

Assignment # 1

SYSC 5704 – Model Driven Development of Real-Time and Distributed Software

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Submitted To
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By

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Answer: 1 (b)**1. Use Case Name:** Payment Process

Summary: Sales Assistant takes the payment from the customer

Actor: Sales Assistant

Preconditions: A welcome message is displayed on the screen in-front of the customer at the point of sale terminal.

Description:

- a. As soon as the customer comes at the cash counter, the payment process is started by the sales assistant.
- b. The payment process includes payment by credit card, debit card and with cash.
- c. In the cash process, the customer gives the cash to sales assistant for things/goods purchased by the sales assistant.
- d. In the case of credit card/debit card option, a customer inserts the credit card/debit card into the machine and the machine in-turn asks for pin.
- e. If the pin is correct, the approved message is displayed in-front of the sales assistant screen and the customer screen.
- f. The receipt will be printed for the successful transaction and the sales assistant gives the receipt to the customer.

Alternatives:

- a. The debit card/credit card machine may decline the transaction if the pin is wrongly entered.
- b. Also, the debit/credit card machine may decline the transaction for the following few reasons:
 - If the card has been reported stolen.
 - If the card is expired.
 - If the pin is wrongly 3 times in the debit card/ credit card machine at the POST.
 - If the customer enters the cancel button for some reasons in the credit card/debit card machine then the transaction gets cancelled.

Postcondition: Sales assistant ends the payment process after a successful transaction with a customer.

2. Use Case Name: Sell items/goods to customer

Summary: Sales assistant sells goods/items to the customer.

Actor: Sales Assistant

Preconditions: Customer comes at the Point of Sales Terminal with the things he/she has purchased and waits for the sales assistant to check out all the purchased things.

Description:

- a. Customer comes at the POST with the purchased things and waits for the sales assistant to check out.
- b. The sales assistant scans all the purchased items/goods and enters all the details into the cash machine.
- c. After entering the details into the cash machine, the cash machine comes up with the total amount and that amount is entered by the sales assistant into the debit/card machine. If the customer wish to pay with cash, then debit/card machine is not required for the transaction.
- d. Customer inserts the debit card/credit card into the card machine and pays the total amount mentioned on the screen in-front of him
- e. After a successful transaction, customer takes the receipt from the cashier.

Alternatives:

- a. Barcode reader sometimes fails to read/scan the barcode on the items. In that case, the cashier has to manually enter a barcode mentioned on the item.
- b. Customers sometimes may try to purchase an expired items or product. In that case, the expiry information comes on the main screen as soon as the cashier scans the items by using barcode reader and in-turn cashier stops the customer not to purchase the expired things.
- c. If the cashier notices that you have purchased an item which is opened somehow then he/she will not let you purchase that items.

PostConditions: The same in this case also as in the use case 1 that sales assistant ends the payment process after a successful transaction with a customer.

Answer: 2.2 (a)

For the use cases describe in 1.1b, the participant objects involved in **Use Case 1** i.e. Sell items to customer are as follows:

1. Sales Assistant
2. Keyboard
3. Barcode Reader
4. Display
5. Weighing Scale
6. Debit Card/Credit Card
7. Debit Card Machine /Credit Card Machine
8. Customer

The participant objects involved in **Use Case 2** i.e. payment process are as follows:

1. Cash
2. Debit Card
3. Credit Card
4. Receipt Printer
5. Display
6. Sales Assistant
7. Customer

Answer 2.2(c)

In the Use Case 1 i.e. Payment Process, the information passed between objects are as follows:-

