IT314-SOFTWARE ENGINEERING

Lab 6 - Point of Sales System

ID: 202201418
Name: Dev Darpesh Soni

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

“Process Sale Use Case”

- **Primary Actor:** Cashier, Customer
- **Preconditions:** Cashier has logged into the POS, Customer has reached the cashier’s desk/checkout with goods to be purchased along with them.
- **Post Condition:** The sale is successful, the customer receives a printed receipt, the POS stores details of the sale, the updated stock and the payment details.

Basic Flow:

1. The cashier initiates a new sale transaction.
2. The cashier scans the barcode of a particular good.
3. The system retrieves item details from the backend, adds the item to the current bill, incrementing the total. Steps 3 & 4 will be repeated by the cashier until all the goods have been scanned and added to the bill.
4. The system calculates and displays the total price to the customer.
5. The cashier accepts the coupons(if given) by the customer, enters the discount codes/ coupon details into the system and requests the customer the updated price of the goods.
6. The customer chooses a payment method, and proceeds with the payment.
7. The system finalizes the sale, updates stock data in the backend, saves the transaction details and requests the printer to print a receipt.

8. The printer prints a receipt.
9. The customer leaves with the goods and receipt.

Extensions:

1. **System Failure:**
    a. If the system fails at any point, it must be able to recover the transaction state and events to maintain transaction integrity.
    b. The cashier restarts the system, logs in, and attempts to recover the previous transaction state.
    c. The system reconstructs the prior state.
    d. If anomalies are detected during recovery, the cashier starts a new sale.
2. **Scanning goods:**
    a. Invalid scan:
        i. The system displays an error message and rejects the entry.
            - The cashier enters the barcode number manually
            - The cashier instructs the customer to bring another unit of the same good.
    b. Multiple units of the same good: The cashier enters the quantity in the quantity field for that particular good.

4**. Item Removal:**

    a. If the customer wishes to remove an item or a set of items from the final bill, the cashier can remove those goods from the interface itself and keeps those goods in a different basket to be restocked later.

5. **Expired Coupons:**

    a. The customer gives expired coupons, which can not be used and have to be discarded.

6. **Payment Problems:** In case the transaction fails, the customer is asked to retry payment with the same or a different process.

“Handle Return Use Case”

- **Primary Actor:** Cashier, Customer
- **Preconditions:** The cashier is logged into the POS, and the customer has the receipt for the original sale along with the goods to be returned
- **Postconditions:** The customer returns the goods and leaves with the updated receipt and the amount of the returned goods(in the original payment method).

Basic Flow:

1. The cashier initiates a return transaction in the system.
2. The cashier scans the items to be returned.
3. The system retrieves details from the original sale and validates the return eligibility based on store policy.
4. The system updates the inventory to add the returned items back to stock.
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 records the return and prints a return receipt.
8. The customer leaves with the refund receipt.

Extensions:

1. **System Failure:**
    a. If the system fails during the return, the same recovery process as in "Process Sale" applies.
2. **Invalid Receipt:**
    a. If the receipt is invalid or cannot be found:
        1. The system signals an error.
        2. A manager may be required to approve the return manually.
3. **Partial Returns:**
    a. If only some items from the original sale are being returned:
        1. The cashier scans only those items.

