

Tribhuvan University
Faculty of Humanities & Social Sciences



A PROJECT REPORT SUBMITTED FOR MIS & E-BUSINESS
ON THE TOPIC:
E-COMMERCE WEB-BASED APPLICATION – ONLINE SHOPPING SYSTEM
(ONLINE PASAL)

Submitted to

Department of Computer Science & Applications
Mechi Multiple Campus
Bhadrapur, Jhapa

In partial fulfillment of the requirement for Bachelors in Computer Applications

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Supervisor's Recommendation

I hereby recommend that this project prepared under my supervision by **Pawan Bhandari and Saugat Ghimire** entitled **Online Shopping System (Online Pasa)** in partial fulfillment of the requirements for degree of Bachelor of Computer Application is recommend for the final evaluation.

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LETTER ON APPROVAL

This is to certify that this project prepared by **Pawan Bhandari** and **Saugat Ghimire** entitled "**Online Shopping System (Online Pasal)**" in partial fulfillment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

SIGNATURE OF EXTERNAL
EXAMINER

SIGNATURE OF SUPERVISOR

ABSTRACT

In the digital era, traditional shopping methods are increasingly being replaced by online platforms due to convenience, speed and broader accessibility. This project, **Online Shopping System – Online Pasa**, aims to develop a user-friendly, efficient and secure e-commerce platform that allows users to browse, select and purchase products online from the comfort of their homes.

The main goal of the project is to design a professional web-based system that offers essential functionalities such as product listing, search and filter options, shopping cart and online payment gateway integration. The system is developed using **HTML, CSS, Bootstrap** and **JavaScript** for the front-end interface to ensure responsiveness and dynamic user experience, while **PHP and MySQL** are used for the back-end to manage server-side operations and data storage.

The application is built with cost-effectiveness in mind while ensuring scalability and security. The platform also provides an admin panel to manage product categories, inventory, customer orders, and user feedback.

By implementing this system, we aim to digitalize the shopping experience for both customers and shop owners, streamline operations, reduce overhead costs and provide a practical solution for local businesses to go online under the brand name **Online Pasa**.

Keywords

Platform, Integration, Gateway, Responsiveness, Inventory, Cart, Experience, Feedback, Business

ACKNOWLEDGEMENT

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We are deeply grateful to our supervisor, whose guidance and valuable suggestions have helped us prepare and complete this project report titled **Online Shopping System- Online Pasal**. This project has been a significant learning experience for us, providing a deeper understanding of how to design and manage an ecommerce system. This project serves as a foundation for developing and improving various systems in the future. We believe this project has enriched our knowledge and creativity and we hope to apply this experience to our future works.

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LIST OF ABBREVIATIONS

Business to Consumer
(B2C), 1

Data Flow Diagrams
(DFD), 4

User Interface/ User Experience
(UI/UX), 7

Artificial Intelligence
(AI), 7

Entity-Relationship Diagram
(ERD), 16

Hypertext Preprocessor
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Chapter 1: Introduction

1.1 Introduction

The rapid advancement of digital technology in the 21st century has revolutionized communication, information sharing and management processes. The digital world enables seamless access to devices, media, and networks, fostering opportunities for innovation and efficiency. Systems created in this era are designed to address challenges dynamically, making processes more streamlined and accessible. In this context, digital systems play a crucial role in storing, processing, and communicating information effectively.

An online shopping system, or Online Pasa, is a digital marketplace that allows customers to browse, select, and purchase products over the internet. It streamlines the retail process for businesses and provides a convenient shopping experience for consumers. It is a Business to Consumer (B2C) model. This system manages product inventories, processes orders, handles payments and facilitates user interactive platform for performing online transactions. It significantly reduces the need for traditional stores, offering a structured, time-saving approach to commerce. It is particularly beneficial for businesses by expanding their reach and for customers by providing easy access to a wide variety of goods. It is a system that aims to digitalize the shopping procedure by providing a smooth process of purchasing products by allowing customers to browse, add items to a cart and complete transactions online.

We want to build this system to address the inefficiencies and challenges of traditional retail, which can be geographically limited, require significant overhead and may have restricted operating hours. The current process often limits customer access and requires physical presence. By developing an online shopping system, there is aim to modernize and simplify the retail procedure, ensuring a more efficient and transparent experience for both businesses and customers.

The implementation of an online shopping system brings numerous advantages to businesses by enhancing operational efficiency and expanding market reach. Additionally, it enhances accessibility for customers, allowing them to shop from anywhere at any time. This digital transformation not only optimizes business workflows but also improves user experience, encouraging a more transparent and convenient purchasing process.

1.2 Problem Statement

In every process, challenges can hinder the system's effectiveness if not addressed properly. The following are some key problems associated with the System:

a) Limited Technical Knowledge

Many users have trouble using the system but don't get help quickly. Without support, they find it hard to finish applications, which causes frustration and missed chances. This lack of assistance can be especially challenging for first-time users who are unfamiliar with the process.

b) Frequent Technical Issues

Systems often crash or go offline during peak shopping times. Slow loading times and poor performance frustrate users. An Internet connectivity issues can disrupt the application process. Such disruptions can lead to incomplete applications, forcing customers to restart the process multiple times.

c) Weak Security

Personal information like customer details, academic records and payment data is not always protected. Data breaches can expose sensitive information, leading to privacy concerns. Weak passwords and lack of proper security measures can make the system vulnerable to hacking.

d) Complex and Confusing Interface

Many systems are not user-friendly with complicated menus and unclear instructions. Customers often struggle to navigate the system that leads errors which make incomplete information to purchase any goods or items. A poorly designed interface increases the likelihood of mistakes, requiring additional administrative efforts to correct them.

e) Errors in Data Entry and Processing

Mistakes in entering or processing details can cause delays or unfair rejections. A lack of proper validation checks leads to inaccurate data. Typing mistakes or incorrect information entered by customers can result in misleading records, making it difficult to verify their details accurately.

These challenges highlight the need for constant monitoring and improvement by qualified administrators and customers to ensure the system's effective functioning in the digital era.

1.3 Objectives

The Online Shopping System has several key objectives that ensure its efficiency and usefulness. Some of the main objectives are:

- a) To create a web-based platform which allows to view, search and buy products from online.
- b) To make the trading process easy and error-free by reducing physical factors.

1.4 Scope and Limitations

Scope:

a) Product Searching and Browsing

Customers can browse various product categories and search for specific products based on filters like price, brand and rating.

b) User Login and Registration

Customers can register accounts, login securely and access personal details and order history.

c) Shopping Cart and Checkout

Customers can add items to a cart, modify quantities and proceed to secure checkout.

d) Admin Panel:

Admin may modify products, categories, users, orders and sales reports via backend panel.

e) Fee Payment Integration:

Online payment gateway integration for making payments of specific goods and items.

Limitations:

a) Technical Issues:

Internet connectivity issues, system downtime, or technical glitches can disrupt the application process.

b) Product Return and Exchange Complexity:

Online Processing of returns and refunds may involve delays and required proper verification.

c) System Maintenance:

The system requires regular maintenance, updates and security patches to ensure its smooth functioning.

1.5 Report Organization

The first chapter provides a summarized introduction of the entire report. It includes the overview, scope, limitations, problem statement and objectives of the system. Additionally, it highlights the importance of the system and its impact on the trading process.

The second chapter includes the background study, which consists of a description of fundamental theories, general concepts and terminologies related to the project. It also contains a literature review analyzing similar projects, previous research and existing theories by other researchers. This chapter helps in understanding the existing solutions and identifying gaps that the proposed system aims to address.

The third chapter covers the system analysis and design phase, which includes a detailed report of functional and non-functional requirements of the project. This phase uses use case diagrams and system diagrams to describe the system's behavior. It also includes a feasibility study to determine whether the system can be successfully developed based on available resources, budget and technology. The feasibility study covers technical, operational, economic and other aspects of the project. Additionally, this chapter explains the system design, including data modeling and process modeling, represented by ER diagrams and Data Flow Diagrams (DFD). The architectural design, database design and user interface design are shown as detailed in this section.

The fourth chapter includes the implementation and testing phase of the proposed system. In the implementation phase, the choice of programming languages, frameworks, tools and database platforms is explained. The testing phase ensures the system functions correctly by using unit testing, integration testing, system testing and User Acceptance Testing (UAT). This chapter also includes error handling and debugging strategies.

The fifth chapter contains the conclusion and future recommendations. It summarizes the final outcome of the system, presents the developer's point of view and discusses challenges faced during the project. The lessons learned from all the phases of development are also included. Additionally, this chapter suggests future improvements and upgrades to enhance the system's performance, security and usability.

Chapter 2: Background Study and Literature Review

2.1 Background Study

Online shopping, also known as e-commerce, has significantly transformed how people buy and sell goods. With the growing use of the internet and mobile technology, customers now prefer the comfort and convenience of shopping from home rather than visiting physical stores. In Nepal, the demand for web-based platforms like Online Pasal has rapidly increased, especially after the impact of COVID-19 and the rising digital awareness but it's not for only Nepal, it is also accessible in international countries.

However, traditional retail shops and even some basic online platforms still face several challenges, including limited product visibility, manual order management, lack of secure payment options, and inefficient customer service.

To overcome these issues, Online Pasal aims to build a user-friendly, secure, and efficient web-based online shopping system. It will allow customers to browse a wide range of products, add items to a cart, pay securely using popular gateways like Khalti, Paypal and other various platforms which track their orders in real-time. For admins, the system will offer easy product management, inventory tracking, and order processing through a dedicated dashboard.

This project highlights the growing importance of digital platforms in the retail sector and how solutions like Online Pasal can enhance user experience, reduce operational workload, and promote a modern approach to commerce in Nepal.

