



Dhirubhai Ambani Institute of Information & Communication Technology

IT314 - Software Engineering
Instructor - Prof. Saurabh Tiwari

**Lab06 - Modeling Class Diagram and
Activity Diagram (Point of Sale System)**

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Task-1: Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases.

Use Case Textual Description for Process Sale:

Actor:

- Cashier

Preconditions:

- The cashier is logged into the POS system.
- The POS system is linked to the backend catalog and inventory systems.
- Sufficient stock is available for all items being purchased.

Main Flow:

1. The use case begins when a customer arrives at the POS counter with items to buy.
2. The cashier starts a new transaction in the POS system.
3. For each item:
 - The cashier scans the item's barcode using a scanner.
 - The system fetches the item's name and price from the backend catalog.
 - The system communicates with the inventory system to reduce the stock count of the item.
 - The system adds the item to the transaction and updates the total.
4. If the customer provides a gift coupon:
 - The cashier scans or enters the coupon code.
 - The system checks the coupon's validity and applies the discount.
 - The system recalculates the total price, factoring in the coupon.
5. The system shows the total amount due, including taxes and discounts.
6. The cashier informs the customer of the final amount.
7. The customer selects a payment method (cash, credit card, or check).

8. The cashier processes the payment:
 - For cash: The cashier enters the received amount, and the system calculates and displays the change to be returned.
 - For credit card: The system processes the payment through the card reader.
 - For check: The cashier enters the check details, and the system verifies the check if necessary.
9. The system confirms the payment and finalizes the sale.
10. A receipt is printed by the system.
11. The cashier gives the receipt and the purchased items to the customer.

Alternative Flows:

3a. Invalid barcode:

1. The system shows an error indicating the barcode could not be recognized.
2. The cashier manually enters the item code or attempts to scan again.

8a. Payment failure:

1. The system shows an error indicating the payment failed.
2. The cashier asks for another payment method and returns to step 7.

Postconditions:

- The sale is recorded in the POS system.
- Inventory is updated to reflect the items sold.
- A receipt is printed and handed to the customer.
- The payment is processed, and transaction details are stored.

Use Case Textual Description for Handle Return:

Actors:

- Cashier

Preconditions:

- The cashier is logged into the POS system.
- The customer has the items for return along with the original receipt.
- The POS system is connected to the backend catalog and inventory systems.

Main Flow:

1. The use case starts when a customer arrives at the POS counter to return items.
2. The cashier begins a return transaction in the POS system.
3. The cashier asks the customer for the original receipt and scans its barcode.
4. The system retrieves the details of the original purchase from the backend catalog.
5. For each item the customer wishes to return:
 - The cashier scans the item's barcode.
 - The system verifies that the item is part of the original purchase.
 - The cashier checks the item for return eligibility (e.g., undamaged, within the return window).
 - The cashier confirms the return of the item in the POS system.
 - The system adds the item back into the inventory.
 - The system calculates the total refund based on the returned items.
 - The cashier informs the customer of the refund amount.
6. The cashier processes the refund based on the original payment method:
 - For credit card purchases: The system credits the refund to the customer's card.
 - For cash or check purchases: The cashier gives the customer a cash refund.
7. The system confirms the refund has been processed successfully.
8. The system prints a return receipt.

9. The cashier hands the return receipt and refund (if applicable) to the customer.

Alternative Flows:

3a. Receipt is unavailable:

1. If the customer doesn't have the receipt, the cashier searches for the original transaction using details like the customer's name or the transaction date.
2. If the transaction is found, the return proceeds from step 4. If not, the return cannot be processed.

5a. Item not found in the original purchase:

1. If the system cannot find the item in the original transaction, an error message is shown.
2. The cashier informs the customer that the item cannot be returned.

5b. Item is not eligible for return:

1. The cashier checks the item and finds it is ineligible for return (e.g., damaged or past the return window).
2. The cashier informs the customer that the item cannot be returned and removes it from the return transaction.

Postconditions:

- The return transaction is recorded in the POS system.
- The inventory is updated to reflect the returned items.
- A return receipt is printed and provided to the customer.
- The refund is processed.

