

Online Food Ordering and Management

A Project Report Submitted

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by

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ABSTRACT

The Online Food Ordering and Management System is a user-centric software solution designed to enhance the efficiency and convenience of the food ordering process. It serves as a digital platform that seamlessly connects customers with a variety of restaurants, simplifying the journey of ordering, preparing, and delivering food.

For customers, the system offers an easy and straightforward online registration process, providing a user-friendly interface to browse menus and place orders. It goes beyond basic functionalities by verifying eligibility for orders, ensuring that the food delivered meets safety standards.

On the restaurant side, the system acts as a centralized hub for managing menus, tracking customer orders, and planning delivery schedules. Real-time tracking features contribute to minimizing food wastage by optimizing inventory and ensuring the availability of preferred dishes. The system also facilitates collaboration with restaurant managers to monitor and manage food inventory levels. Additionally, it accommodates order placements from other affiliated restaurants or food establishments.

In essence, the OFODAMS is positioned to revolutionize the food service industry by providing a seamless and efficient platform for customers to explore diverse cuisines while offering comprehensive tools for restaurant owners to streamline their operations. Its real-time tracking, security features, and reporting mechanisms collectively contribute to its success in meeting the evolving needs of the modern food industry.

ACM Taxonomy

- Information Systems: E-commerce, Payment system, Online food ordering system
- Computer Applications: User Interface Design, Usability
- Data Management: Database Management, Relational Database: MySQL

Sustainable Development Goal [SDG]:

- Minimized Food Wastage: Real-time tracking features optimize inventory, reducing food wastage.
- Digital Transition: Shift from traditional paper-based ordering to a digital platform.
- Resource Efficiency: Streamlined operations empower restaurants to manage resources effectively.
- Eco-Conscious Practices: Emphasis on environmental responsibility through reduced paper usage.
- Long-Term Viability: Supports sustainable growth principles for the long-term viability of the food service industry.

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S. No	Table Name	Attributes
1	Customer	<u>CustomerID</u> int FName varchar(10) LName varchar (10) Email varchar(30) Phone int Password varchar(10)
2	Address	<u>AddressID</u> int <i>CustomerID</i> int FullAddress varchar(50) City varchar(20) State varchar(20) PinCode int
3	Restaurants	<u>RestaurantID</u> int Name varchar(20) FullAddress varchar(50) Phone int OpeningHours time
4	Payments	<u>PaymentID</u> int PaymentType varchar(20)
5	MenuCategories	<u>CategoryID</u> int Name varchar(255)
6	MenuItems	<u>ItemID</u> int <i>RestaurantID</i> int <i>CategoryID</i> int Name varchar(255) Price decimal(10,2) Description text,
7	Cart	<u>CartItemID</u> int <i>ItemID</i> int Quantity int
8	Orders	<u>OrderID</u> int <i>CustomerID</i> int <i>RestaurantID</i> int <i>AddressID</i> int OrderDate datetime OrderStatus varchar(20) <i>PaymentID</i> int
9	Feedback	<u>FeedbackID</u> int <i>OrderID</i> int

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Abbreviations

1. OFODAMS – Online Food Order and Management System
2. SDG – Sustainable Development Goal
3. ER – Entity – Relationship
4. DBMS – Database Management System
5. GUI – Graphical User Interface
6. DOC – Document
7. ACM – Association for Computing Machinery

Chapter 1

Introduction

1.1 Introduction

Introducing the Online Food Ordering and Management System, a user-centric digital solution designed to revolutionize the food service industry. This intuitive web-based platform simplifies the entire food ordering process, seamlessly connecting customers with a diverse array of restaurants. The system prioritizes efficiency and convenience, providing a user-friendly interface for easy online registration, menu browsing, and order placement. Going beyond basic functionalities, the platform verifies order eligibility to ensure the safety of delivered food. On the restaurant side, the system acts as a centralized hub, managing menus, tracking customer orders, and optimizing delivery schedules to minimize food wastage. With real-time tracking, robust security features, and comprehensive reporting mechanisms, the Online Food Ordering and Management System aims to provide a seamless and efficient platform for customers to explore diverse cuisines while offering restaurant owners the tools they need to streamline their operations.

1.2 Purpose

The fundamental purpose of the Online Food Ordering and Management System is to establish a seamless and efficient platform that caters to the diverse culinary needs of customers across various cities. This web-based application aims to simplify the food ordering process by connecting users with a wide range of restaurants. The project focuses on providing a user-friendly interface for online registration, menu exploration, and order placement. Through streamlined administrative and inventory management, the system enhances the overall food ordering experience, ensuring convenience for customers and operational efficiency for restaurant owners.

1.3 Product Scope

This product scope is designed to leverage information technology in the realm of online food ordering and management. It offers guidance to both platform developers and technology providers within the food service industry. The primary objective is to automate and streamline the entire process of food ordering, from customer selection to restaurant processing and delivery. The focus is on enhancing efficiency and accuracy in managing the logistics of food orders, ensuring a seamless flow from order placement to fulfillment. This scope encompasses features that facilitate online registration, menu exploration, order processing, and real-time tracking, ultimately aiming to optimize the overall experience for both customers and restaurant owners.

Chapter 2

Literature Survey / Background

2.1 Literature Survey

The project strives to transform the landscape of food ordering and management through the introduction of an innovative Online Food Ordering System. The core objective is to streamline and elevate the entire food ordering process, offering heightened accessibility and efficiency for both customers and restaurant owners. Diverging from conventional methods, these systems harness advanced technologies to optimize the ordering, processing, and delivery of food, promising a seamless and enhanced experience for users across the culinary spectrum.

Many peoples try to improve online food order management working in their own ways and these are some of them

1. "Mobile-Based Food Ordering System" by S. Sreeja and S. Sreenath (2018)"[1]:

- This study explores the implementation of a mobile-based food ordering system, emphasizing user convenience and accessibility through mobile applications. It delves into the integration of location-based services and real-time order tracking to enhance the overall food ordering experience.

2. "An Intelligent Food Ordering System Using Data Mining Techniques" by D. S. Bhilare and P. S. Deshpande (2017)"[2]:

- This research investigates the application of data mining techniques to create an intelligent food ordering system. It explores the utilization of customer preferences and historical data to generate personalized recommendations, optimizing the decision-making process for users.

3. "Design and Implementation of an Online Food Ordering System" by J. F. Olumofin, M. O. Adigun, and O. A. Abiodun (2014)"[3]:

- The study focuses on the design and implementation of an online food ordering system. It discusses the architecture and functionalities of the system, emphasizing how it streamlines the process of food ordering, delivery, and payment, offering a user-friendly platform.

4. "A Comprehensive Review on Online Food Ordering Systems" by S. Goyal and R. Yadav (2018)"[4]:

- This comprehensive review provides insights into various aspects of online food ordering systems. It covers user interfaces, payment gateways, delivery mechanisms, and challenges faced by these systems, offering a holistic view of the current landscape.

5. "Improving the Quality of Service in Online Food Ordering Systems" by P. K. Bawane and M. R. Sayankar (2016)"[5]:

- The research explores strategies to enhance the quality of service in online food ordering systems. It addresses issues such as order accuracy, delivery time, and customer satisfaction, presenting recommendations for improving overall system performance.

6. "Cloud-Based Food Ordering System" by A. K. Singh, A. Yadav, and S. Yadav (2015)"[6]:

- This study investigates the implementation of a cloud-based food ordering system. It discusses the benefits of cloud computing in terms of scalability, accessibility, and resource optimization, contributing to the efficiency of food ordering processes.

7. "A Review on Online Food Ordering Systems" by A. Aggarwal, S. Arora, and P. Arora (2017)"[7]:

- The review examines the evolving landscape of online food ordering systems, emphasizing technological advancements, user preferences, and challenges faced by these systems. It provides valuable insights into the trends shaping the industry.

