EASY BUY

A PROJECT REPORT
for
Mini Project (KCA353)
Session (2023-24)

Submitted by
Shivam Gupta

2200290140144

Submitted in partial fulfillment of the
Requirements for the Degree of

MASTER OF COMPUTER APPLICATION

Under the Supervision of
Dr. Shashank Bhardwaj
Associate Professor

Submitted to

DEPARTMENT OF COMPUTER APPLICATIONS
KIET Group of Institutions, Ghaziabad
Uttar Pradesh-201206

(JANUARY 2024)

CERTIFICATE

Certified that **Shivam Gupta (2200290140144)** has/ have carried out the project work having "**EASY BUY**" (**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:

Shivam Gupta
2200290140144

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

Date:

Dr. Shashank Bhardwaj
Associate Professor
Department of Computer Applications
KIET Group of Institutions, Ghaziabad

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

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

Success in life is never attained single-handedly. My deepest gratitude goes to my project supervisor, **Dr. Shashank Bhardwaj** for his guidance, help, and encouragement throughout my project work. Their enlightening ideas, comments, and suggestions.

Words are not enough to express my gratitude to **Dr. Arun Kumar Tripathi**, Professor and Head, Department of Computer Applications, for his insightful comments and administrative help on various occasions.

Fortunately, I have many understanding friends, who have helped me a lot in many critical conditions.

Finally, my sincere thanks go to my family members and all those who have directly and indirectly provided me with moral support and other kinds of help. Without their support, completion of this work would not have been possible in time. They keep my life filled with enjoyment and happiness.

TABLE OF CONTENTS

	Certificate	ii
	Abstract	iii
	Acknowledgements	iv
	Table Of Content	v
1.	Introduction	1
2.	Relevant Tools and Technologies	3
3.	Feasibility Study	5
4.	Feature	8
5.	System Architecture And Design	11
6.	Implementation and Result	20
7.	Testing	28
8.	Conclusion	30
9.	References	32

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 Java programming language, JDK and JRE, Java EE, HTML, CSS, JSP technology (EL and JSTL), JavaMail API and MySQL. Others are Eclipse IDE and Express Checkout.

2.1 JAVA PROGRAMMING LANGUAGE

This is the main programming language used to develop the application. The Java Programming Language was formerly developed by Sun Microsystems as proposed by James Gosling. It was first released in 1995. It runs on Mac OS, Windows, the different versions of UNIX, and other platforms. Java is considered to be secure and robust. Also, it is multithreading and platform independent .

2.2 JDK AND JRE

The Java Development Kit (JDK) is a software development environment for developing applets and applications written in Java. It consists of an interpreter, a Java compiler, a documentation generator (JavaDoc) and several other tools for building Java applications. The Java Runtime Environment is a component of JDK, and it consists of the Java Virtual Machine (JVM), libraries, files and other components for running applications written in Java. JVM is an implementation of JRE for running Java bytecode.

2.3 SPRING BOOT

Java Spring Boot is an open-source tool that makes it easier to use Java-based frameworks to create microservices and web apps. For any definition of Spring Boot, the conversation has to start with Java—one of the most popular and widely used development languages and computing platforms for app development. Developers all over the world start their coding journey learning Java. Flexible and user-friendly, Java is a developer favorite for a

variety of apps—everything from social media, web, and gaming apps to networking and enterprise applications.

2.4 VUE.JS

VueJS is an open source progressive JavaScript framework used to develop interactive web interfaces. It is one of the famous frameworks used to simplify web development. VueJS focus on the view layer. It can be easily integrated into big projects for front-end development without any issues.

The installation for VueJS is very easy to start with. Any developer can easily understand and build interactive web interfaces in a matter of time. VueJS is created by Evan You, an ex-employee from Google. The first version of VueJS was released in Feb 2014. It recently has clocked to 64,828 stars on GitHub, making it very popular.

2.5 PAYMENT

A payment gateway is a network through which your customers transfer funds to you. Payment gateways are very similar to the point-of-sale terminals used at most brick and mortar stores. When using a payment gateway, customers and businesses need to work together to make a transaction.

Once your customer has placed an order, the payment gateway verifies the customer's card details and checks if they have enough funds in their account to pay you.

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.

4.5 Payment Processing

Objective: Securely handle financial transactions.

Key Features:
- **Multiple Payment Options:** Support various payment methods (credit cards, Debit cards, etc.).
- **Secure Transactions:** Implement encryption and secure protocols (SSL).
- **Payment Gateway Integration:** Integrate with reliable payment gateways.
- **Refund Handling:** Provide a clear process for handling refunds.

4.6 Reviews and Ratings

Objective: Enhance the credibility of products and the overall shopping experience by allowing customers to share their opinions through reviews and ratings.

