Mini Project Report

on

LuxVision: An Optical E-Commerce Website

Submitted for partial fulfillment of award of

BACHELOR OF TECHNOLOGY

degree

In

Computer Science & Engineering

By

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Dec 2025

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STUDENT'S DECLARATION

We hereby declare that the work being presented in this report entitled **LuxVision: An Optical E-Commerce Website** is an authentic record of our own work carried out under the supervision of **Ms. Madhvi Gaur.**

The matter embodied in this report has not been submitted by us for the award of any other degree.

Dated: 17/12/2025 **Signature of students**

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

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(Computer Science & Engineering Department)
Date- .....17/12/2025.....

Signature of Mentor
Ms. Madhvi Gaur
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(Guide)
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CERTIFICATE

This is to certify that project report entitled **LuxVision: An Optical E-Commerce Website** which is submitted by **Hardik Bhardwaj and Harsh Gupta** in partial fulfillment of the requirement for the award of degree B. Tech. in Department of Computer Science & Engineering of **Dr. A.P.J. Abdul Kalam Technical University**, formerly Uttar Pradesh Technical University is a record of the candidate own work carried out by him/them under my supervision. The matter embodied in this thesis is original and has not been submitted for the award of any other degree.

Signature of Mentor

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We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind assistance and cooperation during the development of our project. Last but not the least, we acknowledge our friends for their contribution in the completion of the project.

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ABSTRACT

The Optical E-Commerce Website is a comprehensive online platform designed to revolutionize the way customers browse, select, and purchase optical products including eyeglasses, sunglasses, and contact lenses. In today's digital age, traditional optical shops face limitations in reach and accessibility, making it challenging for customers to explore diverse options and make informed decisions from the comfort of their homes.

This project addresses the gap between offline optical retail and online convenience by developing a responsive, user-friendly web-based platform that enables seamless product browsing, detailed specification viewing, and secure online transactions. The system is built using modern web technologies including HTML5, CSS3, JavaScript, and Bootstrap framework for the frontend, ensuring cross-device compatibility and optimal user experience across desktops, tablets, and mobile devices.

The platform features a comprehensive product catalog with high-quality images, detailed descriptions, lens type specifications, frame material information, and pricing details. Users can navigate through various categories, filter products based on preferences, add items to shopping cart, and complete purchases through an intuitive checkout process.

Key features include responsive design ensuring accessibility across all devices, interactive product galleries with zoom functionality, shopping cart management with real-time price calculation, user registration and authentication system, order tracking functionality. The project focuses on affordability, quality, and user convenience while maintaining high standards of accessibility compliance.

This e-commerce solution serves as a bridge between traditional optical retail businesses and the digital marketplace, enabling small and medium optical shops to expand their customer base and compete with larger players in the industry. The platform demonstrates the practical application of web development technologies in creating functional, scalable, and user-centric e-commerce solutions.

Keywords :

E-Commerce, Optical Products, Web Development, HTML, CSS, JavaScript, Bootstrap, Online Shopping, Product Catalog, Responsive Design.

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
UI	User Interface
UX	User Experience
SRS	Software Requirement Specification
DFD	Data Flow Diagram
HTML	HyperText Markup Language
CSS	Cascading Style Sheets
JS	JavaScript
DOM	Document Object Model
GUI	Graphical User Interface
API	Application Programming Interface
URL	Uniform Resource Locator
HTTP	HyperText Transfer Protocol
WWW	World Wide Web
IDE	Integrated Development Environment
MVC	Model View Controller

RAM	Random Access Memory
OS	Operating System
JSON	JavaScript Object Notation
W3C	World Wide Web Consortium
ER	Entity Relationship
SDLC	Software Development Life Cycle

CHAPTER 1

INTRODUCTION

1.1 Problem Introduction

In the modern digital era, the rapid growth of internet technologies has transformed the way people shop and interact with businesses. Customers now prefer online platforms that offer convenience, accessibility, and a wide variety of choices. However, many traditional optical shops still rely heavily on offline sales models, limiting their reach to a small geographical area. Customers visiting physical optical stores often face challenges such as limited frame options, lack of price comparison, time constraints, and repeated visits for selection and fitting.

The LuxVision Optical E-Commerce Website addresses these issues by providing a web-based frontend platform where users can browse eyeglasses, sunglasses, contact lenses, and optical accessories from anywhere. The system offers a visually rich and interactive interface that enables users to explore products, view details, compare prices, and manage their cart and wishlist digitally. The project focuses on the front-end development, demonstrating how an intuitive user interface can improve customer experience in optical retail.

1.2 Motivation

The motivation for developing this project originated from observing real-world scenarios in local optical shops. Despite having quality products, many shops struggle to attract younger, tech-savvy customers who prefer online shopping. Additionally, large brands like Lenskart and Titan Eye+ dominate the online market, making it difficult for small businesses to compete.