2.1.1 Description of Fundamental Theories

a) Data Management and Error Prevention

It stores customer details, product and order data for smooth operations by validating contact and payment details to avoid mistakes and ensure smooth order completion.

b) Process Automation:

Automating processes such as order placement, stock updates, billing, and notification systems to reduce manual errors and speed up transactions.

c) User-Friendly Design:

Designing a simple and intuitive interface so that even non-technical users can easily shop online.

d) Transparency:

Providing real-time updates to customers on order status and payments for trust and satisfaction.

2.1.2 General Concepts and Terminologies Related to the project

a) Online Shopping System:

A digital platform that allows users to browse products, place orders, make payments, and track delivery through the internet.

b) Customers:

Users who register on the platform to search, select, and purchase products available in the system.

c) User Roles:

There are two main user types: Customers, who shop and place orders, and Admins, who manage product listings, stock levels, and customer orders.

d) Product Listing and Order Status:

Admin uploads product details like name, price, images, and stock status, which are then displayed for customers to view and purchase. It shows the current state of a customer's order such as pending, completed.

e) Cart and Checkout:

Customers can add items to their shopping cart and proceed to checkout, where they confirm details and complete payment.

g) Dashboard:

A centralized panel where customers can view their orders and profile info, and admins can manage the entire system.

h) Authentication:

Secure login and registration system to ensure that only authorized users can access or modify their account data.

i) Payment Integration:

Payment with online wallets or bank systems to handle digital transactions.

j) Database:

A backend system that stores all necessary data, including customer profiles, product details, order records, and payment info securely.

2.2 Literature Review

2.2.1 Theory done by other researchers

The shift from traditional in-store shopping to online shopping platforms has gained significant attention among researchers, driven by advancements in digital technology and changing consumer behavior. Studies reveal that online shopping systems offer improved convenience, time savings, and a broader product selection compared to traditional marketplaces. These systems are found to streamline the entire purchasing process, allowing users to search, compare, and purchase products with minimal effort. [1]

Researchers have also emphasized the importance of e-commerce scalability, especially during peak shopping seasons or promotional campaigns. Cloud-based infrastructures allow online platforms to handle large user traffic efficiently, ensuring consistent performance and reducing downtime. [2]

Security and payment protection are critical factors in building user trust in online shopping. Multiple studies highlight the necessity of end-to-end encryption, secure payment gateways, and multi-factor authentication to prevent fraud and data breaches. [3] Alongside security, user interface and experience (UI/UX) also play a key role in customer retention. Research shows that intuitive navigation, mobile responsiveness, and clear product categorization significantly impact customer satisfaction and conversion rates. [4]

In recent years, the integration of Artificial Intelligence (AI) in online shopping systems has enhanced the personalization of the shopping experience. AI-powered recommendation engines analyze user behavior and preferences to suggest relevant products, thereby increasing user engagement and sales. Furthermore, AI-driven chatbots are being used to assist customers in real-time, reducing support wait times and improving customer service efficiency. [5]

Table 1: Literature Review Summarization

Study Focus	Key Findings	References
Digital Transformation in Shopping System	Online shopping systems enhance convenience, speed and flexibility for buyers.	[1]
Role of Cloud-Based Platforms	Cloud support enables the platform to scale during peak shopping times, ensuring high availability.	[2]
Security in Online Shopping System	Secure payment gateways, encryption, and authentication are vital for protecting user data.	[3]
User Experience (UI/UX)	Easy navigation, product search, and mobile compatibility increase user satisfaction.	[4]
AI in Online Shopping	AI enables smart recommendations and chatbot support, enhancing user interaction and service.	[5]

2.2.2 Review of similar projects

Here is the short review of existing system which is similar to our system including its features, strengths, weakness and areas for improvements.

Common Features

- a) User registration, login and customer profile management.
- b) Product browsing with search, filters and detailed views.
- c) Admin dashboard for manage products, orders and users.
- d) Shopping cart and checkout system.
- e) Payment integration, order placement, tracking and history.

Strengths

- a) Convenient shopping from home, 24/7 availability.
- b) Efficient order processing and digital payment system.
- c) Provides a centralized admin dashboard for efficient management.
- d) User friendly interfaces with search and filter functions.

Weaknesses

- a) Limited mobile responsiveness and lack of multi-language support.
- b) Lack of product return mechanisms.
- c) Security vulnerabilities and server downtime issues.
- d) No email or SMS notifications for application updates.
- e) No offline order or call- based support for rural users.

Areas for Improvement

- a) Introduce full multi-language options.
- b) Enhance security and authentication mechanisms.
- c) Implement an email and SMS notification system to keep informed to the users.
- d) Practice the system of product return to enhance customer satisfaction.

Chapter 3: System Analysis and Design

3.1 System Analysis

This system is designed with the series of processes starting with requirement gathering, design, implementation, testing maintenance and documentation. During requirement analysis, all the functional and nonfunctional requirement are analyzed and system is developed according to the requirement then designing of the system is carried out. After the design process, coding and development part is started then after integrating the system there is testing of the system. If the testing is positive then system is implemented otherwise some maintenance is done and system come in operation.

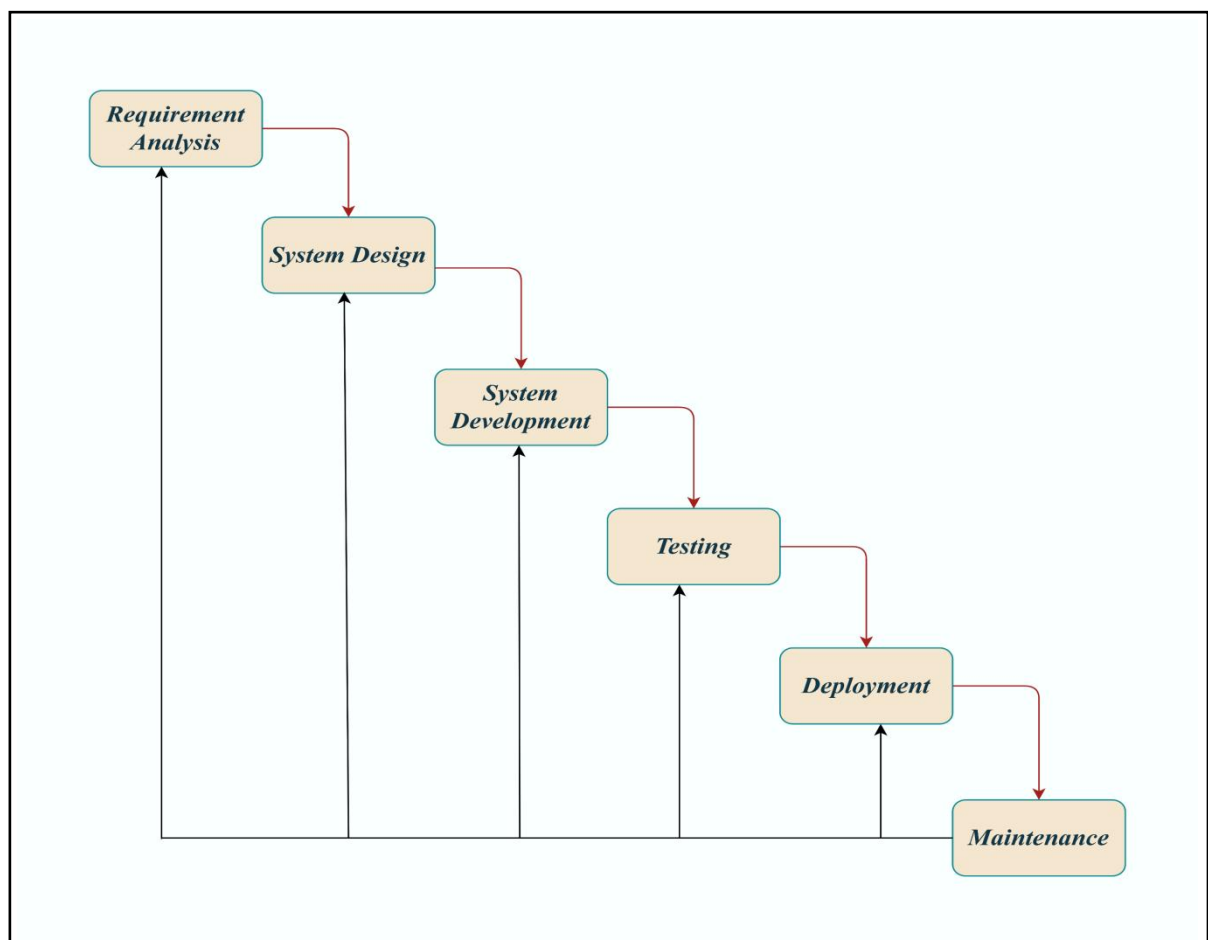


Figure 1: Waterfall Methodology of Online Shopping System (ONLINE PASAL)

We decided to choose the Waterfall model to proceed with the web-based system development since our requirements are clear from the starting and it provides a clear structure with well-defined phases, making it suitable for projects with fixed requirements. The different phases are explained below:

a) Requirement Analysis:

Requirement Analysis is the first phase of system development in the Waterfall Model, as well as in many other methodologies. In the Requirement Analysis phase, the focus is on gathering and documenting the needs of the shopping system, including functionalities like user registration, best product selection, trading and payment of products.

b) Design:

Design is the second phase of system development. This phase focuses on the outward development of any system. The Design phase involves creating the architecture of the Online Shopping system (Online Pasa) including database schemas, workflows and user interfaces. High-level designs like ER diagrams and flowcharts are developed to visualize data flow and interactions.

c) Development:

In this phase, system can build using programming language by development teams. Frontend development involves creating responsive and user-friendly forms with CSS, Bootstrap and JavaScript. Backend development includes writing code in PHP to process and SQL database to store data securely. The database is implemented with tables for user and other different information about campus, course, faculty etc.

d) Testing:

It is a process of evaluating the quality of system. It is an approach of evaluating an error or fault before marketing. For login, unit testing involves verifying that the system accepts a valid email and password combination, redirects users to the appropriate dashboard (customer or admin) and denies access for invalid credentials. Form testing ensures that all fields to follow validation rules such as correct email formats, fill up required fields and valid data entries. Integration testing checks the interaction between components, like the form submission saving data in the database and notifying the admin for approval.

e) Deployment:

The Deployment phase is the final step in system development, where the product is launched in the market after thorough testing and development. This phase involves implementing the system in a specific environment, ensuring that all components are functional and accessible to users. Initially, our shopping system is deployed on a localhost server after testing and evaluation.

f) Maintenance:

Maintenance involves the ongoing process of updating and managing the system after it has been delivered. Regular monitoring of the system on the localhost server helps identify and resolve performance issues, bugs or errors reported by users. Maintenance tasks include updating the system to accommodate changes in requirements, such as new items or products and refining other features.