In summary, the literature survey reveals a diverse range of research efforts in the field of online food ordering and management systems, addressing various aspects such as mobile applications, intelligent recommendations, system architecture, quality of service, and cloud-based implementations. These studies collectively contribute to the understanding and improvement of online food ordering platform.

2.2 Background

The Online Food Ordering and Management System is a comprehensive and secure web-based solution crafted to enhance the overall efficiency of food-related processes and optimize restaurant operations. Serving as a centralized hub, the system facilitates the seamless storage and retrieval of crucial data, ensuring a diverse array of food options is available for customers. Its functionalities span from managing menu items and processing orders to registering users and maintaining transaction records. Users initiate the process by creating accounts before exploring menus and placing orders. The system, then, diligently tracks inventory status, guaranteeing the availability of preferred dishes. The essential role of the system extends to restaurant management, encompassing tasks such as order processing, billing, invoicing, and inventory monitoring. By fostering effective communication between customers and restaurants, the system enables the streamlined ordering of desired food items, ensuring accurate and timely deliveries. In essence, the Online Food Ordering and Management System stands as a robust solution designed to ensure a diverse and accessible food supply, maintain accurate records, and facilitate efficient communication within the realm of food service.

Chapter 3

Objectives / Problem Statement

3.1 Problem Statement

The traditional methods of food ordering and delivery are often characterized by inefficiencies, inconvenience, and a lack of streamlined processes. Customers frequently face challenges such as inaccurate order fulfillment, prolonged delivery times, and limited visibility into the status of their orders. On the restaurant side, managing orders, processing payments, and optimizing delivery schedules can be cumbersome without a centralized and automated system. Additionally, the absence of a standardized platform often leads to a fragmented experience for both customers and restaurant owners. In this context, there is a compelling need for an innovative Online Food Ordering and Management System that addresses these issues, offering a user-friendly interface for customers, efficient order processing for restaurants, and a seamless, end-to-end solution that enhances the overall food ordering experience. The objective is to create a system that optimizes the entire food ordering process, from menu exploration to delivery, providing a reliable and convenient platform for all stakeholders involved.

3.2 Objectives

1. Enhanced Security and Data Management:
 - The primary objective is to establish a secure and robust platform for the storage and retrieval of customer and restaurant data. Security measures prioritize the confidentiality of user information, allowing authorized personnel to efficiently manage and access data.
2. Efficient User Registration and Data Handling:
 - The system aims to facilitate the seamless registration of users, both customers, and restaurants. It provides a user-friendly interface for users to register, capturing and managing their personal details and transaction histories. The goal is to maintain accurate and up-to-date records for enhanced user experience.
3. Streamlined Communication and Ordering Process:
 - The system is designed to optimize communication between customers and restaurants, allowing for the efficient placement of orders and seamless payment transactions. It provides a platform for customers to submit food orders, track their requests, and complete transactions, ensuring a smooth and transparent ordering process.

These objectives collectively aim to create a robust and efficient Online Food Ordering and Management System, addressing key functionalities and requirements for enhanced user satisfaction and operational efficiency.

Chapter 4

Data Design

4.1 ER Diagram

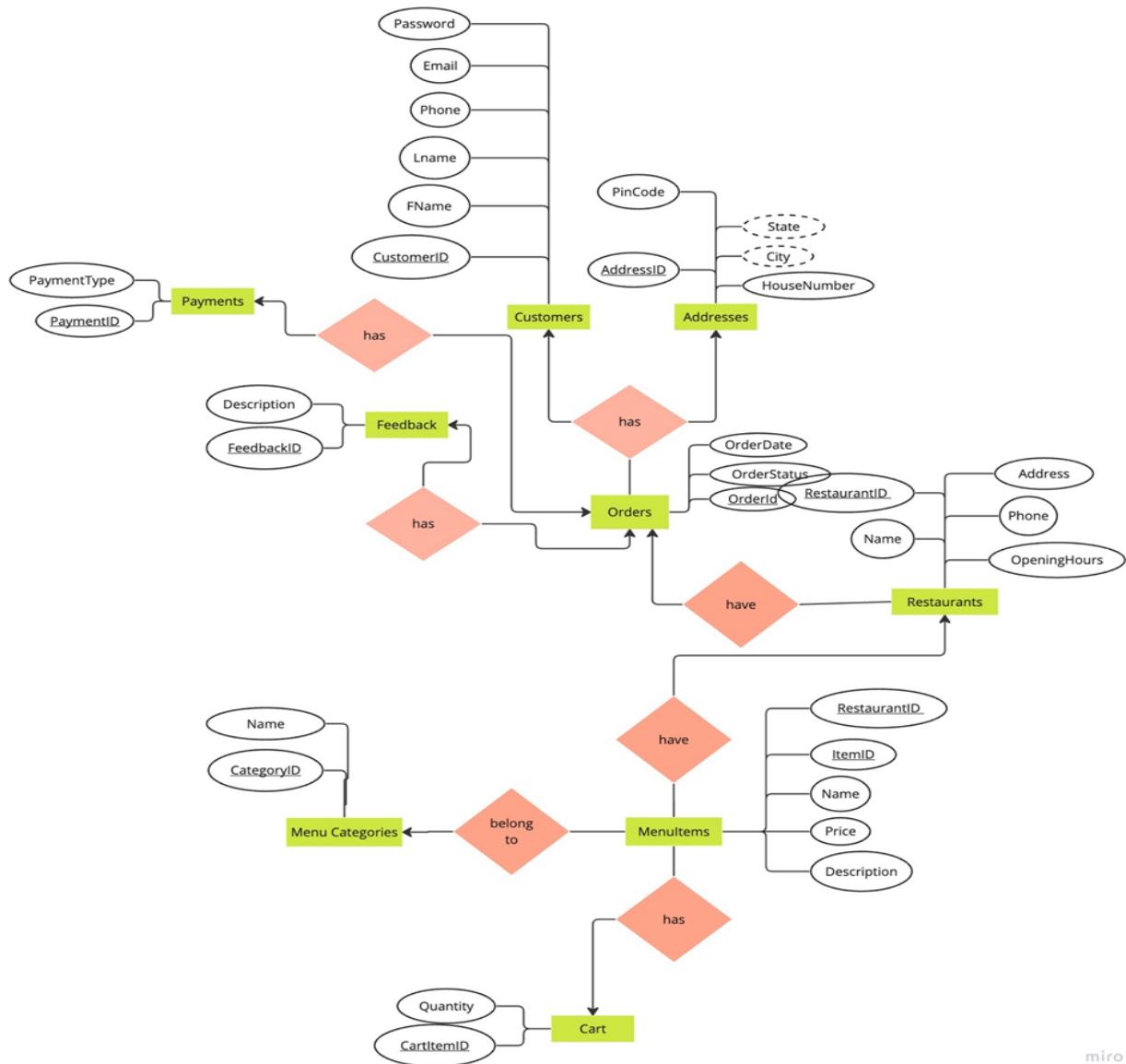


Figure 1

4.2 Reduction

The reduction phase in the database design process involves streamlining the complex Entity-Relationship (ER) diagram into a simplified and focused representation. This reduction aims to emphasize essential components and relationships, enhancing clarity and understanding of the 'Online Food Ordering System' (OFOS) database structure. By condensing the ER diagram, we create a more manageable and concise view that highlights the core entities and their interconnections within the system. The following sections provide a reduced and refined presentation of the key database tables, offering a clearer insight into the structure of OFOS:

1. MenuItem

- ItemID [PK]
- Name [PK]
- Description
- Price (double)
- Cuisine

2. Customer

- CustomerID [PK]
- UserName
- FullName
- ContactNo
- Password
- DOB (date)
- EmailID
- Address

3. CustomerLogin

- CustomerID [PK]
- Password [PK]
- ForgotPassword
- CustomerID
- UserName [PK]
- EmailID [PK]