This project was initiated to understand how a professional optical e-commerce interface is designed and how frontend technologies can be used to simulate real-world shopping experiences. LuxVision aims to bridge the gap between traditional optical businesses and digital platforms by creating a scalable and modern frontend system that can later be integrated with backend services.

1.3 Project Objectives

The objectives of the LuxVision Optical E-Commerce Website are:

- To design and develop a modern, responsive, and user-friendly frontend interface.
- To display optical products in categorized and well-structured layouts.
- To implement dynamic product rendering using JavaScript.
- To provide cart and wishlist functionalities using client-side storage.
- To ensure smooth navigation and interactive UI elements.
- To gain practical exposure to frontend web development concepts.

1.4 Scope of the Project

The scope of this project is limited to the **frontend user dashboard** only. It includes:

- Product listing and categorization
- Product filtering and browsing
- Wishlist and cart management
- Responsive UI design

Backend services such as database integration, payment gateway, admin dashboard, and authentication are not implemented and are planned for future development.

1.5 Related Previous Work

Various optical e-commerce platforms already exist in the market, such as Lenskart, Titan Eye+, and ClearDekho. These platforms provide features like virtual try-on, prescription uploads, and doorstep delivery. LuxVision draws inspiration from these systems while focusing primarily on frontend implementation for academic learning.

1.6 Organization of the Report

This report is structured into seven chapters.

Chapter 1- Introduces the project.

Chapter 2- Discusses the literature survey.

Chapter 3- Covers software requirement specifications.

Chapter 4- Explains system design.

Chapter 5- Details implementation.

Chapter 6- Presents testing and results.

Chapter 7- Concludes the report with future scope.

CHAPTER 2

LITERATURE SURVEY

Online retail systems have significantly changed consumer purchasing behavior. Optical e-commerce platforms allow customers to explore eyewear products online, compare prices, and make informed decisions. This chapter reviews existing systems, frontend technologies, and design practices relevant to the project.

2.1 Optical E-Commerce Platforms

Leading optical platforms such as Lenskart, Cleardekho and Titan Eye+ offer extensive product catalogs, interactive UI designs, and seamless navigation. These platforms highlight the importance of frontend usability and responsiveness in enhancing customer engagement.

Table 2.1 Comparison of E-Commerce Platforms

Features	LuxVision	LensKart	TitanEye+
Platform Type	Web Based (Frontend Only)	Web & Mobile App	Web & Mobile App
Product Categories	Eyeglasses, Sunglasses, Contact Lenses	Eyeglasses, Sunglasses, Contact Lenses	Eyeglasses, Sunglasses
User Interface	Simple, Responsive, Student-Oriented	Advanced, Commercial	Advanced, Commercial
Product Filtering	Yes	Yes	Yes
Cart & Wishlist	Yes (Client Side)	Yes	Yes
Payment Gateway	No (Future Scope)	Yes	Yes
Admin Dashboard	No (Future Scope)	Yes	Yes
Target Users	Academic/Small Optical Shop	General Public	General Public
Backend Integration	No	Yes	Yes

2.2 Role of Frontend Technologies

Frontend technologies like HTML5, CSS3, JavaScript, and Bootstrap are essential for building responsive web applications. HTML structures the content, CSS handles styling, and JavaScript adds interactivity. Bootstrap simplifies responsive design using pre-built components.

2.3 Client-Side State Management

Modern web applications often use client-side storage such as LocalStorage to manage temporary data like cart items and user preferences. This approach improves performance and reduces server dependency for basic operations.

2.4 User Experience (UX) Design in E-Commerce

UX design plays a critical role in online shopping platforms. Features like intuitive navigation, visual hierarchy, and interactive feedback enhance user satisfaction and retention.

2.5 Summary

The literature survey emphasizes the importance of frontend-focused design and interactivity in optical e-commerce systems. LuxVision incorporates these principles to create an engaging user interface.

CHAPTER 3

SOFTWARE REQUIREMENT SPECIFICATION (SRS)

This chapter describes the general factors that affect the LuxVision Optical E-Commerce Website and its requirements. It provides an overall understanding of the system from the user and customer perspective in simple language. The detailed and developer-oriented requirements are derived based on the background explained in this chapter. The current version of the project is a **web-based, frontend-only system** focusing on the user dashboard.

3.1. Product Perspective

The LuxVision Optical E-Commerce Website is an independent, self-contained web-based frontend application. It is not currently integrated with any backend server, database, or third-party services. The system is designed to simulate the user-side functionality of a real-world optical e-commerce platform.

In comparison with existing optical e-commerce platforms such as Lenskart and Titan Eye+, LuxVision provides similar user-facing features like product browsing, cart management, wishlist functionality, and responsive design. However, unlike commercial systems, LuxVision currently operates without backend services such as authentication, order processing, or inventory management. These components are planned for future integration.

