# ****COMPANY SALES MANAGEMENT SYSTEM****

**Submitted by**  
**Mahamat Kher | 25MCD10068**

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Special thanks to my colleagues and friends who provided constructive feedback during the development phase, helping me refine the system architecture and functionality.

## ****Analysis/ Critical Thinking****

### ****Problem Statement****

The modern business environment requires efficient management of sales, inventory, and employee performance data. Traditional manual record-keeping systems are prone to errors, lack real-time insights, and struggle with data consistency. There is a critical need for an integrated database system that can handle complex business operations while maintaining data integrity and providing analytical capabilities.

### ****Requirements Analysis****

* **Data Management**: Track employees, managers, products, customers, and sales transactions
* **Relationship Management**: Maintain hierarchical relationships between managers and employees
* **Inventory Control**: Monitor product stock levels and automate updates
* **Sales Analytics**: Generate reports on sales performance, product popularity, and revenue trends
* **Data Integrity**: Ensure referential integrity and prevent data anomalies

### ****Critical Evaluation****

The system addresses several key business challenges:

* **Data Redundancy Elimination**: Normalized database design minimizes duplicate data
* **Real-time Updates**: Automated triggers maintain stock consistency
* **Performance Monitoring**: SQL queries enable manager and employee performance analysis
* **Scalability**: Modular design allows for future expansion of business operations

### ****Challenges Identified****

1. Complex relationship management between multiple entities
2. Ensuring ACID properties in sales transactions
3. Optimizing query performance for large datasets
4. Maintaining data consistency across related tables

## ****Project Design and Implementation / Technical Implementation****

### ****System Architecture****

The Company Sales Management System follows a three-tier architecture:

1. **Data Layer**: MySQL database with structured tables
2. **Business Logic Layer**: Stored procedures and triggers
3. **Presentation Layer**: SQL queries for reporting and analysis

### ****Database Design Methodology****

* **ER Modeling**: Entities identified include Managers, Employees, Products, Customers, Sales, and Sale\_Details
* **Normalization**: Applied up to 3NF to eliminate redundancy
* **Relationship Mapping**: One-to-Many and Many-to-Many relationships properly implemented

### ****Implementation Details****

#### ****Core Tables Implementation****

sql

-- Enhanced Managers Table with additional constraints

CREATE TABLE Managers (

Manager\_ID INT PRIMARY KEY AUTO\_INCREMENT,

Manager\_Name VARCHAR(50) NOT NULL,

Department VARCHAR(30),

Phone VARCHAR(15) UNIQUE,

Salary DECIMAL(10,2) CHECK (Salary > 0),

Email VARCHAR(100),

Hire\_Date DATE DEFAULT CURRENT\_DATE

);

#### ****Advanced Business Logic****

sql

-- Comprehensive sales analysis procedure

DELIMITER //

CREATE PROCEDURE GenerateSalesReport(IN start\_date DATE, IN end\_date DATE)

BEGIN

SELECT

m.Manager\_Name,

e.Emp\_Name,

COUNT(s.Sale\_ID) AS Total\_Sales,

SUM(s.Total\_Amount) AS Total\_Revenue,

AVG(s.Total\_Amount) AS Average\_Sale

FROM Sales s

JOIN Employees e ON s.Emp\_ID = e.Emp\_ID

JOIN Managers m ON e.Manager\_ID = m.Manager\_ID

WHERE s.Sale\_Date BETWEEN start\_date AND end\_date

GROUP BY m.Manager\_Name, e.Emp\_Name

ORDER BY Total\_Revenue DESC;

END //

DELIMITER ;

#### ****Data Integrity Mechanisms****

* Foreign key constraints for referential integrity
* CHECK constraints for data validation
* AUTO\_INCREMENT for unique identifier generation
* Triggers for automated business rules enforcement

### ****Performance Optimization****

* Indexes on frequently queried columns
* Efficient JOIN operations
* Stored procedures for complex operations
* Proper data typing and sizing

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## ****ABBREVIATIONS SYMBOLS****

**DBMS** - Database Management System  
**RDBMS** - Relational Database Management System  
**SQL** - Structured Query Language  
**ERD** - Entity Relationship Diagram  
**DDL** - Data Definition Language  
**DML** - Data Manipulation Language  
**ACID** - Atomicity, Consistency, Isolation, Durability  
**3NF** - Third Normal Form  
**PK** - Primary Key  
**FK** - Foreign Key  
**UID** - Unique Identifier

**Symbols Used:**  
→ Represents relationship direction  
∞ Represents many in relationships  
□ Represents entity in ER diagrams  
○ Represents attribute in ER diagrams