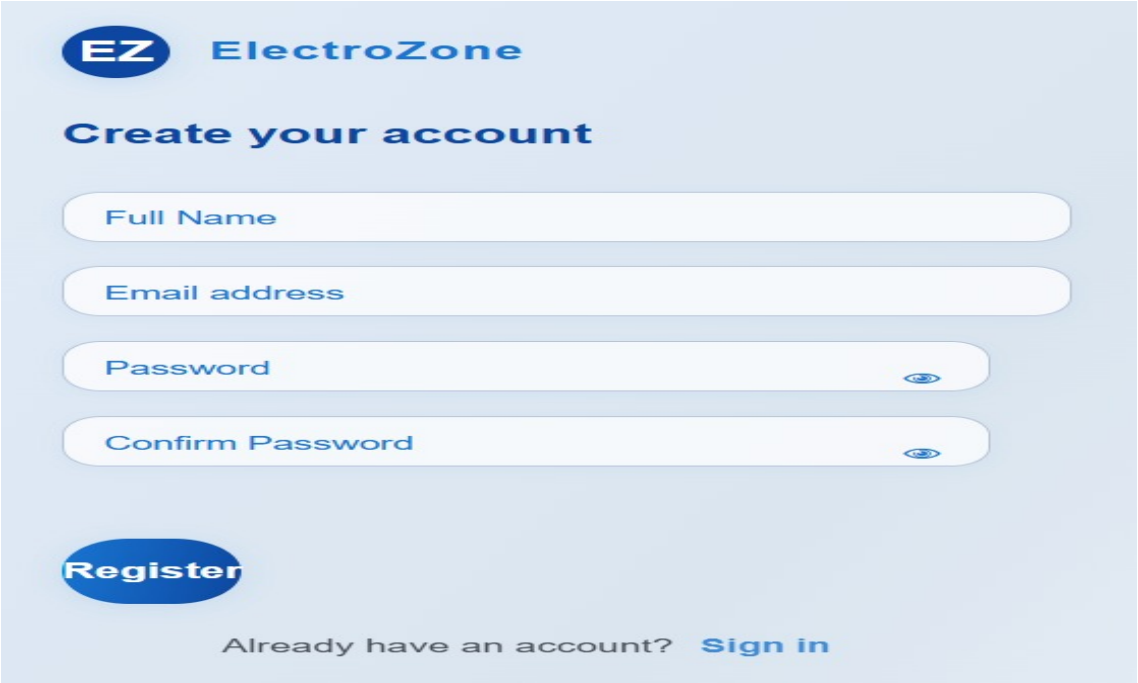

Figure 3.5: Register Page

The Form Validation page on ElectroZone helps ensure that all your personal details are entered correctly and securely before completing any purchase or registration. It checks key information like your name, email, phone number, and password to catch any errors early on. The system automatically detects issues like invalid email formats, weak passwords, or incorrect phone numbers, and gives you instant feedback so you can fix them right away. This not only protects your data but also ensures a smoother, faster checkout experience.

Chapter 4

TESTING

4.1 Testing

- **Unit Testing:** We check key features like login, product listings, cart, and payments individually to make sure they work perfectly.
- **Integration Testing:** We ensure the front-end, backend, and database work smoothly together like when you add items to your cart and place an order.
- **System Testing:** We test the entire shopping flow from browsing to checkout to confirm everything runs seamlessly.
- **Performance Testing:** We simulate high traffic to keep the site fast during busy times.
- **Security Testing:** We protect your data by testing for vulnerabilities and unauthorized access.
- **User Acceptance Testing:** Real users try the platform to make sure it's easy, intuitive, and meets your expectations.

4.1.1 Test Result

The ElectroZone platform underwent thorough testing for functionality, performance, and security. Core features like user registration, login, product browsing, cart management, and payment processing all passed with flying colors. Minor issues around input validation were quickly fixed during the process. The system showed fast response times even during heavy usage and handled multiple users shopping at the same time without problems. Security checks confirmed that user data is safe and no vulnerabilities were found. Overall, ElectroZone is reliable, easy to use, and ready to deliver a great shopping experience.

Test Type	Test Cases	Passed	Failed	Skipped	Notes
Unit Testing	78	75	3	0	A few edge cases needed tweaks
Integration Testing	15	15	0	0	All systems working smoothly
End-to-End Testing	10	9	1	0	Minor login issue found
Performance Testing	5	4	1	0	One performance hiccup fixed

Table 4.1: Test Results Summary

4.1.2 Test Bugs

During ElectroZone's testing phase, we found and fixed a few minor bugs to ensure everything runs smoothly and you have the best shopping experience possible. Some of the issues included form validation problems, where fields like phone number and password confirmation sometimes accepted incorrect entries. We also spotted login errors where the error messages weren't clear enough for incorrect usernames or passwords. There were a few glitches with the cart, such as items occasionally not updating correctly, which we resolved by improving real-time stock checks. Payment gateway timeouts during weak net- work connections were also addressed by adding retry logic and better error handling.