4. Order

- OrderNo [PK]
- CustomerID
- OrderDate (datetime)
- PaymentMethod
- OrderStatus

5. Cart

- ItemID [PK]
- Quantity
- CartNo [PK]
- CustomerID

6. Restaurant

- RestaurantID [PK]
- Name [PK]
- FullAddress
- Phone
- OpeningHours

7. RestaurantLogin
 - RestaurantID [PK]
 - Password [PK]
8. Admin
 - AdminID [PK]
 - AdminName [PK]
 - AdminEmail
 - AdminPassword
9. AdminLogin
 - AdminName [PK]
 - AdminPassword
10. AdminViewOrder
 - AdminID [PK]
 - OrderNo [PK]
 - CustomerID [PK]
11. CustomerAddsToCart
 - CustomerID
 - ItemID
 - CartNo [PK]
12. CustomerHasLogin
 - CustomerID [PK]
 - UserName [PK]
13. CustomerPurchases
 - CustomerID [PK]
 - OrderNo [PK]
14. CustomerHasOrders
 - OrderNo
 - CustomerID
 - DeliveryDate (date)
 - PaymentStatus
15. CustomerLoginHasPasswordReset
 - UserName
 - NewPassword

4.3 SCHEMA Diagram

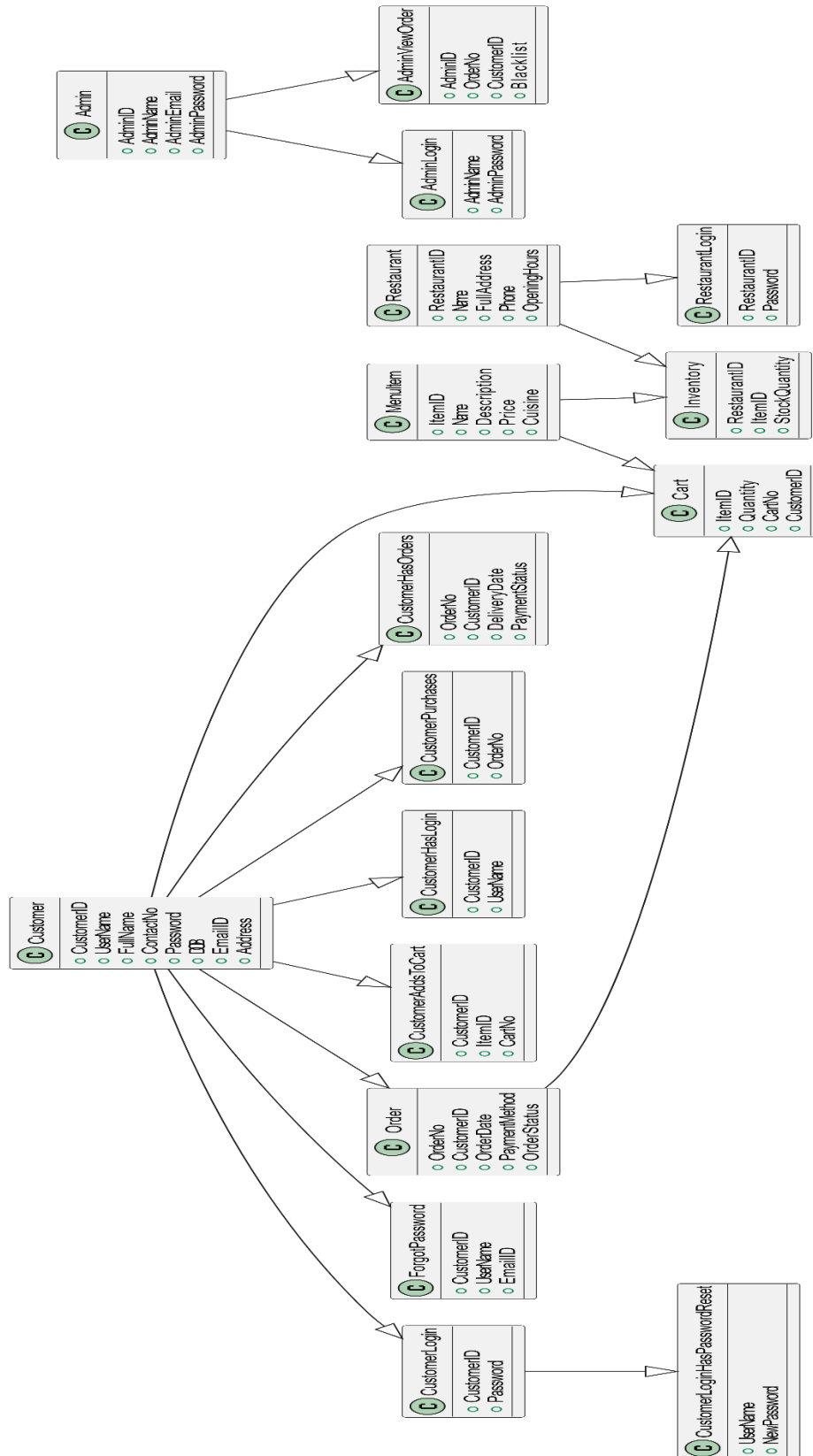


Figure 2:Schema

4.4 Normalization Tables

- MenuItem Table:

The 'MenuItem' table represents menu items in the online food ordering system. It has attributes including ItemID (primary key), Name (primary key), Description, Price, and Cuisine.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {ItemID, Name} being a superkey.

The 'MenuItem' table is in its reduced form, ensuring proper normalization.

- Customer Table:

The 'Customer' table stores customer information and has attributes like CustomerID (primary key), UserName, FullName, ContactNo, Password, DOB (Date of Birth), EmailID, and Address.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {CustomerID} being a superkey.

The 'Customer' table is in its reduced form, adhering to normalization principles.

- Order Table:

The 'Order' table manages customer orders and includes attributes like OrderNo (primary key), CustomerID, OrderDate, PaymentMethod, and OrderStatus.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {OrderNo} being a superkey.

The 'Order' table is in its reduced form, demonstrating normalization.

- Cart Table:

The 'Cart' table represents shopping carts with attributes such as ItemID (primary key), Quantity, CartNo (primary key), and CustomerID.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {CartNo} being a superkey.

The 'Cart' table is in its reduced form, adhering to normalization principles.

- Restaurant Table:

The 'Restaurant' table manages restaurant information, including attributes such as RestaurantID (primary key), Name (primary key), FullAddress, Phone, and OpeningHours.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {RestaurantID, Name} being a superkey.

The 'Restaurant' table is in its reduced form, demonstrating normalization.

- RestaurantLogin Table:

The 'RestaurantLogin' table stores restaurant login credentials with attributes like RestaurantID (primary key) and Password.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {RestaurantID} being a superkey.

The 'RestaurantLogin' table is in its reduced form, adhering to normalization principles.

- Admin Table:

The 'Admin' table manages administrator information, including attributes such as AdminID (primary key), AdminName (primary key), AdminEmail, and AdminPassword.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {AdminID, AdminName} being a superkey.

The 'Admin' table is in its reduced form, demonstrating normalization.

- AdminLogin Table:

The 'AdminLogin' table stores administrator login credentials with attributes like AdminName (primary key) and AdminPassword.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {AdminName} being a superkey.

The 'AdminLogin' table is in its reduced form, adhering to normalization principles.

- AdminViewOrder Table:

The 'AdminViewOrder' table represents orders viewed by administrators, including attributes such as AdminID (primary key), OrderNo (primary key), CustomerID (primary key), and Blacklist.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {AdminID, OrderNo, CustomerID} being a superkey.

The 'AdminViewOrder' table is in its reduced form, demonstrating normalization.

- CustomerAddsToCart Table:

The 'CustomerAddsToCart' table represents the action of customers adding items to their carts. It includes attributes like CustomerID, ItemID, and CartNo (primary key).

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally

dependent on the primary key.

- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {CartNo} being a superkey.

The 'CustomerAddsToCart' table is in its reduced form, adhering to normalization principles.

