LAB-6

MODELLING CLASS DIAGRAM & ACTIVITY DIAGRAM

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DEVELOP USE CASE TEXTUAL DESCRIPTION FOR “PROCESS SALE” AND “HANDLE RETURN” USE CASES

Use Case: Process Sale

Primary Actor: Cashier

Preconditions: Cashier is identified and authenticated

Post Conditions: Sale is saved. Receipt is printed. Stock data updated. Payment authorization approvals are recorded.

Basic Flow:

1. Customer arrives at POS checkout with goods to purchase.

2. Cashier starts a new sale.

3. Cashier enters item identifier.

4. System retrieve item information from the catalog system and, records sale line item and presents item description, price, and running total. Cashier repeats steps 3-4 until indicates done.

5. System calculates and presents total price.

6. Cashier tells Customer the total, and asks for payment.

7. Customer pays and System handles payment.

8. System records completed sale and sends sale information to the external Inventory system for stock update.

9. System presents receipt.

10. Customer leaves with receipt and goods.

Extensions:

* At any time, System fails: To support recovery and correct accounting, ensure all transaction sensitive state and events can be recovered from any step of the scenario.

1. Cashier restarts System, logs in, and requests recovery of prior state.

2. System reconstructs prior state.

    2a. System detects anomalies preventing recovery:

        1. System signals error to the Cashier, records the error, and enters a clean state

        2. Cashier starts a new sale.

3a. Invalid identifier:

    1. System signals error and rejects entry.

3b. There are multiple of same item:

    1. Cashier can enter item category identifier and the quantity.

3-6a Customer asks Cashier to remove an item from the purchase:

    1. Cashier enters item identifier for removal from sale.

    2. System displays updated running total.

3-6b Customer tells Cashier to cancel sale:

    1. Cashier cancels sale on System.

3-6c Cashier suspends the sale:

    1. System records sale so that it is available for retrieval on any POS terminal.

4a The item's price is not the customer wanted (e.g., Customer complained that the item is offered at a lower price):

    1. Cashier enters override price.

2. System presents new price.

6a Customer says they intended to pay by cash but don't have enough cash:

1a. Customer uses an alternate payment method.

1b. Customer tells Cashier to cancel sale. Cashier cancels sale on System.

7a. Paying by cash: (UC Handle Cash Payment)

7b. Paying by credit: (UC Handle Credit Payment)

7c. Paying by check: (UC Handle Check Payment)

Use Case: Handle Returns

Primary Actor: Cashier

Preconditions: Cashier is identified and authenticated. Customer has a valid receipt for the purchase.

Post Conditions: Returned items are recorded. Refunds are processed. Stock is updated (if applicable). System generates a new receipt for the return.

Basic Flow:

1. Customer arrives at the POS counter with items to return and presents the original receipt.
2. Cashier starts the return process on the POS system.
3. Cashier enters or scans the item identifier(s) from the receipt.
4. System retrieves the sale information, including the item description, original price, and transaction details.

5. System validates the return eligibility (e.g., within return window, valid items, etc.).
6. System calculates the total amount to be refunded.
7. Cashier informs the customer of the refund amount and asks for their preferred refund method.
8. Customer confirms the refund method (cash, credit, store credit, etc.).
9. System processes the refund and updates inventory (if items are being returned to stock).
10. System prints a new receipt for the return.
11. Customer leaves with the return receipt and any refunded amount.

Extensions:

- Invalid item identifier (e.g., item not in the original sale or not eligible for return):
    1. System signals an error and rejects the return.
    2. Cashier informs the customer and cancels the return transaction.
- Item damaged or return not eligible (e.g., outside return window):
    1. Cashier informs the customer that the return is not allowed.
    2. Cashier cancels the return transaction.
- System failure during return process:
    1. Cashier restarts the system and logs back in.
    2. System restores the transaction state and continues the return process.

