IT314: Software Engineering

Lab 6

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.

Process Sale Use Case

- **Primary Actor**: Cashier
- **Secondary Actor**: Customer

- **Preconditions**:
  - Cashier is logged in; POS system is operational.
  - POS system and backend services (catalog, inventory) are operational.
- **Postconditions**: Sale transaction is recorded, stock is updated, receipt printed, payment processed.

- **Main Success Scenario**:
  1. Cashier starts a new sale transaction.
  2. Customer goods are scanned; for each item, the system retrieves the name and price from the catalog
  3. The system checks the inventory system to ensure each item is in stock.
  4. Customer pays using cash, credit card, or check.
  5. The customer provides payment.
  6. If applicable, the customer presents a coupon, and the system applies the discount.
  7. The POS system processes the payment.
  8. Prints a receipt.
  9. Inventory system updates the stock for each item
  10. Sale transaction is completed.

- **Extensions**:
  - **2a**. If scanner not work then insert item manually
  - **3a**. If an item is out of stock, cashier informs the customer, and they can remove the item or place an order.

- **6a.** If the coupon is invalid, the system rejects it, and the cashier informs the customer.
- **7a.** If payment fails, the customer retries or selects another payment method.

Handle Return Use Case

- **Primary Actor**: Cashier
- **Preconditions**: Cashier is logged in; the original sale exists in the system.
- **Postconditions**: Sale return is recorded, stock is updated, refund is processed.

- **Main Success Scenario**:
  1. Customer requests to return goods.
  2. Cashier retrieves original transaction from the system.
  3. The cashier selects the items to be returned
  4. System verifies the goods and allows the return.
  5. The system processes the return
  6. Refund is processed.
  7. The inventory system updates the stock to reflect the returned items.
  8. Return transaction is completed.

- **Extensions**:
  - **3a**. Return period has expire or item is not eligible for return
  - **5a**. Refund method fails.

Task-2

Identify Entity/Boundary Control Objects

Process Sale Use Case

Entity Object	Boundary Objects	Control Objects
• Item • Catalog • Inventory • Coupon • Payment • Receipt • Sale Transaction	• POS Interface • Barcode Scanner • Payment Gateway • Receipt Printer	• Sale Controller • Payment Controller • Inventory Controller • Coupon Validator