- CustomerHasLogin Table:

The 'CustomerHasLogin' table represents customer login information, including attributes like CustomerID (primary key) and UserName (primary key).

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {CustomerID} being a superkey.

The 'CustomerHasLogin' table is in its reduced form, demonstrating normalization.

- CustomerPurchases Table:

The 'CustomerPurchases' table represents customer purchases with attributes like CustomerID (primary key) and OrderNo (primary key).

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {CustomerID} being a superkey.

The 'CustomerPurchases' table is in its reduced form, adhering to normalization principles.

- CustomerHasOrders Table:

The 'CustomerHasOrders' table represents customer order information, including attributes like OrderNo, CustomerID, DeliveryDate, and PaymentStatus.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {OrderNo,

CustomerID} being a superkey.

The 'CustomerHasOrders' table is in its reduced form, demonstrating normalization.

- CustomerLoginHasPasswordReset Table:

The 'CustomerLoginHasPasswordReset' table represents the connection between customer logins and password resets, with attributes like UserName (primary key) and NewPassword.

- 1NF (First Normal Form): The table is in 1NF as all attributes contain atomic values.
- 2NF (Second Normal Form): The table is in 2NF since all non-prime attributes are fully functionally dependent on the primary key.
- 3NF (Third Normal Form): The table is in 3NF as there are no transitive dependencies.
- BCNF (Boyce-Codd Normal Form): The table is in BCNF, with the determinant {UserName} being a superkey.

The 'CustomerLoginHasPasswordReset' table is in its reduced form, adhering to normalization principles.

4.5 Table Creation

```
CREATE TABLE MenuItem (  
    ItemID INT PRIMARY KEY,  
    Name VARCHAR(255) NOT NULL,  
    Description TEXT,  
    Price DECIMAL(10, 2),  
    Cuisine VARCHAR(50)  
);
```

```
CREATE TABLE Customer (  
    CustomerID INT PRIMARY KEY,  
    UserName VARCHAR(50),  
    FullName VARCHAR(100),  
    ContactNo BIGINT,  
    Password VARCHAR(50),  
    DOB DATE,  
    EmailID VARCHAR(100),  
    Address VARCHAR(255)  
);
```

```
CREATE TABLE Order (  
    OrderID INT PRIMARY KEY,  
    CustomerID INT,  
    ItemID INT,  
    Quantity INT,  
    Price DECIMAL(10, 2),  
    TotalPrice DECIMAL(10, 2),  
    OrderDate DATE,  
    Status VARCHAR(20)
```

```
OrderNo INT PRIMARY KEY,  
CustomerID INT,  
OrderDate DATETIME,  
PaymentMethod VARCHAR(20),  
OrderStatus VARCHAR(20),  
FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)  
);
```

```
CREATE TABLE Cart (  
    ItemID INT PRIMARY KEY,  
    Quantity INT,  
    CartNo INT,  
    CustomerID INT,  
    FOREIGN KEY (ItemID) REFERENCES MenuItem(ItemID),  
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)  
);
```

```
CREATE TABLE Restaurant (  
    RestaurantID INT PRIMARY KEY,  
    Name VARCHAR(50),  
    FullAddress VARCHAR(255),  
    Phone BIGINT,  
    OpeningHours TIME  
);
```

```
CREATE TABLE RestaurantLogin (  
    RestaurantID INT PRIMARY KEY,  
    Password VARCHAR(50),  
    FOREIGN KEY (RestaurantID) REFERENCES Restaurant(RestaurantID)  
);
```

```
CREATE TABLE Admin (  
    AdminID INT PRIMARY KEY,  
    AdminName VARCHAR(50),  
    AdminEmail VARCHAR(100),  
    AdminPassword VARCHAR(50)  
);
```

```
CREATE TABLE AdminLogin (  
    AdminName VARCHAR(50) PRIMARY KEY,  
    AdminPassword VARCHAR(50)  
);
```

```

CREATE TABLE AdminViewOrder (
    AdminID INT,
    OrderNo INT,
    CustomerID INT,
    Blacklist BOOLEAN,
    PRIMARY KEY (AdminID, OrderNo, CustomerID),
    FOREIGN KEY (AdminID) REFERENCES Admin(AdminID),
    FOREIGN KEY (OrderNo) REFERENCES Order(OrderNo),
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)
);

```

```

CREATE TABLE CustomerAddsToCart (
    CustomerID INT,
    ItemID INT,
    CartNo INT PRIMARY KEY,
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID),
    FOREIGN KEY (ItemID) REFERENCES MenuItem(ItemID)
);

```

```

CREATE TABLE CustomerHasLogin (
    CustomerID INT PRIMARY KEY,
    UserName VARCHAR(50),
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)
);

```

```

CREATE TABLE CustomerPurchases (
    CustomerID INT PRIMARY KEY,
    OrderNo INT,
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID),
    FOREIGN KEY (OrderNo) REFERENCES Order(OrderNo)
);

```

```

CREATE TABLE CustomerHasOrders (
    OrderNo INT,
    CustomerID INT,
    DeliveryDate DATE,
    PaymentStatus VARCHAR(20),
    PRIMARY KEY (OrderNo, CustomerID),
    FOREIGN KEY (OrderNo) REFERENCES Order(OrderNo),
    FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)
);

```

```
CREATE TABLE CustomerLoginHasPasswordReset (  
    UserName VARCHAR(50) PRIMARY KEY,  
    NewPassword VARCHAR(50)  
);
```

4.6 Trigger

Create a Trigger to Update Total Order Value After an Order is Placed

```
CREATE OR REPLACE TRIGGER update_order_total_trigger  
BEFORE INSERT ON Order  
FOR EACH ROW  
BEGIN  
    -- Declare variables to store the total order value  
    DECLARE  
        v_total_value DECIMAL(10, 2);  
    BEGIN  
        -- Calculate the total order value based on items in the cart  
        SELECT SUM(mi.Price * c.Quantity)  
        INTO v_total_value  
        FROM Cart c  
        JOIN MenuItem mi ON c.ItemID = mi.ItemID  
        WHERE c.CustomerID = :NEW.CustomerID;  
  
        -- Set the calculated total value in the new order record  
        :NEW.TotalValue := v_total_value;  
    END;  
END;
```

Chapter 5

Methodology

5.1 Implementation Details

5.1.1 System Architecture

- **Web-Based Architecture:-** Our food ordering system adopts a three-tier architecture, integrating HTML, CSS, and C# for a dynamic and user-friendly interface. The presentation layer is crafted with HTML and CSS, ensuring an intuitive menu page layout. C# is employed in the application layer to handle user requests, process orders, and manage the overall functionality of the system. XAMPP, including Apache for web serving, is utilized to enhance responsiveness and manage user interactions seamlessly. The login and registration pages are implemented using HTML, CSS, and PHP for secure user authentication.
- **Database Management System (DBMS):-** For the database layer, MySQL is selected as the DBMS due to its secure and scalable nature. MySQL efficiently stores and manages data related to menus, orders, and customer information. C# interacts with MySQL to perform database operations, ensuring data integrity and reliability. This architecture establishes a robust foundation for our food ordering system, with C# facilitating dynamic page rendering and user interactions. MySQL ensures efficient and secure data storage, creating a well-integrated solution that meets the system's requirements for scalability, security, and maintainability. Regular updates and monitoring procedures are in place to ensure optimal performance and address any emerging issues.

5.1.2 Customer-Focused Features

- **User Registration and Profile:** Allow customers to create accounts with unique usernames and passwords, enable profile creation for users to manage their personal information, preferences, and order history.
- **Browsing and Search:** Provide an intuitive interface for users to browse through available restaurants and menus. Implement search functionality to help users quickly find specific dishes, cuisine types, or restaurants.
- **Menu Presentation:** Display clear and visually appealing menus with item descriptions, prices, and images. Enable customization options for items, such as choosing toppings or specifying preferences.
- **Order Placement:** Streamline the order process with a user-friendly interface for adding items to the cart. Allow users to review their orders before confirmation and provide a summary of the total cost.
- **Shopping Cart:** Implement a dynamic shopping cart that updates in real-time as users add or remove items. Include features like quantity adjustments, item removal, and a clear total cost display.