Test Case ID	Test Case Description	Input	Expected Result
TC-01	Valid Login	Username: validUsername, Password: validPassword	Login successful and user is redirected to the homepage/- dashboard.
TC-02	Invalid Username	Username:invalidUsername, Password: validPassword	Error message displayed: "Invalid username."
TC-03	Invalid Password	Username: validUsername, Password: invalidPassword	Error message displayed: "Invalid password."

Table 4.2: Test Cases

Chapter 5

WEBSITE LAUNCH

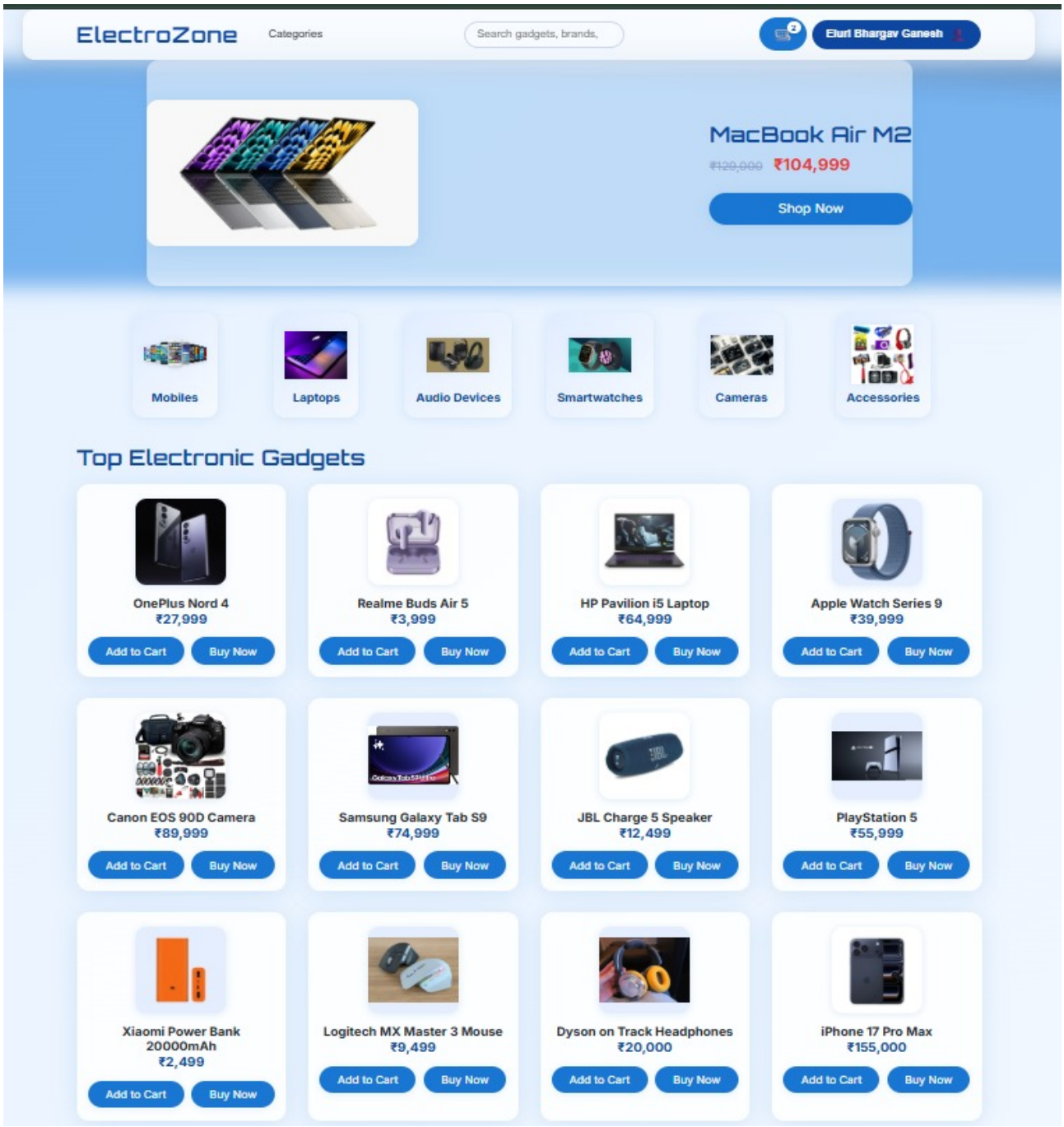

Figure 5.1: Test Image

Chapter 6

RESULTS AND DISCUSSIONS

6.1 Website performance

- It quickly pages show up when someone visits your site.
- It smooth everything is once the page appears: do buttons respond, does scrolling feel natural, is the experience free of glitches.
- The overall feeling for the user: Website performance is all about speed + user experience.

