A Project Report On

TWISTELA

Submitted in partial fulfillment of the requirement for the award of the degree

Master of Computer Applications
(MCA)

Academic Year 2025 – 26

Astha Dadhaniya (92400584069)

Kreena Jotangiya (92400584121)

Krisha Shah (92400584182)

Internal Guide

Prof. Jaypalsinh Gohil

Rajkot-Morbi Road, At & PO : Gauridad, Rajkot 360 003. Gujarat. India

Marwadi University
Marwadi Chandarana Group

NAAC A+

Faculty of Computer Applications (FoCA)

Certificate

This is to certify that the project work entitled
Twistela
submitted in partial fulfillment of the requirement
for
the award of the degree of
Master of Computer Applications (MCA)
of the
Marwadi University
is a result of the bonafide work carried out by
Astha Dadhaniya -92400584069
Kreena Jotangiya -92400584121
Krisha Shah -92400584182
during the academic year 2025-26

Faculty Guide	HOD	Dean

DECLARATION

We hereby declare that this project work entitled Twistela is a record done by us.

We also declare that the matter embodied in this project is genuine work done by us and has not been submitted whether to Marwadi University or to any other University / Institute for the fulfillment of the requirement of any course of study.

Place:
Date:

Astha Dadhaniya	92400584069	Signature:_____
Kreena Jotangiya	92400584121	Signature:_____
Krisha Shah	92400584182	Signature:_____

ACKNOWLEDGEMENT

It is indeed a great pleasure to express our thanks and gratitude to all those who helped us. No serious and lasting achievement or success one can ever achieve without the help of friendly guidance and co-operation of so many people involved in the work.

We are very thankful to our guide **Prof. Jaypalsinh Gohil,** the person who makes us to follow the right steps during our project work. We express our deep sense of gratitude to for his /her guidance, suggestions and expertise at every stage. A part from that his/her valuable and expertise suggestion during documentation of our report indeed help us a lot.

Thanks to our friend and colleague who have been a source of inspiration and motivation that helped to us during our project work.

We are heartily thankful to the Dean of our department **Dr. R. Sridaran** sir and HoD **Dr. Sunil Bajeja** sir for giving us an opportunity to work over this project and for their end-less and great support to all other people who directly or indirectly supported and help us to fulfil our task.

Astha Dadhaniya 92400584069 Signature:_____
Kreena Jotangiya 92400584121 Signature:_____
Krisha Shah 92400584182 Signature:_____

CONTENTS

Table Index:

Figure Index:

Chapter 1

INTRODUCTION OF PROJECT DESCRIPTION

Project Title: - Twistela

Twistela is a full-featured eCommerce platform enabling users to browse, filter, and purchase products, while offering administrators control over inventory and order management. It supports browsing without login, and enforces login for actions like adding to cart or placing orders. Admins also must authenticate to manage data.

For administrators, the platform ensures role-based access control, enabling only authenticated users to manage inventory, update product details, and handle customer orders. Twistela supports essential eCommerce functionalities such as product categorization, shopping cart, secure checkout, and order tracking. Furthermore, it integrates multiple payment options to improve customer convenience.

The platform leverages modern web technologies for scalability, responsiveness, and security. By digitalizing crochet product sales, Twistela provides value to both customers (through convenience and accessibility) and sellers (through efficient management and data-driven insights).

Chapter 2

PREAMBLE

E-Commerce has revolutionized modern shopping by making it faster and easier to access products. Twistela aims to offer a seamless online shopping experience using scalable full-stack technology. It bridges the gap between user satisfaction and admin efficiency, blending product browsing, secure checkout, and real-time inventory management.

2.1 Module Description

Client/User Module

Users can access and browse products without logging in.
Features include viewing product details, filtering by category and price.
Authentication is required to:
Add products to the cart.
Place an order.
View and manage order history.
Update delivery address.
After login, users can:
Manage their profile.
Track placed orders.
Access personalized features (e.g., saved address, cart).

Admin Module

Admins can access the site interface without logging in.
Authentication is required to access admin functionalities.
After login, admins can:
Add, edit, and delete product categories.
Perform CRUD operations on product listings.
View and manage all user orders.
Access a secure dashboard to monitor system activity and inventory.

Chapter 3

REVIEW OF LITERATURE

Similar Systems Analyzed:

We analyzed websites like Mindori and Enchanted threads, which specifically sells crochet products, we found they had simple website, which made it easy for customers to find the products they needed, however they do not have an admin side, as they owned a brand.

Major Findings

User experience must support unauthenticated browsing.
Admin portals must offer strong CRUD and access control.
Cart and checkout actions should always require authentication.
Product filtering and real-time updates enhance user engagement.

Chapter 4

TECHNICAL DESCRIPTION

4.1 Hardware Requirement

Processor	Intel i3
RAM	8 GB
Hard Disk	Minimum 250 GB

Table 4.1 Hardware Requirement

4.2 Software Requirement

Operating System	Windows
Database	MongoDB + Mongoose
Frontend	React.js, Bootstrap/CSS
Backend	Node.js, Express.js
Authentication	JWT
Code Editor	VS Code

Table 4.2 Software Requirement

Chapter 5

SYSTEM DESIGN AND DEVELOPMENT

Algorithm

Step 1Start

Step 2Display Home Page with product listings and categories

Step 3IF User is not logged in THEN
Allow browsing, product viewing, and filter usage.
IF user clicks "Add to Cart" or "Place Order" THEN
Redirect to Login/Register.
On success, continue.

Step 4IF User is logged in THEN
Allow full access to:
Add to Cart
View/Update Profile
Place Orders
View Order History

Step 5On Checkout
User selects address and payment option.
System stores order data in database.
Display confirmation.

Step 6IF Admin is not logged in THEN
Allow viewing the site.
IF trying to manage product/order data THEN
Redirect to Admin Login.

Step 7IF Admin logs in THEN
Display Admin Dashboard.
Allow:
Add/Edit/Delete Product
Add/Edit/Delete Categories
View All Orders

Step 8Ensure all protected routes are secure with token-based authentication (JWT)

Step 9Maintain session state using Context API for Cart & Auth

Step 10Allow Logout from both user and admin

Step 11End

FlowChart

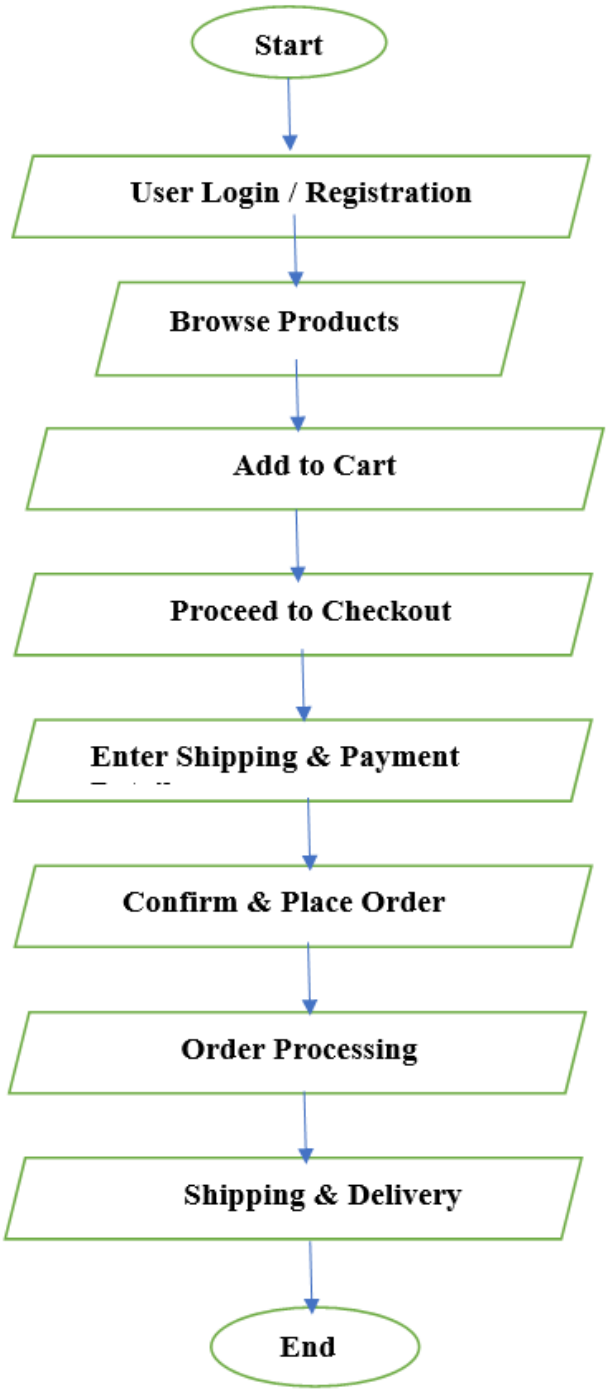

Figure 5.1 FlowChart

DFD

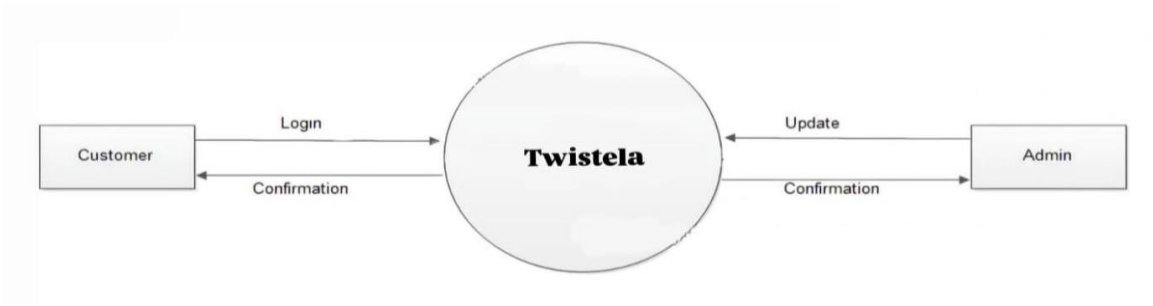

Figure 5.2 DFD(0 LEVEL)

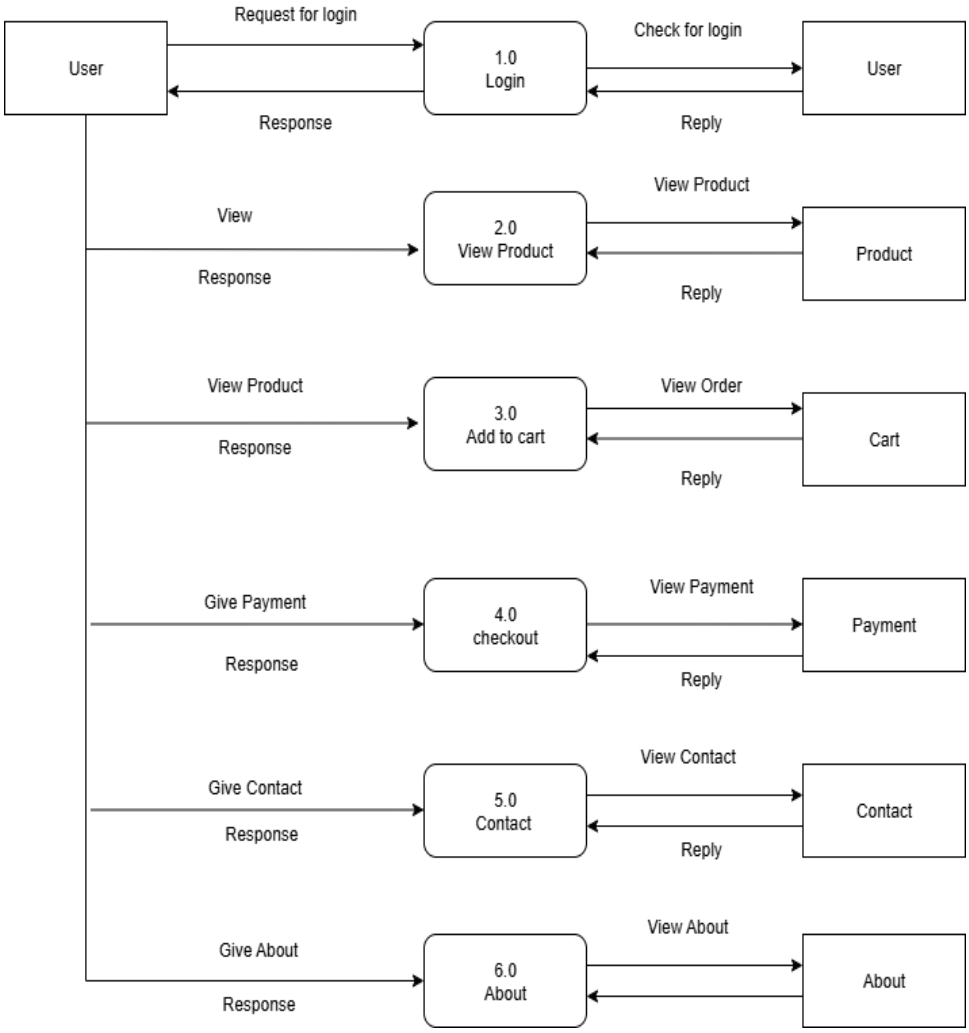

Figure 5.3 DFD (1 LEVEL)

