Shoping Cart (ecommerce)

Major Project Report
Submitted to
Rabindranath Tagore University, Bhopal

in
I Partial fulfillment of requirement
for the award of the Degree in
Bachelor of Engineering in Computer Science & Engineering

By

RAJAN KUMAR
(R21ET1CS0047)

Under the Guidance of

Department of Computer Science & Engineering
Rabindranath Tagore University, Bhopal
May-2025

CIRTIFICATE

This is to certify that the project report entitled "**Electronics Shop"** submitted by "**Rajan Kumar**" to the Department of Computer Science & Engineering, Rabindranath Tagore University, Bhopal is a Bonafide work carried out by the student during the 8th semester of their course under the guidance of undersigned. It is further certified that the work reported in the project fulfills the requirement of the ordinance related to the award of the degree in **Bachelor of Engineering in Computer Science & Engineering** from Rabindranath Tagore University, Bhopal.

Guide

Principle

DECLARATION

We hereby declare that work presented in the project report entitled "**Reminder (eCommerce)** is submitted in partial fulfillment for the award of the Degree in Bachelor of Engineering in Computer Science & Engineering. The work has been carried out at Rabindranath Tagore University Bhopal and is an authentic record of our own work.

Bhopal .....

Date :...../...../.....

Name of Student (Enroll No.)

RAJAN KUMAR(AU210396)

ACKNOWLEDGEMENT

We wish to express our sincere gratitude to our guide (Name) for her/ his encouragement and invaluable guidance and support without which this project could not have been completed.

We are thankful to **Dr. Rakesh Kumar,** Head Department of Computer Science & Engineering for his encouragement.

We wish to thank all our friends and those involved directly or indirectly in completing this project. Our utmost thanks go to our family members for their moral and financial support throughout the academic year.

Bhopal

(Signature)

Date Name of Student

Preface

The rapid growth of digital technology has transformed how businesses operate, with e-commerce emerging as a crucial platform for modern retail. This project, titled **"REMINDER – An eCommerce Web Application"**, is developed to meet the increasing demand for a reliable and convenient online shopping experience for electronic products.

The primary objective of this project is to design and implement a fully functional e-commerce system that allows users to browse, select, and purchase electronic goods from the comfort of their homes. It aims to provide a user-friendly interface for customers, a simple and effective inventory management system for sellers, and administrative control for system management.

This project integrates essential features such as product search, shopping cart, order management, user authentication, and secure payment processing. It also focuses on scalability, responsiveness, and efficient database handling to support real-time interactions and a smooth user experience.

The development of this eCommerce platform has been a valuable learning experience, combining theoretical knowledge with practical skills in web development, database management, and user experience design. It reflects the potential of technology to enhance convenience, efficiency, and accessibility in the retail sector.

This document and the accompanying system are presented as a demonstration of what a modern ShopingCartping platform can offer and serve as a foundation for future enhancements and real-world deployment.

Table of Content

1. **Abstract** 01
2. **Introduction** 02
   - 2.1 Justification 02
   - 2.2 Objective 03
3. **Platform Used** …
   - 3.1 H/W Specification …
   - 3.2 S/W Specification …
4. **System Requirement Analysis** …
   - 4.1 Information gathering …
   - 4.2 System Feasibility …..
5. **System analysis** …..
   - 5.1 Data Flow Diagram ….
   - 5.2 E-R Diagram ….
   - 5.3 Control Hierarchy of Module ….
6. **Testing** ….
   - 7.1 Testing Objectives ….
   - 7.2 Types of Testing ….
   - 7.3 Testing Methods Used
   - 7.4 Testing Results and analysis ….
7. **Outputs** ….
8. **Limitations** ….
9. **Conclusion** ….
10. **Future scope** ….
11. **Bibliography** ….

List of Table

S.No.	Table Name	Description
1	users	Stores user information including customers and administrators
2	products	Contains details of all electronic products listed on the platform
3	categories	Defines product categories (e.g., Mobiles, Laptops, Accessories)
4	orders	Stores order details placed by users
5	order items	Contains specific items within an order (linked to products and orders)
6	cart	Temporarily stores products added to cart by a user before checkout
7	payments	Stores payment transaction information related to orders
8	shipping address	Stores shipping details for user deliveries
9	product reviews	Contains user-submitted reviews and ratings for products
10	Wishlist	Stores products added by users to their Wishlist
11	admin_logs	Keeps track of administrative actions and updates

Abstractions

This e-commerce (Reminder) project is designed to provide a digital platform for buying and selling products online. The system facilitates seamless interaction between customers, sellers, and administrators through a user-friendly interface and robust backend functionality. Users can browse products, add items to a shopping cart, make secure payments, and track orders. Sellers can manage inventory, process orders, and view sales reports, while administrators oversee user management, product listings, and analytics.

The system leverages modern web technologies to ensure scalability, security, and efficiency. Features include user authentication, product search and filtering, order history, payment gateway integration, and responsive design for cross-device compatibility. The project aims to replicate the core functionalities of a real-world e-commerce platform, providing a practical and scalable solution for online retail.

Introduction

In today's digital era, online shopping has become an essential part of everyday life. With the increasing use of the internet and smart devices, customers now prefer to buy products online due to its convenience, speed, and accessibility. The eCommerce platform offers an efficient and flexible way for businesses to showcase and sell their products, especially in the electronics sector where demand is high and product variety is vast.

This project focuses on developing an eCommerce application specifically for electronic products. The system is designed to allow customers to browse and purchase items like mobile phones, laptops, accessories, and home appliances online. It also includes features for user registration, secure login, shopping cart, order management, and an admin dashboard for managing products and users.

The development of this system provides both a functional and educational experience, combining key concepts from web development, database design, and system architecture to solve real-world problems in retail management.

2.1 Justification

The need for a digital platform that facilitates the buying and selling of electronic goods is more relevant than ever. Traditional brick-and-mortar stores are limited by geographic location and operating hours, whereas an online store is accessible 24/7 from anywhere. Additionally, electronic products often require detailed specifications and comparisons, which can be effectively presented through a digital interface.

Building an eCommerce system for electronics allows businesses to reach a broader audience, reduce operational costs, and enhance customer experience through personalized recommendations, search filters, and product reviews. For users, it offers a convenient and time-saving way to shop, compare products, and access up-to-date information. This project serves as a practical solution to bridge the gap between consumers and electronic product retailers in the digital age.

