Software engineering Lab

202201429 - Isha Bhanushali

Use Case: Process Sale

I) Description

Actor : Cashier, Inventory System, Catalog system,Customer

Precondition :

1. If applicable, gift coupons are applied.

2 .The inventory and catalog systems are operational.

3. The customer has selected items to purchase.

Postcondition:

1.The sale is completed, the payment is processed, and the stock is updated in the inventory.

2. The system prints a receipt.

3. If applicable, gift coupons are applied.

Basic Flow:

1. The cashier initiates a new transaction.

2.The cashier scans or enters the item's identifier.

3.The system fetches the product details from the catalog, logs the sale line item, and displays the item’s description, price, and running total. The cashier repeats this process for each item until all are scanned.

4.Once all items are scanned, the system computes and shows the final total.

5. The cashier informs the customer of the total amount and requests payment.

6.The customer provides payment, which the system processes accordingly.

7.The system finalizes the sale, updates the inventory in the external system, and records the transaction.

8.A receipt is generated by the system.

9.The customer leaves with both the receipt and their purchased items.

Alternative Flow:

3a. Invalid Item Identifier:

1. The system detects an error and rejects the entry.

3b. Multiple Items of the Same Type:

1. The cashier can input the item category and the quantity for multiple identical items.

3-6a. Customer Requests Removal of an Item:

1. The cashier enters the item's identifier to remove it from the transaction.
2. The system updates and displays the new total.

3-6b. Customer Requests Cancellation of the Sale:

1. The cashier cancels the transaction in the system.

3-6c. Cashier Suspends the Sale:

1. The system saves the sale, allowing it to be retrieved on any POS terminal later.

4a. Item Price Discrepancy (Customer Finds the Price Higher Than Expected):

1. The cashier enters a price override.
2. The system displays the updated price.

6a. Customer Is Short on Cash:
1a. The customer selects an alternate payment method.
1b. If no alternate method is available, the customer requests the cashier to cancel the transaction, and the cashier cancels the sale.

II) Entity/Boundary/Control Objects

- **Entity Objects**

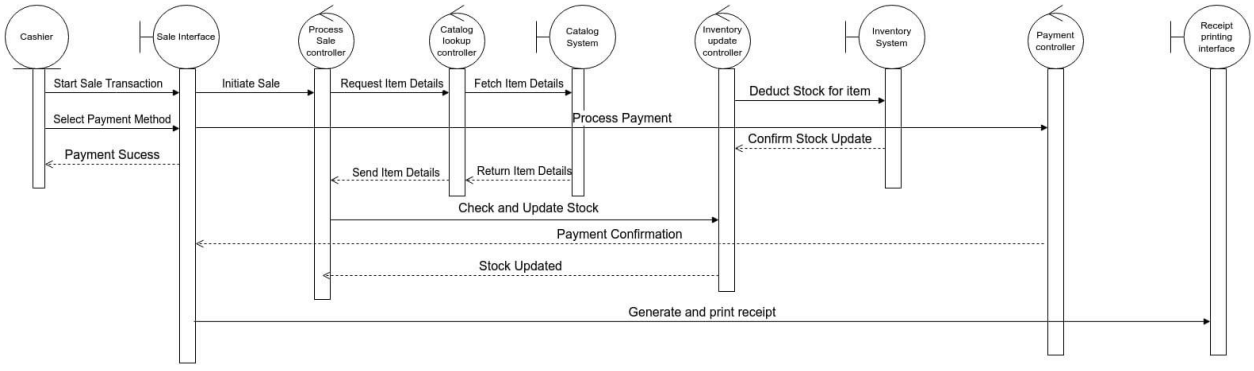
    1. cashier

- **Boundary Objects:**
    1. SaleInterface
    2. Catalog System
    3. Inventory System
    4. Receipt Printing interface