At a higher level, the system can be viewed as a part of a larger e-commerce ecosystem consisting of frontend UI, backend services, database, payment gateway, and admin dashboard. In the present implementation, LuxVision represents only the **frontend user interface**, which interacts directly with the user and handles client-side logic.

3.1.1. System Interfaces

In the current version, the system does not interact with any external systems such as payment gateways, databases, or authentication servers. All operations are handled locally within the user's web browser. Therefore, no system-level external interfaces are required at this stage.

Future versions of the system may interface with:

- Backend application servers
- Database management systems
- Payment gateway APIs
- Admin dashboard systems

3.1.2. User Interfaces

The LuxVision system provides a **Graphical User Interface (GUI)** accessible through standard web browsers. The interface is designed for ease of use, clarity, and visual appeal. Major characteristics include:

- Navigation bar for category-wise product browsing
- Product cards displaying images, prices, and action buttons
- Cart and wishlist icons with interactive feedback
- Off-canvas panels and modal dialogs for enhanced usability
- Light and dark theme support

The interface is designed keeping in mind users with basic internet and smartphone usage experience. Responsive design principles ensure accessibility across desktops, tablets, and mobile devices.

3.1.3. Hardware Interfaces

The system has no direct hardware interface requirements. It does not interact with any external hardware devices. The application runs entirely within a web browser.

Statement: The system has no hardware interface requirements.

3.1.4. Software Interfaces

The LuxVision Optical E-Commerce Website relies on standard web technologies and tools that are pre-installed or commonly available on user systems. These software interfaces are mandatory for the operation of the system:

- **Web Browser**
  Purpose: Rendering the frontend application and executing JavaScript logic
  Examples: Google Chrome, Mozilla Firefox, Microsoft Edge
- **Bootstrap Framework (v5.x)**
  Purpose: Responsive layout design and UI components
  Source: Bootstrap Documentation
- **LocalStorage API**
  Purpose: Temporary storage of cart and wishlist data on the client-side

No customer-mandated third-party software or proprietary systems are required in the current version. Selection of backend software or databases is deferred to the design phase of future versions.

3.1.5. Communication Interfaces

The current system does not directly interact with any communication protocols such as FTP, SMTP, or custom network protocols. All operations are performed locally within the browser.

Future enhancements may include HTTP/HTTPS-based communication with backend servers and REST APIs.

3.1.6. Memory Constraints

There are no specific memory constraints imposed by the customer. The system is designed to operate efficiently on standard modern devices. Cart and wishlist data stored using LocalStorage occupy minimal memory.

Statement: No specific memory constraints are defined for the current version of the system.

3.1.7. Operations

The system supports the following normal operations:

- Interactive browsing of products
- Adding and removing items from cart
- Managing wishlist items
- Theme toggling

The system does not require unattended operations, background batch processing, or scheduled tasks. Backup and recovery operations are not applicable in the frontend-only version.

3.1.8. Site Adaptation Requirements

No special site adaptation requirements are needed for deploying the LuxVision frontend application. The system can be run locally using a web browser or deployed on any standard web hosting service.

No additional hardware, software, or environmental modifications are required at the user site.

3.2. Product Functions

The major functions performed by the LuxVision Optical E-Commerce Website are:

- Display optical products in categorized form.
- Allow users to browse and view product details.
- Enable users to add and remove products from the cart.
- Allow users to maintain a wishlist.
- Provide responsive UI for different screen sizes.
- Store user interaction data temporarily using Local Storage.

These functions collectively provide a complete frontend shopping experience for optical products.

Functional Requirements :Table 3.1

Requirements	Functional Requirement Description
FR-01	The system shall allow user to browser optical products
FR-02	The system shall display product details such as image, price, and category
FR-03	The system shall allow users to add products to the cart
FR-04	The system shall allow users to remove the products from the cart
FR-05	The system shall allow users to add/remove products from wishlist
FR-06	The system shall update care and wishlist dynamically
FR-07	The system shall store cart and wishlist data using local storage
FR-08	The system shall support light and dark theme modes
FR-09	The system shall be responsive across different devices
FR-10	The system shall provide smooth navigation between section

3.3. User Characteristics

The intended users of the system include:

- General customers with basic knowledge of using websites
- Students and young adults familiar with online shopping platforms
- Users accessing the system through mobile phones or desktops

Users are expected to have minimal technical expertise. Therefore, the interface is designed to be intuitive, visually guided, and easy to navigate.

3.4. Constraints

The development of the LuxVision system is subject to the following constraints:

- Frontend-only implementation without backend services
- Limited development time as per academic schedule
- Browser dependency for execution
- No real-time payment or order processing

Security-related constraints such as authentication and encryption are deferred to future versions.

3.5. Assumptions and Dependencies

The system is developed under the following assumptions:

- Users have access to a modern web browser
- JavaScript is enabled in the browser
- Internet access is available for loading external libraries

Any changes to these assumptions may require modifications to the system requirements.

3.6. Apportioning of Requirements

The requirements of the LuxVision system are divided as follows:

Implemented in Current Version:

- User-side frontend interface
- Product browsing and filtering
- Cart and wishlist management

Deferred to Future Versions:

- Admin dashboard
- Backend integration
- Database storage
- Payment gateway
- User authentication

3.7. Use Case Model

The system supports multiple use cases that describe interactions between the user and the LuxVision application.

3.7.1. Primary Actors

- User (Customer)
- Admin (Future Actor)

3.7.2. Use Case Diagram

The Use Case Diagram represents the interaction between the User and the LuxVision system. The User can browse products, view details, manage cart and wishlist, and control UI preferences. Admin-related use cases are part of future scope and are not implemented in the current version.

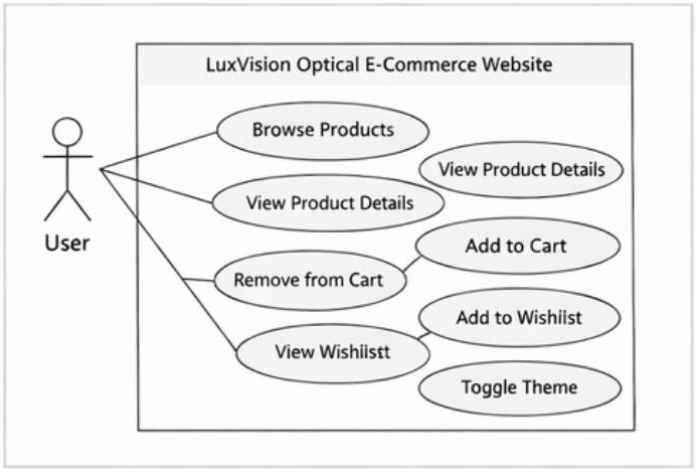

Figure 3.1 Use Case Diagram for LuxVision Optical E-Commerce Website

3.7.3. Use Case Scenario (Example)

Use Case Name: Add Product to cart
Primary Actor: User
Pre –condition: User is browsing the product catalogue
Trigger: User clicks on “Add tot cart”.
Basic Flow:

1. User selects a product
2. System adds the product to cart
3. Cart count is updated
4. User receives visual confirmation

Alternative Flow: If the product already exists, quantity is updated.

CHAPTER 4

SYSTEM DESIGN

4.1 System Architecture

The system follows a client-side architecture where all logic is executed in the browser. Product data is stored in JavaScript arrays.

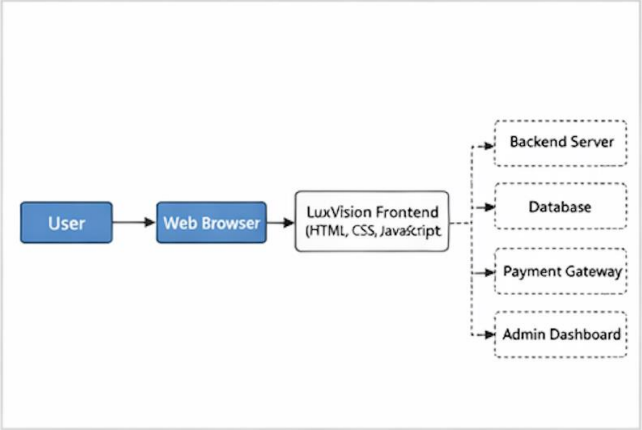

Figure 4.1 System Architecture Diagram for LuxVision System

4.2 Module Description

4.2.1 Navigation Module

Handles menus, dropdowns, and routing.

4.2.2 Product Module

Responsible for dynamic rendering of products.

4.2.3 Cart Module

Manages cart operations using LocalStorage.

4.2.4 Wishlist Module

Allows users to save products for future reference.

4.3 Data Flow Diagram (DFD)

User actions trigger JavaScript functions which update the UI and LocalStorage.

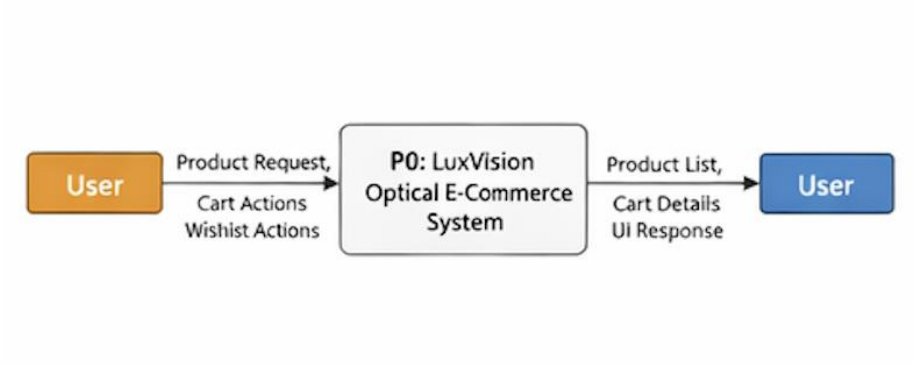

Figure 4.2. Level 0 Data Flow Diagram of LuxVision System

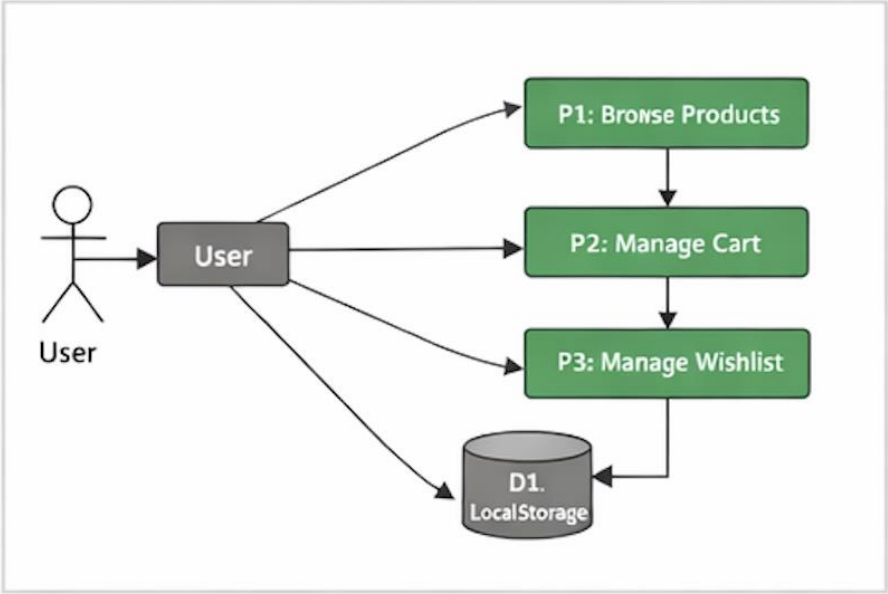

Figure 4.3. Level 1 Data Flow Diagram of LuxVision System

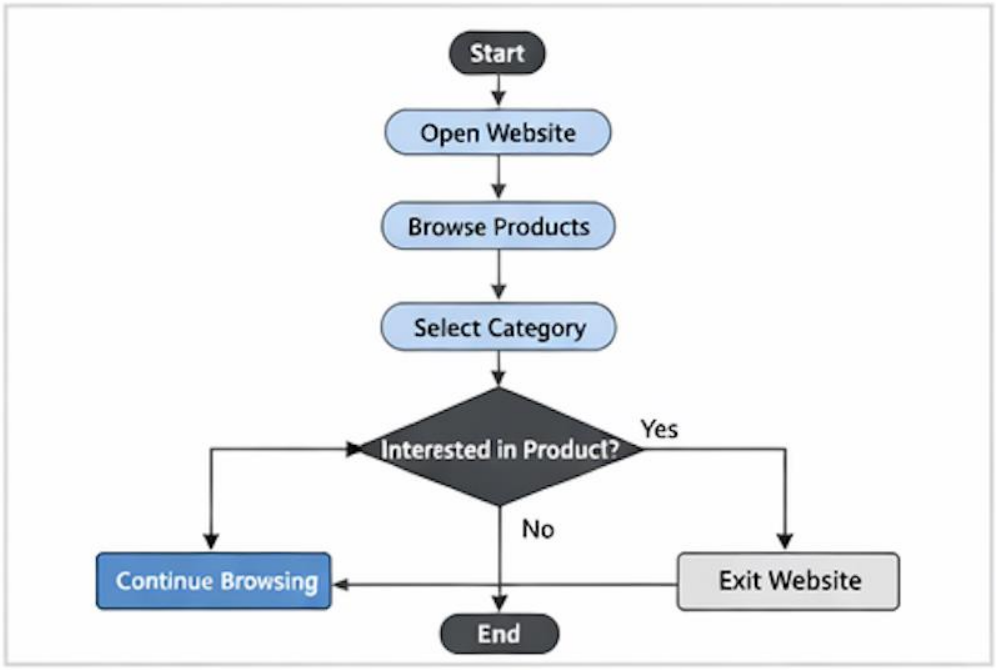

Figure 4.4. Activity Diagram for user Browsing Products

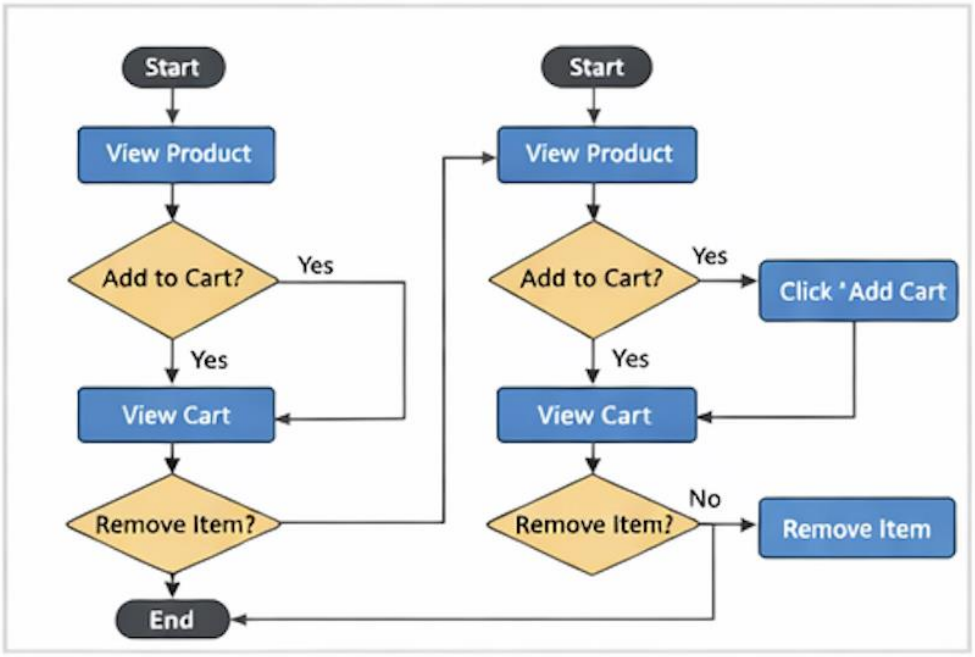

Figure 4.5. Activity Diagram for Wishlist & Cart Management

CHAPTER 5

IMPLEMENTATION DETAILS

5.1 Software Environment

Table 5.1: Software Requirements

Software Component	Description
Operating System	Windows / Linux / macOS
Web Browser	Google Chrome, Mozilla Firefox, Microsoft Edge
Frontend Language	HTML5
Styling Technology	CSS3
Scripting Language	Javascript
UI Framework	Bootstrap 5
Development IDE	VS Code
Storage Mechanism	Browser LocalStorage

5.2 Frontend Structure

The project is divided into three main files:

- index.html
- style.css
- script.js

5.3 HTML Implementation

HTML defines the structure including navbar, product sections, modals, and off-canvas components.

5.4 CSS Implementation

Custom CSS is used for glassmorphism design, gradients, animations, and responsiveness.

5.5 JavaScript Implementation

JavaScript handles dynamic rendering, filtering, cart logic, wishlist logic, and theme toggling.

5.6 User Dashboard

The user dashboard provides access to cart, wishlist, and account-related options (frontend only).