3.1.1 Requirement Analysis

Requirement analysis for a Shopping System involves gathering both functional and non-functional requirements to ensure the system effectively meets the needs of users. Functional requirements include core functionalities such as enabling customer to register, view product details and their price and also receive paying notifications of buying products. Administrators must be able to manage quality goods and services, update new products and monitor trading activities.

On the other hand, non-functional requirements focus on system attributes like scalability, ensuring the system can handle large numbers of users or customer during shopping periods, security to protect sensitive customer data with robust authentication and encryption, and usability, ensuring a user-friendly interface for both customers and administrators. These requirements form the foundation for designing a reliable and efficient shopping system.

A) Functional Requirements

The functional requirements of the system are demonstrated using the Use Case Diagram as shown below. A Use Case Diagram is a vital tool in system design, it provides a visual representation of how users interact with a system. Use case diagram consists actor, use case and system boundary. It can identify actors, use cases, connect actors and system boundary, define relationships etc. In use case diagram of the system there are two actors namely: system user (customer) and admin.

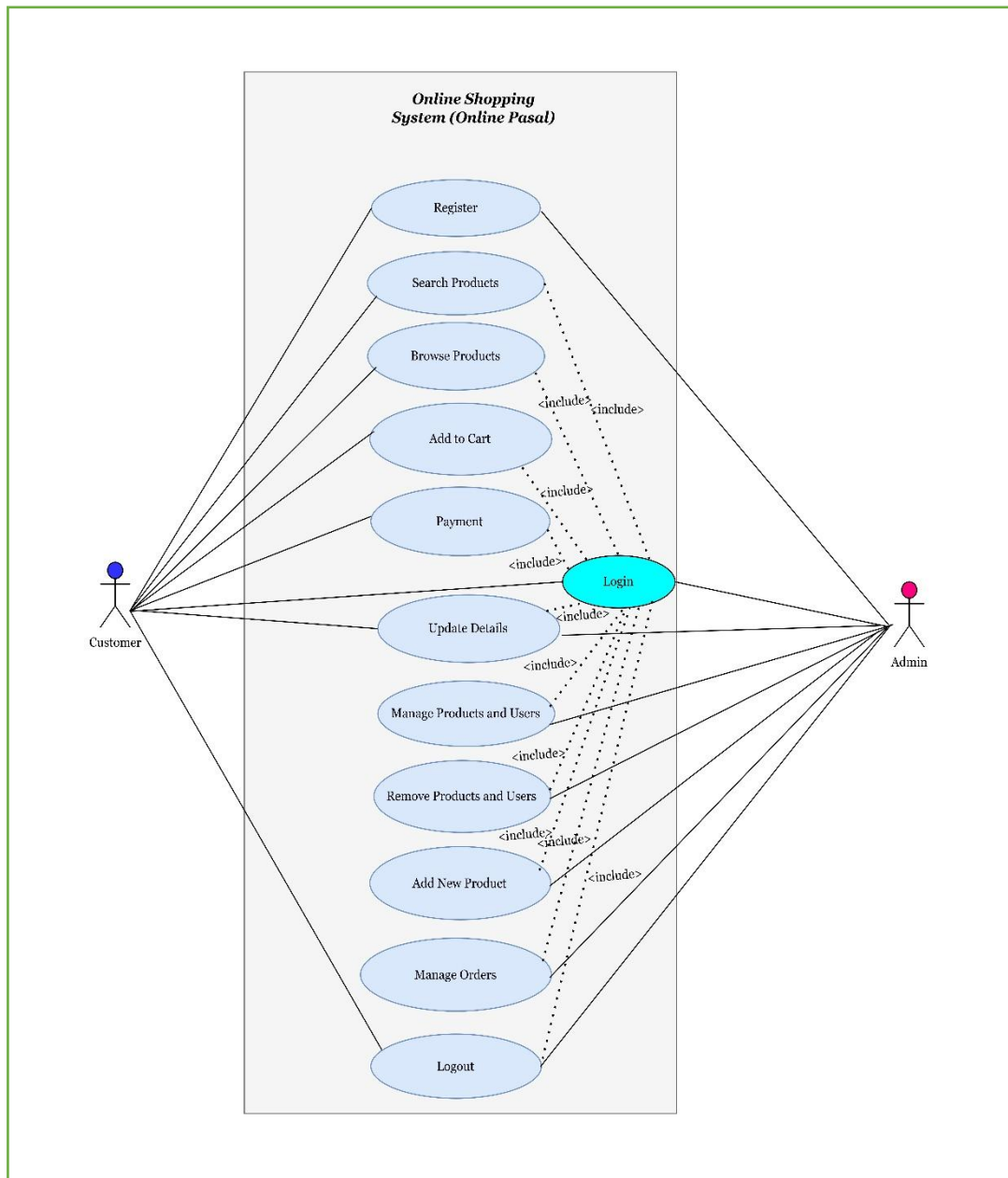


Figure 2: Use Case Diagram of Online Shopping System (ONLINE PASAL)

According to the picture activity we can success to see that user of the system customer can access with register, login, payment, search and browse products, add to cart, update details and logout whereas admin can be accessible with login, register, update details, manage products and users, remove products and users, add new product and manage orders and logout.

B) Non-Functional Requirements

a) Performance:

The system must be capable of handling a high volume of concurrent users, especially during peak periods such as festival, ceremonies etc. It should provide fast response times and ensure that users can access the system without delays even with multiple users interacting at the same time.

b) Maintainability:

Maintainability refers to how easily the shopping system can be updated, improved, or fixed. The system is designed for quick and cost-effective changes, requiring minimal effort to implement updates or fixes. Its modular design, along with clear documentation, makes it easy to troubleshoot problems and add new features or enhancements over time.

c) Scalability:

The system efficiently manages low to moderate user loads, primarily serving admins with occasional user interactions. Data is stored securely in an online database and the system adapts to future increases in user traffic or data volume. The current infrastructure supports smooth operation without overloading.

d) Usability:

A shopping system must be user-friendly, with a clean interface and clear instructions, allowing customers and administrators to navigate easily. It should be responsive across devices, enabling smooth form submission and payment processing.

e) Availability:

The system ensures continuous access, allowing users to perform tasks like form submissions and data retrieval 24/7. It achieves an uptime of at least 99.99%, ensuring availability even during peak times. Backup and failover mechanisms are implemented to maintain operations in case of technical issues.

f) Security:

The system must ensure the protection of sensitive user data, such as personal details, product records and payment information. All data transmitted between the user's device and the server should be encrypted using industry-standard protocols. Access to the system should be restricted through secure mechanisms.

3.1.2 Feasibility Analysis

a) Technical Feasibility:

The technical feasibility of the Shopping System ensures that all necessary resources are available for successful implementation. The system uses reliable software technologies like JavaScript and MySQL and works on standard hardware, including servers, desktops, and mobile devices. With our combined skills, the two of us can efficiently develop the system, handling tasks like form validation, secure data storage and user-friendly dashboards.

b) Economic Feasibility:

The economic feasibility evaluates the cost-effectiveness of the system by analyzing its expenses and benefits. The benefits include a significant reduction in administrative workload, elimination of manual errors and improved efficiency in the trading process. The economic feasibility checks if the system is cost-effective. In our shopping system if analyzing the total cost NPR 50,000–55,000 to develop including tools, development and testing. Annual maintenance costs NPR 5,000–10,000 for updates and support. It reduces paperwork, saves staff time, lowers printing costs and minimizes errors. With faster processing and better data management, the system is worth the investment.

c) Operational Feasibility:

The operational feasibility assesses the system's ability to meet user requirements effectively. For customers, the system provides a simple and intuitive registration process with clear guidance. For administrators, it offers efficient data management, user validity and streamlined workflows to handle shopping activities effectively. By addressing the specific needs of its users, the system ensures operational efficiency and user satisfaction, demonstrating its feasibility in practical application.

d) Legal Feasibility:

The legal feasibility ensures that the system complies with all relevant laws and regulations. It adheres to data protection laws by securely handling sensitive customer information. The software and tools used in the system are properly licensed and all regulatory requirements set by educational authorities for online shopping systems are followed. This ensures that the system operates within the legal framework, avoiding potential legal barriers or conflicts.

e) Scheduled Feasibility:

The scheduled feasibility evaluates its ability to be developed and implemented within the planned timeframe. The project follows a structured timeline with defined phases, including requirement analysis, design, development, testing, deployment, maintenance and documentation. Tasks are allocated efficiently to ensure progress aligns with the academic calendar. This ensures the project meets deadlines without compromising quality, enabling smooth and timely use during the trading process.

