

E-COMMERCE WEBSITE USING PHP

A PROJECT REPORT

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*in partial fulfillment of the requirements for the degree
of*

BACHELOR OF TECHNOLOGY
in
COMPUTER SCIENCE AND ENGINEERING



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Department of Computational Intelligence
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ABSTRACT

This project centres around the design and development of a fully functional e-commerce website, constructed using foundational web technologies such as HTML, CSS, JavaScript, and SQL. The primary objective is to create a dynamic and user-centric platform that allows consumers to interact with a digital marketplace where they can browse a diverse catalog of products, add desired items to a shopping cart, and proceed with simulated purchases. The application aims to closely replicate the structure and flow of real-world e-commerce systems while maintaining simplicity, scalability, and usability.

From the front-end perspective, HTML and CSS are employed to structure and style the interface, ensuring a clean, intuitive, and responsive user experience across various screen sizes and devices. JavaScript is utilized to add interactivity to the application, handling tasks such as form validation, cart updates, and dynamic product rendering without the need to reload pages. This client-side logic significantly improves the user experience by making navigation and interaction seamless.

On the back-end, a relational database is implemented using SQL to manage and store essential data such as user information, product listings, cart contents, and order histories. SQL queries are used to retrieve, update, and manipulate data securely and efficiently. While the website does not incorporate a payment gateway in this prototype stage, it lays the groundwork for integration with secure third-party payment services in the future.

Security is also an important consideration in the development of this website. Although it is in a basic form, features such as login authentication, input sanitization, and session control are planned to simulate a secure shopping environment. The system architecture follows a modular approach, ensuring that future enhancements—like adding recommendation systems, customer reviews, admin dashboards, or inventory tracking—can be integrated with minimal disruption to the existing structure.

Through this project, we aim to demonstrate a practical, hands-on understanding of full-stack web development. By combining front-end design principles with back-end data handling and interactivity, the project reflects how modern e-commerce platforms function in real-world applications. It serves both as an academic learning tool and as a foundation for more advanced commercial development in the future.

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ABBREVIATIONS

HTML	HyperText Markup Language
CSS	Cascading Style Sheets
JS	JavaScript
SQL	Structured Query Language
DB	Database
UI	User Interface
UX	User Experience
CRUD	Create, Read, Update, Delete
SDLC	Software Development Life Cycle
API	Application Programming Interface
PHP	Hypertext Preprocessor
SDG	Sustainable Development Goal
SME	Small and Medium-sized Enterprise
AI	Artificial Intelligence
GDPR	General Data Protection Regulation

CHAPTER 1

INTRODUCTION

1.1 Introduction to Project

In the modern digital age, **e-commerce** has revolutionized the way goods and services are bought and sold, becoming a cornerstone of global retail and commercial activity. As more consumers turn to online platforms for their shopping needs, the importance of reliable, user-friendly, and secure e-commerce websites continues to grow exponentially. This project is centered around the conceptualization, design, and implementation of a dynamic e-commerce platform developed using front-end technologies such as **HTML, CSS, and JavaScript**, and a **SQL-based relational database** to manage backend operations.

The website is developed to simulate a real-world online shopping experience with key features including **user registration and login, product catalog browsing, category filtering, search functionality, shopping cart management, and order processing**. The system is built with an emphasis on scalability and performance, providing a foundation for future integration of advanced functionalities such as real-time payment systems, inventory tracking, and customer feedback systems.

From a development perspective, this project serves as a comprehensive full-stack application that brings together client-side interface design and server-side logic. It demonstrates how various web technologies work in tandem to create seamless and interactive user experiences. The aim is not just to build a website, but to understand the architecture and workflow of an e-commerce system from database design to user interface interactivity, thereby providing practical exposure to essential web development principles.

1.2 Motivation

The motivation behind choosing an e-commerce website as a project stems from the increasing relevance and demand for online retail solutions in today's technology-driven world. With the rising trend of businesses moving online, even small-scale retailers and independent sellers are exploring digital avenues to expand their reach and increase sales. Developing an e-commerce platform provides a strong learning opportunity to explore how real-world web applications function, both from the perspective of users and administrators.

From a technical standpoint, this project offers the chance to work on a wide range of essential skills: **front-end design**, **back-end development**, **database management**, and **user experience (UX) design**. Each component of the system reflects a practical skill needed in the modern web development industry. For instance, creating a responsive layout involves understanding CSS grid systems and media queries, while shopping cart functionalities rely heavily on JavaScript logic and database interactions.

Moreover, building this project is an excellent way to understand core web development paradigms such as **CRUD operations**, **data validation**, **session handling**, and **client-server architecture**. It allows developers to experience the full software development lifecycle—from requirements gathering and planning to design, implementation, testing, and final deployment.

Finally, this project can serve as a stepping stone for future professional endeavors, as experience with e-commerce applications is highly valued in the job market. It also fosters problem-solving and critical thinking by addressing real-world challenges like user authentication, secure data handling, and interface usability.

1.3 Sustainable Development Goal of the Project

This project aligns with the **United Nations Sustainable Development Goal (SDG) 9 – Industry, Innovation, and Infrastructure**. SDG 9 emphasizes the importance of building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation. An e-commerce platform, particularly one that is accessible, affordable, and scalable, directly contributes to these goals.

By enabling businesses—especially **small and medium-sized enterprises (SMEs)**—to digitize their services and reach wider audiences, this project supports industrial growth and economic development. In many developing or under-resourced regions, digital platforms serve as a gateway to market access, employment, and entrepreneurship. This e-commerce solution, once expanded, can help remove geographical and infrastructural limitations by connecting buyers and sellers digitally.

The project also supports responsible innovation by promoting the use of **sustainable digital infrastructure**. The use of lightweight, optimized code and modular design ensures that the platform uses minimal server resources, which can indirectly contribute to reducing the environmental impact of hosting services.

Furthermore, the platform encourages **informed and responsible consumption**. Through clearly displayed product information, customer reviews (potentially added in future versions), and organized categories, the user can make educated purchasing decisions, reducing waste and unnecessary consumption.

1.4 Product Vision Statement

The vision for this project is to develop a fully-functional, adaptable, and user-centered e-commerce platform that can cater to a variety of users—from individual consumers to small business owners. The goal is to empower users with a convenient, secure, and intuitive interface that enhances the shopping experience while offering vendors a simple yet powerful system to manage their inventory and sales.

This platform aims to **bridge the gap between traditional commerce and digital transformation** by providing a flexible framework that can evolve with user needs. Initially launched with core features, the product is designed to be modular and extensible. Future expansions may include **mobile responsiveness, multi-vendor support, real-time notifications, payment gateway integration, analytics dashboards, and machine learning-based recommendations**.

The long-term vision extends beyond just functionality. The product should reflect values like **trust, simplicity, and transparency**. By adhering to user-friendly design principles and following security best practices, the platform aspires to become a trusted solution for users and businesses alike. It envisions a digital ecosystem where local vendors can compete on a level playing field with larger brands, giving consumers more choices and supporting economic inclusivity.