Class Diagram

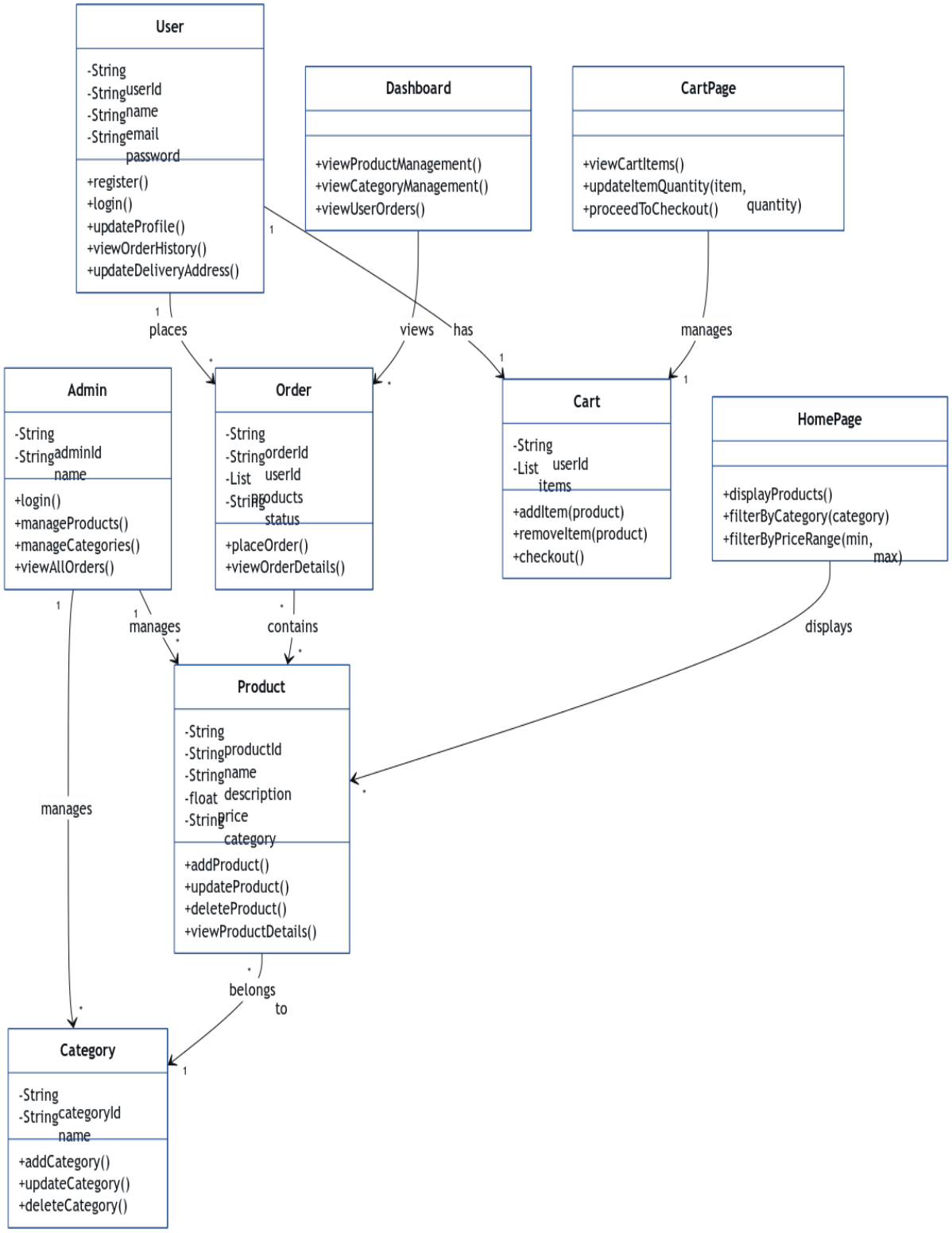

Figure 5.4 Class Diagram

UseCase Diagram

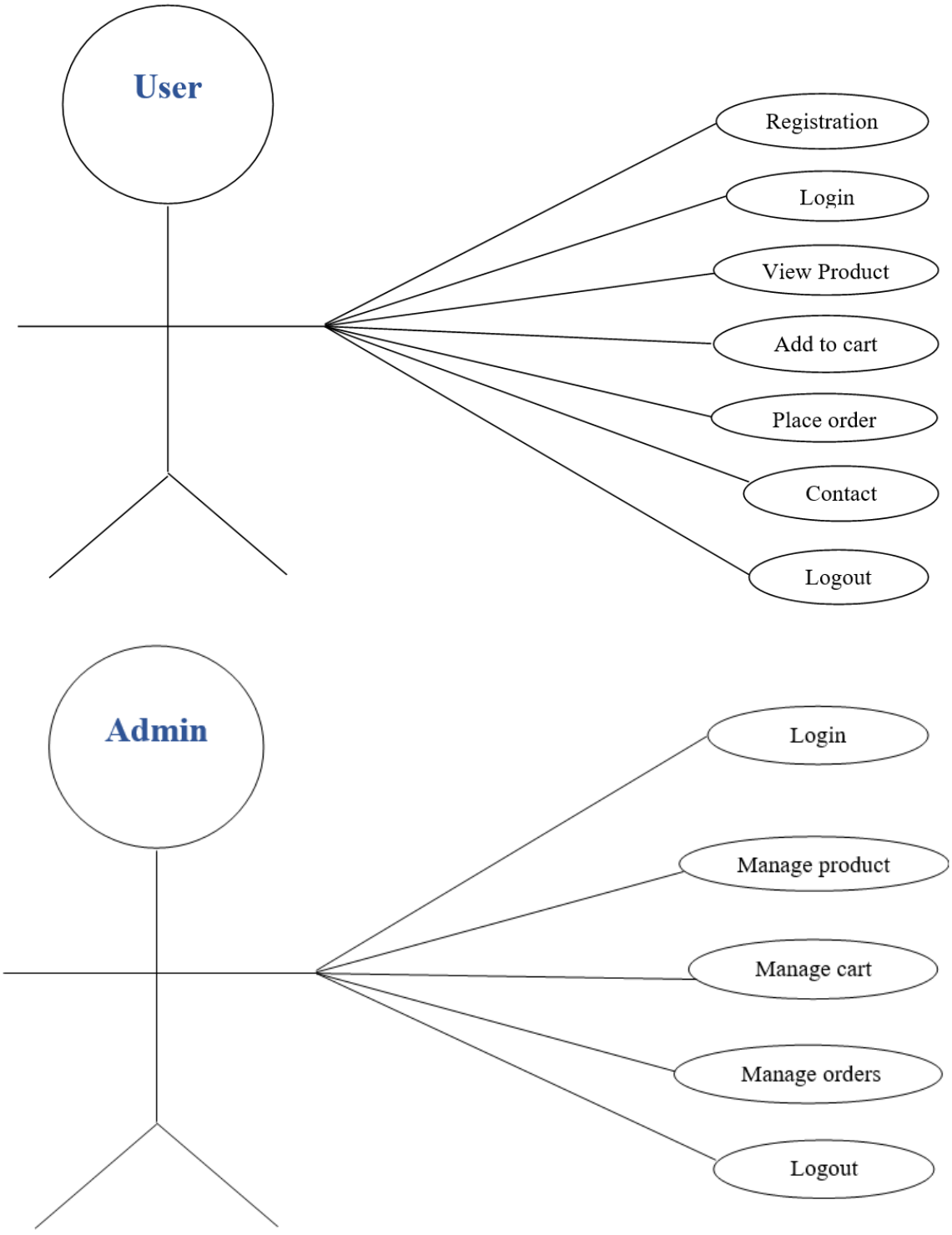

Figure5.5 UseCase Diagram

Sequence Diagram

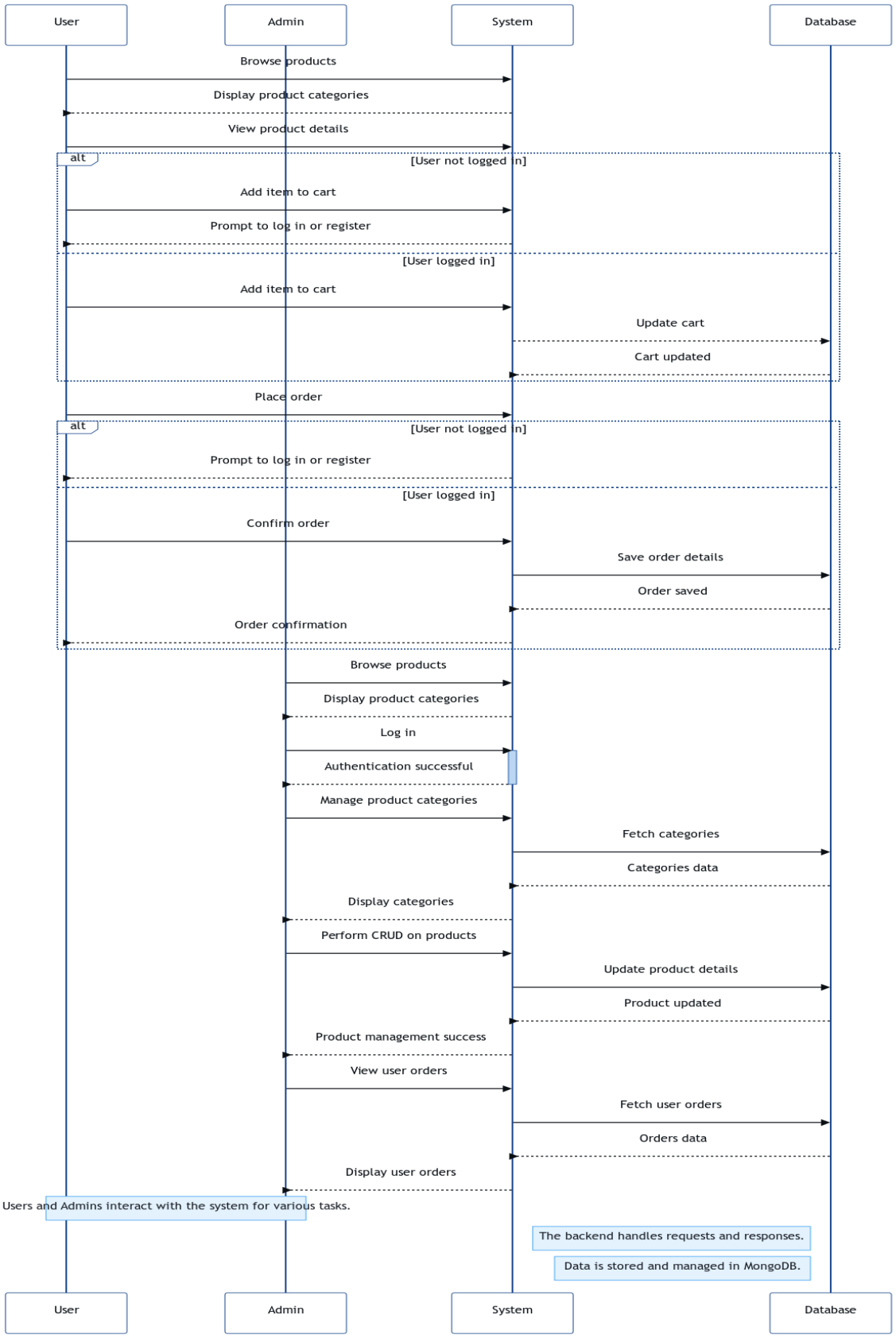

Figure 5.6 Sequence Diagram

Activity Diagram

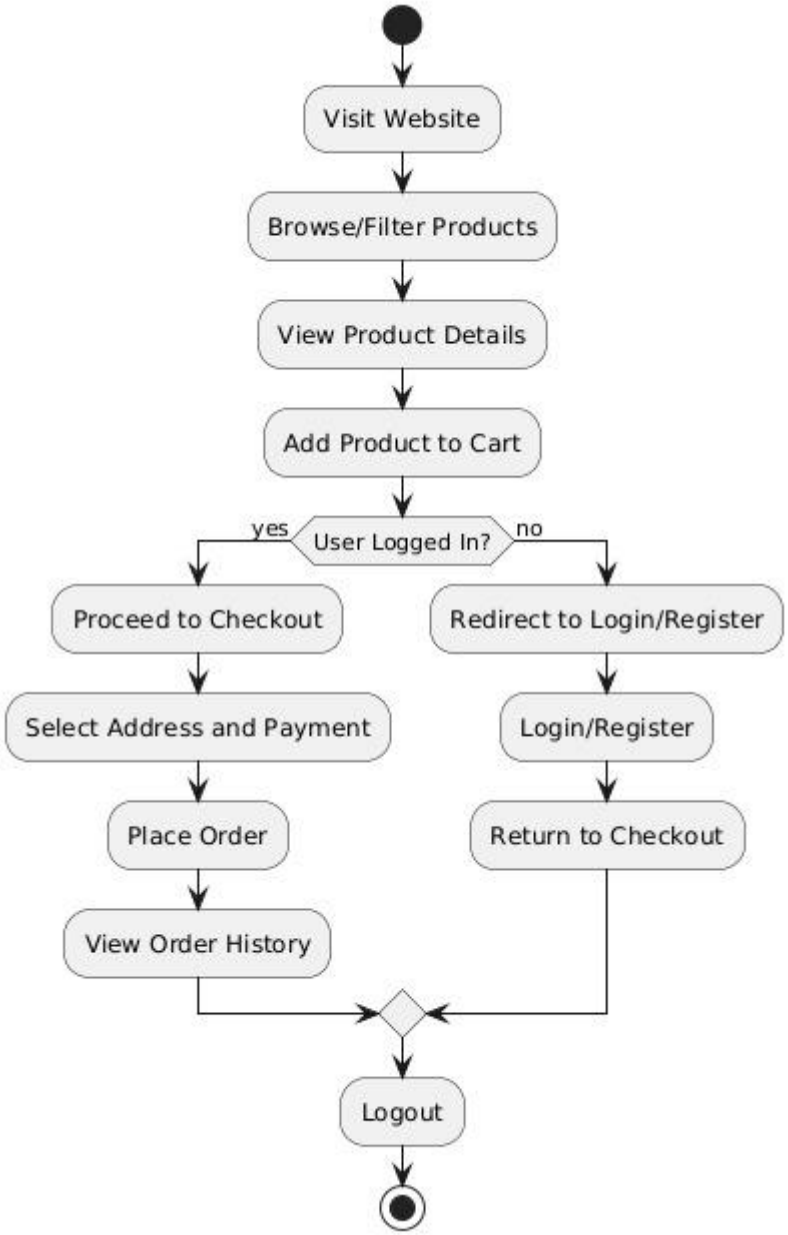

Figure 5.7 Activity Diagram (User)

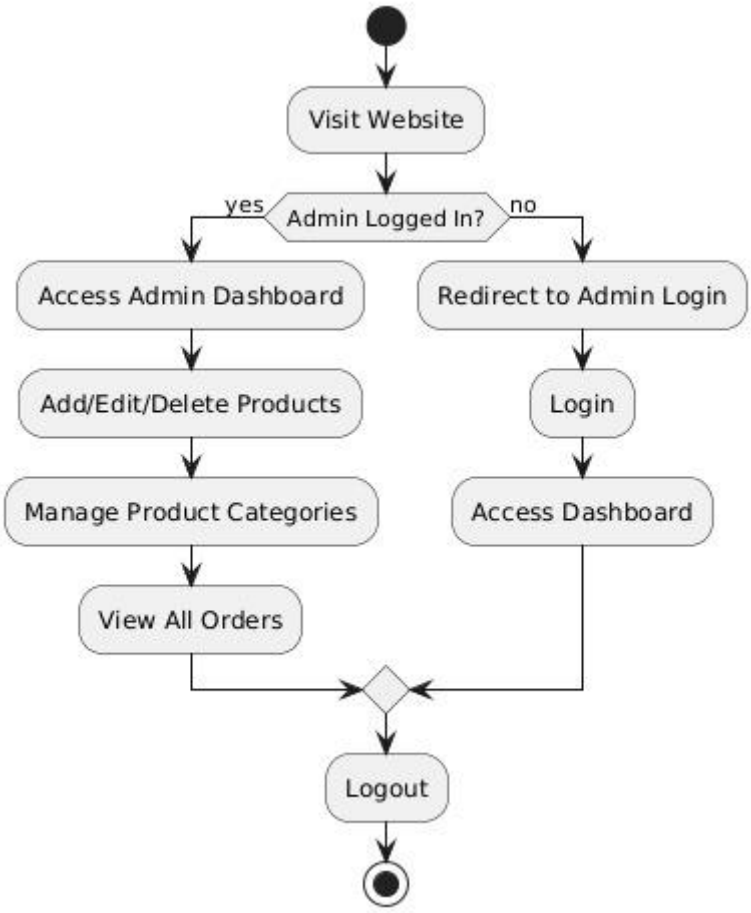

Figure 5.8 Activity Diagram (Admin)

