

CUSTOMER LOYALTY PROGRAM MANAGEMENT

A PROJECT REPORT

Submitted by

REYMAN MULLAR B (8115U23AD046)

in partial fulfillment for the award of the degree

of

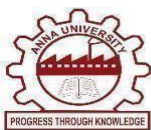
BACHELOR OF TECHNOLOGY

IN

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE



**K.RAMAKRISHNAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
SAMAYAPURAM, TRICHY**



**ANNA UNIVERSITY
CHENNAI 600 025**

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CGB1221 - DATABASE MANAGEMENT SYSTEMS

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Under the Guidance of

Mrs.V.SANKARI

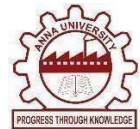
Department of Artificial Intelligence and Data Science
K.RAMAKRISHNAN COLLEGE OF ENGINEERING



**K.RAMAKRISHNAN COLLEGE OF ENGINEERING
(AUTONOMOUS)**

Under

ANNA UNIVERSITY, CHENNAI



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BONAFIDE CERTIFICATE

Certified that this project report on “**CUSTOMER LOYALTY PROGRAM MANAGEMENT**” is the bonafide work of **REYMAN MULLAR B(8115U23AD046)** who carried out the project work during the academic year 2024 - 2025 under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

DECLARATION

I declare that the project report on “ **CUSTOMER LOYALTY PROGRAM MANAGEMENT**” is the result of original work done by us and best of our knowledge, similar work has not been submitted to “**ANNA UNIVERSITY CHENNAI**” for the requirement of Degree of **BACHELOR OF TECHNOLOGY**. This project report is submitted on the partial fulfilment of the requirement of the completion of the course **CGB1221 DATABASE MANAGEMENT SYSTEMS**.

.

Signature

REYMAN MULLAR B

Place: Samayapuram

Date:

ACKNOWLEDGEMENT

It is with great pride that I express our gratitude and in-debt to our institution “**K.Ramakrishnan College of Engineering (Autonomous)**”, for providing us with the opportunity to do this project.

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

VISION OF THE INSTITUTION

To achieve a prominent position among the top technical institutions.

MISSION OF THE INSTITUTION

M1: To bestow standard technical education par excellence through state of the art infrastructure, competent faculty and high ethical standards.

M2: To nurture research and entrepreneurial skills among students in cutting edge technologies.

M3: To provide education for developing high-quality professionals to transform the society.

VISION OF THE DEPARTMENT

To excel in education, innovation, and research in Artificial Intelligence and Data Science to fulfil industrial demands and societal expectations.

MISSION OF THE DEPARTMENT

M1: To educate future engineers with solid fundamentals, continually improving teaching methods using modern tools.

M2: To collaborate with industry and offer top-notch facilities in a conducive learning environment.

M3: To foster skilled engineers and ethical innovation in AI and Data Science for global recognition and impactful research.

M4: To tackle the societal challenge of producing capable professionals by instilling employability skills and human values.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

Our graduates shall

PEO1: Compete on a global scale for a professional career in Artificial Intelligence and Data Science.

PEO2: Provide industry-specific solutions for the society with effective communication and ethics.

PEO3: Enhance their professional skills through research and lifelong learning initiatives.

PROGRAM OUTCOMES

Engineering students will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO1:** Capable of finding the important factors in large datasets, simplify the data, and improve predictive model accuracy.
- **PSO2:** Capable of analyzing and providing a solution to a given real-world problem by designing an effective program.

Program Outcomes and Program Specific Outcomes mapping

ABSTRACT	PROGRAM OUTCOMES (Pos)	PROGRAM SPECIFIC OUTCOMES (PSos)
<p>The Customer Loyalty Program Management System is designed to streamline and automate the process of managing customer rewards in retail or service-based businesses. This system maintains detailed records of customer profiles, tracks purchase transactions, and calculates loyalty points earned or redeemed. By implementing an efficient database structure, it enables businesses to analyze customer behavior, encourage repeat purchases, and improve overall customer retention. The system also manages reward catalogs, points expiration, and tier-based benefits, ensuring a personalized and scalable loyalty experience. Developed using database management principles, this project aims to enhance operational efficiency and strengthen the relationship between businesses and their customers.</p>	<p>PO1</p> <p>PO2</p> <p>PO3</p> <p>PO5</p> <p>PO7</p> <p>PO8</p> <p>PO10</p>	<p>PSO1</p> <p>PSO2</p>

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LIST OF ABBREVIATION

ABBREVIATION	EXPANSION
CRUD	Create Read Update Delete
DBMS	Database Management System
GUI	Graphical User Interface
IDE	Integrated Development Environment
JVM	Java Virtual Machine
OOP	Object-Oriented Programming
OTC	Over The Counter
SQLI	SQL Injection
SQL	Structured Query Language
UI	User Interface

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CHAPTER 1

INTRODUCTION

1.1 Objective

The main objective of the Customer Loyalty Program Management System is to automate and manage the process of rewarding customers based on their purchase behavior, thereby improving customer retention and enhancing business growth through a structured and data-driven approach.

- **Customer Profile Management:** To maintain detailed records of customer information, enabling personalized reward experiences and loyalty tracking.
- **Automated Points System:** To assign, update, and manage loyalty points based on transaction history, ensuring real-time and accurate points calculation.
- **Reward Redemption Process:** To allow customers to redeem accumulated points for available rewards, simplifying the exchange process through defined rules and criteria.
- **Points Expiry and Notification:** To implement expiry rules for unused points and notify customers in advance, encouraging timely redemption and engagement.
- **Loyalty Tier Classification:** To categorize customers into tiers (e.g., Silver, Gold, Platinum) based on spending patterns and offer tier-based benefits and incentives.
- **Admin Dashboard and Reports:** To provide administrators with insights into customer activity, reward usage, and overall program effectiveness through visual and tabular reports.

1.2 Purpose of the Project

The purpose of the Customer Loyalty Program Management System is to provide businesses with an efficient and automated platform to manage customer rewards, fostering long-term relationships and encouraging repeat purchases.