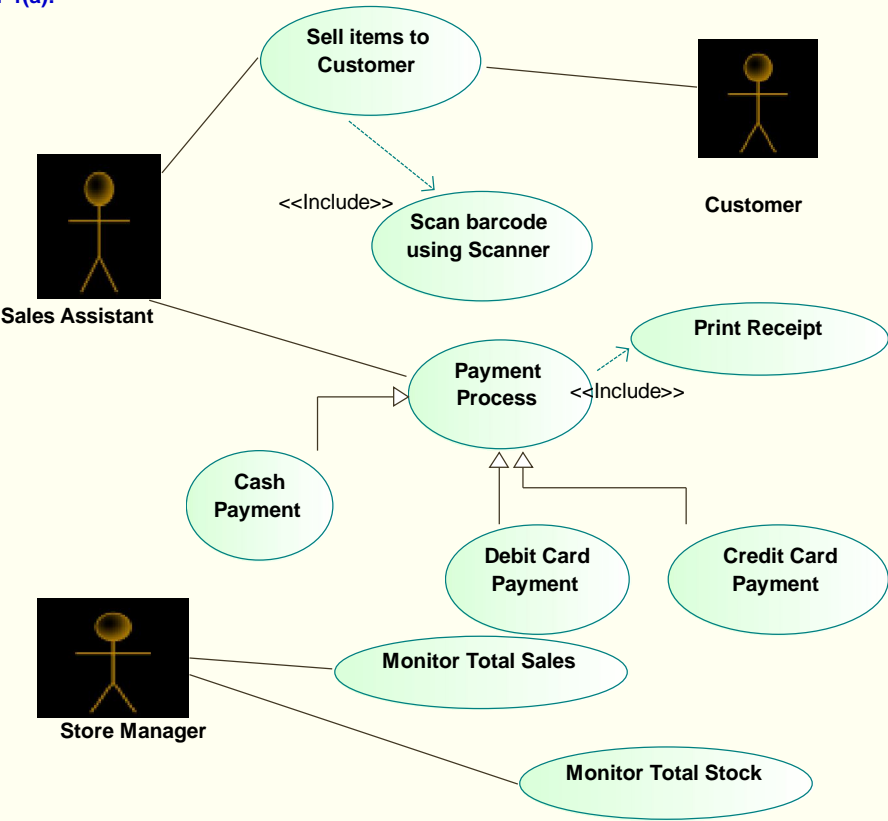
- a. The 1st process which takes place in between the barcode reader and Point of Sale Terminal objects is scanning using barcode reader
- b. The 2nd process is the measurement of weight for the products which require measurement of weight. It takes place in between Point of Sales Terminal and weighing scale objects.
- c. The receipt printer device prints the details of the items purchased by the customer. It takes place in between Point of Sale Terminal and display objects.
- d. The display device display the items customer has purchased which is available both on customer and sales assistant side. It takes place in between Point of Sales Terminal and Display objects.
- e. The last process which is the payment process that includes payment by credit card/debit card or cash. It takes place in between Point of Sales Terminal and Debit Card/Credit Card machine objects.

In the Use Case 2 i.e. Sell items to customer, the information passed between objects are as follows:-