2.2 Objective

The primary objectives of this eCommerce (ShopingCart) project are:

- To develop a responsive and user-friendly eCommerce website for electronic products.
- To allow users to register, log in securely, and manage their profiles.
- To enable users to browse, search, and filter electronic items efficiently.
- To implement a shopping cart and checkout system with secure payment integration.
- To provide order tracking and history for customers.
- To allow administrators to manage products, categories, and users via a dashboard.
- To ensure data integrity, security, and scalability of the system.
- To deliver a real-world simulation of an electronic goods marketplace that demonstrates full-stack development capabilities.

Platform Used

I have used platforms like VS Code for Development or Coding and Postman for API handling and used some frameworks like Bootstrap, Tailwind.

3.1 Hardware Specification (H/W)

Lists the hardware requirements needed to develop or run the project, such as:

- Processor: Intel i5 or higher
- RAM: 8 GB or more
- Hard disk: 500 GB or more

3.2 Software Specification (S/W)

Includes all software requirements like:

- Frontend: HTML, CSS, JavaScript (React)
- Backend: Node.js
- Database: MongoDB
- Tools: VS Code, Postman
- OS: Windows
- Frameworks : Bootstrap, antd.

4. System Requirement Analysis

The **eCommerce (Reminder)** system is designed as a multi-tier architecture that ensures separation of concerns, scalability, and ease of maintenance. The structure follows a standard **three-layered architecture**:

4.1 Information Gathering

The development of any successful software system begins with a clear understanding of the problem domain and user requirements. To ensure the proposed eCommerce platform for electronic products meets both user needs and industry standards, various methods of information gathering were employed during the initial stages of the project.

Methods Used for Requirement Gathering:

1. Surveys

A digital survey was conducted using online forms to gather input from potential users, including students, professionals, and small business owners. The survey focused on:

Shopping habits and preferences

Challenges faced with existing eCommerce platforms

Desired features (e.g., product comparison, reviews, secure checkout)

Preferred payment and delivery options

Key Insights:

Most users preferred a simple and responsive interface.

High demand for secure payment options and order tracking.

Users appreciated product filtering based on brand, price, and ratings.

2. Interviews

Informal interviews were conducted with:

Online shoppers to understand common pain points.

Shop owners and vendors to understand inventory and order management.

Web developers for technical insights and platform feasibility.

Key Insights:

Shop owners desired a backend system to manage stock and orders.

Customers requested email or SMS notifications for orders.

3. Market Research

Research was conducted on existing eCommerce giants such as Amazon, Flipkart, and Best Buy to analyze:

Website structure and features

Product categorization and search filters

Checkout and payment systems

Security practices and UX design

Key Insights:

Standard features like “Add to Cart”, “Wishlist”, and “Product Reviews” are expected by users.

Intuitive navigation and clean design significantly improve user retention.

4. Competitor Analysis

A functional analysis was performed on mid-sized eCommerce websites that specialize in electronics. This helped identify both strengths and weaknesses in:

UI/UX design

Loading speed and performance

Responsiveness across devices

Inventory management features

Key Insights:

Some platforms lacked proper mobile responsiveness.

Backend product management systems were often too complex for small vendors.

4.2 System Feasibility

Feasibility analysis is an essential step in the software development life cycle. It helps determine whether the proposed system can be successfully developed and implemented within the given constraints. The eCommerce (ShopingCart) project was evaluated across three main feasibility aspects:

1. Technical Feasibility

Technical feasibility assesses whether the current technology, tools, and skills are sufficient to develop and deploy the system.
The proposed system uses widely available and proven technologies such as HTML, CSS, JavaScript, along with backend support using Node.js and a database like MongoDB.
All required development tools and frameworks are open-source and well-documented.
Hosting platforms such as XAMPP, Heroku, or cPanel support the technical environment needed for deployment.
The development team has the necessary programming knowledge and access to learning resources to complete the project.

✅ Conclusion: The system is technically feasible with the available resources and technology.

2. Economic Feasibility

Economic feasibility examines whether the project is financially viable, considering the development cost versus expected benefits.
The project uses open-source technologies, reducing licensing and software costs.
Development and testing are carried out on personal computers or free hosting platforms, keeping hardware costs minimal.
Since the project is academic or startup-level, the team does not incur labor costs, reducing overall expenses.

Long-term benefits include learning, scalability, and the potential to evolve into a commercial product.

✅ Conclusion: The system is economically feasible, with minimal development cost and high long-term value.

3. Operational Feasibility

Operational feasibility checks whether the proposed system can be effectively used and maintained in a real-world environment.
The user interface is designed to be intuitive and user-friendly, ensuring ease of use for customers and administrators.
The system includes essential features like product browsing, cart, order placement, and admin control, making it practically usable.
Feedback from potential users (via surveys and interviews) confirmed that the platform meets user needs and expectations.
Future updates and maintenance can be easily handled due to modular coding and documentation.

✅ Conclusion: The system is operationally feasible, as it is easy to use, meets user requirements, and can be efficiently maintained.

5. System Analysis

System analysis is the process of studying a system by analyzing its components, how data flows between them, and how they interact. For an eCommerce system designed to sell electronic products, the system is broken down into several key modules: User Module, Admin Module, Product Management, and Order Management.

5.1 Data Flow Diagram (DFD)

The DFD shows the logical flow of data through the system — how users interact with it, and how the system processes and responds to input.

Level 0 (Context Level DFD)

This is the highest level of the DFD showing the entire system as a single process and how it interacts with external entities.

Entities:

User (Customer)
Admin
Payment Gateway
Processes:
Shopping System
Data Flows:
Users submit registration/login info
System returns account info or errors
Users browse products, add to cart
Admin adds/updates/deletes products
Payment info sent to payment gateway
Orders sent to database, confirmation returned

Level 1 DFD

Breaks the system into sub-processes:
Main Processes:
User Registration/Login
Product Browsing & Search
Cart & Checkout
Payment Handling
Admin Product Management

Order Tracking & History

Example Flow:

User logs in → views product list → adds to cart → proceeds to checkout → submits payment → order confirmed

5.2 E-R Diagram

The Entity-Relationship Diagram shows how different data entities relate to each other in the database.

Entities and Attributes:

User
User_ID (PK)
Name
Email
Password
Role (Customer/Admin)
Product
Product_ID (PK)
Name
Description
Price
Category_ID (FK)
Category
Category_ID (PK)
Category_Name
Cart
Cart_ID (PK)
User_ID (FK)

Product_ID (FK)
Quantity
Order
Order_ID (PK)
User_ID (FK)
Order_Date
Total_Amount
Payment_Status
Order_Items
Item_ID (PK)
Order_ID (FK)
Product_ID (FK)
Quantity
Price
Payment
Payment_ID (PK)
Order_ID (FK)
Payment_Mode
Payment_Date
Amount
Review
Review_ID (PK)
Rating

5.3 Control Hierarchy of Modules

This defines how control flows between different modules and how they interact in a hierarchical manner.

