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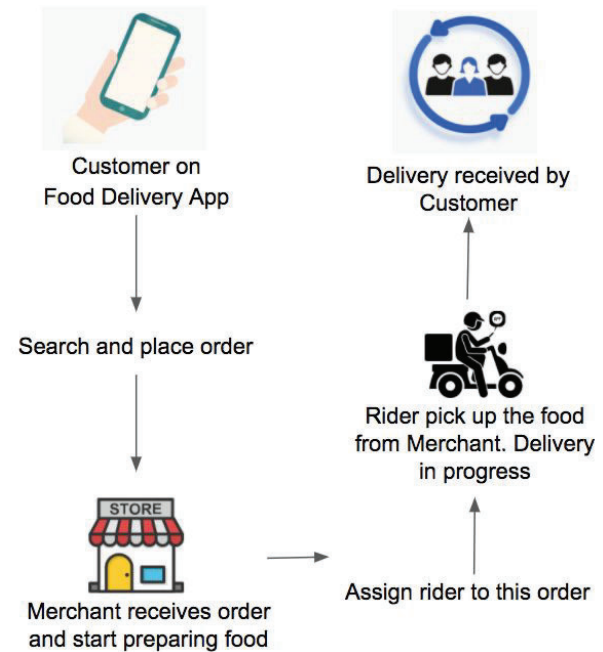
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In this report, we will first introduce the food delivery application that we are going to develop. It provides a platform for customers to make orders, for merchants to sell their products as well as for riders who can participate as delivery men and make money. Oracle VPD design was proposed for this application. We will further present the security policies that were applied to the different database tables and roles in order to ensure each role will only be allowed to access certain tables or information in compliance with the security policies.

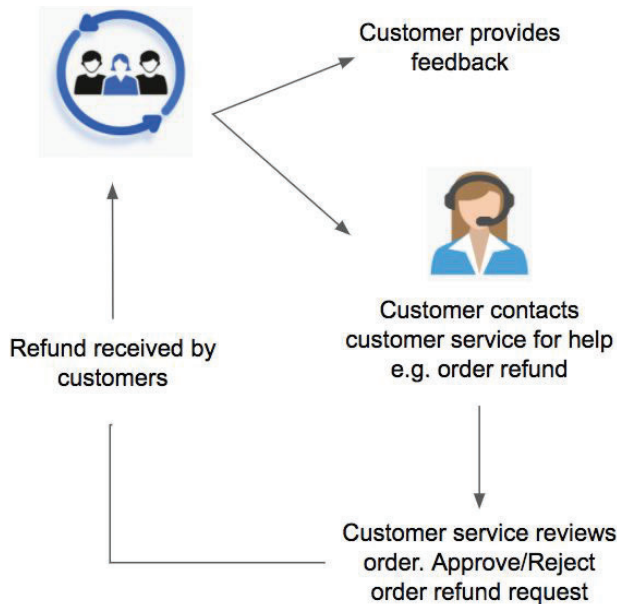
2. APPLICATION



The food delivery application allows customers to place food orders and auto-assigns them a rider nearby for food delivery. First of all, users can download our food delivery application and sign up as Customer/Merchant or join our delivery team as Rider. During registration, users will be asked to provide some personal information as per their roles.

As a Customer, he/she will be able to view all registered Merchants plus their menu items. Once the customer places an order through the app, it generates an Order ID to merchants to prepare this food. In the meanwhile, it looks for riders around that region and assigns one rider for this order. When delivery is in progress, customers can track the status and contact riders for extra

requirements such as contactless delivery but they can't directly talk to merchants.

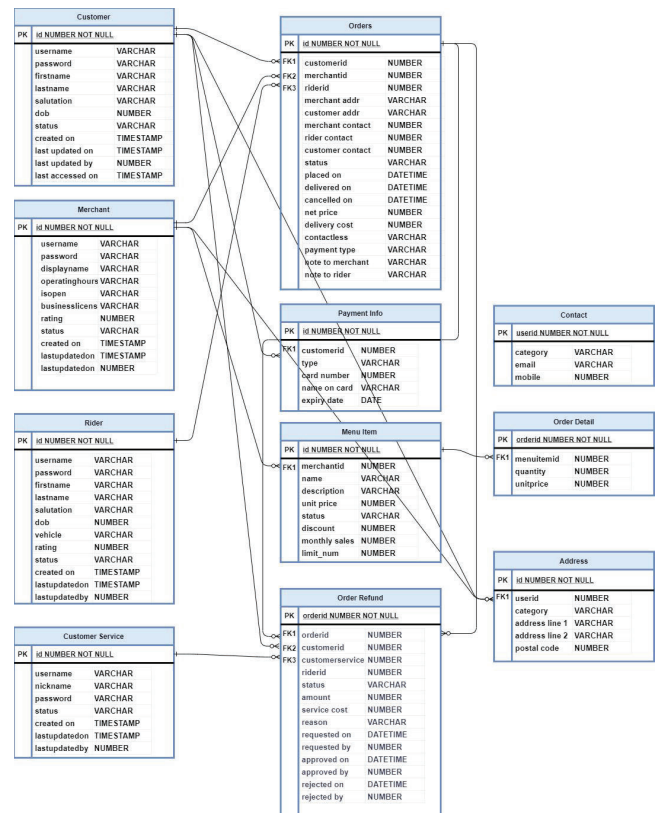


Customers will be asked to give rating and feedback upon arrival of delivery. If they encounter any issues, our food delivery application provides customer service to tackle user issues. Customers may escalate issues to our customer service or initiate a refund through the customer service. Our customer support will review the request, either approve or reject the refund request per given information. As a customer, he/she is able to view the order history within the application. Merchants may also contact the customer service for assistance if they have any problems or difficulties while setting up their store in this application.

This application also offers opportunities for users who are looking for a job and keen to join the delivery team. Users can register as Riders and they got paid per each order they serve.

3. ER and TABLES

Tables can be divided into diverse categories depending on their respective usage.



First, the role-related tables are CUSTOMER, MERCHANT, RIDER, CUSTOMER_SVC. These four tables have many columns in common: ID used for identification, account password used for login, username/displayname and status used for display, and last updated on, last updated by and last accessed on for auditing.

Then there are the tables like ADDRESS, CONTACT, PAYMENT_INFO and MENU_ITEM storing specific types of user information. ADDRESS table stores addresses for both customers and merchants. Similarly, the CONTACT table is a collection of email and mobile number. PAYMENT_INFO table contains payment details like type, card number, expiry date. In the MENU_ITEM table, merchantid column is a foreign key, while other columns contain dish information just like any restaurant's menu.

The last type comprises table ORDERS, ORDER_DETAIL and ORDER_REFUND. The ORDERS table involves customerid, merchantid and riderid, which are tightly coupled with every

order record. We choose to add contact and address columns in this table rather than referring to ADDRESS/CONTACT table by foreign keys because such info in any order record should not reflect users' subsequent changes. To show the real-time status of an order, we have a STATUS column of enum type and timestamp columns like placedon, deliveredon, cancelledon. Due to the current COVID-19 situation, we also add the column for contactless delivery option. The ORDERS table has a one-to-many relationship to ORDER_DETAIL table, where information including menuitemid, quantity and unit_price is stored. The ORDER_REFUND table stores the information about orders' cancellation requests.

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5. SECURITY POLICIES

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