Assignment 1

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Topic - Amazon Management System

Problem Description:

In this project, we aim to design a distributed database system integrating Amazon services like Amazon e-commerce, Amazon Prime, Amazon Pay, and Amazon courier services. Its main objective is to provide users with unified access to different services. Generally, if a user wants to access all the above services, then he/she needs to visit that particular service provider to get each service. In this case, each service provider will have policies that may differ significantly. We are providing a solution to integrate such services so that the same information is used at different sites. Some specific information about that service may change depending on the service provided.

Data Sources:
According to the problem statement, there are following data sources.

1. **Amazon e-commerce:** It is an e-commerce company that sells a wide variety of products. All products are tagged with price, rating, name, product id, available units, product color, in stock, and weight. Amazon requires users to register to buy a product by providing details such as their name, email address, password, and age. Additionally, customers can provide their contact information, such as their address, pincode and phone number. This information is used at different sites to access different services.
   Once registered, a customer can be both a buyer and a seller. Buyers can place orders by adding single or multiple items to the shopping cart. Once the order is placed, a user can view its order details which contain a unique order id, total price, delivery date, order date, order status, delivery address, quantity, shipping price and payment information. Shipping price varies depending on whether a buyer is a prime user or not. Similarly, a seller can sell its products using the same platform, which allows sellers to add seller-related information like its company name, description, average ratings, and website URL.

2. **Amazon couriers:** It offers secure and reliable delivery of consignments over multiple locations. Using this, sellers can ship their products, which includes carrier information such as carrier name, carrier email address, phone number, carrier ID, and rating. Amazon facility tracks each shipment using a unique shipment id, product name, delivery address, pick-up date, and delivery date.

3. **Amazon Prime:** It is a streaming service that offers various award-winning TV shows, movies, anime, documentaries, and more on thousands of internet-connected devices. Users can subscribe to a service by selecting a plan, and each plan has a unique subscription id, subscription type, subscription date, validity, and price. Media in each plan include a unique id, title, release date, and rating, and each media is tagged with a genre id, genre type, and genre description.

4. **Amazon Pay:** It lets users use the payment method already associated with their Amazon account to make payments. Besides paying for the services, users can also make payments to each other. Users must first register their account related details, such as account number, bank name, date of birth, and balance. Upon successful transaction completion, the transaction history is kept, containing the payment ID, the account number of the sender, the account number of the receiver, the date, and the amount of the transaction.

Overall, a single platform allows users to access multiple services. They can buy and sell products on Amazon e-commerce, ship products using Amazon Couriers, stream their favourite shows using Amazon Prime, and do transactions using Amazon Pay.

Queries:

Simple Queries :

1. List all products with prices under 5000.
2. Name of carrier service that has more than four ratings.
3. The details of the transactions that took place on 20/10/2022.
4. The title of the television series with thriller as its genre
5. Amazon's prime subscription type, which is subscribed to by most customers.

Complex Queries :

1. Number of customers who uses both Amazon Pay and Amazon Prime.
2. Pin code of the city in a state that has had the maximum number of orders in the last month.
3. Customer details who bought products from Amazon e-commerce and sold them as sellers on the same.
4. Details of customers whose age<18 and took the subscription price >999.
5. Transaction details of a user between 01/12/2020 to 14/02/2021.

Constraints:

1. Products will only be added to the shopping cart if they are in stock.
2. If the quantity of an item in the shopping cart reaches zero, the item will be removed.
3. Media can only be streamed on a specified number of devices at a time.
4. In order to make a successful payment through Amazon pay, the user's wallet balance must be sufficient.
5. Courier Services will not accept a shipment if it does not provide delivery to the specified location.
6. Users whose age<18 cannot access the genre_type of "R rated".
7. Only those sellers whose average rating >=2 will sell the products.
8. A user cannot do a transaction to himself using Amazon Pay.