IT – 314 Software Engineering

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Lab 6 – Point of Sale System

"Process Sale"

Actor:

- Cashier

Preconditions:

- The POS system is operational and ready to use
- Cashier is logged into the system

Postconditions:

- Sale is recorded in the system
- Inventory is updated
- Receipt is printed and given to the customer

Basic Flow:

1. Customer arrives at the POS with items for purchase
2. Cashier initiates a new sale transaction
3. For each item: a. Cashier scans the item barcode b. System retrieves item details (name, price, availability) from the catalog c. System updates inventory d. System adds the item to the current transaction
4. System calculates and displays the total amount, including applicable taxes
5. Customer chooses a payment method (cash, credit card, debit card, or mobile payment)
6. Cashier processes the payment through the Payment Processor
7. System records the sale and generates a unique transaction ID
8. System prints the receipt with transaction details
9. Cashier gives the receipt and purchased items to the customer

Alternative Flows:

- 3b. If item not found in catalog, Cashier manually enters item details and notifies manager
- 4a. Customer has a loyalty card or discount coupon:

    1. Cashier applies the discount to the sale
    2. System recalculates the total and displays savings
- 5a. Customer decides not to complete the purchase:
    1. Cashier cancels the transaction
    2. System reverts any inventory changes and logs the cancellation
- 6a. Payment processing fails:
    1. System notifies Cashier with error details
    2. Cashier asks customer for an alternative payment method or to try again

"Handle Return"

Actor:

- Cashier

Preconditions:

- The POS system is operational and ready for use
- Cashier is logged into the system
- Customer has goods to return and the original receipt or transaction ID

Postconditions:

- Return is recorded in the system
- Inventory is updated
- Refund is processed
- Return receipt is printed and given to the customer

Basic Flow:

1. Customer arrives at the POS with goods to return and the original receipt or transaction ID
2. Cashier initiates a new return transaction
3. Cashier scans or enters details of the items being returned
4. System verifies return eligibility (e.g., within return period, item condition)
5. System calculates the refund amount, including any restocking fees if applicable
6. Cashier confirms the return reason with the customer and inspects item condition
7. System updates inventory and logs item condition

8. Cashier processes the refund in the original payment method
9. System records the return and links it to the original transaction
10. System prints the return receipt with refund details
11. Cashier gives the return receipt to the customer and stores returned items

Alternative Flows:

- 4a. Items are not eligible for return:
    1. System notifies Cashier with specific reasons
    2. Cashier informs customer of return policy
    3. Return process is terminated
- 7a. Items are damaged or used:
    1. Cashier assesses the condition and documents it in the system
    2. System may adjust the refund amount or reject the return based on condition
- 8a. Original payment method is not available:
    1. Cashier selects an alternative refund method approved by management
    2. System processes the refund using the alternative method and logs the change

Identify Entity/Boundary/Control Objects:

Entity Objects

1. Sale
2. Item
3. Payment
4. Customer
5. Cashier
6. Inventory
7. Coupon
8. Return
9. LoyaltyCard

Boundary Objects

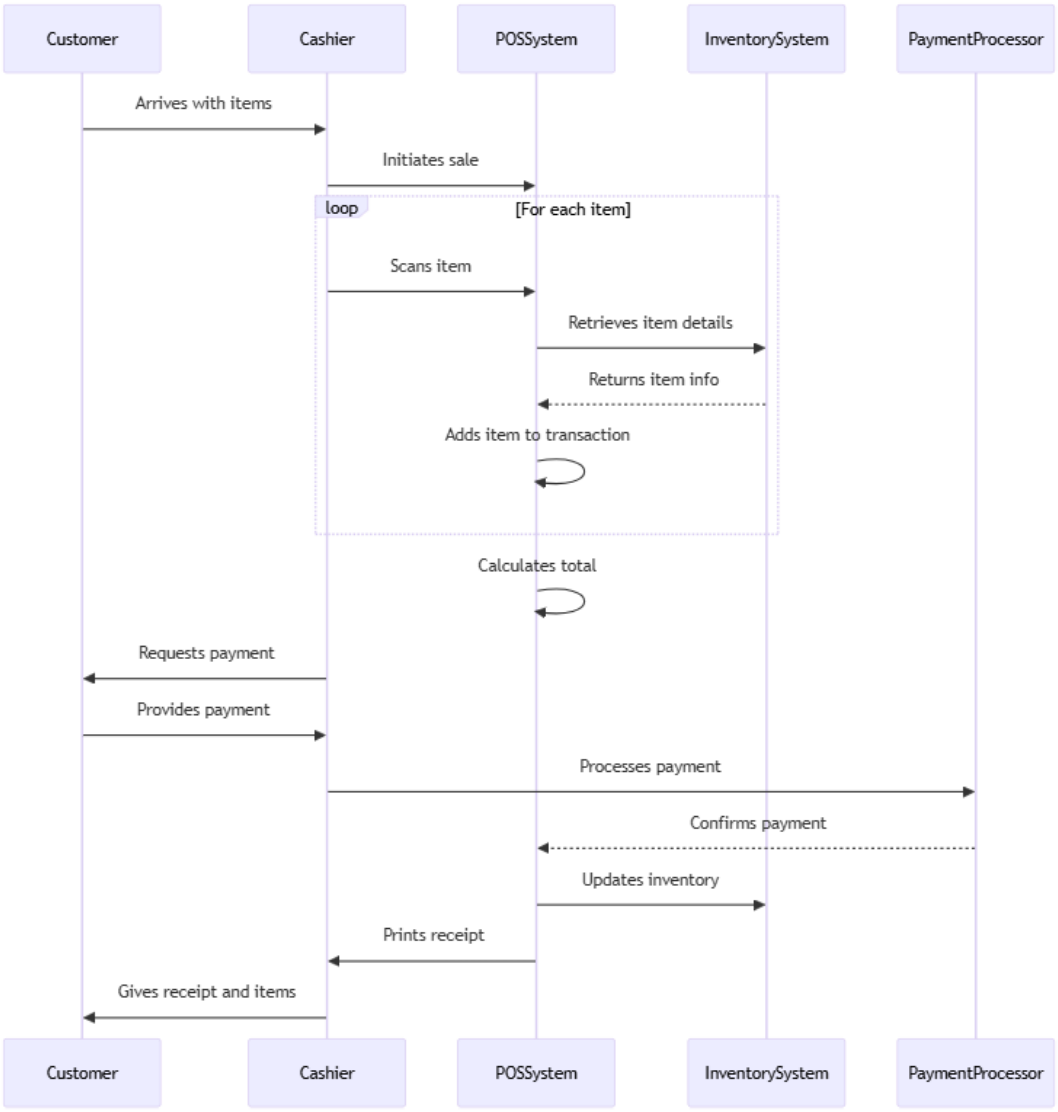
1. POS Terminal Interface
2. Barcode Scanner
3. Receipt Printer
4. Payment Terminal
5. Customer Display