6.2 Security

When we talk about "project security", we're saying: making sure your project website is built and run in a way that keeps data safe, prevents bad actors from messing things up, and maintains user trust.

- Always serve the site or app over HTTPS so data is encrypted in transit.
- Ensure only authorised users/admins can log in and do critical operations.
- Use strong passwords, ideally multi-factor authentication

6.3 Responsiveness and mobile-friendliness

- The site works well on any device — whether someone's using a big desktop monitor, a tablet, or a smartphone.
- The layout adapts: text, images, menus shift and resize so nothing looks awkward or unreadable on smaller screens.
- The site loads well, and everything is easy to tap or use.
- Most people now browse the web on their phones. A site that doesn't behave well on mobile will frustrate users and they'll leave.

Chapter 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 Conclusion

The ElectroZone project successfully demonstrates a modern and user-friendly e-commerce platform designed for purchasing electronic gadgets online. It provides a seamless shopping experience by allowing users to browse through various categories such as mobiles, laptops, audio devices, and accessories, all within a visually appealing and responsive interface. The integration of essential features like Add to Cart, Buy Now, and Order Summary ensures that users can easily manage their purchases and view order details, including customer information and total billing. The clean design, organized layout, and dynamic functionality make the application efficient and easy to use.

7.2 Future Enhancements

- **Secure Online Payment Integration:**Add multiple payment gateways (like UPI, credit/debit cards, PayPal) to enable safe and convenient online transactions.
- **Personalized Recommendations:**Use AI-based recommendation systems to suggest products based on users' browsing and purchase history.
- **Mobile Application Development:**Develop a mobile app version (Android/iOS) for easier access and notifications about offers and updates.
- **Advanced Search and Filtering Options:**Improve product discovery with filters based on price, brand, rating, and category.

Chapter 8

SOURCE CODE

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8" />
  <meta name="viewport" content="width=device-width, initial-scale=1.0"/>
  <title>ElectroZone Electronics eCommerce</title>
  <link rel="stylesheet" href="style.css"/>
  <link rel="preconnect" href="https://fonts.googleapis.com">
  <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
  <link href="https://fonts.googleapis.com/css2?family=Inter:wght@400;700&family=Orbitron:
      wght@600&display=swap" rel="stylesheet">
</head>
<body>
  <!-- Navbar -->
  <nav class="navbar glass">
    <div class="nav-left">
      <span class="logo">ElectroZone</span>
      <div class="categories-dropdown">
        <button id="categoriesBtn" aria-haspopup="true" aria-expanded="false">Categories</
            button>
        <ul id="categoriesMenu" class="dropdown-menu" aria-label="Categories">
          <li>Mobiles</li>
          <li>Laptops</li>
          <li>Audio Devices</li>
          <li>Cameras</li>
          <li>Smart Devices</li>
          <li>Accessories</li>
        </ul>
      </div>
    </div>
    <div class="nav-center">
      <input type="search" id="searchBar" placeholder="Search gadgets, brands, categories "
          aria-label="Search"/>
    </div>
    <div class="nav-right">
      <button id="cartBtn" aria-label="Open cart" class="cart-icon">
        <span class="cart-badge" id="cartCount">0</span>
      </button>
      <div id="profileMenu" class="profile-menu">
```

```
function getAllUsers() {
    return JSON.parse(localStorage.getItem('users') || '[]');
  }
  function getAllOrders() {
    return JSON.parse(localStorage.getItem('orders') || '[]');
  }