- **Enhance Customer Retention:** To create a structured loyalty system that motivates customers to stay engaged and conti
- **Improved Restaurant Operations:** To help restaurants receive and manage orders efficiently, reducing manual errors and improving kitchen workflow.
- **Seamless Payment Processing:** To provide a secure and smooth payment experience through various digital payment methods.

- **Real-Time Order and Delivery Tracking:** To keep customers informed of their order status and estimated delivery time, and assist delivery agents with accurate delivery information.
- **Ensure Secure and Reliable Operations:** To protect customer data and maintain system integrity through robust access controls and secure transactions.

1.3 Scope of the Project

- The scope of the **Customer Loyalty Program Management System** includes the development and implementation of a database-driven platform that efficiently manages all aspects of a customer loyalty program for retail .
- **Customer Data Management:** Capturing and maintaining detailed customer profiles, including contact information, membership status, and loyalty tier classification.
- **Points Management:** Handling the accrual, redemption, and expiration of loyalty points, ensuring accuracy and timely updates.
- **Support multiple payment options** including credit/debit cards, digital wallets, and cash on delivery.
- **Scalability:** Designing the system to accommodate growth in customer base, transaction volume, and program complexity.

1.4 Need for the System

The well-organized loyalty program is essential for creating long-term relationships and encouraging repeat purchases. The **Customer Loyalty Program Management System** is needed to address the following challenges:

- **Manual Management Inefficiency:** Traditional methods of tracking customer points and rewards are time-consuming.
- **Eliminates Manual Errors:** Digital order placement reduces misunderstandings and errors that commonly occur in phone or in-person orders.
- **Faster Order Processing:** Restaurants can receive and process orders quickly, improving service speed and customer satisfaction.

- **Lack of Real-Time Updates:** Customers often face delays or confusion regarding their points balance and reward eligibility.
- **Improved Customer Engagement:** Customers expect transparent, easy-to-use systems where they can track and redeem

1.5 Significance of the Project

The Customer Loyalty Program Management System plays a vital role in helping businesses build stronger relationships with their customers by rewarding repeat purchases and encouraging brand loyalty. In an increasingly competitive market, retaining existing customers is often more cost-effective than acquiring new ones, making a well-designed loyalty program essential for sustained growth. This system not only automates the tracking and management of loyalty points and rewards but also provides valuable insights into customer behavior, enabling businesses to tailor their marketing strategies effectively. By improving customer satisfaction through timely rewards and clear communication, the project contributes to increased sales, enhanced customer engagement, and long-term profitability. Furthermore, the system ensures secure handling of customer data, fostering trust and compliance with privacy standards.

The system also helps businesses understand customer preferences through data analysis, enabling targeted marketing. Ultimately, it boosts customer satisfaction and drives increased sales and loyalty.

CHAPTER 2

LITERATURE SURVEY

2.1 Summary of Related Works

Several existing customer loyalty systems focus on automating reward points and managing customer engagement to enhance business retention strategies. Many commercial solutions integrate loyalty management with POS and CRM systems, offering real-time tracking of customer transactions and points. Research in this area often emphasizes data-driven personalization, where loyalty programs adapt based on customer purchase behavior to maximize effectiveness. However, many systems face challenges related to scalability, data security, and user-friendly interfaces. This project aims to build on these works by creating a secure, scalable, and intuitive loyalty management system tailored for small to medium businesses, emphasizing accurate points tracking, reward management, and detailed analytics.

2.2 Key Findings

The study of existing customer loyalty program management reveals that digital platforms significantly enhance the convenience and efficiency of food services. Most systems provide real-time order tracking, which improves transparency and customer satisfaction. Several existing customer loyalty systems focus on automating reward points and managing customer engagement to enhance business retention strategies. Many commercial solutions integrate loyalty management with POS and CRM systems, offering real-time tracking of customer transactions and points. Research in this area often emphasizes data-driven personalization, where loyalty programs adapt based on customer purchase behavior to maximize effectiveness. However, many systems face challenges related to scalability, data security, and user-friendly interfaces. This project aims to build on these works by creating a secure, scalable, and intuitive loyalty management system tailored for small to medium businesses, emphasizing accurate points tracking, reward management, and detailed analytics.

Another key finding is the importance of data analytics and reporting features for restaurants and system administrators. Moreover, the analysis highlights the importance of seamless integration between loyalty management systems and existing business processes such as sales and customer relationship management. Effective communication and timely notifications about points balance and reward availability play a crucial role in keeping customers engaged. The use of data analytics not only supports marketing decisions but also helps in identifying high-value customers and potential churn risks. This comprehensive approach ensures that loyalty programs are not just a tool for rewards but a strategic asset for long-term business success. The project, therefore, focuses on incorporating these aspects to create a holistic loyalty management solution. Studies highlight the significance of mobile compatibility, as most users prefer ordering via smartphones. Integrating features like notifications, chat support, and AI-based order suggestions further boosts user engagement. The importance of maintaining system reliability and ensuring cybersecurity is evident across all platforms. Hence, future systems must balance usability, performance, and security to succeed in the competitive market.

2.3 Relevance to Project

In today's highly competitive business environment, retaining customers and encouraging repeat purchases are critical for sustainable growth. The Customer Loyalty Program Management **System** is highly relevant as it enables businesses to systematically reward loyal customers, enhancing customer satisfaction and fostering brand loyalty. By automating the management of loyalty points and rewards, the system reduces operational inefficiencies and minimizes errors commonly found in manual processes. Additionally, the project supports data-driven decision-making through detailed reporting and analytics, helping businesses tailor marketing strategies and improve customer engagement. This relevance makes the system an invaluable tool for businesses aiming to strengthen their customer relationships and increase profitability.

CHAPTER 3

EXISTING AND PROPOSED SYSTEM

3.1 Existing System

Small businesses may still rely on manual methods such as paper records or simple spreadsheets to track customer loyalty, which can lead to inaccuracies, delayed updates, and poor customer experience. Larger or more technologically advanced businesses use third-party loyalty platforms like Smile.io, LoyaltyLion, or Fivestars to manage customer points and rewards. These platforms typically offer features such as automated points tracking, tiered membership, and reward redemption.