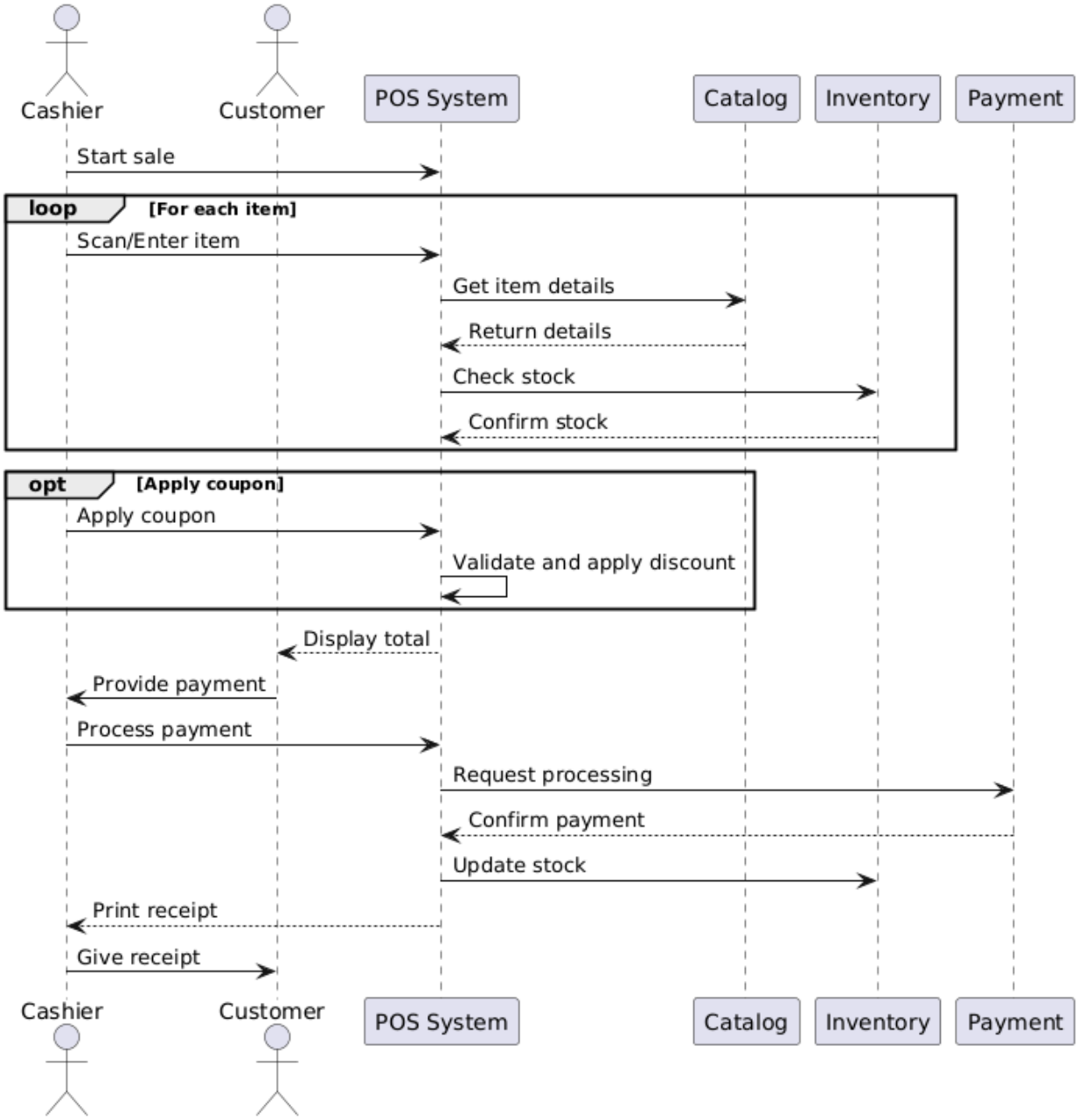
Handle Return Use Case

Entity Object	Boundary Objects	Control Objects
• Item • Inventory • Coupon • Refund • Return Transaction • Receipt	• POS Interface • Receipt No. Input • Payment Gateway • Receipt Printer	• Return Controller • Refund Controller • Inventory Controller • Return Validator