1.5 Product Goal

The overarching goal of the project is to deliver a **reliable, scalable, and aesthetically pleasing** e-commerce website that allows users to engage in the complete online shopping experience. This includes creating an end-to-end system with seamless **user interaction**, effective **data handling**, and **administrative control** over the product catalog and order flow.

Key functional goals include:

- Allowing users to **register** and **log in** securely.
- Enabling users to **browse, search, and filter products** by category or keyword.

- Facilitating **cart management**, where users can add, remove, and adjust product quantities before checkout.
- Implementing a checkout process with a final **order summary** stored in a database.

In addition, the platform should prioritize **performance and responsiveness**, ensuring it functions well on various devices and browsers.

1.6 Product Backlog

Table 1.1 Product Backlog

S.No	User Stories of E-Commerce Website
#US 1	As a user, I want to register and log in to my account so that I can keep track of my orders.
#US 2	As a user, I want to view products by category so that I can find items easily.
#US 3	As a user, I want to search and filter products so that I can discover items that meet my needs.
#US 4	As a user, I want to add products to a shopping cart so that I can review them before purchasing.
#US 5	As a user, I want to see a summary of my order and total cost before checkout so that I can confirm my choices.
#US 6	As an admin, I want to add or remove products from the database so that the catalog remains updated.
#US 7	As an admin, I want to view customer orders so that I can process shipments.
#US 8	As a user, I want to receive email confirmation after placing an order so that I have a record of my purchase.
#US 9	As a user, I want to reset my password if I forget it so that I can regain access to my account.
#US 10	As an admin, I want to manage user accounts so that I can assist users with issues or block suspicious activities.

The product backlog of the **E-commerce Website** was configured using the **MS Planner Agile Board**, as shown in **Figure 1.1**. The Product Backlog includes a comprehensive set of user stories relevant to the development and functionality of the E-commerce platform.

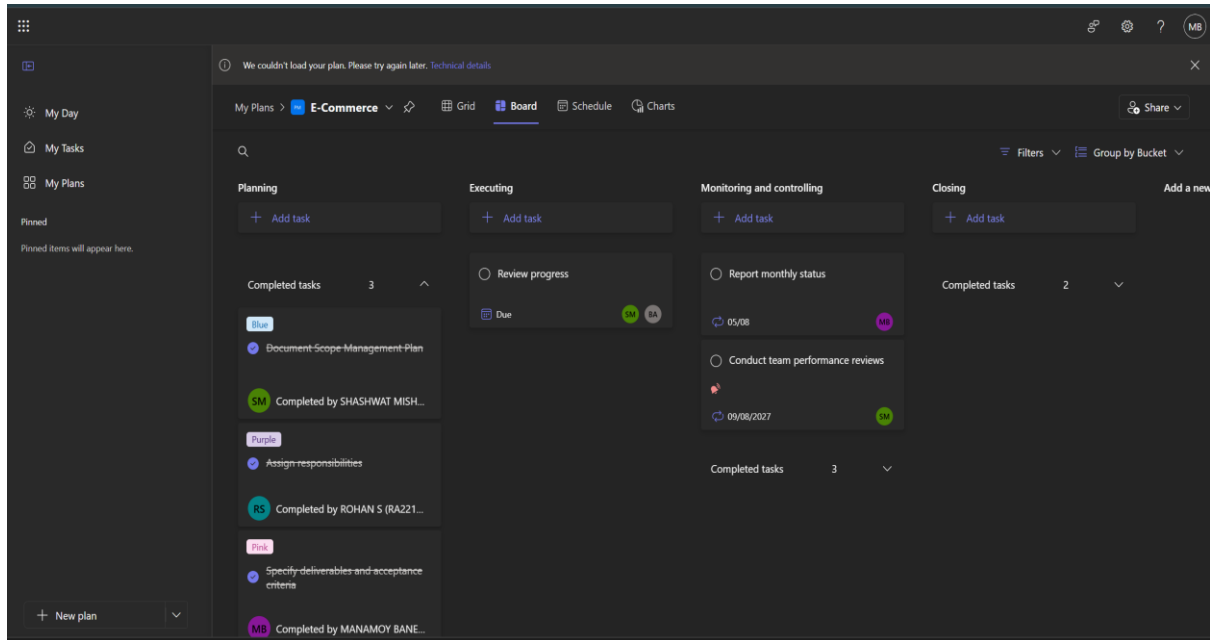


Figure 1.1 MS Planner Board of E-Commerce Website

1.7 Product Release Plan

The following Figure 1.2 depicts the release plan of the project

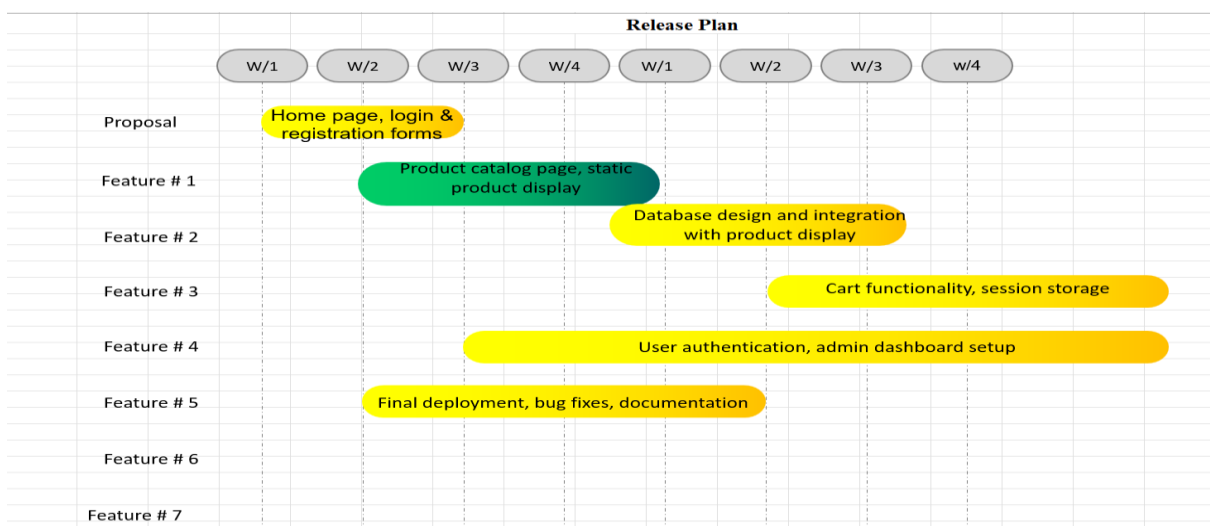


Figure 1.2 Release plan of E-Commerce Website

CHAPTER 2

SPRINT PLANNING AND EXECUTION

2.1 Sprint 1

2.1.1 Sprint Goal with User Stories of Sprint 1

Sprint Goal: To construct the user landing page and enable foundational features such as user registration, profile creation, and basic search functionality for skills and courses.

