CSE 202
Fundamentals of Database Management Systems

Project Title

Design of an online retail store system

Group 30 Members

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Scope of Project

The design of an online retail store system replicates the database management of retail stores with online shopping availability such as Big Bazaar, and is worked on and studied to understand the different aspects involving the storage of products, the interaction of employees, the company itself and the customer among various other objectives.

Stakeholders

Stakeholders are a person or a group being directly or indirectly affected by the activity of an organisation. Stakeholders may be directly or indirectly involved.

1. Customers: External stakeholders who can shop on the online portal

2. Employees: Internal stakeholders that manage the concerns of the customers through customer care department, delivery of the required goods as per the customer and the management and maintenance of

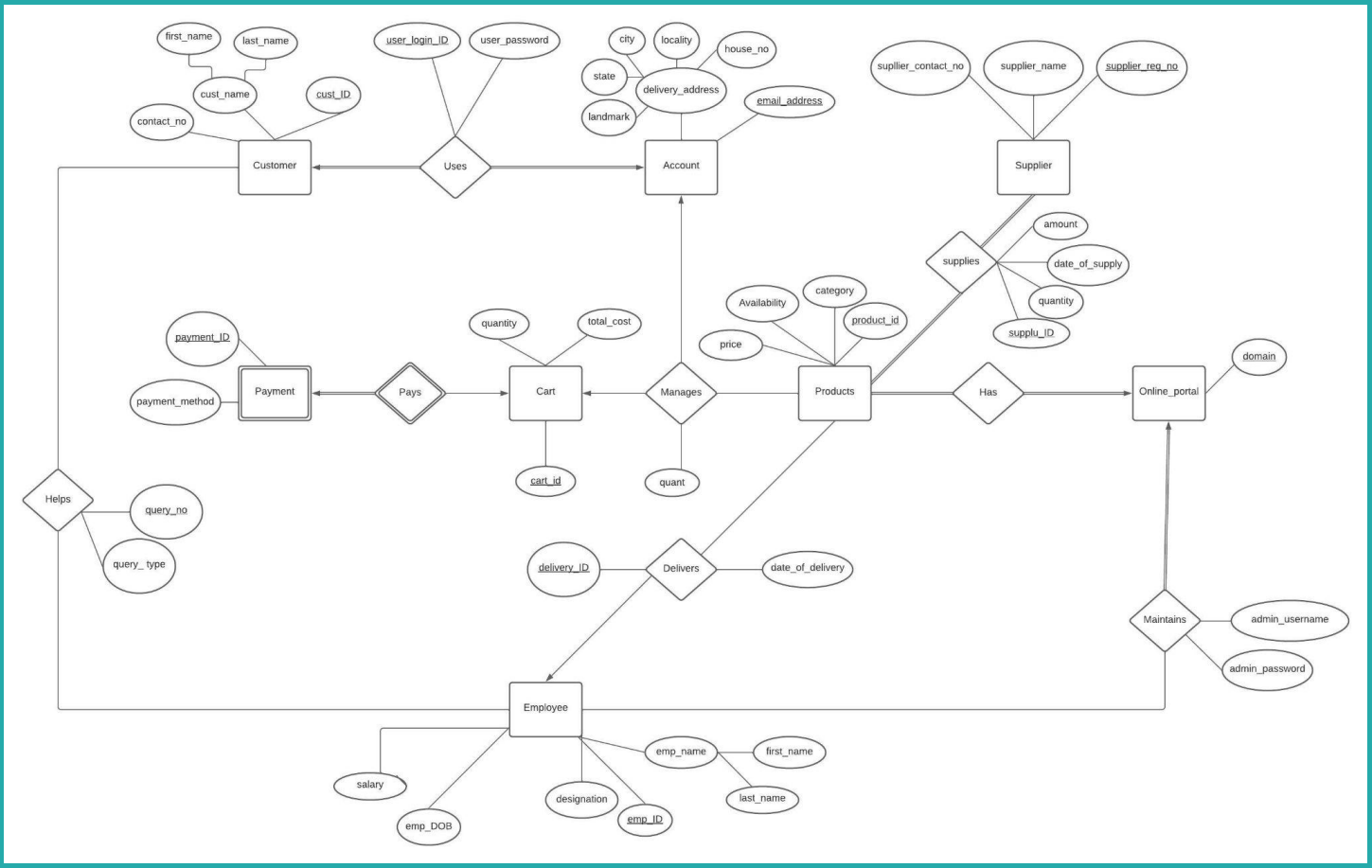
3. Suppliers: External stakeholders that provide the products to the company to be provided and delivered to the customers.

