

Online Retail Database

Mark Kim

Student ID: 918204214

GitHub Username: mkim797

Milestone/Version	Date
M1V1	09/11/2021

Contents

I	Project Description	2
II	Use Cases	3
A	Use Case 1	3
B	Use Case 2	3
C	Use Case 3	3
D	Use Case 4	3
E	Use Case 5	3
III	Database Requirements	3
IV	Detailed List of Main Entities, Attributes and Keys	8
V	Entity Relationship Diagram (ERD)	8
VI	Testing Table	8

Section I: Project Description

The goal of this project is to design and implement an online retail database that functions similarly to the online portals of major retailers such as Walmart, The Home Depot, and Amazon. This database system is to manage all aspects of online retail operations from product acquisition and warehousing, to customer order fulfillment and followup. By implementing this database, the online retailer will be able to better understand product turnover, supply chain, human resourcing, fulfillment efficiency, and many other key performance indicators.

From the vendor side of the business, the database will manage the supply chain. This will allow the business to ensure that its resources are applied as efficiently as possible. The business will be able to understand how long it will take for each incoming order to be fulfilled so they can plan for the correct amount of warehouse space to be allocated for each order. Additionally, the business will be able to choose multiple different vendors to aggregate supply capacity in the case that there are supply chain breakdowns. This will minimize the chance for an interruption in the business's ability to fulfill orders to their customers.

Of course, as an online retail business, customers need to be carefully managed. This database will facilitate the management of customer accounts, transactions, order fulfillment, and purchase habits. By tracking these items, the business will be better equipped to manage their inventory, vendors, and sales trends. By managing customer transactions, the business will be able to make informed decisions about how to manage its supply chain; the business will know how much of each product to order from its vendors. As an added value to customers, the database will also allow customers to comment and review the products they order and their general experience with the business.

Lastly, and possibly most importantly, this project will manage internal operations. This includes, but is not limited to, inventory management, warehousing and distribution, human resources and capital resources. With this system, the business will be able to manage its staffing requirements and responsibilities, which warehouses to use when fulfilling customer orders, management and administrative hierarchy, and working capital. This will allow the business to maintain smooth operations by ensuring proper staffing at all of its locations. Furthermore, the business will be able to resource its distribution network to ensure timely and efficient fulfillment of orders. Finally, the database will be able to support multiple roles for employees to ensure a separation of duties.

Section II: Use Cases

Use Case 1

Title	Product Purchase from Website
Actors	Customer (Jane)
Description	Jane is someone who is looking for a new thingamadoodad. She is not happy with the la

Use Case 2

Title	Product Purchase from Website
Actors	Customer (Jane)
Description	Jane is someone who is looking for a new thingamadoodad. She is not happy with the la

Use Case 3

Title	Product Purchase from Website
Actors	Customer (Jane)
Description	Jane is someone who is looking for a new thingamadoodad. She is not happy with the la

Use Case 4

Title	Product Purchase from Website
Actors	Customer (Jane)
Description	Jane is someone who is looking for a new thingamadoodad. She is not happy with the la

Use Case 5

Title	Product Purchase from Website
Actors	Customer (Jane)
Description	Jane is someone who is looking for a new thingamadoodad. She is not happy with the la

Section III: Database Requirements

1. General User (Strong)
 - (a) A user shall create only one account with an unique email.
 - (b) A user shall be able to register to many mailing lists
 - (c) A user's confidential data shall be saved in the company servers
 - (d) A user shall have many shipping addresses
 - (e) A user shall have many billing addresses
 - (f) A user shall have many transactions
 - (g) A user shall have one shopping cart
 - (h) A user shall receive many receipts
2. Registered User (Strong)

- (a) A registered user is a user.
 - (b) A registered user shall be allowed to login to their account from many supported devices simultaneously.
 - (c) A registered user can login to their account from many IP addresses
 - (d) A registered user shall be able to create only one basic account
 - (e) A registered user shall be able to create only one premium account
 - (f) A registered user shall accrue (have) many rewards
 - (g) A registered user shall have a favorites list
3. Order Status
- (a) An order status shall have one Registered User
4. Device (Strong)
- (a) A device shall log into zero or one account
 - (b) A device shall be used by many registered users
5. Account
- (a) A account shall be created by one and only one user
 - (b) A account is a Basic Account
 - (c) A account is a Premium Account
 - (d) A account shall be logged into by many devices
6. Basic Account
- (a) A Basic account is an account
7. Premium Account
- (a) A Premium account is an account
8. Reward (Strong?)
- (a) A reward shall be accrued by many registered users
 - (b) A reward shall be redeemed for credit? *****
9. Receipt
- (a) A receipt shall be received by one user
 - (b) A receipt shall be created by one transaction
 - (c) A receipt shall have many order statuses
10. Mailing List (Strong)
- (a) A mailing list shall have many users

