Lab Session 6: Modeling Class Diagram and Activity Diagram (Point of Sale System)

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Problem Description:

A POS (Point-Of-Sale) system is a computer system typically used to manage the sales in retail stores.It includes hardware components such as a computer, a bar code scanner, a printer and also software to manage the operation of the store.

The most basic function of a POS system is to handle sales. When a customer arrives at a POS counter with goods to purchase, the cashier will start a new sale transaction. When the barcode of a good is read by the POS system, it will retrieve the name and price of this good from the backend catalog system and interact with the inventory system to deduce the stock amount of this good. When the sale transaction is over, the customer can pay in cash, credit card or even check. After the payment is successful, a receipt will be printed. Note that for promotion, the store frequently issue gift
coupons. The customer can use the coupons for a better price when purchasing goods.

Another function of a POS system is to handle returns....

A user must log in to use the POS. The users of a POS system are the employees of the store including cashiers and the administrator. The administrator can access the system management functions of the POS system including user management and security configuration that cashiers can't
do.

A) Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases

1. Process Sale

- Use Case Name: Process Sale
- Primary Actors: Cashier and Customer
- Goal: To complete a sales transaction successfully.
- Precondition: The cashier is logged in to the POS system, and the customer has selected the items to purchase.
- Triggers: The cashier starts a new sale transaction.
- Description:
    1. The cashier scans the barcode of each item or enters the item manually.
    2. The POS system retrieves the item's name and price from the catalog system and updates the inventory.
    3. The cashier applies any applicable discounts or promotions.
    4. The customer selects a payment method (cash, credit card, or check).
    5. The cashier processes the payment.
    6. The POS system prints a receipt.
- Postcondition: The sale transaction is complete, and the customer has received a receipt.

2. Handle Return

- Use Case Name: Handle Return
- Primary Actor: Cashier
- Goal: To process a return successfully.
- Precondition: The cashier is logged in to the POS system, and the customer has a valid receipt for the item(s) to be returned.
- Triggers: The customer requests to return an item.
- Description:

    1. The cashier scans the receipt or enters the transaction ID manually.
    2. The POS system retrieves the transaction details.
    3. The cashier verifies the item(s) to be returned.
    4. The cashier processes the return and updates the inventory.
    5. The POS system prints a refund receipt (if applicable).
- Postcondition: The return is processed, and the customer has received a refund (if applicable).

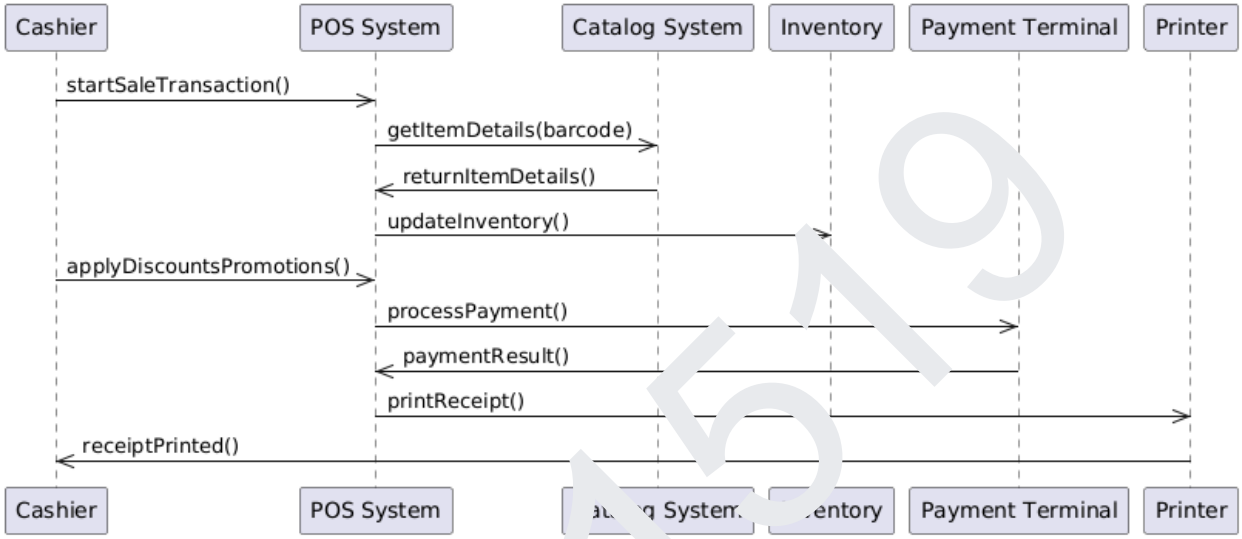
B) Identity Entity/Boundary control Objects