Table 2.1 Detailed User Stories of sprint 1

S.No	Detailed User Stories
US #1	As a new user, I want to easily register for the platform so that I can gain access to its features like profile creation, skill enhancement, and self-learning resources.
US #2	As a new user, I want to create a personal profile after registration so that I can showcase my skills, interests, and achievements.
US #3	As a user, I want to search for skills, courses, and other users on the platform to find relevant learning material and connect with peers.

Planner Board representation of user stories are mentioned below figures 2.1,2.2 and 2.3

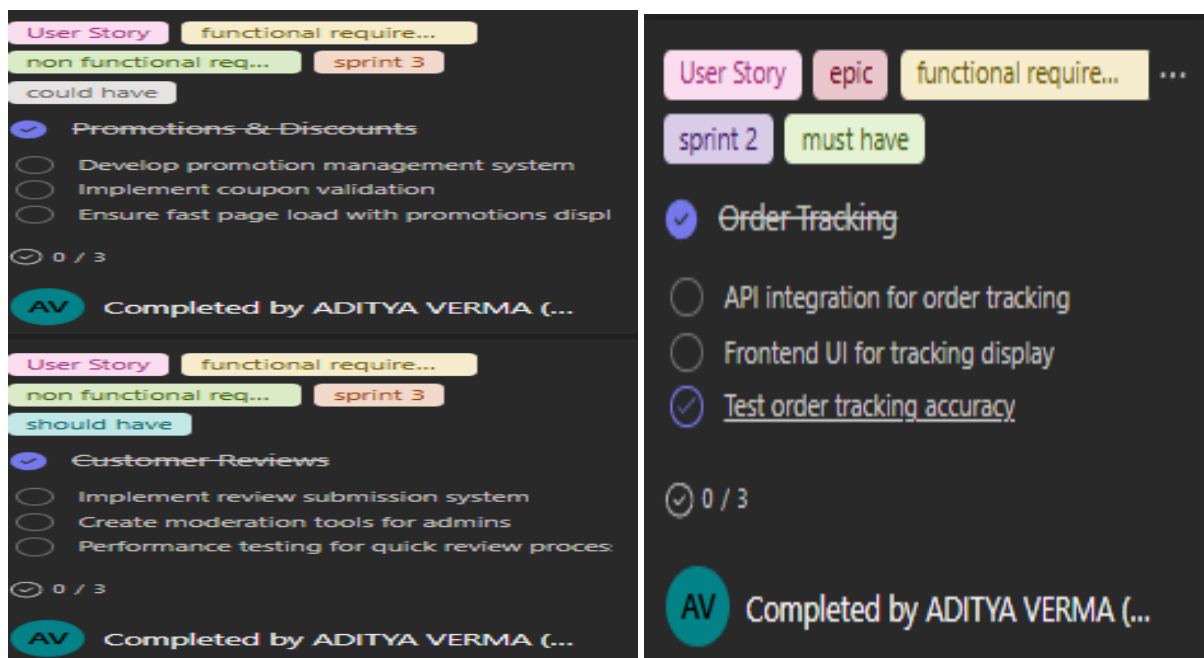


Figure 2.1

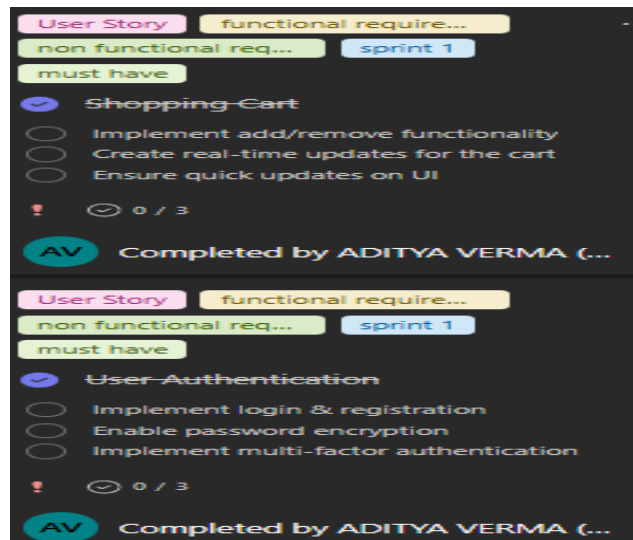


Figure 2.2

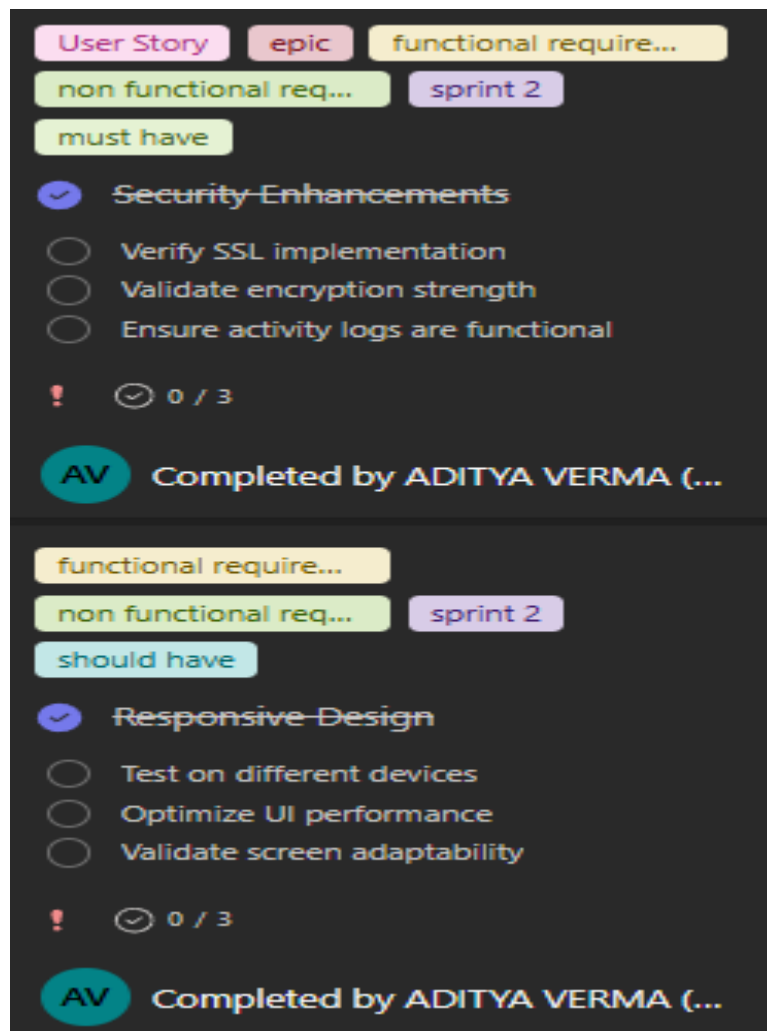


Figure 2.3

2.1.2 Functional Document

2.1.2.1 Introduction

The proposed e-commerce platform aims to redefine digital retail by delivering a user-centric, fast, and secure online shopping experience. The system is designed around key principles of accessibility, personalization, and reliability, ensuring that users—from casual browsers to frequent buyers—can easily discover, evaluate, and purchase products. By leveraging modern web technologies and data-driven design, the platform ensures responsive layouts, smooth navigation, and intuitive interactions across devices. The checkout experience is streamlined to reduce friction, while user accounts enable order tracking, secure payments, and personalized recommendations. The administrative interface provides sellers with powerful tools to manage inventory, track sales, and engage customers. The entire ecosystem is built with scalability and future growth in mind, enabling continuous iteration based on real user behavior and feedback. This makes the platform not just a sales engine but a dynamic marketplace that evolves with user needs and market demands.

