

Project Name : ONLINE RETAIL DATABASE

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Section I: Project Description

This project is creating the Online Retail Database System for a retail store where customers can buy the products online. In this project, the retail store administrator is the main entity to include because the administrator needs to improve their sales by analyzing the store's sales, market's share, the number of customers, the employees, and the viewer of their websites. Moreover, the products are the most important entity in this project because we can not create the retail store without including the product to sell. The product entity also should include the product id to distinguish the category of the product and the amount of the product to inventory for the daily business. In addition, the employees for the store are playing the main role for the retail database system because unlike the in-store service, the online store service needs more employees for managing the inventory, collecting the order from online, packing the product and shipping or delivery to the customers. Another main entity is the store website because since it is an online retail store, the only way to communicate between seller and customer is through online. Therefore, the website needs to have enough information such as customer services, phone number, email address, product's detail according to the product categories. Another entity is the customer which includes the customer's address, phone number and the order items. The website needs to provide the order number, order detail and estimated arrival time after the customer replaces their order. The payment method is also the main entity for the online retail database system because unlike the in-store services, customers can't choose to pay with either credit card/debit card or cash. Customers can only pay with their credit card or debit card when they buy the product online. Therefore, the customer needs to put the correct card holder's name, card type, correct card's number, expired date and billing address. The delivery person and the order are also the most important in this database system. The delivery person should notify the customer whether the order is delayed or arriving on time. The review section where customers can give their feedback about the product, services.

Section II : Use Cases

Use Case Title:	Employee
Actor:	Inventory Manager, stock, daily shipment
Description:	Bob got a job at an online retail store as an Inventory Manager. He has to work 5 days a week and he needs to go to the warehouse every day at 8:00 in the morning to check the inventory. He also needs to collect the inventory from the warehouse. Moreover, he has to receive and record new stock as delivered and shipped out. He also has to check his company's daily deliveries, evaluating new shipments and analyzing different suppliers.

Use Case Title:	Customer
Actor:	Customer, Customer ID, User Account, Address, Phone number, Valid Credit/Debit account.
Description:	Mary is a regular customer at the online retail store. She rarely goes out for shopping. She needs to create an account to shop at the online retail store before shopping. If she doesn't have an account, she can only review the products but she can not try to add the product into the cart. She also can not see the products' details. She also needs to provide her correct address and phone number to order the product from an online retail store. She also needs a valid credit/debit account to replace her order online.

Use Case Title:	User Account
Actor:	User Account, User ID, User Name, Password, Review the item, Put the item into the cart, Check out the item
Description:	Bob wants to shop from the online retail store from the website but he doesn't know that the store only allows the person who has their website's account for reviewing the item's details, putting the item into the cart and checking the order. When he clicked the "see the item detail", he realized that he needed the account to shop from the website. Therefore, he created a new account which need to provide the username and password.

Use Case Title:	Product
Actor:	Product, Categories, Product detail, Price
Description:	Mary is working as an admin of the online retail store. She needs to separate the products as their categories to post online. She also needs to post the products' details including the product's name, item's weight, item's price, available quantity, the rating of the customers, item's available color and order id.

Use Case Title:	Order
Actor:	Order ID, Payment method, Date of the order, Quantity, Customer ID
Description:	Bob needs to ship the order to the customer which just replaces the order from online. He needs to check carefully the details of the date and item's quantity that the customer purchased. He also need to check carefully the status of the order whether the order is delivered or not by the detail shipment option that the customer provided.

Use Case Title:	Payment Method
Actor:	Payment ID, Payment Types, Valid Credit/Debit number, Name on the Card, Expiring data of the card Billing Address
Description:	Mary wants to order the items from the online retail store. She needs to check the total purchased amount that she needs to pay. When she checks out the cart, she needs to put her valid credit/debit card's type, card number, CVV number, name of the card holder which is from the debit/credit card, expiring date of the card and billing address.

