

# Customer Management Data Engineering Project Documentation

## 1. Entity-Relationship Diagram (ERD)

- **Purpose:** The ERD explains the relationships between the entities in the Customer Management system and clarifies the attributes of each entity.
- **Tool:** ERD created using SQL Server.
- **Entities and Relationships:** (Explain the characteristics of each entity and explain the relationships between entities such as 1:M, M:M, M:1.)

## 2. Database Creation

- **Objective:** Create the Customer Management database on SQL Server.
- **SQL Code:** (Use DDL , DML, Data Types)
- **Tools:** SQL Server.

## 3. Data Population with Faker

- **Purpose:** Populate the database with synthetic data for testing.
- **Library Used:** Python's faker library.
- **Method:** (import pyodbc , import faker .)

## 4. Data Warehouse Design (Star Schema)

- Objective: Create a Data Warehouse schema using the Star Schema model.
- SQL Code: (Use DDL , DML, Data Types)
- Design Overview: (Create a Fact table and create Dimensions tables.)
- Tools: SQL Server.

## 5. ETL Process

- Objective: Extract data from the Customer Management database, perform transformations, and load it into the Data Warehouse.

### Steps:

- Extract: Extract data from the CustomerManagement database.
- Transform: Perform simple transformations.
- Load: Load data into the CustomerManagementDWH.
- Tools: Python.

## 6. Data Analysis

- Purpose: Analyze the data to answer business-related questions.
- Analysis Queries: (SELECT, FROM, WHERE, JOIN, ON, GROUB BY, HAVING, ORDER BY )

Business Questions Answered: Questions about the project's business.

## 7. Dashboard

- Objective: Visualize key metrics dynamically for business stakeholders.
- Tool: (POWER BI)
- Visualizations: (POWER BI )

## 8. Conclusion

This project demonstrates a complete Data Engineering pipeline from database creation to data warehousing, ETL, and business analysis.

## Project Implementers

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