2.1.2.2 Product Goal

The primary goal of the platform is to deliver a seamless and secure e-commerce experience that caters to both buyers and sellers. For customers, this means intuitive product discovery, personalized suggestions based on purchase history, and a frictionless checkout process with secure payment gateways. For administrators, the platform offers robust tools for managing product catalogs, analyzing sales data, and processing orders efficiently. A secondary goal is to foster user engagement through account-based features like wishlists, order history, and real-time order tracking. These features increase retention and improve satisfaction. Furthermore, the platform is designed to be mobile-friendly, ensuring accessibility across devices. By balancing functionality with ease of use, the product aims to become a dependable and preferred solution for everyday shopping needs..

2.1.2.3 Demography

The platform targets a broad demographic of online consumers, including tech-savvy millennials, time-constrained working professionals, and first-time internet users exploring digital commerce. On the seller side, it supports small to medium enterprises (SMEs), independent brands, and product resellers. Each user group interacts with the platform in unique ways—shoppers expect quick product discovery, easy payment methods, and

responsive customer service, while sellers require detailed analytics, bulk product uploads, and inventory tracking. The platform supports a multilingual interface and region-specific payment and shipping options to cater to a global user base, with an initial focus on emerging markets where e-commerce is rapidly gaining traction. These demographic considerations influence every aspect of the design, ensuring inclusivity and scalability.

2.1.2.4 Business Processes

Several interconnected business processes define the operation of the platform. The **User Registration and Authentication** process ensures secure onboarding through email or social logins, with encrypted password storage and session handling. Once authenticated, users proceed to **Profile and Address Management**, enabling them to manage shipping details, preferences, and contact information. The **Product Discovery and Search** process allows real-time filtering and sorting, supported by a recommendation engine that factors in user behavior and product metadata. This leads to the **Cart and Checkout** flow, which captures item selection, applies coupons, verifies shipping details, and securely processes payments using integrated gateways. Post-purchase, the **Order Management** process handles confirmation emails, delivery tracking, return initiation, and customer support queries. These business processes are automated where possible and optimized to reduce user friction.

2.1.2.5 Features

The platform features a user-friendly **Registration and Login** system, supporting multi-authentication methods for secure access. **Product Catalog Management** enables dynamic addition and categorization of items by sellers. The **Search and Filtering** system is enhanced with real-time results and personalized suggestions. The **Shopping Cart** allows users to modify quantities, remove items, and apply discount codes. A **Secure Checkout Process** integrates with multiple payment gateways like Stripe and Razorpay, supporting diverse currencies and methods. **Order Tracking** and **User Dashboards** help users monitor purchases, download invoices, and initiate returns. Sellers can access an **Admin Panel** with analytics on sales, traffic, and inventory levels. Collectively, these features provide a full-service e-commerce experience optimized for convenience, reliability, and performance.

2.1.2.7 Assumptions

The development and success of the platform are predicated on several assumptions. First, the **dataset** used to train AI models should reflect a diverse range of learning behaviors, cultural contexts, and subject preferences to avoid bias and deliver effective personalization. Second, **continuous cloud access** is assumed for real-time operations such as live sessions, data syncing, and content delivery. Third, the platform relies on **timely feedback** from users, including ratings, reviews, and engagement metrics, which are essential for improving the recommendation engine and refining content. Finally, the system must comply with all **data privacy norms**, including GDPR and other regional laws, ensuring user data is secure, transparent, and used ethically.

2.1.2 Functional Document

2.1.3.1 Application

The platform follows a **microservices-based architecture** to ensure scalability, modularity, and ease of maintenance. Each core function is encapsulated within an independent microservice. The **Authentication Service** handles secure logins, password recovery, and session tracking. The **Course Management Service** oversees course creation, categorization, and version control. The **User Role Management Service** dynamically adjusts user permissions based on activity or administrative changes. The **Notification Service** ensures real-time updates through in-app alerts, emails, and push notifications, keeping users informed about deadlines, new course releases, or peer messages. This modular breakdown helps isolate issues, facilitates quicker updates, and supports horizontal scaling as the platform grows.

2.1.3.2 System Architecture

The overall architecture is based on a client-server model integrated with cloud-based deployment. The client side, typically accessed via web or mobile applications, communicates with backend services through RESTful APIs. Each microservice is hosted independently, enabling individual scaling and updates. A centralized database supports data storage, while a NoSQL cache layer ensures fast retrieval of frequently accessed information. Third-party AI tools and APIs are embedded to enhance recommendation systems and sentiment analysis modules. A secure API gateway manages all requests, enforces authentication, and tracks performance metrics. The entire infrastructure is containerized using Docker and orchestrated with Kubernetes for fault tolerance and load balancing.

2.1.3.3 Data Exchange Contract

The platform manages various data exchange types to ensure smooth operations. **Real-time data exchanges** occur during user login, live session joins, and course enrollment processes. These transactions are handled with minimal latency to ensure seamless user experiences. **Periodic data exchanges** are scheduled for log processing, AI model training, and performance analytics, typically during off-peak hours to reduce system load. The modes of data exchange include RESTful **APIs** for synchronous requests, **message queues** like RabbitMQ or Kafka for asynchronous communication, and **file-based exchanges** for batch data processing and system backups. These contracts define data formats, validation rules, and security protocols, ensuring consistency and compliance across all integrations.