State Diagram

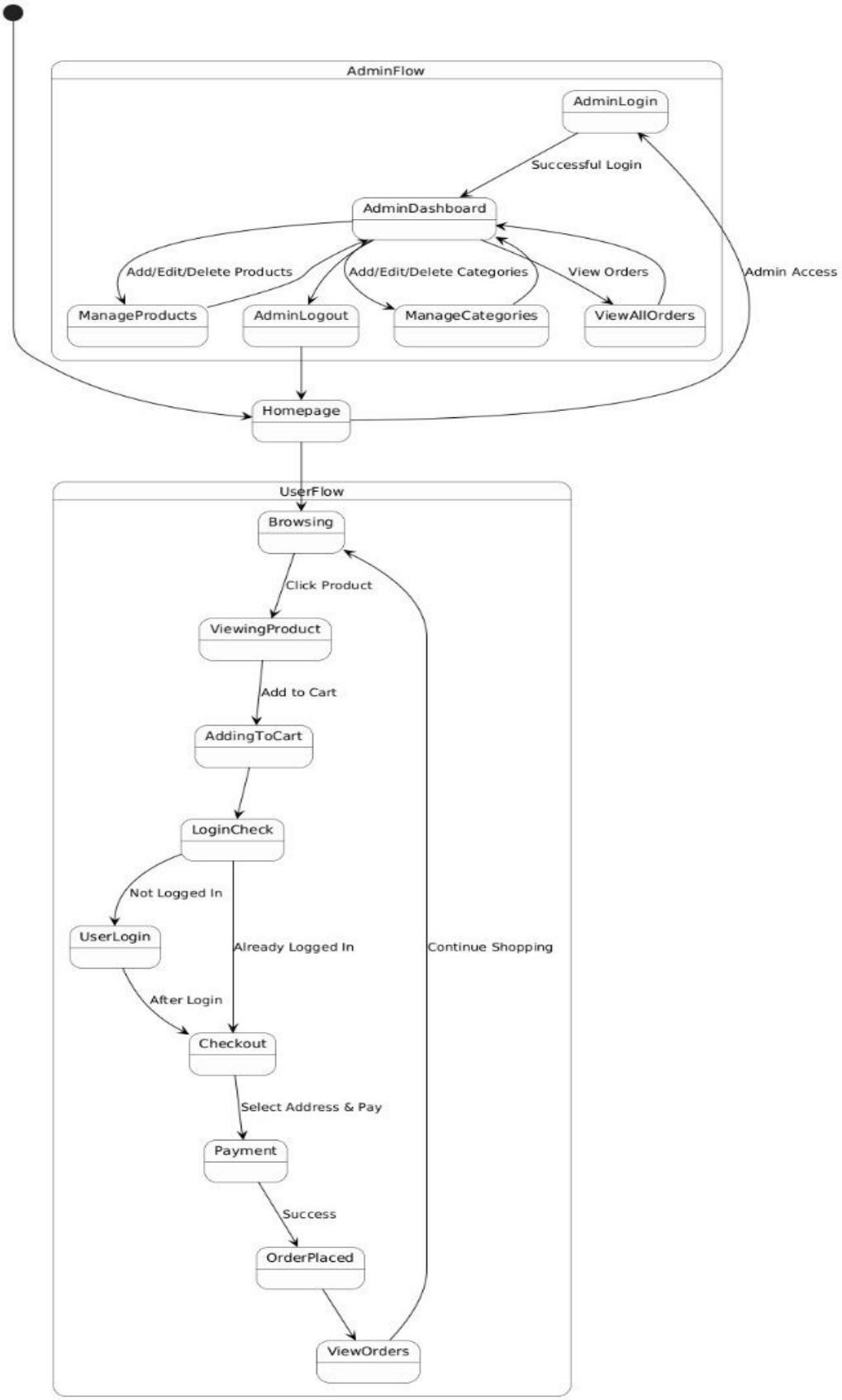

Figure 5.9 State Diagram

5.9 Database Design / File Structure

Collections:
users
products
orders
categories

Backend Folder Structure:

/controllers
/models
/routes
/config
/middleware

Frontend Folder Structure:

/components
/pages
/context

Database Design

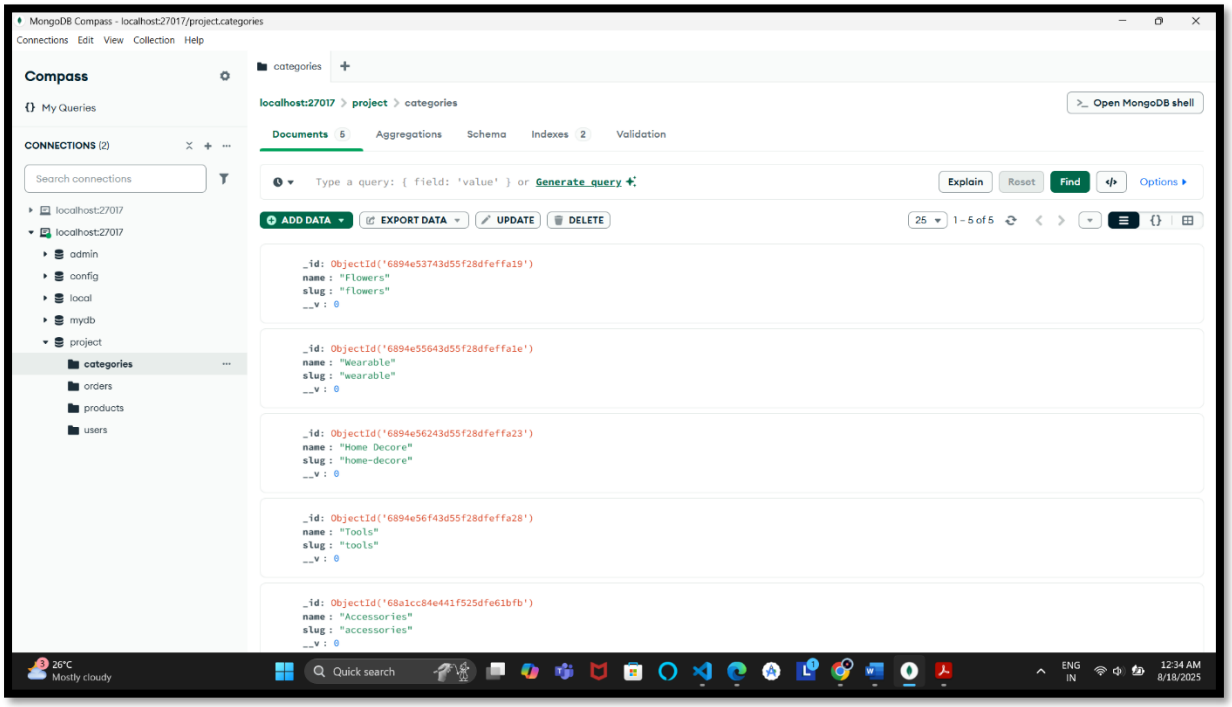

Figure 5.10 Categories Data

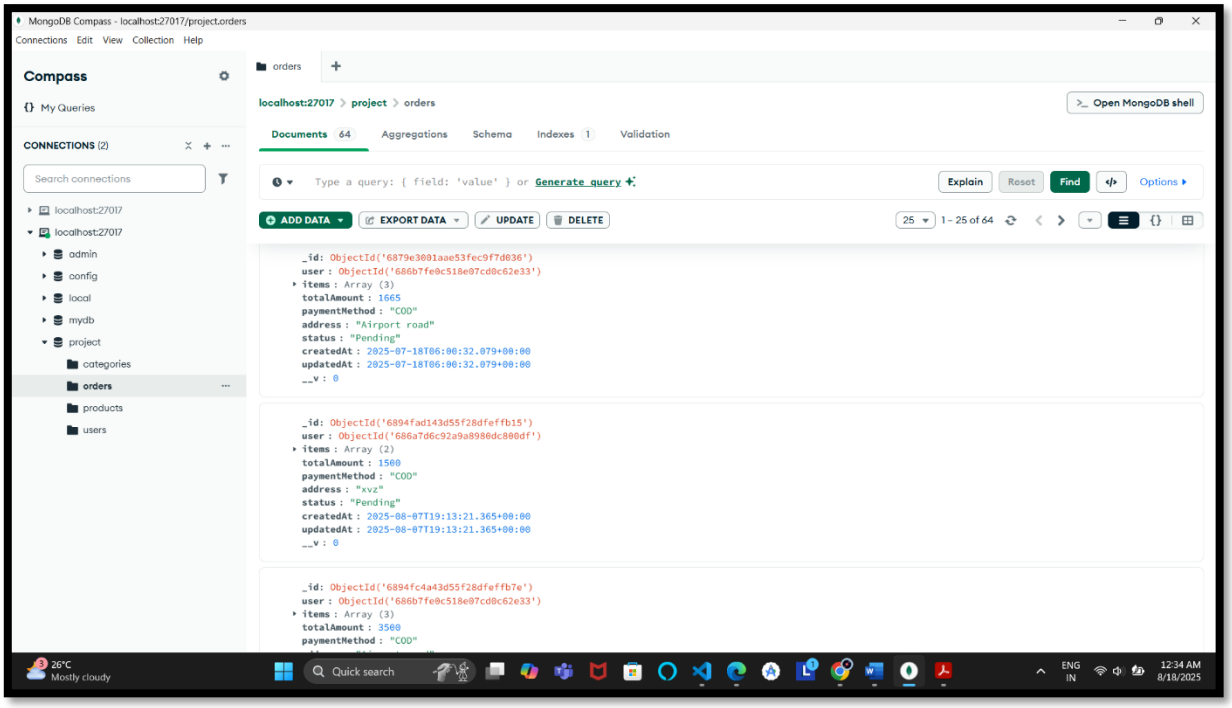

Figure 5.11 Orders Data

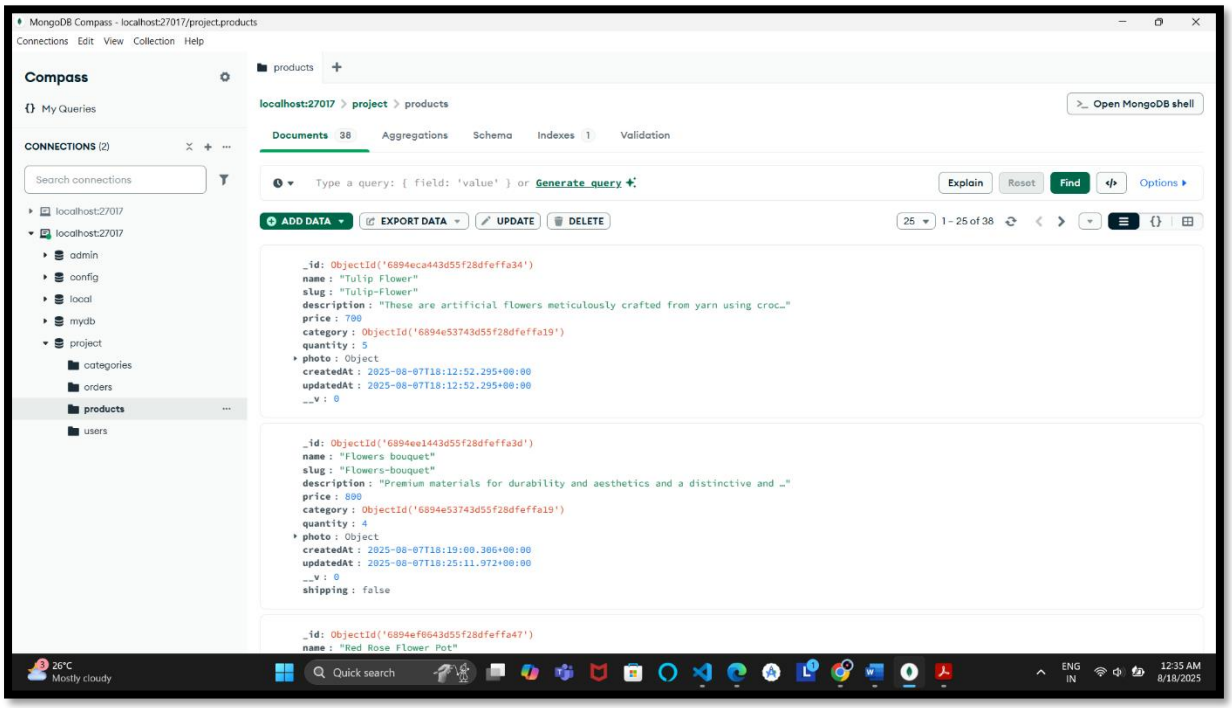

Figure 5.12 Products Data

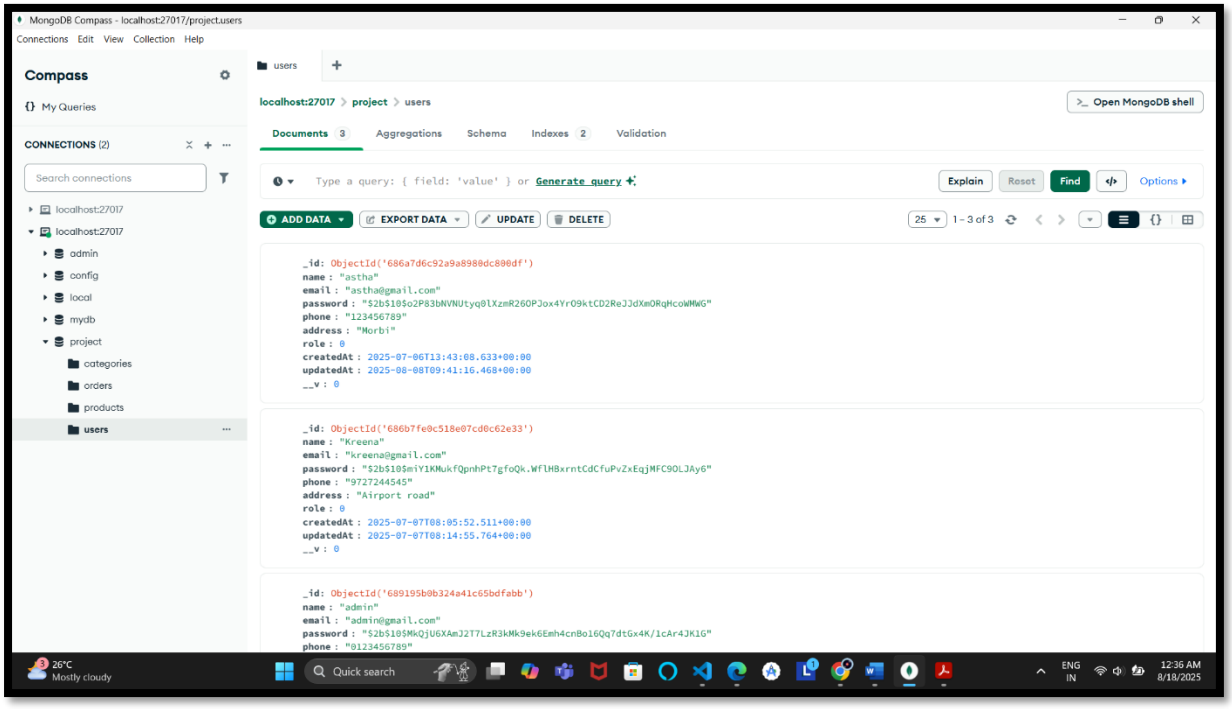

Figure 5.13 Users Data

Screen Design

Figure 5.14 Home Page

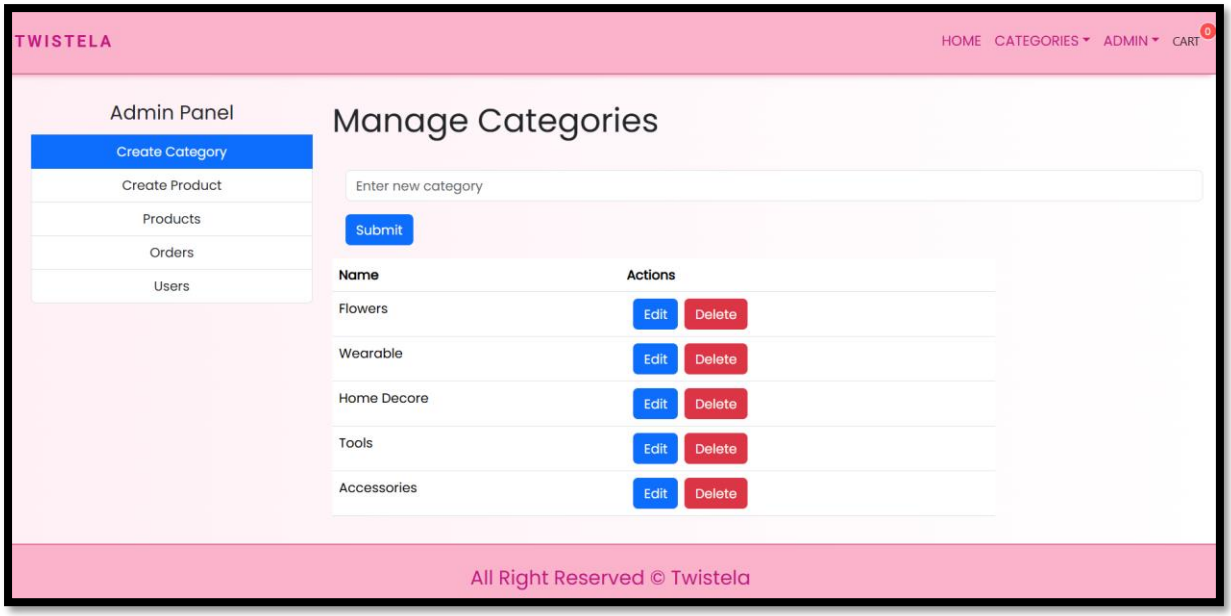

Figure 5.15 Admin Page

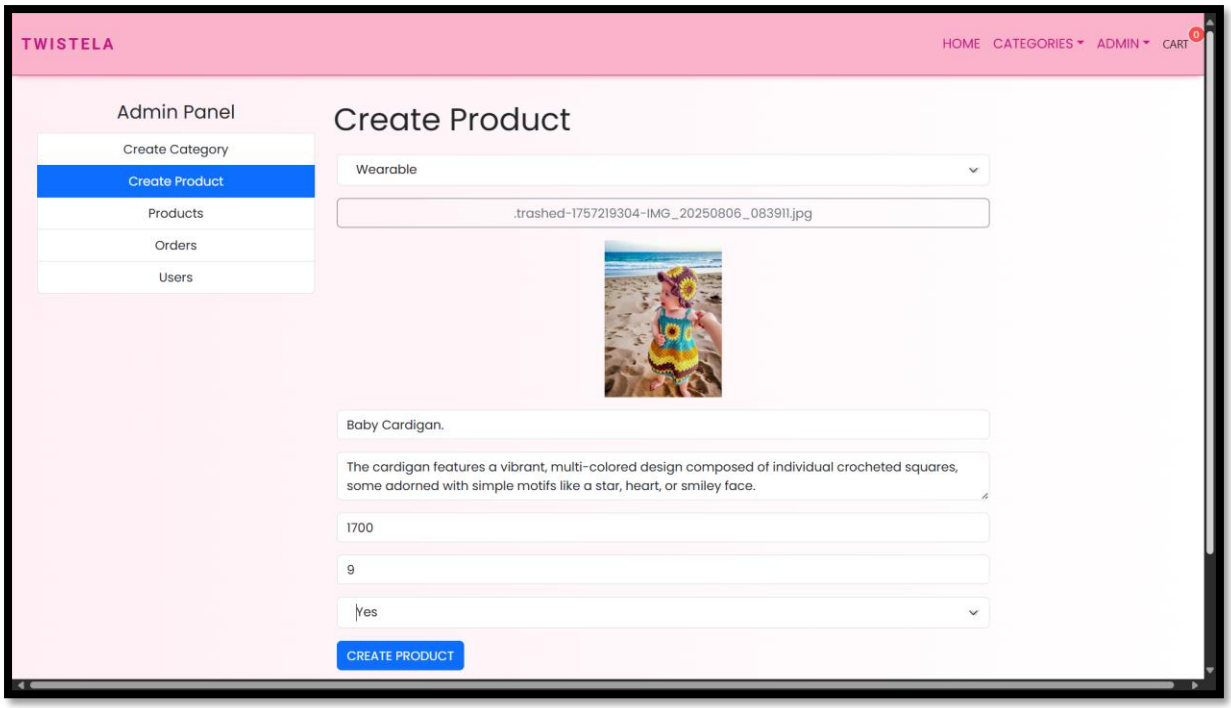

Figure 5.16 Add Product

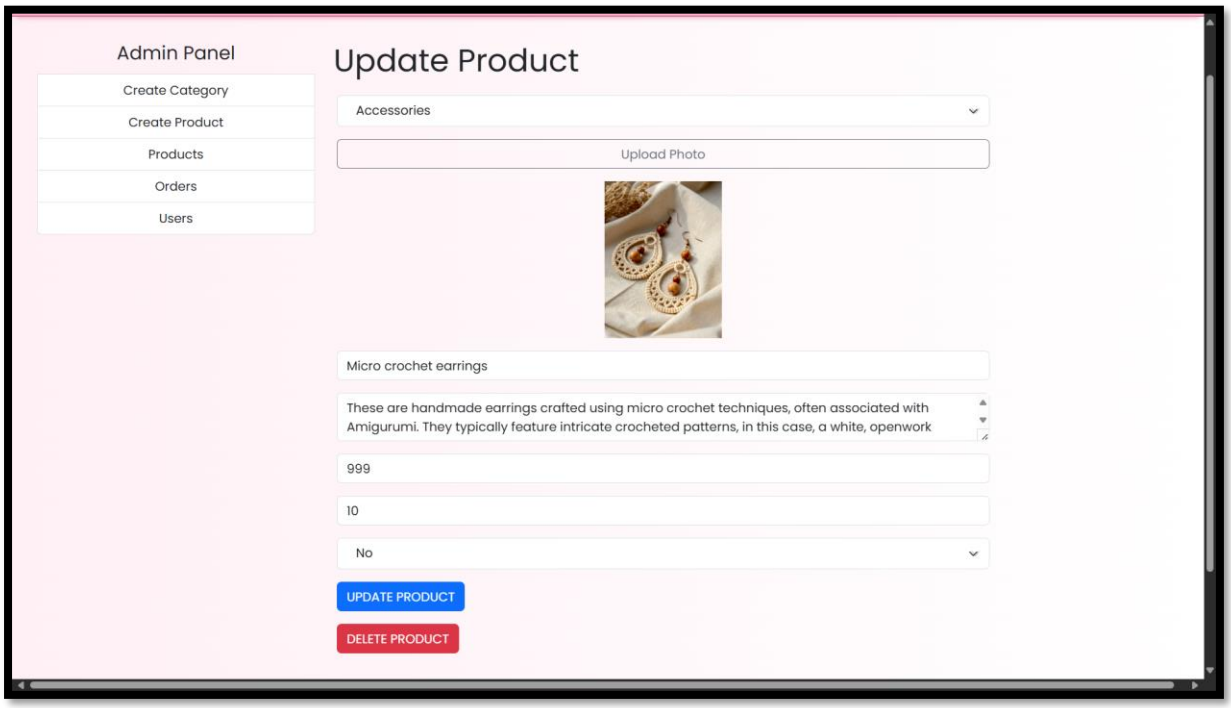