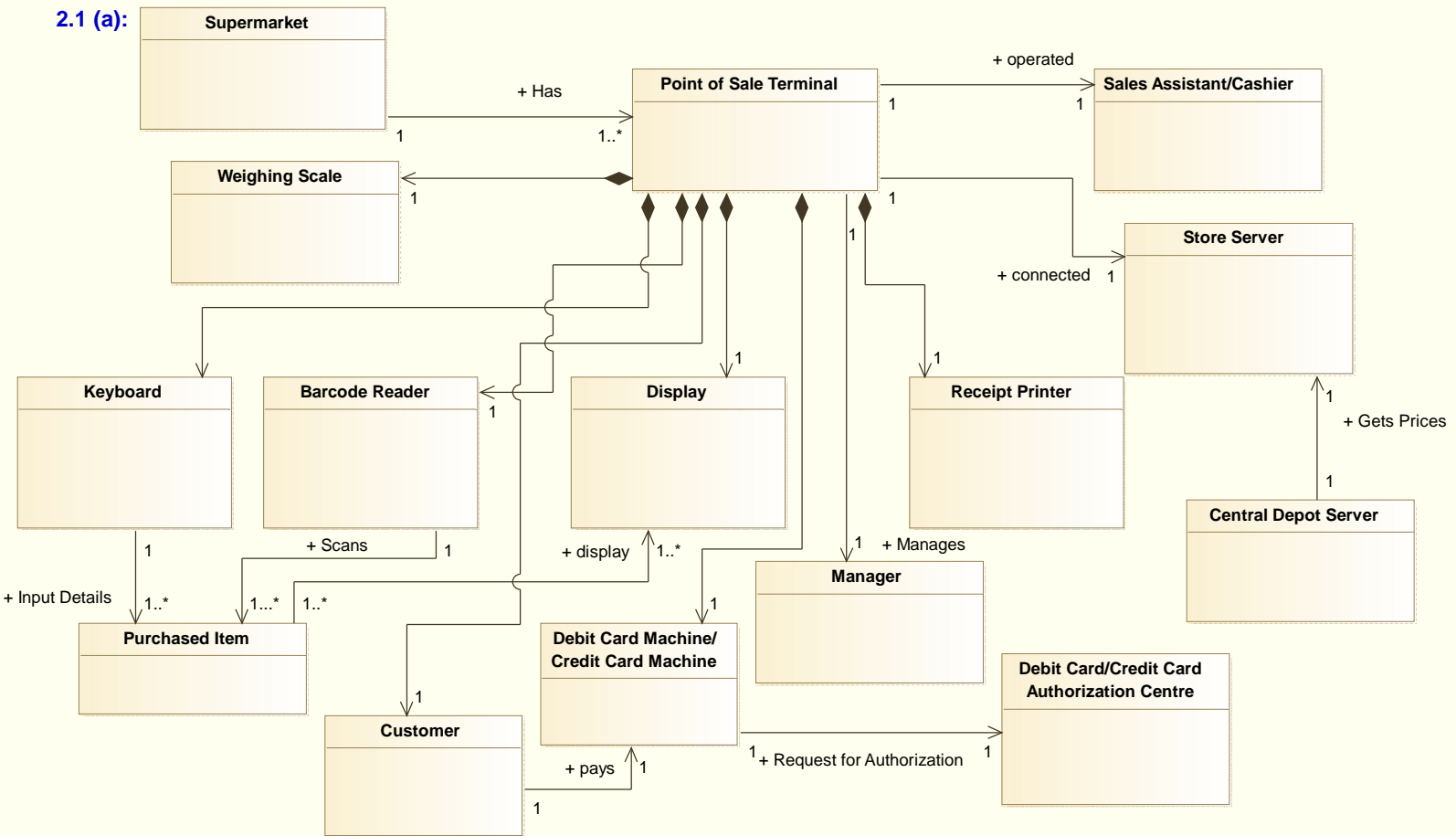
- a. Scanning using barcode reader for items having bar code takes place in between point of sale terminal and bar code reader objects. This is 1st process in this sequence diagram.
- b. Measurement of weight takes place for the products which require measurement and upon that measurement, the amount is calculated. This process takes place in between Point of Sale Terminal and Weighing scale and this is 2nd process in the sequence diagram
- c. The receipt printer prints the details of the items the customer has purchased that includes short name, price, discount, total amount, etc. This process happens in between Point of Sale Terminal and receipt printer and this is 3rd process in the sequence diagram.
- d. The display device displays the products/goods the customer has purchased which is available both on the customer side and the sales assistant side at Point of Sale Terminal. It takes place in between Point of Sales Terminal and Display objects.
- e. The payment process is the 5th process that includes payment by credit card/debit card or cash. It happens between Point of Sales Terminal and Debit Card/Credit Card machine objects.

f. The last process is handling out the purchased goods to customer and giving the receipt.

