



**IT314 – Software Engineering Lab-06**  
**Modeling Class Diagram and Activity Diagram**  
**(Point of Sale System)**  
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**Use case Textual Description:**

**Process Sales Use case:**

**Actors:** Customer, Cashier, Catalog System

**Pre conditions:**

- Cashier is already authenticated and logged in the system
- Goods are available in the inventory

**Post Conditions:**

- Transactions are recorded in the system
- Inventory levels are updated
- Receipt is printed

**Basic Flow:**

1. Customer arrives at checkout with items to purchase
2. Cashier starts new sale and scans the barcode of each item
3. The POS system sends a request to the Catalog System to retrieve item details (name, price). The Catalog System returns item details to the POS system.
4. The POS system updates inventory to reflect the sale of the item. Steps 2-4 are repeated until all item details are retrieved.
5. The POS system calculates total amount
6. Cashier provides the total amount due to the customer.
7. Customer selects the payment method (cash, credit card).
8. The POS system processes the payment.
  - For cash, the system validates the amount.
  - For credit cards, the system checks authorization.
9. Upon successful payment, the system prints a receipt.
10. Customer receives the receipt and purchased items and leaves with them.

**Alternate Flows:**

- 3a. Item not found in the Catalog system. The system alerts the cashier, and the transaction cannot proceed until resolved.
- 3-6a. Customer asks the cashier to remove an item from the purchase.
  1. The item is removed by the cashier
  2. The total amount is updated.
- 3-6b. Customer tells the cashier to cancel the sale.
  1. Cashier cancels the sale on system

8a. If the payment is declined, the system notifies the cashier.

1. Cashier asks the customer to use an alternative payment method

2. Customer uses the other payment method

8b. If the customer pays in cash but does not provide enough money

1. Customer uses an alternate payment method.

2. Customer tells Cashier to cancel sale. Cashier cancels sale on System.

### **Handle Returns Use case:**

**Actors:** Customer, Cashier, Catalog System

**Pre conditions:**

- Customer has a receipt for the item to be returned.
- Cashier is already authenticated and logged in the system.

**Post conditions:**

- Return transactions are recorded in the system.
- Inventory levels are updated.

**Basic Flow:**

1. Customer presents item and receipt for return.
2. Cashier scans the receipt to verify the purchase.
3. The POS system sends a request to the Catalog System to retrieve item details from the transaction record.
4. The Catalog System returns item details to the POS system.

5. Cashier checks the return policy eligibility (time limit, condition of the item).
6. If eligible, the system processes the return. The system updates inventory to reflect the return of the item.
7. Cashier processes the refund based on the customer's preferred method to receive payment.
8. The system prints a return receipt.
9. Customer receives the return receipt and the refund.

#### **Alternate Flows:**

##### **2a. The scanned receipt cannot be verified**

1. The system informs the cashier that receipt is not found
2. Cashier requests the customer to provide the receipt again or additional purchase details.
3. If resolved, the return process continues; if not, the return is aborted.

##### **5a. Item Not Eligible for Return**

1. The system informs the cashier that the item does not meet return criteria.
2. Cashier communicates this to the customer.
3. The return process is halted, and the customer may choose to keep the item.

##### **7a. Refund Processing Error**

1. The system notifies the cashier of the refund error.
2. Cashier checks the system for issues. If resolved, the refund is processed; if not, the customer is informed of the delay or a different payment method is used.

#### **Entity/Boundary/Control Objects:**

### **Entity Objects:**

- Transaction
- Payment System
- Receipt
- Coupon
- Cashier
- Catalog System
- Inventory System
- Item

### **Boundary Objects:**

- POS Interface
  - Display scanned item details and prices
  - Show total amount due
  - Input coupon codes
  - Print receipt
- Payment Interface
  - Accept cash and credit card payment details
  - Confirm payment processing status
- Return Interface
  - Accept return requests from customers
  - Display return eligibility and policies
  - Show refund amounts
- Barcode Scanner
  - Device used to scan product barcodes, interacting with the POS system to retrieve product information.