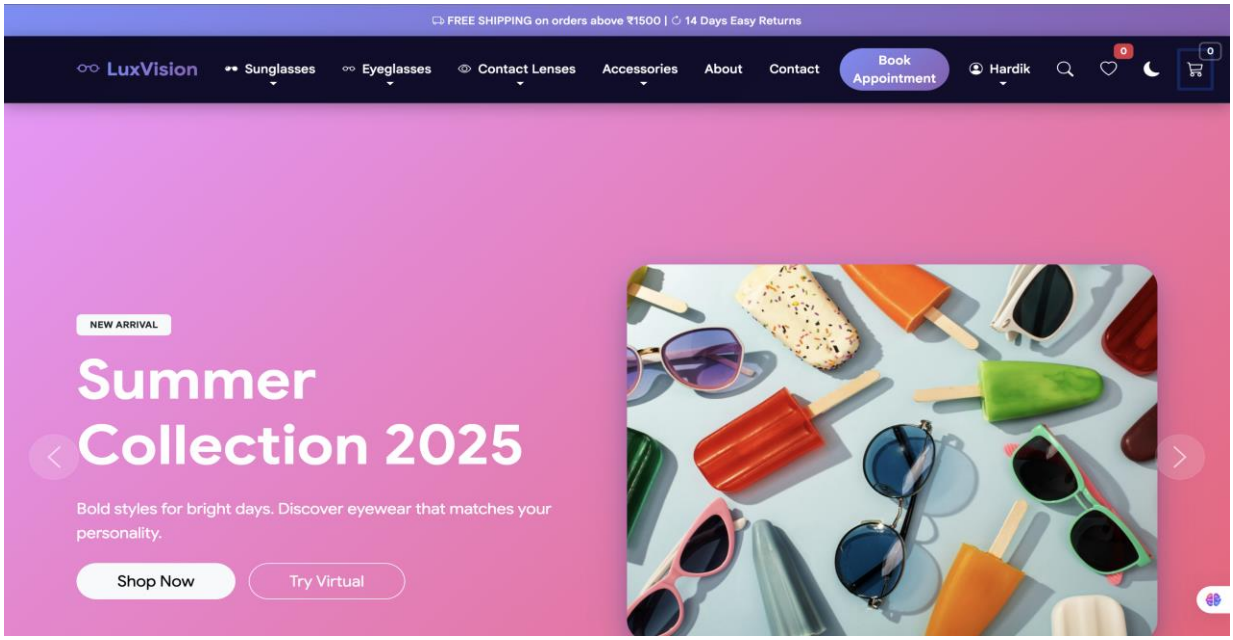

Figure 5.1 Home Page Interface of LuxVision System

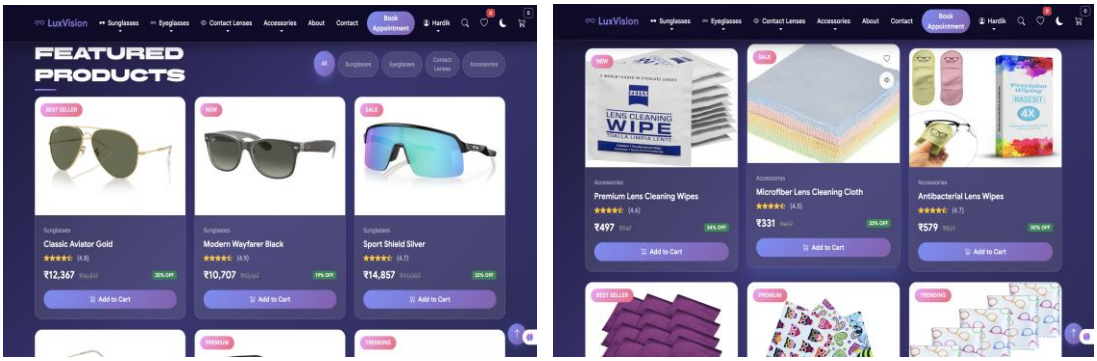

Figure 5.2 Product Catalog Page of LuxVision System

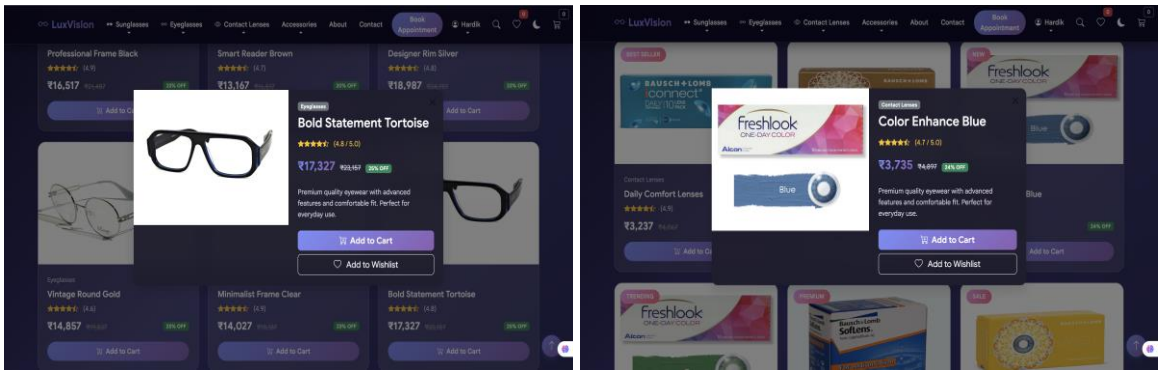

Figure 5.3 Product details Page

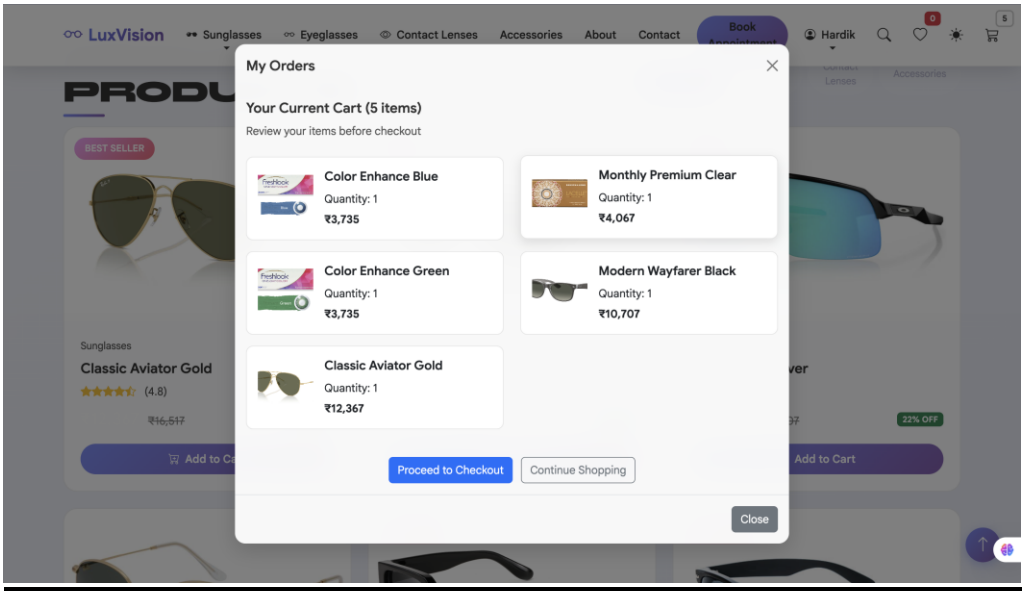

Figure 5.4 Shopping Cart Page

CHAPTER 6

TESTING AND RESULTS

6.1 Testing Strategy

Manual testing was conducted for UI responsiveness, interactivity, and browser compatibility.