1. Main System Controller
Controls access based on user roles: Customer or Admin

2. Customer Modules
Authentication Module (Login/Register)
Product Module (Browse/Search/View Details)
Cart Module (Add/Remove/Update Items)
Order Module (Checkout, View Order Status)
Review Module (Add/Edit/Delete Reviews)

3. Admin Modules
User Management (Manage customer accounts)
Product Management (Add/Edit/Delete products)

Order Management (View/Update order status)
Inventory Management (Update stock, view low stock alerts)
Category Management (Add/Delete product categories)
Each module interacts through function calls or API endpoints depending on the framework being used (e.g., REST APIs for a web app).

🗂️ E-R Diagram Description

📌 Entities & Their Attributes:

User
User_ID (Primary Key)
Name
Email
Password
Role (Customer / Admin)
Product
Product_ID (Primary Key)
Name
Description
PriceCategory_ID (Foreign Key)
CategoryCategory_Name
Cart
Cart_ID (Primary Key)
User_ID (Foreign Key)Quantity
Order
Order_ID (Primary Key)
User_ID (Foreign Key)
Order_Date
Total_Amount
Payment_Status
Order_Items
Item_ID (Primary Key)
Order_ID (Foreign Key)
Product_ID (Foreign Key)

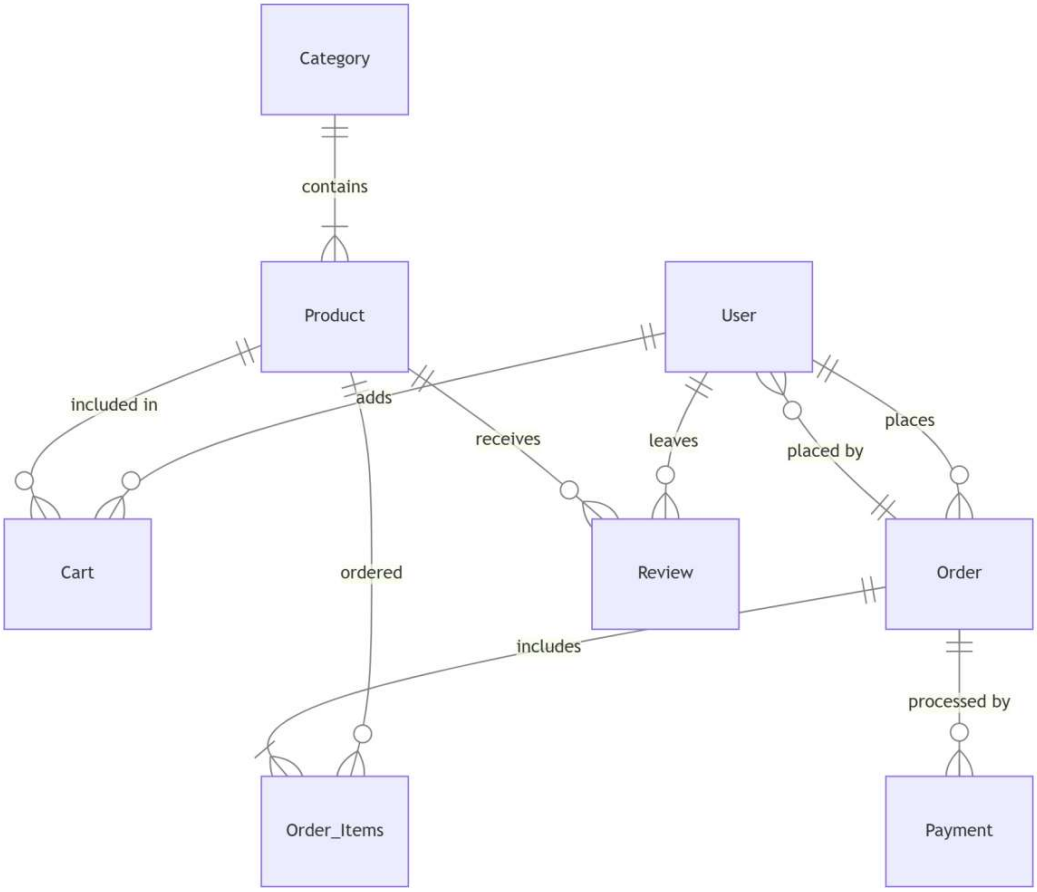
Quantity
Price
Payment
Payment_ID (Primary Key)
Order_ID (Foreign Key)
Payment_Mode
Payment_Date
Amount
Review
User_ID (Foreign Key)
Product_ID (Foreign Key)
Rating

🔄 Relationships Between Entities:

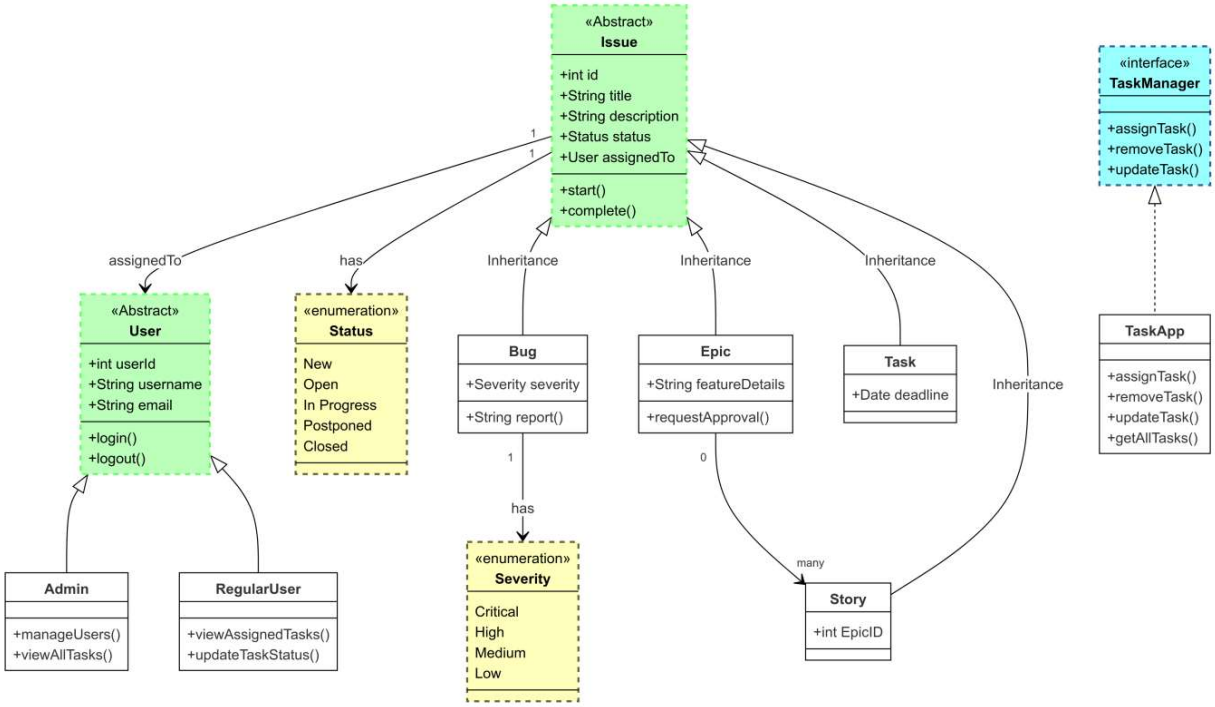
A User can:
Place multiple Orders
Add Products to their Cart
Leave Reviews for Products
A Product:

Belongs to one Category
Can appear in many Carts
Can appear in many Order_Items
Can have multiple Reviews
An Order:
Belongs to one User
Contains multiple Order_Items
Has one Payment

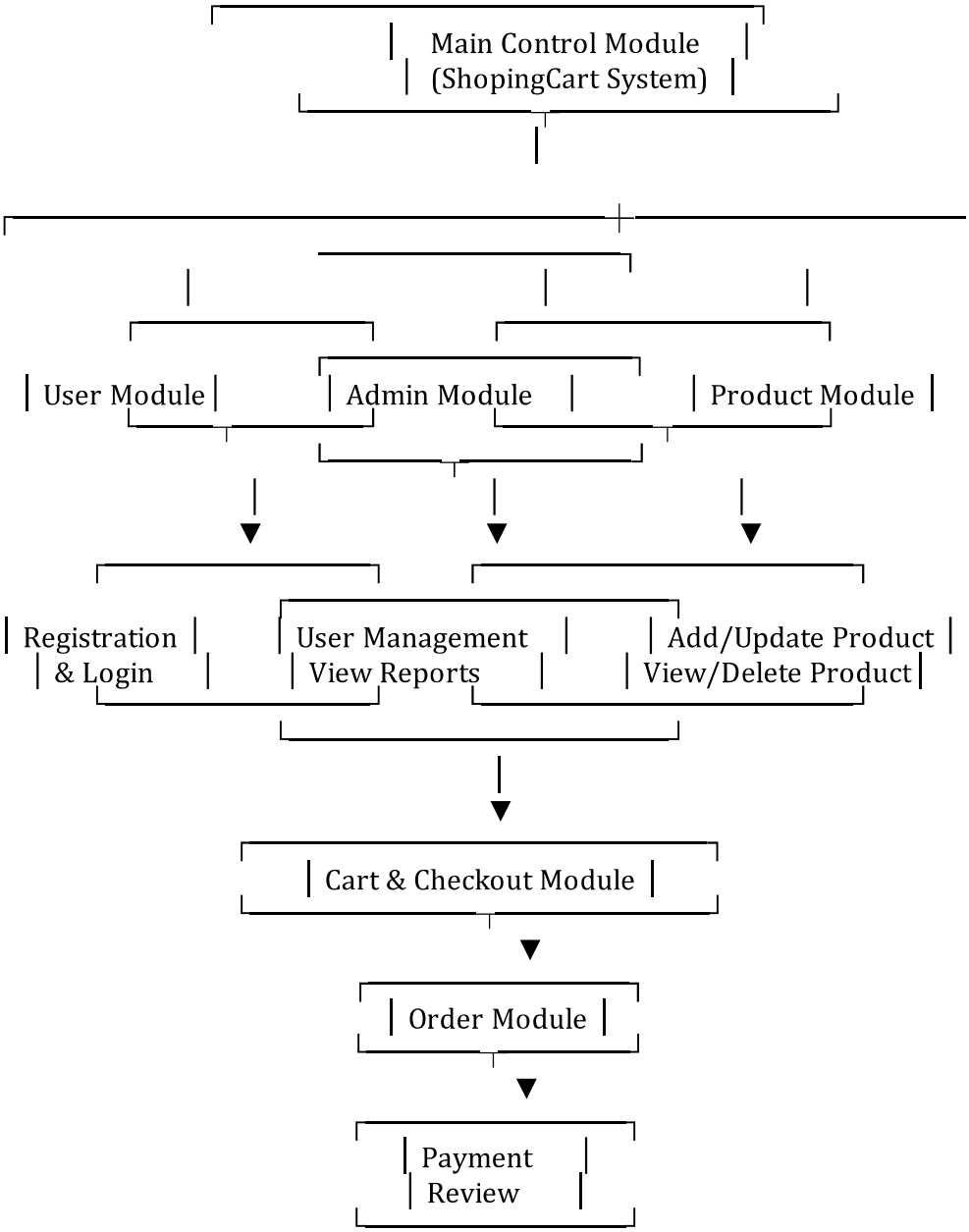
ER-Diagram


Category
contains
Product
User
included in
adds
receives
leaves
placed by
places
Cart
ordered
Review
Order
includes
processed by
Order_Items
Payment

Data Flow Diagram



5.3 Hierarchy Structure Overview



6. Testing

6.1 Testing Objectives

Outlines the purpose of testing—validating functionality, checking reliability, and finding bugs.

