

# WHOLESALE MANAGEMENT SYSTEM DATABASE

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## Section I: Project Description

The project is a wholesale management system database. The system would manage the process of buying and selling products in wholesale on a database level. The system would make sure that customers can find products easily on the website without any discrepancy within the inventory of business, for example if an item is out of stock then the database should reflect that in real time. The system would have the customers information stored and protected. The database would be based on the businesses requirements such as what to sell, when to sell and the prices of products. It manages the type of purchase if it is online or in store. For online orders the database would provide shipping information such as tracking number, estimate of delivery time and shipping cost. The system would maintain a purchase history record of customers. Customers would be able to be members so that they collect reward points for every purchase they make. They also can be regular users in the system with an account but no membership.

## Section II: Use Cases

Use Case Title:	Create an account
Actors:	Bob
Description:	Bob wants to have an account. He started the process of creating an account. He provided the following info: full name, username, email, date of birth, address, payment info, and a password. Then Bob submitted the request. Now Bob is a user in our database. Bob can add his family to his account. Bob is now a primary user. Bob can now place orders. Bob can now become a member.

Use Case Title:	Adding a user to an account
Actors:	Primary user
Description:	Bob is a primary user. He can add one or many users to his account. He started the process of adding a user to his account, he enter the new username, Alice. Bob wants to add another user, however he can't do that until he finishes the process of adding Alice then he can start a new process to add another user.

Use Case Title:	Become a member
Actors:	Bob
Description:	Bob already has an account in the database. He submitted a request to become a member. In the request he provided/confirmed payment info and agreed terms and condition of becoming a member. Now Bob has a track record of his reward points in the database.

Use Case Title:	Purchase a product
Actors:	Bob
Description:	Bob is a non-member user who is placing an order online. Bob searches for the item. He finds it then he adds it to his cart. Bob proceeds to check out. Bob must create an account so he can place the order. When Bob provides all the info he now can place the order and a confirmation email sent to him with the receipt and order number.

Use Case Title:	Updating inventory
Actors:	Admin
Description:	Product X gets restocked in the inventory, the admin would use his/her (or it in case it is an automated system) privileges to update the system to reflect the goods that have been added to the inventory.

Use Case Title:	Adding new product
Actors:	Admin
Description:	The admin starts the process of adding a new item to the products list. He/she must provide the following info, item name, category, pictures, serial number (optional), price, and adding any other necessary attributes.

## Section III: Database Requirements (Business Rules)

1. General User
  - 1.1. A general user shall have only one unique user ID
  - 1.2. A general user shall create only one account using a unique email address.
  - 1.3. A general user shall have a full name.
  - 1.4. A general User shall have an email.
  - 1.5. A general User is a registered User.
2. Account
  - 2.1. An account shall have only one unique account ID.
  - 2.2. An account shall have only one credential.
  - 2.3. An account shall belong to only and only one user.
  - 2.4. A registered user shall have one or many profiles.
  - 2.5. An account shall have one or many addresses.
  - 2.6. An account shall have zero or many payment methods.
  - 2.7. An account shall have zero or one membership.
  - 2.8. An account shall have a creation date.
3. Credential
  - 3.1. A credential shall have account ID.
  - 3.2. An account shall have only one encrypted password.
  - 3.3. A credential shall have only one unique email.
4. Registered User
  - 4.1. A registered user shall have only one unique registered user ID
  - 4.2. A registered user shall have one or many roles.
  - 4.3. A registered user shall have only one shopping cart.
  - 4.4. A registered user shall use one or many devices.
5. Profile
  - 5.1. A profile shall have only one unique profile ID
  - 5.2. A profile shall belong to only one account.
  - 5.3. A profile shall have one avatar or profile picture.
  - 5.4. A profile shall have only one date of birth.
  - 5.5. A registered user shall have only one username.
6. Devices
  - 6.1. A device shall have one unique device ID
  - 6.2. A device shall have a type.
  - 6.3. A device shall have a name.
  - 6.4. A device shall login to one or many accounts.