    3. If recovery fails, the system signals an error, and the cashier must restart the return transaction.

- Customer changes their mind and decides not to return the item:
    1. Cashier cancels the return on the system.
    2. System removes any records of the initiated return.
- Return involves multiple items:
    1. Cashier enters or scans the identifiers for each item being returned.
    2. System calculates the total refund and displays the updated information.
- Partial refund due to promotions or used coupons:
    1. System calculates the refund amount based on the actual paid value, considering discounts or applied coupons.
- Refund method issues (e.g., original payment method unavailable for refund):
    1. Cashiers offer an alternative refund method (cash, store credit, etc.).
    2. System processes the refund via the selected method.

IDENTIFY ENTITY - BOUNDARY - CONTROL OBJECTS

PROCESS SALE:

1. Entity Objects:

- Cashier
- Sale Transaction
- Item
- Receipt
- Payment
- Inventory
- Customer

2. Boundary objects:

- POS Interface
- Barcode Scanner
- Receipt Printer
- Payment Gateway
- Inventory System Interface
- Catalog System Interface

3. Control Objects:

- SalesController
- ItemEntryController
- PaymentProcessingController
- InventoryUpdateController
- ReceiptGenerationController
- ErrorHandlingController

HANDLE RETURNS:

1. Entity Objects:

- Return Transaction
- Item
- Receipt
- Refund
- Inventory
- Customer
- Payment

2. Boundary Objects:

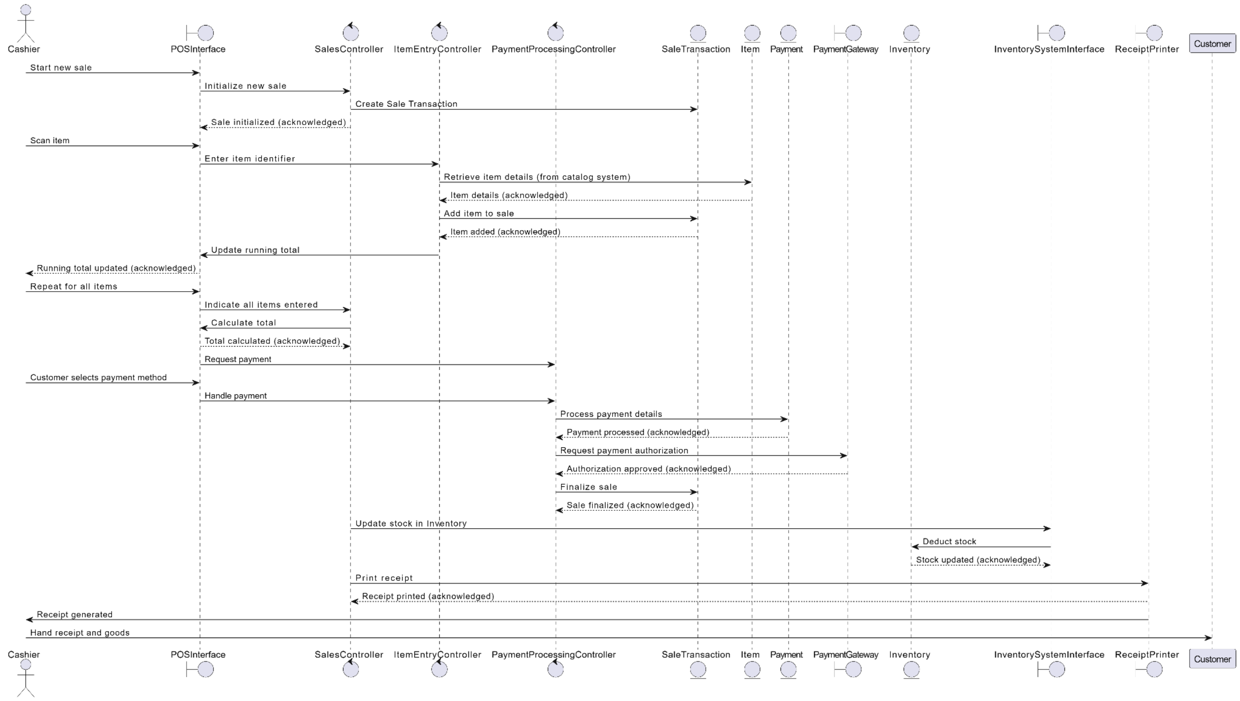
- POS Interface
- Barcode Scanner
- Receipt Printer
- Payment Gateway
- Inventory System Interface