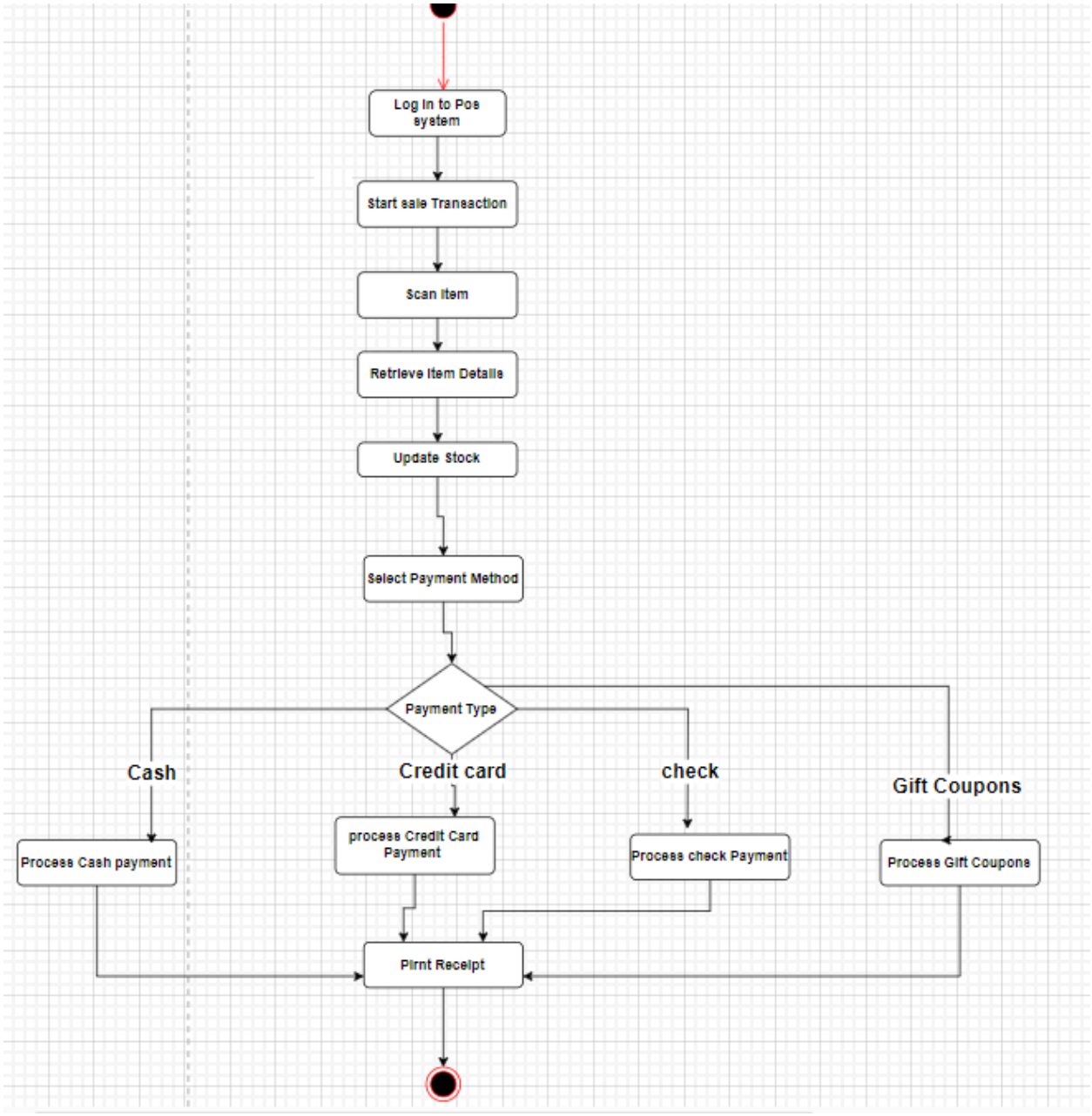
- **Control Objects**

    1. Process sale Controller
    2. Catalog lookup Controller
    3. Inventory update Controller

III) Sequence Diagram



v) Activity Diagram



Use Case: Handle Return

- **Actor**: Inventory System, Customer, Catalog System,Cashier.
- **Precondition**:

  1. The cashier is logged into the POS system.

  2. The customer presents the original receipt for the purchase.

  3. The items being returned are eligible for return as per the store's return policy.

- **Postcondition**:

  1.The returned item is removed from the inventory and the stock is updated.

  2.The system processes the refund or store credit for the customer.

- **Basic Flow**:

  1.The cashier selects the "Return" option on the POS system.

  2.The cashier scans or enters the receipt number to locate the original sale in the system.

  3.The cashier scans the barcode of the item(s) being returned or selects them from the transaction record.