6.2 Types of Testing

Describes the types used:
Unit Testing
Integration Testing
System Testing
Acceptance Testing

6.3 Testing Methods Used

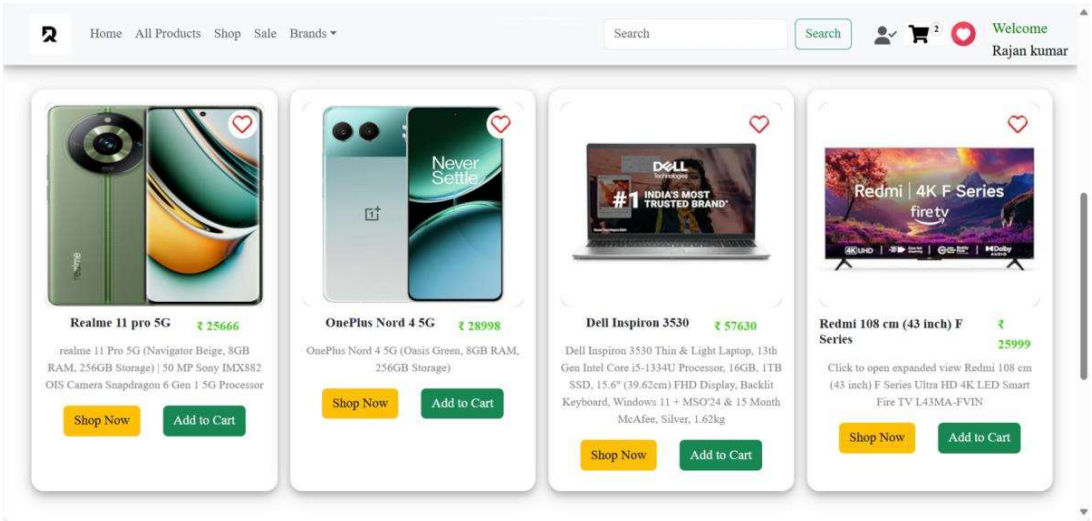
Explains testing methods, such as:
Manual Testing
Automation Testing (if any)

6.4 Testing Results and Analysis

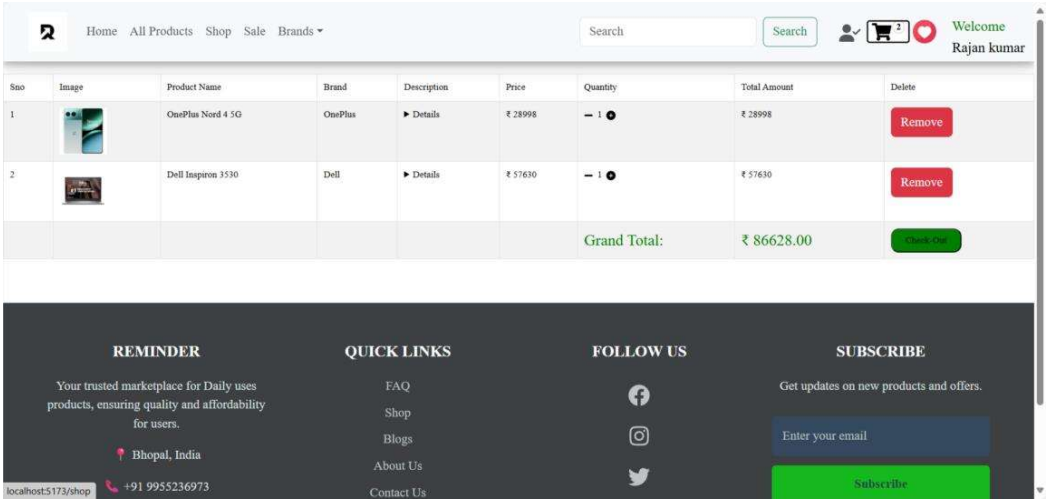
Presents test cases, expected vs actual results, and confirms that the system performs as intended.

7. Outputs

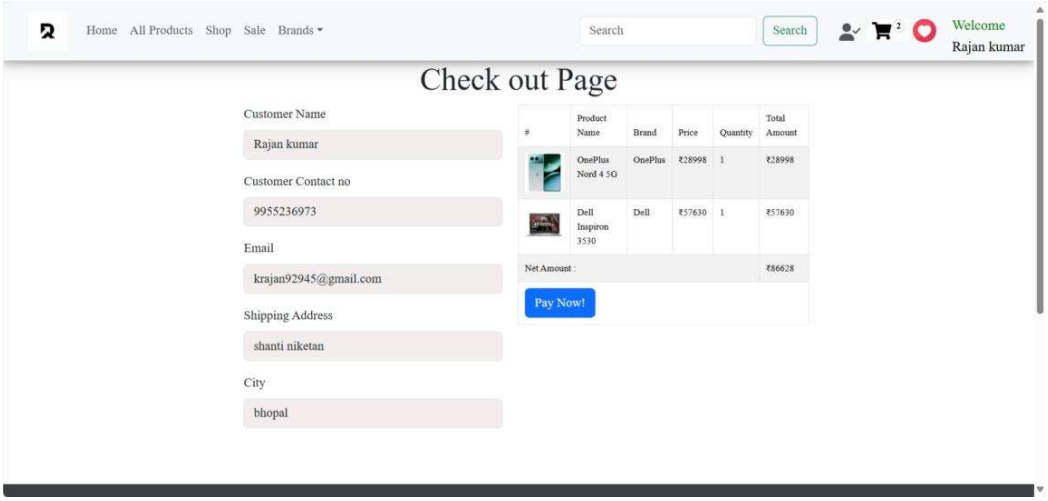
Home Page



Cart Items

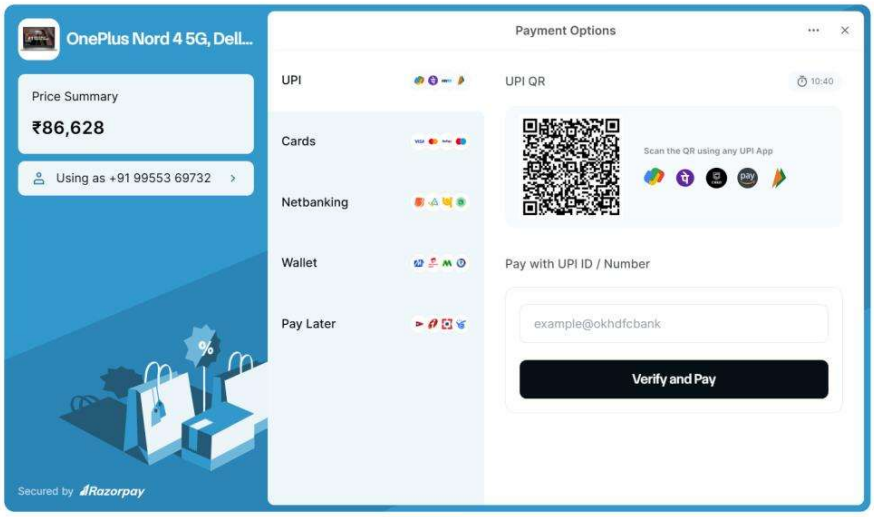


Payment Gateway

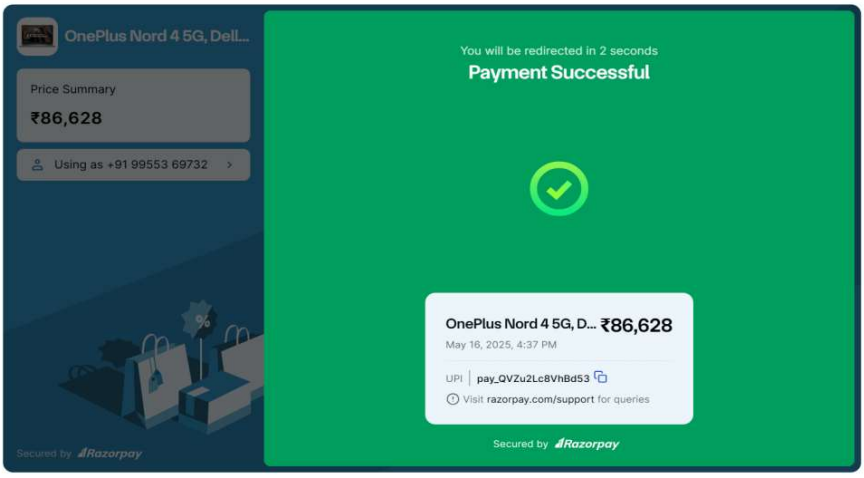


Razorpay

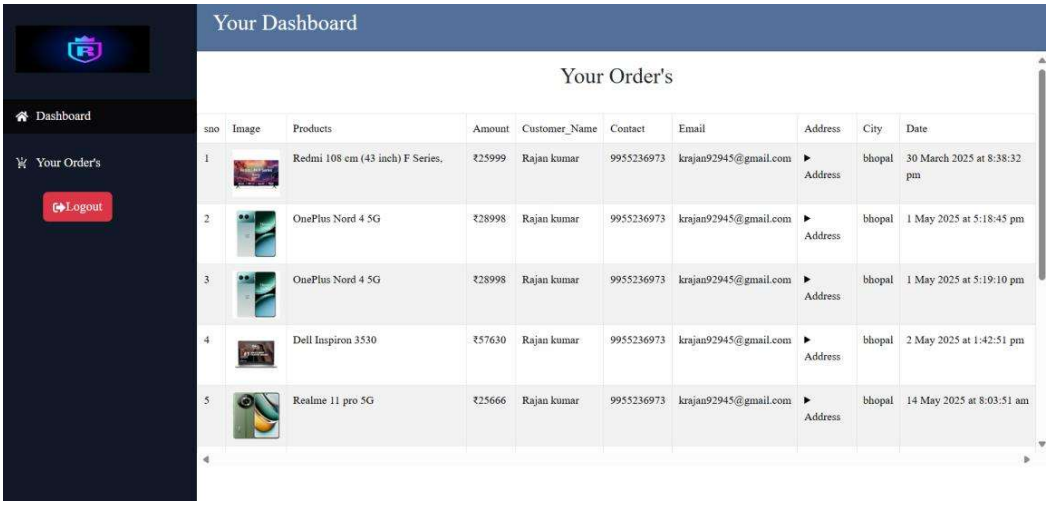
Hi



Payment Success

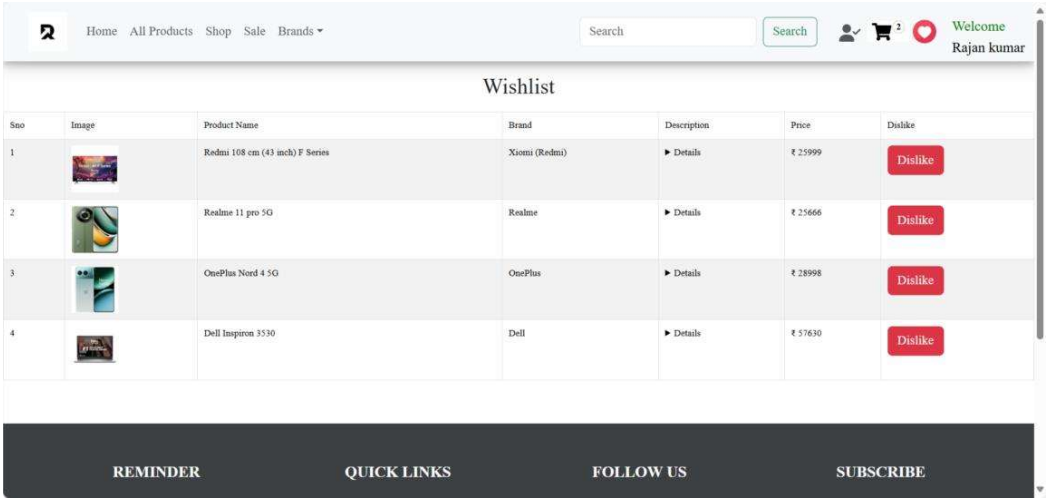


User Dashboard

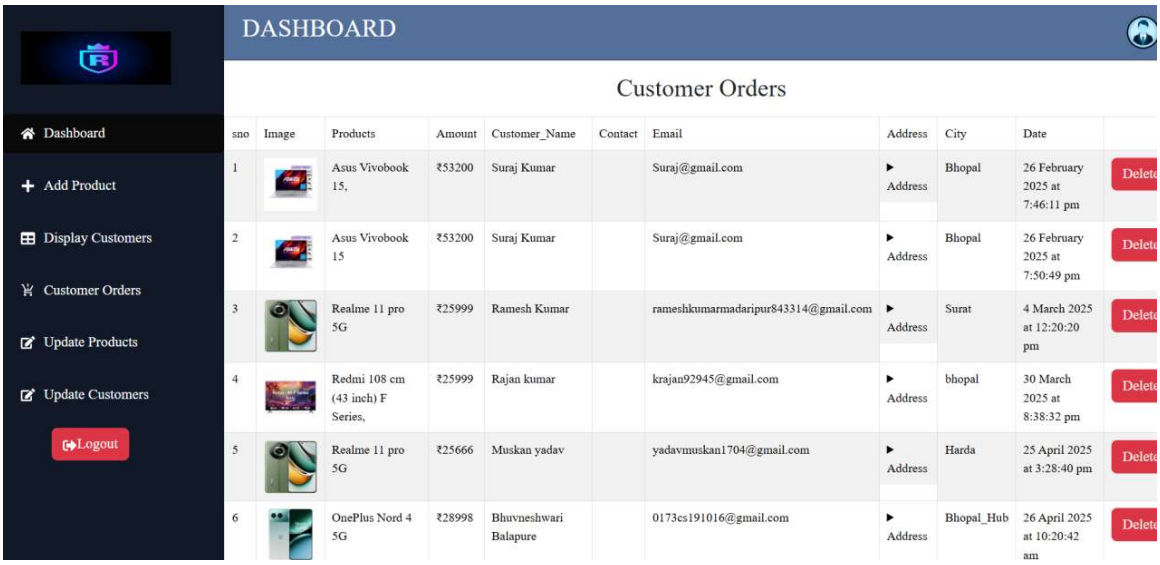


sno	Image	Products	Amount	Customer_Name	Contact	Email	Address	City	Date
1		Redmi 108 cm (43 inch) F Series,	₹25999	Rajan kumar	9955236973	krajan92945@gmail.com	▶ Address	bhopal	30 March 2025 at 8:38:32 pm
2		OnePlus Nord 4 5G	₹28998	Rajan kumar	9955236973	krajan92945@gmail.com	▶ Address	bhopal	1 May 2025 at 5:18:45 pm
3		OnePlus Nord 4 5G	₹28998	Rajan kumar	9955236973	krajan92945@gmail.com	▶ Address	bhopal	1 May 2025 at 5:19:10 pm
4		Dell Inspiron 3530	₹57630	Rajan kumar	9955236973	krajan92945@gmail.com	▶ Address	bhopal	2 May 2025 at 1:42:51 pm
5		Realme 11 pro 5G	₹25666	Rajan kumar	9955236973	krajan92945@gmail.com	▶ Address	bhopal	14 May 2025 at 8:03:51 am

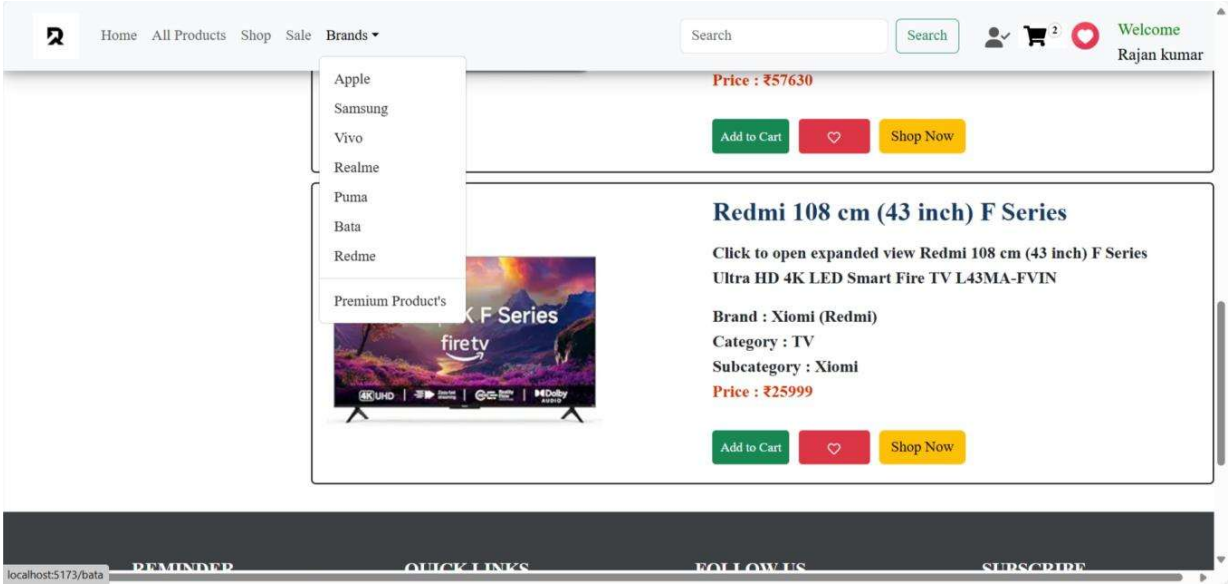
Wishlist Items



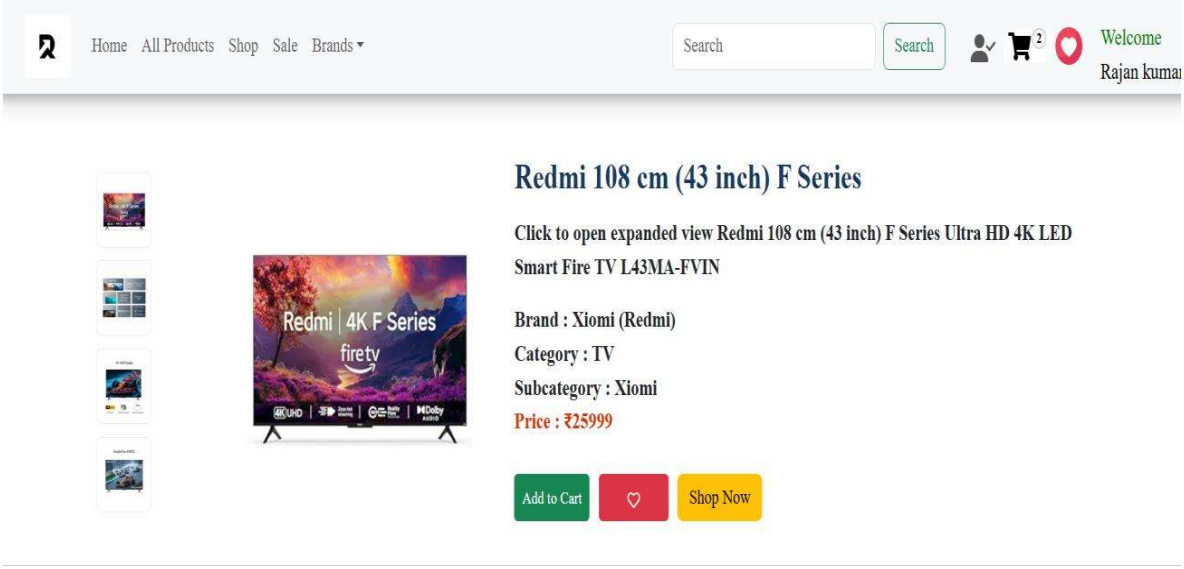
Admin Dashboard (Cutomer Order's)



Filter by Categories



Product Details Page



8. Limitation

⚠ 1. Limited Payment Integration

- The system may only support basic payment gateways (e.g., PayPal or credit/debit card).
- Advanced features like **multi-currency support**, **EMI options**, or **UPI** may not be integrated.

⚠ 2. No Real-Time Inventory Sync

- Inventory updates occur after order placement, not in real time.
- This can cause **stock inconsistency issues** if multiple users order the same item simultaneously.

⚠️ 4. Admin Access is Centralized

- The admin panel lacks **role-based sub-admin management**.
- There's no provision for assigning limited access rights to multiple managers or staff.

⚠️ 5. Scalability Issues

- The current database structure and codebase may not handle **very high traffic or massive product data** efficiently.
- Performance could degrade as user and order volume grows.

6. Security Measures are Basic

- Basic authentication is in place, but advanced security measures like:
  - 2-Factor Authentication (2FA)
  - SQL injection protection
  - End-to-end encryption may not yet be implemented.

9. Conclusion

The development of the **eCommerce (Reminder) Project** has provided a comprehensive platform for buying and selling electronic products

online. It streamlines the entire shopping experience for both customers and administrators by integrating essential functionalities such as **user registration**, **product browsing**, **cart management**, **order processing**, and **payment handling** within a single web-based system.

This project demonstrates the core principles of modern web applications, including **modular design**, **data integrity**, and **user-centric interaction**. It ensures a smooth experience for users while also equipping administrators with tools to manage inventory, users, and sales reports efficiently.

Although the system has some limitations in scalability, security, and feature depth, it successfully meets the primary objectives of offering a functional, easy-to-use, and organized electronic commerce platform.

🎯 **Key Takeaways:**

- Successfully implemented basic modules for users and administrators.
- Demonstrated understanding of database relationships and system flow.
- Laid a strong foundation for future enhancements like advanced analytics, mobile app support, and intelligent product recommendations.

🔮 10. Future Scope – eCommerce (Reminder) Project

📱 1. Mobile App Integration

- Developing a **dedicated mobile application** for Android and iOS platforms will enhance accessibility and user engagement.
- Push notifications can be used to notify users about new products, offers, and order updates.

- A mobile app also allows offline browsing, easier login via biometrics, and mobile wallet integrations like Google Pay and Apple Pay.

🔍 2. Advanced Search and Filtering

- The current search is basic; future upgrades can include:
  - **Multi-criteria filtering** (brand, price range, specifications, ratings)
  - **Voice search**
  - **Auto-suggestions** based on user behavior
- These features help users find the exact products they need faster and more efficiently.

📦 3. Live Inventory Tracking

- Real-time synchronization of inventory across all platforms (admin panel, user view, mobile app).
- Helps prevent stock mismatch or overselling.
- Can also include **alerts for low stock levels** and **auto-reordering features** for administrators.

🤖 4. AI-Based Product Recommendations

- Implementing AI algorithms to analyze user behavior (browsing, past purchases, ratings).
- Recommending relevant products can **boost sales** and improve **user satisfaction**.
- Techniques like collaborative filtering, content-based filtering, and purchase prediction can be used.

🔐 5. Enhanced Security Features

- Future versions should include:
  - **Two-Factor Authentication (2FA)**
  - **Data encryption**
  - **Security audit logs**

- These features protect both users and administrators from unauthorized access and data breaches.

🌍 6. Multi-Language and Multi-Currency Support

- To reach a global audience, support for multiple languages and currencies is essential.
- This will allow expansion to international markets with localized shopping experiences.

📄 7. Smart Order Tracking System

- Real-time integration with shipping providers to track delivery status.
- Users can receive live updates on their orders via email, SMS, or app notifications.

📊 8. Advanced Analytics Dashboard

- For admin users to view:
  - Sales trends
  - User activity
  - Popular products
- Visual dashboards can help make better business decisions and improve store performance.

🚀 Summary

The future enhancements outlined above will transform the current system into a fully-featured, scalable, intelligent eCommerce platform. By integrating modern technologies such as **mobile apps**, **real-time systems**, and **AI**, the platform can offer a competitive, seamless, and personalized experience for users while empowering administrators with powerful tools for growth and optimization.

📚 11. Bibliography – eCommerce (Electronic Shop) Project

This section lists all the references, tools, technologies, and resources that were consulted or used during the development of the eCommerce project. Proper acknowledgment ensures transparency and gives credit to the original sources of information.

🛠️ Tools & Technologies Used

HTML, CSS, JavaScript – For designing the frontend interface.

PHP / Node.js / Django (choose as per your project) – Used for backend development.

MySQL / MongoDB – For database management and storage.

XAMPP / WAMP / Localhost Server – Local development server used for testing the application.

Git & GitHub – Version control and code management.

Visual Studio Code / Sublime Text – Code editor used during development.

🌐 Online References & Tutorials

W3Schools – For web development tutorials and references.

Stack Overflow – For resolving coding errors and implementation help.

MDN Web Docs – For official web standards and development documentation.

GeeksforGeeks – For algorithm, database, and backend logic references.

📝 Project Planning and Documentation

Class notes and lectures

Supervisor/guide instructions

Self-Study

Sample project reports from previous batches (for structure and formatting)

📖 References – eCommerce (Electronic Shop) Project

Here is a list of **references** used to design, develop, and document your eCommerce project. These sources supported your understanding of both the technical and theoretical aspects of building an online electronic shopping platform.

🛠 Technical Tools & Documentation

1. **MDN Web Docs** – *HTML, CSS, JavaScript, and Web API documentation*
   https://developer.mozilla.org/
2. **MySQL Documentation** – *Structured Query Language, ER modeling, and relational design*
   https://dev.mysql.com/doc/
   a. **Node.js Docs** *(depending on your tech stack)*Node.js: https://nodejs.org/en/docs

📚 Books & Study Materials

1. Roy, U. K. *Web Technologies: HTML, JavaScript, PHP, Java, JSP, ASP.NET, XML and AJAX*
   Oxford University Press, 2010.
2. Gilmore, W. J. *Beginning PHP and MySQL: From Novice to Professional*
   Apress, 2010.

3. Laudon, K. C., & Traver, C. G. *E-Commerce: Business, Technology, Society*
   Pearson Education, 2021.

Online Learning Platforms

1. **W3Schools** – *HTML/CSS/JS and PHP/MySQL tutorials*
   https://www.w3schools.com/
2. **GeeksforGeeks** – *Web development, data structures, and backend programming*
   https://www.geeksforgeeks.org/
3. **Stack Overflow** – *Community-driven coding problem solving*
   https://stackoverflow.com/
4. **YouTube Channels** – *Tutorials and walkthroughs*
   a. Traversy Media
   b. CodeWithHarry
   c. Programming with Mosh

Other References

- Project guidelines and evaluation rubrics provided by the academic institution
- Feedback and suggestions from the project supervisor/mentor
- Sample final-year projects from previous sessions (for structure and layout inspiration)