2.1.4 UI DESIGN

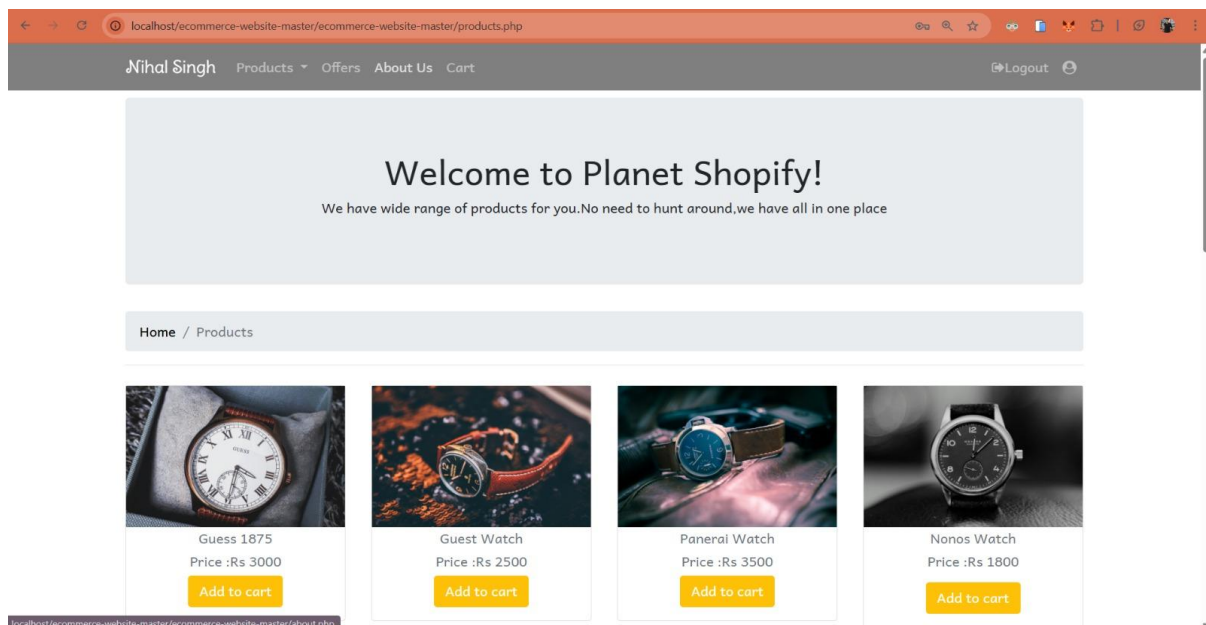


Figure 2.4 UI Design for Landing page

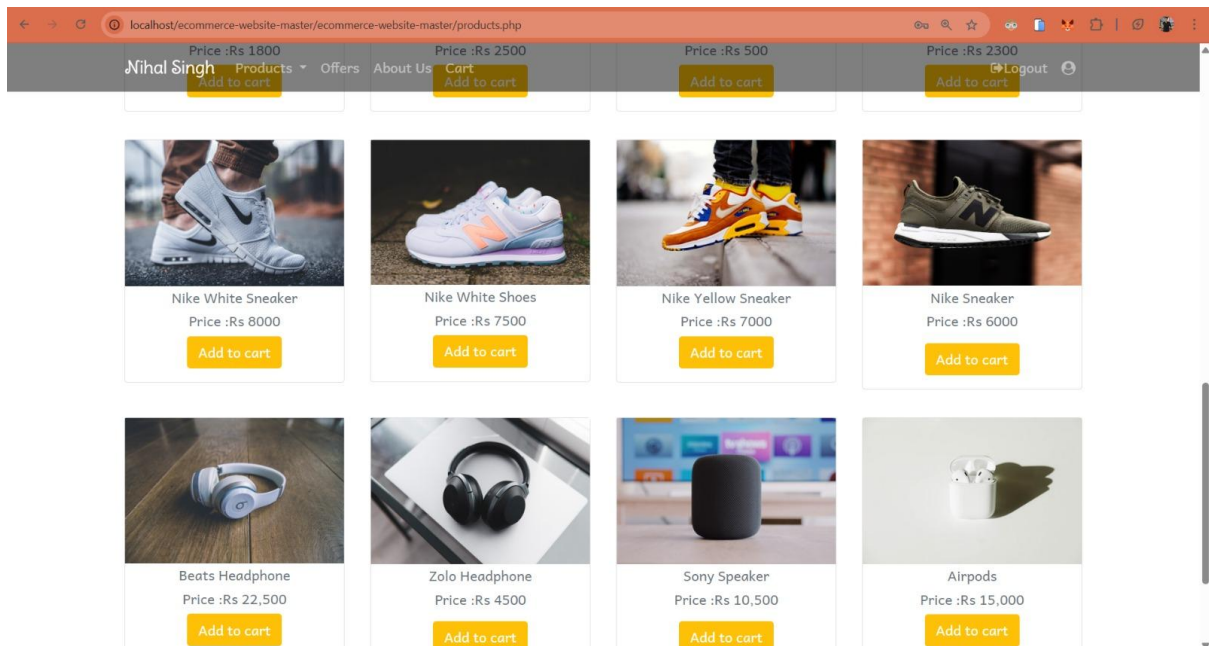


Figure 2.5 UI design for Products Page

2.1.5 Functional Test Cases

Table 2.2 Detailed Functional Test Case

Feature	Test Case	Steps to Execute Test Case	Expected Output	Actual Output	Status	More Information
User Registration	Register with valid credentials	1. Go to signup page 2. Enter valid email and password 3. Click Register	Account is created and user is redirected to homepage	As expected	Pass	Covers email validation and success message
User Registration	Register with invalid email	1. Enter incorrect email format 2. Click Register	Error message for invalid email format	As expected	Pass	Ensures frontend email validation
User Login	Login with correct credentials	1. Go to login page 2. Enter valid credentials 3. Click Login	Redirect to user dashboard	As expected	Pass	Checks JWT or session storage
User Login	Login with wrong credentials	1. Enter wrong password 2. Click Login	Error message shown	As expected	Pass	Handles failed authentication
Home Page	Load homepage without login	1. Visit site root URL	Home page loads with limited options	As expected	Pass	Confirms public route works without login
Navigation	Navigate to login/signup pages	1. Click login/signup buttons from nav bar	Login or signup form displays	As expected	Pass	Navigation bar routing confirmed
Database Setup	Verify user table in DB	1. Register a new user 2. Check database	User details inserted correctly	As expected	Pass	Confirms backend-to-DB flow