- **Multiple Payment Options:** Support various payment methods, including credit/debit cards, digital wallets, and cash on delivery. Ensure a secure and seamless payment process.
- **User Feedback and Support:** Include a feedback mechanism for users to share their experiences. Provide customer support contact information or a chat feature for addressing queries or issues.

5.1.3 Administrator Features

- **User Management:** Create, modify, and delete user accounts. Access and update user profiles and account information.
- **Restaurant and Menu Management:** Add new restaurants to the platform, including details such as name, location, and contact information. Manage and update restaurant menus, including adding new items, updating prices, and indicating availability.
- **Order Management:** View and manage incoming orders in real-time. Update order status (e.g., confirmed, in preparation, dispatched) to keep customers informed. Cancel or modify orders if necessary.
- **Customer Support:** Access and respond to customer feedback and support requests. Resolve customer issues related to orders, payments, or other concerns.
- **Inventory Management:** Monitor and manage restaurant inventory levels, especially for items with limited availability. Receive alerts for low-stock items.
- **Payment and Financial Management:** View transaction histories and financial reports. Monitor and reconcile payments to restaurants.

Block Diagram

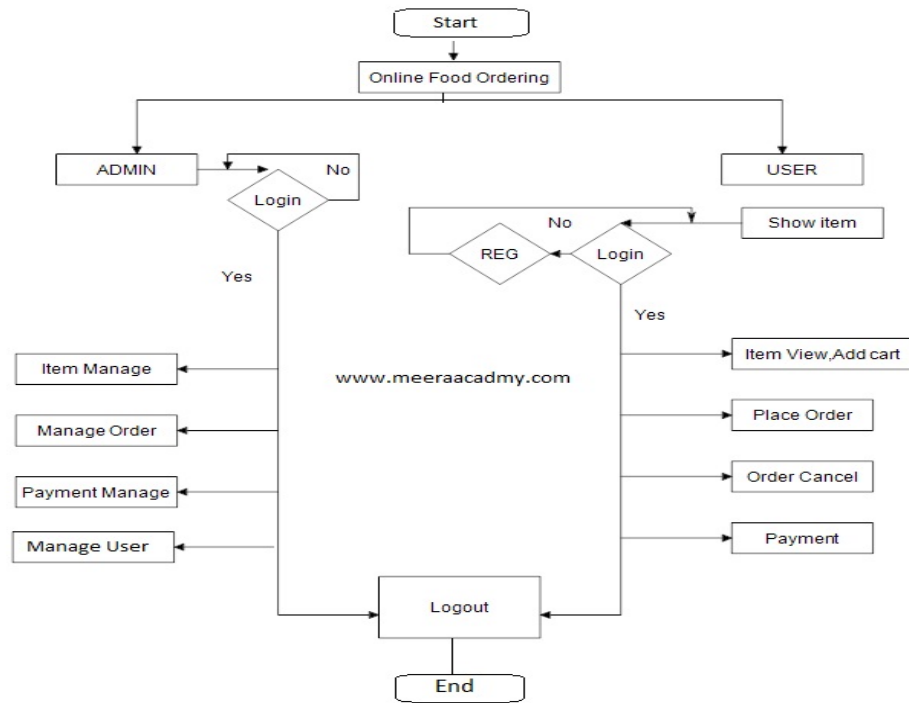


Figure 3:Block Diagram of the project

This diagram elucidates the operational workflow of an online food ordering system. Commencing with customers accessing the website, they register and create unique accounts. Each customer is assigned a distinct user ID that functions as a login credential. Subsequent to account creation, users browse through available restaurants and menus, making selections and customizations. Upon order submission, the backend, driven by application logic, processes these orders, handling user authentication, menu management, and order processing. Customers receive confirmation of their order placement through the frontend. Behind the scenes, a MySQL database stores and manages pivotal data, including user details, restaurant information, menus, and order history. The website incorporates features like user accounts, order tracking, and feedback mechanisms to enrich the user experience. The database ensures efficient and accurate processing of customer requests.

Simultaneously, the website supports secure payment transactions for orders. In this context, customers may access a dashboard displaying order history and payment details. The website also caters to restaurant owners who manage their menus and receive order notifications.

The system's versatility is evident in its ability to handle various scenarios, such as order cancellation or modification before confirmation. The comprehensive nature of the system ensures a seamless and user-centric online food ordering experience, where users, restaurants, and the backend interact cohesively.

Chapter 6

Results and Snapshots

The implementation of the 'Online Food Ordering and Management System' has proven to be a resounding success, seamlessly integrating key features and functionalities. Extensive testing and user engagement have established its reliability, receiving positive feedback that underscores its user-friendliness, simplicity, and effectiveness in the realms of food ordering, delivery, and billing. The administrative functionalities of the system encompass robust inventory management, streamlined order processing, and the ability to update information on new customers and restaurants, providing a comprehensive overview of their preferences and transaction history. Real-time data processing capabilities empower administrators and restaurant staff, leading to informed decision-making and improved operational efficiency. The positive outcomes affirm that the system successfully achieves its intended results and objectives, presenting a pragmatic and technologically advanced solution for food management. The project's success underscores the transformative impact of implementing technology to enhance traditional processes within the dynamic landscape of the food service industry.