Control Objects

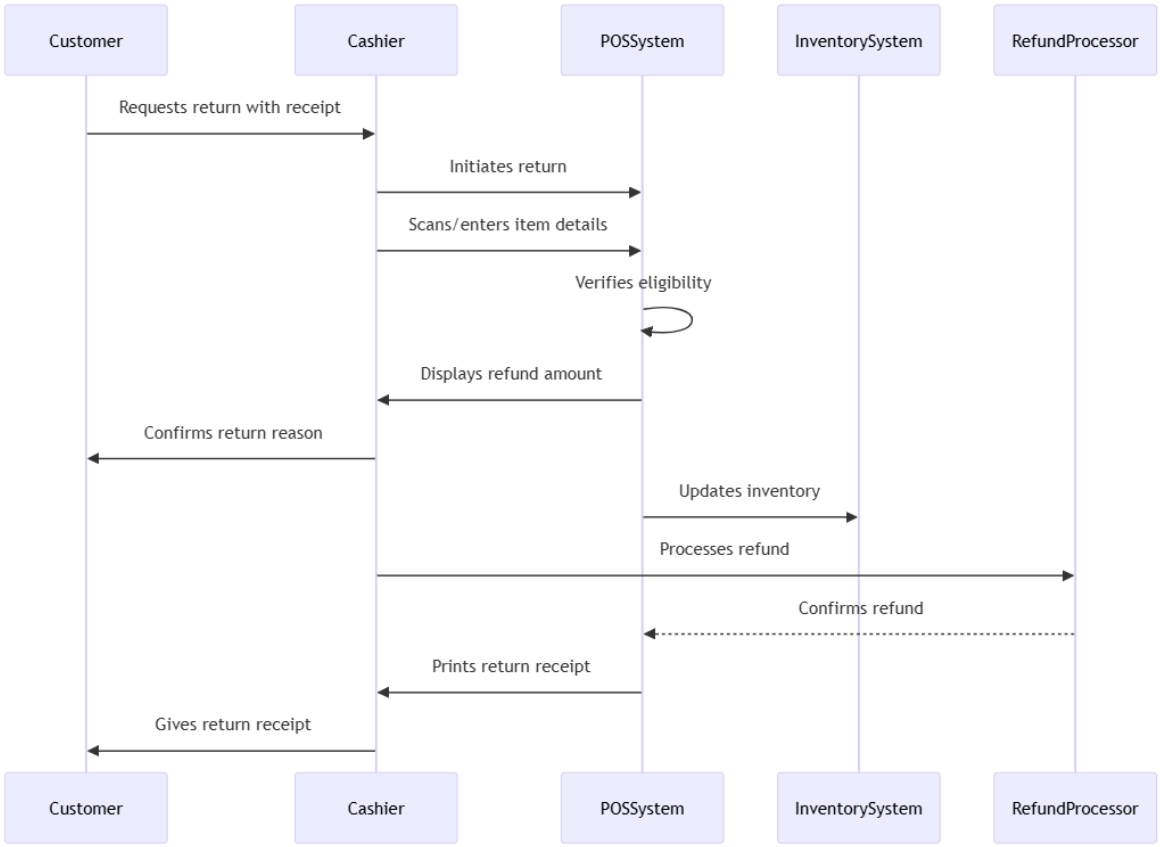
1. Sale Manager
2. Inventory Controller
3. Payment Processor
4. Catalog Manager
5. Return Manager
6. LoyaltyProgram Manager

Sequence Diagrams:

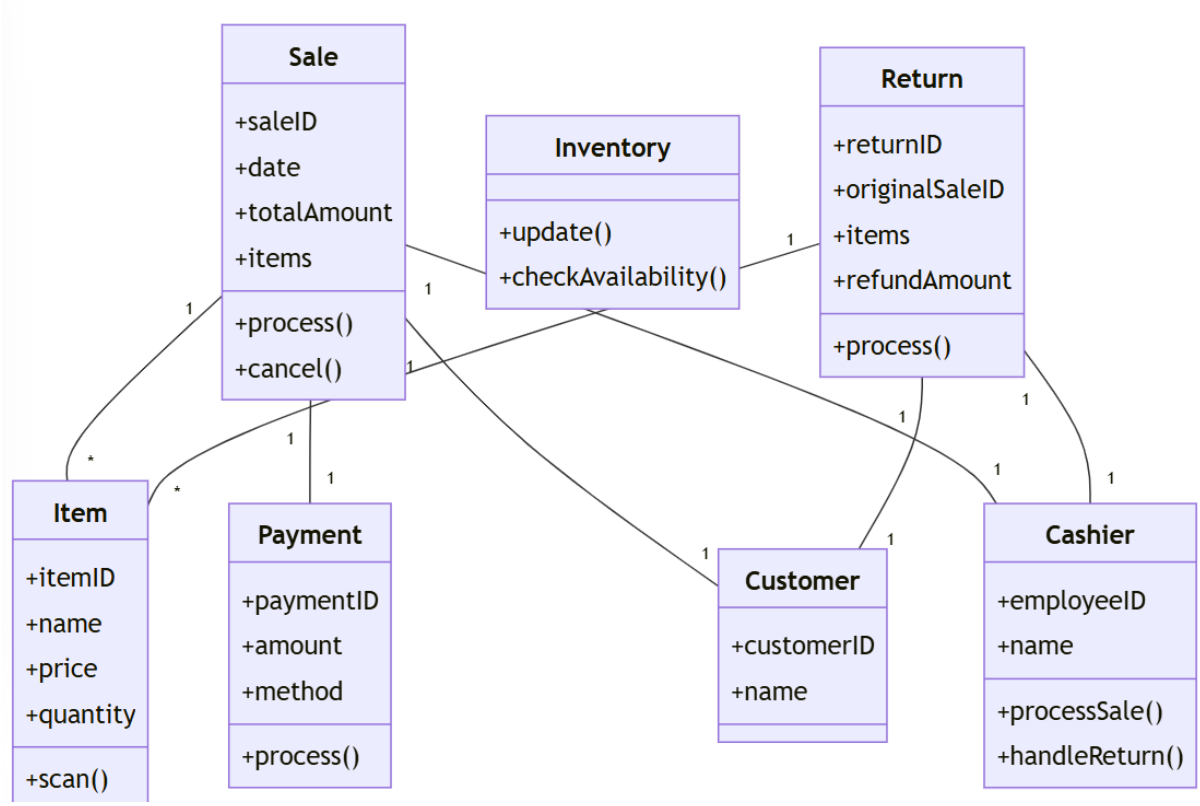
- "Process Sales"