Use Case Title:	Customer Review
Actor:	Customer Review ID, Review Date, Comment text box, Rating
Description:	<p>Bob is one of the customers of the online retail store. He ordered online and got the order on time. Moreover, the quality of the product is the one that he expected. Therefore, he wants to write a good review about the website. Before he writes the review, he needs to login to the website with his username and password. There are 2 sections in the review section, the first one is the text box for the comment review and the second one is the rating section. After he finished both sections, he needed to submit the review. After submitting, the website will show his comment review and rating with the review ID.</p>

Section III : Database Requirements (Business Rules)

1. Store
 - 1.1 Store has at least one employee.
 - 1.2 Store has one or many store websites.
 - 1.2 Store shall have one unique id number.
 - 1.3 Store shall have zero or many customers.
2. Employee
 - 2.1 Employee should have a unique employee id number.
 - 2.2 Employee belongs to one store
 - 2.3 Employees belong to one or more departments.
3. Store Website
 - 3.1 The Store Website could belong to one store.
 - 3.2 The Store Website could include many categories.
 - 3.3 The Store Website shall include one shopping cart.
 - 3.4 The Store Website shall have at least one contact number.
 - 3.5 The Store Website shall have one customer service.
 - 3.6 The Store Website shall have one review section.
4. Product Categories
 - 4.1 Each product should have a unique id number.
 - 4.2 Each product provide many informations.
 - 4.3 Each product should have one price.
5. Customer Service
 - 5.1 Customer Service should provide one or many phone numbers.
 - 5.2 Customer Service should include one email address.
6. Shopping Cart
 - 6.1 Shopping cart should have a unique id number
 - 6.2 Shopping cart should have one check out button.
7. Order
 - 7.1 Each Order should have one unique id.
 - 7.2 Each Order should have one shipment duration.
 - 7.3 Each Order should have one order's date.
 - 7.4 Each Order should have one status.
8. Check out
 - 8.1 Each check out shall have one unique id number.
 - 8.2 Each check out shall have one payment method.
 - 8.3 Each check out shall have one description.
 - 8.4. Each check out shall have one the quantity of the items.

9. Review Section

- 9.1 The Review Section should have one comment box.
- 9.2 The Review Section should have one rating section.

10. Department

- 10.1 Each Department should have a unique id.
- 10.2 Each Department should have many Employees.

11. Customer

- 11.1 Customer shall have at least one account.
- 11.2 Customer can get zero or many information from the website.
- 11.3 Customers could have one or many orders.
- 11.4 Customer needs one credit/debit card.
- 11.5 Customer needs one billing address.
- 11.6 Customer can review one or many items by logging in with the account.
- 11.7 Customer can write one or many reviews by logging in with the account.
- 11.8 Customer can review many time their shipment status.

12. Address

- 12.1 Address can have a unique address id number.

13. User Account

- 13.1 User account should have a unique id number.
- 13.2 User account should own one and only one user.