2. The system adjusts the refund and updates the inventory accordingly.

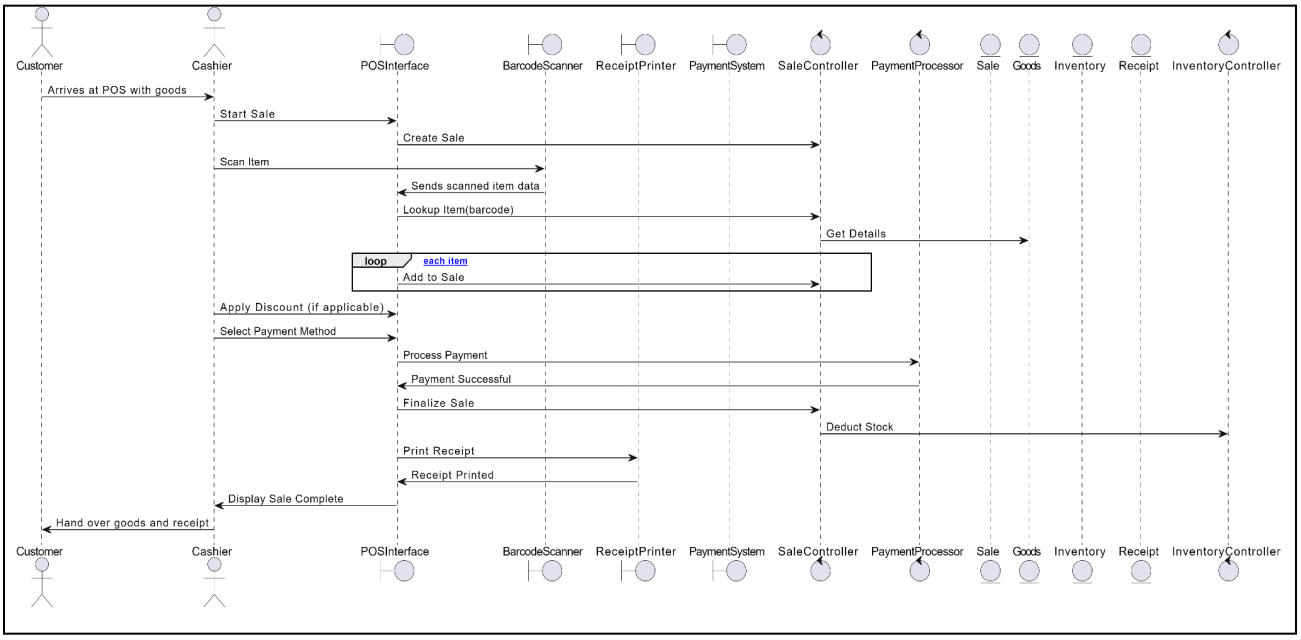
4. **Exchange for Different Items:**
    a. If the customer wants to exchange the returned items for different ones:
        1. The cashier processes the return.
        2. The cashier initiates a new sale for the new items, adjusting the total with the refund.

Task 2: Identify Entity/Boundary Control Objects

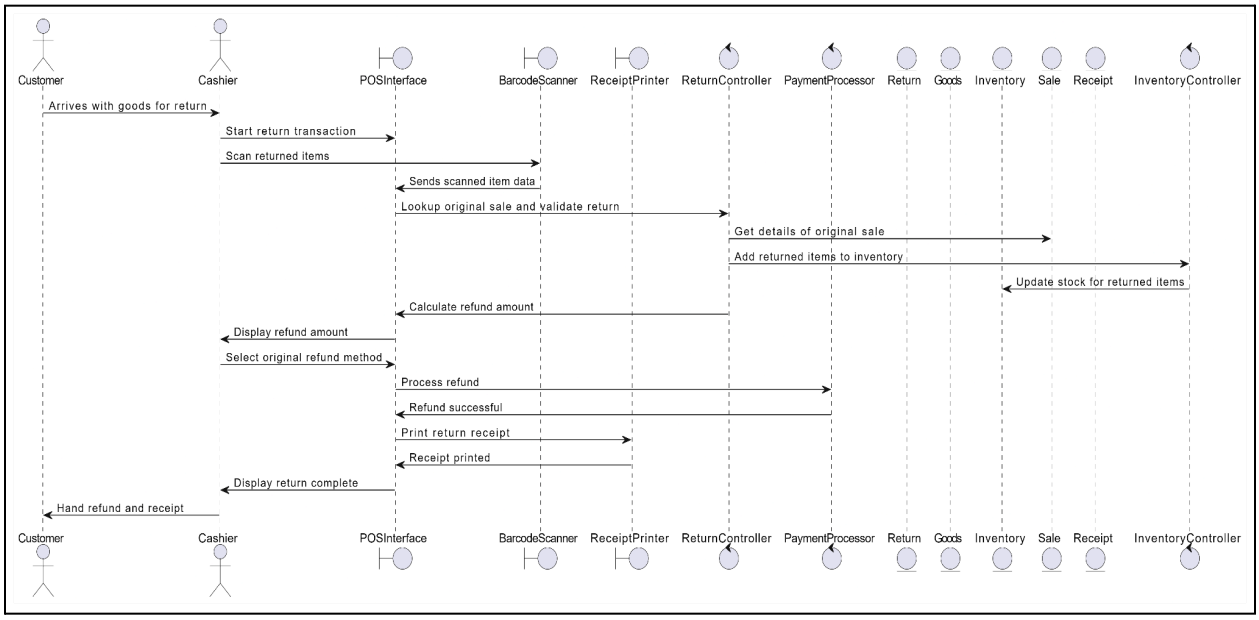
- **Entity Objects**:
    - Sale
    - Return
    - Inventory (Backend)
    - Cashier
    - Customer
    - Receipt
    - Goods
- **Boundary Objects:**
    - POS Interface (for cashier interactions)
    - Barcode Scanner
    - Receipt Printer
- **Control Objects:**
    - SaleController (manages the sale transaction)
    - PaymentProcessor (handles payment processing)
    - ReturnController (handles product return)
    - InventoryController(handles stock details on the backend)