2.1.6 Daily Call Progress

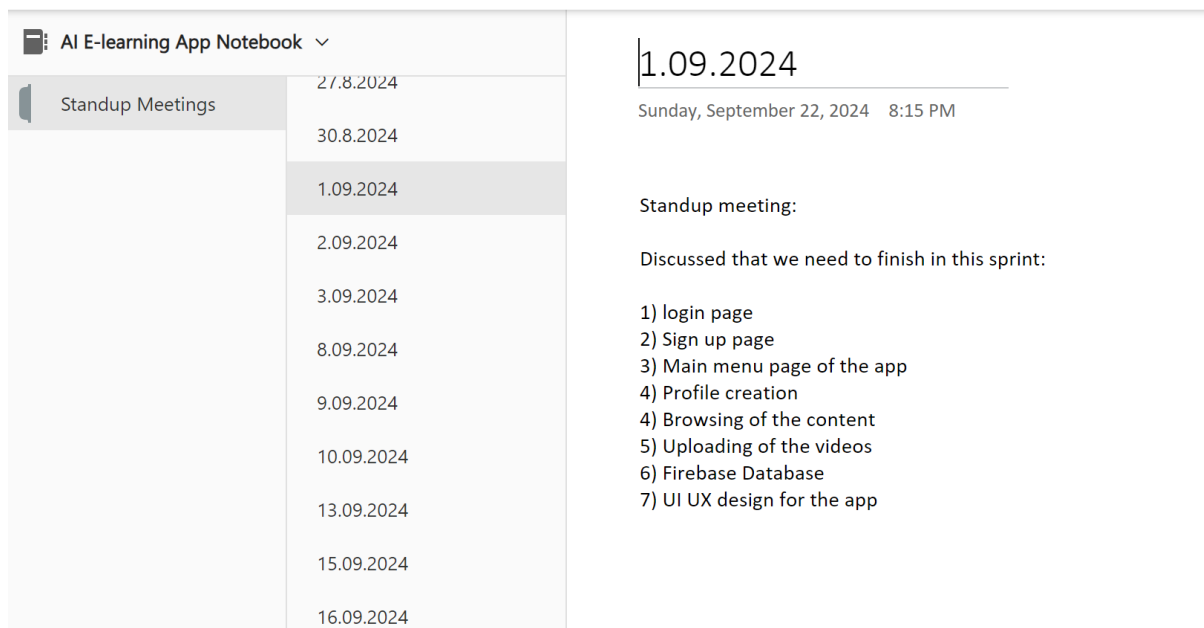


Figure 2.6 Standup meetings

2.1.7 Committed Vs Completed User Stories

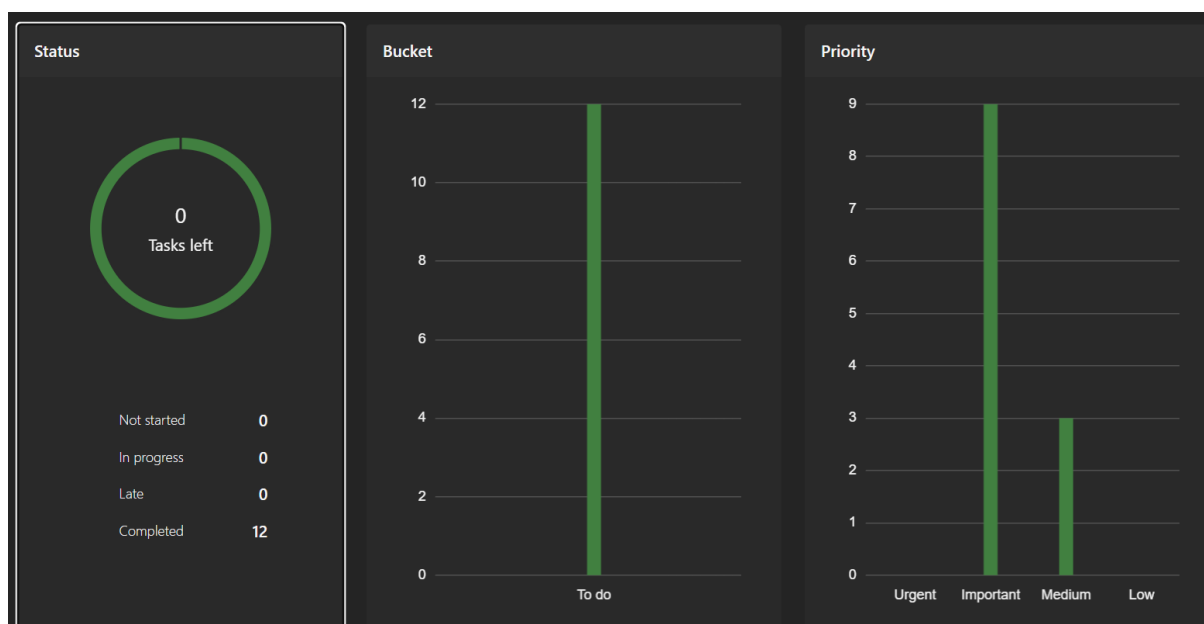


Figure 2.7 Bar graph for Committed Vs Completed User Stories

2.1.8 Sprint Retrospective

Sprint Retrospective				Guidelines
What went well	What went poorly	What ideas do you have	How should we take action	
<i>This section highlights the successes and positive outcomes from the sprint. It helps the team recognize achievements and identify practices that should be continued.</i>	<i>This section identifies the challenges, roadblocks, or failures encountered during the sprint. It helps pinpoint areas that need improvement or change.</i>	<i>This section is for brainstorming new approaches, tools, or strategies to enhance the team's efficiency, productivity, or project outcomes.</i>	<i>This section outlines specific steps or solutions to address the issues and implement the ideas discussed, ensuring continuous improvement in future sprints.</i>	
Project setup was completed smoothly	CSS layout became inconsistent across browsers	Use browser dev tools for better cross-browser testing	Add testing phase after each UI change	
User login and registration forms created successfully	Input validation was initially missing	Use JavaScript for client-side validation	Implement validation before form submission	
Database connection was established	Faced issues with database schema for users	Plan schema on paper before starting	Draw ER diagram before coding DB	
Roles and responsibilities were clearly assigned	Time management was a challenge	Use a Kanban board to track tasks	Start using Trello or Jira to assign deadlines	
Learned to use version control (Git) effectively	Merge conflicts occurred during pushes	Better communication before pushing changes	Set daily sync meeting for updates	
Basic home page layout was completed	Lack of design consistency	Use a style guide or CSS framework	Use Bootstrap for a unified look	
HTML structure was done modularly	Forgot to include accessibility features	Add ARIA roles and alt tags	Review WCAG guidelines during design	

Figure 2.8 Sprint Retrospective for the Sprint 1

2.2 SPRINT 2

2.2.1 Sprint Goal with User Stories of Sprint 2

Sprint Goal: To implement dynamic product recommendation using AI, enhance user interaction through real-time chat support, and analyze customer satisfaction through sentiment analysis on reviews.

Table 2.3: Detailed User Stories of Sprint 2

S.No	Detailed User Stories
US #4	As a customer, I want the platform to recommend personalized products so I can find items I'm more likely to buy.
US #5	As a user, I want to chat with support in real-time so that I can resolve order issues quickly.
US #6	As an admin, I want to analyze customer reviews using sentiment analysis so that I can measure user satisfaction.

2.2.2 Functional Document

2.2.2.1 Introduction

In Sprint 2, the focus shifted from establishing a foundational shopping experience to creating intelligent, interactive, and data-driven improvements. This sprint enhances the personalization and usability of the e-commerce platform by leveraging AI to tailor product suggestions, enabling real-time chat support for immediate customer service, and using sentiment analysis to monitor customer feedback. These additions serve to increase user retention, satisfaction, and conversion rates.

2.2.2.2 Product Goal

The key objective of this sprint is to introduce intelligent product discovery and improve customer engagement through AI-enhanced features. The recommendation engine will suggest items based on user browsing and purchase behavior. Additionally, real-time

customer service will reduce friction in the buying process, while sentiment analysis provides valuable insights into user experience and potential product improvements.

2.2.2.3 Demography

Sprint 2 enhancements benefit repeat customers and active users the most, particularly those in regions with high e-commerce adoption. It targets tech-savvy shoppers who value personalized experiences and quick support. Business owners using the platform as vendors or sellers also benefit from customer sentiment analytics, helping them fine-tune offerings.

2.2.2.4 Business Processes

The newly introduced business processes include:

- **AI Product Recommendation:** Utilizes past interactions to generate personalized product suggestions.
- **Real-Time Chat Support:** Allows users to receive instant help on order, delivery, or product issues.
- **Sentiment Analysis on Reviews:** Processes text data from product reviews to assign sentiment scores and generate analytics for administrators.

These build on top of the search, registration, and checkout processes implemented in Sprint 1.

2.2.2.5 Features

Key features developed during Sprint 2:

- **Recommendation Engine:** Offers users a dynamic set of products based on their browsing/purchase history.
- **Live Chat Support Widget:** Provides real-time messaging with support agents.
- **Review Sentiment Analyzer:** Backend tool that interprets review tone and categorizes them as positive, negative, or neutral.
- **Admin Dashboard Updates:** Visual graphs and metrics showcasing review sentiments and most recommended products.

2.2.2.6 Authorization Matrix

The role-based access system remains unchanged from Sprint 1, but the scope of actions available under each role now includes newly added features:

Role	Additional Access in Sprint 2
Administrator	Monitor sentiment trends, update recommendation logic, manage chat routing rules
Seller	View sentiment analysis for their products, adapt pricing/marketing accordingly
Customer	View product recommendations, access live chat, submit reviews
Guest	See basic trending items without personalized recommendations

This ensures that new features are securely and logically integrated across roles.

2.2.2.7 Assumptions

- Historical customer data is clean and sufficient for training recommendation models.
- Users interact regularly to generate enough data for accurate predictions.
- The platform infrastructure supports increased load from real-time chat and analytics processing.
- Sentiment models are pre-trained and periodically updated based on user-generated content.

2.2.3 UI Design

The screenshot shows a web browser window with the URL 'localhost/Hotel-Management-System-main/card.php'. The page layout is divided into three main sections:

- Payment methods:** A sidebar on the left with options: 'Payment by card' (highlighted in green), 'Internet banks', and 'Apple/Google Pay'.
- Card Details Form:** A central form with fields for:
 - Card number: 9465 2189 4512 4965
 - Expiry date: 12/36
 - CVV: 548
 - Email: raghav@gmail.com
 A green 'PAY NOW' button is at the bottom of this section.
- Order Information:** A sidebar on the right displaying:
 - Name: ujh
 - Email: uu@gmail.com
 - Room Type: Superior Room
 - Check-In: 2025-05-05
 - Check-Out: 2025-05-07
 - Nights: 2
 - Rooms: 1
 - Base Price: ₹6,000 /night
 - Total Amount: ₹12,000**

Figure 2.9 UI Design of Payment Page

2.2.4 Functional Test Cases

Feature	Test Case	Steps to Execute Test Case	Expected Output	Actual Output	Status	More Information
Product Listing	Display products on home page	1. Load homepage 2. Scroll to product section	List of available products is shown	As expected	Pass	Confirms DB-to-frontend rendering
Product Listing	Product card UI check	1. Check each product tile	Product name, price, and image are displayed	As expected	Pass	Ensures consistent UI structure
Search Function	Search for a known product	1. Enter product name in search bar 2. Press Enter	Matching products are listed	As expected	Pass	Verifies search logic and filter
Search Function	Search for nonexistent product	1. Enter random keyword in search 2. Press Enter	No products found message	As expected	Pass	Validates fallback messaging
Admin Dashboard	Add new product (UI)	1. Login as admin 2. Fill product form 3. Submit	Product added and listed on site	As expected	Pass	Verifies form-to-database integration
Admin Dashboard	Edit product details	1. Click edit on existing product 2. Change price 3. Submit	Product updates reflect in listing	As expected	Pass	Update logic checked
Database Check	Verify product table entries	1. Add/edit/delete product 2. Query product table	Data matches operations performed	As expected	Pass	Confirms correct CRUD functionality

Figure 2.10 Functional Test Cases

2.2.5 Sprint Retrospective

Sprint Retrospective				
What went well	What went poorly	What ideas do you have	How should we take action	
<i>This section highlights the successes and positive outcomes from the sprint. It helps the team recognize achievements and identify practices that should be continued.</i>	<i>This section identifies the challenges, roadblocks, or failures encountered during the sprint. It helps pinpoint areas that need improvement or change.</i>	<i>This section is for brainstorming new approaches, tools, or strategies to enhance the team's efficiency, productivity, or project outcomes.</i>	<i>This section outlines specific steps or solutions to address the issues and implement the ideas discussed, ensuring continuous improvement in future sprints.</i>	Guidelines
Product listing page was implemented	Search function was slow initially	Optimize database queries	Use indexes in SQL for performance	
Admin panel UI was designed	No user feedback on design	Conduct informal peer reviews	Share pages with classmates for feedback	
Integrated products table into the database	Product images weren't loading correctly	Validate image paths and formats	Use consistent naming and file checks	
Filtering by category worked well	No pagination implemented	Add pagination in later sprint	Plan pagination logic with offset/limit	
JavaScript DOM manipulation improved	Code became repetitive	Use JS functions/modules	Refactor repeated code into reusable functions	
Good coordination among team members	Incomplete documentation of features	Maintain a dev log after each feature	Assign rotating documentation duties	
Data validation added on product forms	SQL queries not protected from injection	Use parameterized queries	Review SQL security practices	

Figure 2.111 Sprint Retrospective

CHAPTER 3

RESULTS AND DISCUSSION

3.1 Project Outcomes

The development of the e-commerce website has successfully met the core objectives outlined at the start of the project. The website now stands as a fully operational online store that is both functional and user-friendly. Its responsive design ensures that users can shop seamlessly across different devices, while the robust back-end, powered by SQL, supports efficient inventory management and transaction processing.

The successful integration of dynamic features using JavaScript, such as the shopping cart and product filters, has enhanced the website's interactivity and user experience. The secure payment gateway integration assures users that their sensitive information is protected during transactions. From a project management perspective, the completion of the majority of the user stories and the handling of the few delays demonstrated the team's ability to adapt to challenges and deliver high-quality results.

Looking forward, there are several potential enhancements that can be made to improve the website further. One of the primary future enhancements is the implementation of personalized recommendations based on user behavior. By incorporating machine learning algorithms, the website could suggest products tailored to individual preferences, increasing user engagement and potentially boosting sales.

Another area for improvement is the addition of advanced search functionality, allowing users to filter products by additional criteria, such as brand, price range, and customer ratings. This would help customers find the products they are looking for more efficiently, improving the overall shopping experience.

Furthermore, while the website's mobile responsiveness has been successfully implemented, there is always room for improvement in optimizing the platform for different devices, especially with the rapid advancement in mobile technology. Future iterations of the website could focus on refining this aspect to ensure that users on all types of devices experience seamless navigation and fast loading times.

Finally, expanding the website's capabilities by incorporating a blog or content section could increase customer engagement and provide useful content related to the products being sold. This could also improve the website's SEO ranking, drawing more organic traffic.

In conclusion, while the e-commerce website is fully functional and successful in its current form, there are numerous opportunities for future growth and enhancement. By continuously evolving the platform with new features, optimized performance, and improved user experience, the website can stay competitive in the fast-paced world of e-commerce.

3.2 Committed Vs Completed User stories

Throughout the development process, the project team committed to a series of user stories that would help structure the e-commerce platform's functionalities. The user stories were detailed in the project planning phase and included tasks such as product page design, cart functionality, payment gateway integration, and user authentication features. Each user story was assigned a completion deadline and given an estimated timeline for development and testing.