Figure 5.17 Update Product

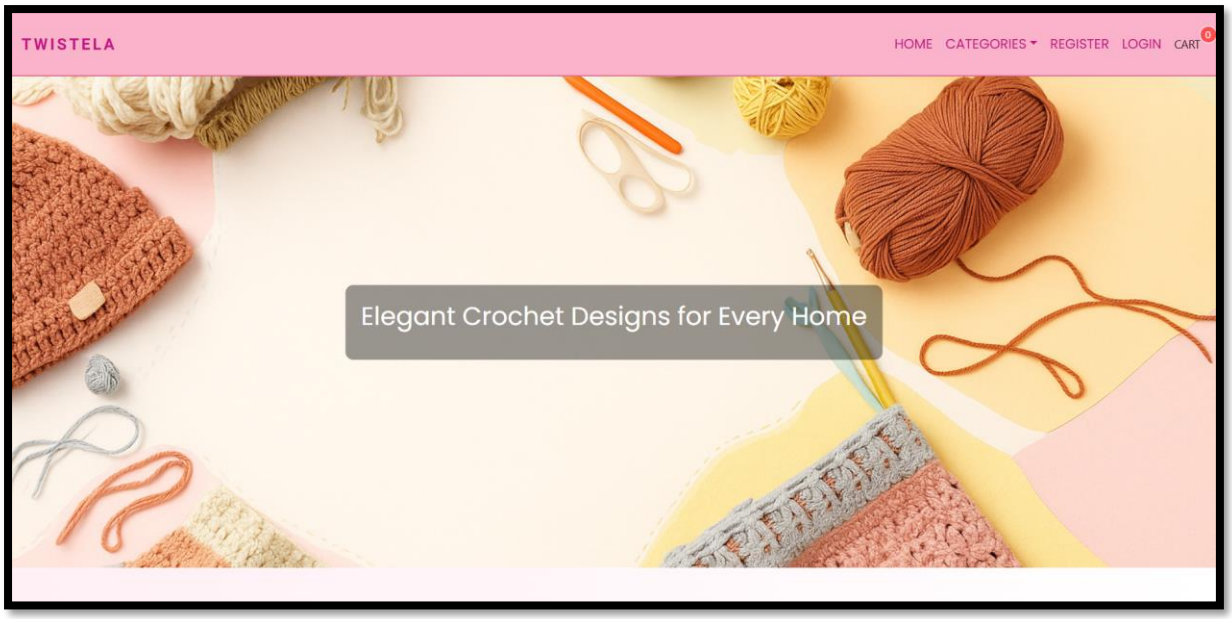

Figure 5.18 Banner Design

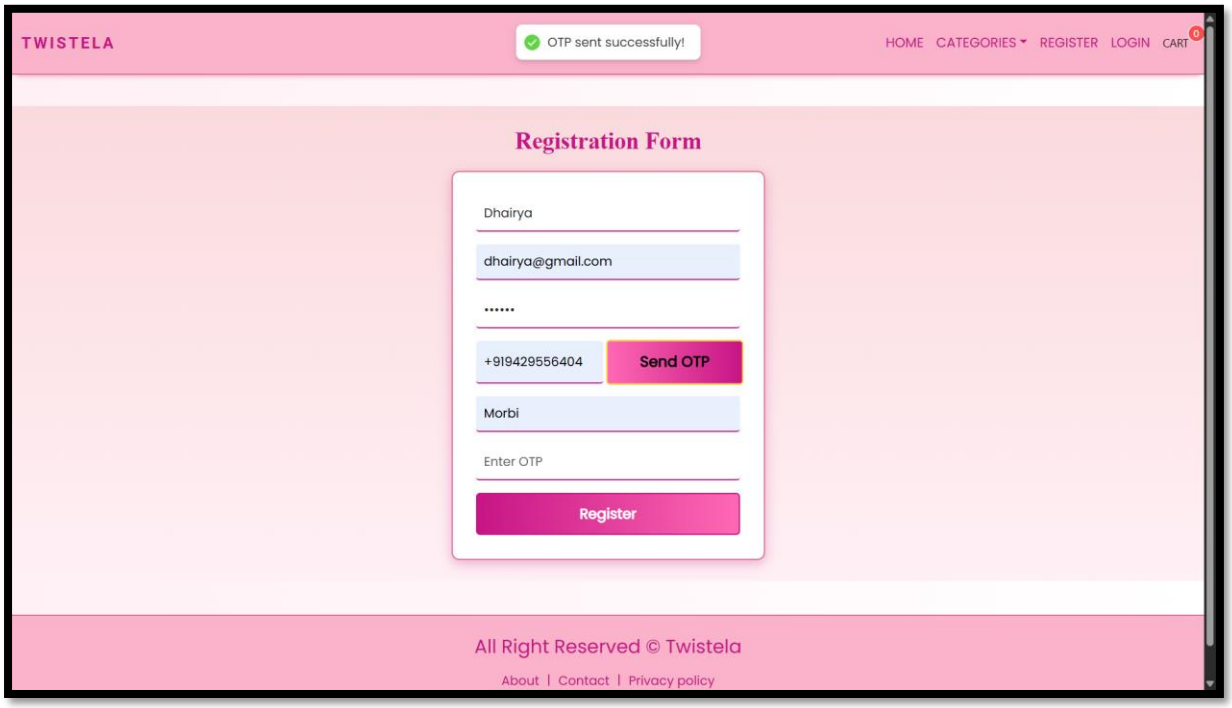

Figure 5.19 User Registration

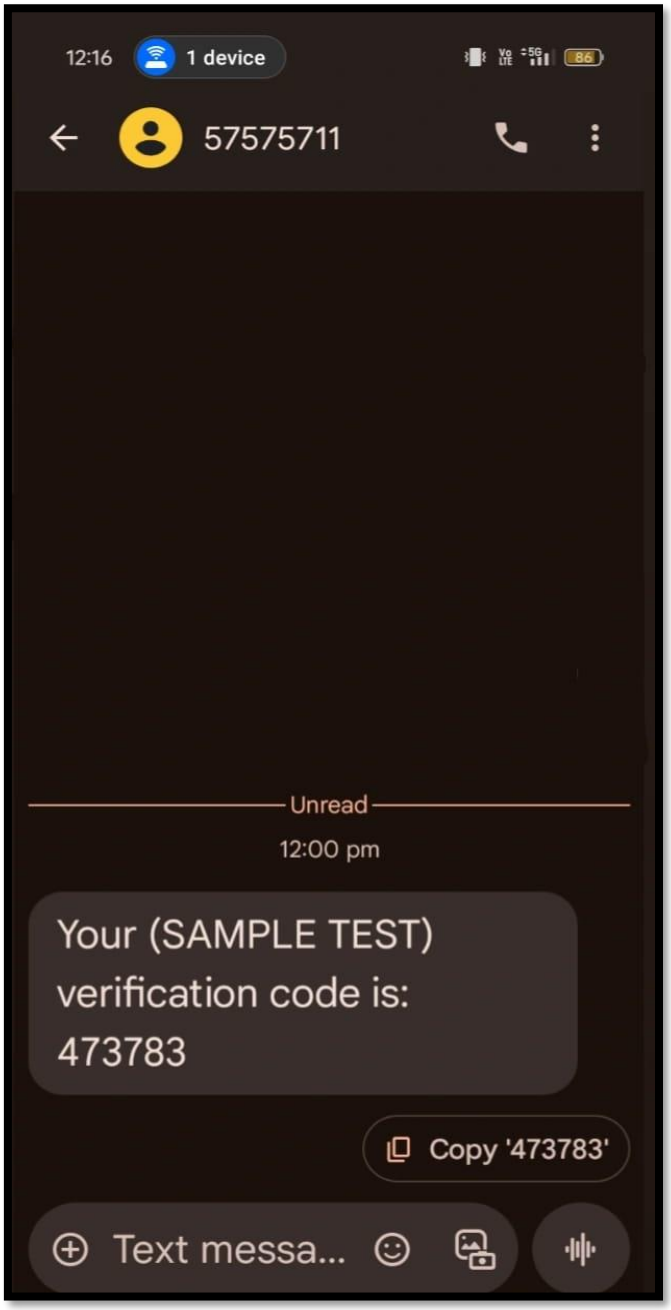

Figure 5.20 SMS on Registered Mobile Number

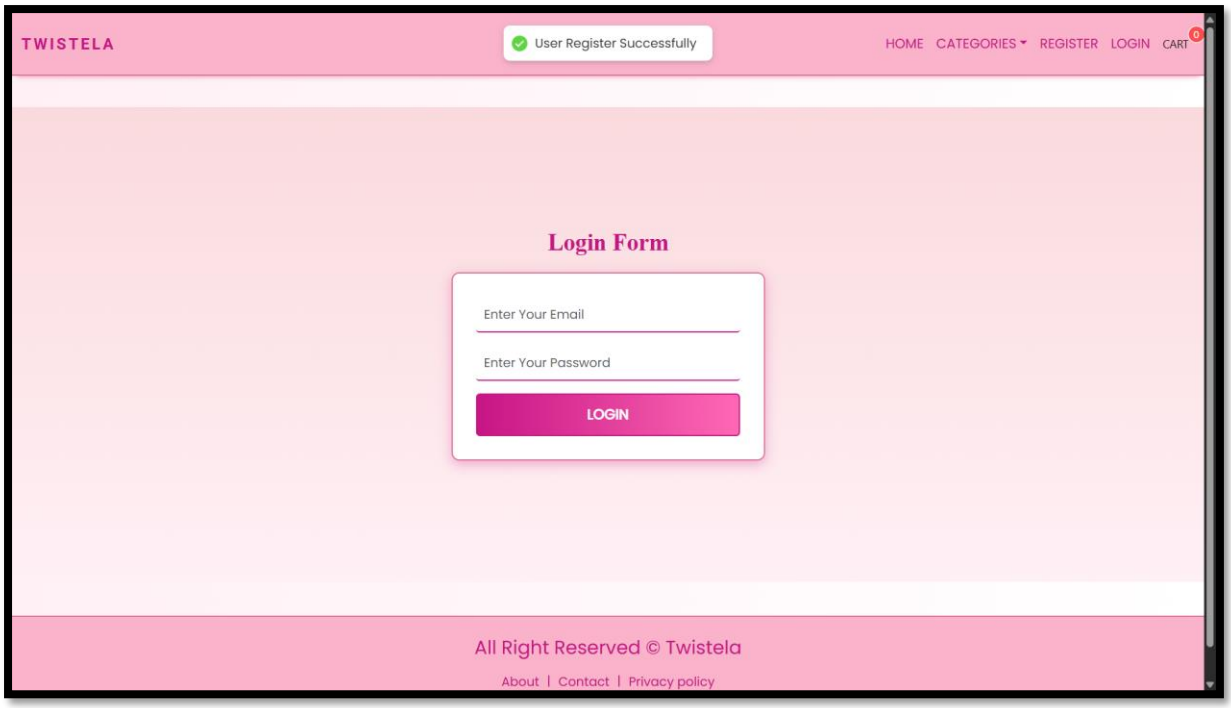

Figure 5.21 Login Page

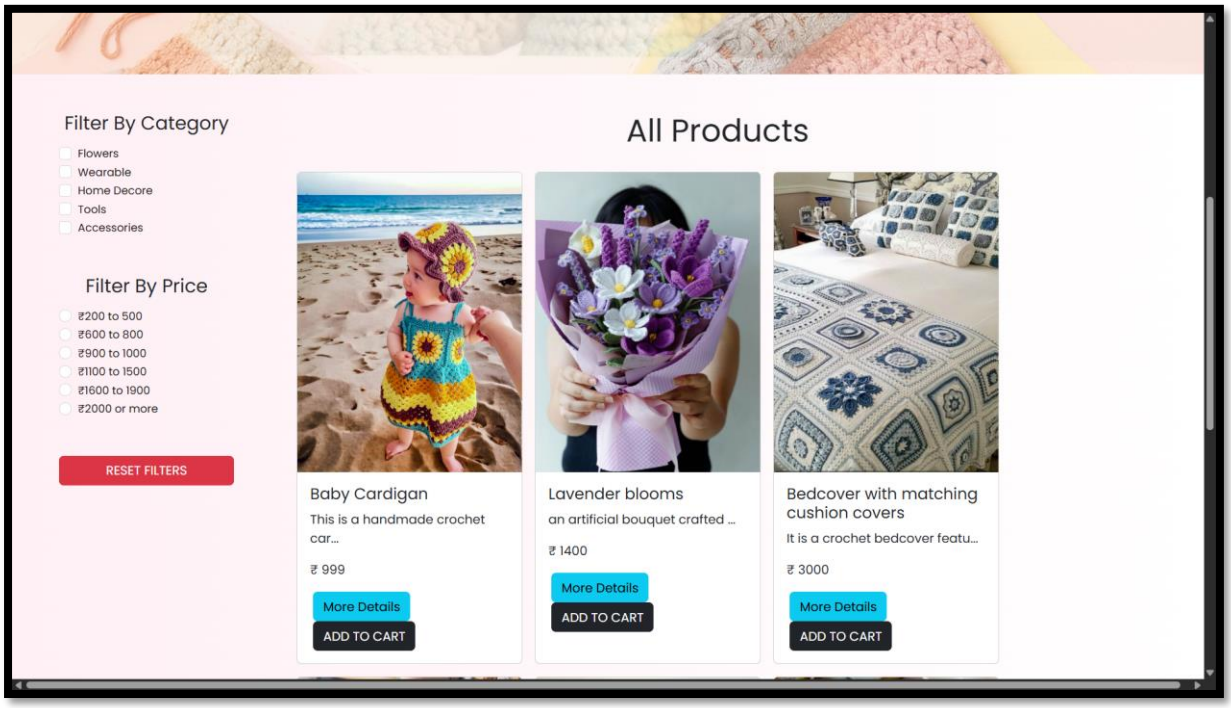

Figure 5.22 All Products Page

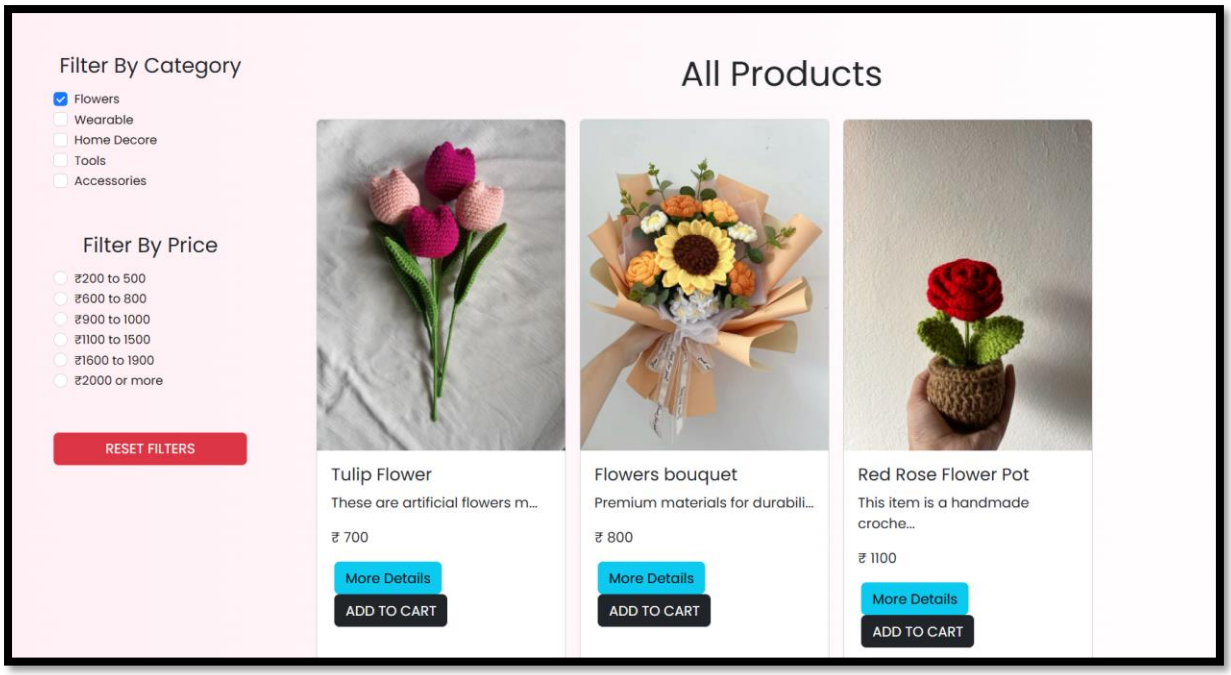

Figure 5.23 Filter by Price

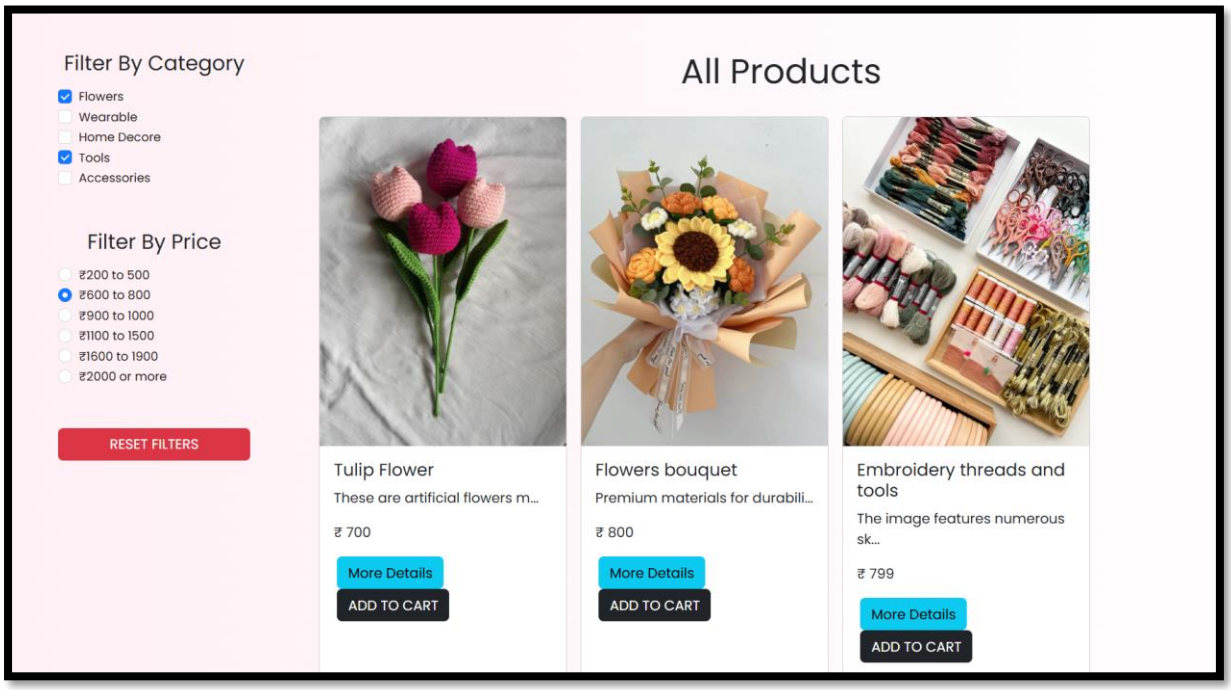