3. Control Objects:

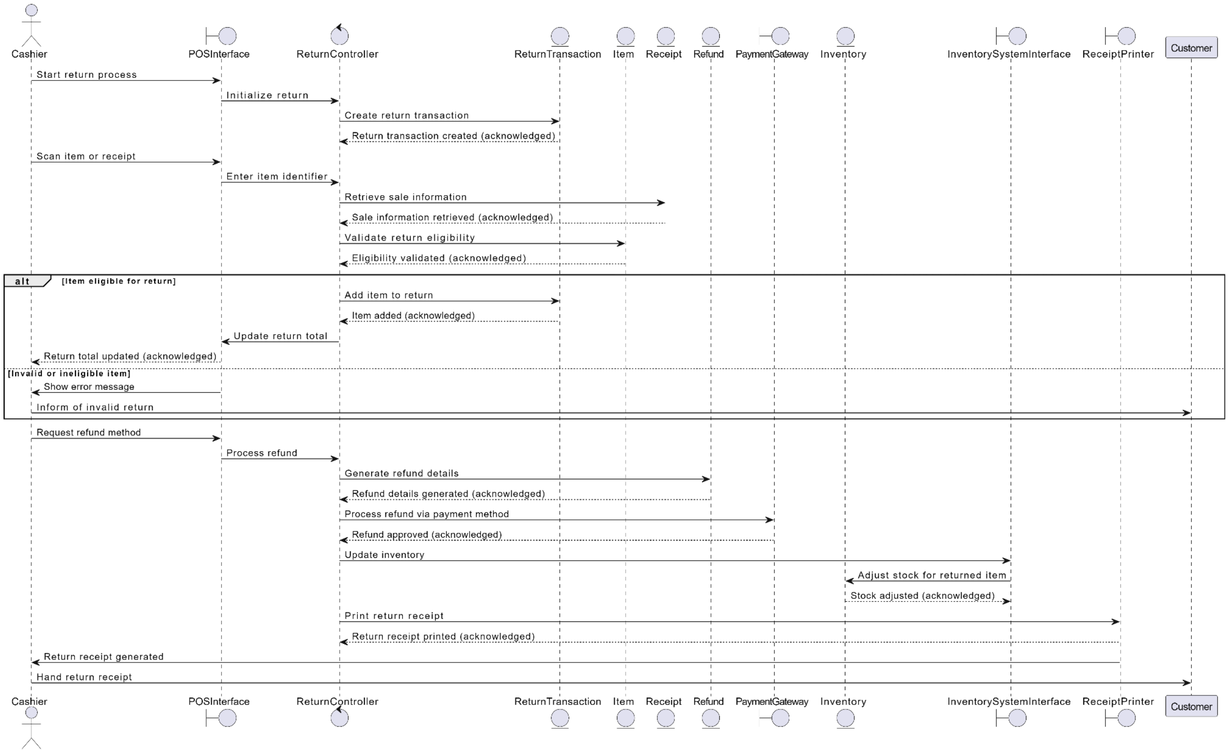
- ReturnController
- ItemValidationController
- RefundController
- InventoryUpdateController
- PaymentAuthorizationController

DEVELOP SEQUENCE DIAGRAMS

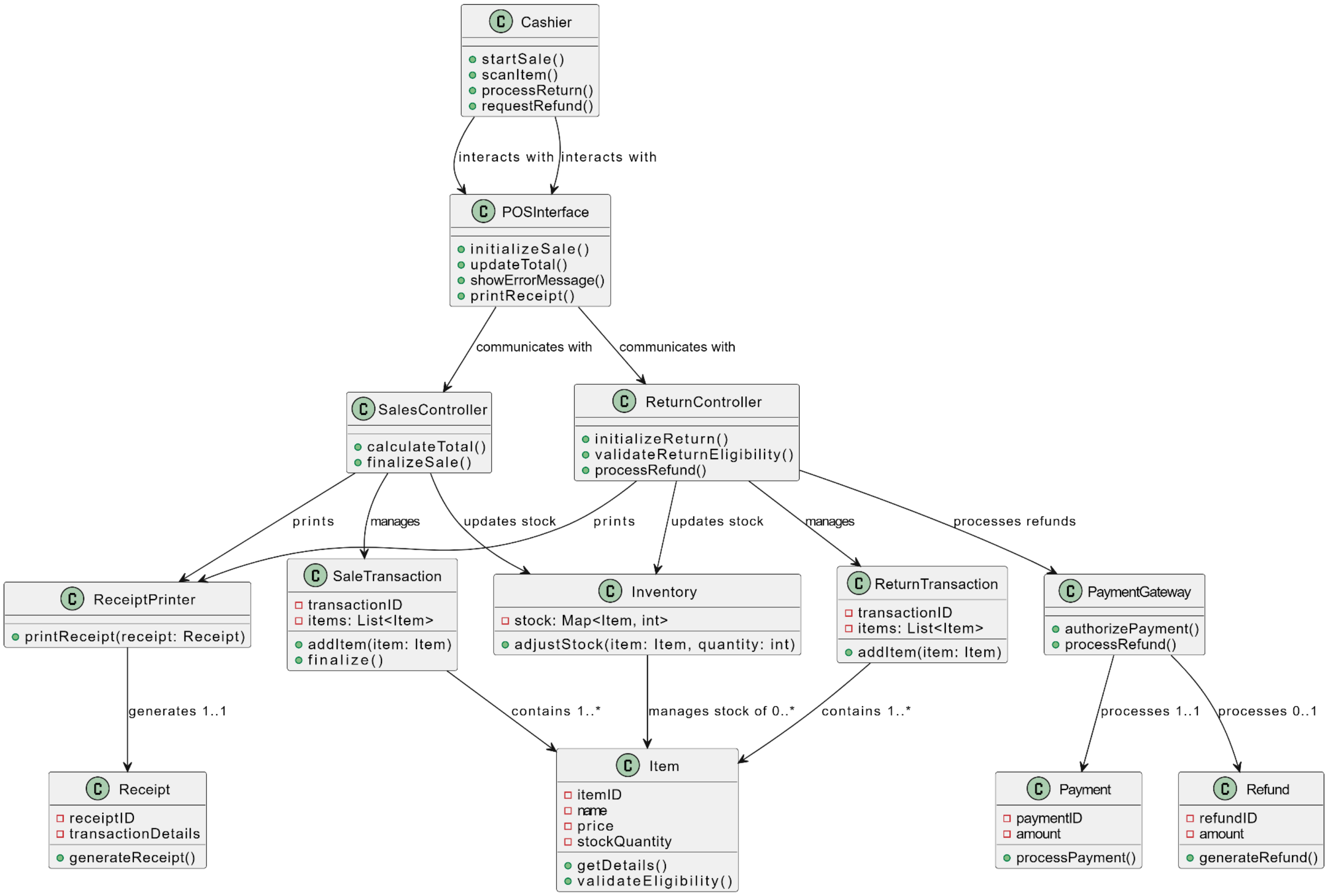
PROCESS SALE:



HANDLE RETURNS:

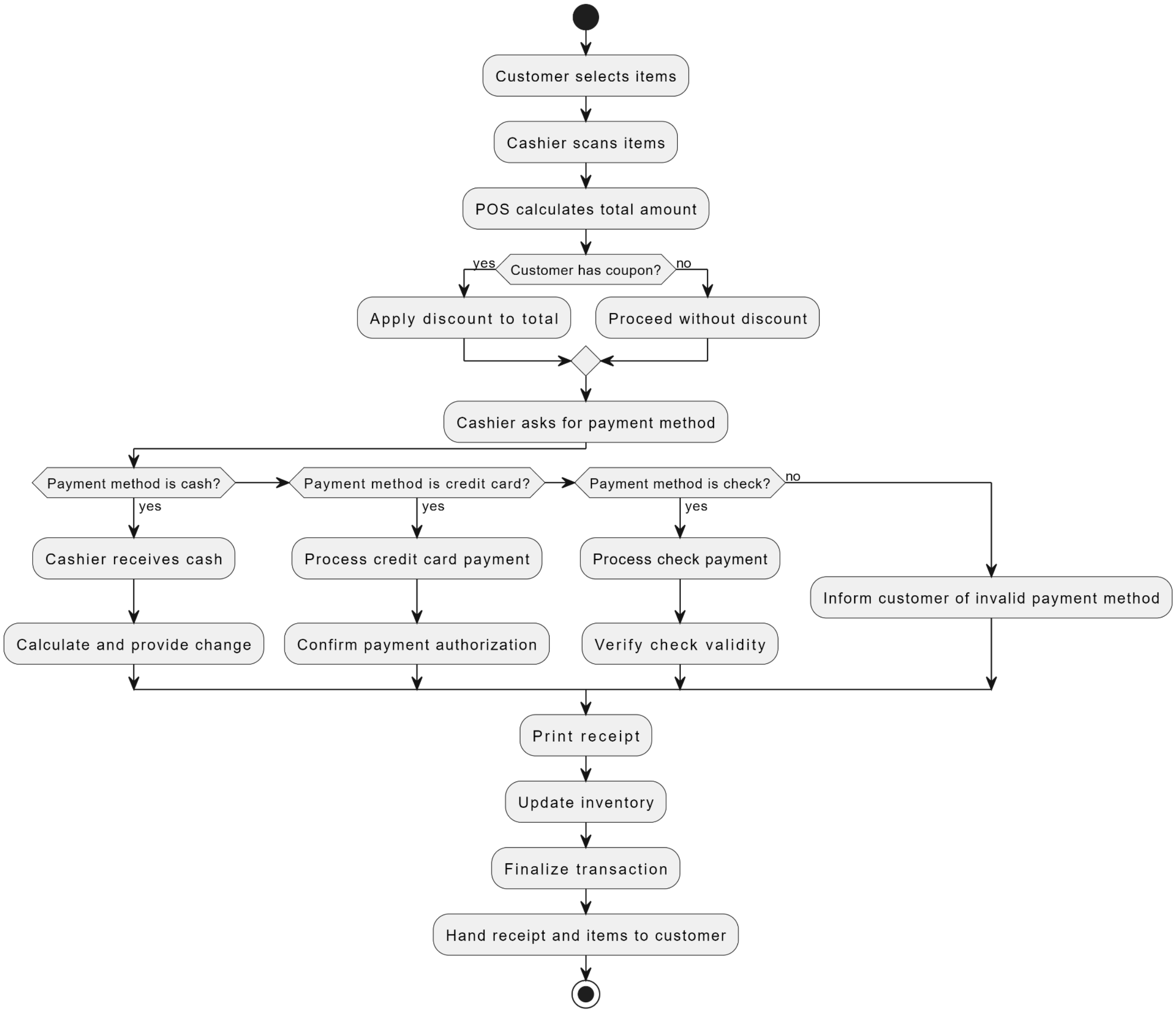


DEVELOP ANALYSIS DOMAIN MODEL

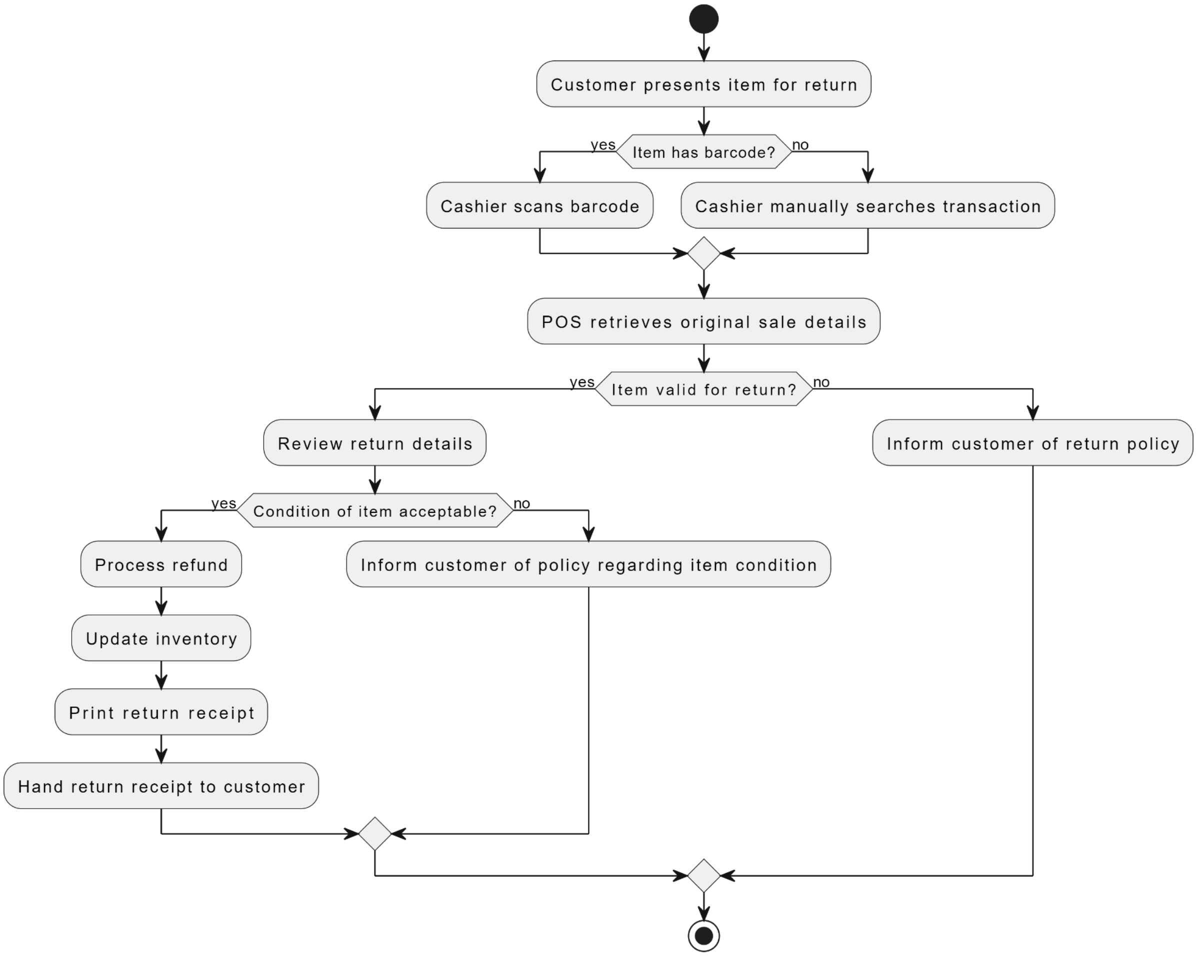


DEVELOP ACTIVITY DIAGRAM FOR “PROCESS SALE” AND “HANDLE RETURNS” USE CASE

PROCESS SALE:



HANDLE RETURNS:


Customer presents item for return
yes
Item has barcode?
no
Cashier scans barcode
Cashier manually searches transaction
POS retrieves original sale details
yes
Item valid for return?
no
Review return details
Inform customer of return policy
yes
Condition of item acceptable?
no
Process refund
Inform customer of policy regarding item condition
Update inventory
Print return receipt
Hand return receipt to customer