7. Shopping Cart
  - 7.1. A shopping cart shall have only one unique cart ID
  - 7.2. A shopping cart shall belong to only one registered user.
  - 7.3. A shopping cart shall have product id.
  - 7.4. A shopping cart shall have an added date.
8. Role
  - 8.1. A role shall have only one unique role ID.
  - 8.2. A role shall belong to one or many registered users.
  - 8.3. A role is admin or customer.
9. Admin
  - 9.1. An admin shall have only one unique admin ID.
  - 9.2. An admin shall add one or many products to the inventory
  - 9.3. An admin shall remove one or many products from the inventory.
  - 9.4. An admin can make one or many registered users members.
  - 9.5. An admin can update user info.
  - 9.6. An admin can add or remove a membership from an account.
10. Costumer
  - 10.1. A customer shall have one unique customer ID.
  - 10.2. A customer can buy one or many products.
  - 10.3. A customer shall be able to redeem reward points.
11. Membership
  - 11.1. A membership shall have one unique membership ID.
  - 11.2. A membership shall have reward points.
  - 11.3. A membership shall belong to only one account.
  - 11.4. A membership shall have one renewal date.
12. Payment Method
  - 12.1. A payment method shall have only one unique payment ID.
  - 12.2. A payment method shall belong to only one account.
  - 12.3. A payment method is a bank account or credit card.
  - 12.4. A payment method shall have one or many billing addresses.
13. Bank account
  - 13.1. A bank account shall have one unique bank account ID.
  - 13.2. A bank account shall have a routing number.
  - 13.3. A bank account shall have a bank account number.
14. Credit Card
  - 14.1. A credit card shall have one unique credit card ID

- 14.2. A credit card shall have a full name.
  - 14.3. A credit card shall have a card number.
  - 14.4. A credit card shall have CVV.
  - 14.5. A credit card shall have only one expiration date.
15. Address
- 15.1. An Address shall have only one unique address ID.
  - 15.2. An Address shall belong to zero or many accounts
  - 15.3. An Address shall have only one zip code
  - 15.4. An Address shall have only one number.
  - 15.5. An Address shall have only one street.
  - 15.6. An Address shall have only one state.
  - 15.7. An Address shall have only one country
16. Inventory
- 16.1. An inventory shall have only one unique inventory ID.
  - 16.2. An inventory shall have one or many products.
  - 16.3. An inventory shall be managed by a registered user with an admin role.
17. Product
- 17.1. A Product shall have only one unique product ID.
  - 17.2. A Product shall have only one price.
  - 17.3. A Product shall have a name.
  - 17.4. A Product shall have only one description.
  - 17.5. A Product shall have images .
  - 17.6. A Product can be bought by a registered User.
  - 17.7. A Product shall have weight.
  - 17.8. A Product shall have quantity.
  - 17.9. A Product is an Electronics, Clothes, Food, Beauty Products, and Health Products.
18. Electronics
- 18.1. Electronics Shall have only one unique Electronics ID.
  - 18.2. Electronics is a product
  - 18.3. Electronics shall have a serial number.
  - 18.4. Electronics shall have a model date.
  - 18.5. Electronics shall have brand name.
19. Clothes
- 19.1. Clothes Shall have only one unique Clothes ID.
  - 19.2. Clothes is a product
  - 19.3. Clothes shall have one or many sizes
  - 19.4. Clothes shall have one or many size type (male, femail, kids, etc).



- 20. Food
  - 20.1. Food Shall have only one unique food ID.
  - 20.2. Food is a product
  - 20.3. Food shall have only one expiration date.
  - 20.4. Food shall have food type.
- 21. Beauty Products
  - 21.1. Beauty Products Shall have only one unique Beauty Products ID.
  - 21.2. Beauty Products is a product
  - 21.3. Beauty Products shall have one or many sizes
  - 21.4. Beauty Products shall have type.
- 22. Health Products
  - 22.1. Health Products Shall have only one unique Health Products ID.
  - 22.2. Health Products is a product
  - 22.3. Health Products shall have only one expiration date.
  - 22.4. Health Products shall have type.

