RESTAURANT MANAGEMENT SYSTEM(RMS)

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Project Overview

The Restaurant Management System (RMS) is designed to streamline restaurant operations by managing orders, reservations, customer details, staff records, and inventory efficiently. Utilizing a relational database in MySQL, the system ensures seamless data storage, retrieval, and management, improving overall service quality and customer satisfaction.

Purpose of the Report

This report provides a comprehensive analysis of the Restaurant Management System, detailing its objectives, structure, relationships, and managerial implications. It serves as a reference for restaurant managers, database administrators, and IT professionals to understand the system's design and functionality.

Objectives

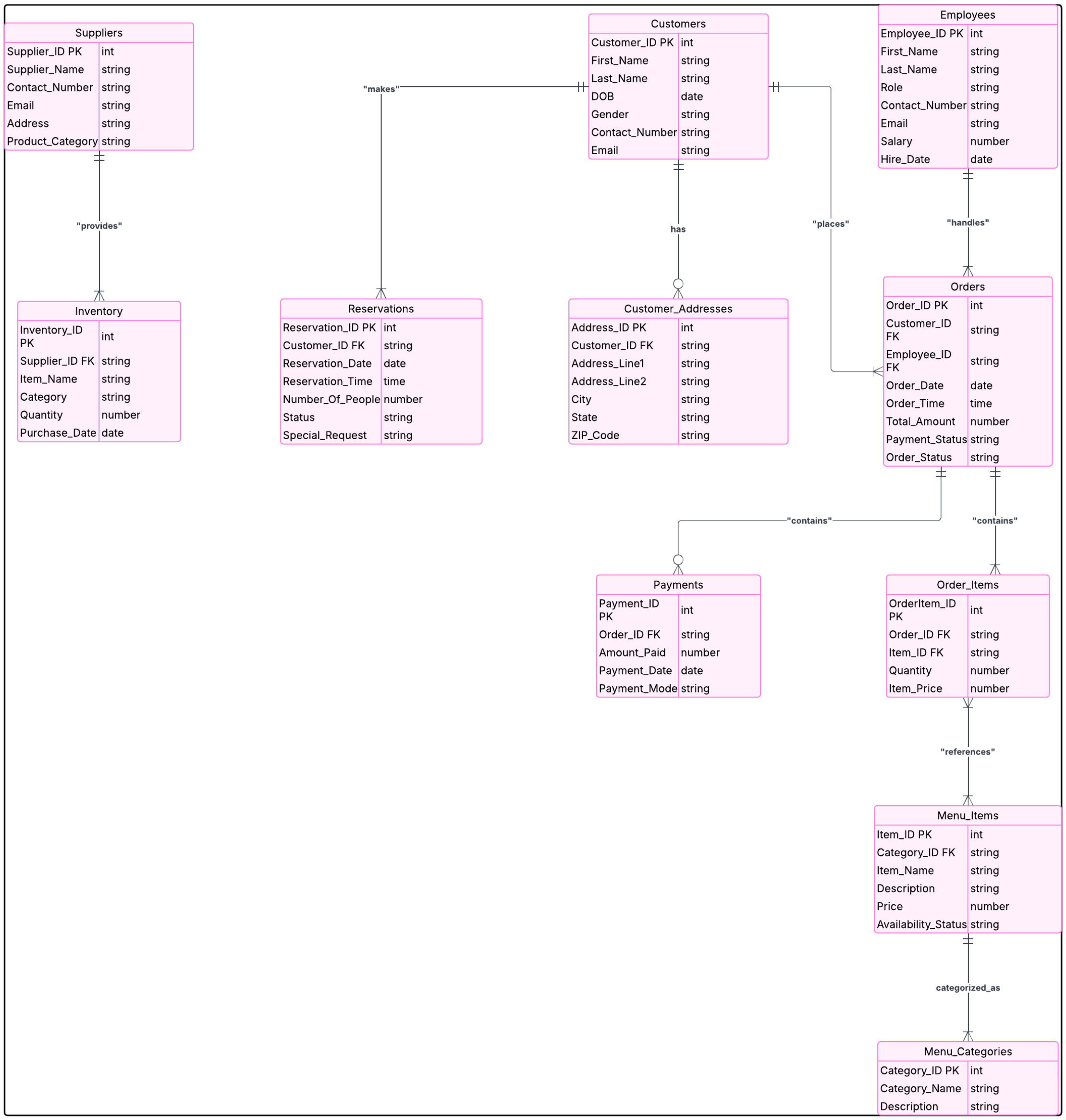
The primary objectives of the Restaurant Management System are:

- To centralize restaurant data for efficient management of operations.
- To improve customer experience through fast order processing and seamless reservation handling.
- To facilitate structured inventory management and minimize food wastage.
- To enhance staff productivity and track employee records.
- To ensure secure access control, protecting sensitive data and maintaining privacy.
- To integrate real-time analytics for better decision-making and operational efficiency.

Database Description

The database consists of 11 relational tables, each serving a specific function. The structure follows normalization principles to reduce redundancy and maintain data consistency.

ERD Diagram



Suppliers	
Supplier_ID PK	int
Supplier_Name	string
Contact_Number	string
Email	string
Address	string
Product_Category	string

Customers	
Customer_ID PK	int
First_Name	string
Last_Name	string
DOB	date
Gender	string
Contact_Number	string
Email	string

Employees	
Employee_ID PK	int
First_Name	string
Last_Name	string
Role	string
Contact_Number	string
Email	string
Salary	number
Hire_Date	date

Inventory	
Inventory_ID PK	int
Supplier_ID FK	string
Item_Name	string
Category	string
Quantity	number
Purchase_Date	date

Reservations	
Reservation_ID PK	int
Customer_ID FK	string
Reservation_Date	date
Reservation_Time	time
Number_Of_People	number
Status	string
Special_Request	string

Customer_Addresses	
Address_ID PK	int
Customer_ID FK	string
Address_Line1	string
Address_Line2	string
City	string
State	string
ZIP_Code	string

Orders	
Order_ID PK	int
Customer_ID FK	string
Employee_ID FK	string
Order_Date	date
Order_Time	time
Total_Amount	number
Payment_Status	string
Order_Status	string

Payments	
Payment_ID PK	int
Order_ID FK	string
Amount_Paid	number
Payment_Date	date
Payment_Mode	string

Order_Items	
OrderItem_ID PK	int
Order_ID FK	string
Item_ID FK	string
Quantity	number
Item_Price	number

Menu_Items	
Item_ID PK	int
Category_ID FK	string
Item_Name	string
Description	string
Price	number
Availability_Status	string

Menu_Categories	
Category_ID PK	int
Category_Name	string
Description	string

Detailed Features of the Tables

Key Features

- **Customer Management:** Stores customer details, including name, contact, and reservation history.
- **Menu and Categories:** Organizes menu items under specific categories.
- **Order Processing:** Tracks customer orders and order status in real-time.
- **Staff Management:** Maintains employee details, roles, and work schedules.
- **Inventory Management:** Tracks stock levels to optimize purchases and reduce waste.

- **Reservations:** Allows customers to book tables in advance.
- **Billing and Payments:** Manages order payments and billing records.
- **Security and Scalability:** Implements role-based access control (RBAC) and supports future system expansions.

Table Descriptions & Attributes

1. **Customers**
   - **Stores:** Personal details of customers.
   - **Primary Key:** customer_id (INT, PRIMARY KEY)
   - **Attributes:** first_name, last_name, contact_number (unique), email, reservation_history.
2. **Customer Address**
   - **Stores:** Customer address details.
   - **Primary Key:** address_id (INT, PRIMARY KEY)
   - **Attributes:** customer_id (FOREIGN KEY), street, city, state, zip_code.
3. **Menu Categories**
   - **Stores:** Categories for menu items.
   - **Primary Key:** menu_category_id (INT, PRIMARY KEY)
   - **Attributes:** category_name, description.
4. **Menu Items**
   - **Stores:** Details of menu items.
   - **Primary Key:** menu_id (INT, PRIMARY KEY)
   - **Attributes:** menu_name, menu_category_id (FOREIGN KEY), price, description.
5. **Orders**
   - **Tracks:** Customer orders.
   - **Primary Key:** order_id (INT, PRIMARY KEY)
   - **Attributes:** customer_id (FOREIGN KEY), order_date, status.
6. **Order Items**
   - **Stores:** Individual items in an order.
   - **Primary Key:** order_item_id (INT, PRIMARY KEY)
   - **Attributes:** order_id (FOREIGN KEY), menu_id (FOREIGN KEY), quantity, total_price.
7. **Reservations**
   - **Tracks:** Customer table bookings.
   - **Primary Key:** reservation_id (INT, PRIMARY KEY)
   - **Attributes:** customer_id (FOREIGN KEY), table_number, reservation_date, time_slot.
8. **Employees**
   - **Stores:** Employee records.
   - **Primary Key:** employee_id (INT, PRIMARY KEY)
   - **Attributes:** first_name, last_name, job_position, salary, contact_number.
9. **Inventory**
   - **Tracks:** Stock levels.
   - **Primary Key:** inventory_id (INT, PRIMARY KEY)

- **Attributes:** item_name, quantity_available, last_restocked.

10. **Suppliers**
    - **Stores:** Supplier details.
    - **Primary Key:** supplier_id (INT, PRIMARY KEY)
    - **Attributes:** supplier_name, contact_person, contact_number, email, supplied_items.
11. **Payments**
    - **Stores:** Payment transactions.
    - **Primary Key:** payment_id (INT, PRIMARY KEY)
    - **Attributes:** order_id (FOREIGN KEY), payment_method, amount_paid, payment_status.

Relationships in Detail

- **Customers → Orders (1:M)**
  - A customer can place multiple orders, but each order belongs to only one customer.
  - **Foreign Key:** customer_id in ORDERS references CUSTOMERS.customer_id.
- **Orders → Order Items (1:M)**
  - An order can have multiple menu items, but each order detail entry is linked to one order.
  - **Foreign Key:** order_id in ORDER_ITEMS references ORDERS.order_id.
- **Menu Items → Order Items (1:M)**
  - A menu item can appear in multiple orders, but each order detail entry refers to a single menu item.
  - **Foreign Key:** menu_id in ORDER_ITEMS references MENU_ITEMS.menu_id.
- **Menu Categories → Menu Items (1:M)**
  - A category can have multiple menu items, but each menu item belongs to one category.
  - **Foreign Key:** menu_category_id in MENU_ITEMS references MENU_CATEGORIES.menu_category_id.
- **Customers → Reservations (1:M)**
  - A customer can make multiple reservations, but each reservation belongs to only one customer.
  - **Foreign Key:** customer_id in RESERVATIONS references CUSTOMERS.customer_id.
- **Employees → Orders (1:M)**
  - An employee can process multiple orders, but each order is handled by a single employee.
  - **Foreign Key:** employee_id in ORDERS references EMPLOYEES.employee_id.
- **Suppliers → Inventory (1:M)**
  - A supplier can provide multiple inventory items, but each inventory item comes from a single supplier.
  - **Foreign Key:** supplier_id in INVENTORY references SUPPLIERS.supplier_id.
- **Orders → Payments (1:1)**
  - Each order has one payment transaction associated with it.

    - **Foreign Key:** order_id in PAYMENTS references ORDERS.order_id.

Managerial Implications

Impact on Restaurant Administration

- **Improved Efficiency:** Automated tracking of orders, reservations, and inventory reduces manual workload.
- **Better Menu Organization:** Categorization ensures optimal menu structuring and faster retrieval.
- **Compliance with Health and Safety Standards:** Proper inventory tracking reduces food wastage and ensures compliance.
- **Seamless Integration:** The database can integrate with POS systems and mobile ordering apps.

Impact on Customers

- **Personalized Dining Experience:** Order history enables better service and customized recommendations.
- **Faster Service:** Automated order processing reduces wait times.
- **Reservation Convenience:** Online booking enhances customer satisfaction.

Impact on Staff and Management

- **Optimized Workforce Management:** Staff schedules and roles can be managed efficiently.
- **Data-Driven Decision Making:** Insights from customer preferences and sales trends assist in menu optimization.
- **Enhanced Financial Management:** Real-time billing and expense tracking improve financial accuracy.

Conclusion

The Restaurant Management System is a scalable and secure solution designed to optimize restaurant operations. With real-time analytics, seamless integration, and enhanced security, it ensures improved service delivery, efficient resource management, and enhanced customer satisfaction.