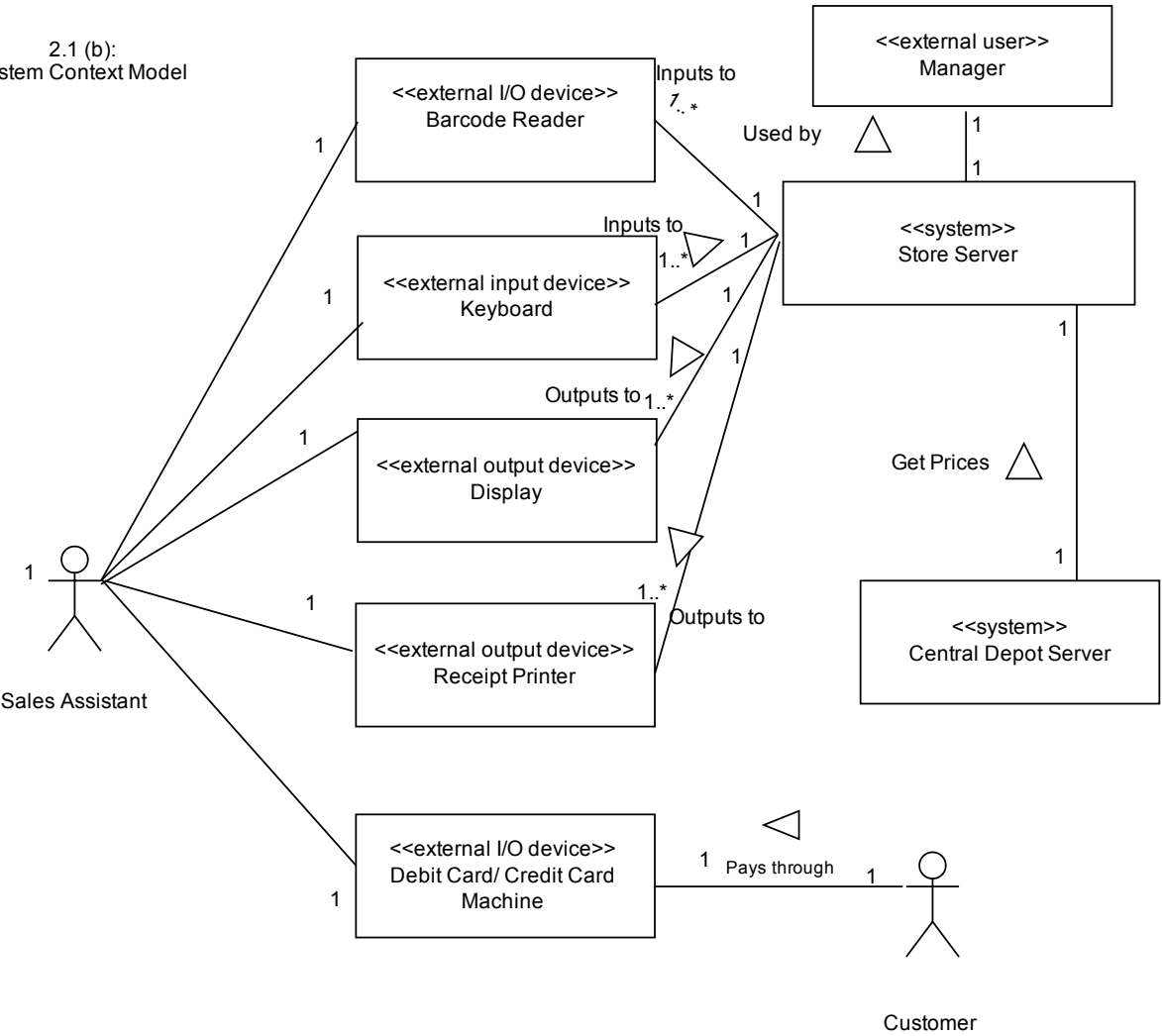
Answer 1(a):