Task 3: Develop Sequence Diagrams

1. “Process Sale Use Case”

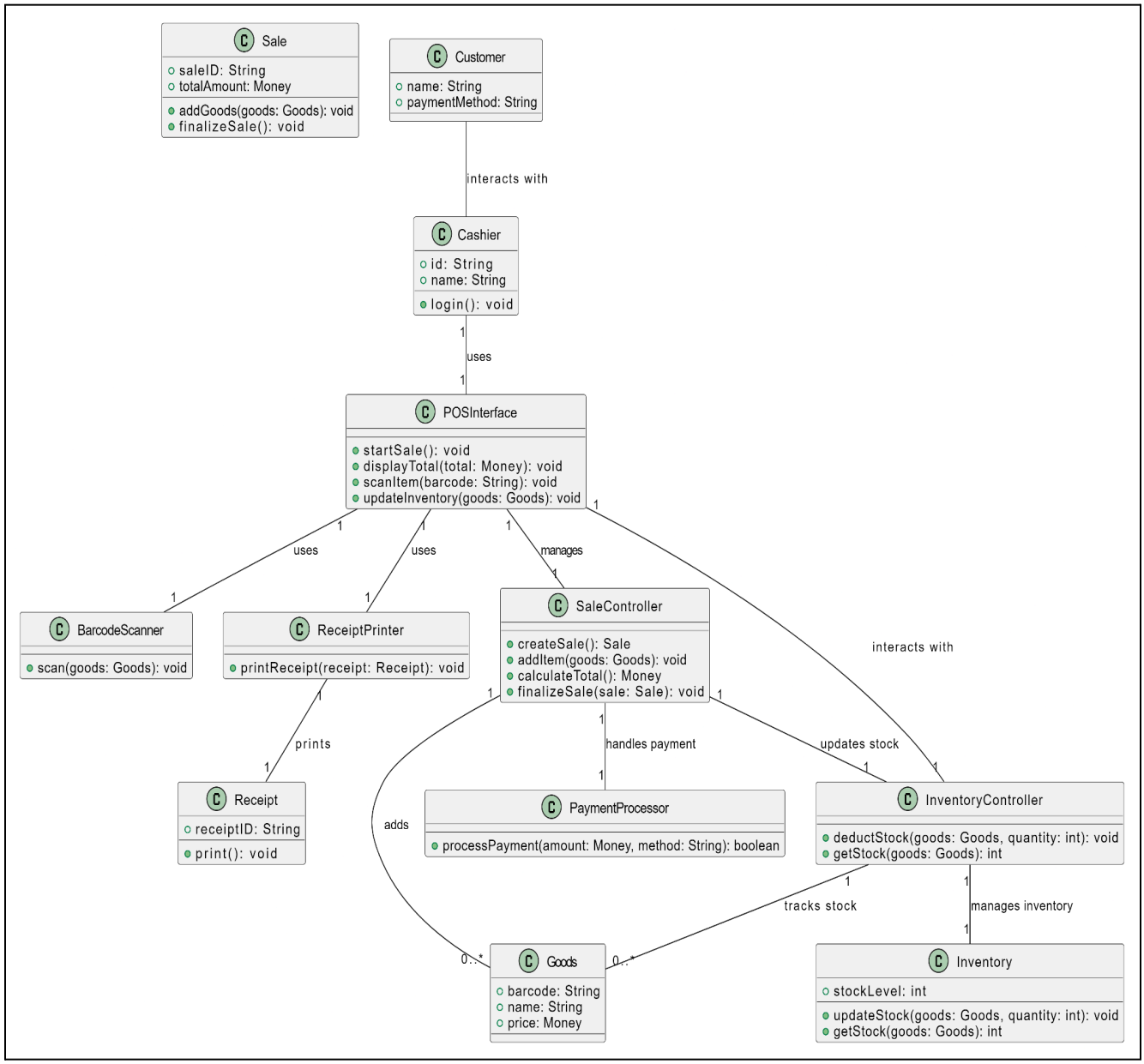


2. “Handling Returns Use Case”

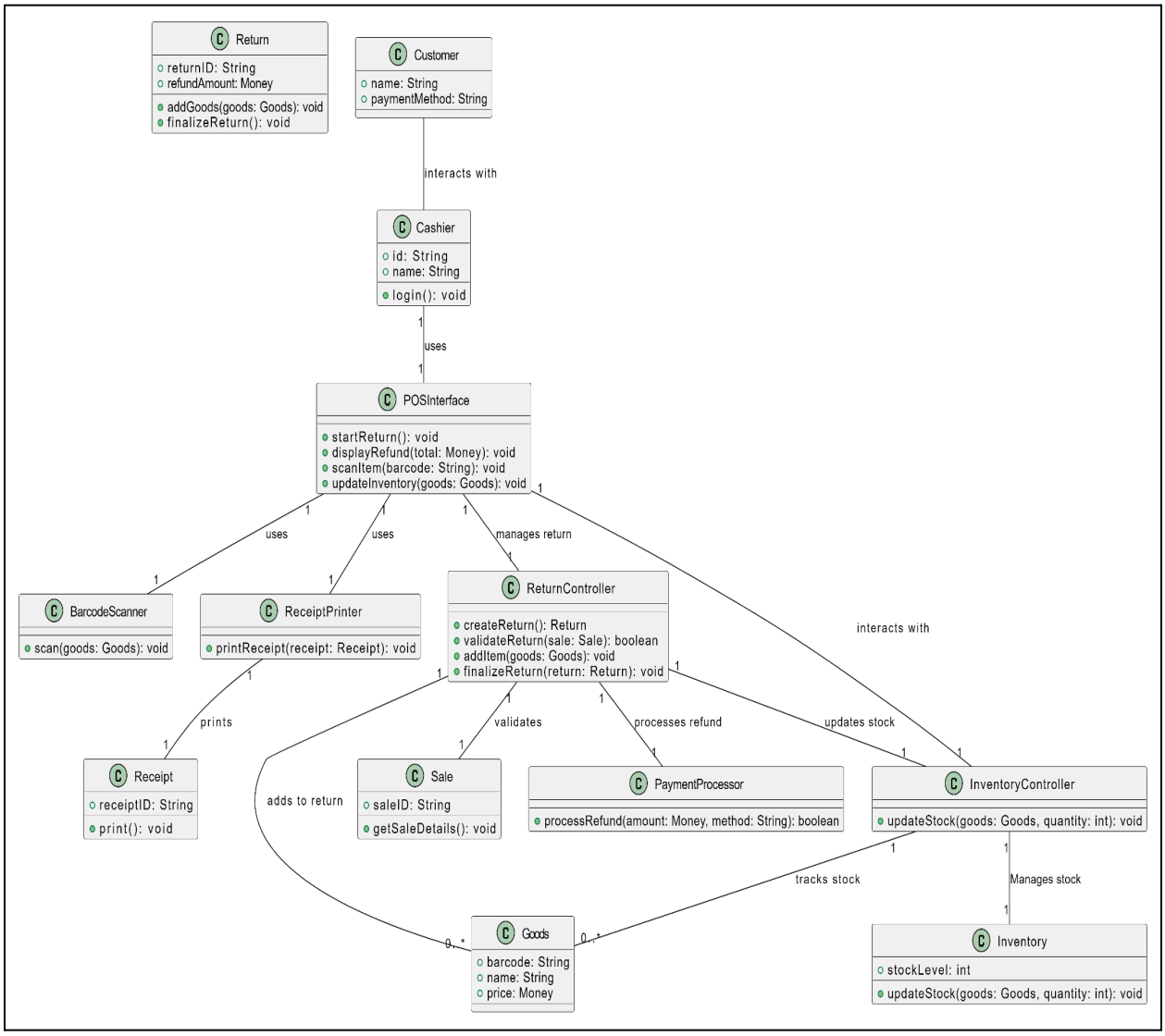


Task 4: Develop Analysis Domain Models

1.“Process Sale Use Case”

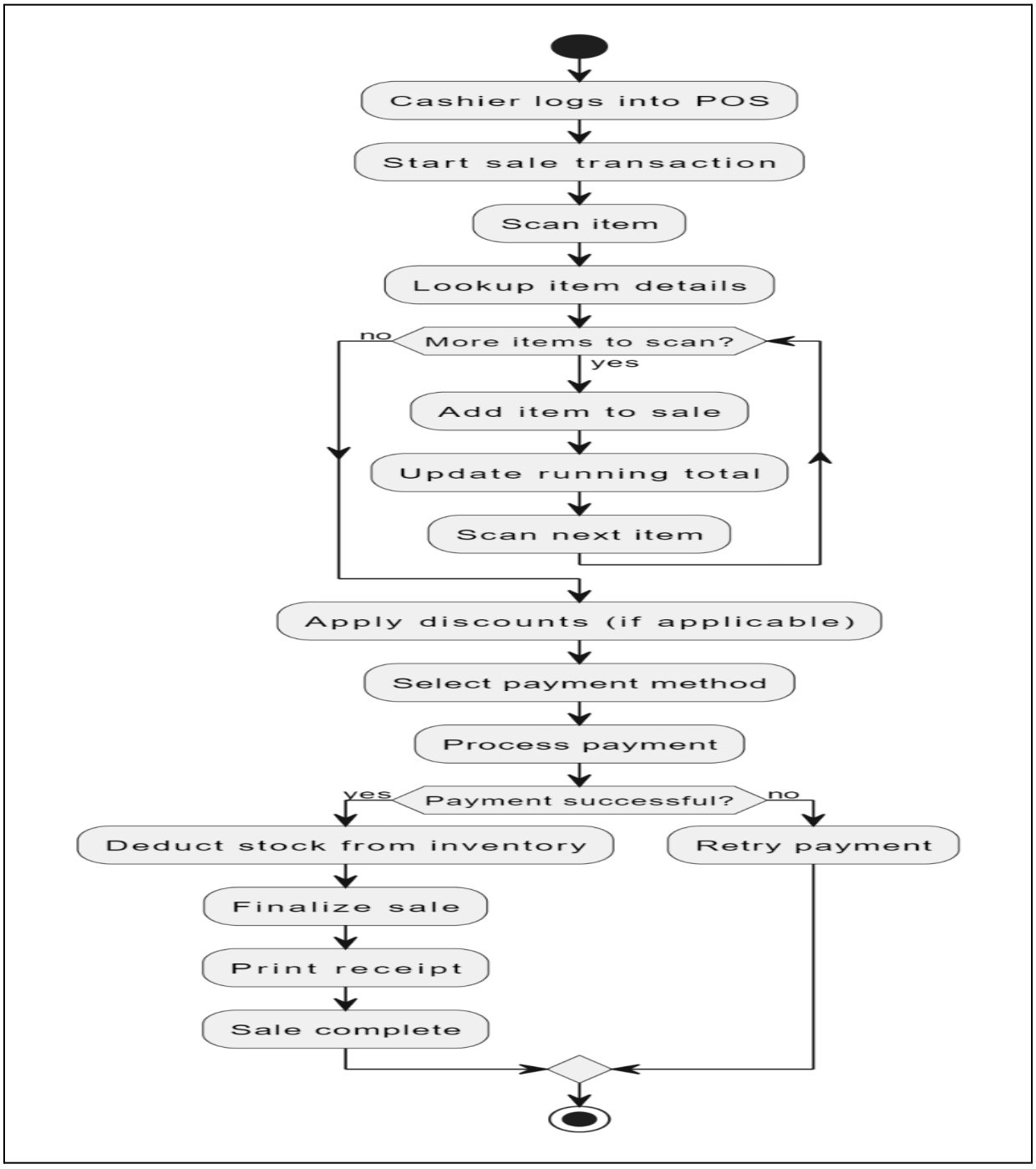


2.”Handle Returns Use Case”



Task : 5 Develop activity diagram for "Process Sale" and "Handle Return" use cases.

1.“Process Sale Use Case”



2.”Handle Returns Use Case”