- Limited customization options to tailor loyalty rules.
- Limited control over customer data and feedback.
- Inability to support personalized offers or customer-specific features.
- Restricted access to detailed customer behavior analytics and insights..
- Poor performance during high traffic or technical downtime.
- Limited delivery logistics support for in-house delivery teams.

In summary, This highlights the opportunity to develop a comprehensive Customer Loyalty Program Management System that offers complete customization, real-time data processing, seamless integration with existing operations, and an engaging user experience, all within a secure and scalable platform.

3.2 Limitations of the Existing System

The existing online food ordering systems, while widely used by restaurants and customers, face several limitations that impact their efficiency, scalability, and user experience. These limitations include:

- **Limited Customization:** Many third-party platforms do not allow restaurants to fully customize their menus, branding, or promotional offers, reducing brand identity and customer engagement.
- **High Commission Fees:** Restaurants relying on external platforms often pay substantial commissions, which cut into profit margins and affect sustainability.
- **Fragmented Customer Data:** Existing systems typically restrict access to detailed customer information and order history, limiting marketing and loyalty program opportunities.

- **Inadequate Integration:** Many platforms lack seamless integration with restaurant kitchen management, inventory, and billing systems, causing workflow disruptions.
- **Limited Delivery Management:** Platforms may offer poor support for managing in-house delivery logistics, resulting in delayed or inefficient deliveries.
- **Security Vulnerabilities:** Insufficient data protection measures can expose sensitive user payment and personal information to security breaches.
- **Poor Real-Time Updates:** Delays in updating order status or inventory can cause customer dissatisfaction and operational inefficiencies.
- **User Interface Challenges:** Complex or non-intuitive interfaces may hinder users, especially restaurant staff and delivery personnel, from efficiently managing orders.
- **Dependence on Internet Connectivity:** Many cloud-based solutions experience operational disruptions during poor or unstable internet connections.
- **Limited Analytics:** Basic reporting features restrict restaurants from gaining deep insights into customer behavior, sales trends, and delivery performance.

These limitations highlight the need for a more comprehensive, secure, and restaurant-centric Online Food Ordering System that integrates all key functionalities into a unified platform.

3.3 Proposed System

The proposed **Customer Loyalty Program Management System** is a comprehensive, database-driven platform designed to overcome the limitations of existing loyalty tracking methods. This system will automate the entire loyalty lifecycle—from point allocation and tracking to reward redemption and tier upgrades—ensuring accuracy, transparency, and real-time updates for both customers and business administrators. Unlike third-party solutions, the proposed system offers full customization, allowing businesses to define their own rules for earning and redeeming points, manage a personalized reward catalog, and implement tier-based benefits based on customer spending or visit frequency. The system will feature a secure, user-friendly interface where customers can log in to view their points, claim rewards, receive notifications, and monitor their loyalty status. For administrators, the backend dashboard will provide detailed reports and analytics on customer engagement, top spenders, reward utilization, and program effectiveness, enabling data-driven decision-making.

Additionally, the system will be designed with scalability in mind, allowing it to grow alongside the business by accommodating more users, transactions, and advanced features such as referral tracking or promotional campaigns. It will also support integration with existing POS systems or e-commerce platforms to streamline operations and eliminate the need for manual data entry. Enhanced security measures will be implemented to protect sensitive customer data and ensure compliance with privacy standards. Notifications through email or SMS will be incorporated to alert users about expiring points, new rewards, or tier changes—encouraging more frequent interaction with the program. Overall, the proposed system aims to provide a cost-effective, customizable, and robust solution for managing loyalty programs, improving customer retention, and increasing long-term business profitability.

The proposed Customer Loyalty Program Management System is designed to provide a fully automated, scalable, and customizable solution for managing customer rewards. This system aims to eliminate the inefficiencies of manual record-keeping and the limitations of third-party platforms by offering complete control to the business. It will feature an automated points management module where loyalty points are awarded based on purchase amounts or defined customer activities. Businesses can set up tier-based memberships—such as Silver, Gold, or Platinum—with varying rewards and benefits. A dynamic reward catalog will allow businesses to list, update, or remove rewards and associate them with specific point values, all while maintaining stock status and availability in real-time.

CHAPTER 4

HARDWARE & SOFTWARE REQUIRED

4.1 Hardware Required

To run a Customer Loyalty Program Management System efficiently, the following hardware components are typically required:

- **Server System:** Intel i5/i7 or Xeon processor, 8–16 GB RAM, 500 GB to 1 TB SSD storage, high-speed internet connectivity, and a stable server operating system (Linux/Windows Server).
- **Client Devices:** Desktop or laptop with at least Intel i3 processor or equivalent, 4 GB RAM, 128 GB storage, 15-inch monitor; or smartphones/tablets running Android or iOS for customer access.
- **Peripherals :** Desktop or laptop with at least Intel i3 processor or equivalent, 4 GB RAM, 128 GB storage, 15-inch monitor; or smartphones/tablets running Android or iOS for customer access..

4.2 Software Required

To develop and operate the Customer Loyalty Program Management System, the following software components are typically required:

- **Operating System:** Windows 10/11, Linux (Ubuntu/CentOS), macOS, Windows Server.
- **Database Management System:** MySQL, PostgreSQL, Oracle, Microsoft SQL Server, SQLite.
- **Web/Application Server:** Apache Tomcat, XAMPP, WAMP, LAMP, Node.js, Nginx, Apache HTTP Server.
- **Development Tools & Frameworks:** HTML, CSS, JavaScript, React, Angular, Vue.js, PHP, Python, Java, Node.js.
- **Others:** Payment Gateway APIs, Version Control (Git), Mobile Development Platforms (Android Studio, Xcode).