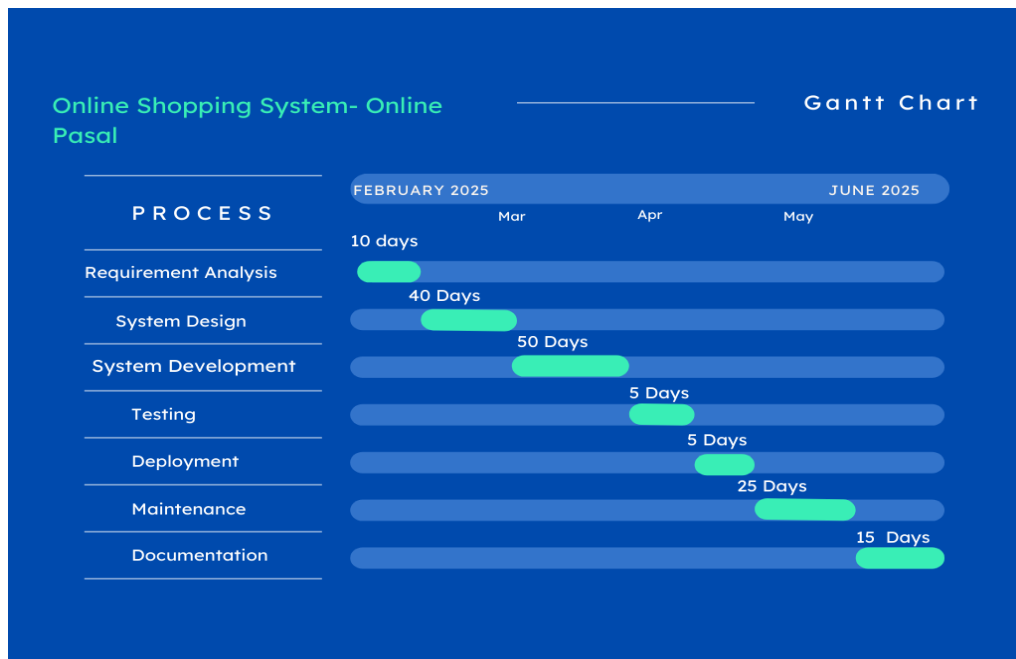


Figure 3: System Gantt Chart

Task	Total Duration (150 Days)	Start Date	End Date
Requirement Analysis	10	February 25, 2025	March 6, 2025
Design	40	March 7, 2025	April 15, 2025
Development	50	April 16, 2025	May 4, 2025
Testing	5	May 5, 2025	May 9, 2025
Deployment	5	May 10, 2025	May 14, 2025
Maintenance	25	May 15, 2025	June 9, 2025
Documentation	15	June 10, 2025	June 25, 2025

Figure 4: System Project Timeline

3.1.3 Data Modelling (ER diagram)

An Entity-Relationship Diagram for an online system visually represents the key entities, their attributes, and relationships within the system. It helps in database design and ensures data is stored and managed efficiently. It includes entities like Payment, Admin, Login, Cart, Products, Brands, Categories and relationships like branded as, contains, places, classified as, paid via, has.

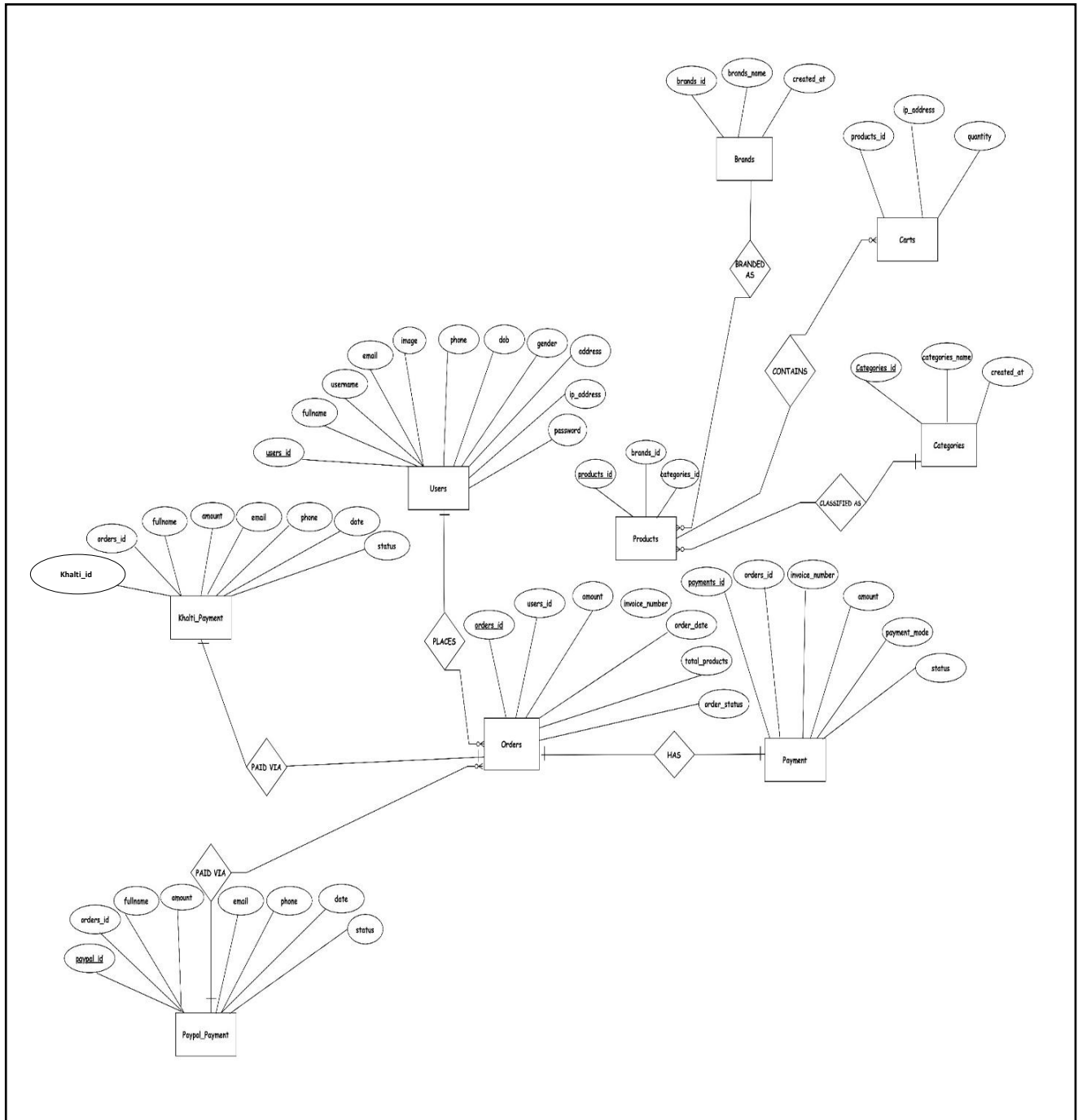


Figure 5: ER Diagram of Online Shopping System (ONLINE PASAL)

3.1.4 Process Modelling

Process modeling is a method used to visually represent the steps, activities, and flow of information in a system or business process. It helps in understanding, analyzing and improving how a process operates, ensuring efficient and effective outcomes. It includes DFD Levels. It is also called Context Diagram.

A. Context Diagram

A Context Diagram is a high-level Data flow diagram (DFD) that represents a system and its interactions with external entities. It provides a simple, big-picture view of how data flows between the system and its environment without detailing internal processes. Here is the context diagram of Shopping system which provides the description of system process.

System Interaction: The diagram illustrates the interaction between users (customers) and administrators with the Shopping System, showing data flow between them.

User Operations: Users can register, log in, provide enrollment information, make payments, and receive enrollment reports from the system.

Admin Role: Administrators log in, manipulate customer details, and generate reports, ensuring efficient shopping management.

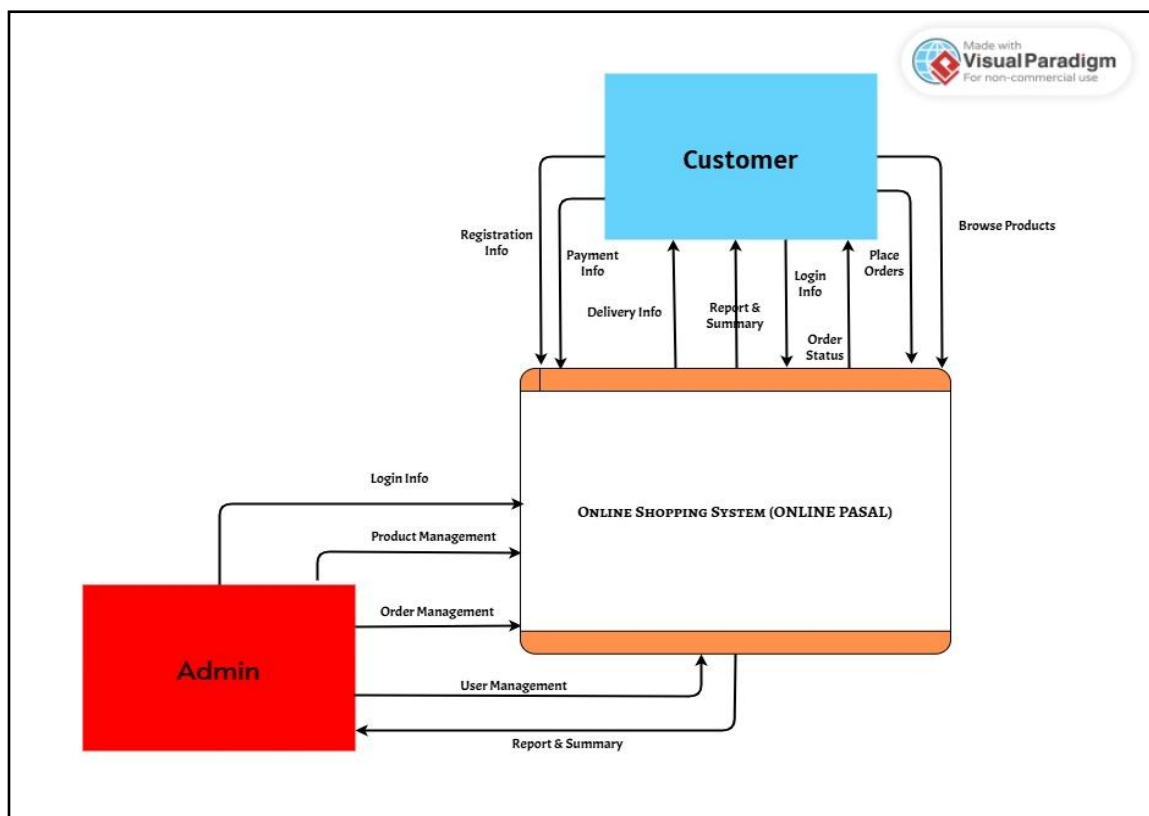


Figure 6: Context Diagram of Online Shopping System (ONLINE PASAL)