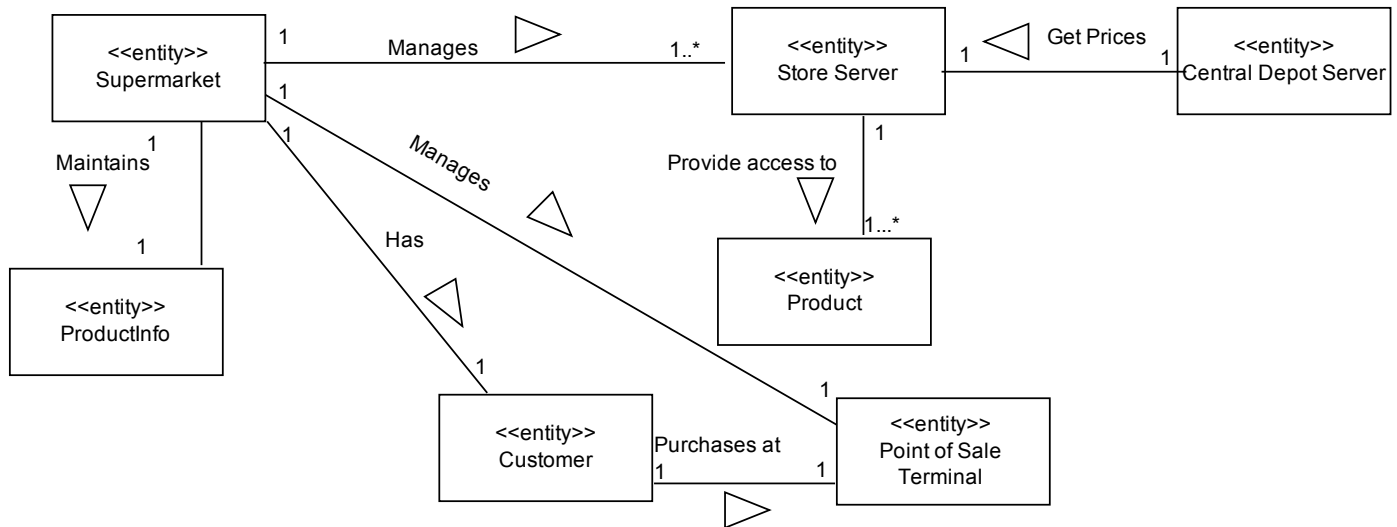


2.1 (a):