14. Payment Method

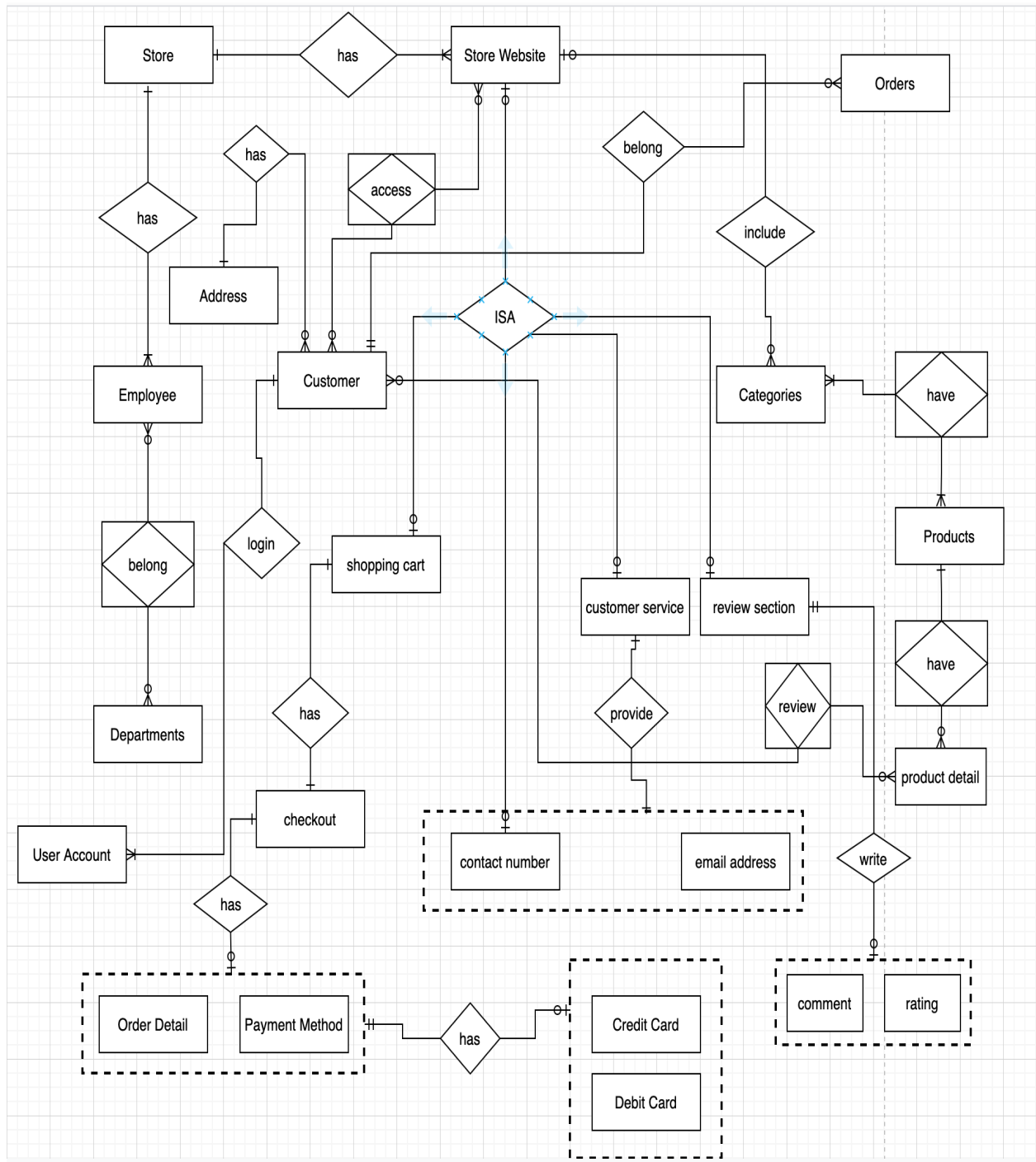
- 14.1 Payment method should have one payment type.
- 14.2 Payment method should include the cardholder's name.
- 14.3 Payment method should include one credit/debit card number.
- 14.4 Payment method should include one CVV_Number.
- 14.5 Payment method should include expiry Date.

Section IV : Detailed List of Main Entities, Attributes and Keys

1. Store (Strong)
 - Store_id : key, numeric
 - Employee_id: key, numeric
 - Department_id: key, numeric
2. Employee (Weak)
 - Employee_id: key,numeric
 - Department_id: key,numeric
 - Name : composite, alphanumeric
 - Dob: multivalue, timestamp
3. Department (Strong)
 - Department_id: key, numeric
 - Name : composite, alphanumeric
 - Categories : composite, alphanumeric
4. Store Website(Strong)
 - Website_id: key, numeric
5. Product Categories (Strong)
 - Categories_id : key, numeric
 - Name: composite, alphanumeric
6. Price (Strong)
 - Price : numeric
7. Shopping cart (Weak)
 - Cart_id: key, numeric
8. Phone number (Strong)
 - Phone_number_id : key, numeric
9. Customer Service (Weak)
 - Customer_service_id : key, numeric
 - Informations : multivalue
10. Review Section (Weak)
 - Comment : multivalue
 - Rating : multivalue
11. Shipment Information (Strong)
 - Information : multivalue

12. Shipment Status (Strong)
 - shipment_status : multivalue
13. Check out (Strong)
 - Check_out_id : key, numeric
 - Description: multivalue
 - Item_quantity : numeric
14. User Account (Strong)
 - Account_id :key, numeric
15. Customer (Strong)
 - Customer_id: key, numeric
 - Name: composite, alphanumeric
 - Dob: multivalue, timestamp
16. Customer's Address (Strong)
 - Address : multivalue
17. Order (Strong)
 - Order_id : key, numeric
18. Payment Method (Strong)
 - Payment_type : multivalue
 - Account_number : numeric
 - Billing_address : multivalue
19. Credit/Debit Card (Strong)
 - Card_number : numeric
 - Name : composite, alphanumeric