Task-2: Identify Entity/Boundary Control Objects

Entity Objects:

- Sale
- Item
- Inventory
- Payment
- Return

Boundary Objects:

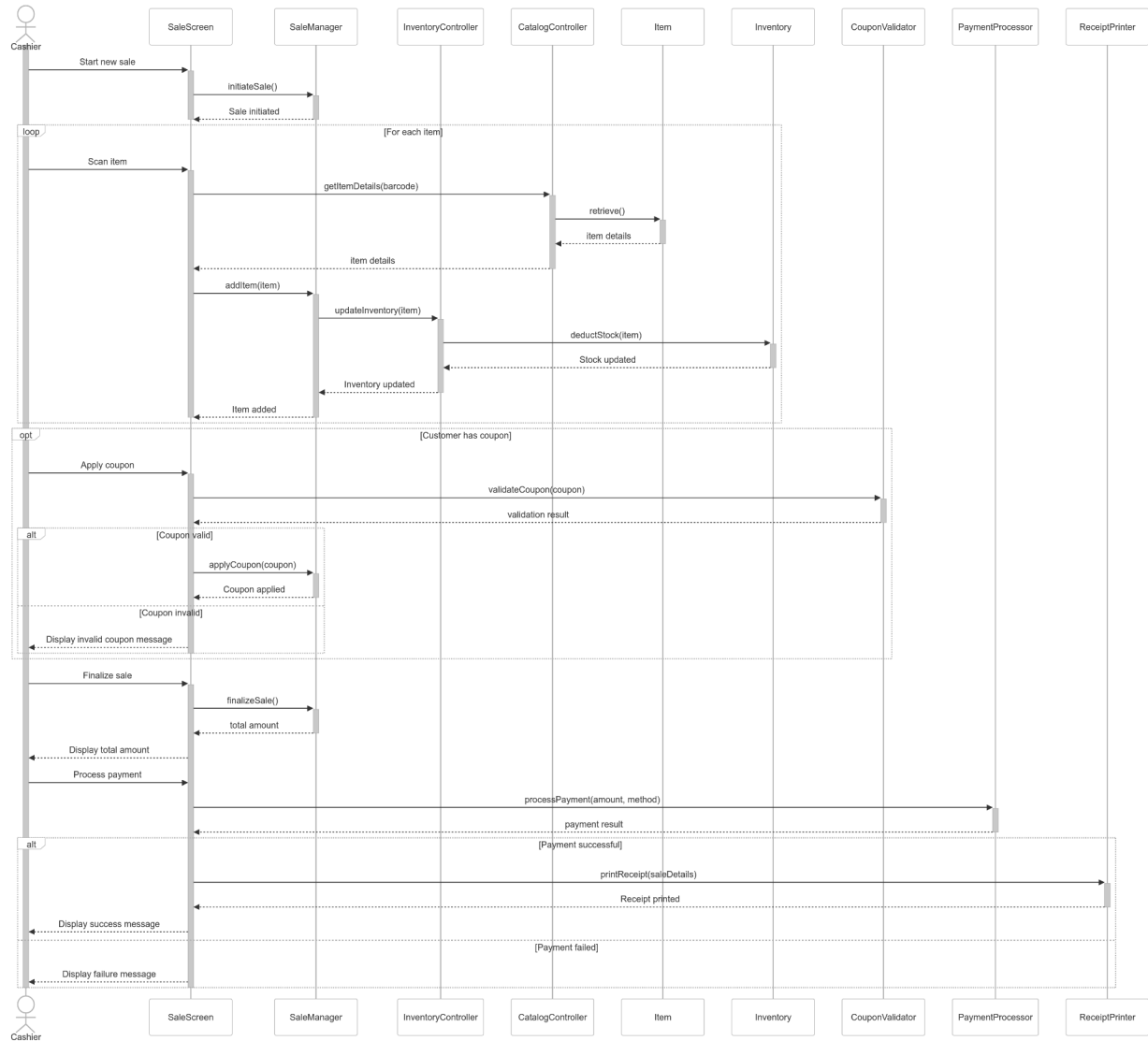
- SaleScreen
- ReturnScreen
- ReceiptPrinter
- BarcodeScanner
- PaymentTerminal
- CatalogSystem
- InventorySystem