B. Top Level DFD (Level 0 DFD)

A **Level 0** is Top-Level DFD expands on the Context Diagram by breaking down the system into its main functional processes while maintaining external entities and data flows.

Process Flow: The diagram represents the structured process of a shopping system, covering registration, login verification, enrollment, payment and report generation.

User and Admin Roles: Users provide login credentials, enroll in courses, make payments, and receive reports, while admins verify data, manipulate details, and generate reports.

Data Storage and Flow: The system stores login, enrollment, and payment details in databases, ensuring secure data handling and efficient shopping management.

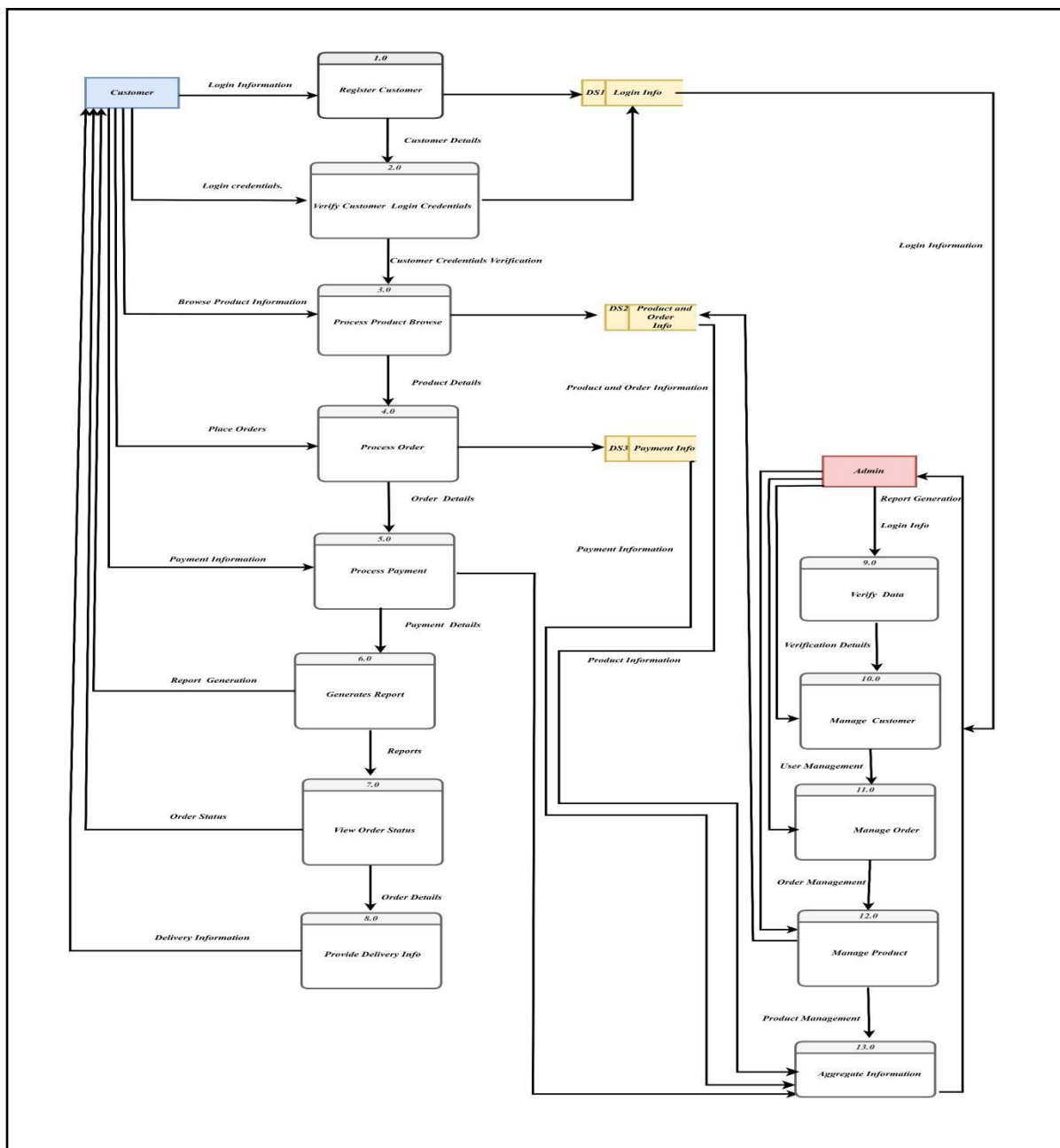


Figure 7: Top Level DFD of Online Shopping System (ONLINE PASAL)

3.2 System Design

System design is the process of structuring the architecture, components, and data flow of a system to meet specified requirements. The Online Shopping System enables customers to browse and purchase products digitally, streamlining the shopping experience through features like online registration, product catalog browsing and order placement. The design is achieved through various schema designs and the following detailed designs:

3.2.1 Architectural Design

The architecture includes three main layers:

Presentation Layer:

- a) User interfaces such as login, registration forms and dashboards for customers and administrators.
- b) Built with CSS, Bootstrap and JavaScript for responsiveness and interactivity.

Business Logic Layer:

- a) Manages core functionalities such as customer registration, validation and data processing.
- b) Built with PHP for backend processing.

Data Layer:

- a) Stores user data, documents and application records in a MySQL database.
- b) Ensures data security and integrity.

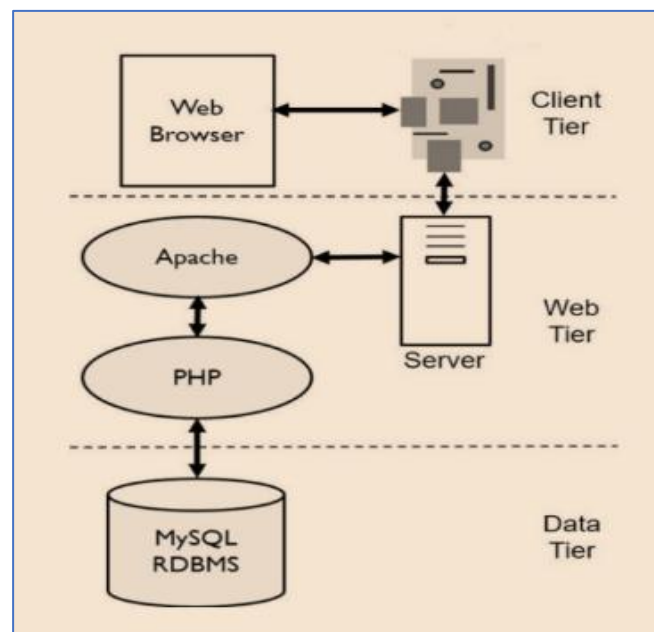


Figure 8: Architectural Design of Online Shopping System (ONLINE PASAL)

3.2.2 Database Schema Design

A database schema design is crucial for structuring data efficiently and ensuring smooth interactions between the system's components. The schema organizes the data into separate tables, defines the relationships among the tables and applies constraints like primary and foreign keys for data integrity.