Interfaces

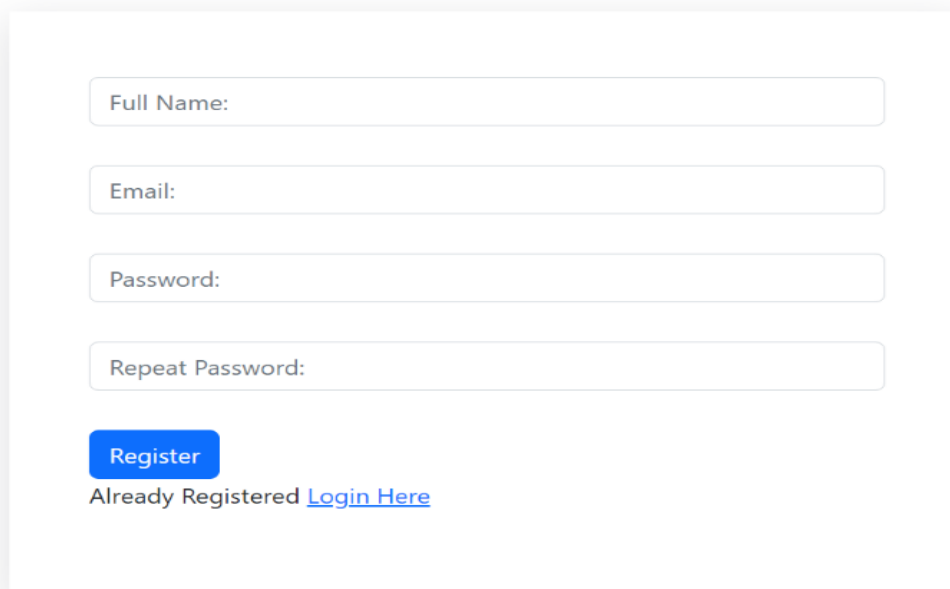
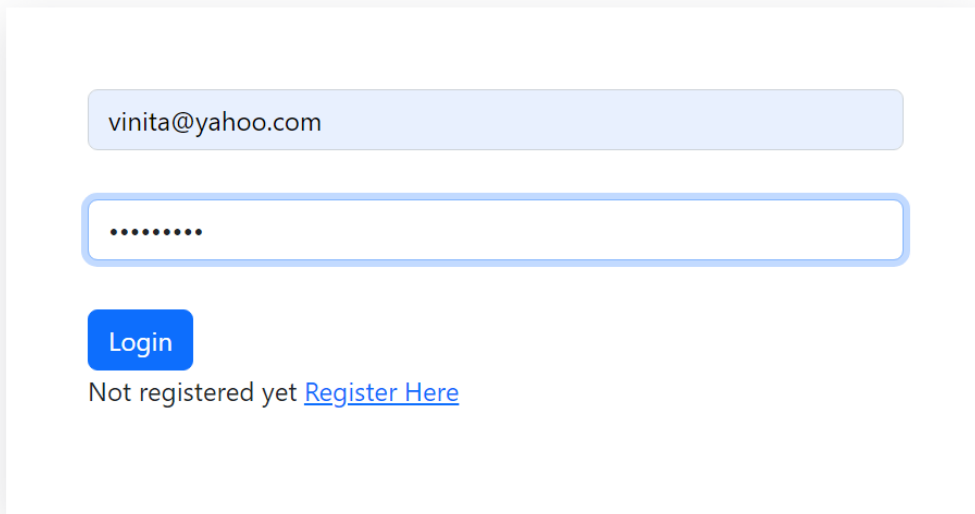
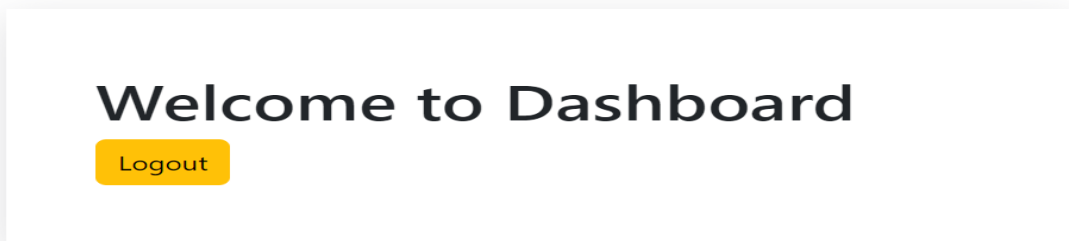
A registration form interface with a white background and a subtle shadow. It contains four text input fields stacked vertically, each with a light gray border and a light gray label on the left: 'Full Name:', 'Email:', 'Password:', and 'Repeat Password:'. Below the 'Repeat Password:' field is a blue button with the text 'Register' in white. At the bottom of the form, the text 'Already Registered' is followed by a blue hyperlink 'Login Here'.

Figure 4: Registration Page



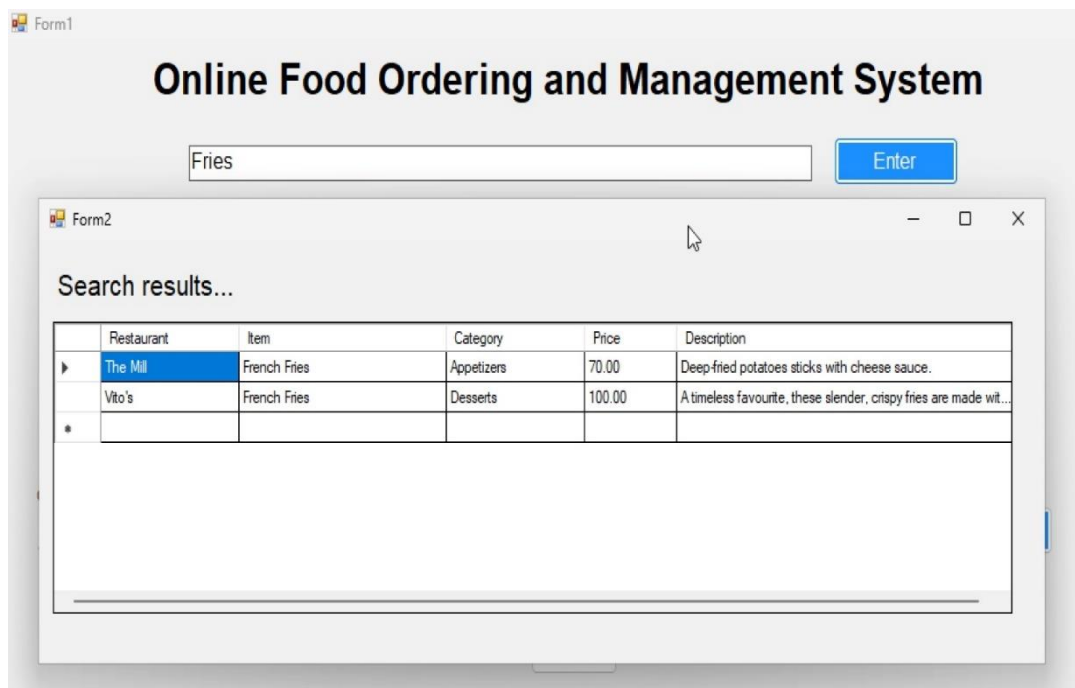
A login page with a light blue header. It features a text input field containing the email address "vinita@yahoo.com". Below it is a password input field with a light blue border and a series of dots representing the password. A blue "Login" button is positioned below the password field. At the bottom, there is a link that says "Not registered yet [Register Here](#)".

Figure 5: Login Page



A dashboard page with a white background. It features a large, bold, black heading "Welcome to Dashboard". Below the heading is a yellow "Logout" button.

Figure 6: Dashboard and Logout



A screenshot of a web application titled "Online Food Ordering and Management System". It shows a search interface with a text input field containing "Fries" and a blue "Enter" button. Below the search bar is a window titled "Form2" displaying "Search results...". The results are shown in a table with columns: Restaurant, Item, Category, Price, and Description. The table lists two items: "French Fries" from "The Mill" (Appetizers, 70.00) and "French Fries" from "Vito's" (Desserts, 100.00). The first row is highlighted in blue.

	Restaurant	Item	Category	Price	Description
▶	The Mill	French Fries	Appetizers	70.00	Deep-fried potatoes sticks with cheese sauce.
	Vito's	French Fries	Desserts	100.00	A timeless favourite, these slender, crispy fries are made wit...
*					