11. Transaction (Weak)
 - (a) A transaction is a purchase
 - (b) A transaction is a return
 - (c) A transaction has at least one product
 - (d) A transaction shall create a receipt
 - (e) A transaction has at least one payment method
 - (f) A transaction shall be created by Shopping Cart
 - (g) A transaction is processed by one fulfillment center
 - (h) A transaction shall create one order status
12. Accounting Dept (Strong?)
 - (a) The accounting dept shall receive payment from many Payment Types
 - (b) The accounting dept shall pay many Vendors
 - (c) The accounting dept shall pay many Employees
13. Fulfillment center (Strong)
 - (a) Fulfillment center processes transaction
 - (b) Fulfillment center sends order to many distribution networks
14. Return
 - (a) A return is a transaction
 - (b) A return has one warehouse address
15. Purchase
 - (a) A purchase is a transaction
 - (b) A purchase has one shipping address
16. Shopping Cart (Strong)
 - (a) A shopping cart shall have many users
 - (b) A shopping cart shall have many products
 - (c) A shopping cart shall have at most one shipping address
 - (d) A shopping cart shall have many payment methods
 - (e) A shopping cart creates one transaction
17. Favorites List
 - (a) A favorites list shall have many registered users
 - (b) A favorites list shall have many products

18. Address (Strong)
 - (a) A address is a billing address
 - (b) A address is a shipping address
 - (c) A address is an employee's address
19. Billing Address
 - (a) A billing address is an address
 - (b) A billing address has a payment method
 - (c) A billing address has many general users.
20. Shipping Address
 - (a) A shipping address has one region
 - (b) A shipping address is an address
 - (c) A shipping address has many general users
 - (d) A shipping address is shipped to by one distribution network
21. Employee Address
 - (a) A employee's address is an address
 - (b) A employee's address has many employees
22. Employee
 - (a) A employee has at least one address
 - (b) A employee is a warehouse worker
 - (c) A employee is a manager
 - (d) A employee is a buyer
 - (e) A employee is paid by one payroll company
23. Warehouse Worker
 - (a) A warehouse worker is an employee
 - (b) A warehouse worker works in one warehouse
24. Manager
 - (a) A manager is an employee
 - (b) A manager manages many employees
25. Buyer
 - (a) A buyer is an employee
26. Payroll Company (Strong)

- (a) Payroll company pays many employees
- 27. Payment method (Strong)
 - (a) A payment method pays for one transaction at a time
 - (b) A payment method is a Debit Card
 - (c) A payment method is a Credit Card
- 28. Vendor (Strong)
 - (a) A vendor sends product to many warehouses
 - (b) A vendor has at least one region
 - (c) A vendor creates many invoices
- 29. Region (Strong)
 - (a) A region has many shipping addresses
 - (b) A region has many vendors
 - (c) A region has one warehouse
- 30. Invoices
 - (a) A invoice is created by many vendors
 - (b) A invoice is sent to many warehouses
- 31. Distribution Network
 - (a) A distribution network uses many shipping companies
 - (b) A distribution network has one region
 - (c) A distribution network has many warehouses
 - (d) A distribution network ships to many addresses
 - (e) A distribution network receives order from one fulfillment center
- 32. Warehouse (weak?)
 - (a) A warehouse has one distribution network (could be region?)
 - (b) A warehouse contains many products
 - (c) A warehouse is request from many vendors
 - (d) A warehouse receives many invoices
 - (e) A warehouse has many warehouse workers
 - (f) A warehouse has many managers
- 33. Courier (Strong)
 - (a) A courier is used by many distribution networks

- 34. Product (Strong)
 - (a) A product is ordered in many transactions
 - (b) A product is contained by many warehouses
 - (c) A product is contained by many shopping carts
 - (d) A product is contained by many favorites lists
 - (e) A product has many product reviews
 - (f) A product has many categories
- 35. Debit Card
 - (a) A debit card is a payment method
- 36. Credit card
 - (a) A credit card is a payment method
- 37. DB System (Strong)
 - (a) DB system monitors everything
- 38. Category (Strong)
 - (a) A category has many products

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

Section V: Entity Relationship Diagram (ERD)

Section VI: Testing Table