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

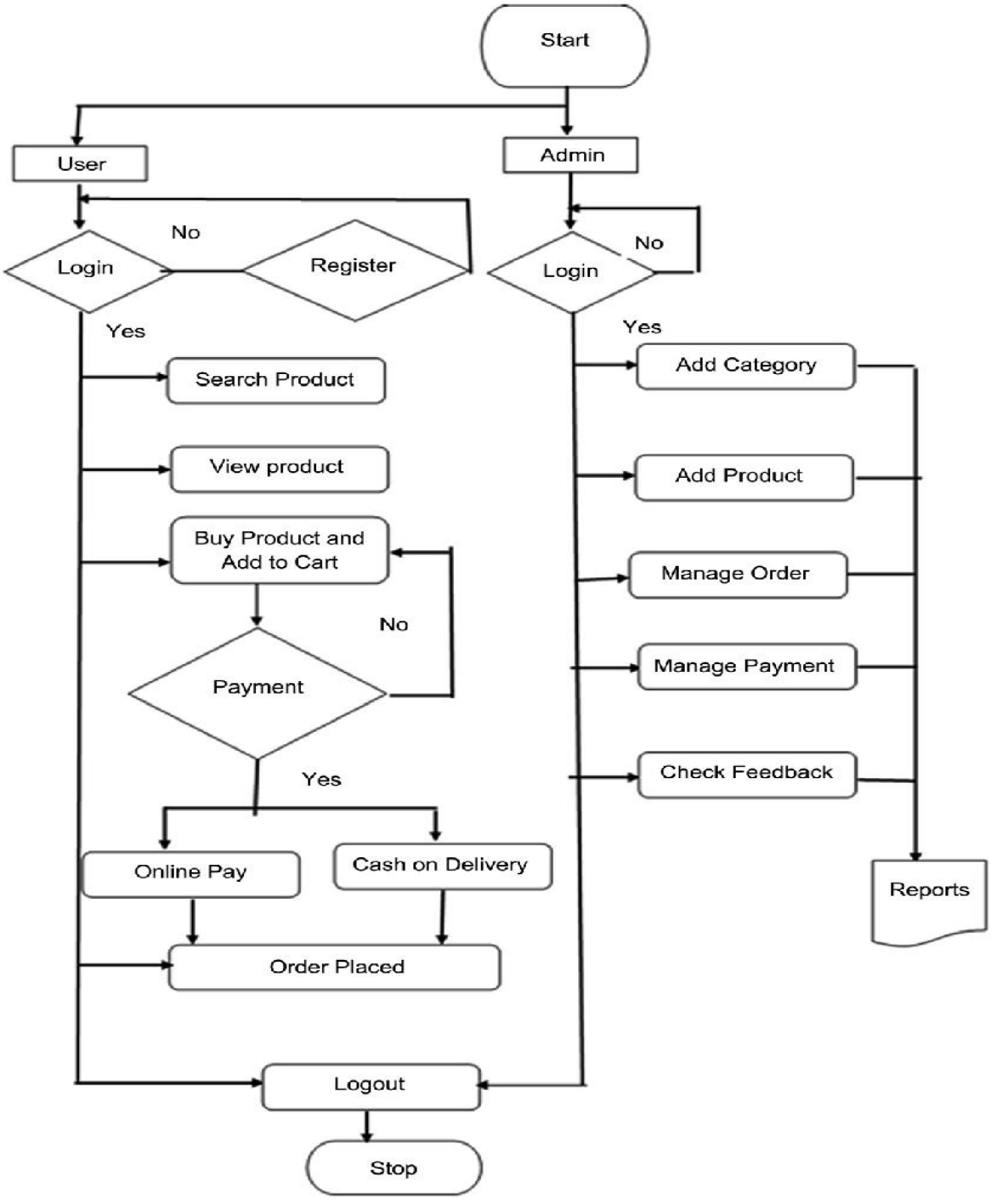

Fig 5.2: Flowchart Diagram

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.