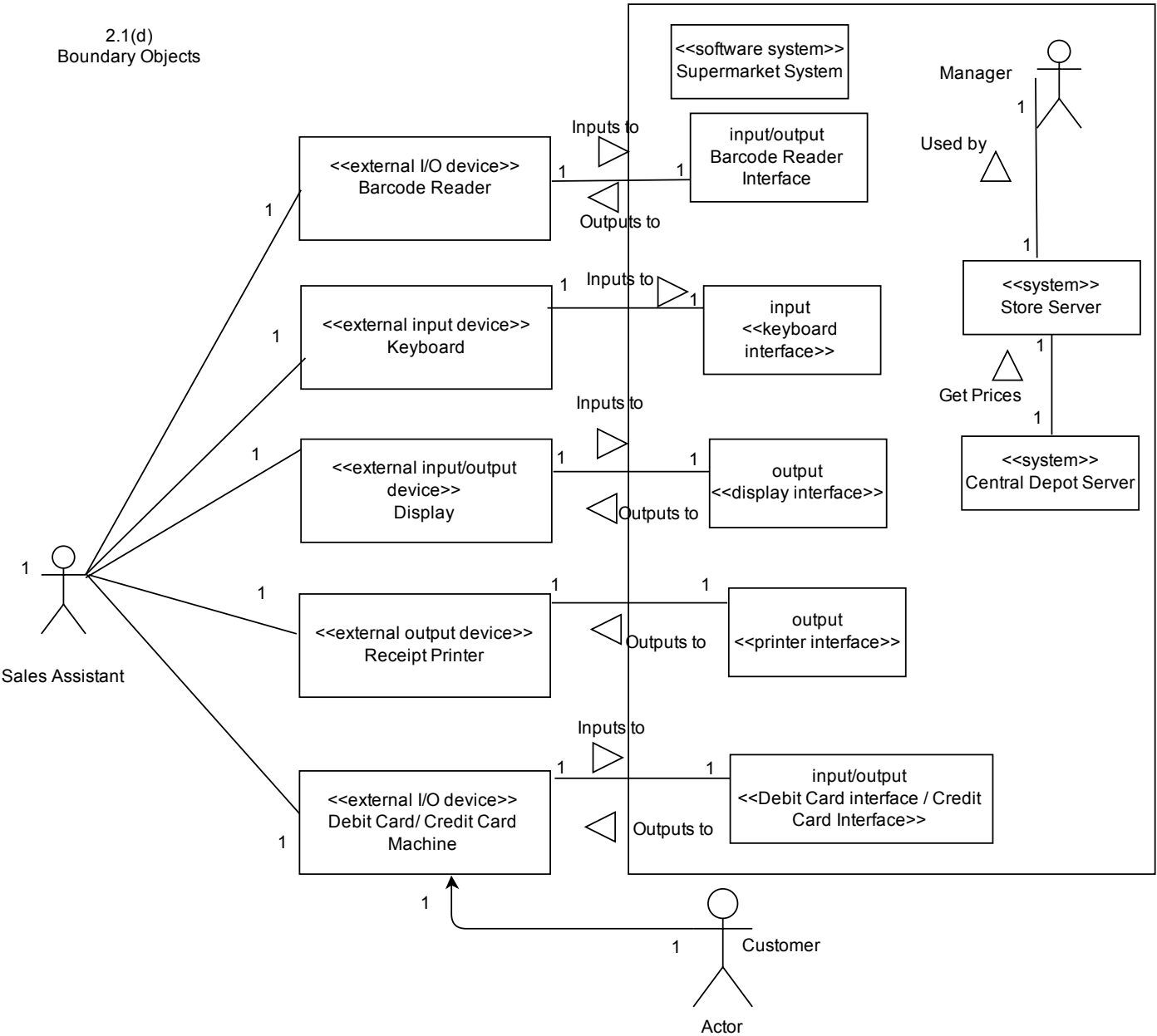


2.1 (b):
System Context Model

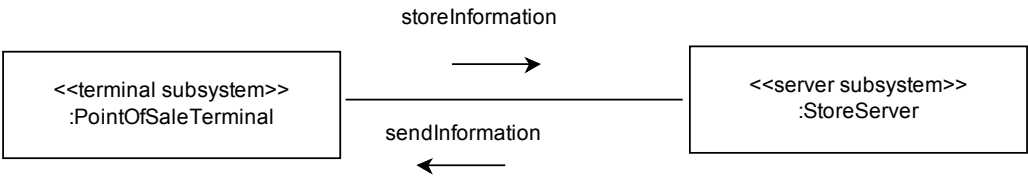


2.1(c):
Entity Classes

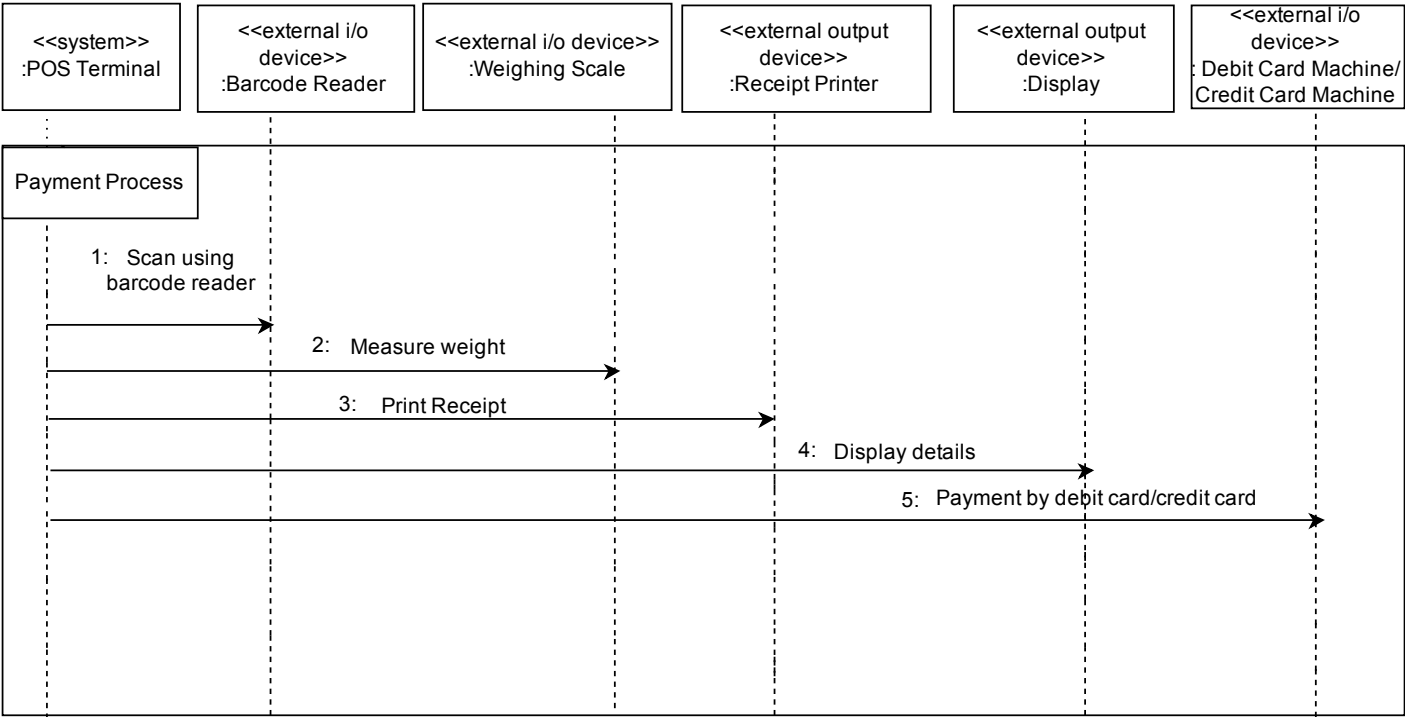
2.1(d)
