

Database Design Project - Group 8

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May 3, 2021

1 Problem Description

The EasyDelivery Company provides food/products delivery service for customers. Customer can place takeout/delivery orders through the EasyDelivery App. Now, EasyDelivery would like one relational database to store the information about their management system to be able to carry out their work in an organized way. They have some major modules such as Employee and Customer, Restaurant and Order. Employee's information is stored in the database, such as employee ID, Name (First, Middle, Last), Address, Gender, Date of Birth (should be constrained as 16 years or older) and Phone number (one person may have more than one phone number). The Employee's ID should have the format \XXXX", where X is a number from 0-9. (Hint: you can use regexp_like() function). Details of a customer such as ID, Name (First, Middle, Last), Address and Phone number are recorded. You are free to define the format of customer ID. Customer is further classified as Ordinary Customer and Silver Member. Every silver member owns one member card issued by Staff. Employee and Silver Member can further become Gold Member. Every gold member owns a Gold Pass, which can allow the member has free delivery fee in their orders 10 times monthly. Employee is further classified as Area Manager, Deliverer and Staff. The start date of the designation of each employee is stored. Every deliverer is supervised by an area manager, an area manager may supervise many deliverers. Every deliverer needs to register at least one Vehicle for

delivery. Vehicle's information such as Plate Number, Maker, Model and Color are stored. Area managers work in an Area (Richardson, Frisco, Plano, Dallas, etc.), and is responsible for making contracts with the Shops in his working area. The contract start time of each shop is stored. There are two types of Shops: Restaurants and Supermarkets. Restaurants' Name, Type (Fast Food, BBQ, Buffet, Drink, etc.), Address, Area, Business Phone Number are recorded. A Restaurant can have more than one type. Supermarkets' Name, Addresss, Business Phone Number are recorded. Supermarkets sell various Products, one product may be sold in different supermarkets at different price. Supermarkets maintain Inventories of their products showing how much products in stock. Each Shop opens and closes at specific times following a schedule table. Shops may have different open and close time in different days in a week. Shops sometimes may provide Promotion. Each Promotion includes a unique Promotion code, and its description. When Customers place orders, customer may choose to use promotion codes. Customers can make Comments to the Shops. The comments include rating score (can be 1,2,3,4,5), and comment contents. Details of Orders such as Order ID, Order Contents, Total Balance are recorded. Each order belongs to corresponding Restaurants. Customer can select different payment types to pay for the order. Details of Payment such as unique Payment Confirm Number, Payment Type, Payment Time is recorded. Deliverer will deliver the order with a specific registered vehicle.

2 Project Questions

2.1 Question 1

Is the ability to model superclass/subclass relationships likely to be important in the shopping mall management system like above? Why or why not?

Yes, using the superclass/subclass relationships allows us to define common relations and attributes for the superclasses reducing redundancy

as described below:

- Using Person superclass, we avoid the need to define attributes name, address, phone number, etc. for the relations Customer, Employee and their subclasses.
- Using Shop superclass allows us to define common relations involving promotions, orders, comments and schedule for both shop types, restaurants and supermarkets together.

2.2 Question 2

Can you think of 5 more business rules (other than those explicitly described above) that are likely to be used in a shopping mall environment? Add your rules to the above requirement to be implemented.

1. Valid customer review: Only customers who placed an order recently (last 2 days) from a shop can rate and add a comment for that shop
2. For silver and gold customer we can add points to their cards based on the order amount
3. Employee specific promotion codes on orders i.e discount codes which apply only for employees
4. Rating of a deliverer given by the customers
5. Gift cards which can be purchased and used when placing the orders or added to wallet
6. Customer service module where details of customer queries/ text from calls is stored
7. Customer food type preference: Type of food (fast food/drinks/etc.) for which the customer placed the maximum orders

8. Promo code availability to less frequent customers: Promo code of each shop is shown only to customers with the least number of (less than 3) orders from that shop
9. Only deliverers with more than 10 completed deliveries are assigned for order delivery to silver and gold customers.
10. Delivery of orders are assigned to deliverers in the decreasing order of their bill amount.

2.3 Question 3

Justify using a Relational DBMS like Oracle for this project (Successfully design a relational database system, show the design in final report)

We use MySQL as our RDBMS due to its speed, security and ease of use. We design our Relational database system in the third normal form. The design is shown in the "RDB.png" file submitted along with this report.

3 EER diagram

File "EER.png" submitted with this report has the EER diagram.

4 Normalized Relational Schema

File "RDB.png" has the relational database after normalization.

5 Dependency diagram

File "Dependency_diagram.png" has the dependency diagram for all relations.

6 SQL statements

The following files have the required SQL statements:

- "schema.sql" has the SQL code for creating Food_Delivery database and its tables (Phase III-c).
- "populate.sql" contains the code to fill in data into the tables.
- "views.sql" has the code to create the required views (Phase III-d).
- "queries.sql" has the code for each query (Phase III-e).