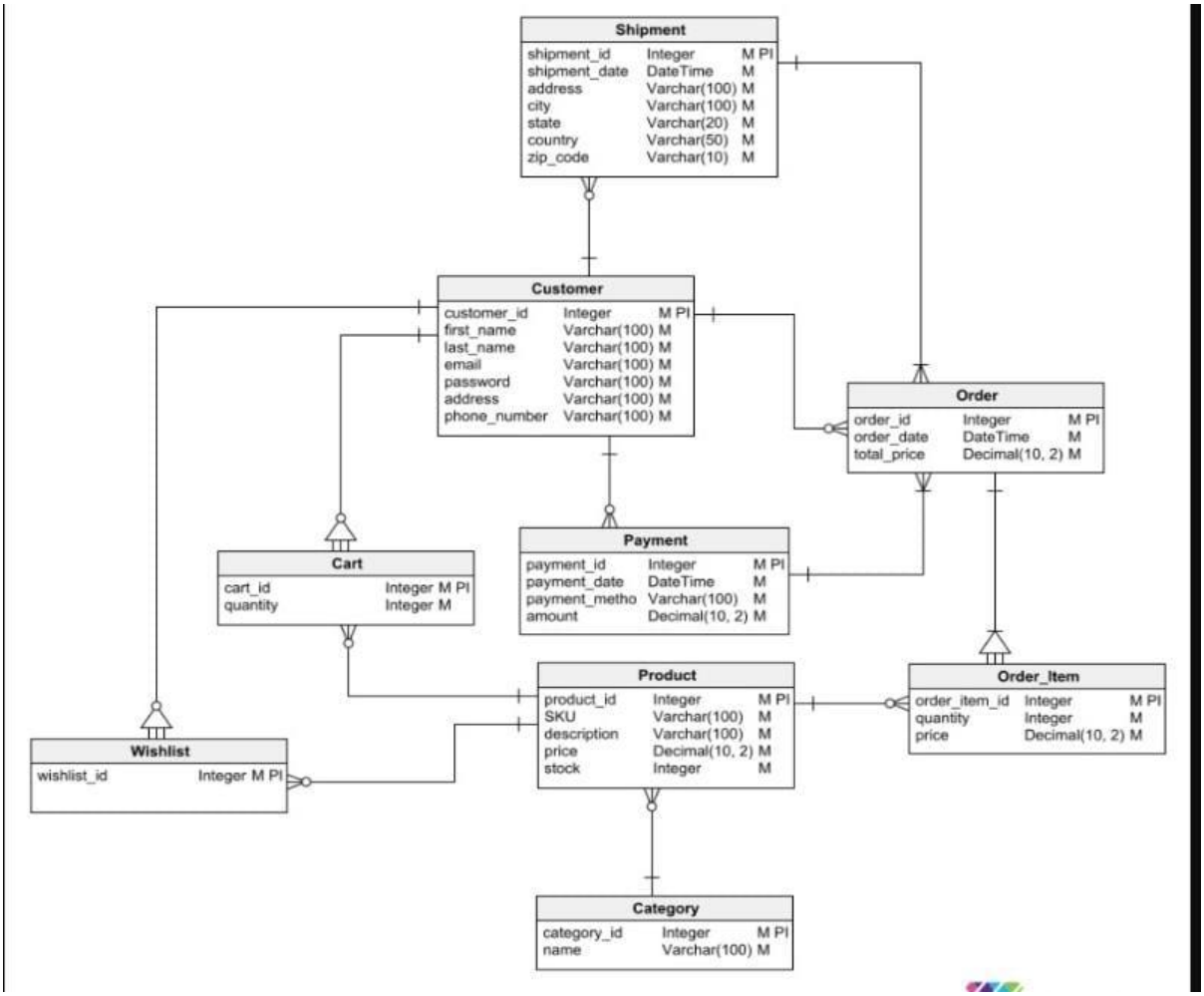

Fig 5.3: ER-Diagram

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

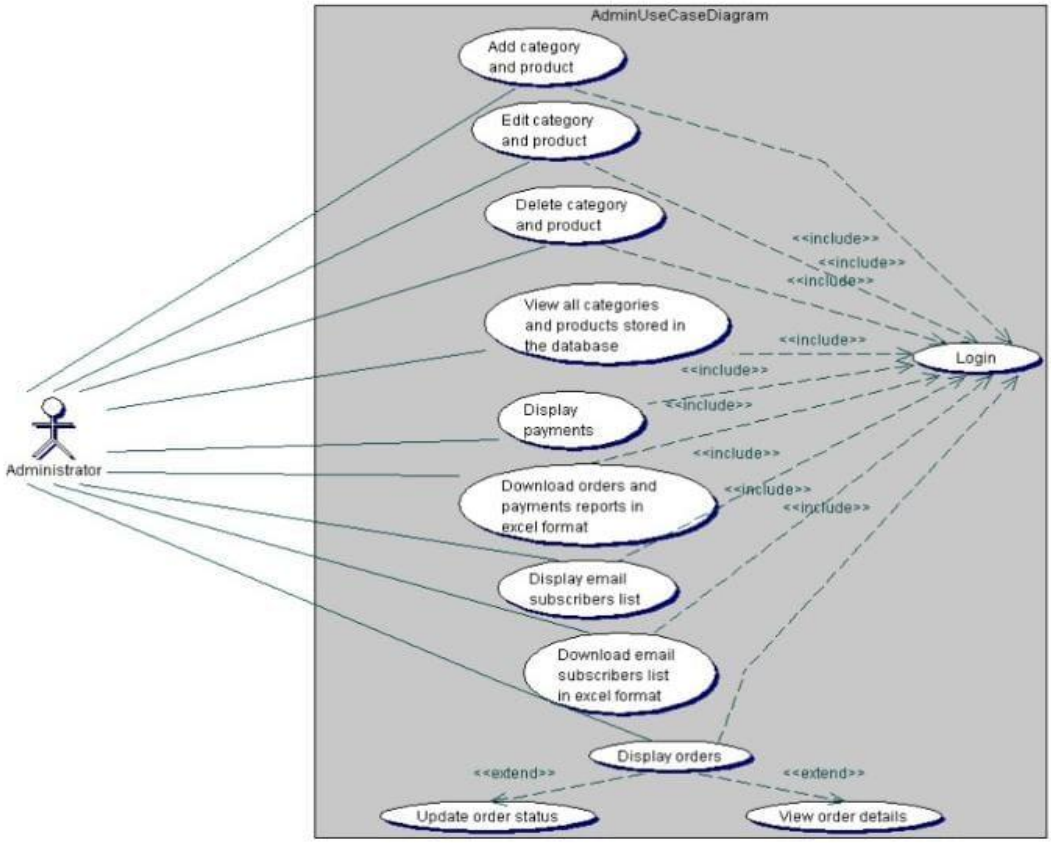

Fig 5.4: Admin Use Case Diagram

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.

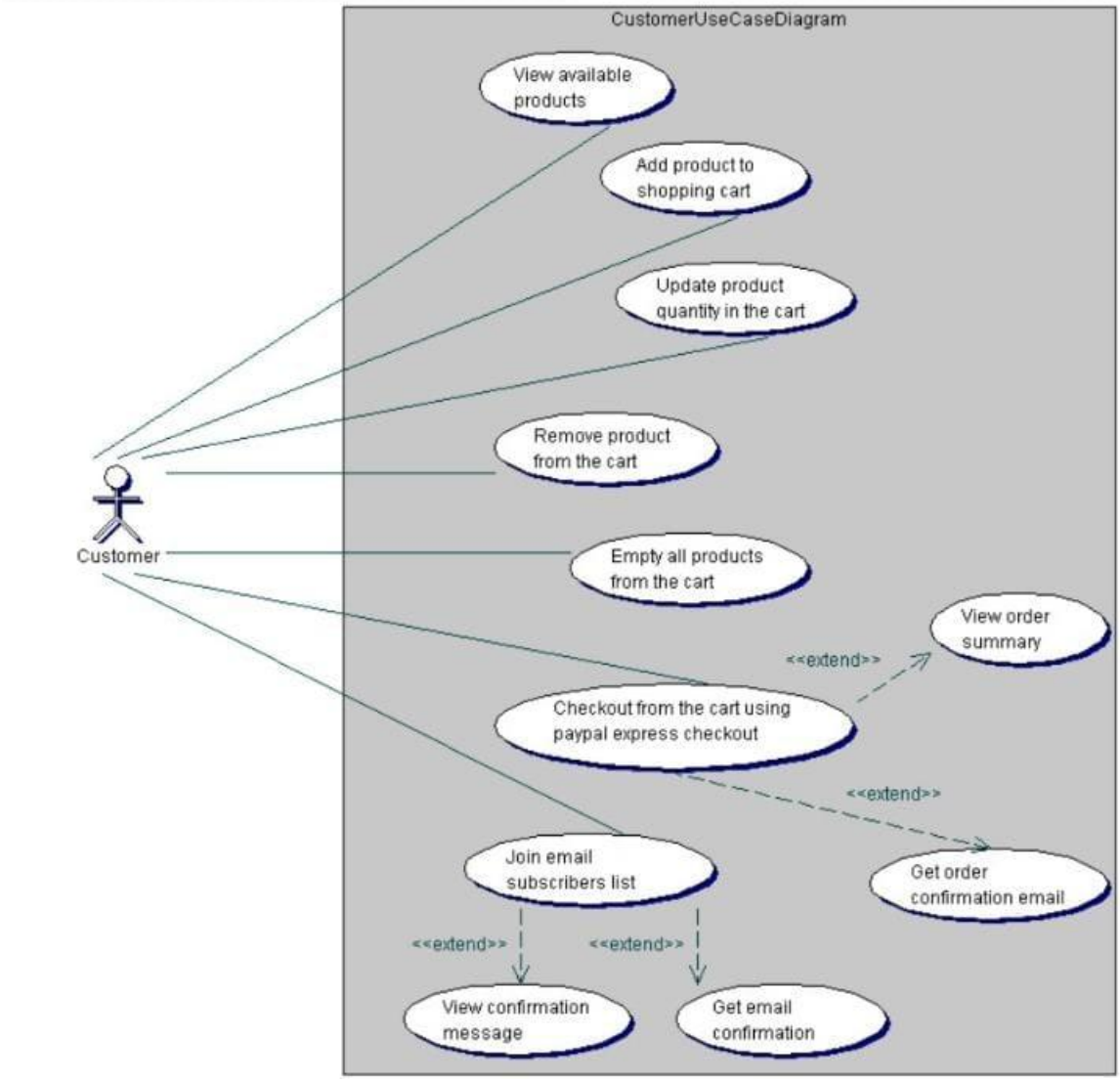

Fig 5.5: Customer Use Case Diagram

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.