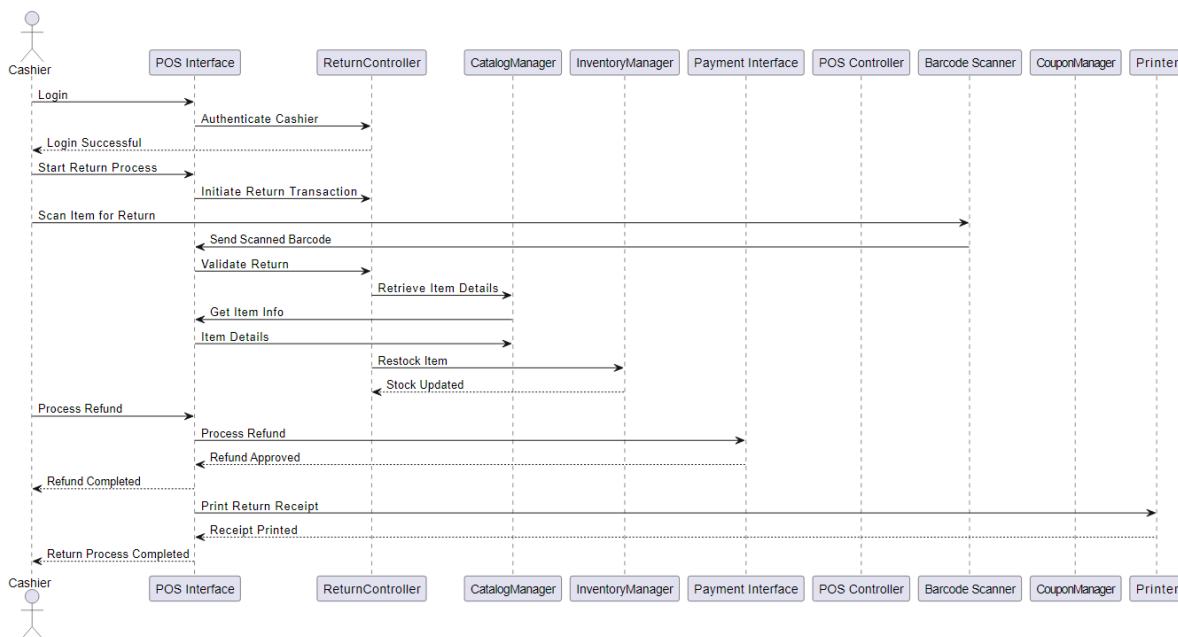
### **Control Objects:**

- SaleController
  - Manages the sale process flow

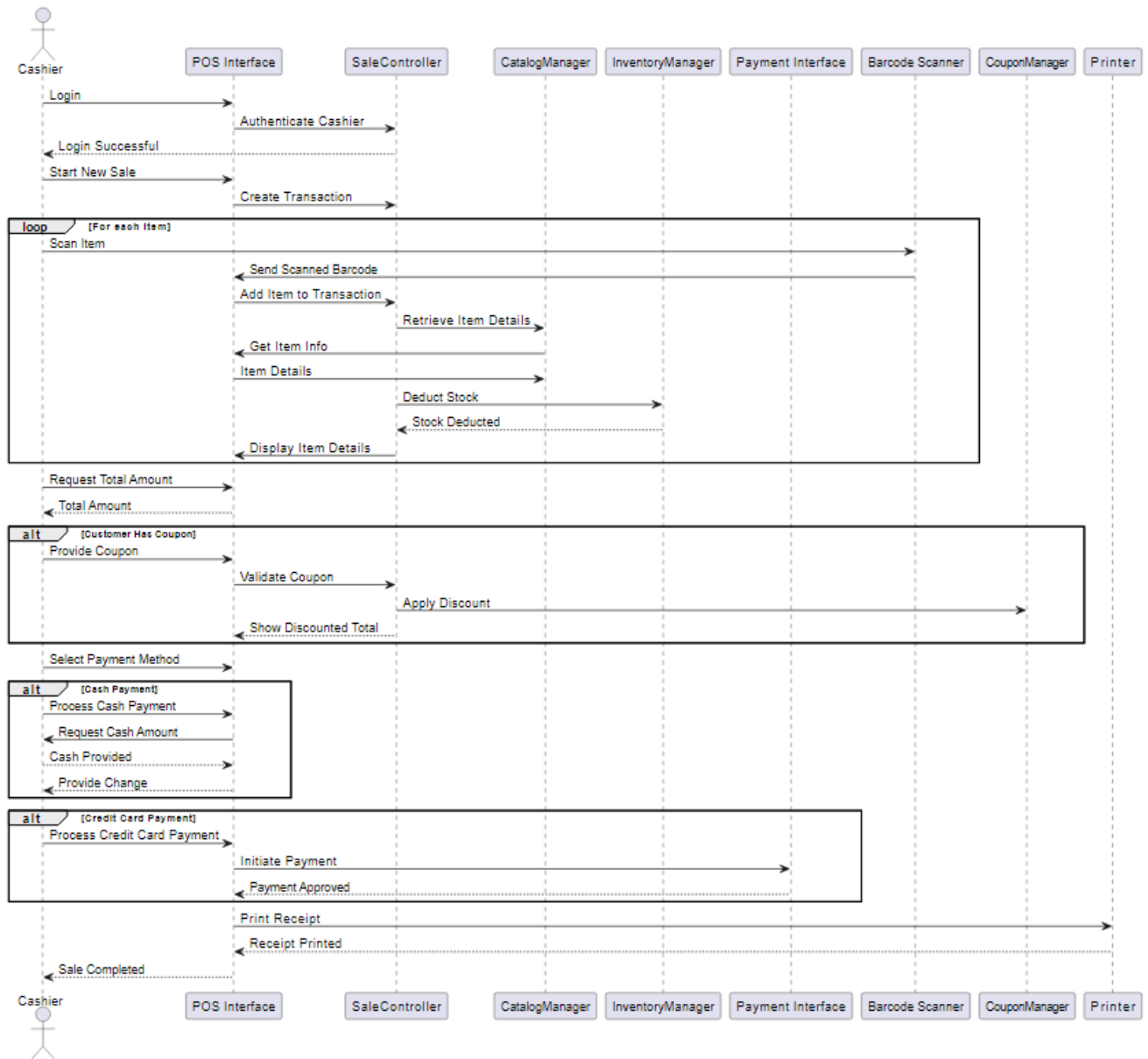
- Validates items and calculates total amount (including discounts)
- Process payments and update inventory
- Validate and apply coupon codes
- Calculate discounts based on applicable coupons
- InventoryManager
  - Update stock levels for sold items
  - Check item availability
- CatalogManager
  - Retrieve item details from the Catalog System
  - Validate item information against inventory
- ReturnController
  - Manage the return process flow
  - Verify receipt and item eligibility
  - Process refunds and adjust inventory