Control Objects:

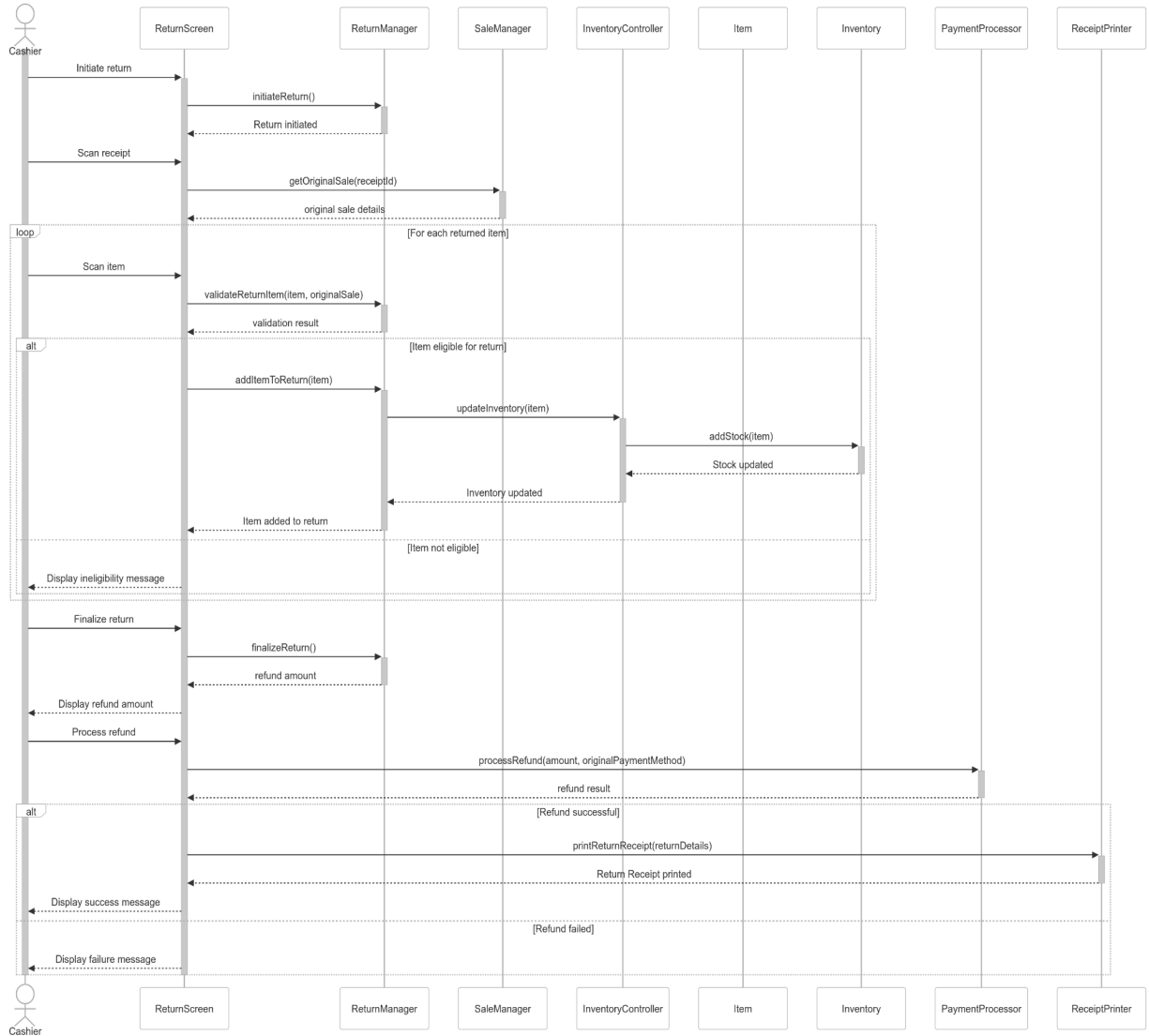
- SaleManager
- ReturnManager
- InventoryController
- PaymentProcessor
- CouponValidator