In terms of the total committed versus completed user stories, most of the user stories were successfully completed by the assigned deadlines. Key functionalities, such as the product listing, user login system, and shopping cart, were delivered on time and tested thoroughly to ensure smooth operations. However, there were some user stories that faced delays. For example, integrating a third-party payment gateway presented unforeseen challenges related to API integration and security configurations. As a result, the payment system was slightly delayed but was eventually completed with enhanced security features that improved the overall user experience.

Another delay occurred with the testing of the mobile responsiveness across different devices. The team had initially underestimated the complexity of ensuring perfect mobile display compatibility, which led to a few additional testing cycles. While this delayed the deployment by a week, it was important to ensure the website functioned correctly on all screen sizes, which contributed to a better user experience.

Despite these delays, the project team took the necessary steps to address the issues without compromising the quality of the deliverables. Adjustments to the timeline were made,

and the postponed user stories were completed with careful attention to detail, ensuring that the project met its final objectives.

Overall, while a small number of user stories faced delays, the project stayed on track by re-aligning priorities and focusing on quality assurance, which was essential for the success of the e-commerce website.

CHAPTER 4

CONCLUSION & FUTURE ENHANCEMENTS

The development of the e-commerce website has successfully met the core objectives outlined at the start of the project. The website now stands as a fully operational online store that is both functional and user-friendly. Its responsive design ensures that users can shop seamlessly across different devices, while the robust back-end, powered by SQL, supports efficient inventory management and transaction processing.

The successful integration of dynamic features using JavaScript, such as the shopping cart and product filters, has enhanced the website's interactivity and user experience. The secure payment gateway integration assures users that their sensitive information is protected during transactions. From a project management perspective, the completion of the majority of the user stories and the handling of the few delays demonstrated the team's ability to adapt to challenges and deliver high-quality results.

Looking forward, there are several potential enhancements that can be made to improve the website further. One of the primary future enhancements is the implementation of personalized recommendations based on user behaviour. By incorporating machine learning algorithms, the website could suggest products tailored to individual preferences, increasing user engagement and potentially boosting sales.

Another area for improvement is the addition of advanced search functionality, allowing users to filter products by additional criteria, such as brand, price range, and customer ratings. This would help customers find the products they are looking for more efficiently, improving the overall shopping experience.

Furthermore, while the website's mobile responsiveness has been successfully implemented, there is always room for improvement in optimizing the platform for different devices, especially with the rapid advancement in mobile technology. Future iterations of the website could focus on refining this aspect to ensure that users on all types of devices experience seamless navigation and fast loading times.

Finally, expanding the website's capabilities by incorporating a blog or content section could increase customer engagement and provide useful content related to the products being sold. This could also improve the website's SEO ranking, drawing more organic traffic.

In conclusion, while the e-commerce website is fully functional and successful in its current form, there are numerous opportunities for future growth and enhancement. By continuously evolving the platform with new features, optimized performance, and improved user experience, the website can stay competitive in the fast-paced world of e-commerce.

APPENDIX

A. SAMPLE CODING

```
• <?php
• session_start();
• ?>
• <!DOCTYPE html>
• <html lang="en">
• <head>
•     <meta charset="UTF-8">
•     <meta name="viewport" content="width=device-width, initial-
scale=1.0">
•     <meta http-equiv="X-UA-Compatible" content="ie=edge">
•     <title>Planet Shopify | Online Shopping Site for Men</title>
•     <link rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.1.3/css/bootstrap.
min.css">
•     <link href="https://stackpath.bootstrapcdn.com/font-
awesome/4.7.0/css/font-awesome.min.css" rel="stylesheet" >
•     <link href='https://fonts.googleapis.com/css?family=Delius Swash
Caps' rel='stylesheet'>
•     <link href='https://fonts.googleapis.com/css?family=Andika'
rel='stylesheet'>
•     <link rel="stylesheet" href="style.css">
• </head>
• <body style="margin-bottom:200px">
•     <!--Header-->
•     <?php
• include 'includes/header_menu.php';
• include 'includes/check-if-added.php';
• ?>
•     <!--Header ends-->
•     <div id="content">
•         <div id="bg" class=" ">
•             <div class="container" style="padding-top:150px">
•                 <div class="mx-auto p-5 text-white" id="banner_content"
style="border-radius: 0.5rem;" >
•                     <h1>We sell Happiness :)</h1>
•                     <p>Flat 40% OFF on premium brands </p>
•                     <a href="products.php" class="btn btn-warning btn-lg text-
white">Shop Now</a>
•
•                 </div>
•             </div>
•
•         </div>
•     </div>
```

```

•      <div class="text-center pt-4 h3">
•          * Be fashionable Men *
•      </div>
•      <!--menu highlights start-->
•      <div class="container pt-3">
•          <div class="row text-center ">
•              <div class="col-6 col-md-3 py-3">
•                  <a href="products.php#watch"> 
•                  <!-- https://images.unsplash.com/photo-1523170335258-
f5ed11844a49?ixlib=rb-
1.2.1&ixid=eyJhchBfawQiOjEyMDd9&auto=format&fm=jpg&w=400&fit=max-->
•                      <div class="h5 pt-3 font-weight-bolder">
•                          Watches
•                      </div>
•                  </a>
•              </div>
•              <div class="col-6 col-md-3 py-3 " >
•                  <a href="products.php#shirt" >
•                      
•                      <div class="h5 pt-3 font-weight-bolder">
•                          Clothing
•                      </div>
•                  </a>
•              </div>
•              <div class="col-6 col-md-3 py-3">
•                  <a href="products.php#shoes">
•                      
•                      <div class="h5 pt-3 font-weight-bolder">
•                          Shoes
•                      </div>
•                  </a>
•              </div>
•              <div class="col-6 col-md-3 py-3">
•                  <a href="products.php#headphones">
•                      
•                      <div class="h5 pt-3 font-weight-bolder">
•                          Headphones
•                      </div>
•                  </a>
•              </div>
•          </div>
•      </div>
•

```

```

<!--menu highlights end-->
<!--footer -->
<?php include 'includes/footer.php'?>
<!--footer end-->
</body>
<script src="https://code.jquery.com/jquery-3.3.1.slim.min.js"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.3/umd/popper.min.js"></script>
<script src="https://stackpath.bootstrapcdn.com/bootstrap/4.1.3/js/bootstrap.min.js"></script>
<script>
$(document).ready(function(){
    $('[data-toggle="popover"]').popover();
});
$(document).ready(function() {
    if(window.location.href.indexOf('#login') != -1) {
        $('#login').modal('show');
    }
});
</script>
<?php if (isset($_GET['error'])) {$z = $_GET['error'];
    echo "<script type='text/javascript'>
$(document).ready(function(){
$('#signup').modal('show');
});
</script>";
    echo "<script type='text/javascript'>alert('" . $z .
    "')</script>";}}?>

<?php if (isset($_GET['error1'])) {$z = $_GET['error1'];
    echo "<script type='text/javascript'>
$(document).ready(function(){
$('#login').modal('show');
});
</script>";
    echo "<script type='text/javascript'>alert('" . $z .
    "')</script>";}}?>

```

-
-
- `</html>`