CHAPTER 5

SYSTEM DESIGN

5.1 Block Diagram

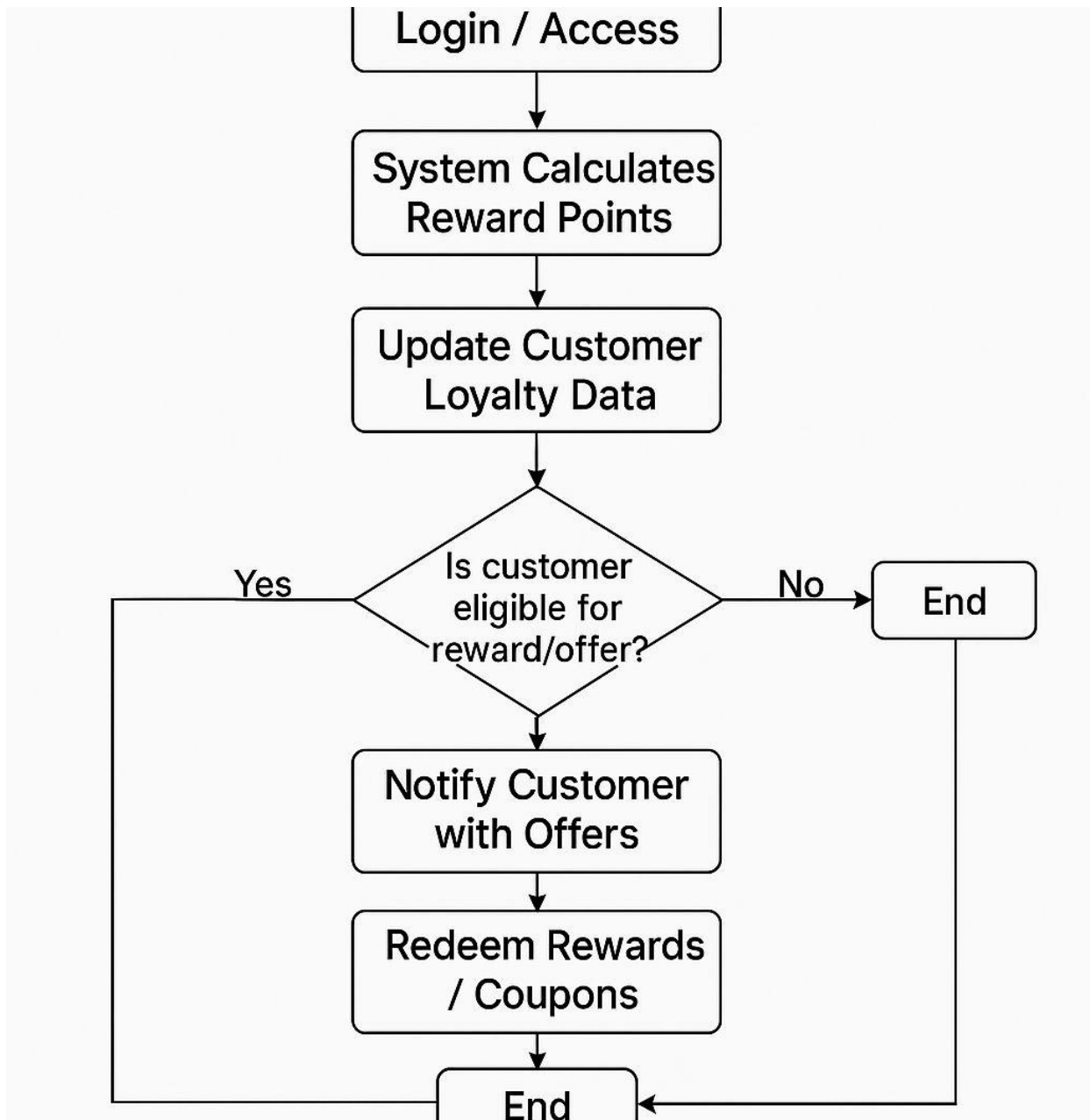


Fig 5.1.1 : BLOCK DIAGRAM FOR ONLINE FOOD ORDERING SYSTEM

5.2 Explanation of System Architecture

The block diagram of the Customer Loyalty Program Management System outlines the systematic flow of activities from the point a customer engages with the program to the moment they redeem rewards or exit the system. The process initiates with Customer Registration, where the customer signs up for the loyalty program by providing necessary personal and purchase details. Once registered, the customer can log in or access their account to interact with the system. When the customer makes a purchase or order, the system captures the transaction data. The next step involves the calculation of reward points based on the purchase details using predefined rules or thresholds. These reward points are then used to update the customer's loyalty data, which includes their total accumulated points, transaction history, and tier level (if applicable).

If Following the data update, the system checks whether the customer is eligible for a reward or offer. This decision point evaluates conditions such as the minimum number of points required, purchase frequency, or specific promotions. If the customer is not eligible, the process ends at that point. However, if the customer meets the eligibility criteria, the system proceeds to notify the customer about the available rewards, coupons, or exclusive offers. These notifications can be sent via SMS, email, or in-app alerts. The customer can then redeem rewards or coupons, either through an online portal, app, or during a future purchase. After successful redemption, the program records the action and ends the transaction loop. This flow ensures that loyal customers are regularly rewarded and encourages them to remain engaged, thereby strengthening the relationship between the customer and the business. The system not only automates reward management but also enhances customer satisfaction by offering timely and personalized incentives.

CHAPTER 6

MODULE DESCRIPTION

6.1 User Management Module

The User Management Module is a fundamental part of the Customer Loyalty Program Management System, as it governs how users interact with the platform. It enables secure and efficient registration, login, and profile handling for different types of users—primarily customers and administrators. This module ensures that users have access to appropriate features based on their roles and that their personal and transactional data is stored and retrieved accurately. For customers, the module provides a user-friendly interface to sign up with basic details such as name, email, phone number, and password. Upon registration, a unique customer ID is generated, and a new loyalty account is created. Once logged in, customers can view their current loyalty points, redemption history, tier status (such as Silver or Gold), and available rewards. The system allows them to update their personal information and preferences, helping maintain a personalized user experience.

This Module also supports financial configurations and reporting functionalities essential for business decisions. In summary, the **User Management Module** ensures a seamless, secure, and role-specific experience for all users of the loyalty system. It acts as the entry point to the platform and plays a vital role in maintaining data integrity, user satisfaction, and overall system control.