Figure 5.24 Filter by Price & Category

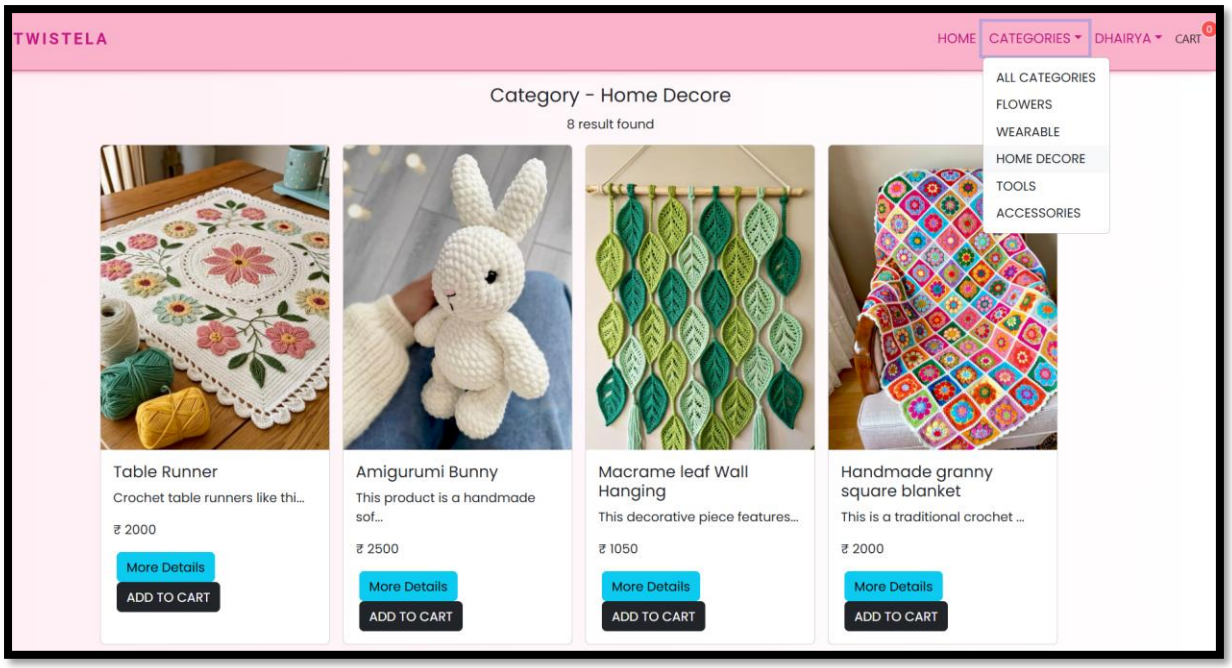

Figure 5.25 All Categories

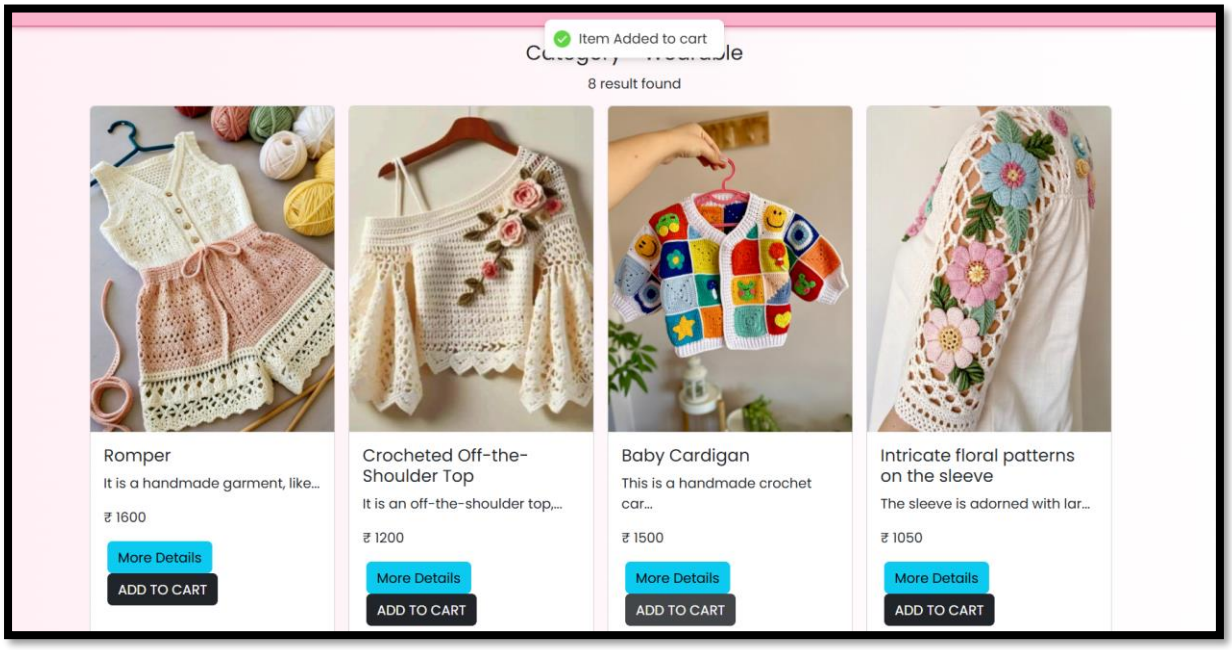

Figure 5.26 Add to Cart Page

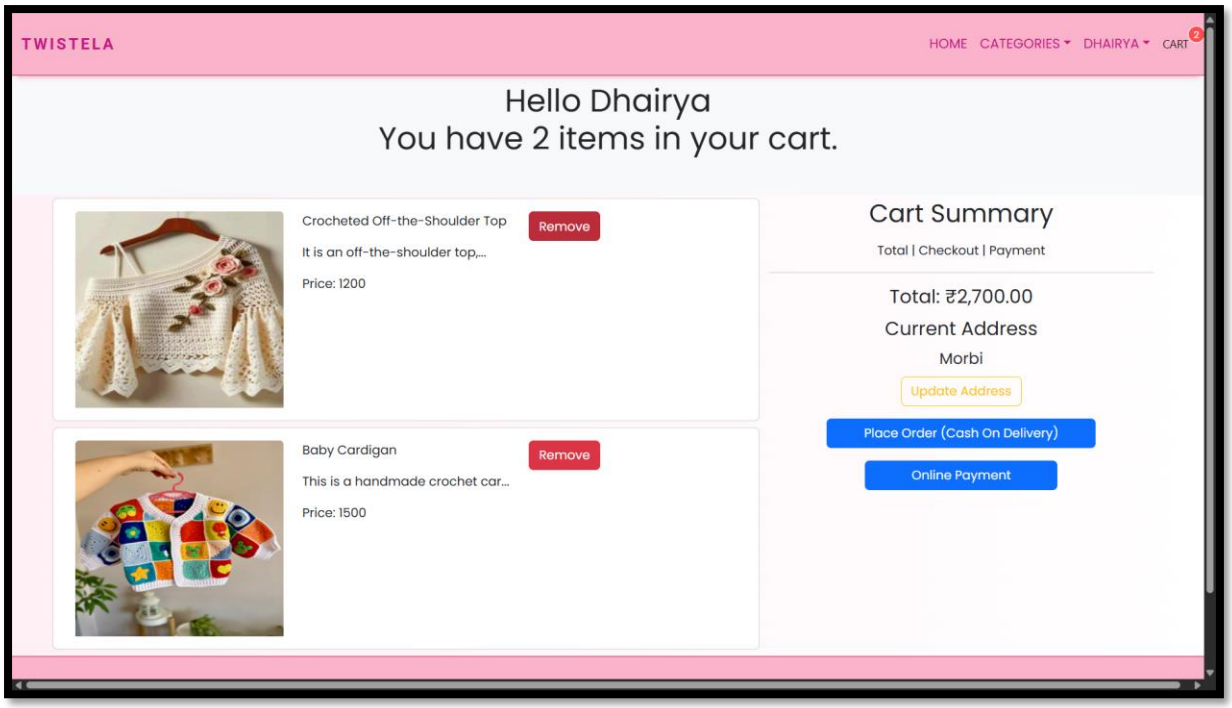

Figure 5.27 Cart Summary Page

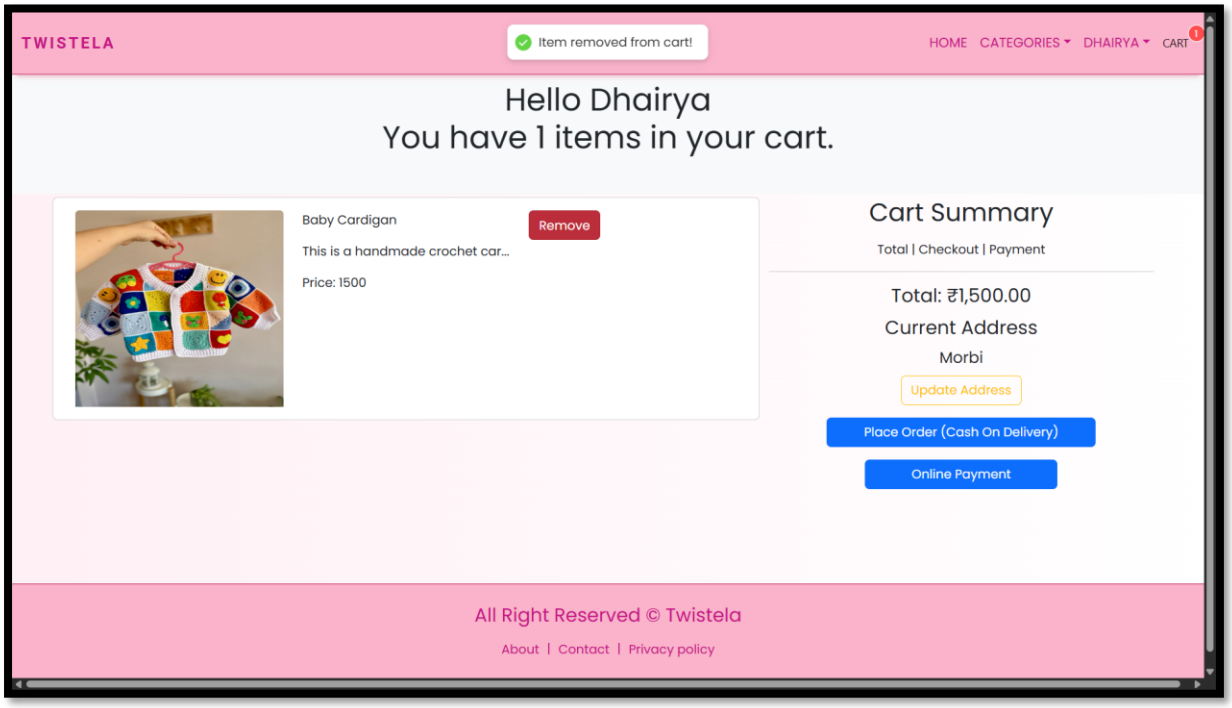

Figure 5.28 Item remove from Cart

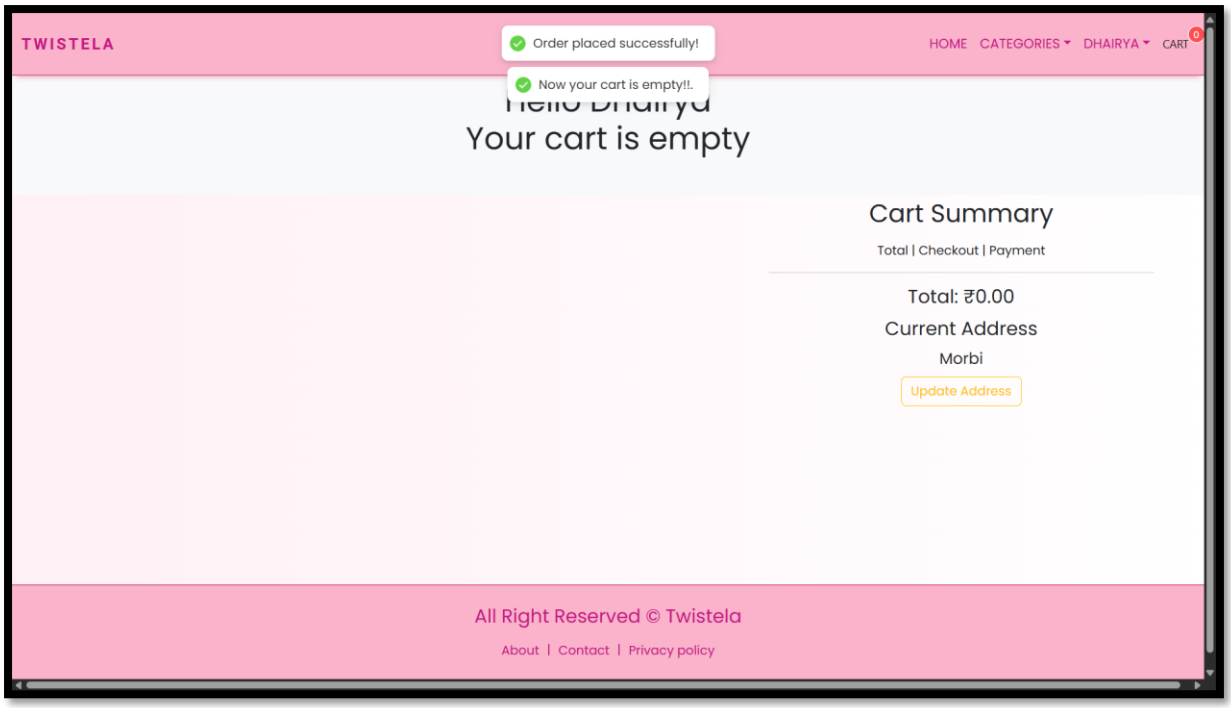

Figure 5.29 Order placed successfully using COD

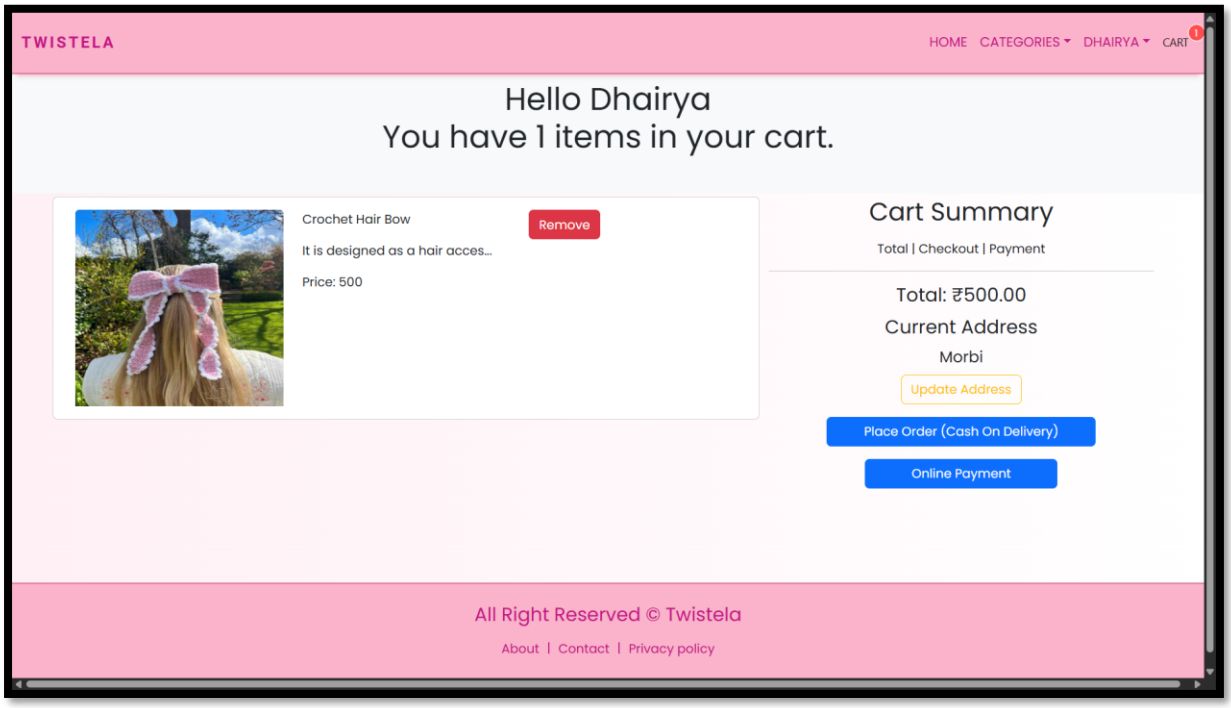

Figure 5.30 Payment using online method (QR)