Entity/Boundary Control Objects

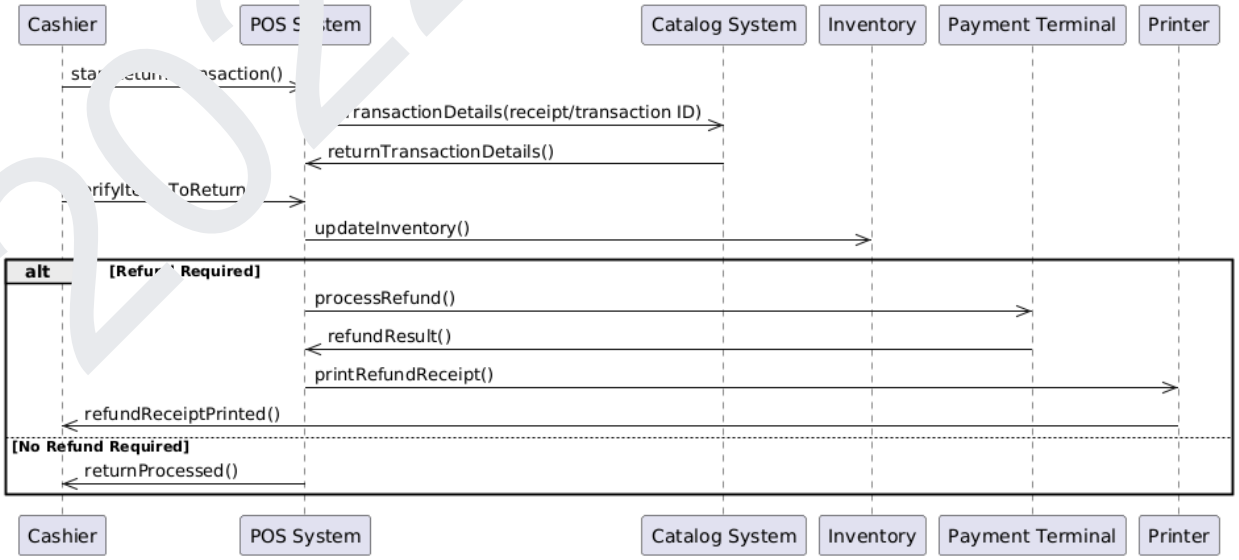
- Entity Objects:
  - Item
  - Customer
  - SaleTransaction
  - Inventory
  - CatalogSystem
- Boundary Objects:
  - POS System
  - Barcode Scanner
  - Printer
  - Payment Terminal
- Control Objects:
  - SaleController
  - ReturnController