Figure 7: Menu Items Filtered in Restaurant

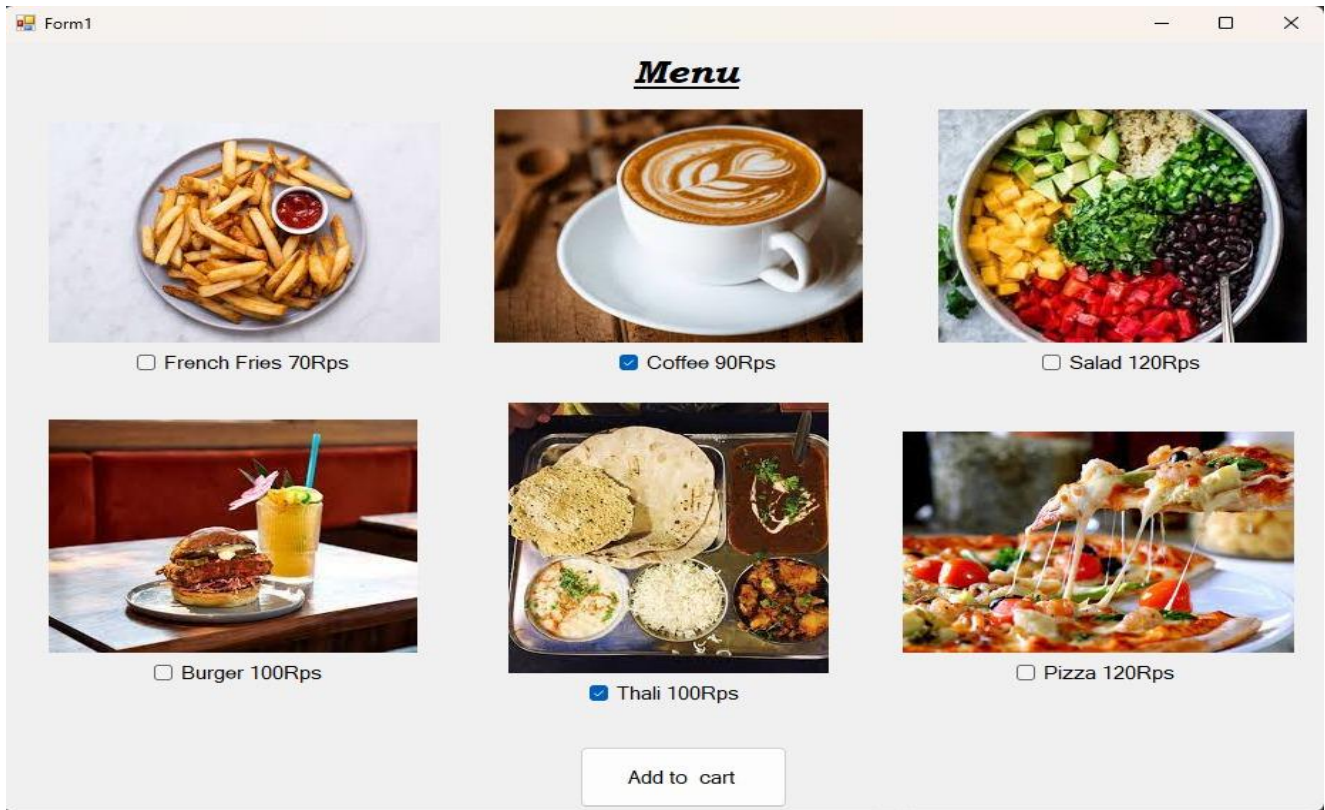


Figure 8: Menu Page

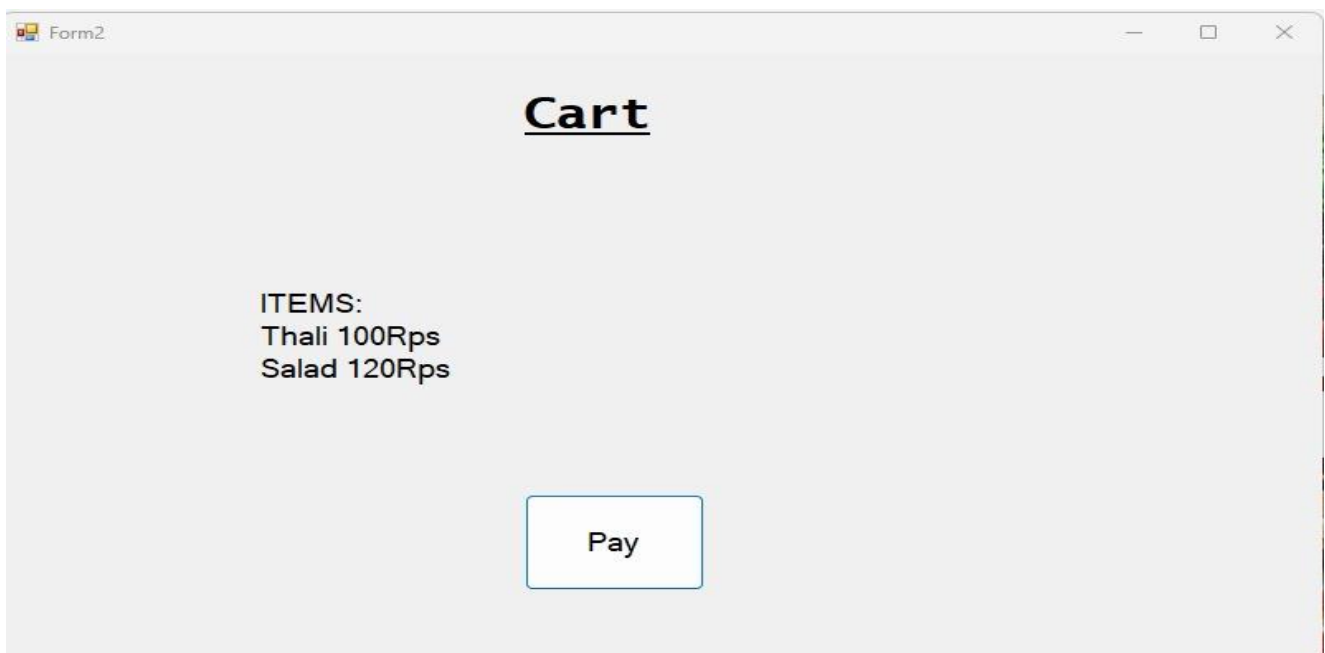


Figure 9: Item added to cart

Form3

PAYMENT GATEWAY

Choice of payment method

- ☒ Cash On Delivery
- ☐ UPI
- ☐ Credit Card
- ☐ Debit Card

Continue

Figure 10: Choosing choice of payment mode

Form3

PAYMENT GATEWAY

Choice of payment method

- ☐ Cash On Delivery
- ☐ UPI
- ☐ Credit Card
- ☒ Debit

Continue

payment succesfull

OK

Figure 11: Payment Successful

Online Food Ordering and Management System

The Mill

Subway

Vito's

Exit

Are you sure you want to exit the Application ?

CustomerID	Restaurant	Address	Order Date	Status	PaymentID	
<input style="width: 100px;" type="text" value="1"/>	<input style="width: 100px;" type="text" value="Subway"/>	<div style="border: 1px solid #ccc; padding: 2px; min-height: 30px;">A1000 Mandavi Pearl City</div>	<input style="width: 150px;" type="text" value="23-11-2023 11:00:12"/>	<input style="width: 100px;" type="text" value="Delivered"/>	<input style="width: 100px;" type="text" value="2"/>	<input style="background-color: #f44336; color: white; padding: 5px 10px;" type="button" value="←"/> <input style="background-color: #007bff; color: white; padding: 5px 10px;" type="button" value="→"/>

Figure 12: Exiting Application

FEEDBACK FORM

Please help us to serve you better by taking a couple of minutes.

How satisfied were you with our Service?

☐ Excellent
☐ Good
☐ Neutral
☐ Poor

If you have specific feedback, please write to us...

Additional comments

Your Name (optional)

Your Email (optional)

Your Number (optional)

Figure 13: Feedback Form

Database and Tables

Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> address	★ Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	32.0 KiB	-
<input type="checkbox"/> cart	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
<input type="checkbox"/> customer	★ Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
<input type="checkbox"/> feedback	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
<input type="checkbox"/> menucategories	★ Browse Structure Search Insert Empty Drop	5	InnoDB	utf8mb4_general_ci	16.0 KiB	-
<input type="checkbox"/> menuitems	★ Browse Structure Search Insert Empty Drop	18	InnoDB	utf8mb4_general_ci	48.0 KiB	-
<input type="checkbox"/> orders	★ Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_general_ci	80.0 KiB	-
<input type="checkbox"/> payments	★ Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_general_ci	16.0 KiB	-
<input type="checkbox"/> restaurants	★ Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
9 tables	Sum	36	InnoDB	utf8mb4_general_ci	288.0 KiB	0 B

Figure 14: Online Food Order Database

	id	full_name	email	password
<input type="checkbox"/> Edit Copy Delete	1	aashita	aashita@gmail.com	\$2y\$10\$fHGSDAqN0nJRGQ6aVwEgVehkCA9hOhfb413AIC4Ygg...
<input type="checkbox"/> Edit Copy Delete	2	aarya	aarya@yahoo.com	\$2y\$10\$yf8DogOycZ.m862c9N/FPOt69X17eNdVFVosgL.WrCQ...
<input type="checkbox"/> Edit Copy Delete	3	anishka	anishka22@gmail.com	\$2y\$10\$AWZEeDkBcrd/U9lvs5PPRuFCO.dGfE5WkGqZoV0Z7.k...
<input type="checkbox"/> Edit Copy Delete	4	vinita	vinita@yahoo.com	\$2y\$10\$gzhqG/TDbPkqaYdsiZKjqO97Tejcxo6vpDkE1LlkUV...

☐ Check all
 With selected:
 Edit Copy Delete Export

Figure 15: Login-Register Database

AddressID	CustomerID	FullAddress	City	State	PinCode
109	1	A1000 Mandavi Pearl City	Manipal	Karnataka	576104
110	3	E034 Shambhavi Palace	Manipal	Karnataka	576104
111	2	Block C2031 NIH	Manipal	Karnataka	576104

Figure 16: Address Table

ItemID	RestaurantID	CategoryID	Name	Price	Description
1	501	1	French Fries	70.00	Deep-fried potatoes sticks with cheese sauce.
2	501	2	Coffee	99.00	A double shot of espresso with steamed milk and a ...
3	501	3	Salad	120.00	Seasonal salads made fresh daily for a quick and h...
4	501	4	Burger	100.00	Juicy, big, loaded with toppings of your choice.
5	501	1	Thali	100.00	rice, dal, vegetables, roti, papad, dahi (yoghurt)...
6	502	1	Pizza	120.00	A classic Italian pizza with fresh mozzarella, bas...
7	502	2	Coffee	100.00	A double shot of espresso with steamed milk, a sma...
8	502	3	Salad	200.00	A refreshing salad with crispy romaine lettuce, gr...
9	502	4	ChocoChip Cookies	99.00	Indulge in a timeless treat that has delighted gen...
10	502	1	Grilled Cheese	90.00	A timeless classic that never disappoints.
11	503	1	Sub	220.00	Sink your teeth into a symphony of flavours and te...
12	503	2	Pasta	150.00	A creamy tomato sauce with vodka added for a subtl...
13	503	3	French Fries	100.00	A timeless favourite, these slender, crispy fries ...
14	503	4	Pizza	210.00	A controversial yet beloved pizza, this combinatio...
15	503	1	Salad	150.00	A hearty salad with grilled chicken, bacon, avocad...
16	503	2	Burger	190.00	A bite-sized indulgence, these mini burgers are pe...
17	503	3	Cafe Latte	110.00	A single shot of espresso with a small layer of fo...
18	503	4	Pasta	140.00	A classic comfort food made with macaroni pasta, b...

Figure 17: MenuItems Table

CustomerID	FName	LName	Email	Phone	Password
1	sarah	singh	sarah00@gmail.com	9876543210	test1
2	priya	mehra	mehra.priya@gmail.com	9988776655	test2
3	neil	kapoor	neil@gmail.com	7654376543	test3

Figure 18:Customer Table

CategoryID	Name
1	Appetizers
2	Main Courses
3	Desserts
4	Beverages
5	Specials

Figure 19:MenuCategories Table

PaymentID	PaymentType
1	UPI
2	Credit Card

Figure 20: Payments Table

OrderID	CustomerID	RestaurantID	AddressID	OrderDate	OrderStatus	PaymentID
1	1	501	109	2023-11-22 10:10:10	Delivered	1
2	1	502	109	2023-11-23 11:00:12	Delivered	2

Figure 21: Order Table

RestaurantID	Name	FullAddress	Phone	OpeningHours
501	The Mill	Near Masjid, Saralabettu, Manipal, 576104	7890789000	11:00:00
502	Subway	KMC Food Court, Eshwar Nagar, Manipal, 576104	5432543211	10:00:00
503	Vito's	Eshwar Nagar, Manipal, Karnataka 576104	8123456789	12:00:00

Figure 22: Restaurant Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1 id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/>	2 full_name	varchar(128)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	3 email	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	4 password	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

Figure 23: User Table

Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> poll	Browse Structure Search Insert Empty Drop	3	InnoDB	latin1_swedish_ci	16.0 K1B	-
<input type="checkbox"/> user	Browse Structure Search Insert Empty Drop	1	InnoDB	latin1_swedish_ci	16.0 K1B	-
2 tables	Sum	4	InnoDB	utf8mb4_general_ci	32.0 K1B	0 B

Figure 24: Feedback Database

	id	name	email	phone	feedback	suggestions
<input type="checkbox"/> Edit Copy Delete	1				neutral	nice food.
<input type="checkbox"/> Edit Copy Delete	2	aashita	ashita14012406@gmail.com		excellent	Delicious food ,nice staff and fast delivery
<input type="checkbox"/> Edit Copy Delete	3	aashita	ashita14012406@gmail.com		excellent	Delicious food ,nice staff and fast delivery

Figure 25: Feedback Table

Chapter 7

Conclusion and Future Work

The development and implementation of the online food ordering system have proven to be a successful venture, offering a user-friendly, efficient, and reliable platform for customers and restaurants alike. The system's intuitive user interface, streamlined order processing, and real-time data capabilities have contributed to a positive user experience. Administrator functionalities, including inventory management and order processing, have facilitated effective restaurant management. The positive feedback from users emphasizes the system's practicality and effectiveness in the realm of food ordering, providing a valuable solution for modernizing traditional processes.

The successful deployment underscores the potential of technology to revolutionize the food service industry. The integration of digital solutions not only enhances customer experiences but also streamlines operations for restaurant owners and administrators. As the system continues to operate seamlessly, its impact on simplifying food ordering processes and improving overall efficiency is evident.

While the current system has achieved its primary goals, there are opportunities for future enhancements and expansions. Some potential areas for future work include:

1. **Integration of Advanced Features:** Explore the integration of advanced features such as machine learning algorithms for personalized recommendations, predictive ordering, and dynamic pricing based on user behavior.
2. **Enhanced User Engagement:** Implement features to enhance user engagement, such as loyalty programs, promotional campaigns, and social media integration to encourage user interaction and participation.
3. **Geographical Expansion:** Consider expanding the system to cover a broader geographical area, incorporating additional restaurants and catering to a more extensive user base.
4. **Mobile Application Development:** Develop a dedicated mobile application to provide users with a more convenient and accessible platform for placing orders and managing their accounts.
5. **Integration with Emerging Technologies:** Explore integration with emerging technologies like augmented reality (AR) or virtual reality (VR) to provide immersive and interactive experiences for users.
6. **Enhanced Analytics and Reporting:** Strengthen analytics capabilities to provide more in-depth insights into user behavior, order trends, and performance metrics for restaurants. This can aid in strategic decision-making for administrators.
7. **Accessibility and Inclusivity:** Focus on improving accessibility features to ensure that the platform is usable by individuals with diverse needs and abilities.
8. **Cybersecurity Measures:** Implement advanced cybersecurity measures to ensure the security and privacy of user data, especially with the increasing reliance on online platforms.

Continued innovation and adaptation to emerging technologies will be crucial for keeping the online food ordering system competitive and aligned with the evolving needs and expectations of users and stakeholders.

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Appendix A :

ACM Taxonomy Keywords

[Information Systems] : Database Management , Information Retrieval , Inventory Management , MySQL Database , User Data Storage

[Computing Methodology] : Local Application Design , Offline Accessibility , Reduced Latency, Mobile Application Development

[Security and Privacy] : Access Control , Database Security , Incident Response , Risk Assessment, Security Architecture , Secure communication

Appendix B :

Glossary

BCNF (Boyce-Codd Normal Form) : A specific level of normalization in the database design process , ensuring certain dependencies are satisfied .

ER Diagram (Entity – Relationship Diagram) : A visual representation of the entities and their relationships with the OFOAMS database .

MySQL : A relational database management system used as the backend database for storing and retrieving data in OFOAMS.

Normalization : The process of organizing data in database to reduce redundancy and improve data integrity .

User Authentication : The process of verifying the identity of users to ensure secure access within the OFOAMS system .

OFOAMS (Blood Bank Management System) : A comprehensive software solution designed to optimize the operation of food ordering through a online user friendly platform .

GUI(Graphical User Interface) : The visual interface that allows the users to interact with the OFOAMS system using graphical elements .