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

1. General User (Strong)
  - user\_id: key, numeric
  - full name: composite, alphanumeric
  - email: key, alphanumeric
2. Account (Weak)
  - account\_id: key, numeric
  - User\_id: weak key, numeric
  - creation date: compuset, date
3. Credential (Weak)
  - account\_id: key, numeric
  - password: alphanumeric
  - email: key, alphanumeric
4. Registered User (Weak)
  - Registered\_user\_id: key, numeric
  - Role: multivalue, alphanumeric
5. Profile (Weak)
  - Profile\_id: key, numeric
  - Avatar: multivalue, image
  - DoB: compuset, date
  - Username: alphanumeric
6. Devices (Strong)
  - Device\_id: key, numeric
  - Type: alphanumeric
  - Name: alphanumeric
7. Shopping Cart (Strong)
  - cart\_id: key, numeric
  - product\_id: weak key, numeric
  - date\_added: compuset, date
8. Role (Strong)
  - role\_id: key, numeric
9. Admin (weak)
  - admin\_id: key, numeric
  - creation date: compuset, date
  - description: alphanumeric

## 10. Costumer (weak)

- costumer\_id: key, numeric

## 11. Membership (weak)

- membership\_id: key, numeric
- reward\_points: numeric
- creation date: compuset, date
- renewal\_date: compuset, date

## 12. Payment Method (weak)

- payment\_id: key, numeric

## 13. Bank Account (weak)

- Bank\_acct\_id: key, numeric
- routing\_number: numeric
- acct\_number: numeric

## 14. Credit Card (weak)

- credit\_card\_id: key, numeric
- full name: compuset, alphanumeric
- card\_number: numeric
- cvv: numeric
- expiration\_date: compuset, date

## 15. Address (Strong)

- address\_id: key, numeric
- zip\_code: numeric
- number: numeric
- street: alphanumeric
- state: alphanumeric
- country: alphanumeric

## 16. Inventory (Strong)

- inventory\_id: key, numeric

## 17. Product (Strong)

- product\_id: key, numeric
- price: numeric
- name: alphanumeric
- description: alphanumeric
- image: multivalue, image
- wight: numeric
- quantity: numeric

#### 18. Electronics (weak)

- electronics\_id: key, numeric
- serial\_num: numeric
- model\_date: compuset, date
- brand: alphanumeric

#### 19. Clothes (weak)

- clothes\_id: key, numeric
- size: alphanumeric
- size\_type: alphanumeric

#### 20. Food (weak)

- food\_id: key, numeric
- expiration\_date: compuset, date
- Food\_type: alphanumeric