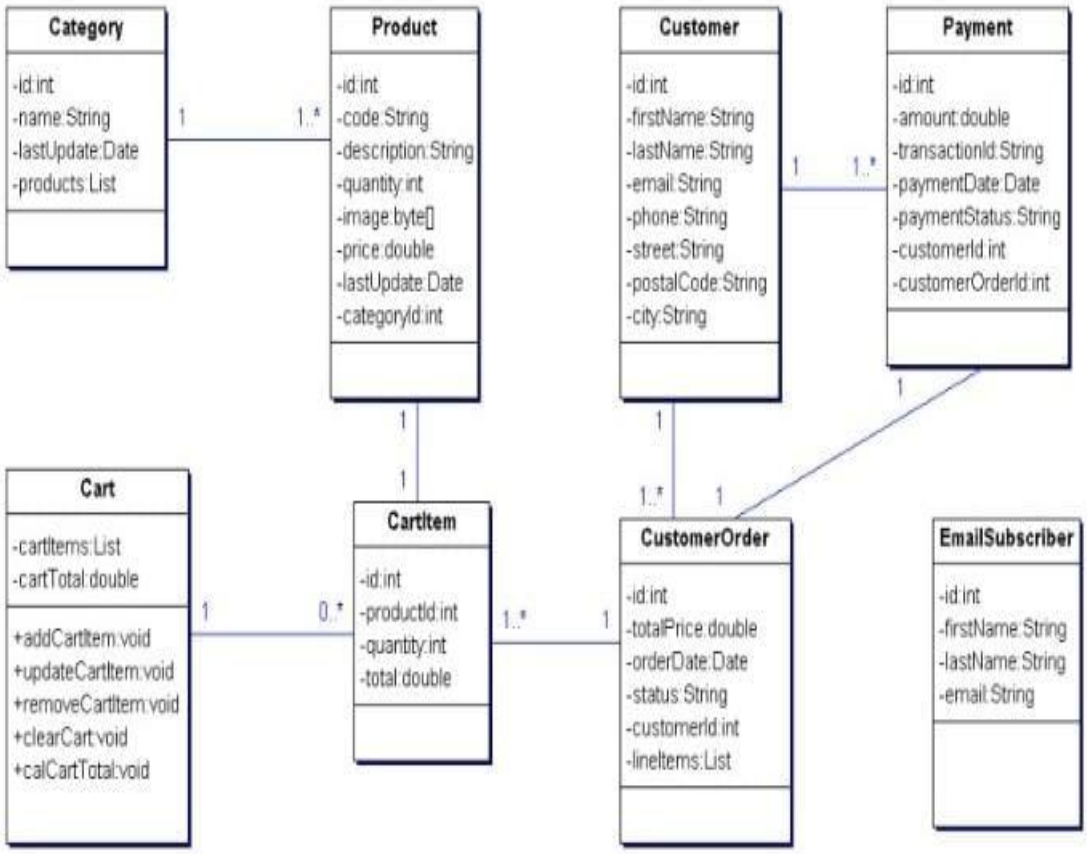

Fig 5.6: Class Diagram

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.

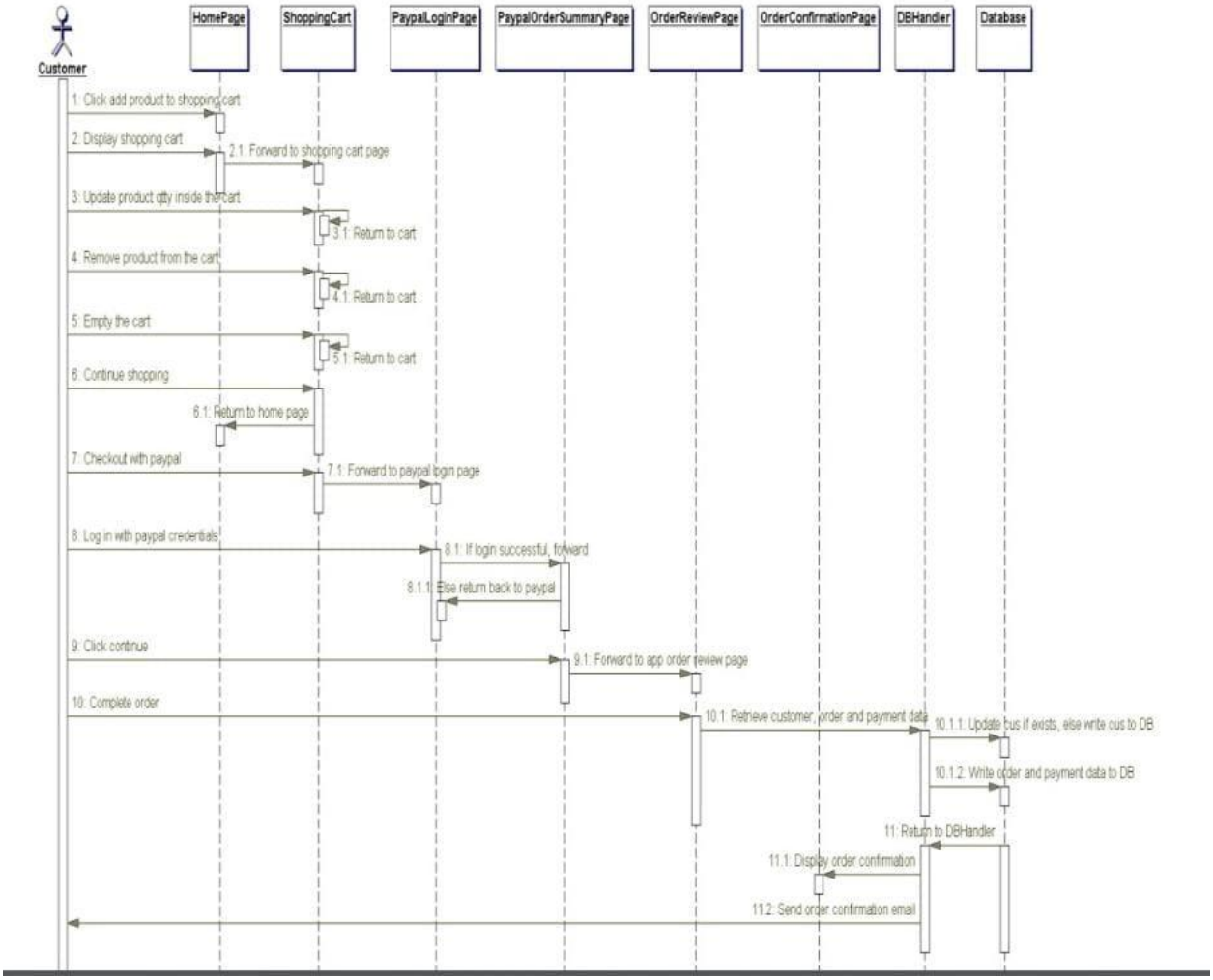

Fig 5.7: SEQUENCE DIAGRAM

5.6 DEPLOYMENT DIAGRAM

The deployment diagram for this application is illustrated in Figure 8. The diagram shows the configuration of the run-time hardware components (nodes) and the software components running on those nodes. As can be seen to deploy this web application a database server, an application server, and computers with internet access are needed. Also, backup servers are provided for the database and application servers.