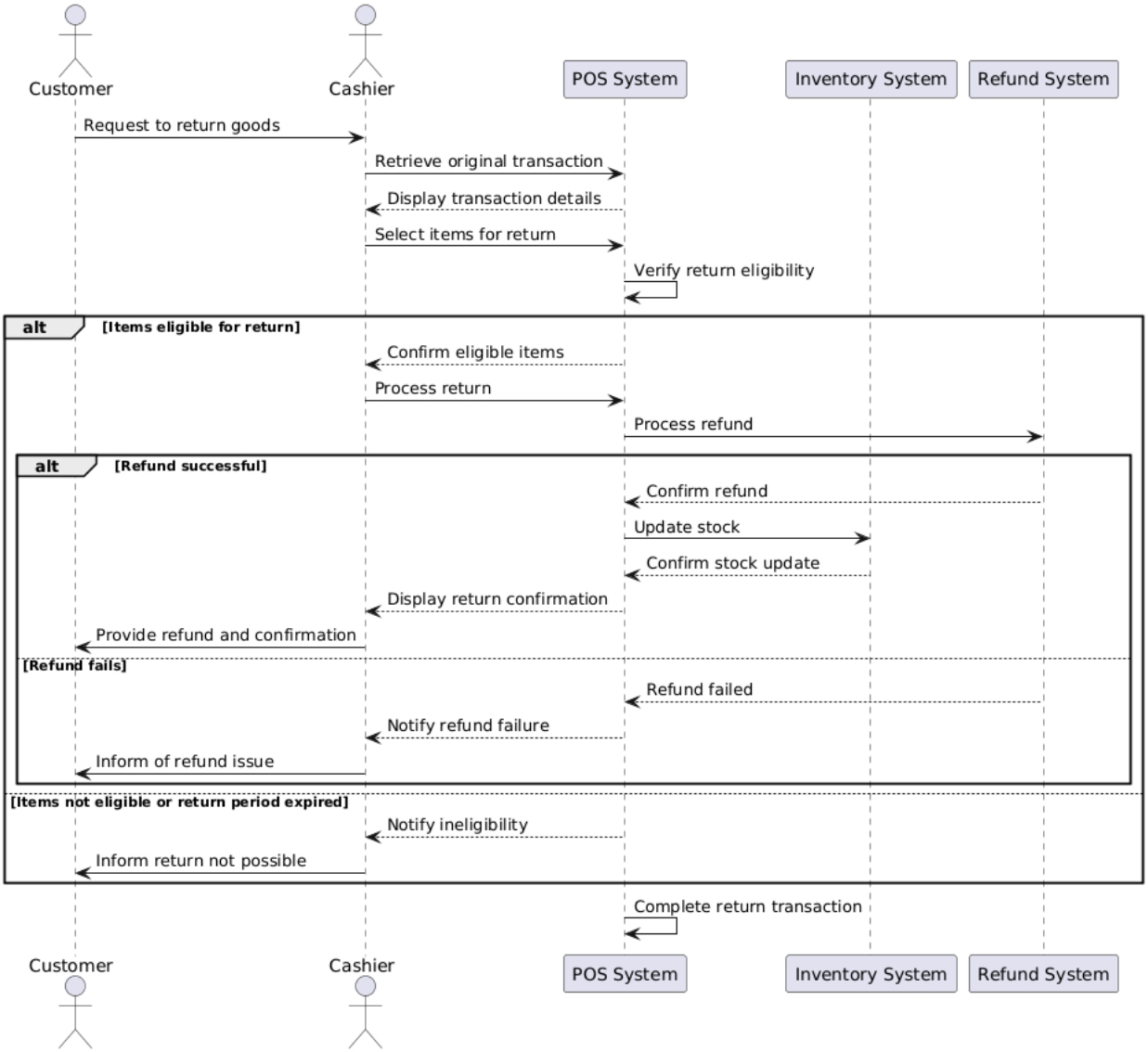
Task-3

Develop Sequence Diagrams

Process Sale Use Case



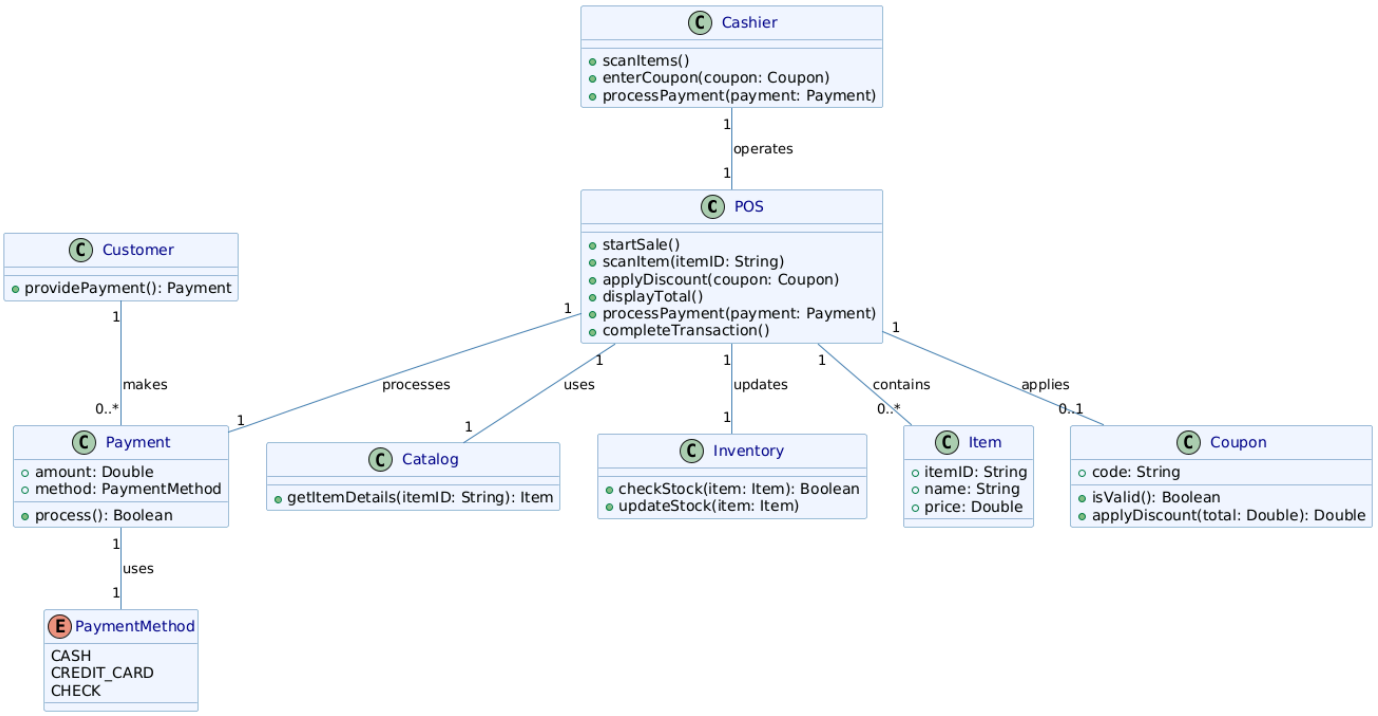
Handle Return Use Case



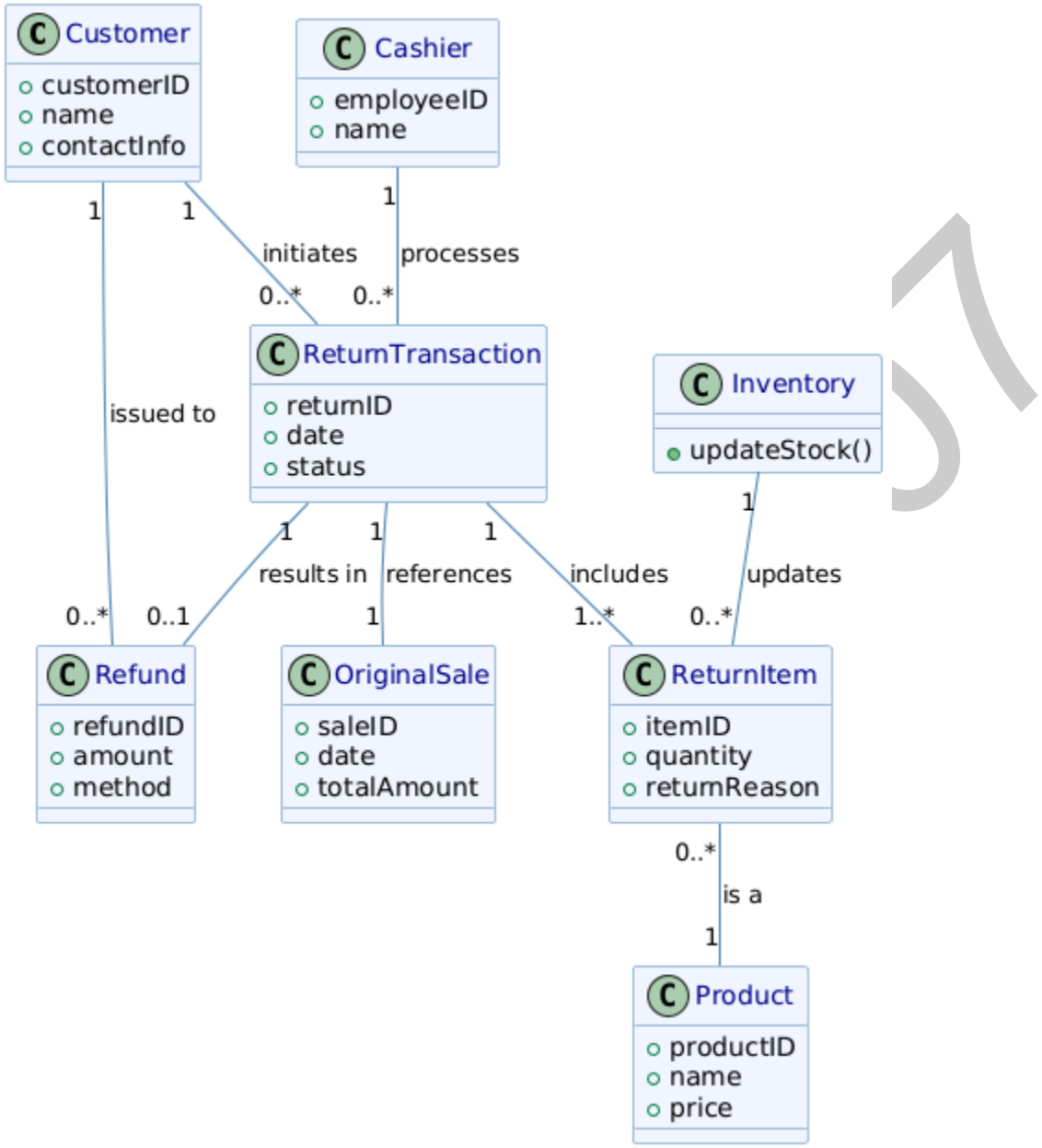
Task-4

Develop Analysis Domain Models

Process Sale Use Case



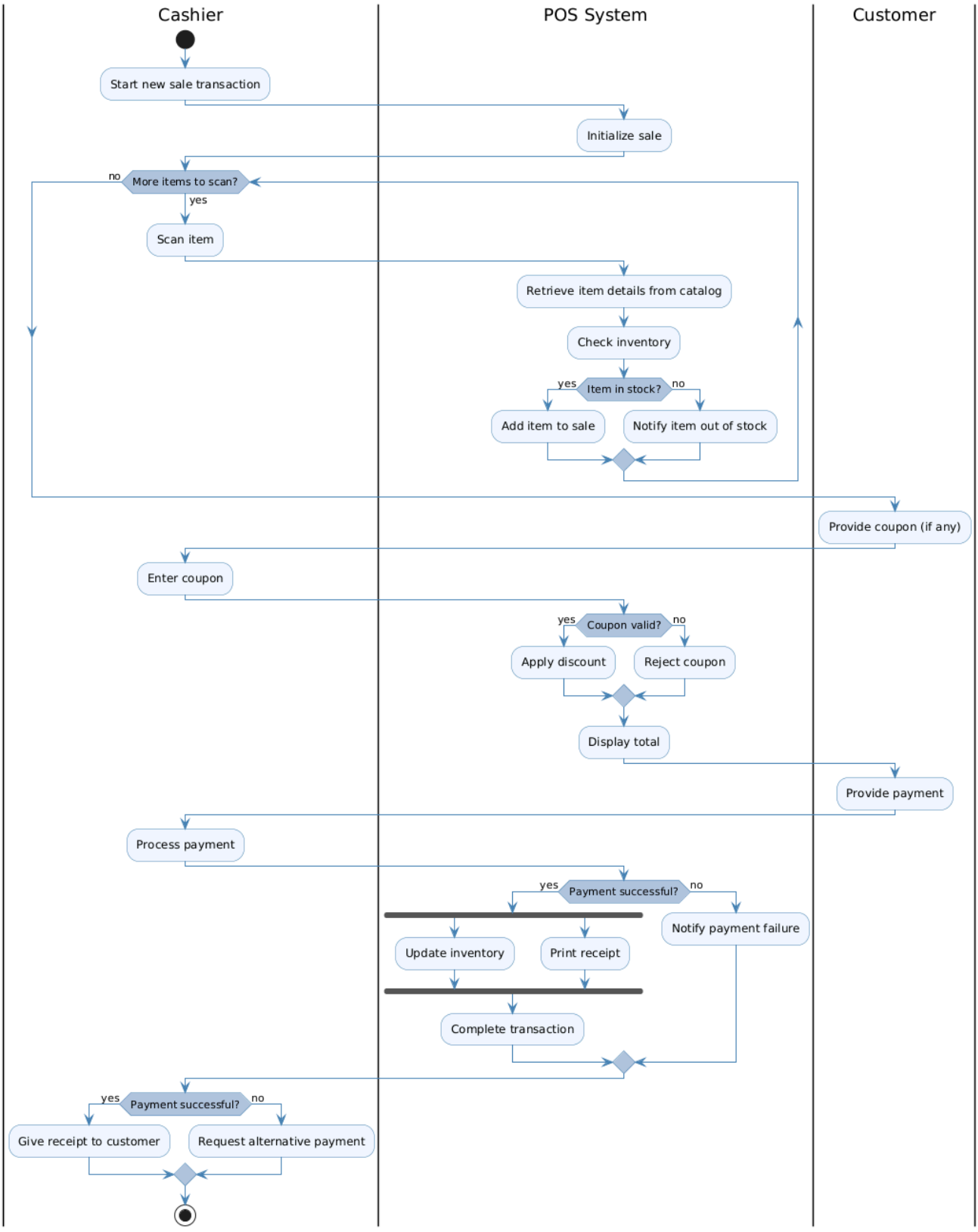
Handle Return Use Case



Task-5

Develop Analysis Domain Models

Process Sale Use Case



Handle Return Use Case