## Sequence Diagrams:

### Handle Returns:

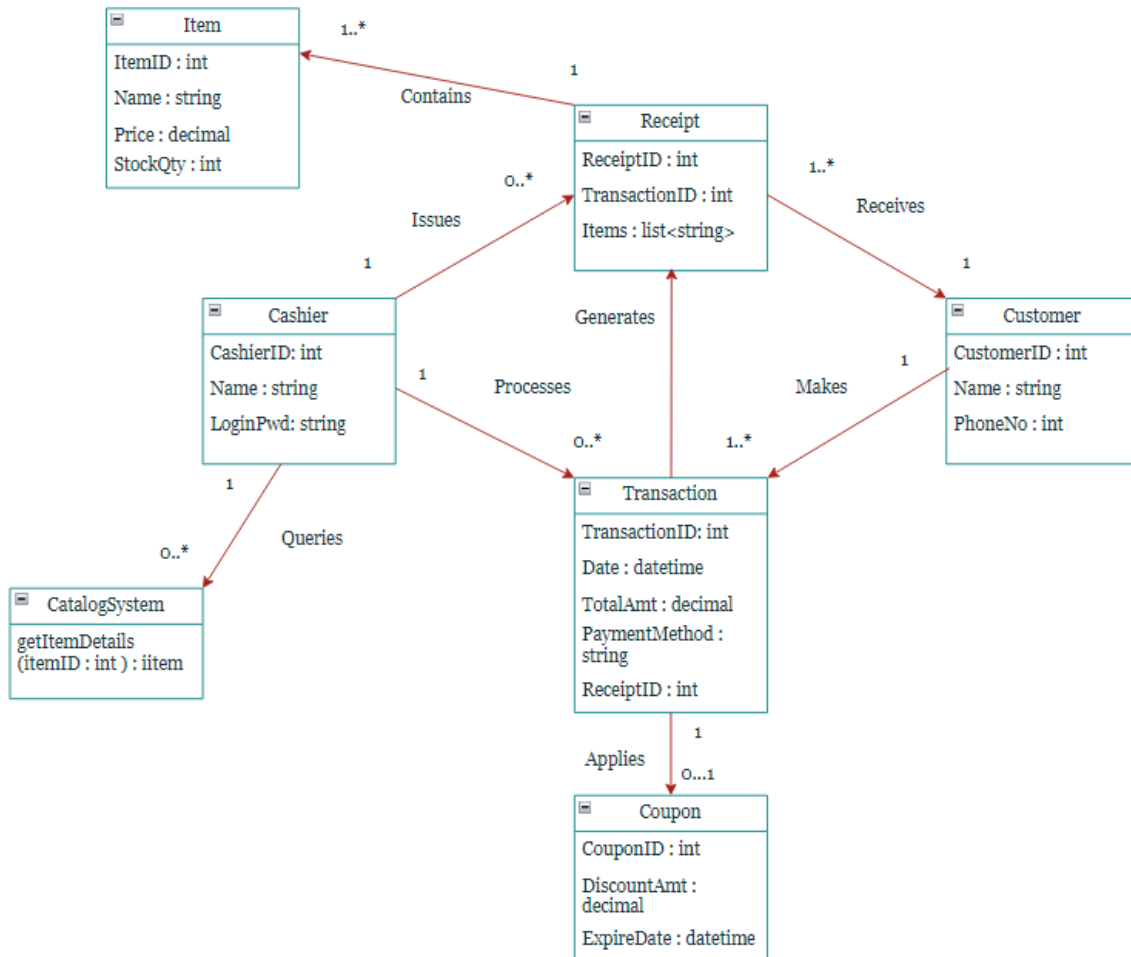


## Process Sales:



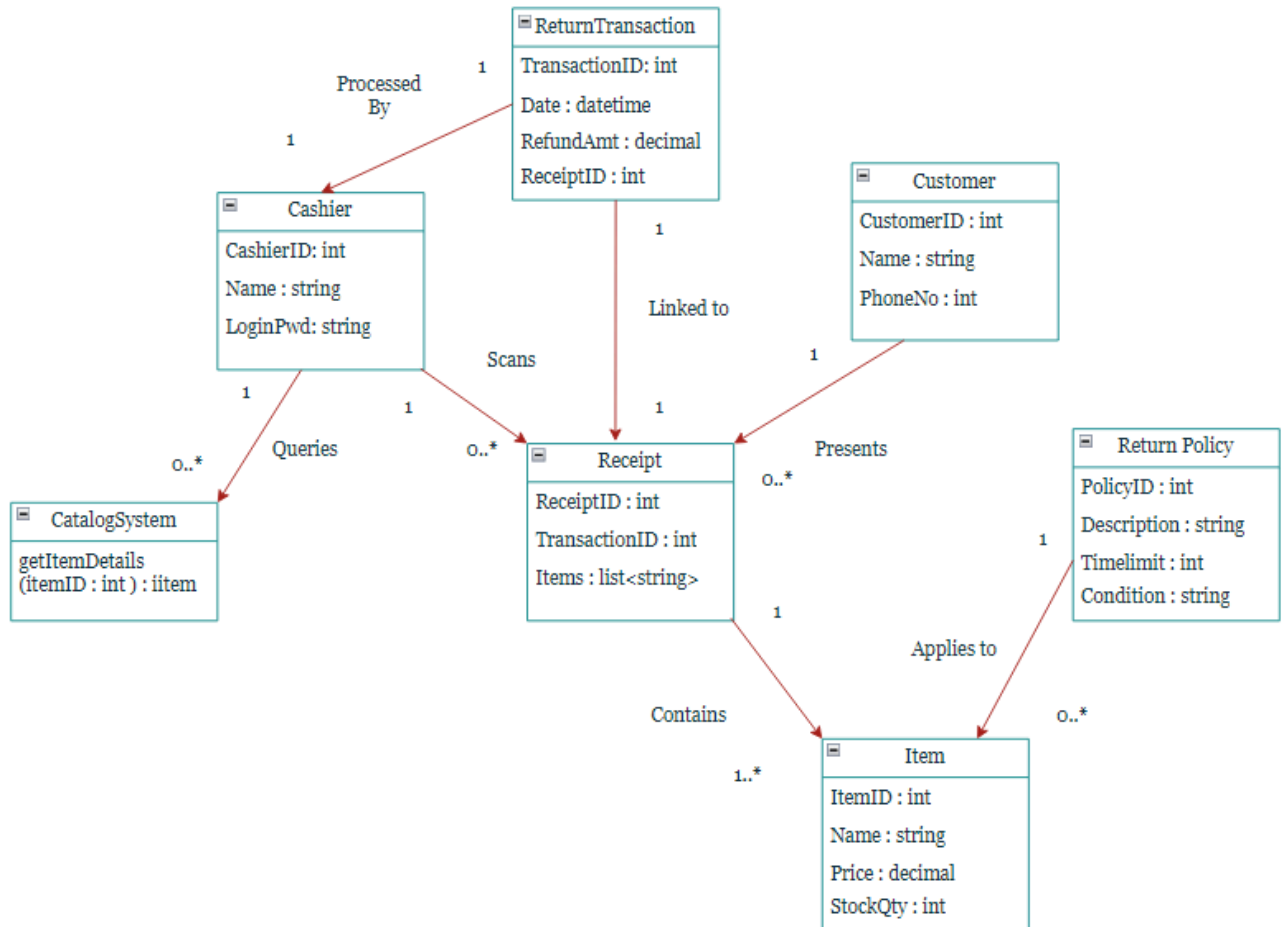
## Analysis Domain Models:

### Process Sales:



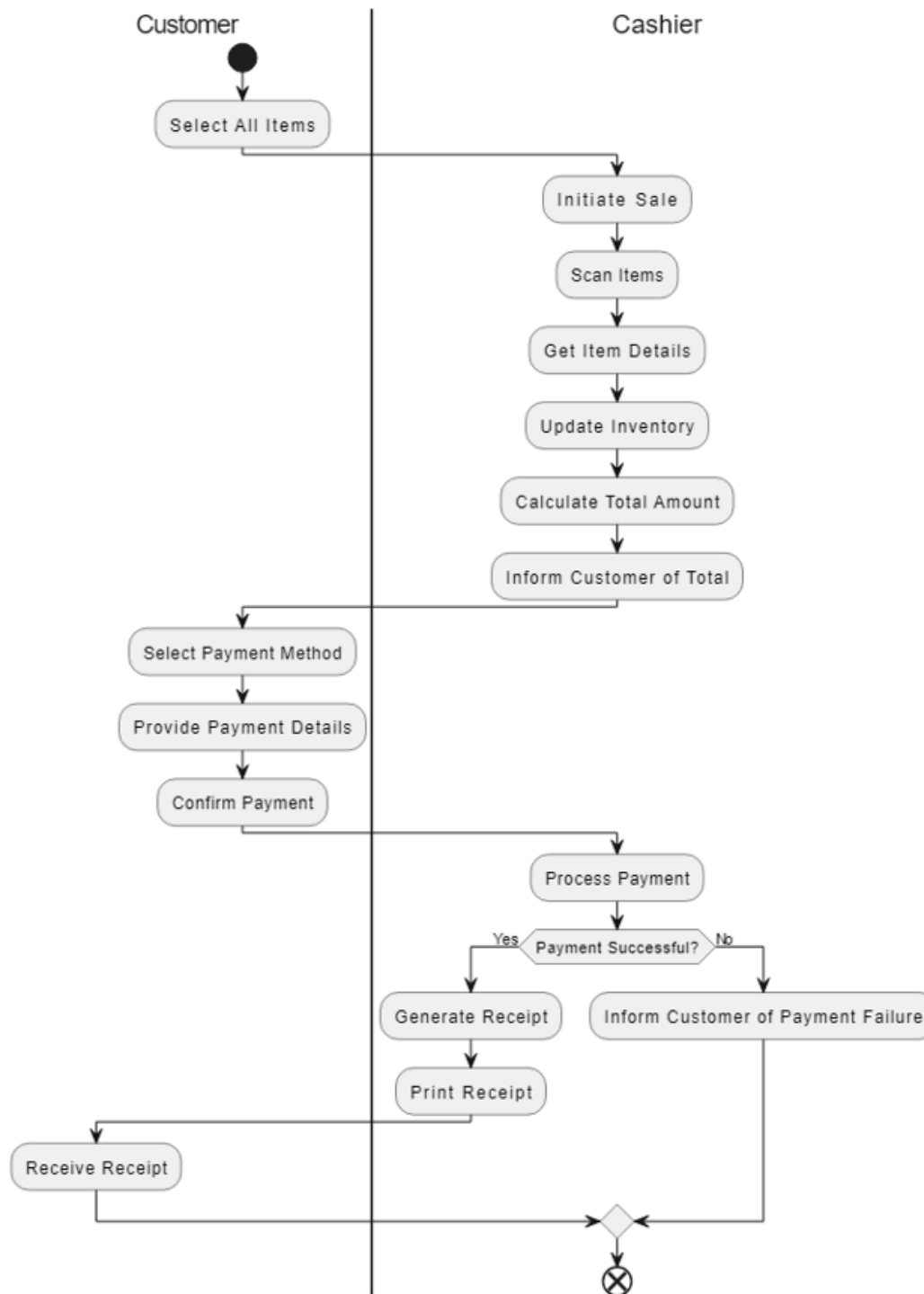


## Handle Returns:



## Activity Diagrams:

### Process Sales:



## Handle Returns:

