

SHOPCRAVE

**A PROJECT REPORT
for
Mini Project (KCA353)
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**Submitted by
Alok Singh**

2200290140021

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Requirements for the Degree of**

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**Under the Supervision of
Ms. Divya Singhal
Assistant Professor**



Submitted to

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Uttar Pradesh-201206**

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CERTIFICATE

Certified that **Alok Singh (2200290140144)** has/ have carried out the project work having “**ShopCrave**” (**Mini Project-KCA353**) for **Master of Computer Application** from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself/herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

Date:

Alok Singh
2200290140021

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date:

Ms. Divya Singhal
Assistant Professor
Department of Computer Applications
Applications
KIET Group of Institutions, Ghaziabad
Ghaziabad

Dr. Arun Tripathi
Head
Department of Computer
KIET Group of Institutions,

ABSTRACT

E-Commerce revolutionizes global commerce by leveraging digital platforms for buying and selling goods and services. Enabled by the internet and secure payment systems, it offers businesses unprecedented reach and consumers seamless access. The dynamic interplay of technology and consumer behavior continually shapes the e-commerce landscape, with innovations like artificial intelligence and social commerce enhancing user experiences.

Despite challenges in cybersecurity and regulatory compliance, the transformative power of e-commerce is undeniable, fostering economic growth and connectivity on a global scale. As businesses adapt to this digital paradigm, e-commerce emerges as a cornerstone of modern economic ecosystems.

ACKNOWLEDGEMENTS

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CHAPTER 1

Introduction

1.1 OVERVIEW

Before the advent of e-commerce and the internet, consumers had to visit the traditional brick and mortar stores to purchase goods or services, and the sellers had to find a space where they could sell their products, but due to the arrival of e-commerce and the internet some decades ago shoppers do not have to visit these stores to make a purchase, neither do the sellers have to find a place to locate their stores. In fact, buying and selling without any form of e-commerce is unthinkable, complicated and cumbersome to many these days . E-commerce, which is now an integral part of many businesses, is used primarily to boost sales revenue, to attract new customers and to survive in today's competitive business environment. Also, it has benefitted the customers as they now have easy access to a wide range of goods and services at any time and anywhere in the world. Well-known examples of e-commerce companies are Amazon, eBay, and Zalando.

1.2 BACKGROUND

E-Commerce, also known as electronic commerce or e-business, is simply the buying and selling of goods and services via an electronic medium, mainly the internet. The usage of electronic commerce has been increasing rapidly in the last decades since its inception, prompting the majority of businesses to have an online platform. It is now essential for companies to do their business online, as virtually any kind of goods and services can be sold or purchased through the internet.

1.2.1 Brief History of E-commerce

Electronic commerce started in the 1960s when Electronic Data Interchange (EDI) was used by companies to carry out their daily business transactions electronically. In 1979, Michael Aldrich invented online shopping from which the term teleshopping was coined. In 1990, Tim Berners-Lee invented the World Wide Web, and thereafter he was able to establish communication between a Hypertext Transfer Protocol (HTTP) client and a server through the internet, leading to the advent of Amazon and eBay in the 1990s. These two prominent online stores have revolutionized the e-commerce market since their inception as more and more online shops spring up every day.

1.2.2 Types of E-Commerce

Basically, there are four types of electronic commerce. They are:

- Business to Business (B2B) – A situation where transactions take place between companies. For example, a computer manufacturing company selling computers to another company.
- Business to Consumer (B2C) – This takes place when a business sells directly to consumers. An example is when a customer buys a product from Amazon web store.
- Consumer to Business (C2B) – This happens when an individual or end user sells goods or services to companies. This is reverse B2C. An example is when a paid Amazon advert is hosted on a consumer's website.
- Consumer to Consumer (C2C) – Involves business transactions between consumers. An example is when a consumer wants to sell a used product to another consumer on eBay.

1.2.3 Why E-Commerce Website for Businesses?

In today's business world, it has become inevitable for any small, medium or large enterprise to have an e-business store. The following are some of the reasons a business should have an online presence.

- To break the barrier posed by physical limitations.
- To reach more shoppers in order to increase revenue.
- To make products available to customers 24/7 globally.
- To allow shoppers purchase goods at their own convenience, with just some mouse clicks.
- To reduce the operational cost of running a business.
- To provide better customer relations.

1.3 OBJECTIVE

The aim of this thesis is to develop an e-commerce Java web application for a small retail store, where the store owner (also called the administrator or admin) can sell goods over the internet. In the application, the admin will be able to manage products, customers, and orders, while the customers will be able to order and pay for products. The payment transaction will be carried out on PayPal testing environment. Furthermore, there will be an email notification after completing an order or subscribing to an email list.

CHAPTER 2

RELEVANT TOOLS AND TECHNOLOGIES

This chapter presents some discussions about the relevant tools and technologies used to develop the e-commerce web application. Some of the tools and technologies are React JS for front-end and firebase for database.

2.1 React JS

React is a framework that employs Webpack to automatically compile React, JSX, and ES6 code while handling CSS file prefixes. React is a JavaScript-based UI development library. Although React is a library rather than a language, it is widely used in web development. The library first appeared in May 2013 and is now one of the most commonly used frontend libraries for web development . React offers various extensions for entire application architectural support, such as Flux and React Native, beyond mere UI.

2.2 Firebase

Firebase is a product of Google which helps developers to build, manage, and grow their apps easily. It helps developers to build their apps faster and in a more secure way. No programming is required on the firebase side which makes it easy to use its features more efficiently. It provides services to android, ios, web, and unity. It provides cloud storage. It uses NoSQL for the database for the storage of data.

CHAPTER 3

FEASIBILITY STUDY

3.1 TECHNICAL FEASIBILITY

This is concerned with specifying equipment and software that will successfully satisfy the user requirement. The system must be evaluated from the technical point of view first. The assessment of this feasibility must be based on an outline design of the system requirements in the terms of input, output, programs and procedures. On having identified an outline system, the investigation must go on to suggest the type of equipment, required method developing the system, of running the system once it has been designed.

The technical needs of the system may vary considerably but might include:

- The facility to produce outputs in given time
- Response time under output conditions
- Ability to process a certain volume of at a particular speed
- Facility to communicate data to distant location
- Technical feasibility centre on the existing computer system (hardware, software, etc. and to extent it can support the proposed addition.

3.2 OPERATIONAL FEASIBILITY

Proposed project is beneficial only if they can be turned into information. Systems that will meet the operating requirement of the organization. This test of feasibility asks if the system will work when it is developed and installed. It is mainly related to human organization and political aspect.

The points to be considered are:

- What changes will be brought with the system?
- What organizational structures are distributed?
- What new skill will be required?

Do the existing staff members have these skills? If not, can they be trained in due course of time? Generally, project will not be rejected simply because of operational in feasibility but such consideration is likely critically affecting the nature and scope of the eventual recommendations.

This feasibility study is carried out by a small group of people who are familiar with information systems techniques who understand the parts of the business that are relevant to the project and are skilled in system analysis and design process.

3.3 BEHAVIORAL FEASIBILITY

Behavioural Feasibility is the measure of how the society is looking towards our project, what is the reaction of people who are going to use this in upcoming future. It includes how strong the reaction of user will be towards the development of new system that involves computer's use in their daily life by taking the online quizzes of the different subjects.

This includes the following questions: -

- Is there sufficient support for the users?
- Will the proposed system cause harm?

The project would be beneficial because it specifies the objectives when developed and installed. All behavioural aspects are considered carefully and conclude that the project is behaviourally feasible.

3.4 ECONOMICAL FEASIBILITY

Economical is most frequently used technique for evaluating the effectiveness of a proposed system. More commonly known as cost or benefit analysis, the procedure is to determine the benefits and saving that are expected from a proposed system and compare with cost.

It benefits out weight costs a decision taken to design and implement the system. Otherwise, further justification or alternative in the proposed system will have to be made if it is to have a chance of being approved. This is an ongoing effort that improves in accuracy at each phase of the system life cycle.

An evaluation of development cost weighed against the ultimate income of benefit derived from the development system or project among the most important information contained in feasibility study is cost benefit analysis an assessment of the economic justification for a computer-based system project.

The benefits of a project include four types:

- Cost saving benefits.
- Cost avoidances benefits.
- Improved service level benefits.
- Improved the information benefits.
- The cost of the hardware and software.
- He costs conduct a full system investigation.
- The benefits in the form of reduced costs or fewer costly errors.

CHAPTER 4

FEATURES

4.1 User Registration

Objective: Allow users to create accounts, providing a personalized and secure experience.

Key Features:

- **Registration Form:** Collect essential user information like name, email and password.
- **Password Security:** Implement secure password storage and encourage strong passwords.
- **Profile Management:** Enable users to update personal information and manage preferences.

4.2 Product Catalog

Objective: Display and organize products in a user-friendly manner.

Key Features:

- **Product Listings:** Present products with details (name, price, description).
- **Categories and Filters:** Organize products into categories; implement filters for easy navigation.
- **Search Functionality:** Allow users to search for specific products.
- **Product Images:** Include high-quality images for each product.
- **Product Reviews and Ratings:** Enable customers to leave reviews and rate products.

4.3 Shopping Cart

Objective: Facilitate users in adding, managing, and reviewing items before purchase.

Key Features:

- **Add to Cart:** Allow users to add products to their shopping cart.
- **Quantity Adjustment:** Enable users to adjust quantities or remove items.
- **Cart Summary:** Display a summary of items and total cost.
- **Save for Later:** Option to move items to a "save for later" list.
- **Cross-device Synchronization:** Sync the shopping cart across devices if the user is logged in.

4.4 Order Management

Objective: Streamline the process of placing and tracking orders.

Key Features:

- **Checkout Process:** Simple and intuitive steps for order placement.
- **Order Confirmation:** Send confirmation emails with order details.
- **Order History:** Maintain a history of past orders for users.
- **Order Tracking:** Provide real-time tracking for shipped orders.
- **Cancel/Modify Orders:** Allow users to cancel or modify orders within a specified timeframe.

Key Features:

- **Text Reviews:** Allow customers to write detailed reviews about their experiences with the product.
- **Rating Scale:** Implement a rating scale (e.g., stars) for customers to assign a quantitative score to the product.
- **Customer Interaction:** Enable customers to comment on reviews or reply to specific comments.

CHAPTER 5

SYSTEM ARCHITECTURE AND DESIGN

5.1 FLOW CHART DIAGRAM

A flowchart is a visual representation of the sequence of steps and decisions needed to perform a process. Each step in the sequence is noted within a diagram shape. Steps are linked by connecting lines and directional arrows. This allows anyone to view the flowchart and logically follow the process from beginning to end. A flowchart is a powerful business tool. With proper design and construction, it communicates the steps in a process very effectively and efficiently.






Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectagle represents a process
	Decision	A diamond indicates a decision

Fig 5.1: Flowchart Symbols

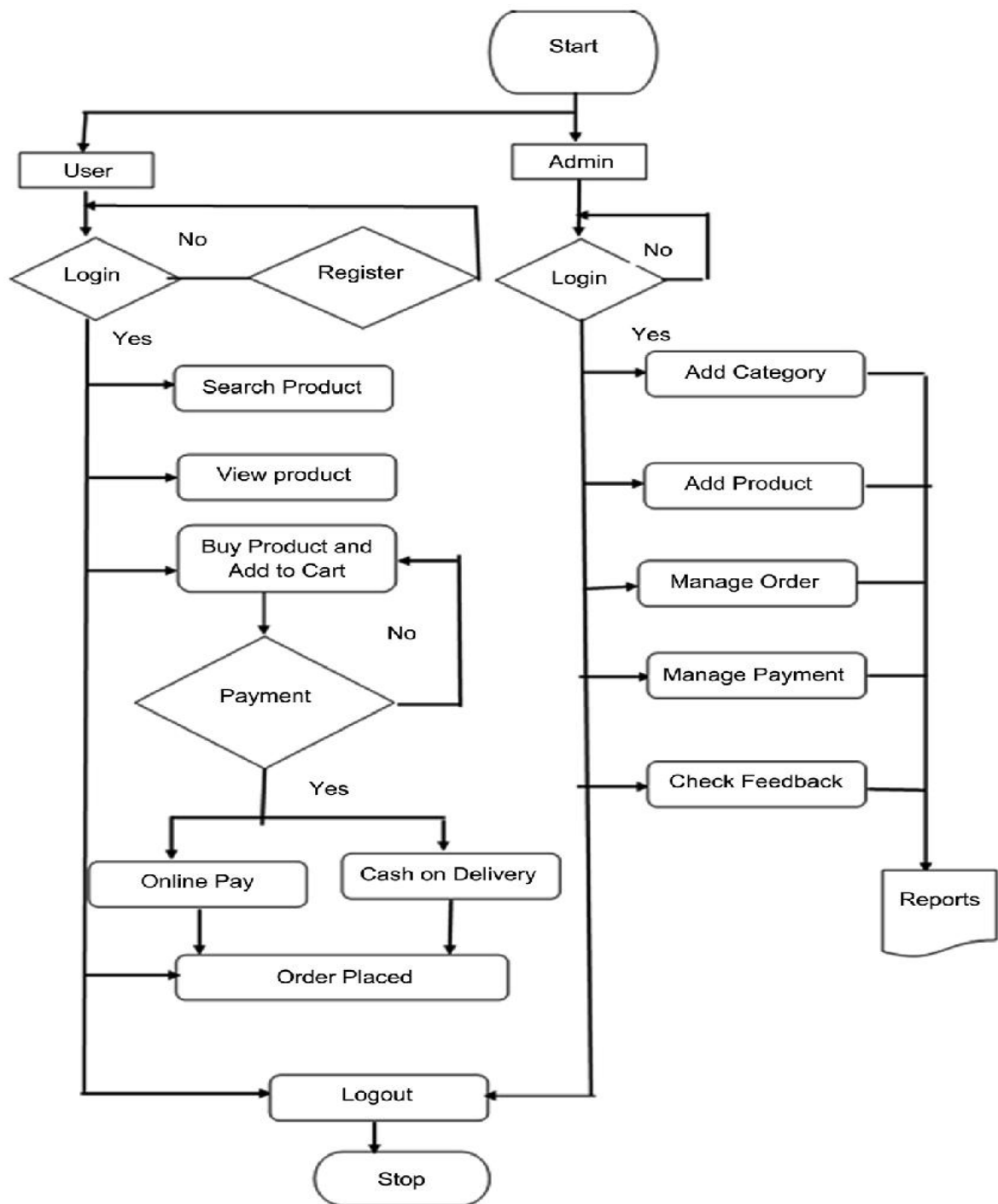


Fig 5.2: Flowchart Diagram

5.2 ENTITY RELATIONSHIP DIAGRAM

Entity-Relationship model stands for an ER model. It is a high-level data model. This model is used to define the data elements and relationship for a specified system. It develops a conceptual design for the database. It also develops a very simple and easy to design view of data. In ER modelling, the database structure is portrayed as a diagram called an entity relationship diagram.

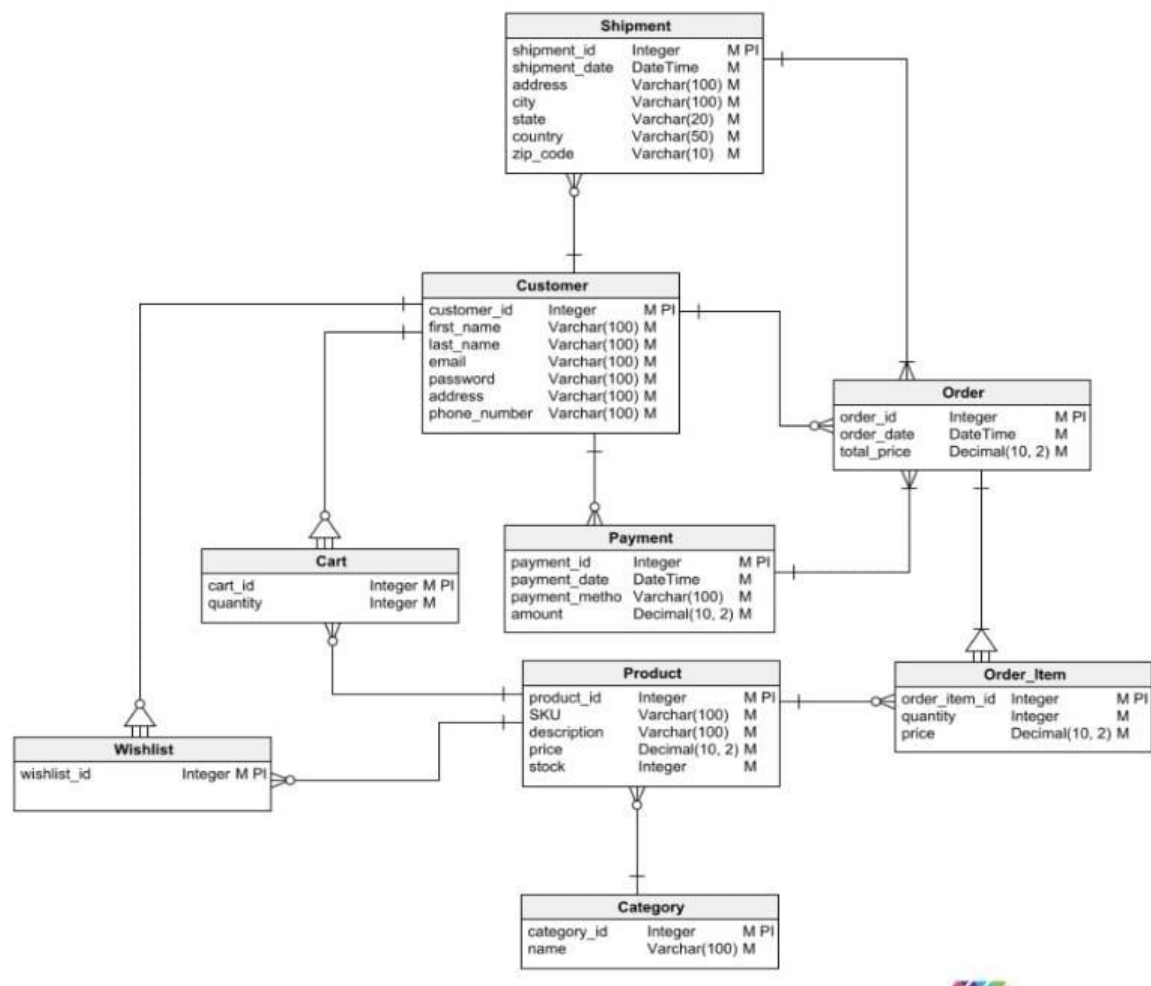


Fig 5.3: ER-Diagram

5.3 USE CASE DIAGRAM

The use case diagrams for this application illustrate the interactions that exist between users (actors) and use cases (actions) within the application. There are two actors identified for this application – administrator (admin) and customer actors. As a result, there are two use case diagrams for the software application – admin use case diagram and customer use case diagram. The admin is the owner of the e-commerce store who performs various administrative tasks such as add products, view orders, and update order status while the customer is any individual who buys a product or products from the online store.

5.3.1 Admin Use Case Diagram

The admin use case diagram. The diagram depicts how the admin communicates with the application. More so, it shows all the actions that the admin can perform on the application. As can be seen in the diagram, before any of these actions could be executed the admin will have to login in order to be authenticate

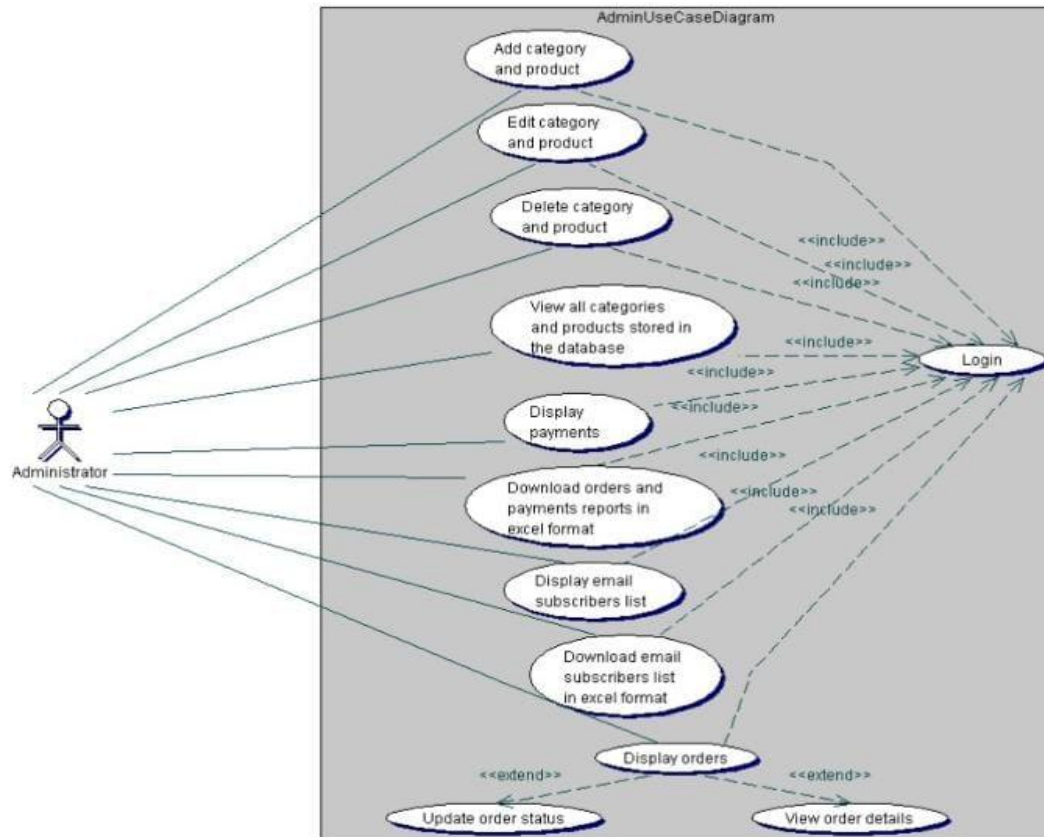


Fig 5.4: Admin Use Case Diagram

5.3.2 Customer Use Case Diagram

The customer use case diagram. It describes the different use cases that can be executed by the customer on the e-commerce application. For the checkout process using online payment Checkout, the buyer will have to be authenticated on a secured online payment website.

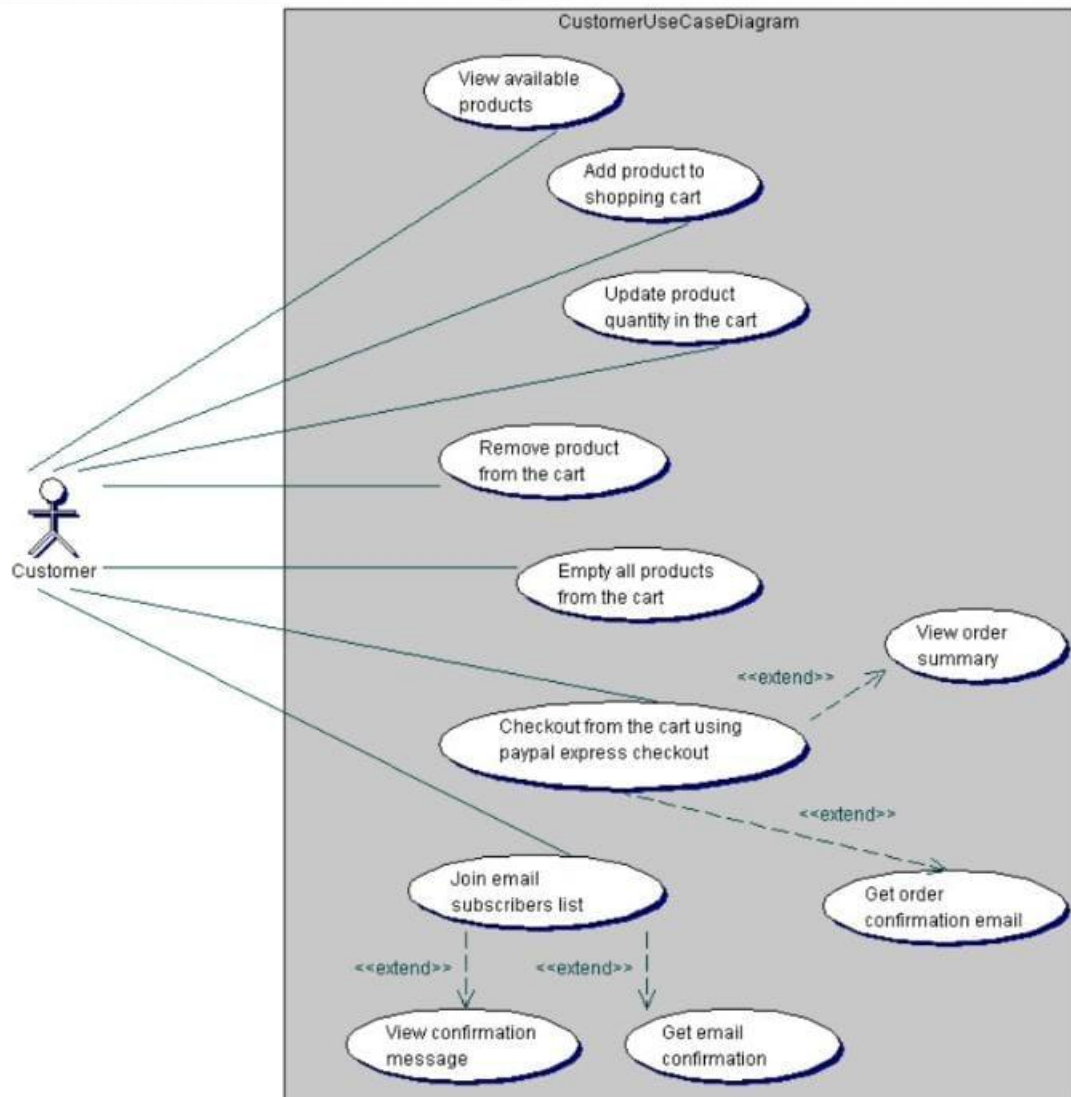


Fig 5.5: Customer Use Case Diagram

5.4 CLASS DIAGRAM

A class diagram depicts the classes in a software system and how they interact with each other. Also, the class attributes and functions are illustrated in a class diagram. The class diagram for this application. It shows the relationships between classes in the application and constraints applied to these relationships.

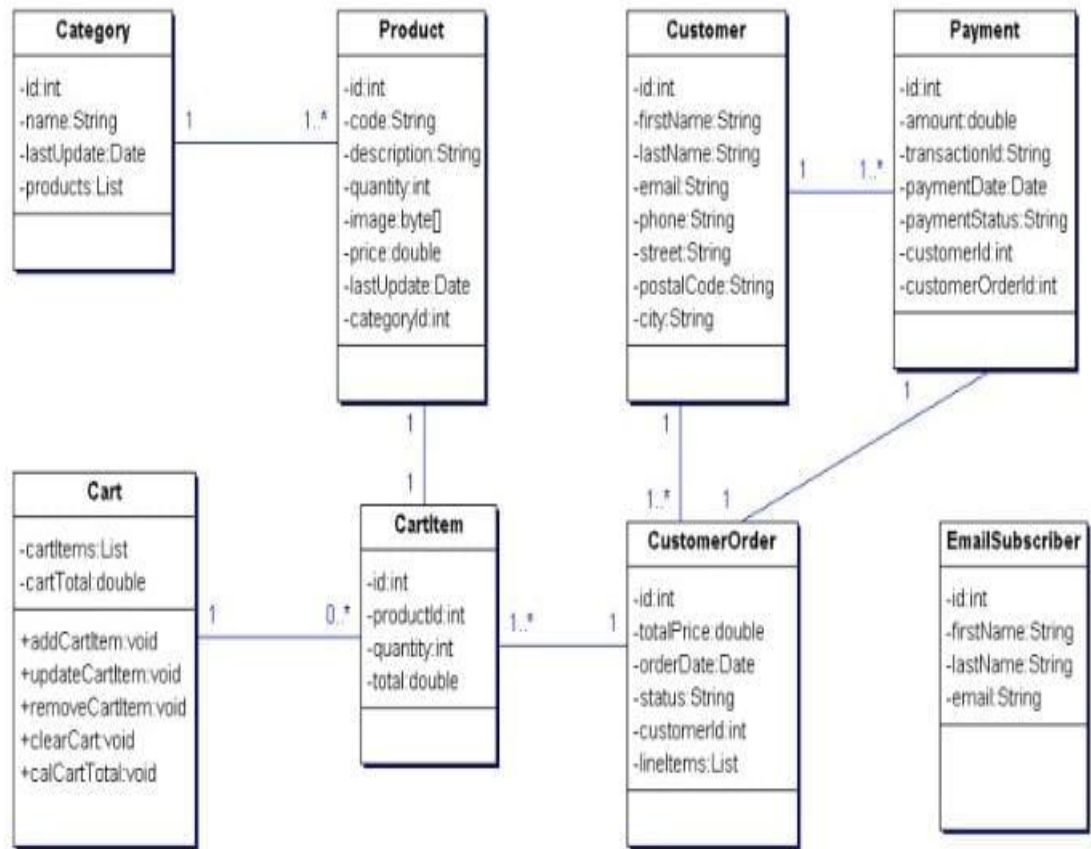


Fig 5.6: Class Diagram

5.5 SEQUENCE DIAGRAM

The sequence diagram (SD) represents the flow of messages in the system and is also termed as an event diagram. It helps in envisioning several dynamic scenarios. It portrays the communication between any two lifelines as a time-ordered sequence of events, such that these lifelines took part at the run time. In UML, the lifeline is represented by a vertical bar, whereas the message flow is represented by a vertical dotted line that extends across the bottom of the page. It incorporates the iterations as well as branching.

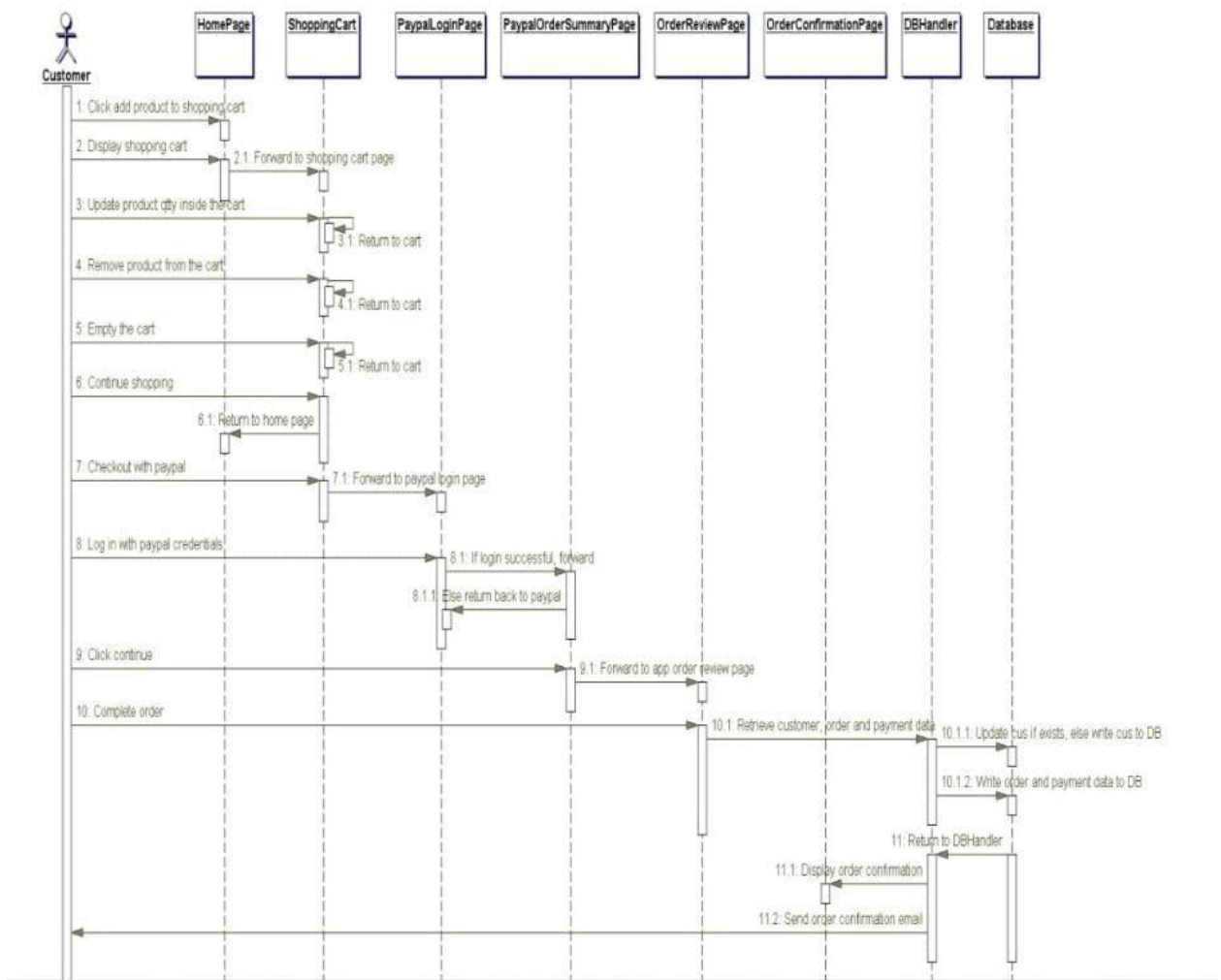


Fig 5.7: SEQUENCE DIAGRAM

CHAPTER 6

IMPLEMENTATION AND RESULT

6.1 HOME PAGE

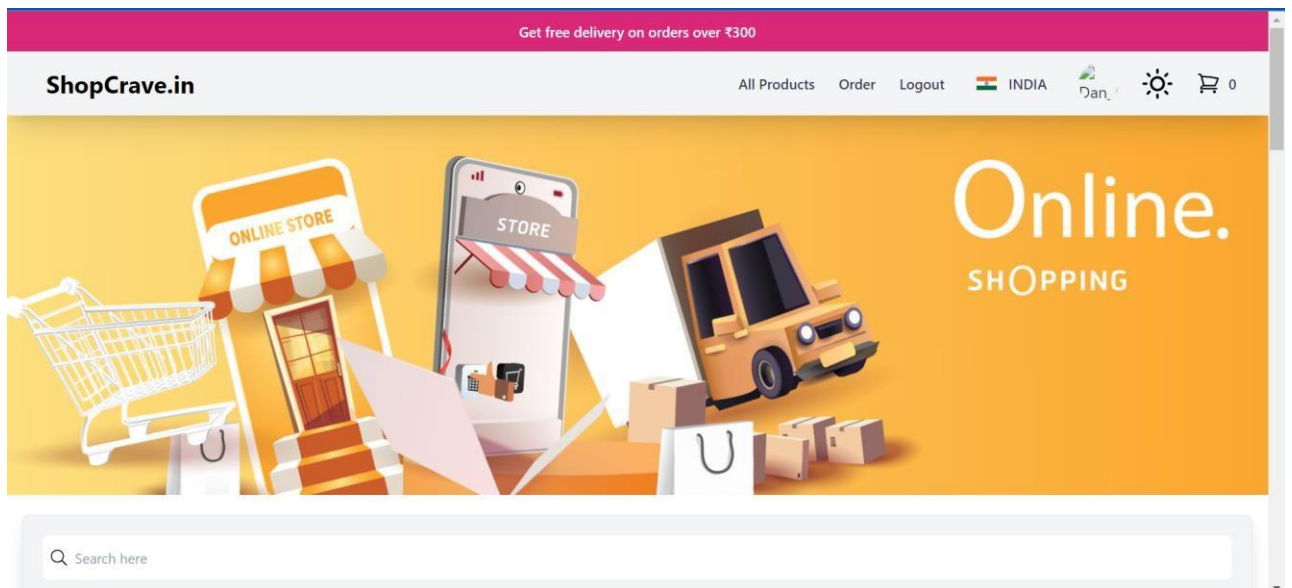
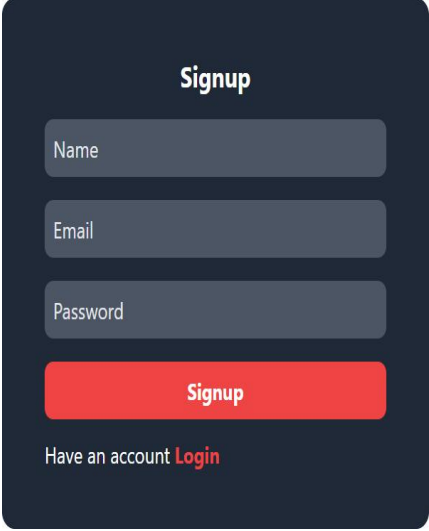


Fig 6.1: Home Pages

6.2 SIGN UP



Signup

Name

Email

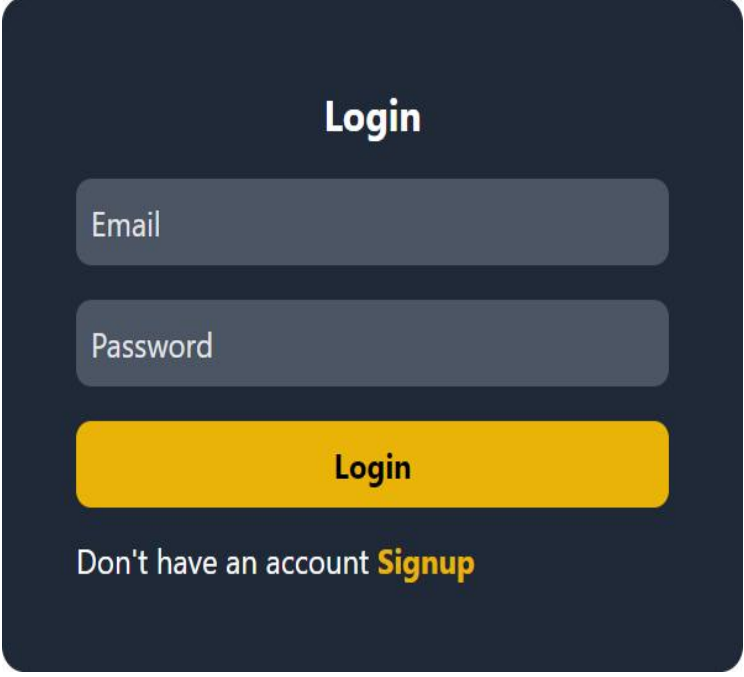
Password

Signup

Have an account [Login](#)

Fig 6.2: Sign up

6.3 SIGN IN



The image shows a login form on a dark blue background. At the top, the word "Login" is centered in white. Below it are two input fields: "Email" and "Password", both with light gray placeholder text. A yellow "Login" button is positioned below the password field. At the bottom, the text "Don't have an account" is followed by a yellow "Signup" link.

Login

Email

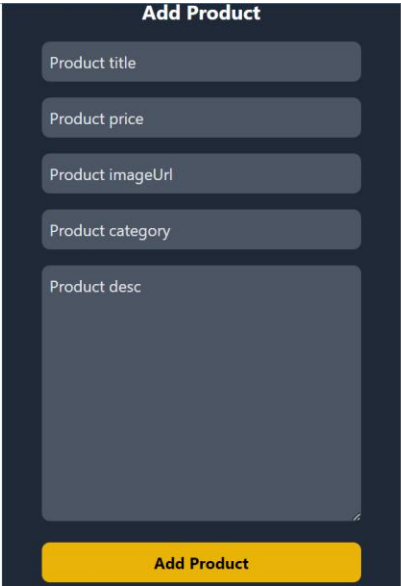
Password

Login

Don't have an account **Signup**

Fig 6.3: Sign In

6.4 ADD PRODUCT



The image shows a web form titled "Add Product" with a dark blue header. The form is set against a light gray background. It contains five input fields: "Product title", "Product price", "Product imageUrl", "Product category", and "Product desc". The "Product desc" field is a larger text area. At the bottom of the form is a yellow button labeled "Add Product".