Entities and their attributes

1. Customer: Has customer ID(cust_ID), customer name(cust_name) and contact_no as the attributes, and is involved in Uses relationship with Account and Helps relationship with Employee
2. Account: Denoting the portal account of the customer, has delivery address(delivery_address) and email address(email_address) of the customer as entities, and is involved in manages Cart and Products
3. Cart: Denoting the cart of the customer, has cart ID(cart_id), total cost of the cart products(total_cost) and quantities(quantity) as the entities
4. Products: Represents products available on the platform, has product ID(product_ID), category(category), stock of product available(Availability) and price of product(price) as the attributes, , and is involved in Manages relationship with Cart, Has relationship with Online_portal and supplies relationship with Supplier

5. Supplier: Denotes the supplier/manufacturer of products, has supplier SSN(supplier_reg_no), supplier name(supplier_name) and supplier contact number(supplier_contact_no) as attributes, , and is involved in supplier relationship with Products
6. Online_portal: Represents online website portal of the company, has domain address(domain) as attribute and involved in Maintains relationship with Employee
7. Employee: Represents employees of the establishment, has employee ID(emp_ID), employee name(emp_name), designation of the employee(designation), employee D.O.B(emp_DOB) and salary(salary) as the attributes, and is involved in Helps relationship with Customer, Maintains relationship with Online_portal, and Delivers relationship with Products
8. Payment: Represents the payment of fee portal side of the store, has payment ID number(payment_ID) and mode of payment i.e UPI, Net banking etc (payment_method) as the attributes, , and is involved in Pays relationship with Cart

Entity Relationship Diagram Model



Link to ER diagram:
https://lucid.app/lucidchart/4a9fce45-f99c-43c8-bb13-78ec5362f944/edit?invitationId=inv_fb13e5da-d0a0-47ae-9245-5bb093fa1f8f

Weak Entity

Payment entity is the weak entity in the project. It has total participation, and has dependency on the Cart entity. Identification of the payment is done through the help of the Cart entity.

Ternary Relationship

Manages is identified as the ternary relationship in the project, the Account of the user manages the Cart as well as the Products that it chooses to have in the Cart. The presence of a ternary relationship simplifies the process and binary relationships may not necessarily be sufficient for this representation.

Relational Schema

customer = (customer id, first_name, last_name, contact_no)
account = (email_address, house_no, locality, landmark, city, state)
payment = (payment_id, payment_method, cart_id)
Employee = (emp_id, first_name, last_name, designation, emp_DOB, salary)
online_portal = (domain)
product = (product_id, category, availability, price)
supplier = (supplier_reg_no, supplier_name, supplier_contact_no)
cart = (cart_id, quantity, total_cost)

uses = (user_login_id, user_password, email_address, cust_id)
maintains = (domain, emp_id, admin_username, admin_password)
supplies = (supply_id, amount, date_of_supply, quantity, product_id, supplier_reg_no)
helps = (query_no, query_type, cust_id, emp_id)
delivers = (delivery_id, date_of_delivery, emp_id, product_id)
manages = (email_address, product_id, cart_id, quant)

NULL Constraints

1. last_name in Customer: Last name of customer may not be given by them/the customer may not have a last name, hence this attribute can be NULL
2. last_name in Employee: Last name of employee may not be given by them/the employee may not have a last name, hence this attribute can be NULL, as it isn't essential to Employee identification process since we have emp_ID
3. landmark in Account: Landmark for address is optional, and may not be given by the customer, hence this attribute can be NULL

SQL Queries

```
select products.product_id, category, max(products.price)
from products group by category;

select first_name
from Employee
where designation = ' hr' and emp_salary > 30000;

Select product_id, price
From products
Where category = 'footwear' order by products.price;

Select contact_no, city
from customer, account, uses
```

```
Where uses.cust_id = customer.cust_id and uses.email_address =
account.email_address;

Select first_name
From Employee
Where year(emp_dob) > '1985' and designation = ' sde';

Select first_name
From customer
Where first_name like '_e%' and cust_id > 20000;

(Select first_name
From Employee
Where designation = ' hr' and year(emp_dob) = 2000)
Union
(Select first_name
From Employee
Where designation = ' customer care' and year(emp_dob) = 1999);

Select distinct supplier_name
From supplier
Where supplier_name not in ('Senger, Hermann and Mertz',
'Abbott, Kilback and Jast', 'Lakin', 'Price-Schneider');

select count(distinct T.first_name)
from Employee as T, Employee as S
where T.emp_salary > S.emp_salary and T.designation = ' finance';

select cart_id, quantity*10 as magnified_quantity
from cart
```

INDIVIDUAL CONTRIBUTION

Kanishk Singh:

1. Created base for ER diagram
2. Helped create relational schema
3. Helped in data population
4. Helped in SQL Queries
5. Documentation/Answers in write-up

Shivam Jindal:

1. Helped in ER diagram
2. Created the tables
3. Data Population of tables
4. SQL Queries

Shreyanshu Sharma:

1. Created the relational schema
2. Helped in data population
3. debugging of queries
4. Helped create the ER diagram

Mehul Singh:

1. Debugged the sql code script before populating the data.
2. Populated the entities.
3. Created some SQL queries.
4. Helped identify the foreign keys in relationship schema.
5. Helped debug the ER diagram.