C) DRAW SEQUENCE DIAGRAM

- ORDER PLACING

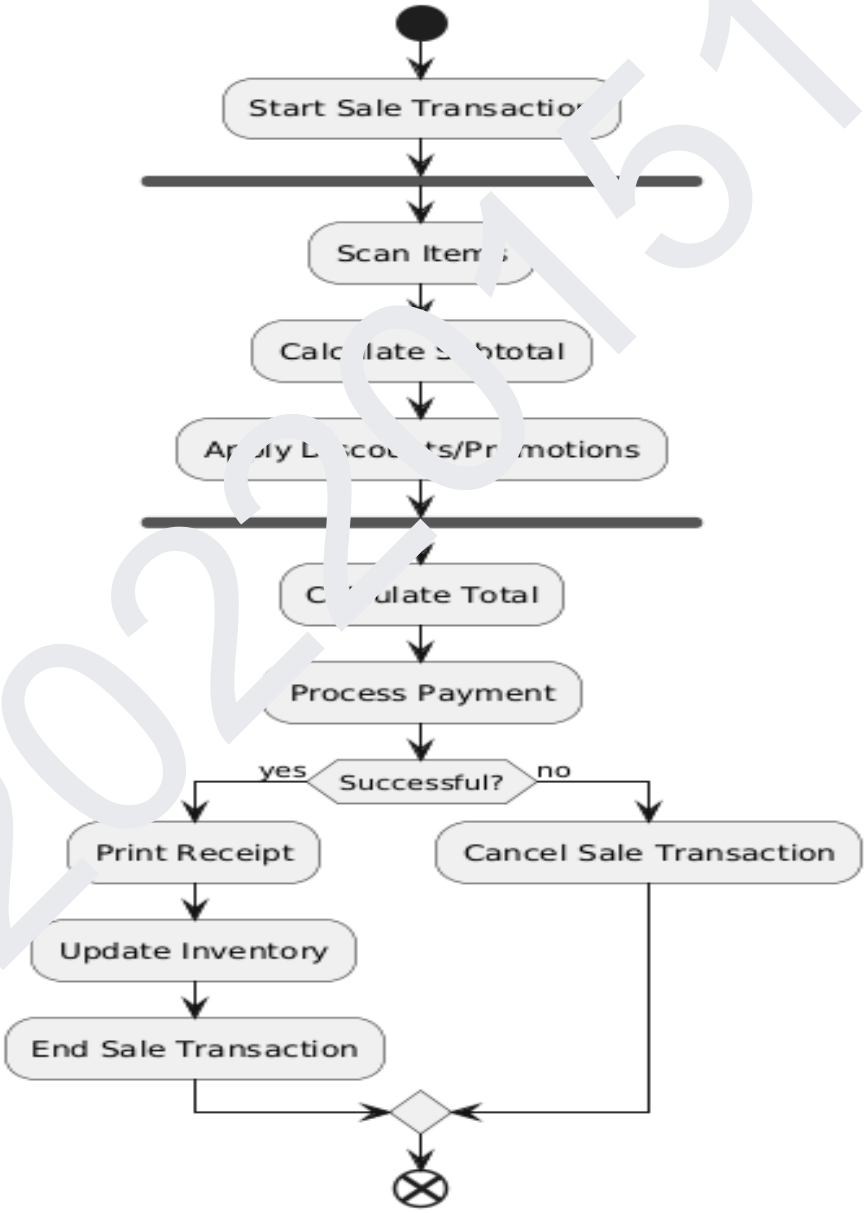


- ORDER RETURN

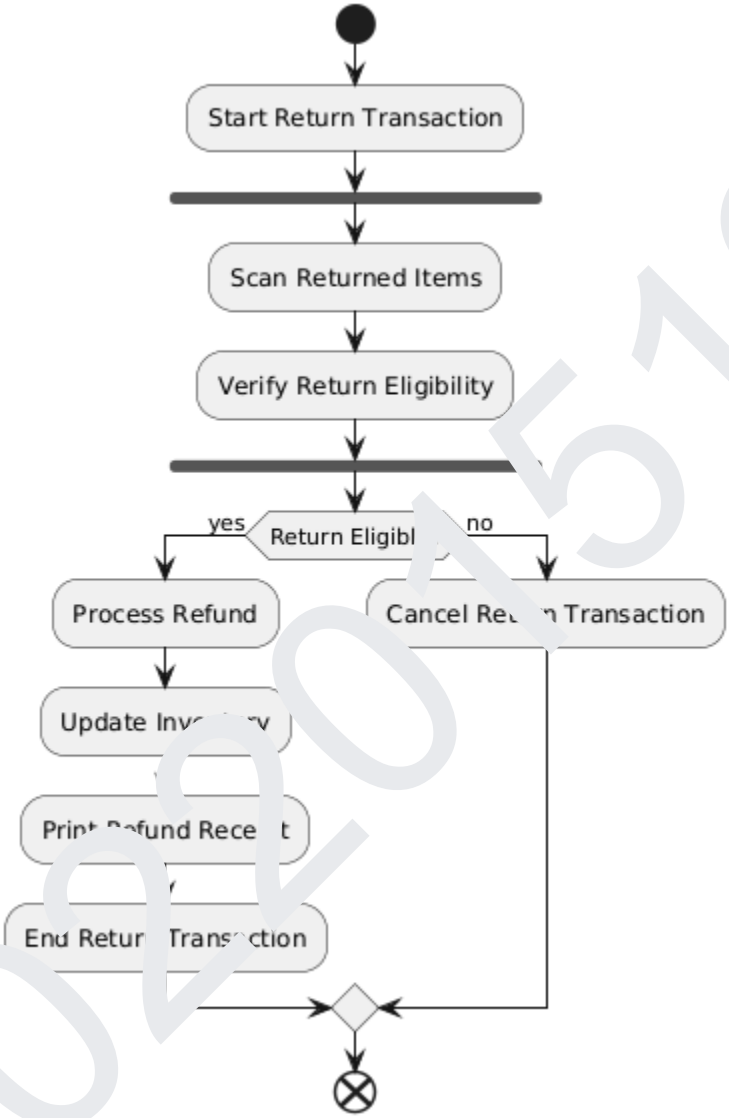


