Project Report: E-Commerce Management System (DBMS Mini Project)

1. Introduction

The **E-Commerce Management System** is designed to handle the backend operations of a typical online retail store. The project encapsulates essential modules such as customer management, product inventory, order processing, and payment tracking. The system ensures relational integrity, optimized queries, and real-time reporting through structured relational schema and SQL views.

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2. Objective

To build a normalized relational database that:

- Manages customers, products, and transactions.
- Tracks individual product orders and stock.
- Stores payment information securely.
- Provides detailed reporting for business analytics.

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3. Tools & Technologies Used

- **Database:** MySQL 8.0
- **Design Tool:** MySQL Workbench / dbdiagram.io
- **Language:** SQL
- **Platform:** Localhost / Server-based deployment

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4. Database Schema Overview

The system includes the following major tables:

Table	Description
Customers	Stores user information like name, email, phone.
Products	Holds catalog data including name, price, stock.

Table	Description
Orders	Represents a customer's order transaction.
OrderItems	Line items per order (product, quantity, price).
Payments	Records payment details for each order.

Each table uses **foreign keys** to ensure referential integrity. The schema is normalized to **3NF** to eliminate redundancy and update anomalies.

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5. Data Flow Example

- A customer places an order.
- The order is recorded in the Orders table.
- Each item is logged in OrderItems with the price at time of purchase.
- A payment is recorded in the Payments table.
- The stock in Products is updated manually or via trigger (optional enhancement).

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6. SQL View: Sales Report

A Sales Report view is created for administrative insights. It joins multiple tables to provide a full picture of customer purchases, payment statuses, and product trends. This helps in identifying high-performing products and payment behaviour.

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7. Conclusion & Future Enhancements

This database lays the foundation for a full-stack e-commerce platform. With this backend, developers can connect a frontend application and start building a complete online shopping experience.

Future scope includes:

- Adding a sales_representative table for team tracking.
- Inventory auto-update with triggers.

- Admin dashboard integration with data visualizations.