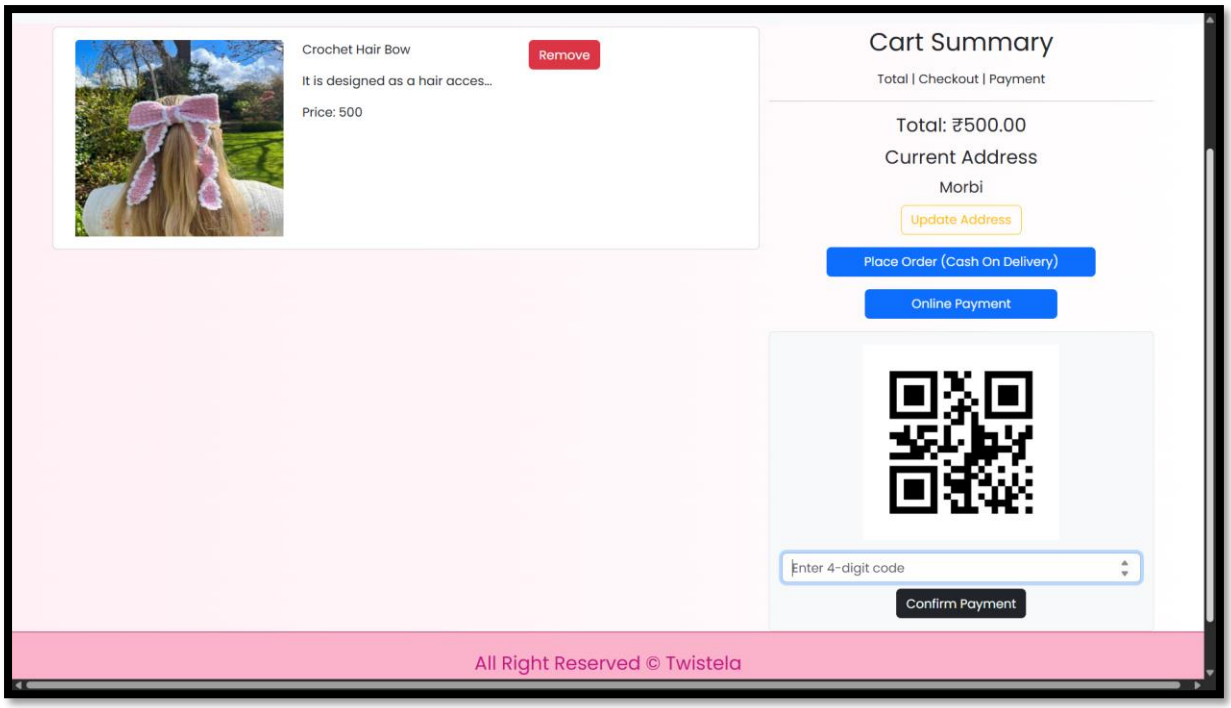

Figure 5.31 After scanning enter displayed 4 digit number

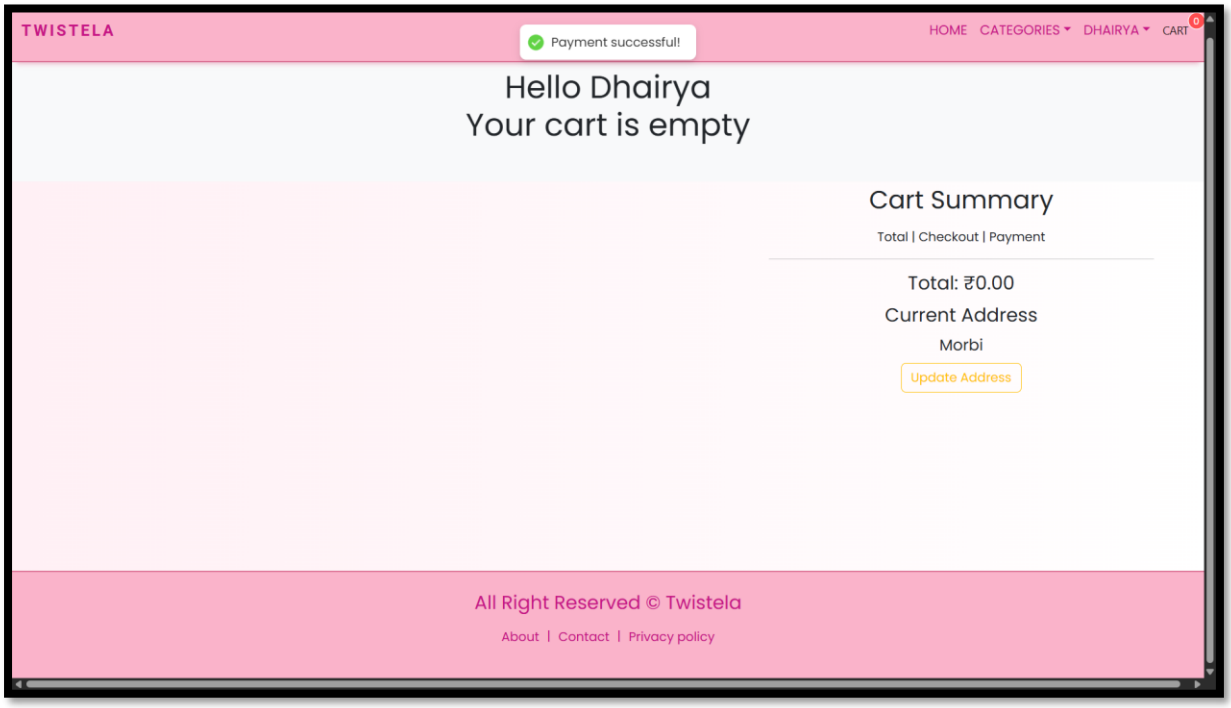

Figure 5.32 Payment Successful

Code of the module

Register.js

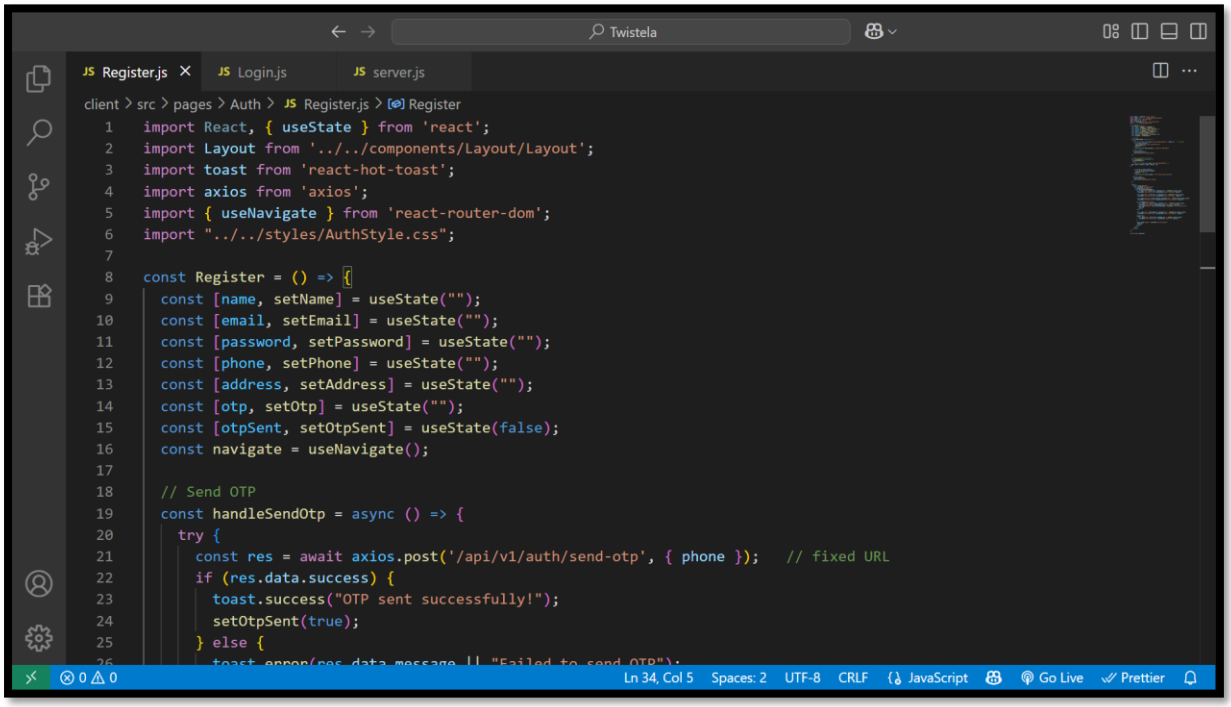

Figure 5.33 Register.js

Login.js

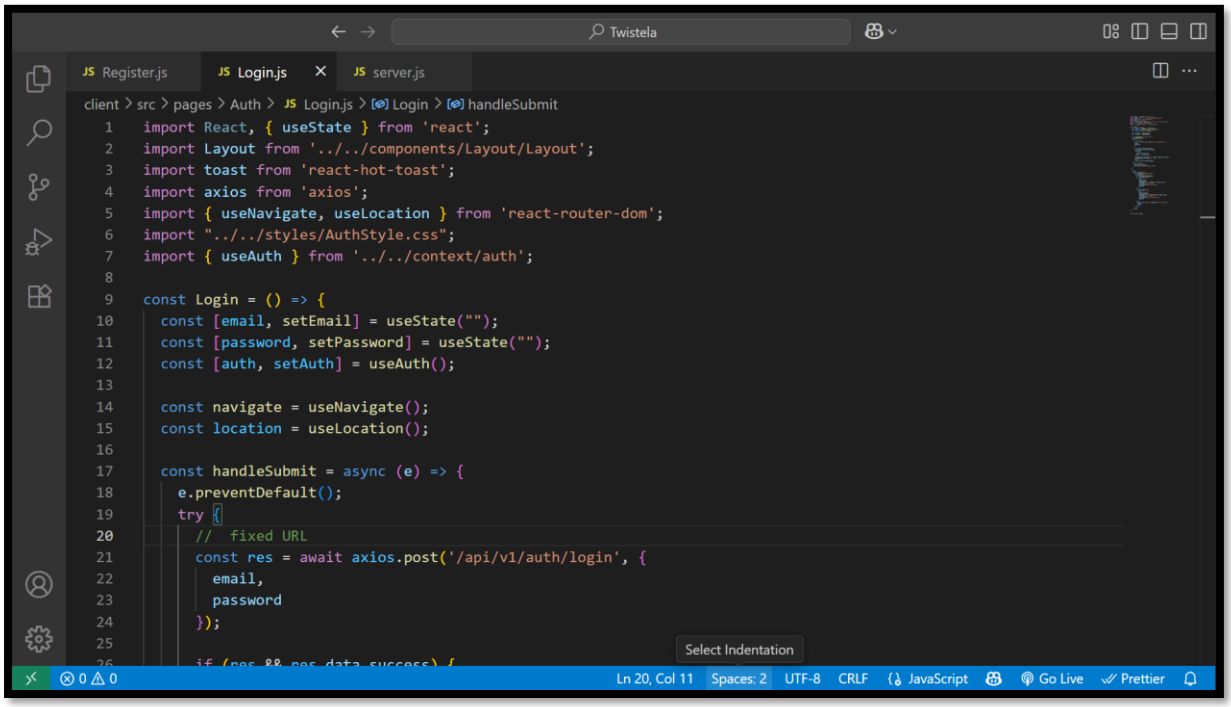

Figure 5.34 Login.js

Server.js

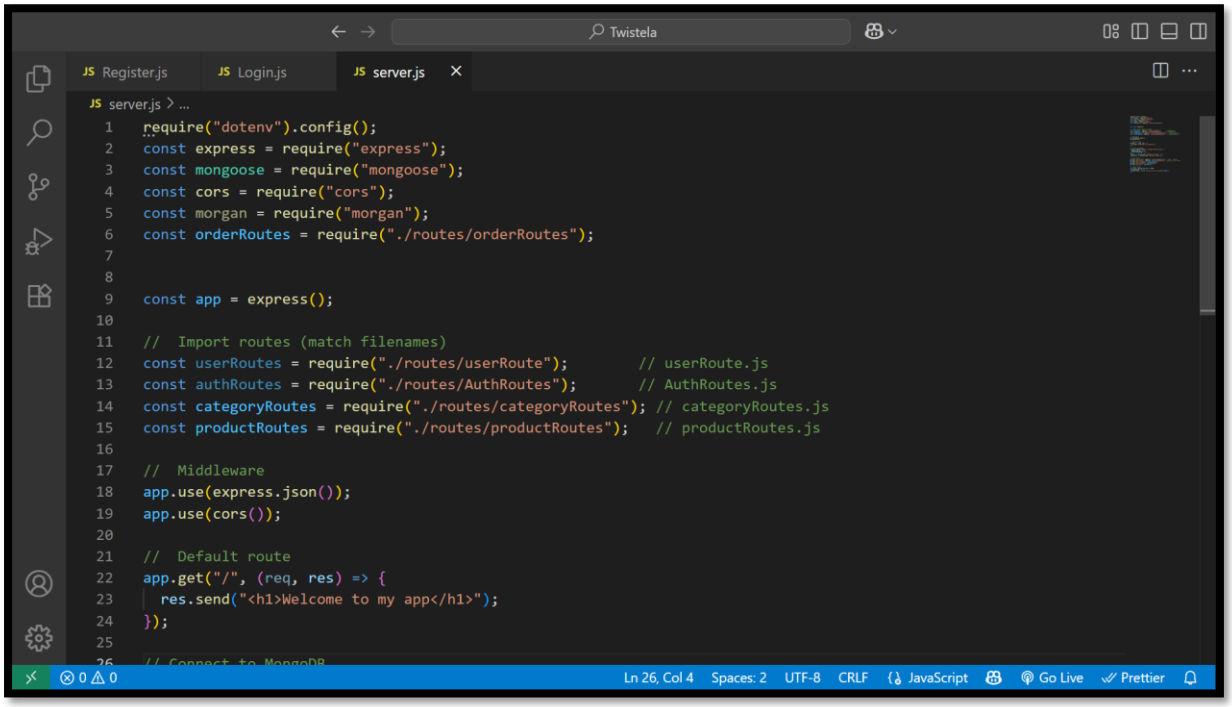

Figure 5.35 Server.js

User.js

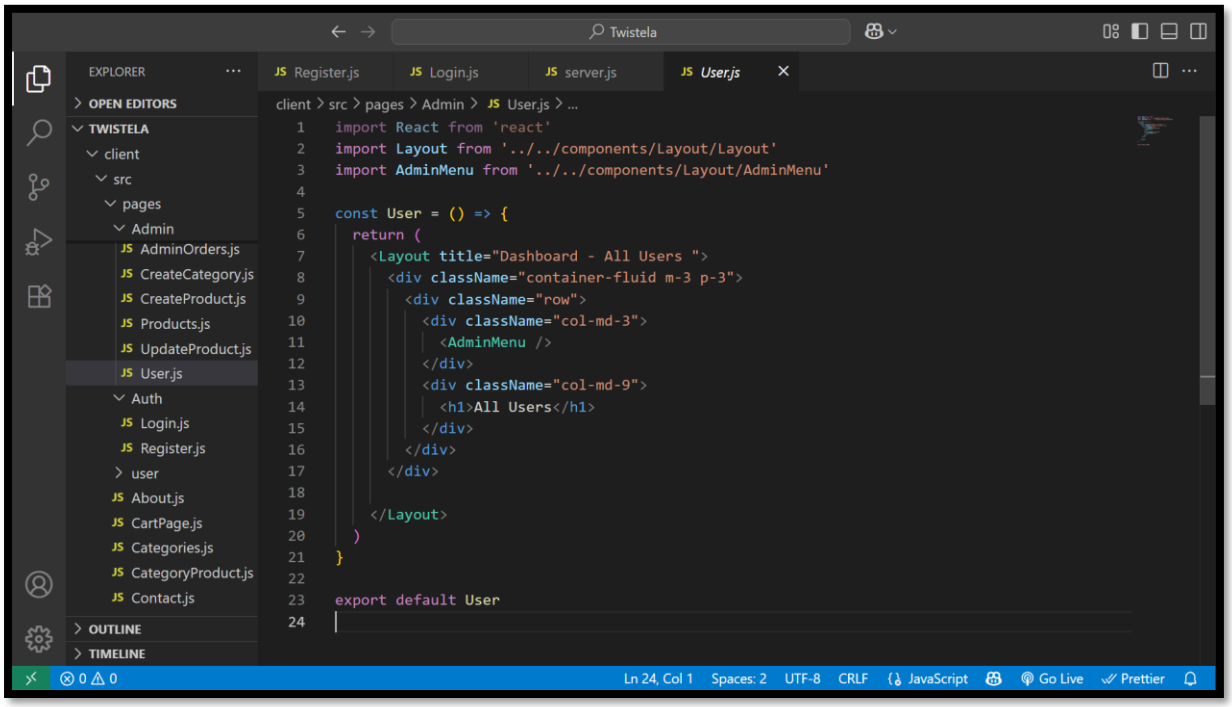

Figure 5.36 User.js

Product.js

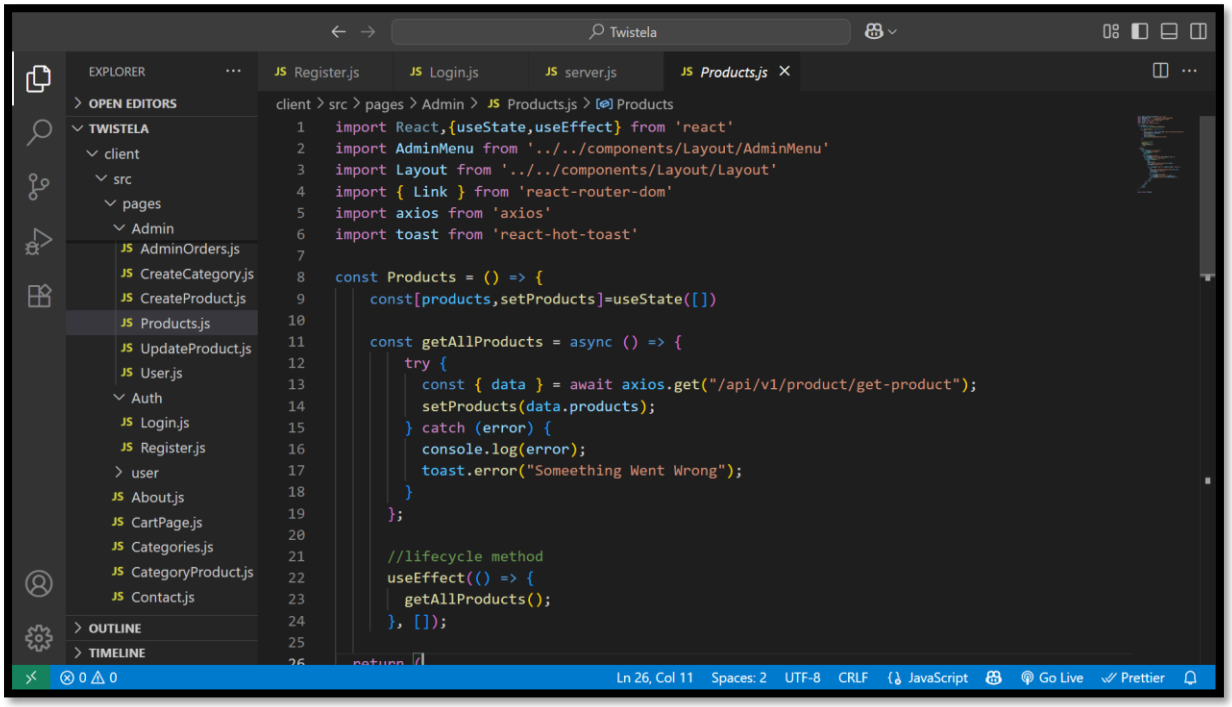

Figure 5.37 Product.js

Cart.js

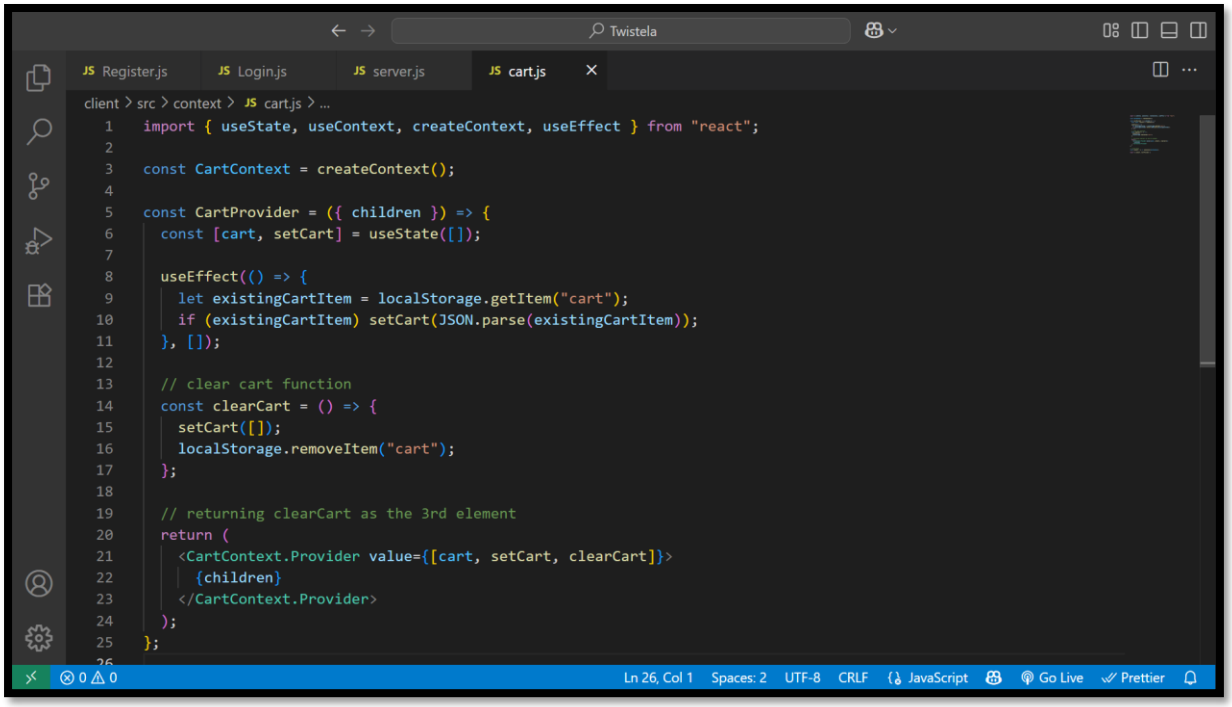

Figure 5.38 Cart.js

Chapter 6

SYSTEM TESTING

System testing for "Twistela" involves validating the end-to-end functionality of the entire system to ensure it meets the requirements and functions correctly under expected conditions, validate its correctness and confirm that all components are integrated properly. Below is a structured approach to writing the System Testing section in your project report for the Ecommerce Website.

Key Modules to test :

1. User Registration
2. User Login
3. Invalid Login
4. OTP Send
5. OTP Verification
6. Product Add
7. Add to Cart
8. Remove from Cart
9. Payment Failure

6.1 Functional Testing:

Test ID	Test Scenario	Test Steps	Expected Result
F001	User Registration	Navigate to signup → Fill form → Submit	New user account created in database
F002	User Login	Enter valid credentials	User successfully logs in
F003	Invalid Login	Attempt login with wrong password	System should deny login
F004	OTP Send	Trigger login with OTP → System sends OTP	OTP received on registered mobile
F005	OTP Verification	Enter OTP (Correct → success, Wrong → error)	Correct OTP → login success, Wrong OTP → error shown
F006	Product Add	Admin navigates to product section → Add new product details	Product saved in database
F007	Add to Cart	Select product → Click "Add to Cart"	Product added successfully to cart
F008	Remove from Cart	Go to cart → Remove product	Product removed successfully
F009	Payment Failure	Simulate payment failure during checkout	Order not placed, error shown

Table 6.1 Functional Testing:

6.2 Test Case Tabe For Ecommerce Twistela:

Test Case ID	Module	Test Case Description	Preconditions	Test Steps	Expected Result	Actual Result	Status
TC01	User Authentication	Verify user registration with valid details	Application is running, internet available	1. Go to "Sign Up" page → Enter email, password → Click Register	New user account created in database	As Expected	Pass
TC02	User Authentication	Verify login with valid credentials	User account exists	1. Go to "Login" page → Enter valid credentials → Click Login	User successfully logs in	As Expected	Pass
TC03	User Authentication	Invalid login with wrong credentials	User account exists	1. Go to "Login" page → Enter invali	System should deny login	As Expected	Pass

				d pass word → Click Login			
TC0 4	User Authent ication	OTP Generation	User account exists, mobile registered	1. Trigg er OTP send reque st	OTP received on registered phone	As Expect ed	Pass
TC0 5	User Authent ication	OTP Verification	OTP already generated	1. Enter corre ct OTP → Login succe ss 2. Enter wron g OTP → Error show n	Correct OTP → success, Wrong OTP → error	As Expect ed	Pass
TC0 6	Product Manage ment	Add new product	Admin account exists	1. Admi n navig ates to produ ct sectio n → Enter produ ct	Product saved in database	As Expect ed	Pass

				details → Save			
TC07	Cart Management	Add product to cart	User logged in, product available	1. Select product → Click "Add to Cart"	Product added successfully to cart	As Expected	Pass
TC08	Cart Management	Remove product from cart	Product already in cart	1. Go to cart → Click "Remove" on product	Product removed successfully	As Expected	Pass
TC09	Payment	Simulate payment failure during checkout	User has items in cart	1. Proceed to checkout → Simulate failure	Order not placed, error message shown	As Expected	Pass

Table 6.2 Test Case Tabe For Ecommerce Twistela:

Chapter 7

CONCLUSION

