Data Modeling Document for Customer, Order, and Shipping Data

1. Introduction

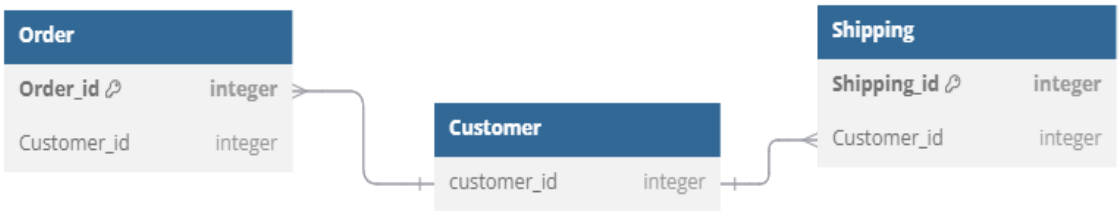
This document outlines the data modeling process for integrating the Customer, Order, and Shipping datasets into a comprehensive database. It covers the conceptual, logical, and physical data models, ensuring that the data is structured effectively for storage, retrieval, and analysis.

2. Conceptual Data Model

The conceptual data model identifies the key entities and their relationships without diving into the details of how these will be implemented in a database.

- **Entities**:
    - **Customer**: Represents individuals making purchases.
    - **Order**: Represents the transaction details of purchases.
    - **Shipping**: Represents the delivery information related to orders.
- **Relationships**:
    - A **Customer** can have multiple **Orders**.
    - An **Order** can have multiple **Shipping** records (in case of partial shipments).

Conceptual Data Model Diagram: (To be provided separately)



3. Logical Data Model

The logical data model provides a more detailed structure, defining attributes for each entity and their interrelations. This model is still independent of any particular database technology but lays the groundwork for the physical model.

- **Customer Entity**:
    - Customer_ID (Primary Key)

    - First_Name
    - Last_Name
    - Age
    - Country
- **Order Entity**:
    - Order_ID (Primary Key)
    - Customer_ID (Foreign Key)
    - Order_Date
    - Amount
    - Item
- **Shipping Entity**:
    - Shipping_ID (Primary Key)
    - Order_ID (Foreign Key)
    - Shipping_Date
    - Status
- **Relationships**:
    - Customer_ID in the Order table references the Customer_ID in the Customer table.
    - Order_ID in the Shipping table references the Order_ID in the Order table.

Logical Data Model Diagram: (To be provided separately)

4. Physical Data Model

The physical data model translates the logical model into an implementation-ready format that includes specific database schema details like data types, indexes, and constraints.

- **Customer Table**:
    - Customer_ID (INT, Primary Key, Auto Increment)
    - First_Name (VARCHAR(50))
    - Last_Name (VARCHAR(50))
    - Age (INT)
    - Country (VARCHAR(50))
- **Order Table**:
    - Order_ID (INT, Primary Key, Auto Increment)
    - Customer_ID (INT, Foreign Key referencing Customer_ID)
    - Order_Date (DATE)
    - Amount (DECIMAL(10, 2))
    - Item (VARCHAR(100))
- **Shipping Table**:
    - Shipping_ID (INT, Primary Key, Auto Increment)
    - Order_ID (INT, Foreign Key referencing Order_ID)
    - Shipping_Date (DATE)
    - Status (VARCHAR(20))
- **Indexes & Constraints**:
    - Primary Key constraints on Customer_ID, Order_ID, and Shipping_ID.
    - Foreign Key constraints linking Customer_ID in Orders to Customer_ID in Customers, and Order_ID in Shipping to Order_ID in Orders.

Physical Data Model Diagram:

5. Conclusion

This document provides a structured approach for modeling the data associated with customers, orders, and shipping. The three levels of data modeling ensure a smooth transition from business requirements to a fully implemented database, optimizing the data for storage, access, and analysis.