- "Handle Returns"

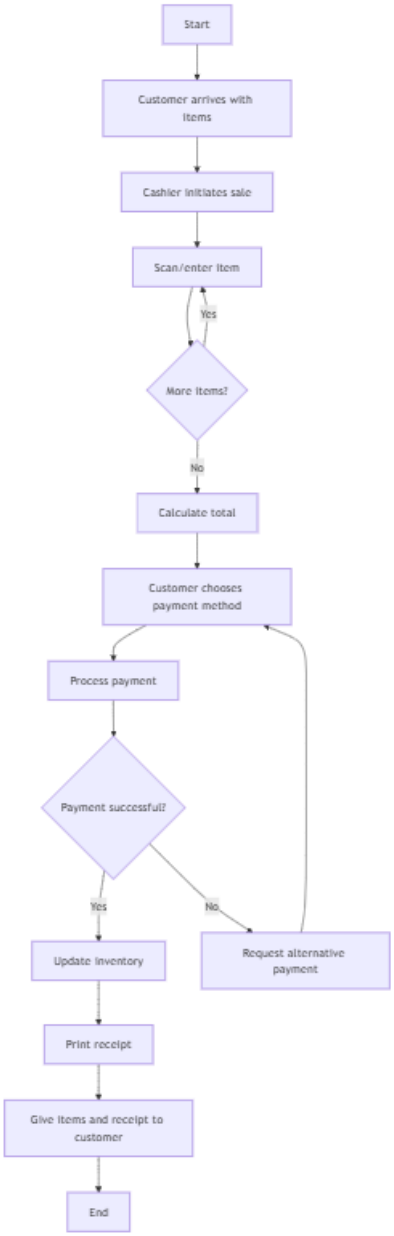
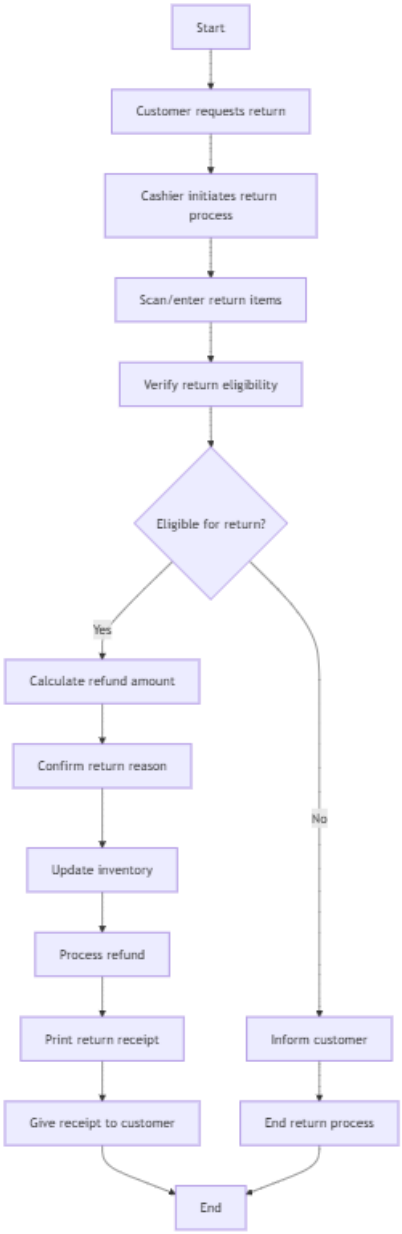


Develop Analysis Domain Models:



Develop activity diagrams:

- "Process Sales"



- "Handle Returns"