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INTRODUCTION TO DATABASE WK 3

1.SCNARIO ANALYSIS:

IT Database Scenario: E-Commerce System

An e-commerce database supports the buying and selling of products online. The main entities in this system include Customer, Product, Order, and Payment. The Customer entity has attributes such as CustomerID, Name, Email, PhoneNumber, and Address. The Product entity includes ProductID, ProductName, Price, StockQuantity, and Category. The Order entity contains OrderID, OrderDate, TotalAmount, and OrderStatus, while the Payment entity includes PaymentID, PaymentMethod, PaymentDate, and PaymentStatus.

Relationships connect these entities. A Customer can place many Orders, but each Order is placed by only one Customer (one-to-many). An Order can include multiple Products, and a Product can appear in many Orders, forming a many-to-many relationship resolved using an OrderDetails entity. Each Order is linked to one Payment, ensuring transaction tracking and data integrity.

2.CONCEPT RESEARCH:

A many-to-many (M:N) relationship occurs when multiple instances of one entity are associated with multiple instances of another entity. In IT systems, this relationship is common in databases such as students enrolling in many courses or products appearing in many orders. M:N relationships cannot be implemented directly in relational databases, so they are resolved using an associative (junction) table that contains foreign keys from both entities. This approach improves data organization, reduces redundancy, and ensures data integrity. Understanding M:N relationships is essential for designing efficient, scalable, and normalized IT databases.

3.TOOL PRACTICE

Creating an ERD in Lucidchart for a small library system helped me understand how theory applies to real IT tasks. I designed entities such as Book, Member, Loan, and Librarian, each with clear attributes like BookID, Title, MemberID, and LoanDate. Defining relationships, such as members borrowing books, improved my understanding of one-to-many and many-to-

many relationships. Lucidchart's visual tools made it easy to organize entities and identify primary and foreign keys. This hands-on activity strengthened my database design skills and showed how ERDs help plan efficient, well-structured information systems before implementation.

4.DIAGRAM CREATION

The Customer–Order ERD visually represents how data is structured in a database system. The main entities are Customer, Order, and Product. Customer includes attributes such as CustomerID, Name, Email, and PhoneNumber. Order contains OrderID, OrderDate, and TotalAmount. Product includes ProductID, ProductName, and Price. A one-to-many relationship exists between Customer and Order, meaning one customer can place multiple orders. Order and Product have a many-to-many relationship, resolved through an OrderDetails entity. This diagram helps visualize entity relationships, improves data organization, and supports accurate and efficient database design.