

Software Engineering IT-314

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Modeling Class Diagram and Activity Diagram (Point of Sale System)

Use Case: Process Sale

Actor: Cashier, Customer

Preconditions

- The cashier is already logged into the point-of-sale (POS) system.
- The POS system has established a successful connection with both the product catalog and inventory systems.

Main Flow

1. The cashier initiates a new sales transaction.
2. For each item in the transaction: a. The cashier scans the item's barcode. b. The system retrieves the item's details, including name and price, from the catalog. c. The inventory is updated to reflect the item being sold. d. The item is added to the current transaction.
3. The system calculates the total amount for the transaction.
4. If the customer provides a gift coupon: a. The cashier applies the coupon. b. The system adjusts the total amount after the coupon is applied.
5. The cashier informs the customer of the final amount due.
6. The customer selects a payment method (cash, card, or check).
7. The cashier processes the chosen payment method.
8. The system validates the payment.

9. A receipt is generated and printed by the system.
10. The transaction is finalized and closed by the system.

Alternative Flows

4a. Invalid Coupon:

- The system alerts the cashier that the coupon is invalid.
- The cashier informs the customer and continues with the transaction starting from step 5.

8a. Payment Validation Failure:

- The system informs the cashier that the payment validation has failed.
- The cashier requests a different payment method from the customer.
- If the customer provides an alternative payment, return to step 7. If not, the transaction is canceled.

Postconditions

- The transaction is recorded in the system.
- The inventory is updated to reflect the sale.
- The payment has been successfully processed.
- A receipt has been printed.

Use Case: Processing a Return

Actor: Cashier, Customer

Preconditions

- The cashier is logged into the POS system.
- The customer has a valid receipt for the items they wish to return.

Main Flow

1. The cashier initiates a new return transaction.
2. The cashier either scans the receipt or manually enters its details.
3. The system retrieves the details of the original transaction.
4. For each item being returned: a. The cashier scans the item's barcode. b. The system verifies that the item matches the original purchase. c. The inventory is updated to reflect the returned item. d. The system adds the item to the ongoing return transaction.
5. The system calculates the total refund amount due.
6. The cashier confirms the return details with the customer.
7. The system processes the refund, using the same payment method as the original transaction.
8. A return receipt is generated and printed.
9. The return transaction is finalized and closed by the system.

Alternative Flows

2a. Receipt Not Found:

- The system notifies the cashier that the receipt is invalid or cannot be found.
- The cashier informs the customer and cancels the return process.

4b. Item Verification Fails:

- The system flags the item as not matching the original transaction.
- The cashier informs the customer and either proceeds with the next item or stops the return process.

7a. Original Payment Method Unavailable:

- The cashier selects an alternative refund method (e.g., store credit or cash).
- The system processes the refund using the newly selected method.

Postconditions

- The return is logged in the system.
- Inventory levels are updated to reflect the returned items.
- The refund has been successfully issued.
- A return receipt is printed and handed to the customer.

Identify Entity/Boundary/Control Objects

Entity Objects:

- Item
- Inventory
- Catalog
- Payment
- Receipt
- Coupon
- User (Cashier/Administrator)
- Return

Boundary Objects:

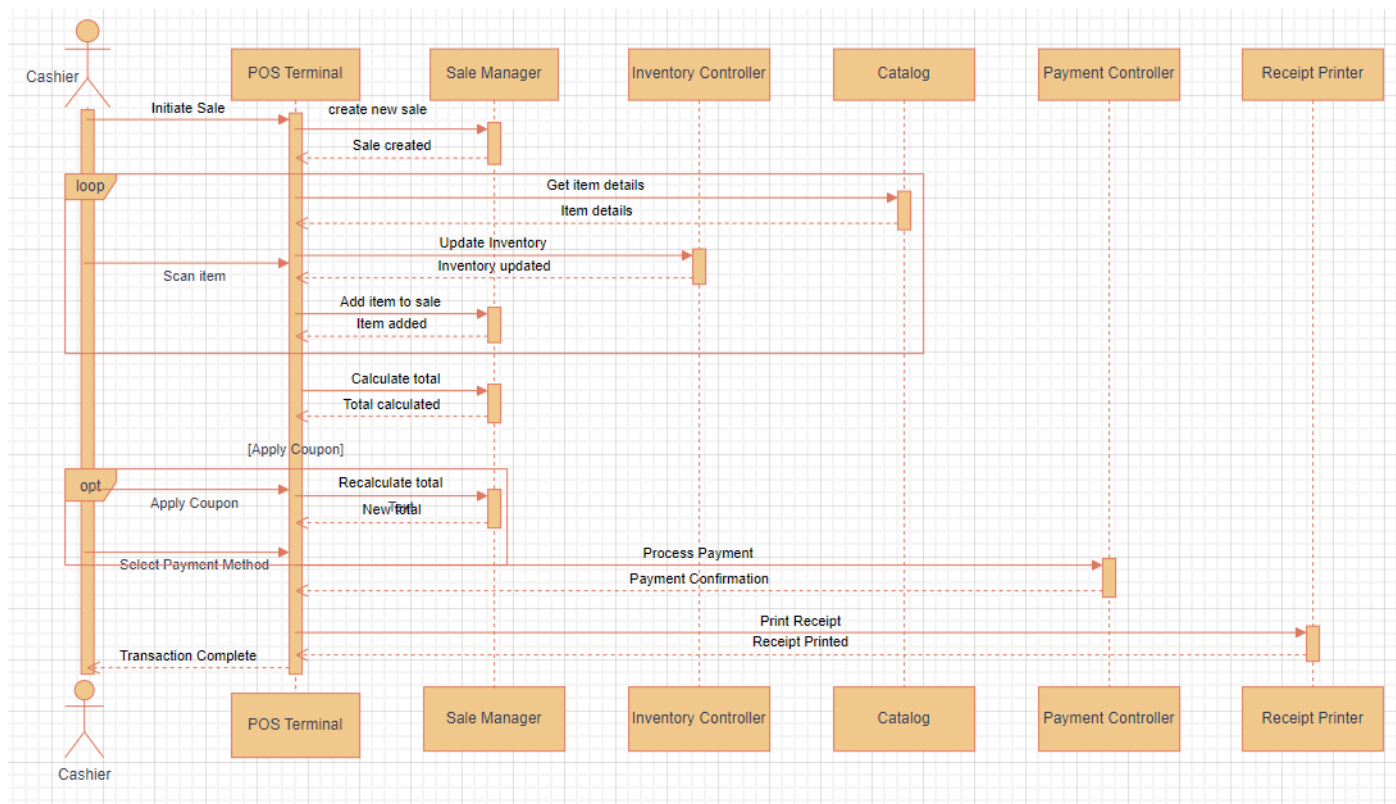
- POS Terminal Interface
- Scanner Interface
- Payment Processing Interface
- Receipt Printer Interface

Control Objects:

- Sale Manager
- Inventory Manager
- Catalog Manager
- Payment Manager
- User Authentication Manager
- Return Manager

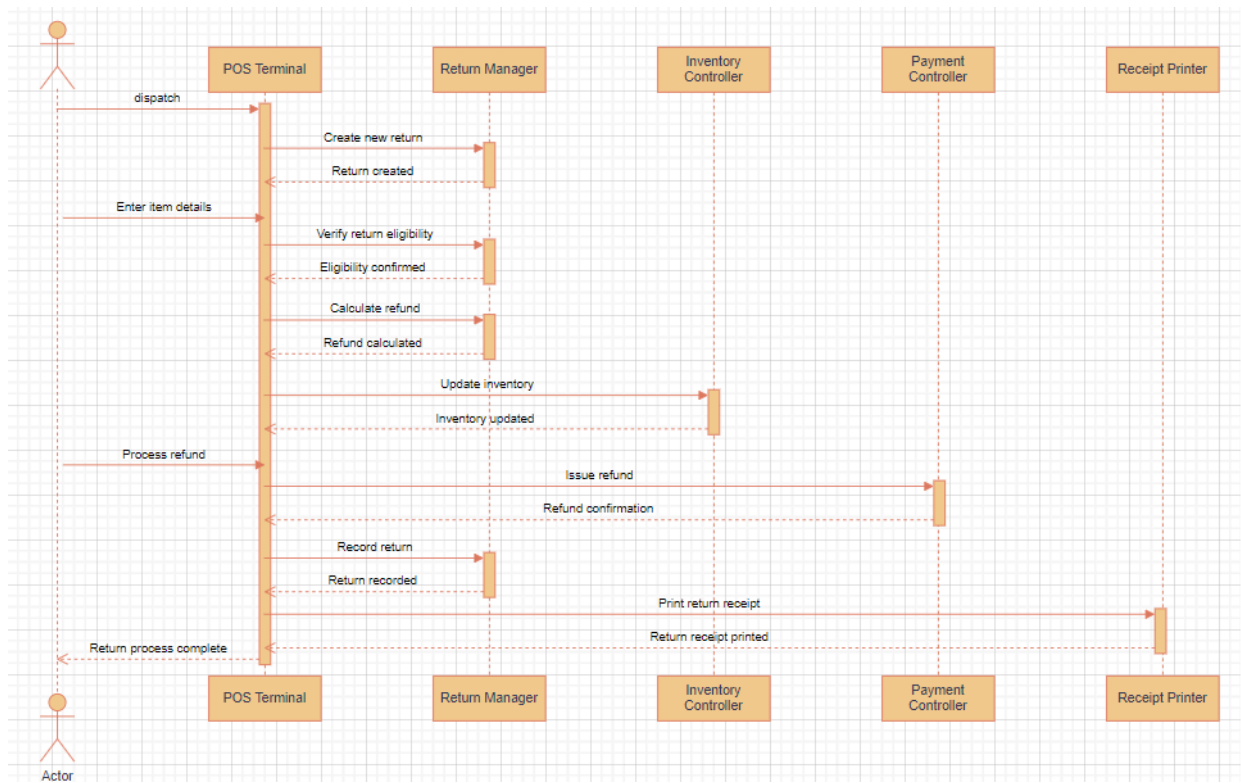
Sequence Diagram:

Process Sale Sequence Diagram

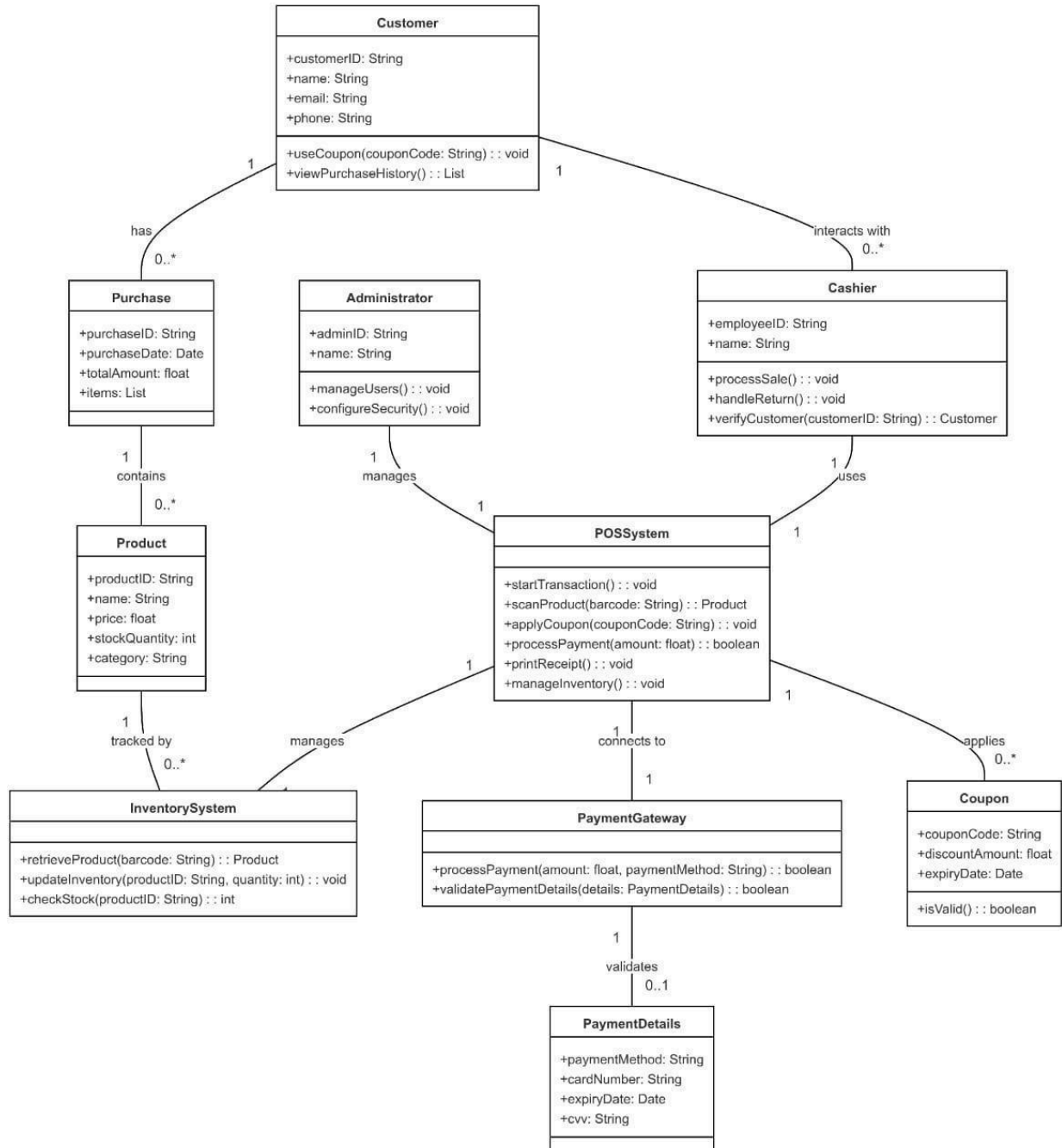


Sequence Diagram:

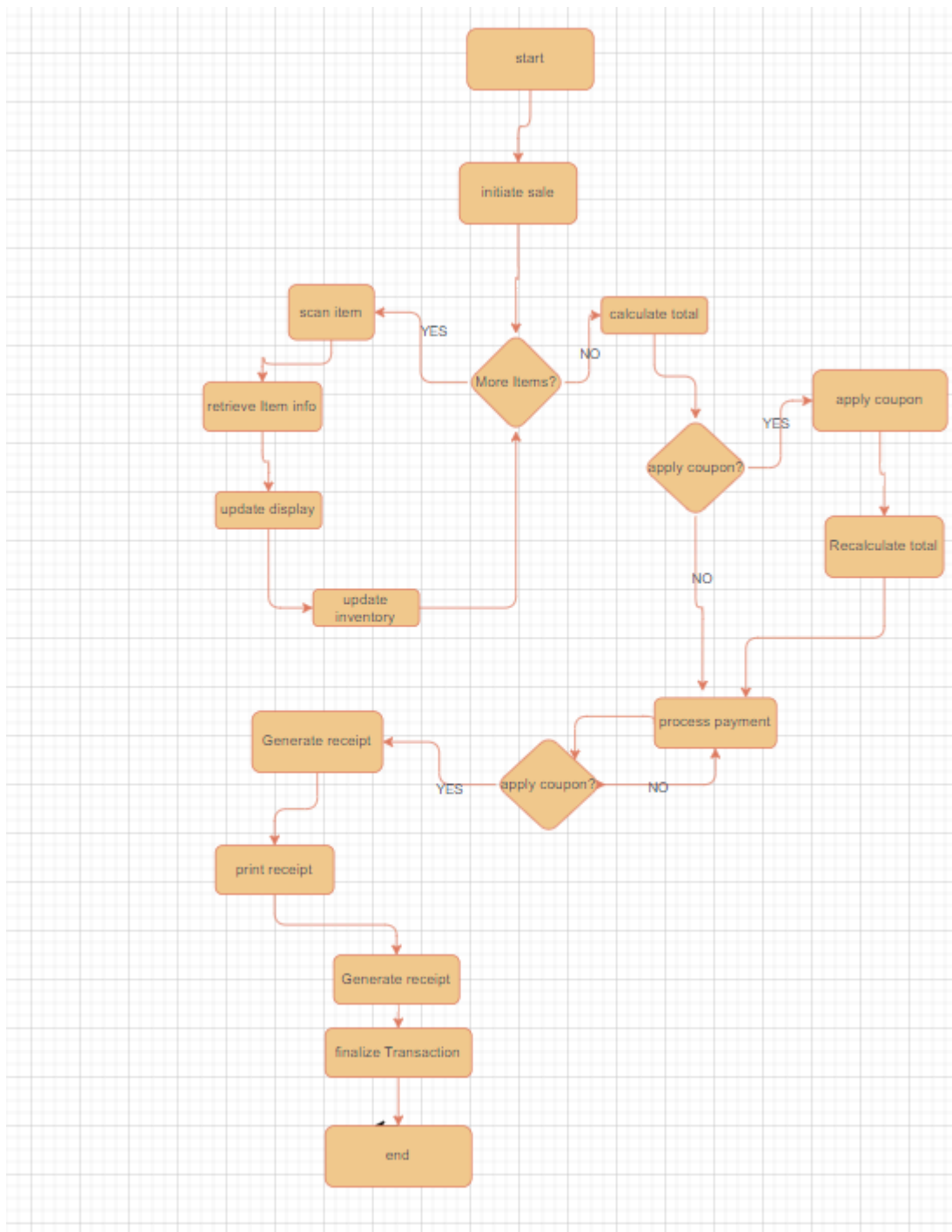
Handle Return Sequence Diagram



Analysis Domain Model



Process Sale Activity Diagram



Handle Return Activity Diagram