6.2 Points Management Module

The Point management Module in the Customer Loyalty Program Management is designed to support restaurant staff and delivery personnel in performing their respective tasks efficiently. Restaurant employees use this module to manage orders, update menu items, and track stock or item availability. Once an order is received, staff can confirm, prepare, and mark it as ready for dispatch. The system provides real-time

order updates to reduce delays and confusion during busy hours. Employees can also manage estimated preparation times and notify delivery agents when orders are ready. Menu modifications such as item availability, price changes, and descriptions can be updated through the module. This ensures customers see accurate information during ordering. Employees may also access customer instructions or preferences added during checkout. Additionally, the system logs employee activity for performance and accountability. This ensures smooth internal communication and timely order processing.

For delivery personnel, the Employee Module includes access to order pickup and delivery details. Once a food order is ready, delivery staff are notified with the pickup location and customer address. The module may include GPS integration to optimize delivery routes and track status in real-time. Delivery agents can update the order status from "picked up" to "delivered" through the system. They can also contact customers in case of delivery issues or address confusion. The module supports digital proof of delivery through OTPs or confirmation screens. Delivery history, earnings, and ratings can also be accessed via their dashboard. The module may allow availability toggling so that delivery staff can go online or offline as needed. Overall, it ensures that employees stay coordinated with the system and offer smooth, professional service. This module bridges the communication between customers, restaurants, and delivery staff.

6.3 Rewards & Tier Management Module

Rewards & Tier Management Module is a critical component of the Customer Loyalty Program Management System that defines how customers can utilize their earned loyalty points and how they progress through various reward levels or membership tiers. This module directly influences customer motivation and retention by offering attractive, structured benefits that reward continued engagement and spending.

On the rewards side, the module allows administrators to create and manage a customizable catalog of items or offers that customers can redeem using their loyalty points. These can include physical products, discount vouchers, free services, exclusive deals, or even cashback. Each reward is associated with a fixed or dynamic point value, and availability can be controlled through stock tracking or time-limited promotions. The system ensures that only eligible customers with sufficient points and within the proper tier can access and redeem specific rewards.

6.4 Transaction & Activity Tracking Module

The Transaction & Activity Tracking Module plays a pivotal role in monitoring and recording every significant interaction within the Customer Loyalty Program. It acts as the system's internal logbook, maintaining a real-time and historical record of all transactions, including purchases, point earnings, redemptions, tier changes, and other user activities. This module ensures transparency, accuracy, and accountability for both customers and administrators.

From an administrative perspective, the module provides a comprehensive backend system to monitor individual customer behavior as well as overall program performance. Admins can filter activity logs based on date, user, transaction type, or location. They can also detect suspicious or unusual activities, such as fraudulent point claims or rapid tier jumps, allowing them to take preventive action quickly. Moreover, activity data helps identify top-performing customers, frequently redeemed rewards, and peak engagement periods.

In essence, the **Transaction & Activity Tracking Module** provides the operational backbone for data accuracy and business intelligence in the loyalty program. By capturing detailed user interactions and transactions, it enhances system reliability, supports decision-making, and ensures a transparent and trustworthy experience for everyone involved.

6.5 Notification & Communication Module

The Notification & Communication Module is designed to keep customers informed, engaged, and connected with the loyalty program through timely and personalized communications. This module plays a key role in enhancing user experience by sending updates about point earnings, redemptions, tier upgrades, promotional offers, and reward availability through various channels like email, SMS, in-app notifications, or push alerts.

For **customers**, this module provides real-time feedback and transparency. Whenever a user earns points from a purchase, receives a tier upgrade, or successfully redeems a reward, the system sends a confirmation message. It also reminds users about expiring points, new reward launches, and personalized promotions based on their shopping behavior. These regular touchpoints help build trust and encourage continued participation in the program.

From the **administration side**, the module offers tools to create, schedule, and manage different types of notifications. Admins can configure rules for automated messages—for instance, sending a “thank you” note after every transaction, or triggering a discount offer if a customer hasn’t made a purchase in a while. The system also allows bulk messaging for campaign announcements, festive greetings, or limited-time offers, making it a valuable tool for marketing and customer retention.

Additionally, this module supports **customization and personalization**, allowing messages to be tailored using the customer’s name, preferences, or loyalty tier. This makes the communication more relevant and engaging. Integration with third-party services like Twilio, Firebase, or email APIs ensures reliability and scalability of message delivery.

6.6 Reports & Analytics Module

The Reports & Analytics Module serves as the intelligence center of the Customer Loyalty Program Management System. It transforms raw data collected from user interactions, transactions, and reward activities into meaningful insights that help businesses evaluate performance, identify trends, and make strategic decisions. This module plays a critical role in assessing the success and ROI (Return on Investment) of the loyalty program.

For administrators and business owners, this module provides an interactive dashboard and reporting interface. It offers key performance indicators (KPIs) such as the number of active users, point distributions, redemption rates, top-performing rewards, and customer retention metrics. These insights allow businesses to understand how customers are engaging with the program and identify which aspects are driving loyalty and repeat purchases.

In summary, the Reports & Analytics Module provides the visibility and clarity needed to continuously optimize the loyalty program. By turning data into actionable insights, it empowers businesses to make data-driven decisions, enhance customer engagement, and achieve long-term loyalty goals more effectively.

CHAPTER 7

CONCLUSION & FUTURE ENHANCEMENT

7.1 CONCLUSION

The Customer Loyalty Program Management System serves as a strategic tool for businesses seeking to retain customers, increase repeat purchases, and build long-lasting relationships. In today's competitive marketplace, simply offering quality products or services is no longer enough—customers expect to be recognized and rewarded for their continued support. This system directly addresses that expectation by implementing a structured framework where loyalty is acknowledged and incentivized.

Each module within the system plays a vital role in ensuring a smooth, engaging, and personalized experience. From user registration and secure login to dynamic point tracking, reward redemptions, and tier-based privileges, the platform covers every critical aspect of a successful loyalty program. Real-time notifications and a robust analytics dashboard enhance transparency and enable businesses to make informed decisions based on customer behavior and trends.