The Twistela application successfully demonstrates the implementation of a modern e-commerce platform using the MERN stack. By integrating MongoDB, Express.js, React.js, and Node.js, the project ensures a scalable, efficient, and user-friendly environment for managing crochet product sales. Core features such as user registration, OTP-based authentication, product management, cart, and checkout flow have been implemented to simulate real-world online shopping. These modules collectively provide both customers and administrators with a seamless experience.

Throughout the development process, various test cases were executed to validate system functionalities, such as login verification, OTP handling, product addition, cart operations, and payment handling. The system achieved its expected outcomes across critical functionalities, confirming its stability and reliability. Moreover, the modular architecture of the MERN stack enables future enhancements, such as integrating secure payment gateways, improving UI/UX, and adding advanced analytics for sales tracking.

In conclusion, this project demonstrates not only technical skills in full-stack development but also the ability to design a complete business solution. Twistela can be further extended into a fully functional online crochet marketplace, bridging the gap between handmade product creators and customers through a robust digital platform.

Chapter 8

LEARNING DURING PROJECT WORK

- **End-to-end MERN wiring**: React views ↔ Express APIs ↔ MongoDB models.
- **State & routing**: React Router, context/state for auth and cart.
- **Secure auth**: JWT guards for user/admin; route-level protection.
- **OTP workflow**: Integrating SMS OTP flow and handling invalid/expired codes.
- **Data modeling**: Schemas for users, products, categories, orders.
- **Admin ergonomics**: CRUD dashboards and instant storefront reflection.
- **Error handling**: Consistent API errors and UI toasts.
- **Version control & teamwork**: Branching, reviews, merge hygiene.
- **UX for catalog & filters**: Clear categories/price bands improve discovery.
- **Deployment readiness**: Env vars, build scripts, basic logging/monitoring.

8.1 Future Enhancements

- **Payments**: Razorpay/Stripe, order status webhooks.
- **Order tracking**: Shipment status timeline + notifications.
- **Inventory & variants**: Sizes/colors; low-stock alerts.
- **Wishlists & reviews**: Social proof and retention.
- **Coupons & promotions**: Category/product-level discounts.
- **Media optimization**: Image CDN/compression for faster galleries.
- **PWA**: Installable app, offline product browsing.
- **Role-based admin**: Manager vs. super-admin; audit logs.
- **Accessibility & i18n**: Alt text, keyboard support; multi-language.
- **Security hardening**: Rate limits on OTP/login; refresh tokens.

Chapter 9

BIBLIOGRAPHY

9.1 Online References

1. W3Schools, “Full Stack JavaScript Tutorial.” [Online].
   Available : https://www.w3schools.com/ [Accessed : July, 10, 2025].
2. MongoDB Inc., “MongoDB Manual.” [Online].
   Available : https://www.mongodb.com/docs/ [Accessed : July, 15, 2025].
3. React Team, “React Documentation.” Meta Platforms, Inc. [Online].
   Available : https://react.dev/ [Accessed : August, 10, 2025].
4. Express.js Foundation, “Express.js Guide.” [Online].
   Available : https://expressjs.com/ [Accessed : August, 25, 2025].
5. MDN Web Docs, “JavaScript, HTML, CSS Reference.” Mozilla Foundation [Online].
   Available : https://developer.mozilla.org/en-US/ [Accessed : August, 15, 2025].

9.2 Offline References

1. S. Holzner, MongoDB : *The Definitive Guide*, 3rd ed. Sebastopol, CA, USA : O’Reilly Media, 2019
2. Banks and E. Porcello, Learning React : *7777*, 2nd ed. Sebastopol, CA, USA: O’Reilly Media, 2018
3. M. Cantelon, M. Harter, T. Holowaychuk, and N. Rajlich, *Node.js in Action*, 2nd ed. Shelter Island, NY, USA : Manning Publications, 2017
4. E. Brown, Web Development with Node and Express *: Leveraging the JavaScript Stack*, 1st ed. Sebastopol, CA, USA : O’Reilly Media, 2019
5. V. Tiwari, Beginning MERN Stack : *Build and Deploy a Full Stack MongoDB*, *Express.js, React.js, Node.js App*, 1st ed. Berkeley, CA, USA : Apress, 2019.