D) Develop Analysis Domain Models

- Sales Analysis Domain Model

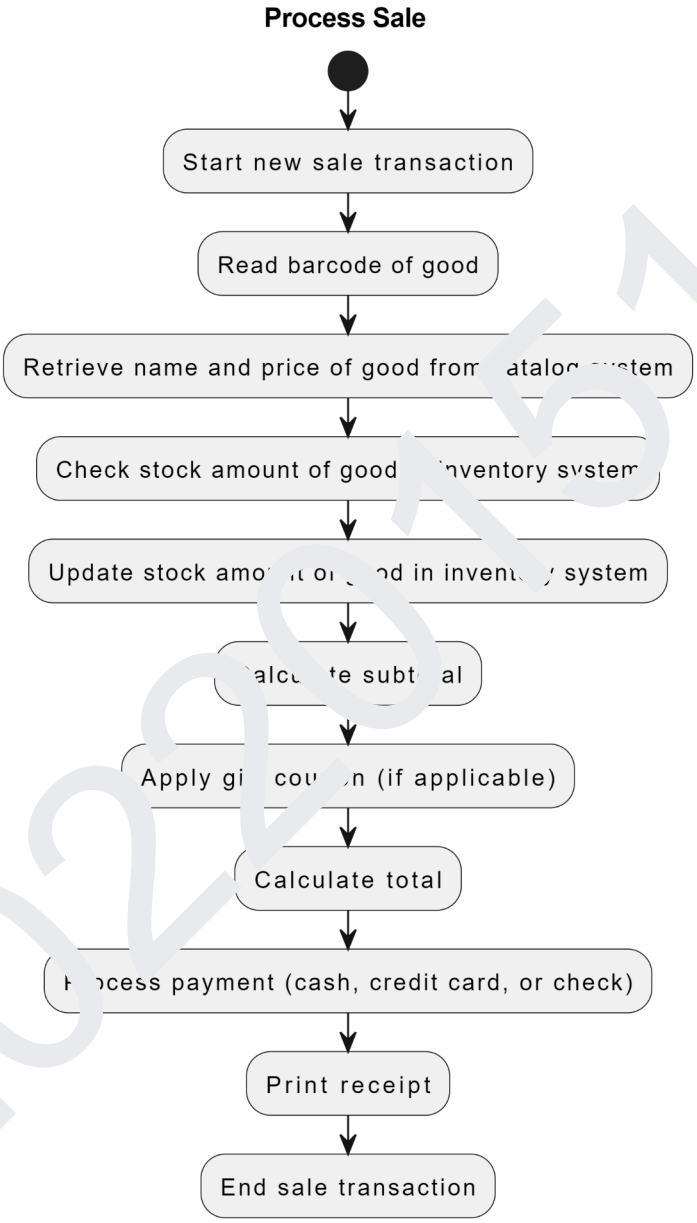


- Return Domain Analysis Model



E) ACTIVITY DIAGRAM

SALE



RETURN