Task-3: Develop Sequence Diagrams

Sequence Diagrams for Process Sale Use Case:

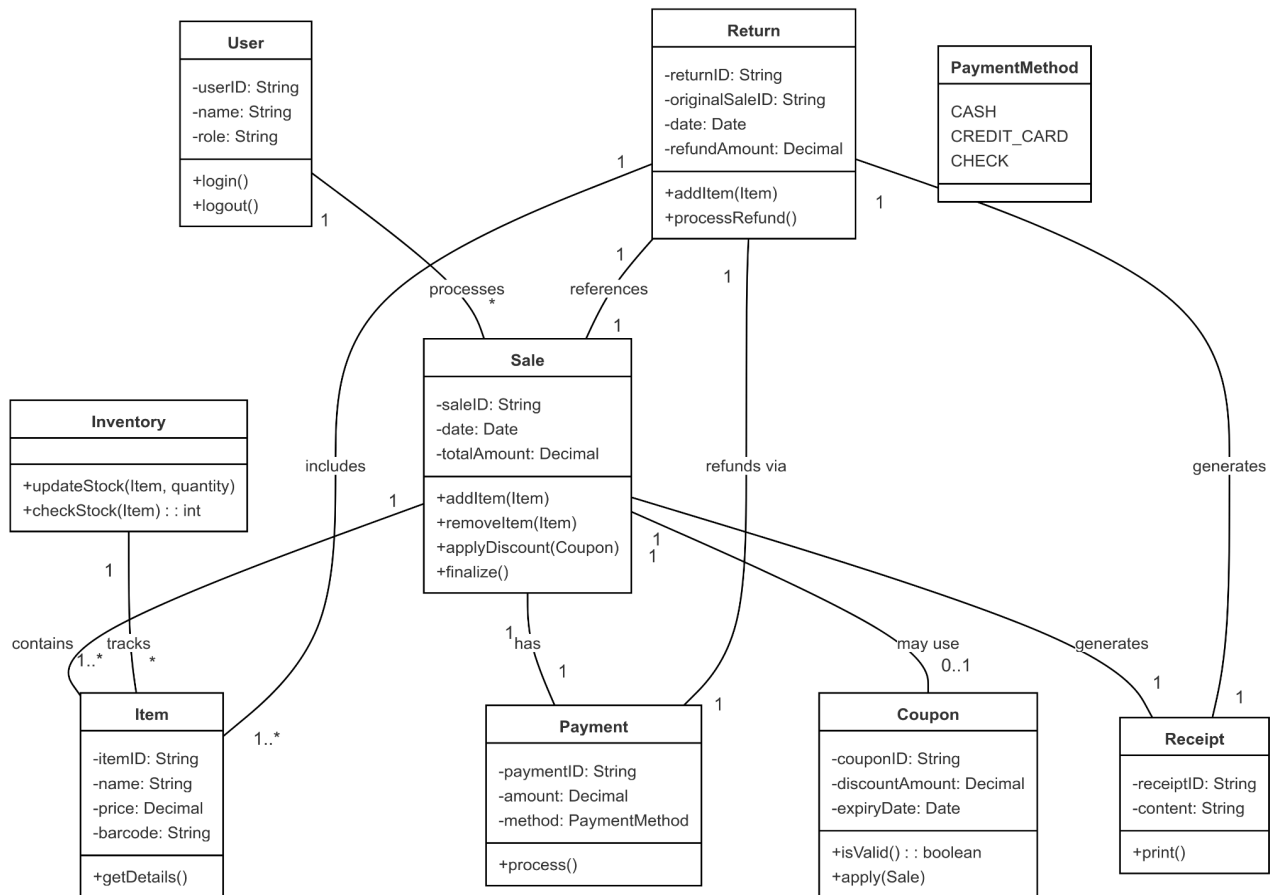


Sequence Diagrams for Handle return Use Case:



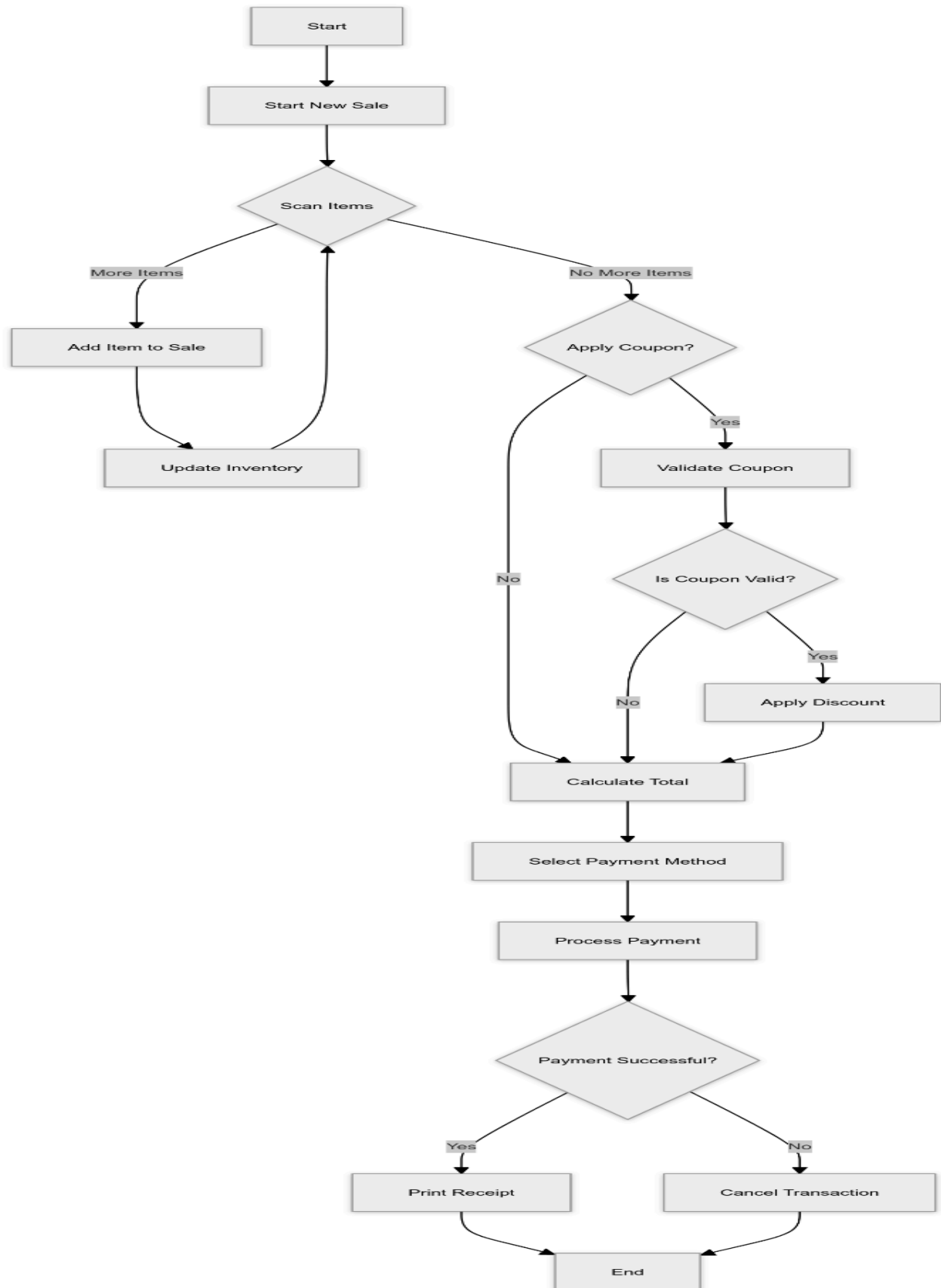
Task-4:

Analysis Domain Models:



Task-5:

Activity Diagram For Process Sale Use Case:



Activity Diagram For Use Case:

