IT-314

Lab 6 - Point of Sales System

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Use Case: Process Sale

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

Preconditions:

- The cashier has logged into the POS system.

- The customer is at the checkout with items to purchase.

Postconditions:

- The transaction is completed successfully.

- The customer receives a printed receipt.

- The POS updates the sale details, stock levels, and payment information.

Basic Flow:

1. The cashier initiates a new sales transaction.

2. The cashier scans the barcode of an item.

3. The system retrieves the item information from the backend and adds it to the current bill, updating the total amount. Steps 2 and 3 are repeated until all items are scanned.

4. The system calculates and displays the total price to the customer.

5. If the customer provides coupons, the cashier enters the discount codes into the system and informs the customer of the updated total.

6. The customer selects a payment method and completes the transaction.

7. The system finalizes the sale, updates stock information in the backend, saves the transaction details, and requests the printer to issue a receipt.

8. The printer generates a receipt.

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

Extensions:

1. System Failure:

- If the system encounters an error, it must be able to recover the transaction state to maintain integrity.

- The cashier restarts the system, logs back in, and attempts to restore the previous transaction.

- The system reconstructs the prior state.

- If any issues arise during recovery, the cashier initiates a new sale.

2. Scanning Issues:

- Invalid Scan:

- The system displays an error message and rejects the input.

- The cashier can manually enter the barcode or ask the customer to provide another unit.

- Multiple Units: The cashier can specify the quantity for the same item.

3. Item Removal:

- If the customer wants to remove any items from the bill, the cashier can remove them through the interface and set those items aside for restocking.

4. Expired Coupons:

- Coupons that are expired will be invalid and discarded by the cashier.

5. Payment Issues: If the transaction fails, the customer is prompted to retry the payment using the same or a different method.

Handle Return Use Case

Primary Actors: Cashier, Customer

Preconditions:

- The cashier is logged into the POS system.

- The customer has the original receipt and the items they wish to return.

Postconditions:

- The customer successfully returns the items and receives an updated receipt along with a refund via the original payment method.

Basic Flow:

1. The cashier initiates a return transaction in the system.

2. The cashier scans the items being returned.

3. The system retrieves information from the original sale and checks the return eligibility according to store policy.

4. The system updates the inventory to reintegrate the returned items.

5. The system calculates the refund amount based on the original price and any applicable return fees.

6. The cashier processes the refund using the original payment method (cash, credit, check).

7. The system logs the return transaction and prints a return receipt.

8. The customer leaves with the refund receipt.

Extensions:

1. **System Failure:**

   - If a failure occurs during the return process, the same recovery procedures from the "Process Sale" use case are followed.

2. **Invalid Receipt:**

   - If the receipt is invalid or cannot be located, the system will signal an error.

   - A manager may need to manually approve the return.

3. **Partial Returns:**

   - If only a subset of items from the original sale is being returned, the cashier scans only those items.

   - The system adjusts the refund amount and updates inventory accordingly.

4. **Exchanging Items:**

   - If the customer wishes to exchange returned items for different products:

      - The cashier processes the return.

      - The cashier then starts a new sale for the new items, adjusting the total with the refund amount.

Entity/Boundary/Control Objects

Entity Objects:

- Sale

- Return

- Inventory (Backend)

- Cashier

- Customer
- Receipt
- Goods

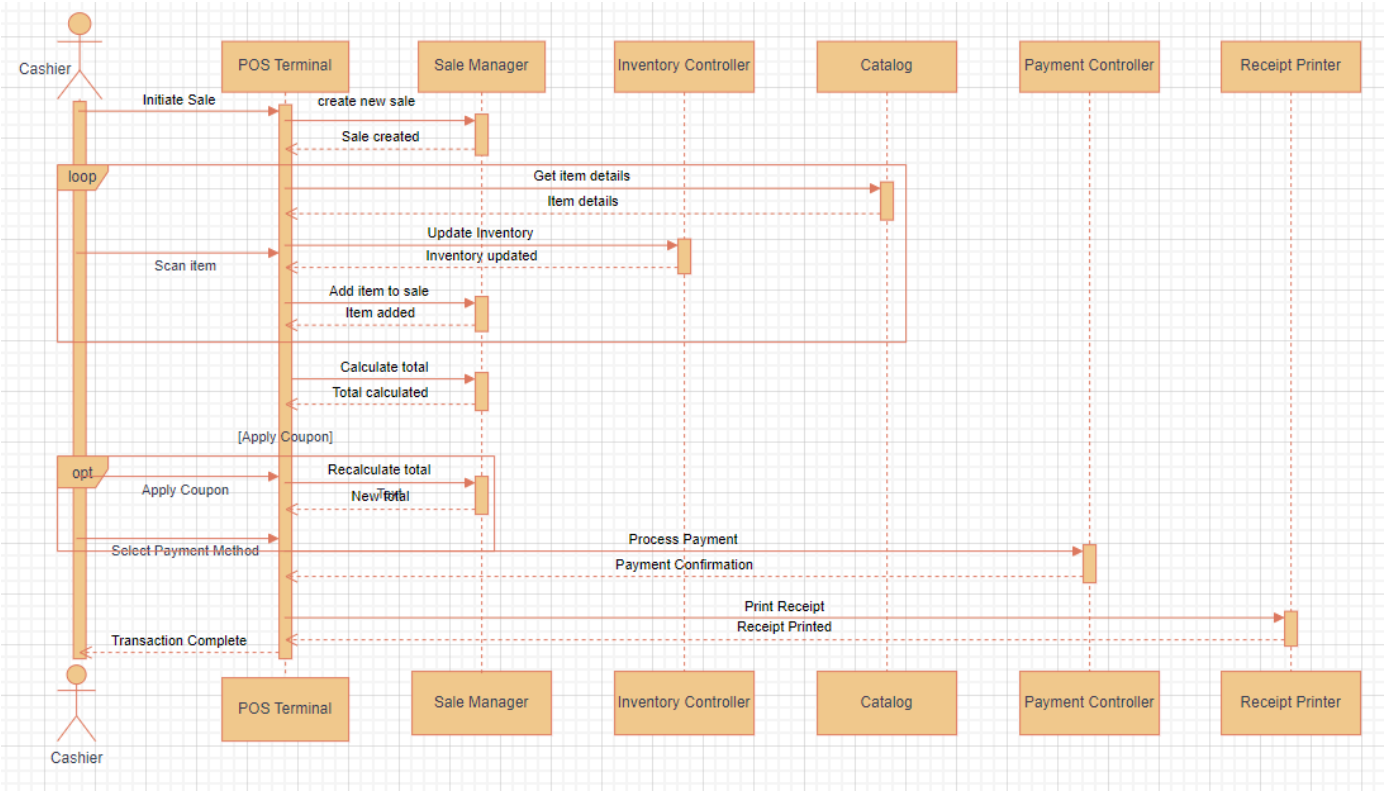
Boundary Objects:

- POS Interface (for cashier interactions)
- Barcode Scanner
- Receipt Printer

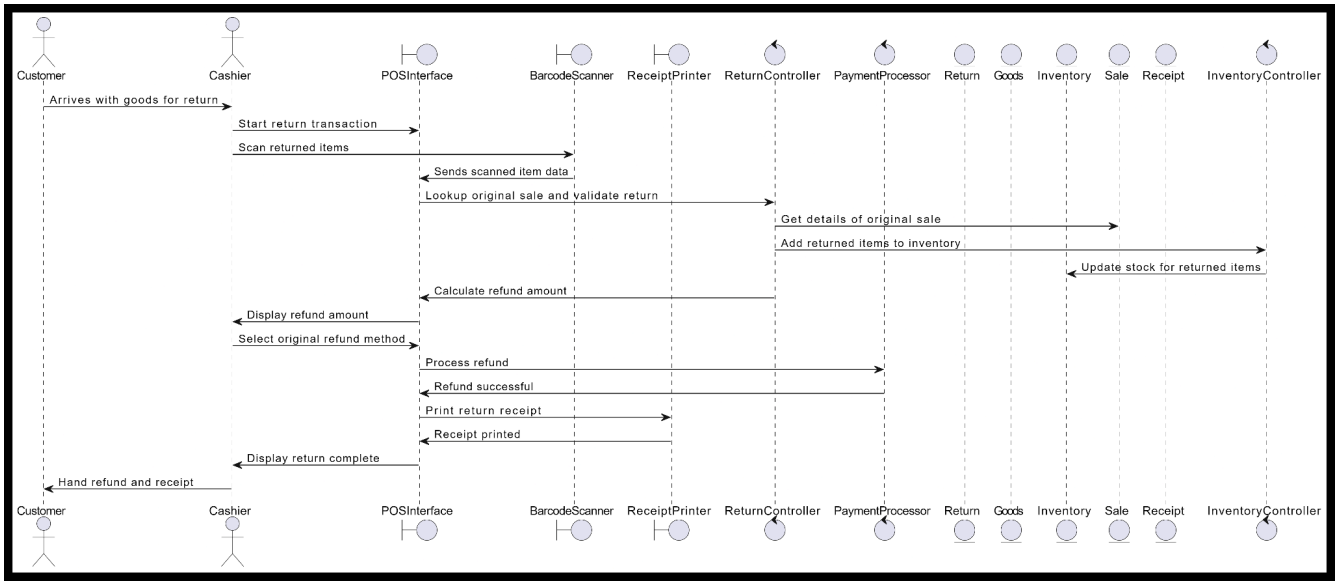
Control Objects:

- SaleController (oversees the sales transaction)
- PaymentProcessor (manages payment processing)
- ReturnController (handles product returns)
- InventoryController (manages stock details in the backend)

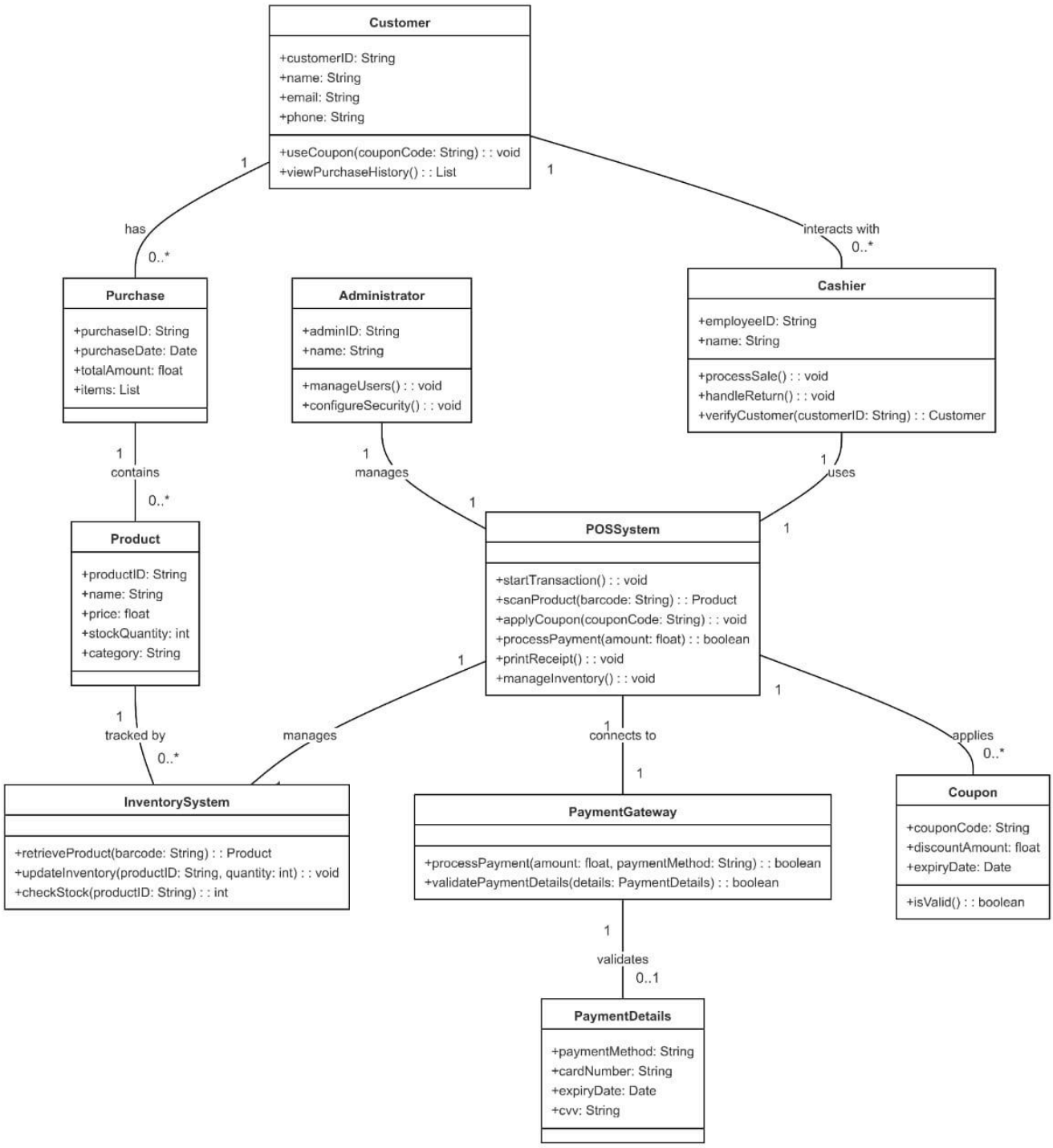
Sequence Diagram:
Process Sale Sequence Diagram



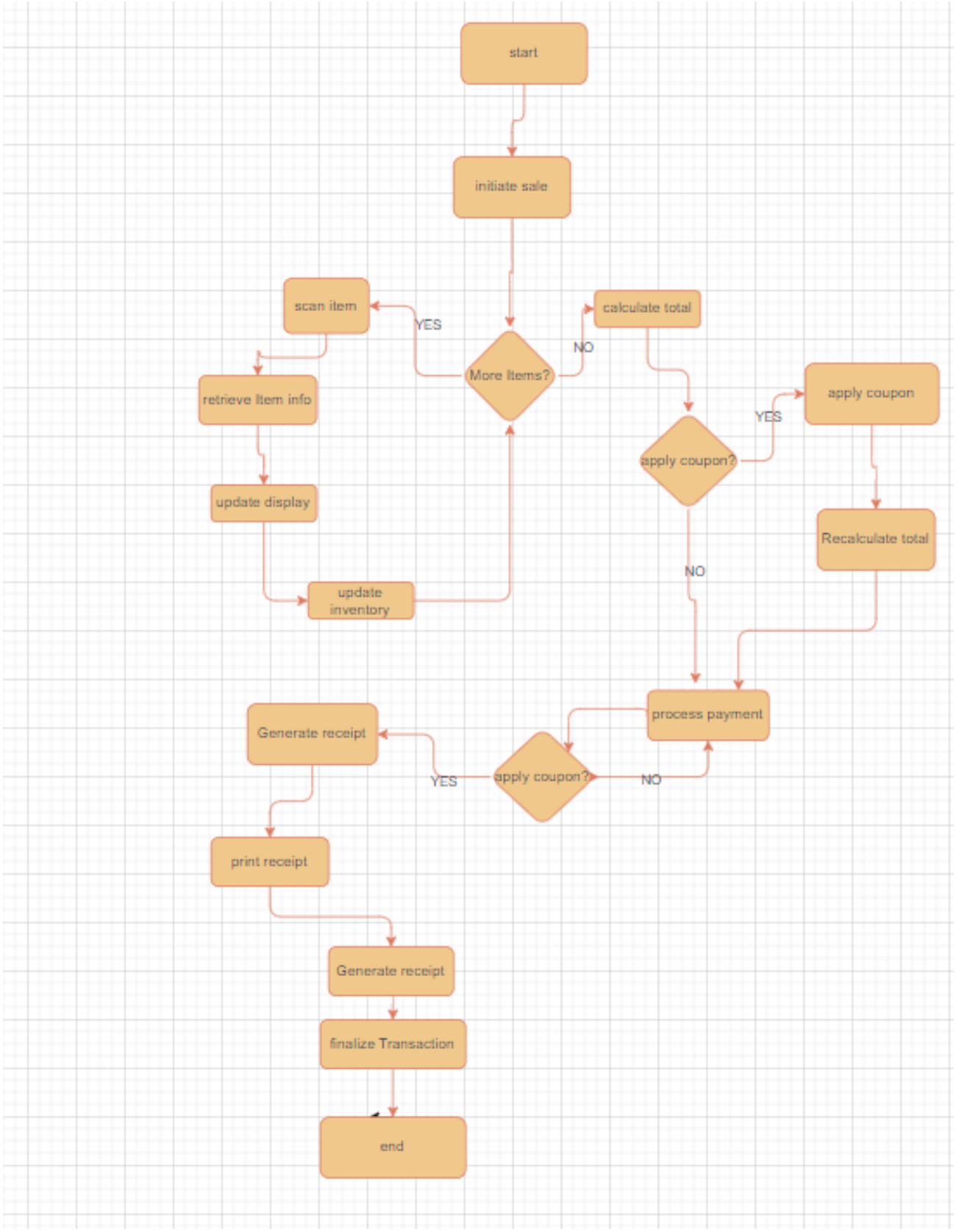
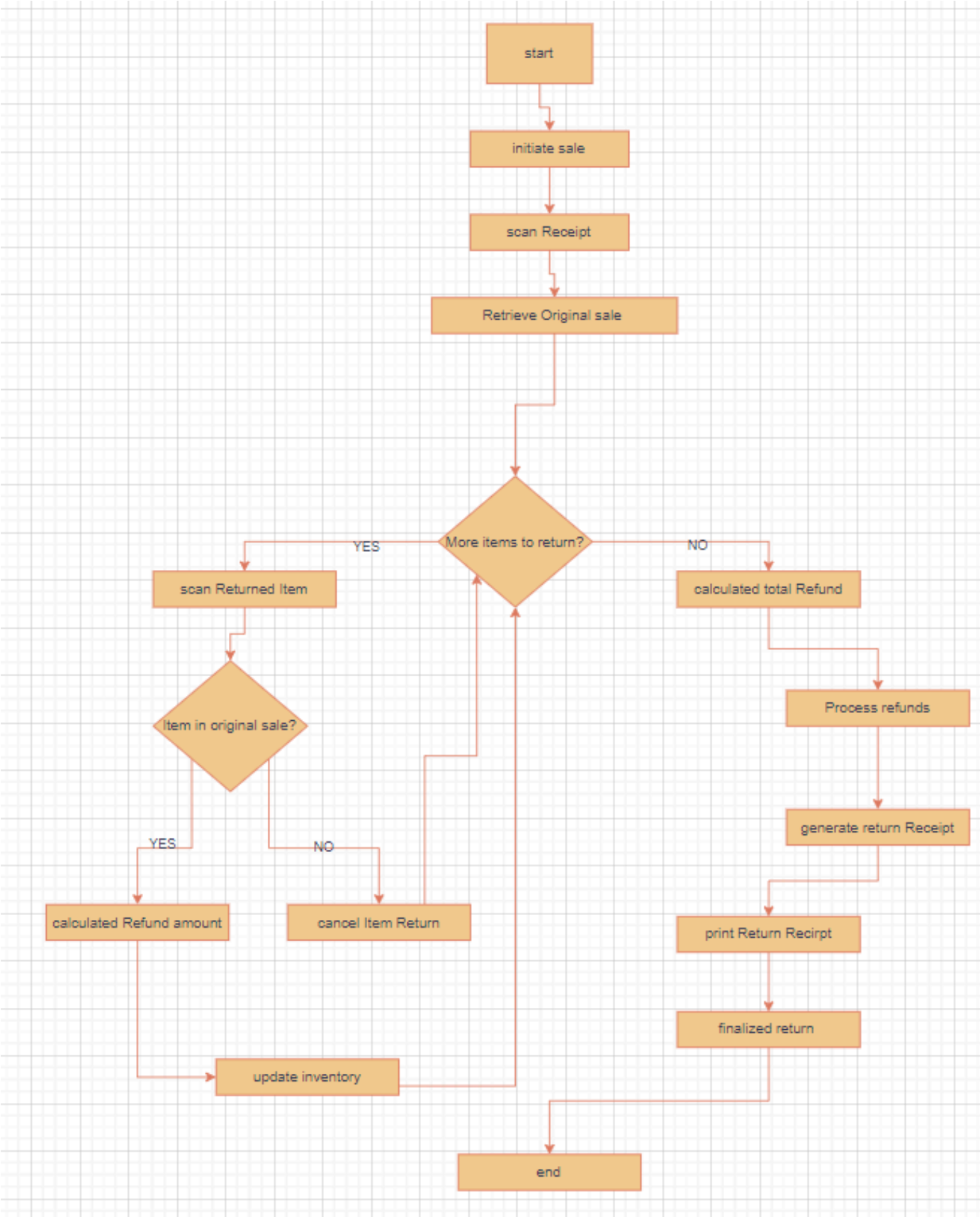
Sequence Diagram:
Handle Return Sequence Diagram



Analysis Domain Model



Process Sale Activity Diagram



Handle Return Activity Diagram