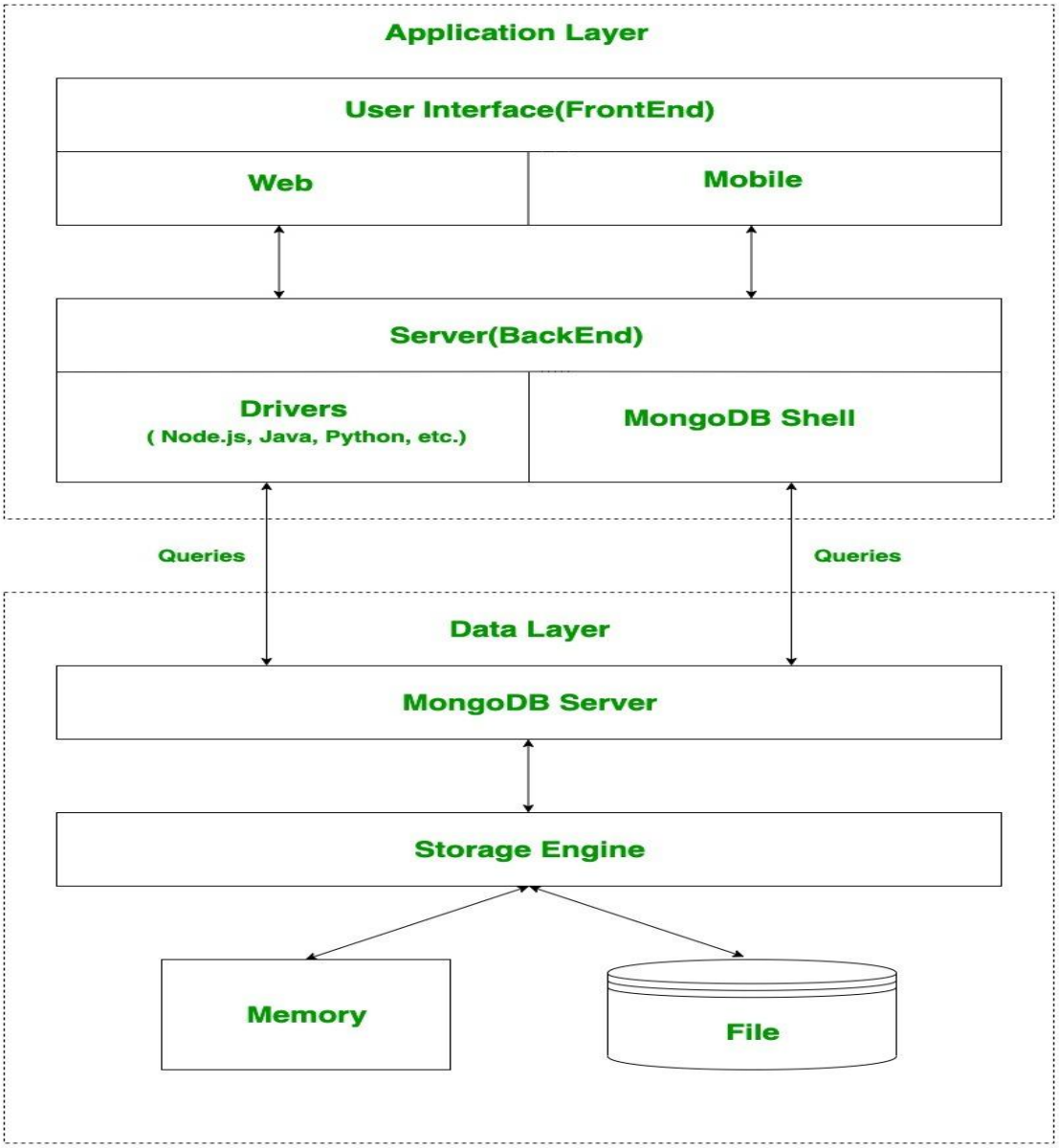

Fig 5.8: Deployment Diagram

CHAPTER 6

IMPLEMENTATION AND RESULT

1.1 HOME PAGE

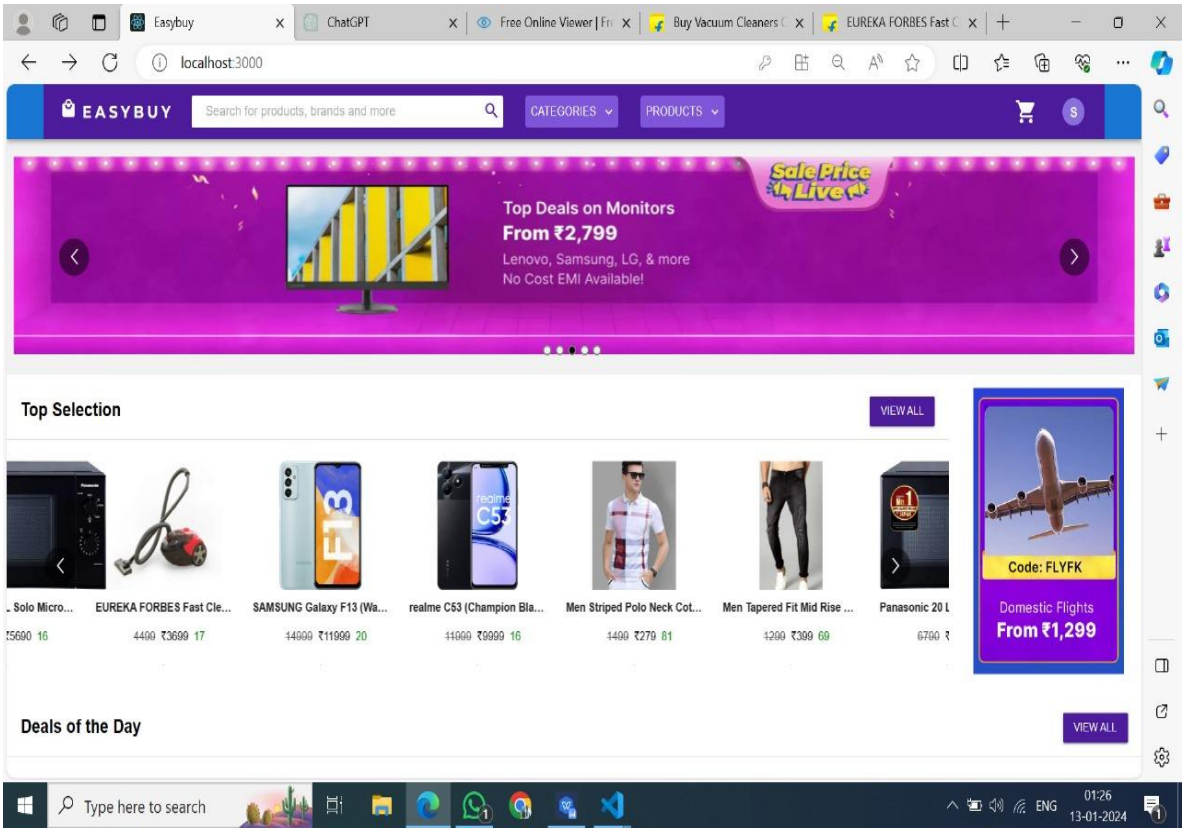

Fig 6.1: Home Pages

1.2 ADMIN SIGN UP

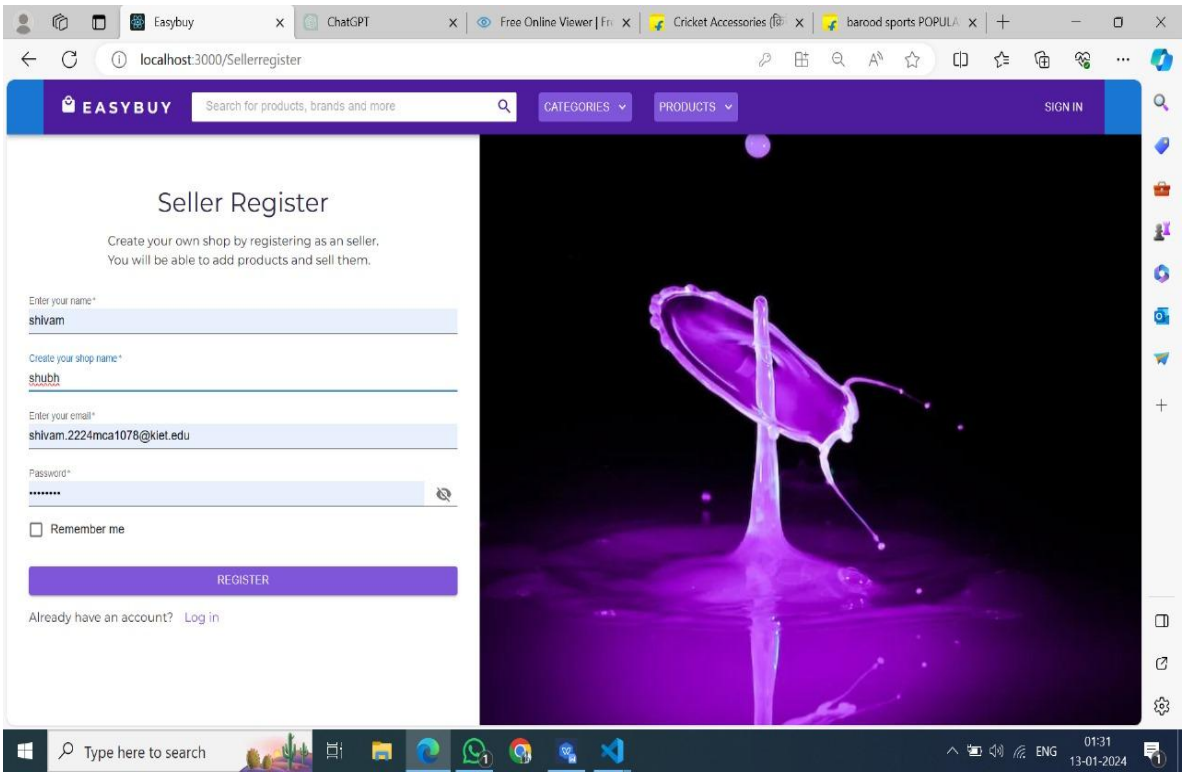

Fig 6.2: Admin Sign up