Section V : Entity Relationship Diagram (ERD)



Section VI : Testion Table

Rule	Entity A	Relation	Entity B	Cardinal ity	Pass/Fail	Error Description
1	Store	Has	Store Website	1-to-M	Pass	None
2	Store Website	Has	Store	M-to-1	Pass	None
3	Store	Has	Employee	1-to-M	Pass	None
4	Employee	Has	Store	M-to-1	Pass	None
5	Employee	Belong to	Departments	M-to-M	Pass	None
6	Departme nts	Belong to	Employees	M-to-M	Pass	None
7	Customer	Login	User Account	1-to-M	Pass	None
8	User Account	Login	Customer	M-to-1	Pass	None
9	Customer	access	Store Website	M-to-M	Fail	Customer can access only one Store Website with the use account.
10	Store Website	access	Customer	M-to-M	Pass	None
11	Customer	have	Address	1-to-M	Fail	Customer and Address should have Many to Many relationship because customer can have many address.
12	Address	Belong	Customer	M-to-1	Fail	Address and

						Customer should have Many to Many relationship because address can belong to many customers
13	Store Website	ISA	Shopping Cart	1-to-1	Pass	None
14	Shopping Cart	ISA	Store Website	1-to-1	Pass	None
15	Store Website	ISA	Contact Number	1-to-1	Pass	None
16	Contact Number	ISA	Store Website	1-to-1	Pass	None
17	Store Website	ISA	Email Address	1-to-1	Pass	None
18	Email Address	ISA	Store Website	1-to-1	Pass	None
19	Store Website	ISA	Review Section	1-to1	Pass	None
20	Review Section	ISA	Store Website	1-to-1	Pass	None
21	Shopping Cart	Has	Check out	1-to-1	Pass	None
22	Check out	Has	Shopping	1-to-1	Pass	None
23	Check out	Has	Order Detail	1-to-1	Pass	None
24	Order Detail	Has	Check out	1-to-1	Pass	None
25	Check out	Has	Payment Method	1-to-1	Pass	None
26	Payment Method	Has	Check out	1-to-1	Pass	None

27	Payment Method	Has	Credit Card	1-to-1	Pass	None
28	Credit Card	Has	Payment Method	1-to-1	Pass	None
29	Payment Method	Has	Debit Card	1-to-1	Pass	None
30	Debit Card	Has	Payment Method	1-to-1	Pass	None
31	Customer Service	Provide	Contact number	1-to-1	Pass	None
32	Contact Number	Belong to	Customer Service	1-to-1	Pass	None
33	Customer Service	Provide	Email Address	1-to-1	Pass	None
34	Email Address	Belong to	Customer Service	1-to-1	Pass	None
35	Review Section	Write	Comments	1-to-1	Fail	The Review Section should have one to many relationships because customers can write many comments in the review section.
36	Comments	Belong to	Review Section	1-to-1	Fail	Comment and review section should be many to one relationship because customer can write many comment in the review section.

37	Review Section	Write	Rating	1-to-1	Fail	The Rating section should have one to many relationship because customers can rate many time in the review section.
38	Rating	Belong to	Review Section	1-to-1	Fail	Rating and review section should have many to one relationship because customer can rate many time in the review section.
39	Store Website	include	Categories	1-to-M	Pass	None
40	Categories	include	Store Website	M-to-1	Pass	None
41	Categories	Have	Products	M-to-M	Pass	None
42	Products	Have	Categories	M-to-M	Pass	None
43	Products	Have	Product Detail	1-to-M	Pass	None
44	Product Detail	Belong to	Product	M-to-1	Pass	None
45	Customer	review	Product	M-to-M	Pass	None
46	Product	Review	Customer	M-to-M	Pass	None
47	Order	Belong	Customer	M-to-1	Pass	None
48	Customer	Has	Order	1-to-M	Pass	None