  4. The system checks the return policy, including time limits and item condition.

  5.The customer chooses whether to receive a refund (cash, credit card, or other) or store credit for the returned item.

  i. If the customer paid by cash, the system prompts the cashier to return the appropriate amount.

  ii. If the customer paid by credit card, the system processes the refund to the original payment method.

  iii.If the customer opts for store credit, the system issues a store credit Voucher.

  6.The system updates the inventory system to reflect the returned item.

  7.The system prints a return receipt, and the cashier provides it to the customer.

8.The return is finalized, and the customer leaves with the receipt and refund/credit.

- **Alternative Flow**:

  2.a No Receipt:

  1. If the customer cannot provide a receipt, the cashier can look up the sale by other means (e.g., customer ID, payment method, or transaction history), if allowed by the store's policy.

  2. If the original transaction cannot be found, the system prompts the cashier to deny the return or issue store credit only.

  4.a Return Denied (Policy Violation):

  If the item is ineligible for return (e.g., outside return window or damaged), the system notifies the cashier and prompts to reject the return.

  4.b Partial Return:

  If the customer returns only part of the original purchase, the system adjusts the refund/store credit accordingly.

  5.a System Error:

  If there is an issue retrieving the original transaction or processing the return, the cashier informs the customer and either manually processes the return or directs the customer to customer service.

  6.a Item Restocking:

  For items that need to be inspected or restocked manually, the system notes the return, and the stock update happens after the inspection.

II) Entity/Boundary/Control Objects

- **Entity Objects:**

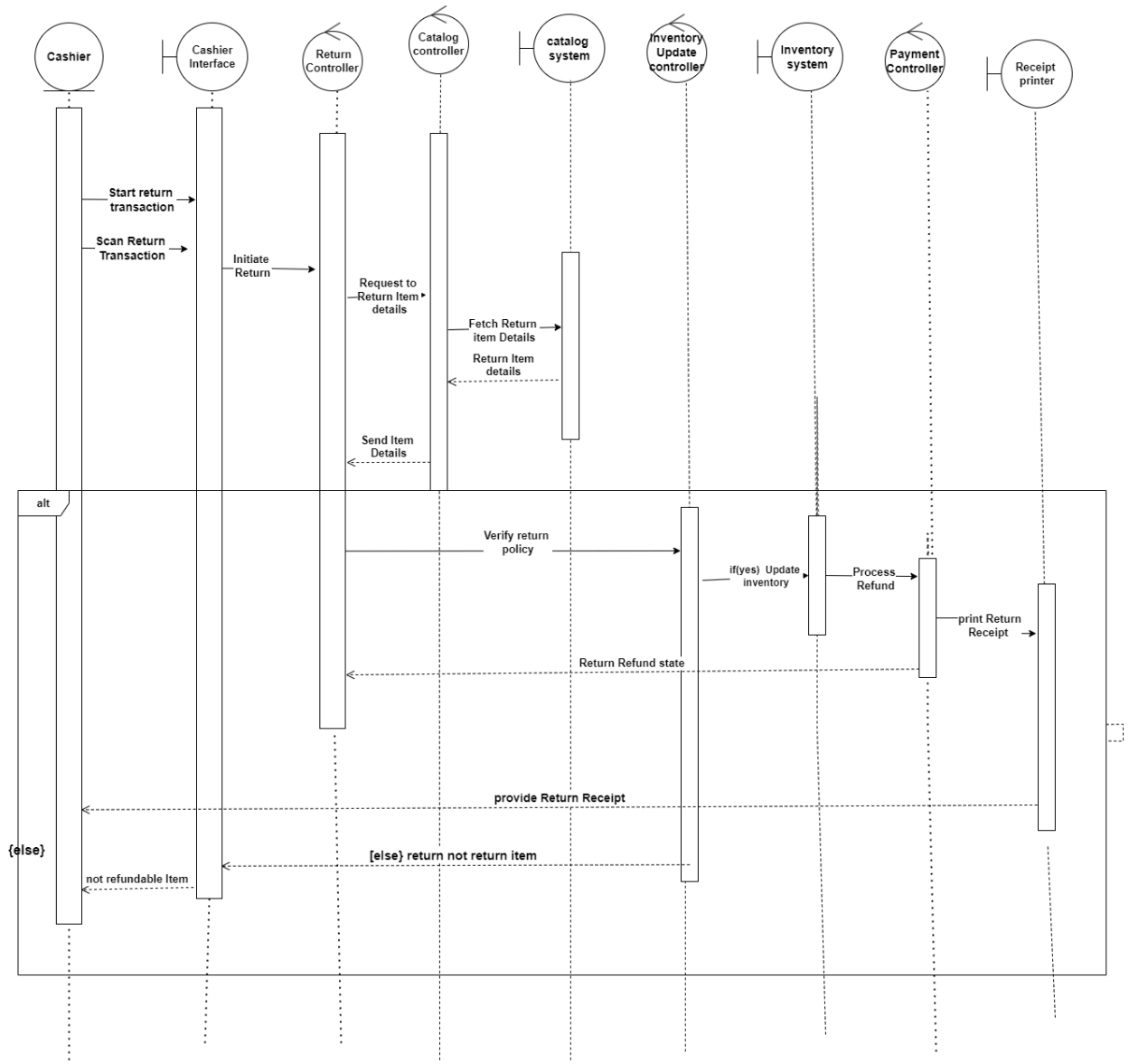
  1. cashier

- **Boundary Objects:**
  1. CashierInterface
  2. Catalog System
  3. Inventory System
  4. ReceiptPrinter

- **Control Objects**

    1. Catalog Controller
    2. ReturnController
    3. Inventory Controller
    4. Payment Controller

III) Sequence Diagram



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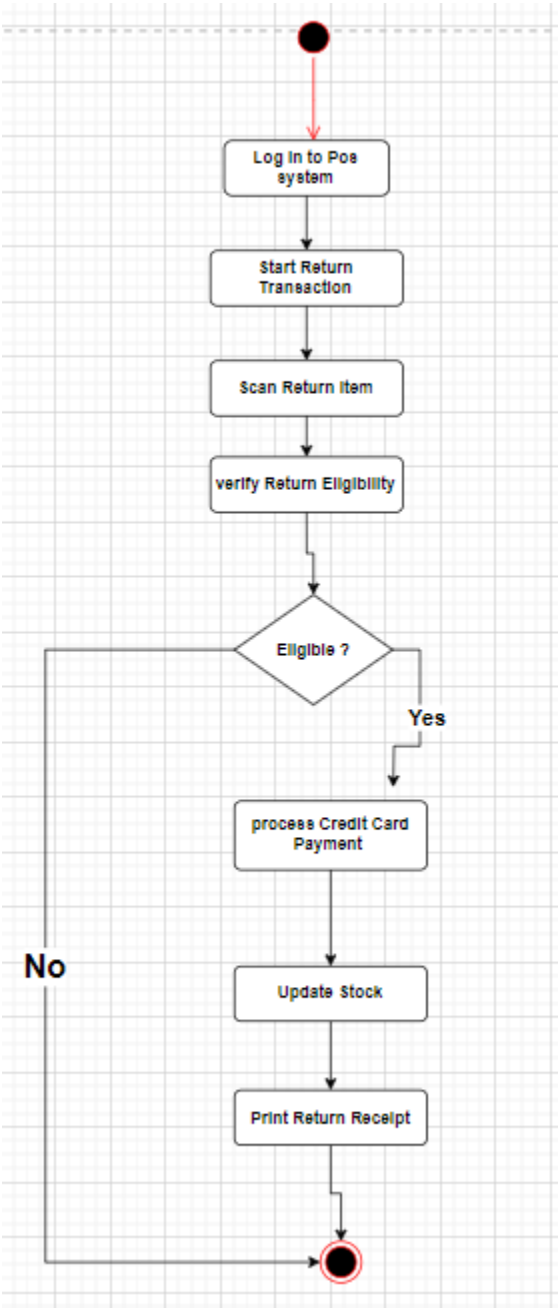

IV). Analysis Domain Models:

The analysis domain model would include classes such as:

Item: Attributes like itemID, name, price, quantity.
Sale: Attributes like saleID, date, totalAmount.
PaymentMethod: Subclasses for CashPayment, CreditCardPayment, CheckPayment, GiftCoupon.
Receipt: Attributes like receiptID, saleID, date.
InventoryRecord: Attributes like itemID, quantity