



Software Engineering (IT314)

Lab 06: Modeling Class Diagram and Activity Diagram

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1).

USE CASE: Processing Sale

ACTOR: Cashier

DESCRIPTION: For this use case we shall deal with the end to end process of completing a sales transaction which includes payment processing and receipt generation.

PRECONDITIONS:

- Cashier logged in to the POS system.
- Customers will select items to be purchased.

POSTCONDITIONS:

- Sale transaction will be completed.
- Receipt will be printed out for the customer.
- Inventory will be updated.
- Transaction will be stored in log file.

MAIN FLOW:

1. Cashier scans the bar code of the item.
2. POS will extract the details of that particular item such as its cost, category etc.
3. System will check the inventory to get whether the item is in stock or not.
4. Items will be added to the transaction list if it is available in stock.
5. Above steps will be repeated for every other item that the user is willing to purchase.
6. After scanning all the items, the POS will determine the total amount owed by the customer.
7. The customer selects the payment method such as via cash, card or UPI.
8. Customers can redeem coupons to avail discounts and the POS system will reduce the total amount accordingly.

9. Cashier will proceed ahead:
 - If the selected payment method is a card, then the cashier will swipe the card, and the system will process the payment.
 - If the selected payment method is cash, then the cashier will enter the amount received, and the system will calculate the change due to the customer.
10. After the payment is successfully completed, the POS system will generate a receipt for the same.

USE CASE: Handling Return

ACTOR: Cashier

DESCRIPTION: For this use case we shall deal with the process of handling a request to return the items purchased by a customer.

PRECONDITIONS:

- The cashier is logged in to the POS system.
- The customer will have items to return and a receipt for the original purchase.

POSTCONDITIONS:

- The returned items will be processed
- Inventory will be updated accordingly
- The return receipt will be printed out for the customer
- The return will be logged into the system

MAIN FLOW:

1. The customer will request the items that they want to return.
2. The cashier will ask for the original purchase receipt.
3. The cashier will verify the receipt and check the return policy such as what's the return duration, or any other terms and conditions which may apply.
4. Then the cashier will then scan the bar code of each item that is being returned.
5. The system will get the original purchase details from the Catalog System.
6. The system will update the Inventory System to add the items which are being

returned back into the stock.

7. The system will compute the refund amount which is due to the customer.

8. The cashier will process the refund using the original payment method that is either with cash or with a credit card.

- In case of cash payment: The cashier will prepare the cash refund.
- In case of credit card refund: The system will process the refund back to the card which was used for payment.

9. The system will generate a return receipt and print it out for the customer.

2). ENTITY OBJECTS

1. Product

- Represents the items which are up for sale and includes attributes like product ID, name, price, and stock quantity.

2. Transaction

- Represents a sale or return transaction which contains details such as transaction ID, data, items which are being sold or returned, payment method and the total amount to be paid or refunded.

3. Receipt

- It represents the printed receipt for transactions which includes the details of the transaction like items, prices, and payment information.

4. Customer

- It represents the user that is making a purchase or returning which includes the attributes like customer ID, name, and their contact details.

5. Coupon

- It represents the coupons that can be used to get a discount and it includes the attributes like coupon code, offer details, and its expiration date.

6. Inventory

- It represents the inventory database which tracks the level of stock for each product.

BOUNDARY OBJECTS

1. POSTerminalInterface

- It is a user interface by which the cashier can interact with the POS system which includes touch screen, buttons.

Barcode Scanner

- It is a device which is used to scan product bar codes and interact with the POS system to retrieve product information.

3. PaymentGatewayInterface

- It is an interface for processing credit card payments which connects to external payment systems.

4. ReceiptPrinter

- It is a boundary object which is responsible for printing transaction receipts for customers.

5. CouponInputInterface

- It is an Interface for the cashier to input or scan coupons during transactions.

CONTROL OBJECTS

1. Process-Sale Control

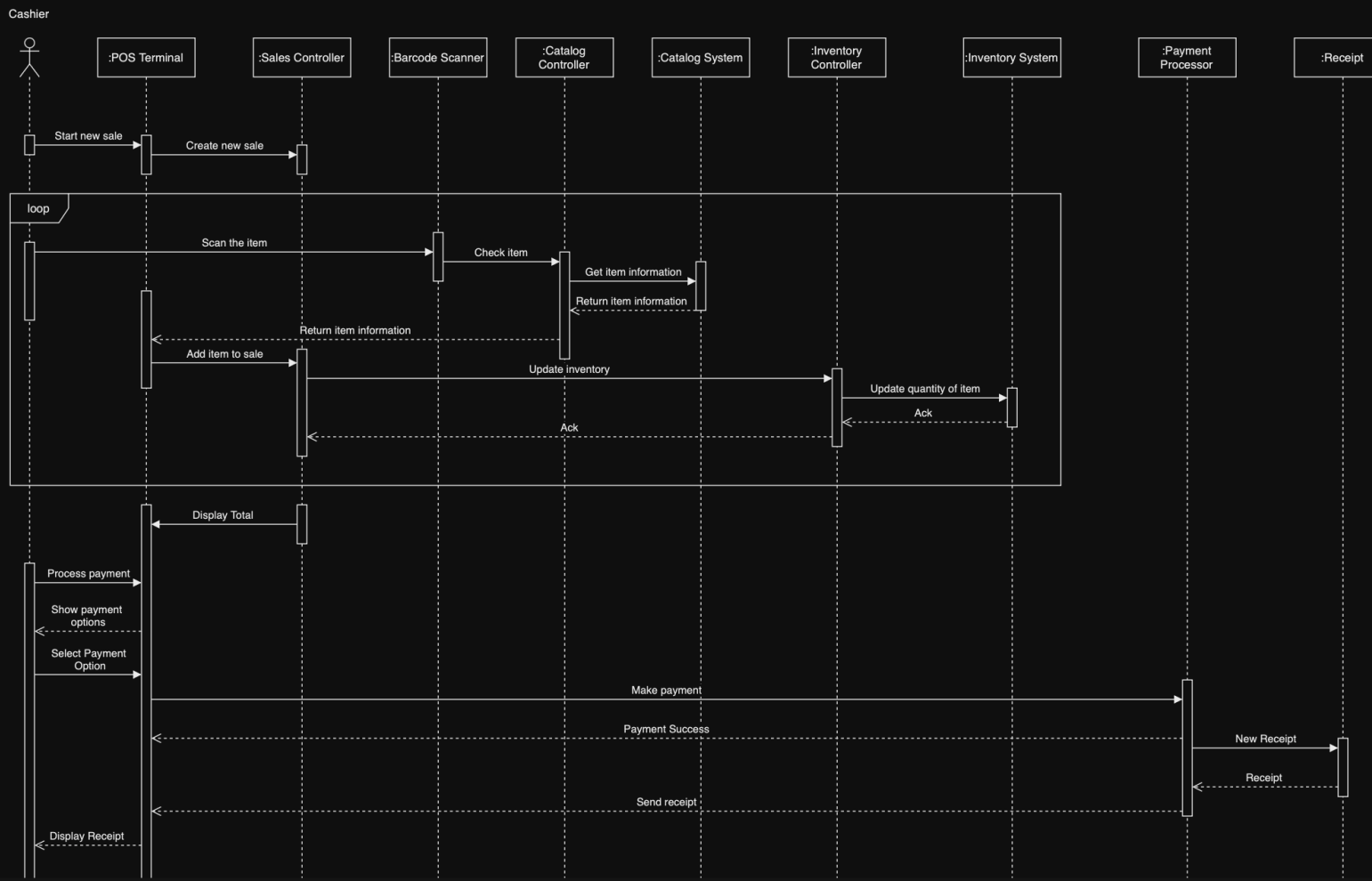
- It is created when the cashier starts a sale transaction in which it coordinates with the scanning of items, handles payment processing, and generates the receipt. It also manages the flow of data between the boundary objects that are Barcode Scanner, Payment Gateway and also with the entity objects that are Transaction and the Product..

2. HandleReturnControl

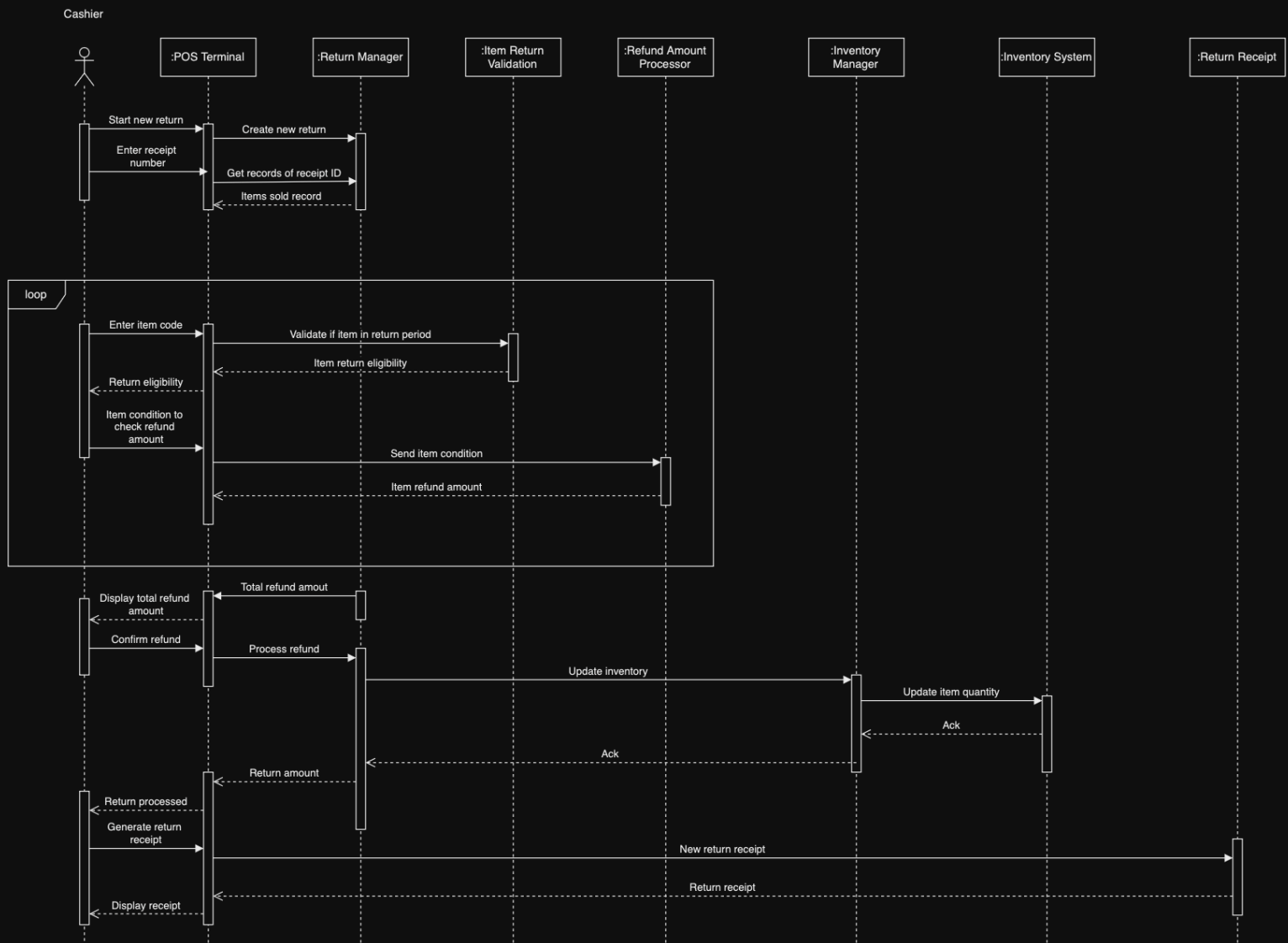
- It is created when the cashier starts processing a return. It also manages the scanning of returned items, and also checks the return policy, processes refunds, and generates return receipts. It also interacts with the relevant boundary and entity objects in the whole return process.

3)

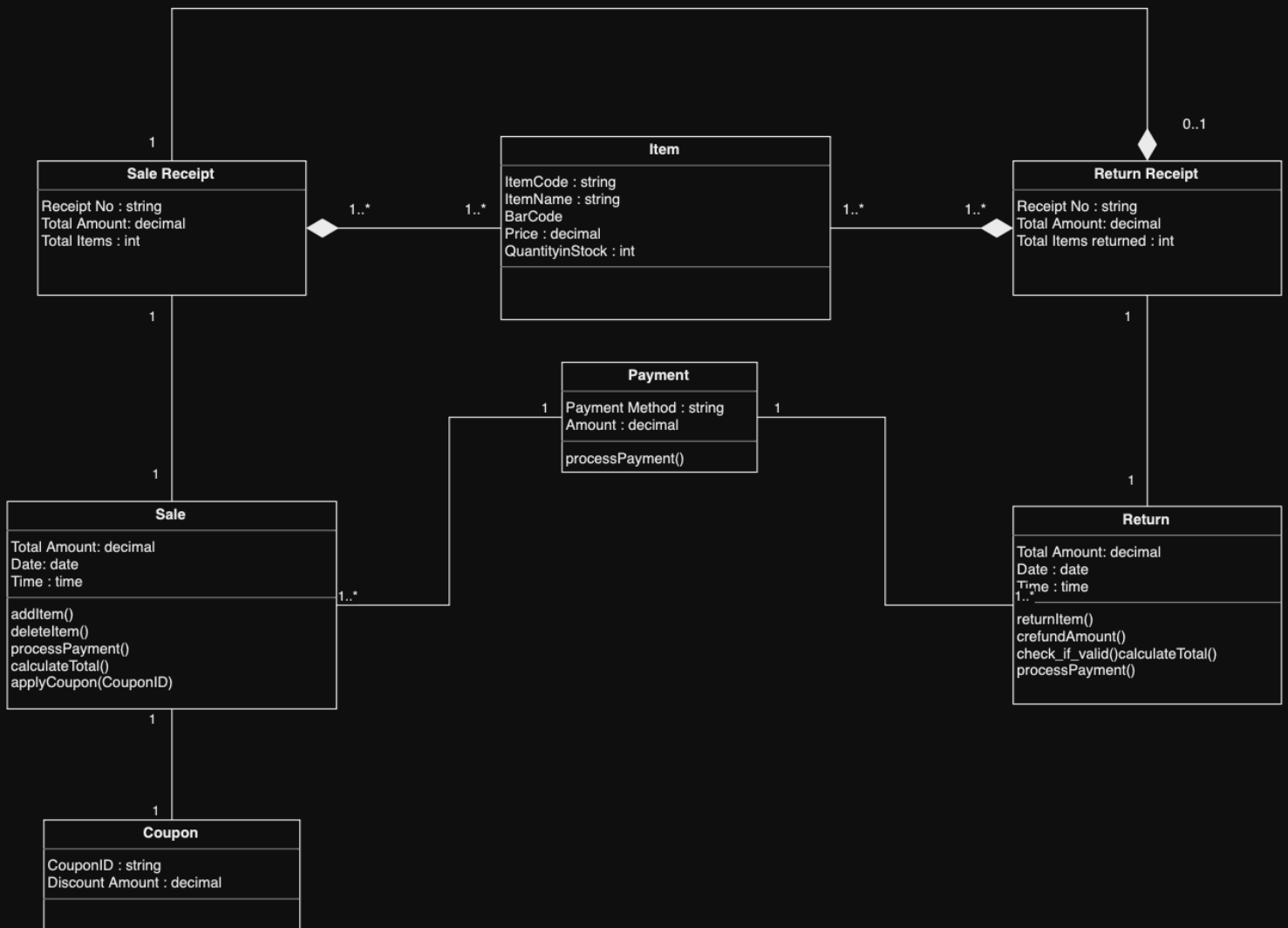
1. Sequence Diagram for Sale Processing



2. Sequence Diagram for Return Processing

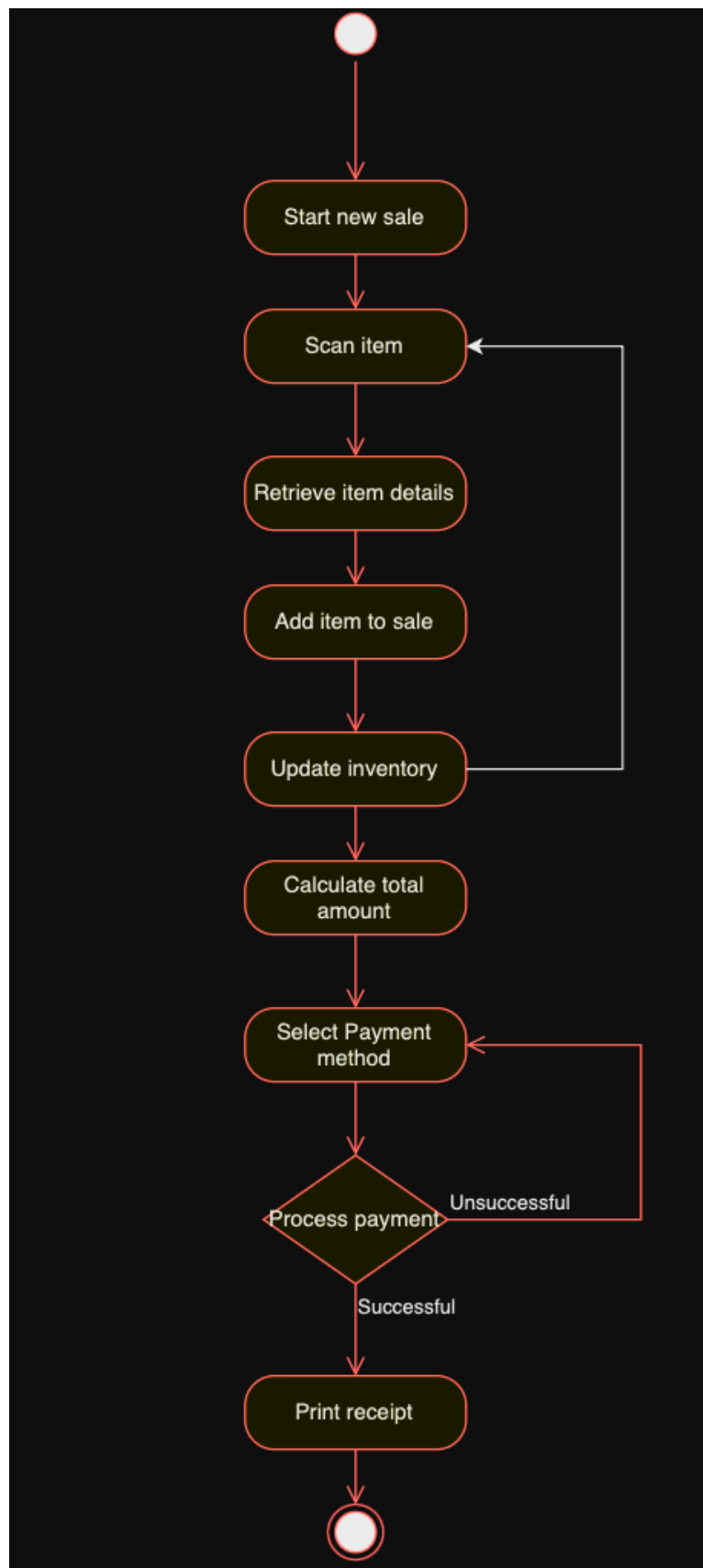


4.



5.

1. Sale Processing Activity Diagram



2. Return Processing Activity Diagram