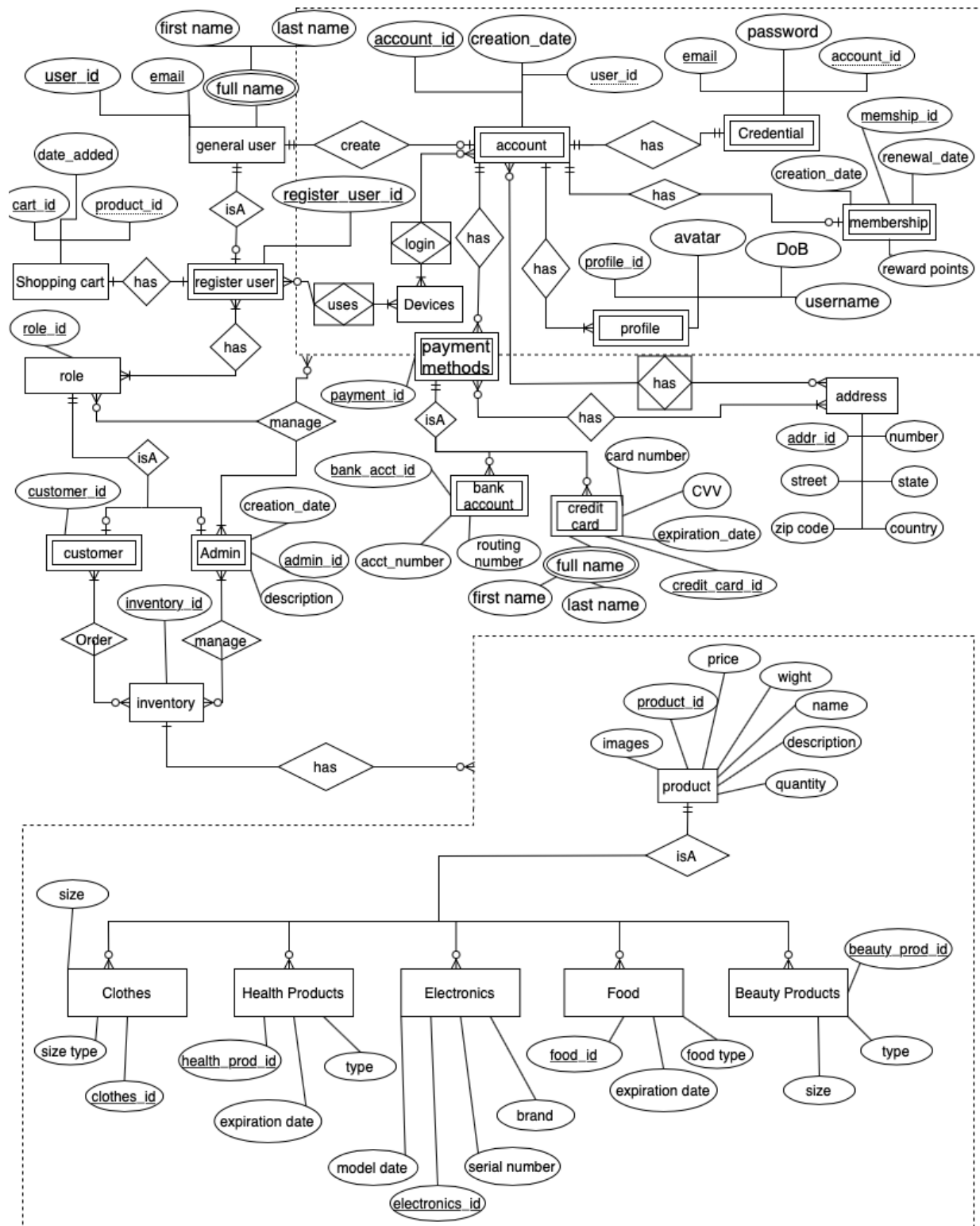
#### 21. Beauty Products (weak)

- beauty\_id: key, numeric
- size: numeric
- type: alphanumeric

#### 22. Health Products (weak)

- health\_prod\_id: key, numeric
- expiration\_date: compuset, date
- type: alphanumeric

## Section V: Entity Relationship Diagram (ERD)



## Section VI: Testing Table

Rule	Entity A	Relation	Entity B	Cardinality	Pass/Fail	Error Description
1	General User	Creates	Account	1-to-1	Pass	None
2	Account	Has	credential	1-to-M	Fail	Users can have an account with only one unique email. There can't be many credentials.
3	General User	IsA	Registered User	1-to-1	Pass	None
4	Registered User	Uses	Devices	1-to-M	Pass	None
5	Devices	Login	Account	M-to-M	Pass	None
6	Account	Has	Profile	1-to-M	Pass	None
7	Account	Has	Membership	1-to-1	Pass	None
8	Account	Has	Payment method	1-to-M	Pass	None
9	Account	Has	Address	M-to-M	Pass	None
10	Registered User	Has	Shopping cart	1-to-1	Pass	None
11	Registered User	Has	Role	M-to-M	Pass	None
12	Role	IsA	Customer	1-to-1	Pass	None
13	Role	IsA	Admin	1-to-1	Pass	None
14	Customer	Order	Inventory	M-to-M	Pass	None
15	Admin	Manage	Inventory	M-to-M	Pass	None

16	Payment method	IsA	Bank account	1-to-M	Pass	None
17	Payment method	IsA	Credit card	1-to-M	Pass	None
18	Payment method	Has	Address (billing address)	M-to-1	Fail	Payment method could have many credit cards or bank accounts which means there could be many different billing addresses.
19	Inventory	Has	product	1-to-M	Pass	None
20	product	IsA	Clothes	1-to-M	Pass	None
21	product	IsA	Health Products	1-to-M	Pass	None
22	product	IsA	Electronics	1-to-M	Pass	None
23	product	IsA	Food	1-to-M	Pass	None
24	product	IsA	Beauty Products	1-to-M	Pass	None
25	Admin	Manage	Account and related entities	M-to-M	Pass	None
26	Admin	Manage	Role	M-to-M	Pass	None