Moreover, the system benefits not only customers but also businesses by providing complete control over loyalty rules, customer insights, and marketing opportunities. By automating processes and minimizing manual errors, it reduces operational burdens while maximizing customer satisfaction. The scalability and customizability of the platform make it suitable for small startups as well as large enterprises.

In essence, the Customer Loyalty Program Management System is more than just a marketing tool—it's a long-term investment in customer engagement and brand loyalty. When executed effectively, it becomes a key driver of revenue growth, customer retention, and competitive advantage in a fast-paced digital economy.

7.2 Future Enhancement

While the current Customer Loyalty Program Management System offers a robust foundation for managing customer engagement and rewards, there are several opportunities for future enhancement that can significantly elevate its functionality and user experience. One major area for improvement is the integration of AI and machine learning. By implementing intelligent algorithms, the system could analyze customer behavior patterns more deeply and recommend personalized rewards, promotions, or product suggestions. Predictive analytics could also forecast customer churn or identify high-value customers, allowing businesses to take proactive measures to retain them.

Another future enhancement involves adding multi-language and multi-currency support to make the platform adaptable for global usage. This would allow businesses operating in different regions to use the system without localization issues, increasing its versatility and market appeal. Additionally, integrating with popular CRM (Customer Relationship Management) tools and e-commerce platforms can streamline business operations and ensure a unified view of customer data.

Lastly, the system can benefit from enhanced security features, such as two-factor authentication, encryption of sensitive data, and real-time fraud detection alerts. These measures will ensure the integrity of customer information and build greater trust in the loyalty program.

APPENDIX A (SOURCE CODE)

Appendix A.1: Create Database

```
CREATE DATABASE clientmsDB;  
USE clientmsDB;
```

Appendix A.2: Create Tables

Cart Table

```
CREATE TABLE `tbladmin` (  
  `ID` int(10) NOT NULL,  
  `AdminName` varchar(120) DEFAULT NULL,  
  `UserName` varchar(120) DEFAULT NULL,  
  `MobileNumber` bigint(10) DEFAULT NULL,  
  `Email` varchar(120) DEFAULT NULL,  
  `Password` varchar(120) DEFAULT NULL,  
  `AdminRegdate` timestamp NULL DEFAULT current_timestamp()  
) ENGINE=InnoDB DEFAULT CHARSET=latin1 COLLATE=latin1_swedish_ci;
```

Category list Table

```
CREATE TABLE `tblclient` (  
  `ID` int(10) NOT NULL,  
  `AccountID` int(10) DEFAULT NULL,  
  `AccountType` varchar(50) DEFAULT NULL,  
  `ContactName` varchar(120) DEFAULT NULL,  
  `CompanyName` varchar(120) DEFAULT NULL,  
  `Address` varchar(200) DEFAULT NULL,  
  `City` varchar(120) DEFAULT NULL,  
  `State` varchar(120) DEFAULT NULL,  
  `ZipCode` int(10) DEFAULT NULL,  
  `Workphnumber` bigint(10) DEFAULT NULL,  
  `Cellphnumber` bigint(10) DEFAULT NULL,  
  `Otherphnumber` bigint(10) DEFAULT NULL,  
  `Email` varchar(200) DEFAULT NULL,  
  `WebsiteAddress` varchar(200) DEFAULT NULL,  
  `Notes` mediumtext DEFAULT NULL,  
  `Password` varchar(200) NOT NULL,  
  `CreationDate` timestamp NULL DEFAULT current_timestamp()  
) ENGINE=InnoDB DEFAULT CHARSET=latin1 COLLATE=latin1_swedish_ci;
```

Product list Table

```
CREATE TABLE `tblinvoice` (  
  `ID` int(10) NOT NULL,  
  `Userid` varchar(120) DEFAULT NULL,  
  `ServiceId` varchar(120) DEFAULT NULL,  
  `BillingId` varchar(120) DEFAULT NULL,  
  `PostingDate` timestamp NULL DEFAULT current_timestamp()  
) ENGINE=InnoDB DEFAULT CHARSET=latin1 COLLATE=latin1_swedish_ci;
```

Appendix A.3: Sample Data Insertion

Insert Carts

```
INSERT INTO `tbladmin` (`ID`, `AdminName`, `UserName`, `MobileNumber`, `Email`, `Password`, `AdminRegdate`) VALUES  
(1, 'Admin', 'admin', 8979555562, 'admin@gmail.com', 'f925916e2754e5e03f75dd58a5733251', '2024-08-01 07:01:36');
```

Insert Category list Tables

```
INSERT INTO `tblclient` (`ID`, `AccountID`, `AccountType`, `ContactName`, `CompanyName`, `Address`, `City`, `State`, `ZipCode`, `Workphnumber`, `Cellphnumber`, `C  
(1, 900370752, 'Active Account', 'Sanjay Malhotra', 'ABC Private Limited', 'ABC Private Limited\r\nB-150,Okhla New Delhi', 'New Delhi', 'Delhi/NCR', 1100096, 888  
(2, 884010538, 'Active Account', 'Sidharth Sukla', 'Infosys Pvt Ltd', 'Infosys Pvt Ltd\r\nC-123, Sector 15 Noida ', 'Noida', 'NCR', 1321121, 4454545454, 77878787  
(3, 809338201, 'Contact/Lead', 'Naveen Singh', 'ghj pvt ltd', 'ghj pvt ltd\r\nG-127 Delhi', 'New Delhi', 'Delhi/NCR', 1100096, 4464654665, 4654654646, 7879877897,  
(4, 639974991, 'Contact/Lead', 'Abir Rajwansh', 'KML PVT LTD', 'KML PVT LTD\r\nH-224 sector 62, Noida(NCR)', 'Noida', 'Delhi/NCR', 5465456, 5523235656, 898565233  
(5, 602410634, 'Active Account', 'Kundan Shah', 'JK Enterprises', 'JK Enterprises\r\nH-120,Shivala Varanasi', 'Varanasi', 'UP', 221001, 1213465464, 1645489799, 3/
```


