Hypermarket Database Management System

Milestone - Project Proposal

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Background:

Hypermarkets are retail superstores combining multiple verticals (supermarket, clothing, food and beverage, jewelry, and appliances) under one roof. These vast stores are very convenient as they fulfill all the shopping needs of the consumers in one trip and offer a wider variety of products to choose from. Hypermarkets are usually cheaper than convenience stores due to their vast inventories and bulk purchasing power of products. The hypermarkets are always overstocked, and the customers do not face problems like unavailability of products, high prices, lack of choices, and shorter operational hours.

Business Problem:

Boston has over 100 universities which attract about 250,000 students from across the globe each year. The city has a vibrant environment, diversified culture, and solid commercial opportunities making it one of the most preferred cities for international students. Chains of hypermarkets in Boston have increased significantly in the past few decades. Some famous examples of hypermarkets in Boston are Walmart, Costco, Target, and IKEA. Hypermarkets have many advantages, but some of the significant problems international students (including us) have faced while buying products from hypermarkets are: American fast food is underhandedly ample, and international students find the quantity quite abundant. Hence it is essential to take calorie intake into account; There is a variation in the price of the same product in different stores in hypermarkets. Overspending on a product leads to very little savings at the end of the month; Students do not get timely information regarding sales, discounts, or arrival of a new product which leads to increased time and effort for traveling to the store, purchasing a product, and traveling back.

Through our project, we want to solve this real-life problem by helping students compare a particular product available in different hypermarkets, that would be the best for them based on various factors. We have selected the most relevant domains that students buy from on a daily, weekly, or monthly basis, for example, groceries, clothing, toiletries, appliances, FnB, and electronics. Many students can benefit from this project by getting information about the best product at the most minimal cost and plan their shopping accordingly without wasting time researching the stores.

Theory for Hypermarket Database:

For each hypermarket, all transactions made by customers are stored in the database in two ways. The first table on the product level contains details of bill id, customer id, product id, description, price, quantity purchased, discount price of the product, and which offer was applied to the product. Along with these stores, vertical and market types should be captured in each transaction. The second data storage method aggregates the product-level transaction data on the overall bill level. It should capture similar data points but on a combined level, plus some extra information: bill date and time, total tax, points earned from the transaction, and payment method. Details of the market and its location need to be stored, along with the verticals and brands it contains and the categories they come under.

Our system needs to capture customer details so each customer can be mapped to a transaction. We must capture their name, mobile number, email, registered date, and address. Each customer also has points associated with the market, which they receive once they register or make a transaction. Our system should also capture when they received these points, how many points are available currently, and how many have expired.

Finally, the system needs to record the entire product inventory details that each hypermarket has: ID, description, category, cost price, size/weight, color, calorie amount in the product, season (winter, summer), and supplier. Name and address of product suppliers are also recorded.

Requirements:

1. A customer can have multiple numbers of bills; a bill must be marked to only one customer.
2. A bill must contain at least one product; a product can be present in zero to many numbers of bills.
3. A supplier can provide multiple products; a product can be supplied by numerous suppliers
4. A vertical has multiple but at least one store; a store must be a part of maximum one vertical.
5. A transaction can contain zero or multiple offers/discounted products; An offer can be present at most once in a single bill.