Database Design for Online Retail Store
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Chapter 1

Defining the Problem

1.1 Objective

The goal is to design a database management system for an online retail store, similar to Big Bazaar, Flipkart and Amazon. Our project models on Grofers (now BlinkIt), a fast grocery marketplace for consumers to purchase day-to-day goods from.

1.2 Problem Statement

The ER diagrams and the relational schema that follow are based on the following (rudimentary) problem statement:

The online retail store serves many customers. The customers are required to hold an account on the platofrm to be able to purchase items. They can create an account by specifying their name, email address, phone number, and address. Customers add products to a shopping cart. They apply coupons on the shopping cart; the coupons have a coupon code and an associated discount percentage.
Customers order items by checking out the items on their shopping cart. The order is placed once the transaction is confirmed. The order is delivered to the customer only, they cannot have the order delivered to other addresses.
A product can belong to various categories and has specifications and a cost. Each product is obtained from a vendor which the store transacts with. After being purchased from the vendor, the products are stored in a warehouse. Warehouse employees are responsible for packing and preparing orders. The readied order is then delivered to the customer by a delivery agent.

In case of any lapses with an order, the customer complains to support staff who create a complaint number against the order. They send out the details regarding the complaint to the customer.

1.3 Assumptions

1. The retail store would be operated in India only. Therefore, there isn't an option to change the country.
2. There will be a shopping cart associated with the customer's account. They won't be able to add item to cart without being logged in.
3. The delivery would be taken care of by the company itself; items will be shipped from one warehouse only (Similar to Blinkit, erstwhile Grofers).
4. Coupons would be applied on the order, not the cart. Coupon would be applied during the checkout process.
5. Coupons would be applied using the coupon code, which is a unique alphanumeric value. A coupon cannot be reused.
6. Employees will be divided into delivery partners (responsible for delivering the order), warehouse workers (tasked with preparation of orders) and service employees (responsible for conflict resolution).
7. Vendors have only one account number and will be based only in India.
8. Employees have only one email address.
9. There won't be any wishlisting features, nor any saved-items feature like the ones offered by Amazon.

Chapter 2

ER Diagram

2.1 Entities

1. Customer
    (a) Customer ID: Primary key
    (b) Phone Number: Multivalued
    (c) Name: composite
        i. First Name
        ii. Last Name
    (d) Address: composite
        i. House Number
        ii. Locality
        iii. City
        iv. State
        v. Pin Code
    (e) Email Address
    (f) Password
2. Product
    (a) Product ID: Primary key
    (b) Specifications
        i. Expiry date

   ii. Manufacture date
   iii. Country of manufacture
   iv. Weight
   v. Dimensions
   (c) Price
   (d) Category
   (e) Discount Percentage
   (f) GST
   (g) Rating : Multivalued
   (h) Photos: multivalued
3. Order
4. Vendor
5. Coupon
6. Warehouse
7. Employee
   - Delivery Partner
   - Warehouse Worker
   - Service Employee
8. Shopping Cart (Weak entity)
   (a) Total cost: Derived