1.3 ADMIN SIGN IN

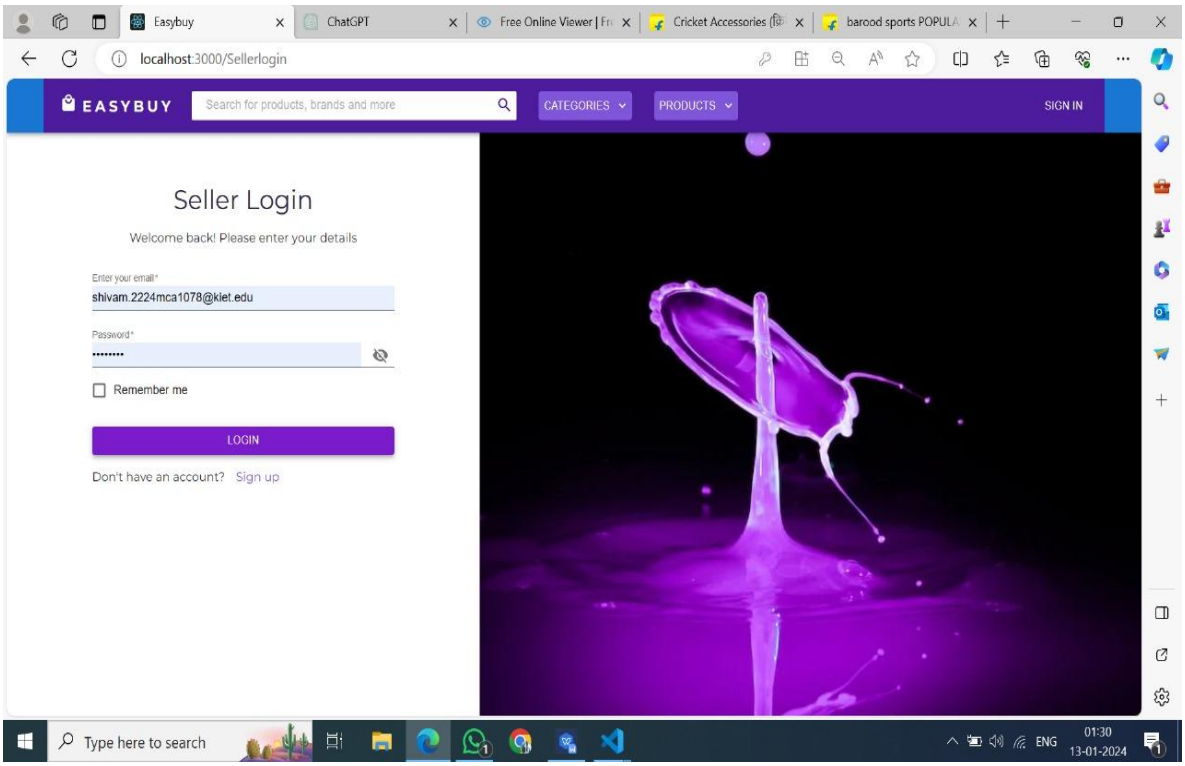

Fig 6.3: Admin Sign In

1.4 ADD PRODUCT

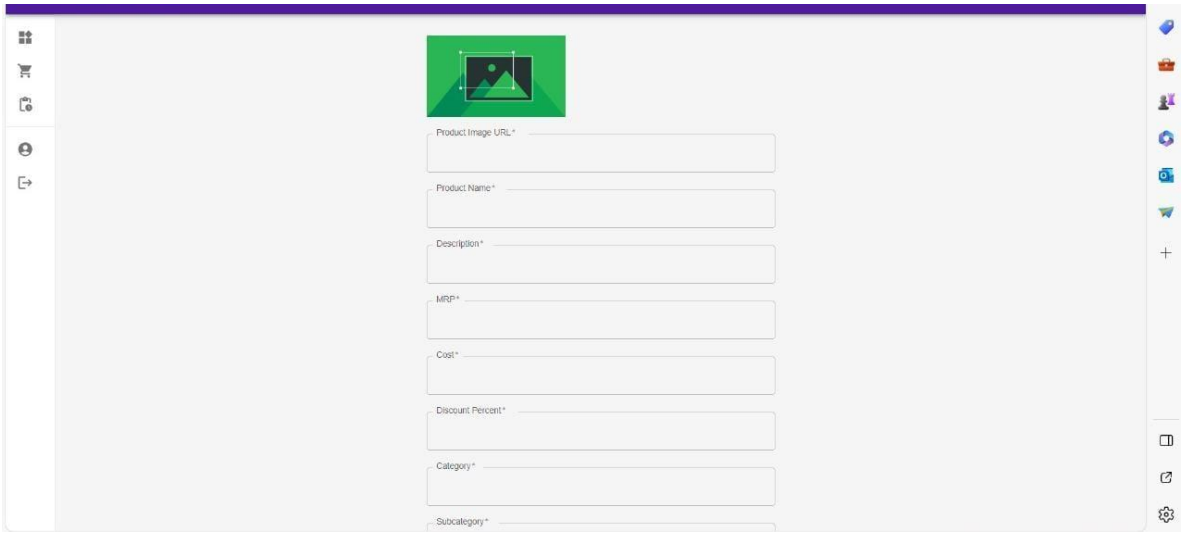

Fig 6.4: Add Product

6.5 USER REGISTER

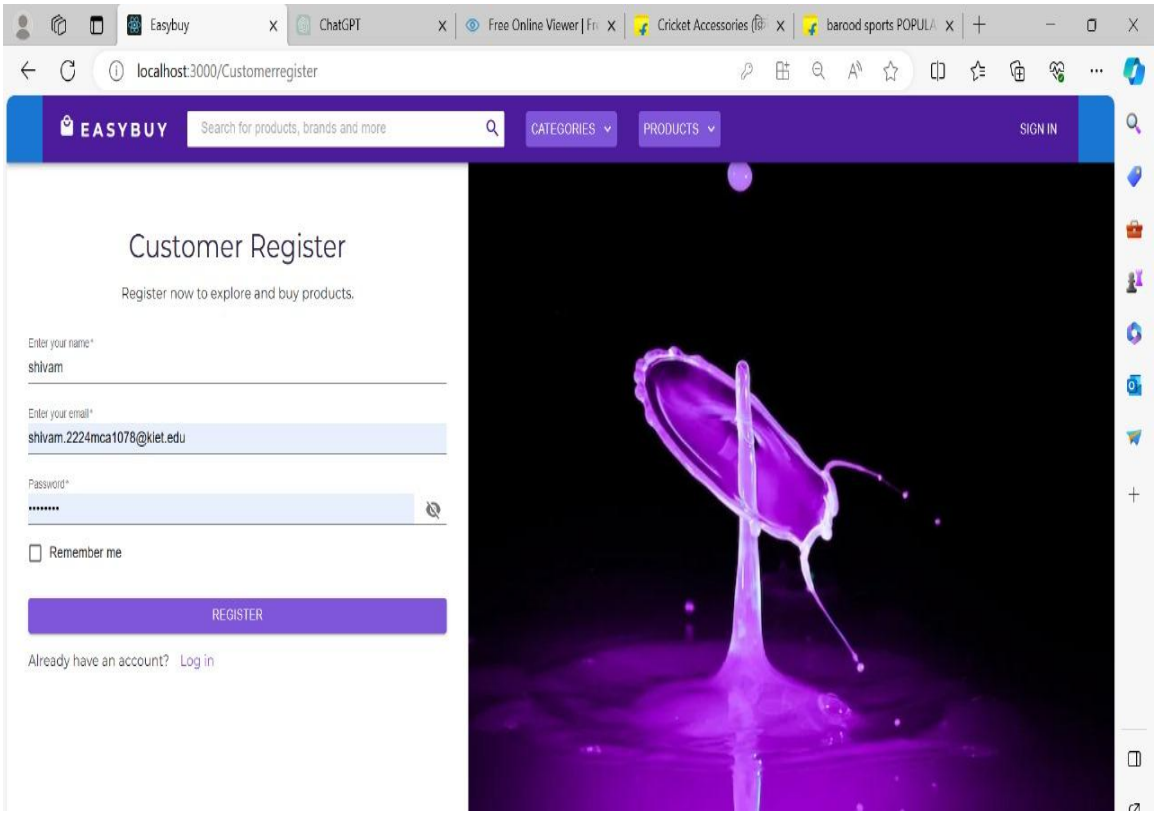

Fig 6.5: User Register

6.6 USER SIGN IN

