

## Group 7 - Restaurant Management System

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### Our Team:

- Ibrahim Raffat → joins, subqueries , ERD
  - Mohamed Nabil Saber Soliman -> mapping, stored procedure, triggers
  - Yumna Gamal Hussien Ali → functions, rules , Business questions & KPI'S
  - Shahd Hesham Ibrahim Mohamed → windows function, index, insertion, creation , Pivot
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### Script:

The **Restaurant Management System** is designed to help restaurant owners manage operations by providing a structured database for storing and processing key information. The system is built on SQL to manage customer details, staff, orders, menu items, reservations, inventory, and payments. It aims to provide a solid framework for managing the restaurant's daily activities, improve efficiency, and enhance overall customer experience.

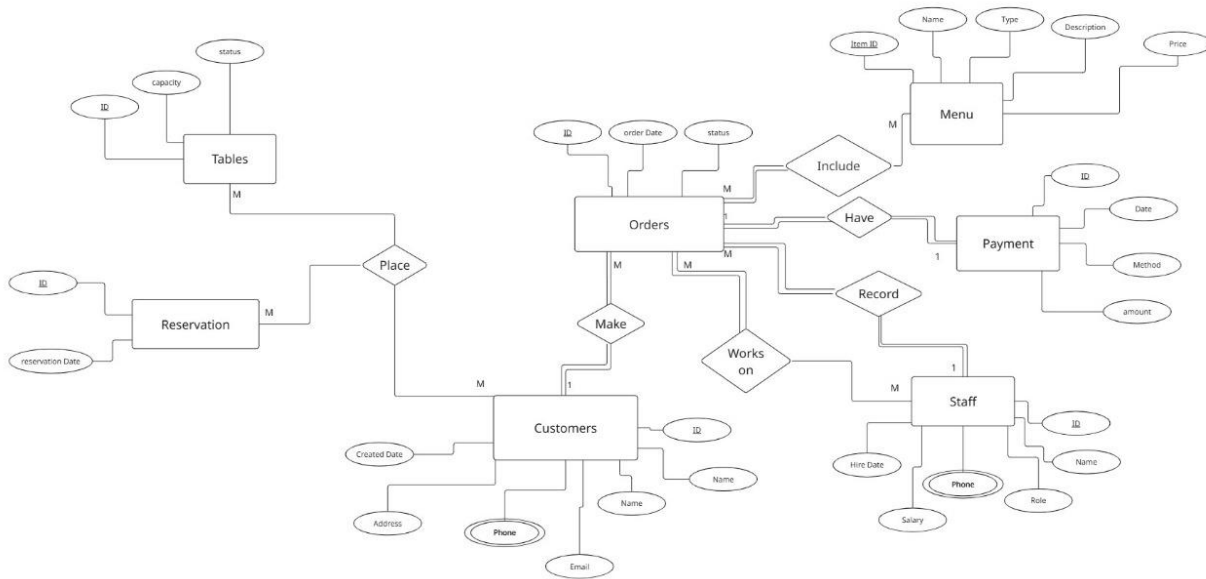
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### Mapping Process:

1. **ERD** (Entity Relationship Diagram)
  2. **Mapping**
  3. **Creating and Inserting**
  4. **Business Questions and KPIs**
  5. **Queries**
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### Entity-Relationship Diagram (ERD) Description:

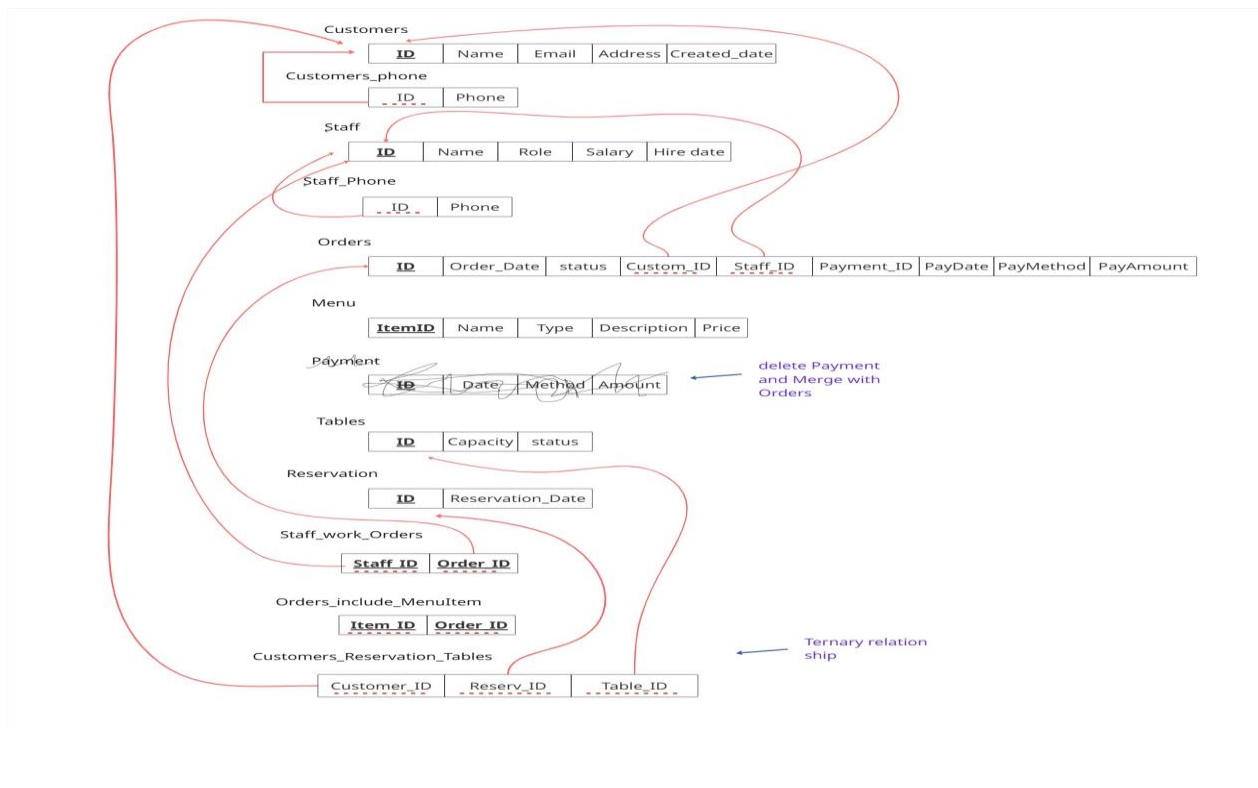
This **ERD** represents the core entities and relationships within the **Restaurant Management System**, providing a comprehensive structure for managing customers, orders, reservations, payments, staff, menu items, and tables.



## 2. Mapping:

1. **Customer ↔ Customer\_Phone (1:N)**
  - One Customer can have many phone numbers.
  - **Foreign Key:** Customer\_Phone.Customer\_ID → Customer.ID
2. **Staff ↔ Staff\_Phone (1:N)**
  - One Staff member can have many phone numbers.
  - **Foreign Key:** Staff\_Phone.Staff\_ID → Staff.ID
3. **Customer → Order (1:N)**
  - One Customer can place many Orders.
  - **Foreign Key:** Order.Customer\_ID → Customer.ID
4. **Staff → Order (1:N)**
  - One Staff member can handle many Orders.
  - **Foreign Key:** Order.Staff\_ID → Staff.ID
5. **Order ↔ Order\_include\_MenuItem (1:N)**
  - One Order can include many Menu Items.
  - **Foreign Key:**
    - Order\_include\_MenuItem.Order\_ID → Order.ID
    - Order\_include\_MenuItem.Item\_ID → Menu.ItemID
6. **Staff ↔ Staff\_work\_Order (M:N)**
  - Many Staff members can work on many Orders (junction table).
  - **Foreign Keys:**
    - Staff\_work\_Order.Staff\_ID → Staff.ID
    - Staff\_work\_Order.Order\_ID → Order.ID
7. **Customer ↔ Reservation ↔ Table (M:N via Customer\_Reservation\_Table)**
  - Many Customers can reserve many Tables (junction table).
  - **Foreign Keys:**

- Customer\_Reservation\_Table.Customer\_ID → Customer.ID
- Customer\_Reservation\_Table.Reserv\_ID → Reservation.ID
- Customer\_Reservation\_Table.Table\_ID → Table.ID



## Business Questions Addressed:

This project aims to provide meaningful insights for decision-makers in the food service industry by answering the following key business questions through SQL queries:

1. **What is the total revenue, average order value, and number of orders?**
  - Assesses overall business performance and profitability.
2. **What are the monthly revenue trends?**
  - Enables identification of seasonal patterns and planning for peak periods.

3. **Which menu items are the most and least frequently ordered?**
    - Supports menu optimization and inventory planning.
  4. **Who are the top five customers based on total spend?**
    - Facilitates targeted marketing and loyalty strategies.
  5. **How many new customers join each month?**
    - Measures customer acquisition effectiveness.
  6. **Which tables are utilized most frequently?**
    - Helps improve seating strategy and restaurant layout.
  7. **Which orders exceed the average order value?**
    - Identifies high-value sales for focused analysis.
  8. **Which customers have made table reservations?**
    - Assists in understanding customer engagement levels.
  9. **Which customers have placed at least one order?**
    - Differentiates active from inactive users.
  10. **How many orders has each customer placed?**
    - Supports calculation of customer lifetime value.
  11. **What is the spending rank of each customer?**
    - Helps in customer segmentation and prioritization.
  12. **How do customer order frequencies and spend distribute across quartiles?**
    - Useful for behavioral segmentation and targeted outreach.
  13. **What is the chronological order of customer registrations?**
    - Useful for growth tracking and cohort analysis.
  14. **How many items have been ordered for each menu item?**
    - Provides detailed product-level performance.
  15. **What is the total number of orders by a specified customer?**
    - Supports customer service and personalized marketing.
  16. **What is the revenue generated during a specific date range?**
    - Aids in financial reporting and forecasting.
  17. **Which staff members have handled the most orders?**
    - Identifies high-performing employees.
  18. **Which staff members are eligible for promotion based on tenure and performance?**
    - Supports human resource planning and talent management.
  19. **What is the complete order and spending summary for each customer?**
    - Enables comprehensive customer profiling.
  20. **How much bonus should each staff member receive based on a percentage of their sales?**
    - Assists in incentive planning and payroll management.
  21. **What are the monthly sales figures categorized by payment method?**
    - Reveals customer payment preferences and operational efficiency.
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## **Key Performance Indicators (KPIs):**

The analysis supports monitoring and evaluation through the following KPIs:

- Total Revenue
- Average Order Value
- Total Number of Orders
- Revenue by Month
- Top-Selling and Least-Selling Menu Items
- New Customers per Month
- Customer Order Frequency
- Customer Lifetime Value Segments
- Table Usage Frequency
- High-Value Order Identification
- Staff Performance Metrics (Order Count, Eligibility for Promotion)
- Revenue by Payment Method
- Bonus Calculations for Staff
- Customer Segmentation by Spend and Order Volume
- Comprehensive Customer Purchase Summaries

Role