6.2 Test Cases

- Add to cart functionality
- Wishlist toggle
- Product filtering
- Responsive layout

Table 6.1. Test Cases & Results

Test Case ID	Test Description	Input	Expected Output	Actual Output	Status
TC-01	Add product to cart	Click "Add to Cart"	Product added to cart	Product added successfully	Pass
TC-02	Remove product from cart	Click "Remove"	Product removed	Product removed successfully	Pass
TC-03	Item added to wishlist	Click wishlist icon	Item added to wishlist	Item added successfully	Pass
TC-04	Theme changes	Click theme toggle	Theme changes	Theme changed	Pass
TC-05	Layout adapts	Resize screen	Layout adapts	Layout adapts correctly	Pass
TC-06	Navigate to section	Click menu links	Navigate to section	Navigation successful	Pass

6.3 Results

The frontend system performs smoothly and meets all defined objectives.

CHAPTER 7: CONCLUSION AND FUTURE SCOPE

7.1 Conclusion

LuxVision successfully demonstrates the development of a modern optical e-commerce frontend. The project provides hands-on experience with frontend technologies and UI design.

7.2 Future Scope

- Backend integration
- Admin dashboard
- Payment gateway
- Virtual try-on using AR
- Deployment on cloud platforms

APPENDIX

APPENDIX A

SOURCE CODE SNIPPETS

This appendix presents selected source code snippets used in the development of the LuxVision Optical E-Commerce Website. Only the most relevant sections are included to demonstrate the implementation logic. The complete source code is maintained separately.

A.1 HTML Structure (index.html)

The HTML file defines the overall structure of the website including navigation bar, product sections, cart area, and footer.

```
<header>
  <nav class="navbar">
    <h1>LuxVision</h1>
    <ul class="nav-links">
      <li><a href="#products">Products</a></li>
      <li><a href="#cart">Cart</a></li>
      <li><a href="#wishlist">Wishlist</a></li>
    </ul>
  </nav>
</header>
```

Description: This code creates the main navigation bar that allows users to access different sections of the website.

A.2 Product Card Layout

```
<div class="product-card">
  <img src="images/glasses1.png"  alt="Optical Glasses">
  <h3>Classic Frame</h3>
  <p>₹1999</p>
  <button onclick="addToCart()">Add to Cart</button>
</div>
```

Description: This snippet represents the structure of a product card displaying product image, name, price, and action button.

A.3 CSS Styling (style.css)

The CSS file is used to style the website and make it responsive.

```
.product-card {
  border: 1px solid #ddd;
  padding: 15px;
  border-radius: 10px;
  text-align: center;
  transition: transform 0.3s;
}

.product-card:hover {
  transform: scale(1.05);
}
```

Description: This styling enhances the user interface by adding hover effects and improving visual appeal.

A.4 JavaScript Cart Functionality (script.js)

```
function addToCart(product) {
  let cart = JSON.parse(localStorage.getItem("cart")) || [];
  cart.push(product);
  localStorage.setItem("cart", JSON.stringify(cart));
  alert("Product added to cart");
}
```

Description: This function manages cart operations using browser LocalStorage without backend support.

APPENDIX B

SAMPLE DATA USED IN PROJECT

This appendix shows sample data used to simulate products in the LuxVision website.

B.1 Sample Product Data

```
const products = [
  { id: 1, name: "Classic Frame", price: 1999 },
  { id: 2, name: "Modern Sunglasses", price: 2499 },
  { id: 3, name: "Premium Lens", price: 2999 }
];
```

Description: This sample dataset is used to display product information dynamically on the website.

B.2 Sample Cart Data (LocalStorage Format)

```
[
  { "id": 1, "name": "Classic Frame", "price": 1999 },
  { "id": 2, "name": "Modern Sunglasses", "price": 2499 }
]
```

Description: This represents how cart items are stored locally in the browser.

APPENDIX C

FUTURE SCOPE (PROPOSED FEATURES)

The current version of LuxVision is limited to frontend functionality. The following enhancements are proposed for future development:

- Backend integration using Node.js or Django
- User authentication and profile management
- Admin dashboard for product management
- Database integration for persistent data storage
- Secure online payment gateway
- Order tracking and history
- Responsive mobile application

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