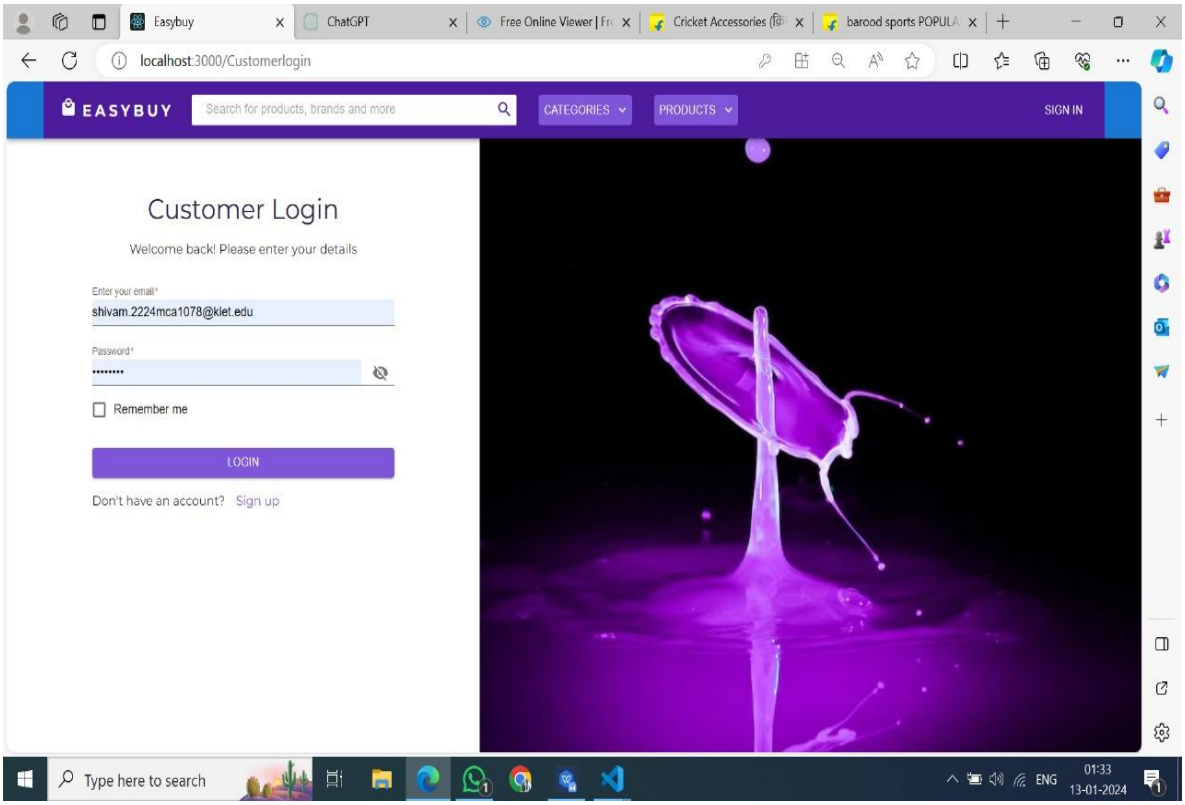

Fig 6.6: User Sign In

6.7 ADD TO CART

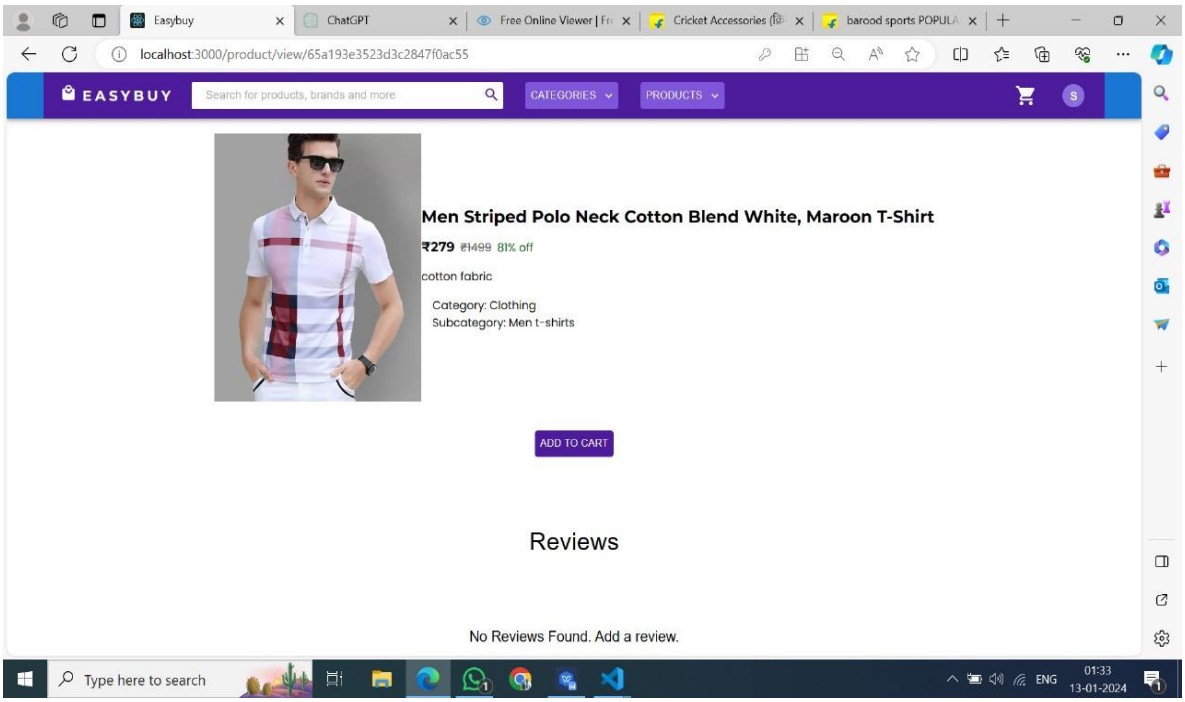

Fig 6.7: Add to cart

6.8 CHECKOUT

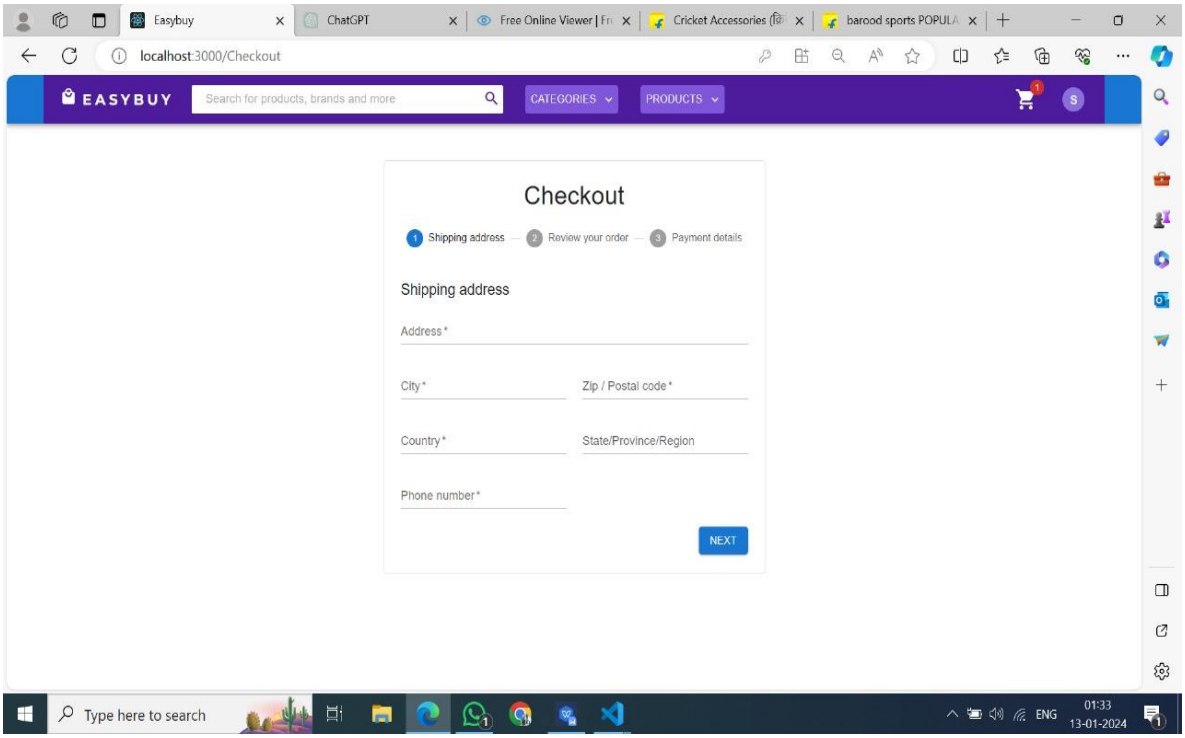

Fig 6.8: Checkout

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://vuejs.org/guide/introduction.html
- https://docs.spring.io/spring-boot/docs/current/reference/htmlsingle/
- **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 Java, Spring Boot, Vue.js, and MongoDB 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.