Boundary Objects



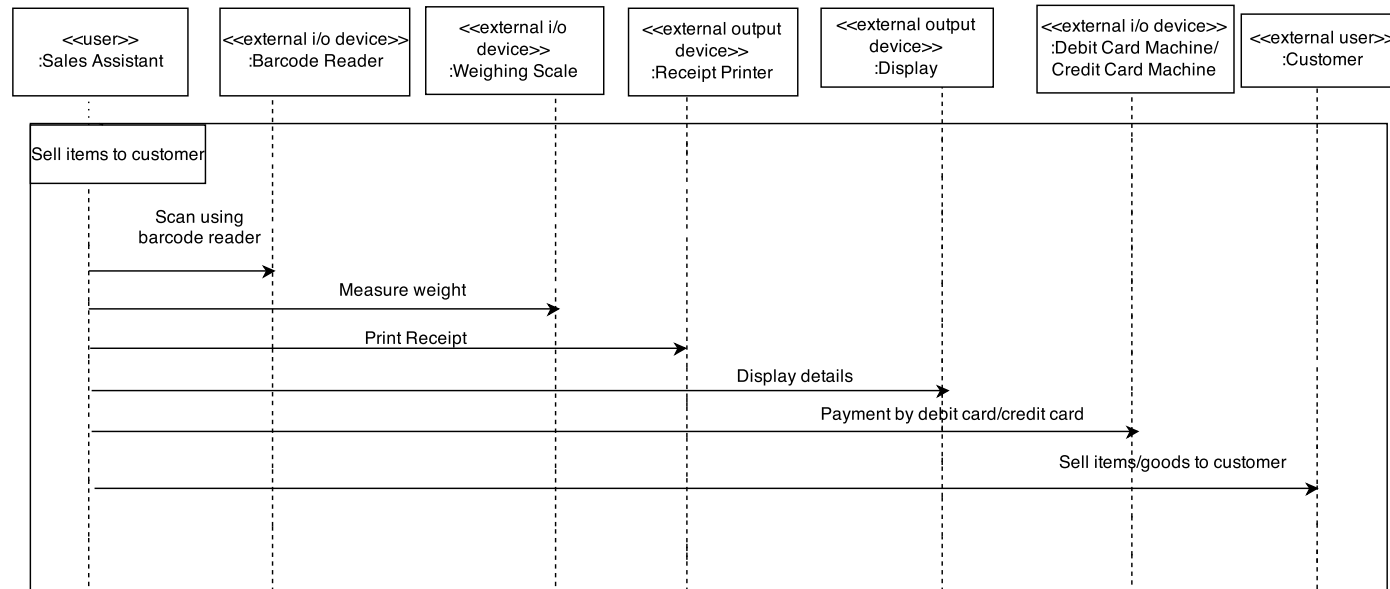
2.1(e)
System Structure



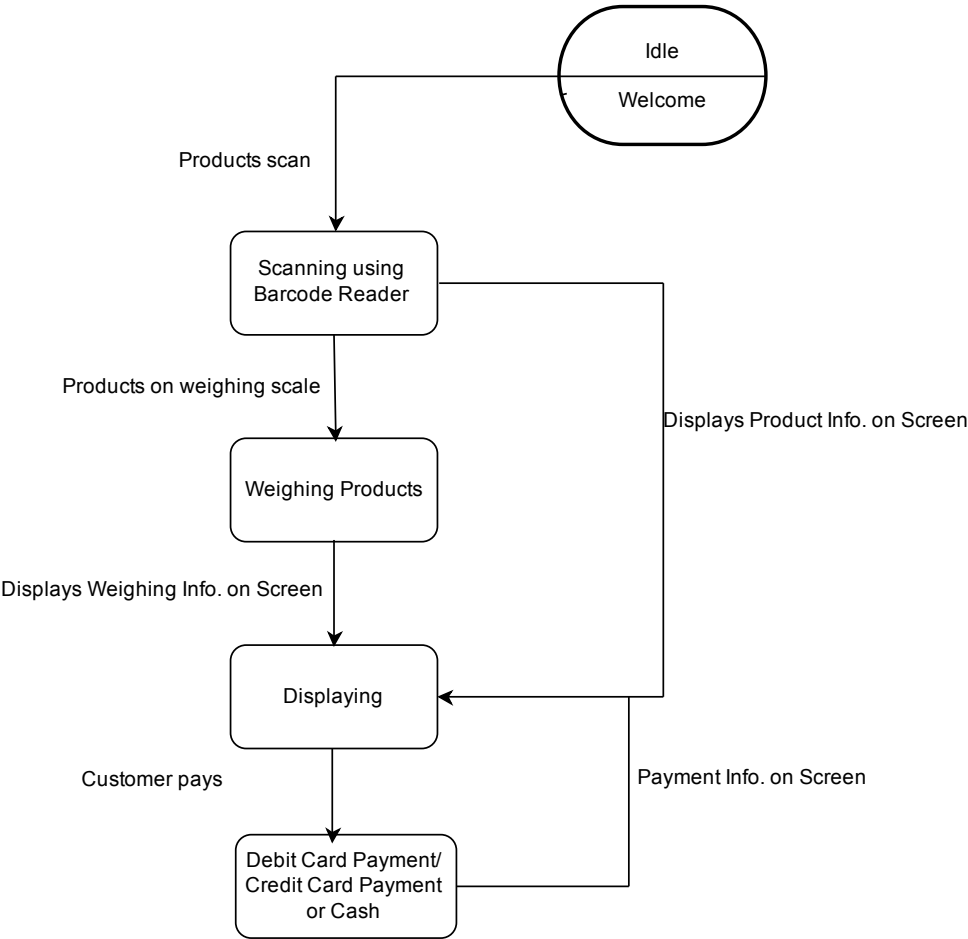
2.2(b)
Sequence Diagram_UseCase1(Payment Process Happy Path)



2.2(b) Sequence Diagram_Use Case2 (Sell Items to Customer Happy Path)



2.2(d)
State Chart Diagram of UseCase1(Payment Process)



2.2(d)
State Chart Diagram of
UseCase2(Sell Items to Customer)