  // Render user list with order count and remove button
  function renderUsers() {
    const usersList = document.getElementById('usersList');
    const users = getAllUsers();
    const orders = getAllOrders();
    document.getElementById('totalUsers').textContent = (${users.length});
    if (!users.length) {
      usersList.innerHTML = "<div style='padding:1em;'>No users registered.</div>";
      return;
    }
    usersList.innerHTML = users.map((user, idx) => {
      const userOrderCount = orders.filter(o => o.email === user.email).length;
      return `
        <div class="user-card">
          <div class="user-header">
            ${user.name || "-"}
             <button class="user-remove-btn" title="Remove user" aria-label="Remove user" data-
                 email="${user.email}">   </button>
          </div>
          <div class="user-email">Email: ${user.email}</div>
          <div class="user-orders-count">Orders placed: ${userOrderCount}</div>
        </div>
      `;
    }).join('');
    // Add remove event listeners
    document.querySelectorAll('.user-remove-btn').forEach(btn => {
      btn.onclick = function() {
      const email = btn.getAttribute('data-email');
        if (!confirm(Remove user ${email} and all their orders?)) return;
        // Remove user
        let users = getAllUsers().filter(u => u.email !== email);
        localStorage.setItem('users', JSON.stringify(users));
        // Remove orders by user
        let orders = getAllOrders().filter(o => o.email !== email);
        localStorage.setItem('orders', JSON.stringify(orders));
        renderUsers();
        renderOrders();
      };
    });
  }
```

Chapter 9

SCREENSHOTS

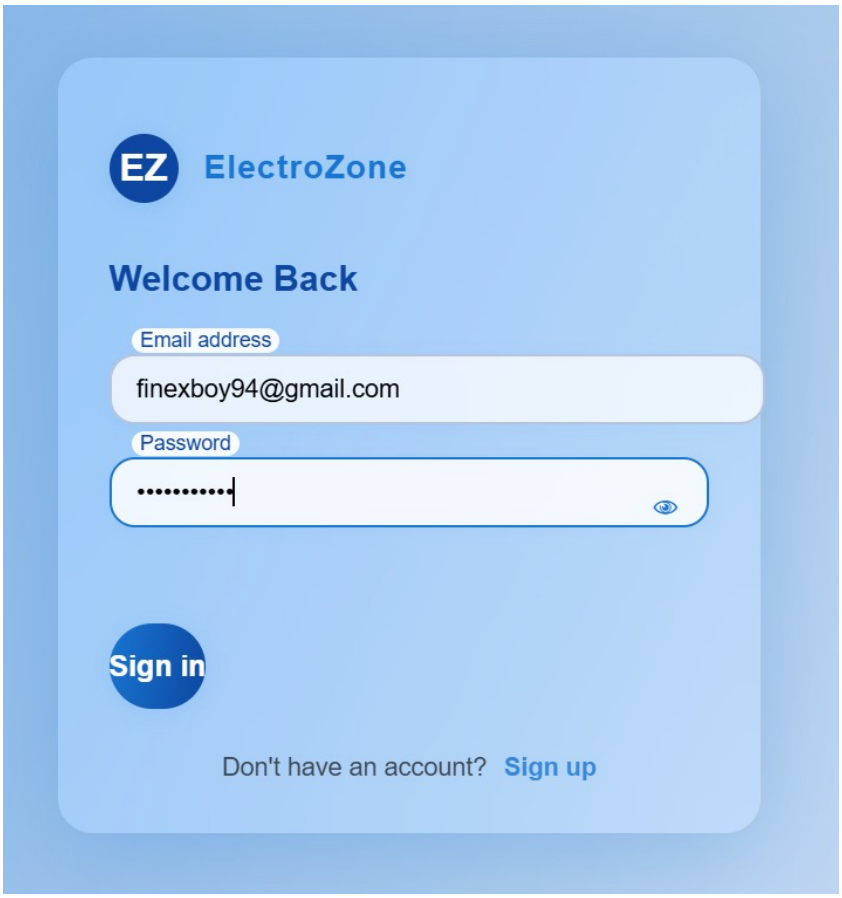

Figure 9.1: Login Page

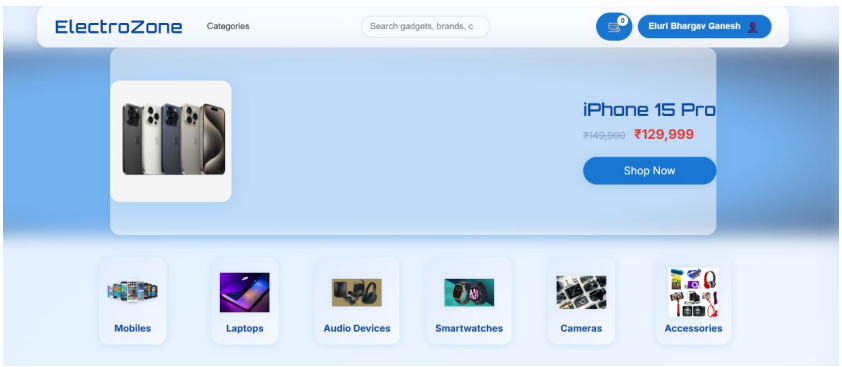

Figure 9.2: Home Page

Chapter 10

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