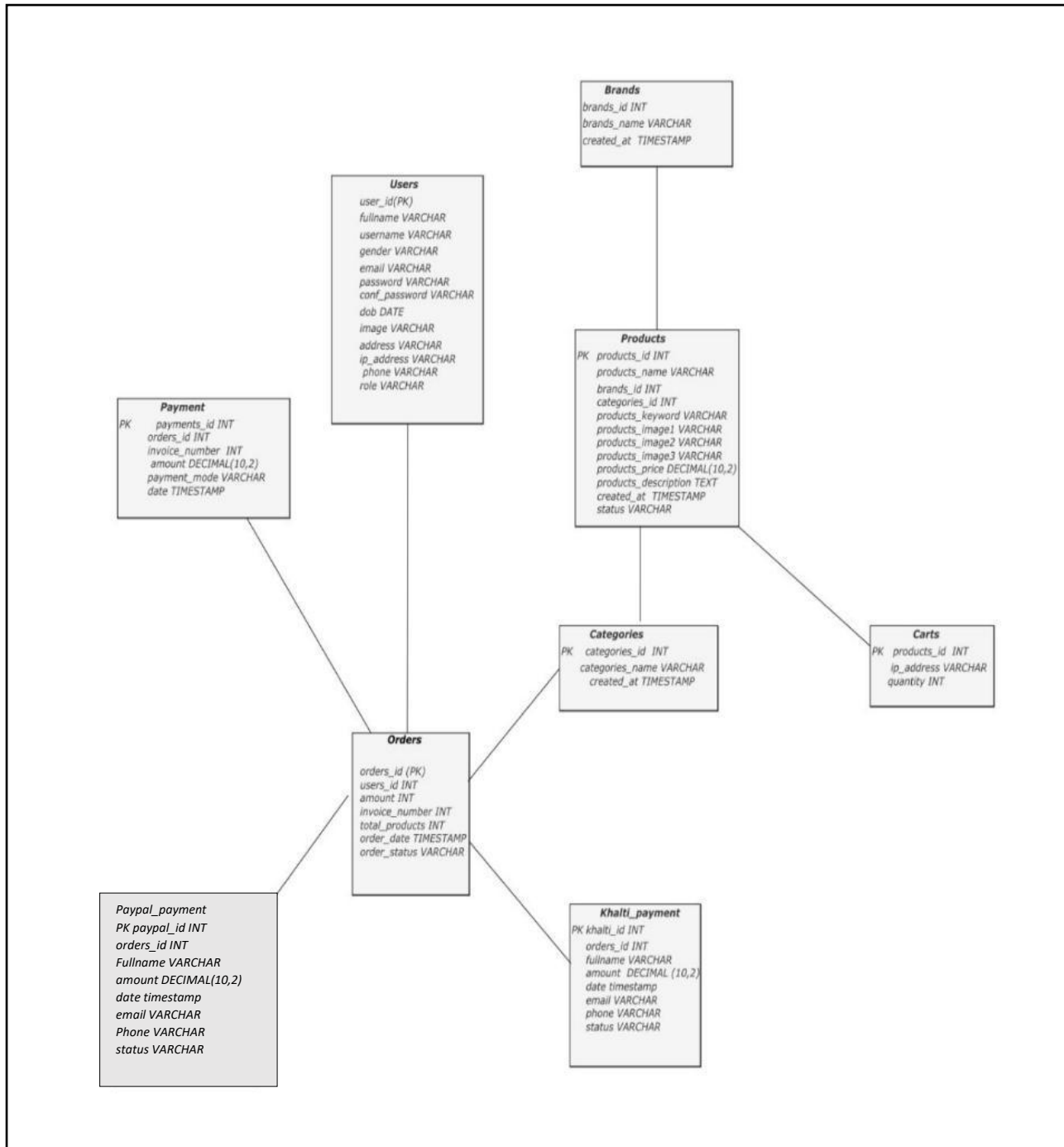


Figure 9: Database Design of Online Shopping System (ONLINE PASAL)

3.2.3 Interface Design

This shopping system interface is designed to streamline the product trading process for both users and administrators. It provides a clear and structured workflow, allowing users to log in, select products, their quantities, make payments and view or update their details. Administrators have access to a comprehensive dashboard where they can manage tasks such as adding products, managing products, updating or deleting products, managing payments and viewing detailed reports.

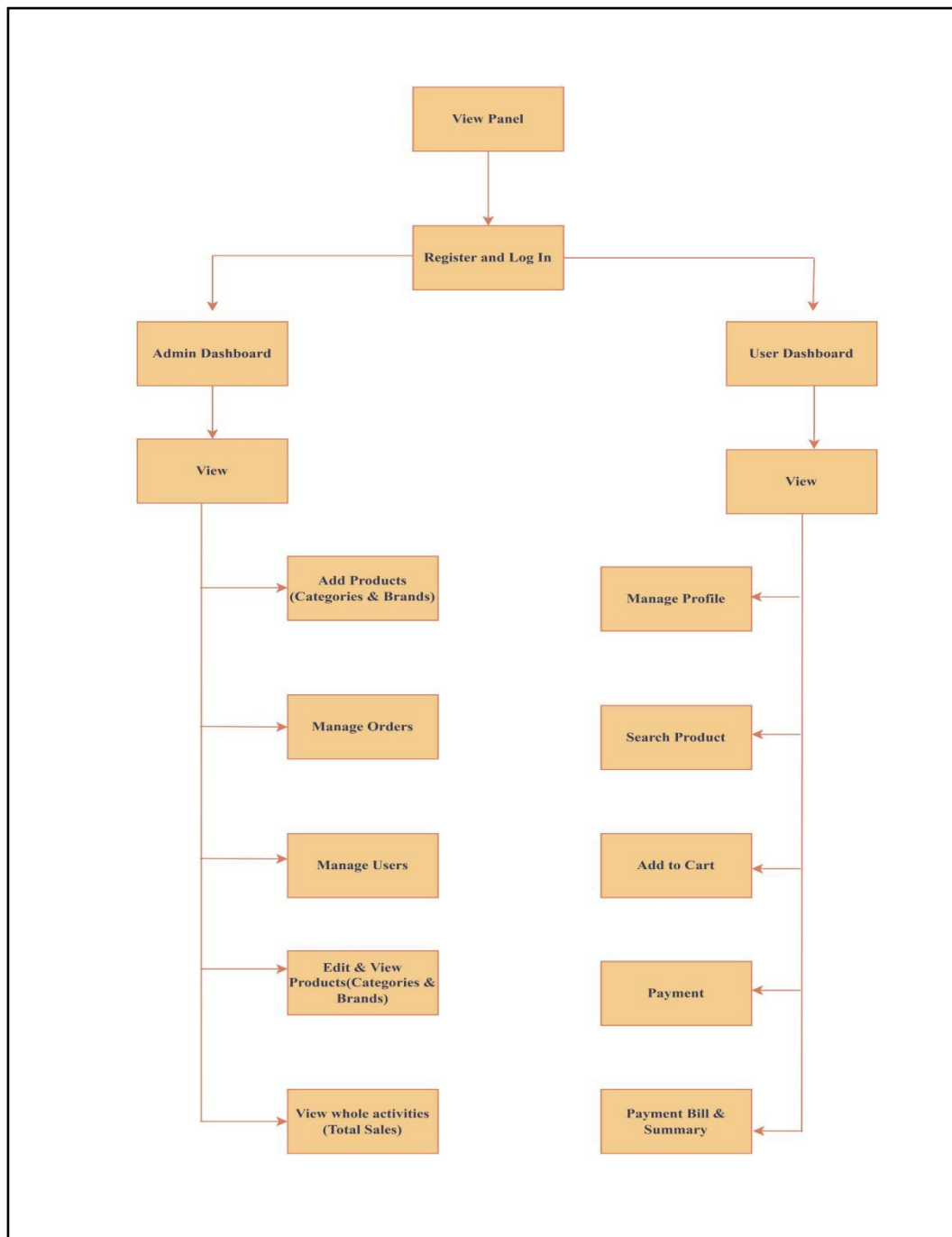


Figure 10: Interface Design of Online Shopping System (ONLINE PASAL)

3.2.4 System Flowchart for Admin

System Flowchart means the process of flowing of the information one after another. Given figure demonstrates the flowchart of Admin.

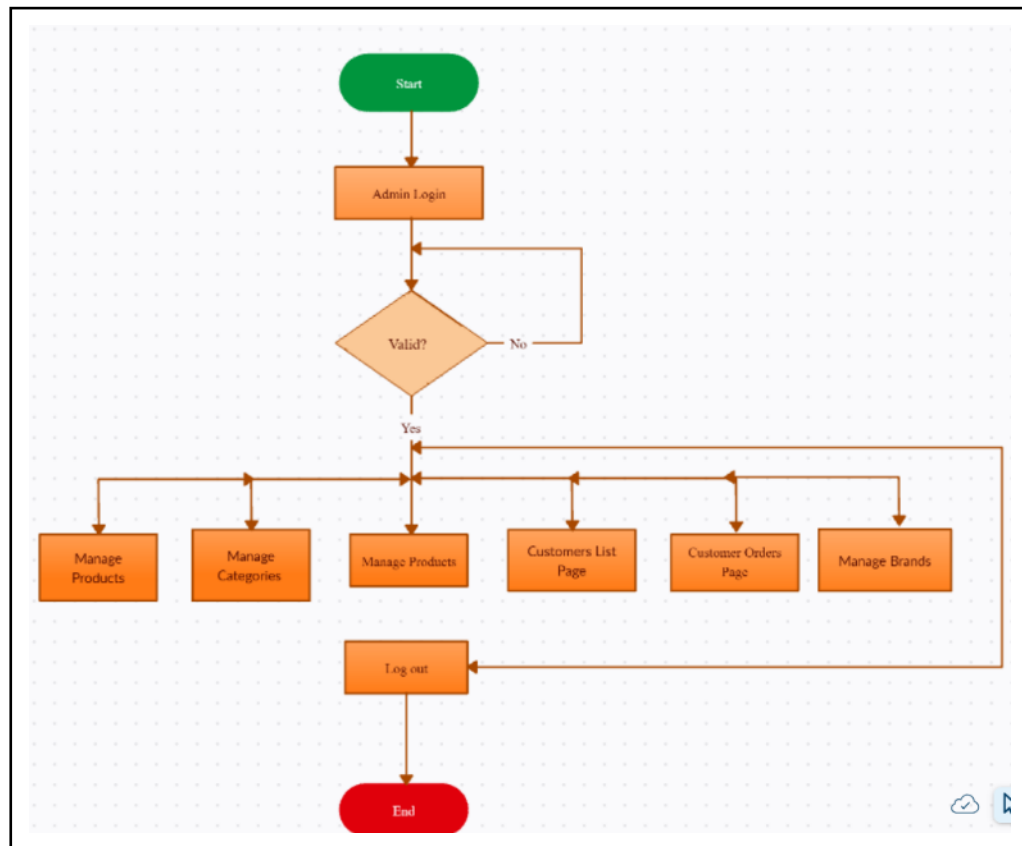


Figure 11: Admin System Flowchart of Online Shopping System (ONLINE PASAL)

The above figure shows the flowchart of the product and order management process managed by the Admin in the Online Shopping System. This flowchart illustrates the Admin Dashboard Workflow for managing product inventory, customer orders, user details, and sales reports. The process begins with the Admin logging into the system and accessing the dashboard. From there, the admin can perform various tasks, including:

- Managing products by adding, updating, or deleting items in the product catalog.
- Viewing and processing customer orders, which involves updating the order status.
- Managing users, including viewing customer details and deleting inactive or fraudulent accounts if necessary.
- Generating and viewing sales reports, with the option to export or print reports for record-keeping.

3.2.5 System Flowchart for User

Given figure shows the flowing process of information of customers or also called users. The process begins with a Start point, followed by the user registering and logging into the system. Once logged in, the user is directed to the Home Page, where they can access the products, prices and their details. After selecting the products and adding to the cart, the user proceeds to the Payment step to complete the required transaction. Finally, the user can view bill and delivery information after successful payment and the process concludes with an End point. Figure can be demonstrated below:

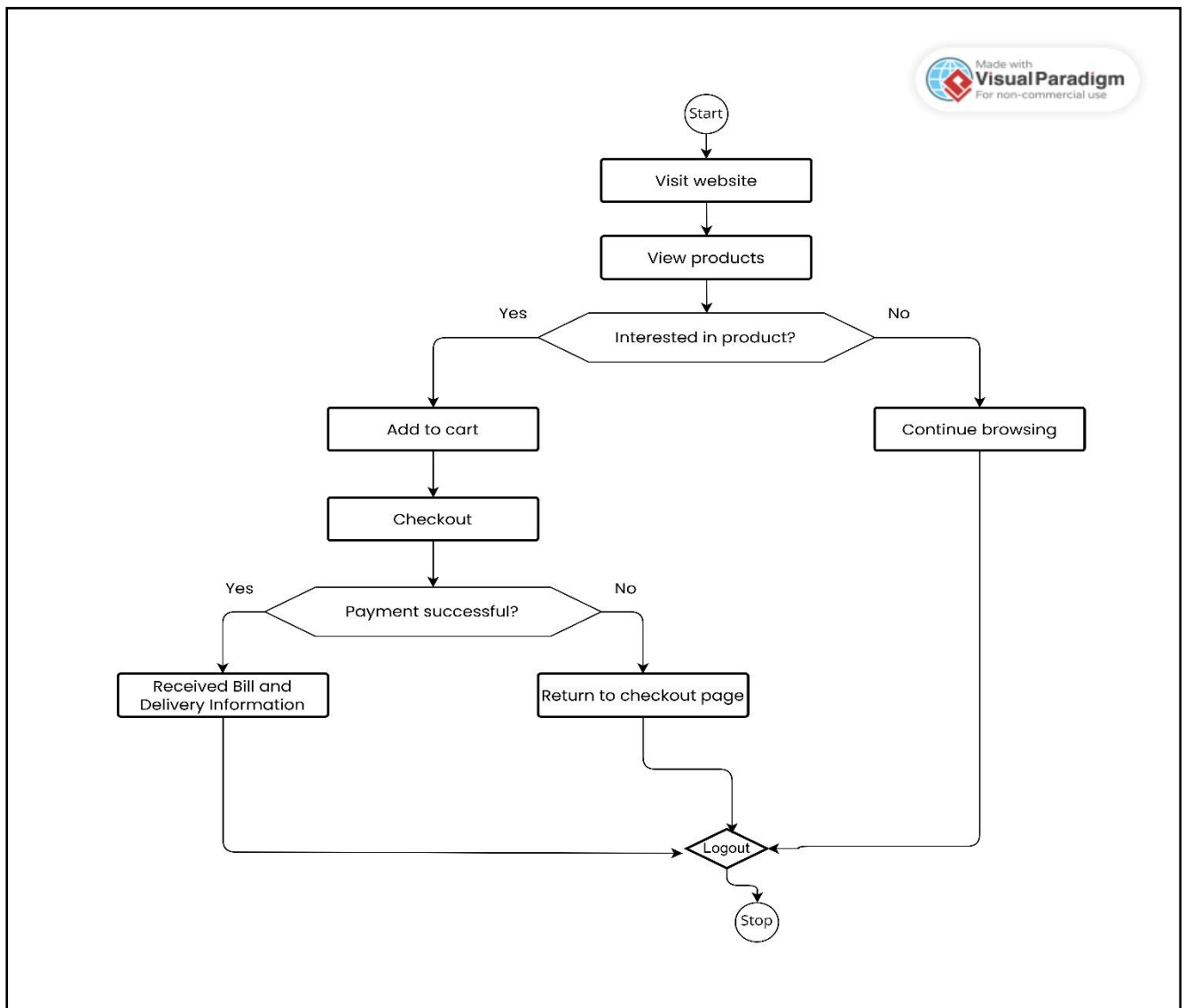


Figure 12: User System Flowchart of Online Shopping System (ONLINE PASAL)

Chapter 4: Implementation and Testing

4.1 Implementation

4.1.1 Tools Used

Following are the tools and framework used for the accomplishment of our project.

A. Frontend Tools

HTML:

Hyper Text Markup Language structures the overall shopping system, defining forms for registration, login and adding products details. It creates tables for displaying user data on dashboards enabling seamless management by users and admins. Additionally, HTML is used for linking pages, embedding multimedia content, and organizing input fields for better usability.

CSS:

Cascading Stylesheets ensure a visually appealing and responsive interface for the Shopping system. It customizes layouts, colors, fonts, button styles, and form designs, ensuring consistency across different devices. CSS also plays a key role in grid and flexbox layouts, animations, and hover effects, enhancing user experience and accessibility.

JS:

JavaScript adds interactivity to the shopping system by implementing form validation, event handling, and dynamic content updates. It ensures that required fields are correctly filled before submission, preventing errors. JS provides popup dialog boxes for user notifications, confirmations, and error messages, improving user engagement.

Bootstrap:

Bootstrap is a popular front-end framework used to design responsive and mobile-friendly web pages easily. It provides pre-designed components like navigation bars, buttons, forms, cards, modals, and a grid system that help developers build consistent and visually appealing interfaces quickly. Bootstrap is used to create a user-friendly layout for customers and admins, ensuring the site works well on all devices and screen sizes.

These technologies together create a robust, efficient, and user-friendly frontend for the Shopping system.

B. Backend Tool

PHP:

It is used for handling server-side logic. In the shopping system, Hypertext Preprocessor is used to manage back-end operations, including inserting data from in the basis of form, updating and retrieving all details of user from the database for displaying on the front end. It also manages session handling to maintain and track user activity.

C. Database

MySQL:

MySQL is a database used for secure and efficient data storage. In the shopping system, My Structured Query Language is used as the database to store and manage all details, which can be accessed and displayed through PHP. It supports data retrieval using queries to fetch specific user information when needed. It also ensures data consistency and integrity through constraints like primary keys, foreign keys, and indexing.

D. Documentation and Diagram Tools

Microsoft Word:

Microsoft Word is used for writing and editing the documentation of the system, providing a platform for creating detailed guides, user manuals and system specifications for an online Shopping system.

Draw.io:

Draw.io is an online application and tool used for designing various elements of the system, such as database schemas, ER schemas, user interface layouts and system flow diagrams. It helps visualize and organize the structure and functionality of the system effectively.

E. Programming Tool

VS code:

Visual Studio (VS) Code is used for programming and coding the system. It provides a powerful, flexible environment with support for multiple programming languages, debugging tools and extensions. For the development of an online Shopping system, VS Code helps streamline the coding process, enabling efficient implementation of features like user registration, product submission and their management.

4.1.2 Implementation details of Modules

Login:

- a. Users enter their registered email and password.
- b. The system verifies the credentials by matching them with the stored data in the MySQL database.
- c. Upon successful verification, users are redirected to their respective dashboards (user/admin).

Registration:

- a. New users fill out a registration form with personal details such as name, profile photo, email, password and other relevant information.
- b. Functions validate inputs, ensuring that the email is unique, passwords meet security standards, and other required fields are completed.
- c. After validation, user details are saved in the MySQL database and a confirmation is sent.

Admin Role:

- a. Admins review and reject product listings, customer reviews and various request from admin dashboard.
- b. Functions manage the status of products and orders (like complete, paid, rejected) and show to the users immediately.
- c. Admin manages customers, products, categories of products and brands of products effectively.

Data Display:

- a. The system retrieves and displays relevant data such as product details and customer orders.
- b. Functions ensure real-time updates and smooth navigation through the shopping interface, enhancing the user experience.

4.2 Testing

4.2.1 Test cases for unit testing

Unit testing focuses on testing individual modules or components of the shopping system to ensure they function correctly. A test case includes a set of conditions or inputs used to verify that a specific module, such as login or registration performs as expected. The objective is to identify and fix issues at the smallest functional level, ensuring system stability and reliability.

Email and Password should be valid:

Table 2: Login Testing on Online Shopping System

Test Case	Scenario	Input	Expected Output	Actual Output	Remarks
1	Register with filling without creating account.	Username: User123 Password: user1@	Registration unsuccessful.	Account cannot be created from this email.	FAIL
	Account created but not match with login.	Creating Account: Username: User234 password: user1@ Login Username: User123 password: user2@	Registration unsuccessful.	Invalid email and password.	FAIL
2	Register with creating account.	Creating Account: Username: User123 password: user1@ Login Username: User123 password: user1@	Registration successful.	You are logged in successfully.	PASS

4.2.2 Test cases for system Testing

a) Password Testing:

Password Field accepts from 5 characters to 10 characters.