Appendix A.4: Record a Sale

```
INSERT INTO `tblinvoice` (`ID`, `Userid`, `ServiceId`, `BillingId`, `PostingDate`) VALUES
(1, '1', '3', '528605656', '2024-09-11 07:06:33'),
(2, '1', '4', '528605656', '2024-09-11 07:06:33'),
(3, '3', '1', '439235854', '2024-09-11 07:08:19'),
(4, '3', '2', '439235854', '2024-09-11 07:08:19'),
(5, '3', '4', '439235854', '2024-09-11 07:08:19'),
(6, '3', '6', '439235854', '2024-09-11 07:08:19'),
(7, '3', '7', '439235854', '2024-09-11 07:08:19');
```

APPENDIX B (SCREENSHOTS)

Fig B.1.1 : Online food ordering system Login Page

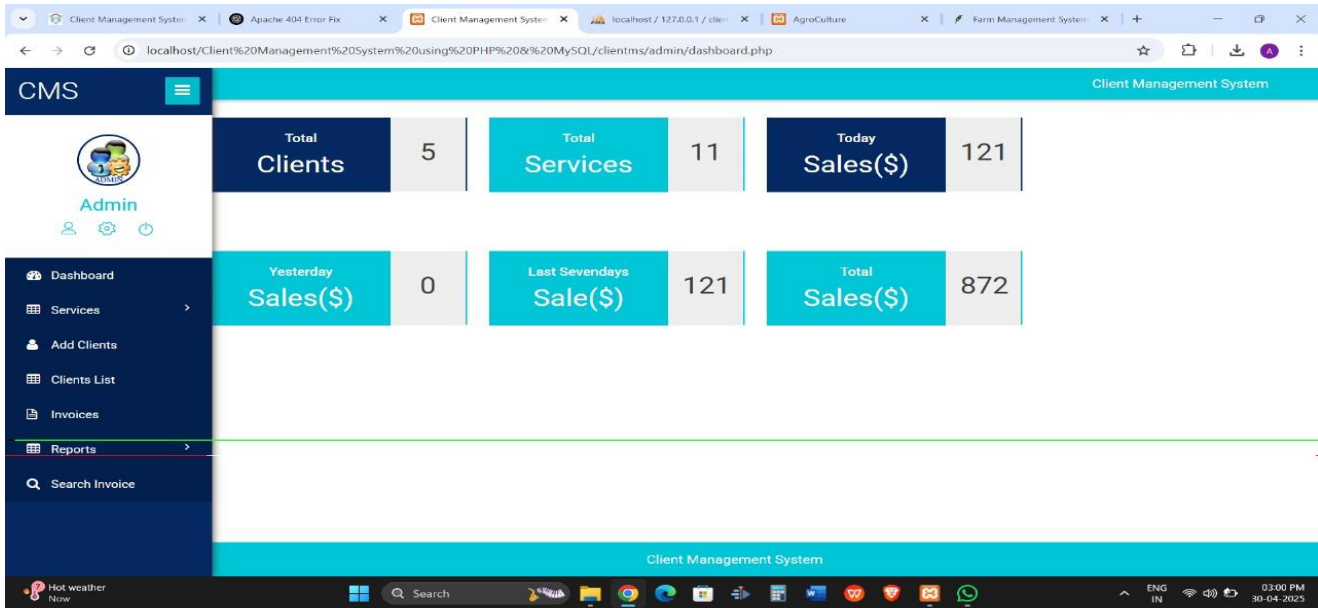


Fig B.1: Login Page

Fig B.1.2 : Online food ordering system Home Page

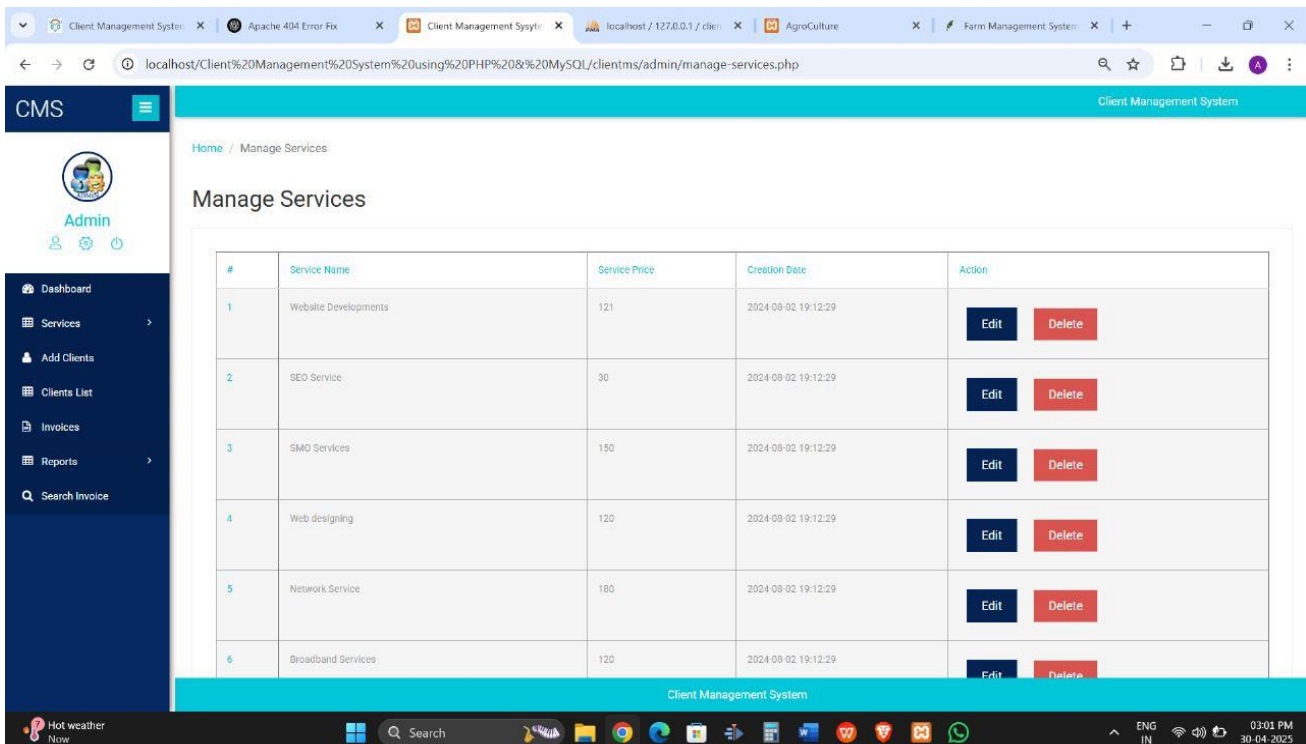


Fig B.1.3: Checkout Page

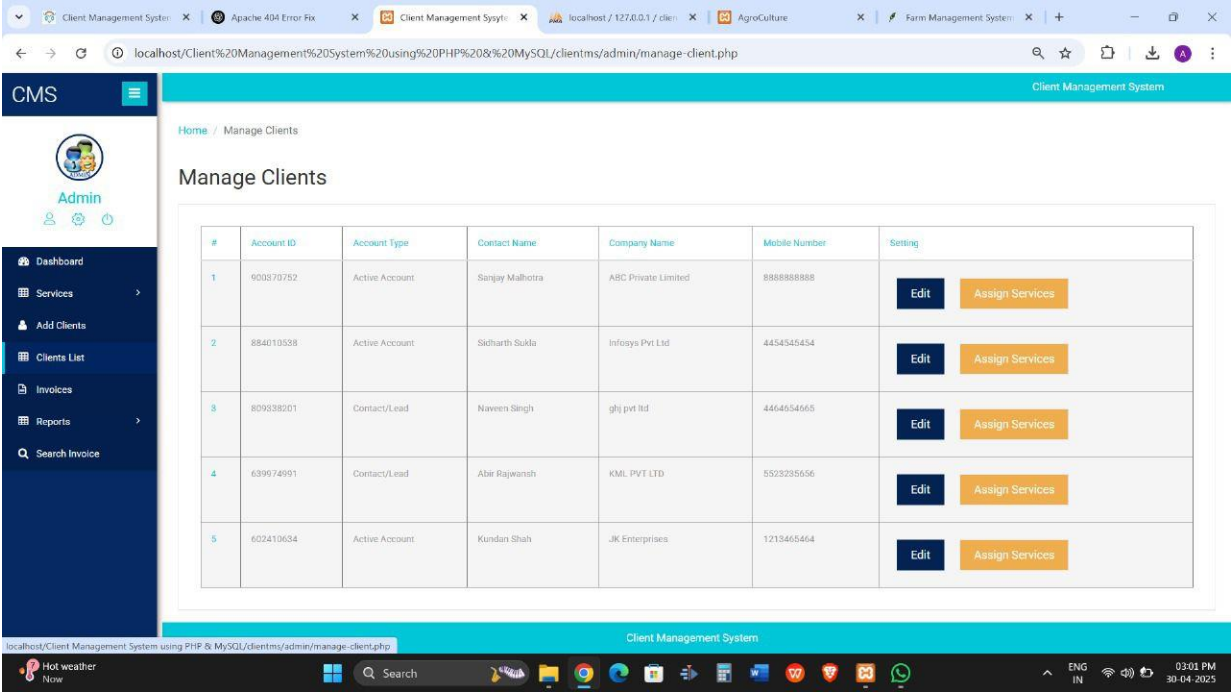
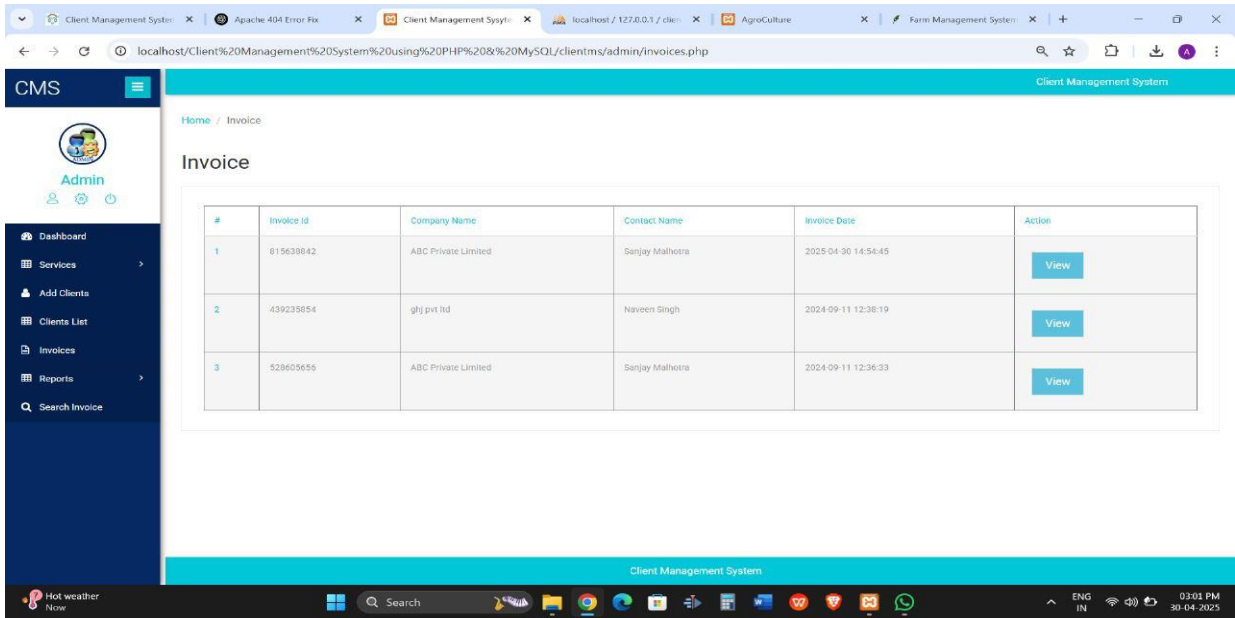


Fig 1.4:Admin page:



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