Add Product

Product title

Product price

Product imageUrl

Product category

Product desc

Add Product

Fig 6.4: Add Product

6.5 PRODUCT DETAIL PAGE

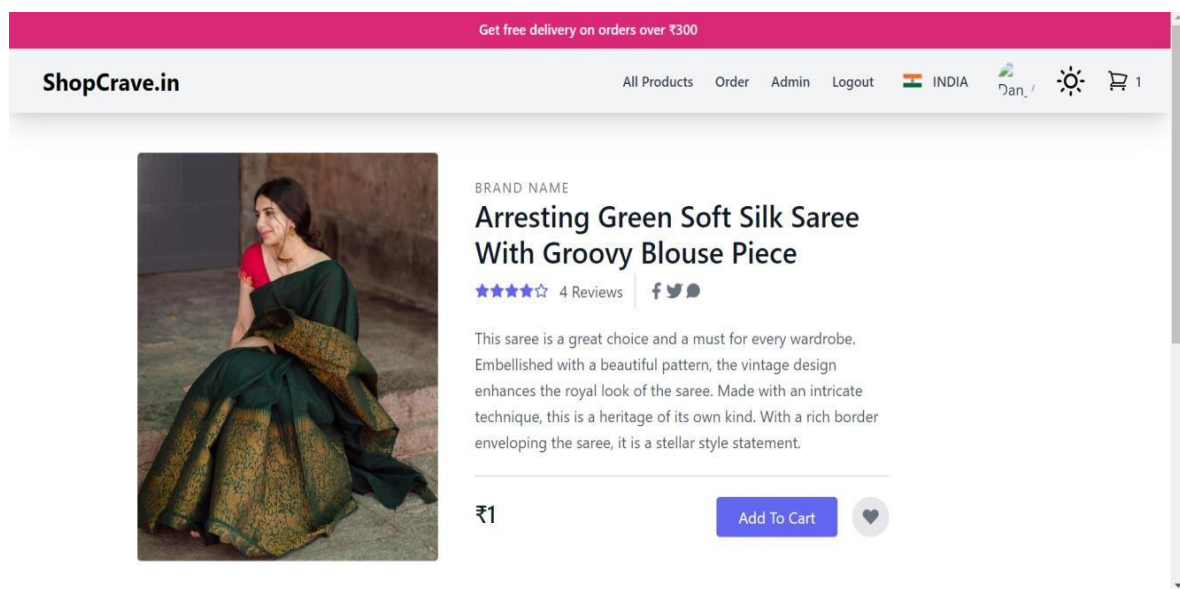


Fig 6.5: Product Detail Page

6.6 CHECKOUT PAGE

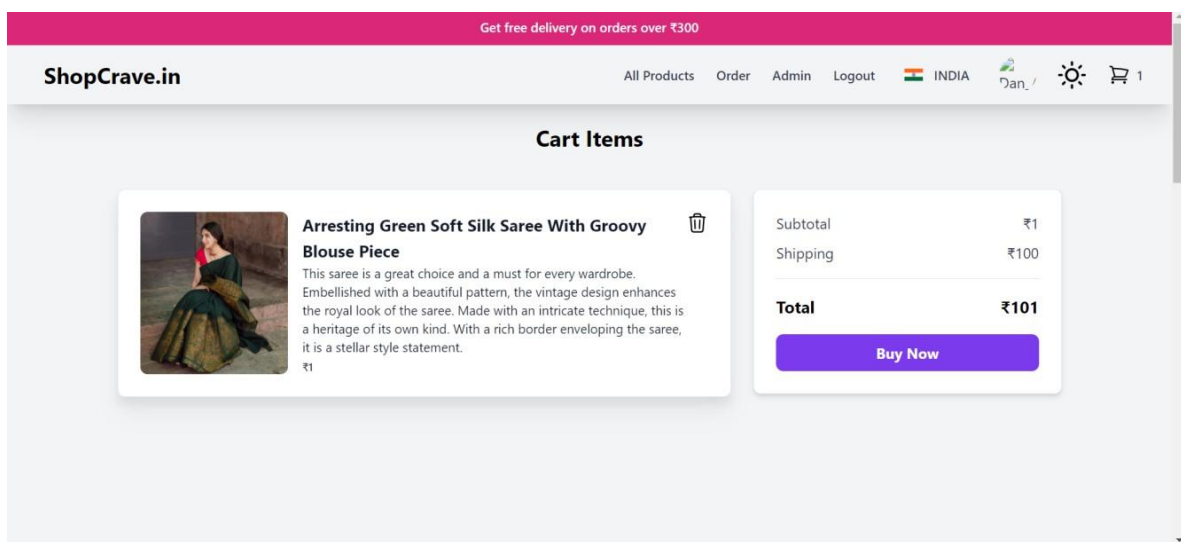


Fig 6.6: Checkout Page

CHAPTER 7

TESTING

7.1 FUNCTIONAL TESTING

A) Unit Testing:

- **Objective:** Verify the correctness of individual components and functions.
- **Key Aspects:** Test business logic, data processing, and interactions with external services.

B) Integration Testing:

- **Objective:** Validate the interactions between different modules and components.
- **Key Aspects:** Test the flow of data, communication between services, and API integrations.

C) System Testing:

- **Objective:** Ensure the entire system works as intended.
- **Key Aspects:** Test end-to-end scenarios, including user registration, product ordering, and payment processing.

7.2 SECURITY TESTING

A) Penetration Testing:

- **Objective:** Identify vulnerabilities and weaknesses in the system.
- **Key Aspects:** Test for common security issues such as SQL injection, cross-site scripting (XSS), and cross-site request forgery (CSRF).

B) Authentication and Authorization Testing:

- **Objective:** Ensure secure user authentication and proper authorization levels.
- **Key Aspects:** Test login/logout processes, password policies, and access controls.

7.3 REGRESSION TESTING

A) Automated Regression Testing:

- **Objective:** Ensure that new features or bug fixes do not negatively impact existing functionality.
- **Key Aspects:** Run automated tests on critical paths and core features.

7.4 COMPATIBILITY TESTING

A) Browser Compatibility Testing:

- **Objective:** Verify the application works consistently across different web browsers.
- **Key Aspects:** Test on popular browsers like Chrome, Firefox, Safari, and Edge.

B) Device Compatibility Testing:

- **Objective:** Ensure the application is responsive and functions well on various devices.
- **Key Aspects:** Test on desktops, tablets, and mobile devices

CHAPTER 8

CONCLUSION

In conclusion, the development and deployment of the e-commerce web application represent a significant achievement with far-reaching implications for both customers and the business. The comprehensive design and implementation of this platform have been guided by a commitment to providing an exceptional user experience, ensuring security, and optimizing performance.

8.1 ACHIEVEMENTS

- **User-Centric Design:**

The user interface has been meticulously crafted to deliver a seamless and intuitive experience. User feedback and usability testing have played a pivotal role in shaping the design.

- **Robust Functionality:**

The application boasts a wide array of features, including user registration, a rich product catalog, a dynamic shopping cart, streamlined order management, and secure payment processing. Each feature has been developed to meet user needs and business objectives.

- **Security Measures:**

Security has been a top priority throughout the development process. Stringent measures, such as encryption, secure authentication, and thorough penetration testing, have been implemented to safeguard user data and transactions.

- **Performance Optimization:**

Rigorous performance testing has been conducted to ensure that the application can handle various loads seamlessly. Load balancing, stress testing, and scalability measures have been implemented to guarantee optimal performance under different conditions.

- **Responsive and Cross-Browser Compatibility:**

The application is designed to be responsive, ensuring a consistent and engaging experience across a range of devices. Compatibility testing across different browsers guarantees a wider reach and accessibility for users.

8.2 FUTURE ENHANCEMENTS

- **AI-Driven Personalization:**

Explore the integration of artificial intelligence to enhance personalized recommendations based on user behavior and preferences.

- **Enhanced Analytics:**

Expand the analytics capabilities to derive deeper insights into user behavior, sales patterns, and marketing effectiveness.

- **Augmented Reality (AR) Integration:**

Consider integrating AR features to provide users with a virtual experience of products before making a purchase.

- **Mobile Application Development:**

Explore the development of native mobile applications to cater to the growing user base on mobile devices.

CHAPTER 9

REFERENCES

- <https://blog.miva.com/the-history-of-ecommerce-how-did-it-all-begin>
- <https://react.dev/learn>
- **Community Forums:** Participate in forums such as Stack Overflow or Reddit. Developers often share code snippets, solutions to common problems, and project recommendations.
- **YouTube Tutorials:** Video tutorials on platforms like YouTube can be helpful. Search for tutorials that cover the integration of React , Firebase in an e-commerce context.
- **GitHub Repositories:** Search on GitHub for open-source projects that match your technology stack. Many developers share their projects, and you can find complete applications or code snippets.