It must include at least one numeric value, one uppercase letter, one lowercase letter and one special character.

Table 3: Password Validation on Online Shopping System

Test Scenario	Test Scenario description	Expected Outcomes
1	Enter less than 5 characters in the password field.	System should not accept.
2	Enter more than 10 characters in password field.	System should not accept.
3	Enter 5-10 characters in the password field with at least 1 uppercase and lowercase letter, 1 digit and one special characters.	System should accept.
4	If Password and Confirm Password matches.	System should accept.
5	Else	System should not accept.

b) Phone Number Testing:

Phone number accepts only 10 digits number otherwise not accept.

Table 4: Phone Number Validation on Online Shopping System

Test Scenario	Test Scenario description	Expected Outcomes
1	Enter less than 10 digits number in field.	System should not accept.
2	Enter more than 10 digits number in field.	System should not accept.
3	Enter the characters in field.	System should not accept.
4	Enter 10 digits number exactly.	System should accept.

c) Email Testing:

Email Pattern should be matched for acceptance.

Table 5: Email Validation on Online Shopping System

Test Scenario	Test Scenario description	Expected Outcomes
1	Address without an @ and a dot	System should not accept.
2	Address with an @ but without a dot	System should not accept.
3	Address without an @ but with a dot	System should not accept.
4	Address with an @ and a dot	System should not accept.
5	Address with @ and dot	System should accept.

d) Testing in registration form of Product and Customers

Table 6: Registration and Products Form Validation

Test Scenario	Test Scenario description	Expected Outcomes
1	If user basic information like first name, last name, address, gender is null.	System should not accept.
2	If phone number should be less than and greater than 10.	System should not accept.
3	If date of birth is input which is lesser than 18 years.	System should not accept.
4	If profile photo is greater than 2MB.	System should not accept.
6	If fields are missing for filling in Products form.	System should not accept.
7	Otherwise, if all of the above condition is not match.	System should accept.

e) Payment Testing

Table 7: Payment Testing of User

Test Scenario	Test Scenario description	Expected Outcomes
1	If user fails to pay.	System should not accept and user cannot be able to take products.
2	If user success to pay.	System should accept, user successfully take their products.

Chapter 5: Conclusion and Future Recommendations

5.1 Lesson Learnt/Outcome

Throughout the development of this system, we have gained significant improvements in our programming skills, time management and understanding of system development processes. Initially, the project posed challenges due to its complexity and our inexperience with similar tasks. However, with dedication and effort, I have successfully delivered a system that met all expectations. The experience highlighted the importance of effective time management, especially in ensuring the project was completed and documented within the given deadline. Moving forward, we aim to enhance the system by incorporating new features to improve its usability and efficiency, making it more adaptable to user needs.

5.2 Conclusion

The Online Shopping System successfully meets its objectives by providing a web-based platform by enhancing easy trading process of goods and services. The system streamlines the shopping process, reduces manual effort and enhances operational efficiency.

Findings indicate that while the system improves accessibility and record management, it lacks email and SMS notifications and operates with a single admin dashboard managing multiple records. These aspects can be improved in future iterations to enhance functionality.

5.3 Future Recommendations

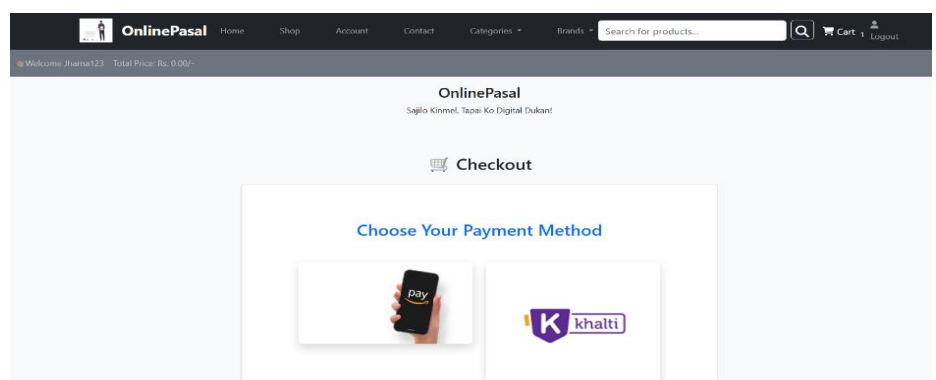
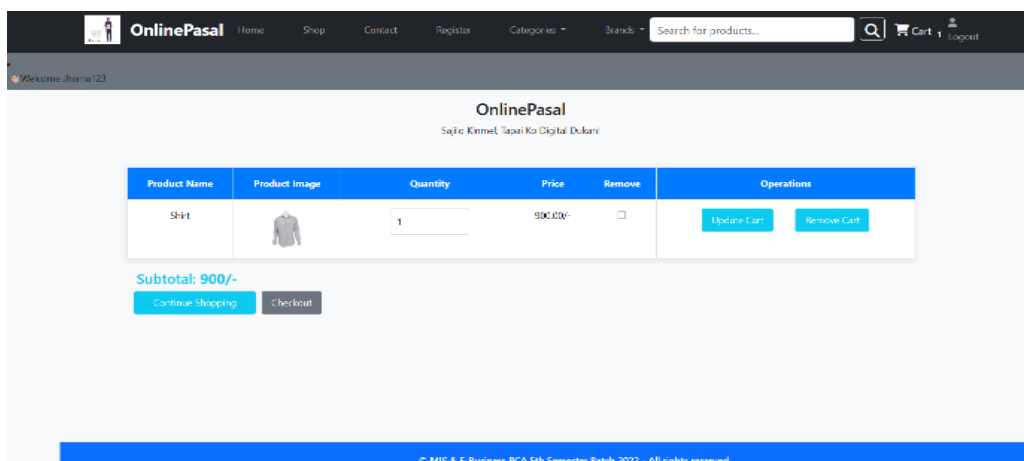
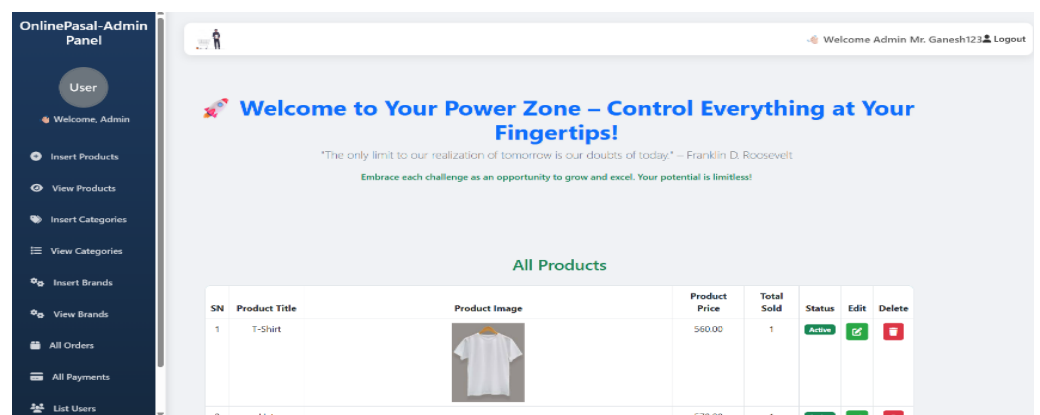
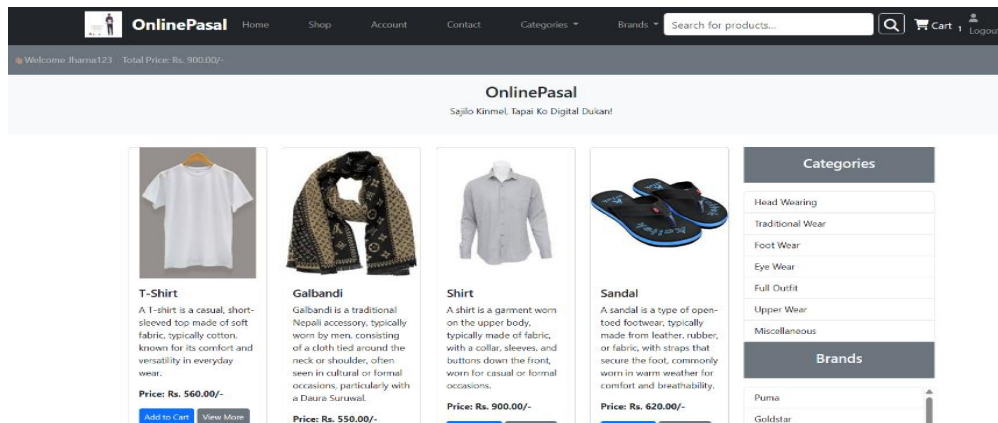
The success of the shopping system depends on how effectively it meets the needs of its users. Future developments will focus on enhancing the system based on user feedback and reviews. The database will be regularly updated and optimized to improve performance. Additionally, the user interface will be updated to reflect changing user needs and advancements in technology. Possible future enhancements include:


- a. Automated Notifications
- b. Advanced Reporting
- c. Enhanced Security Features
- d. Bug Fixes and Performance Improvements
- e. Mobile Application Development

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Appendixes of Index Page, Admin Page, Product Page, Checkout Page, Login & Registration Page respectively




 **Admin/User Login**

Username


 Enter your username

Password

 Enter your password

Login

[Don't have an account? Register here](#)

 **New User Registration**

Full Name

Your full name

Username

Choose a username

Date of Birth

mm/dd/yyyy

Gender

Select Gender

Email Address

Your email address

Password

Create a password

Confirm Password

Re-type your password

Phone Number

Your contact number

Full Address

Your full address

Profile Image

Choose File

No file chosen

IP Address

:1

I agree to the terms & conditions☐

Register Now

Already have an account? [Login here](#)