SEMESTER PROJECT

SOFTWARE DESIGN AND ANALYSIS

ONLINE GROCERY STORE

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1. INTRODUCTION

i. Purpose and Objectives

The purpose of this project is to create an Online Grocery Store which consists of two interfaces- Customer View and Manager View. Customer side enables a customer to view different grocery items, add them to card, and pay for them by choosing either cash on delivery or online payment. The Manager side allows a manager to view all the registered customers, the feedbacks and complaints customers give regarding products and services, and add or update items available to customers too.

2. NON FUNCTIONAL REQUIREMENTS

i. Performance Requirements

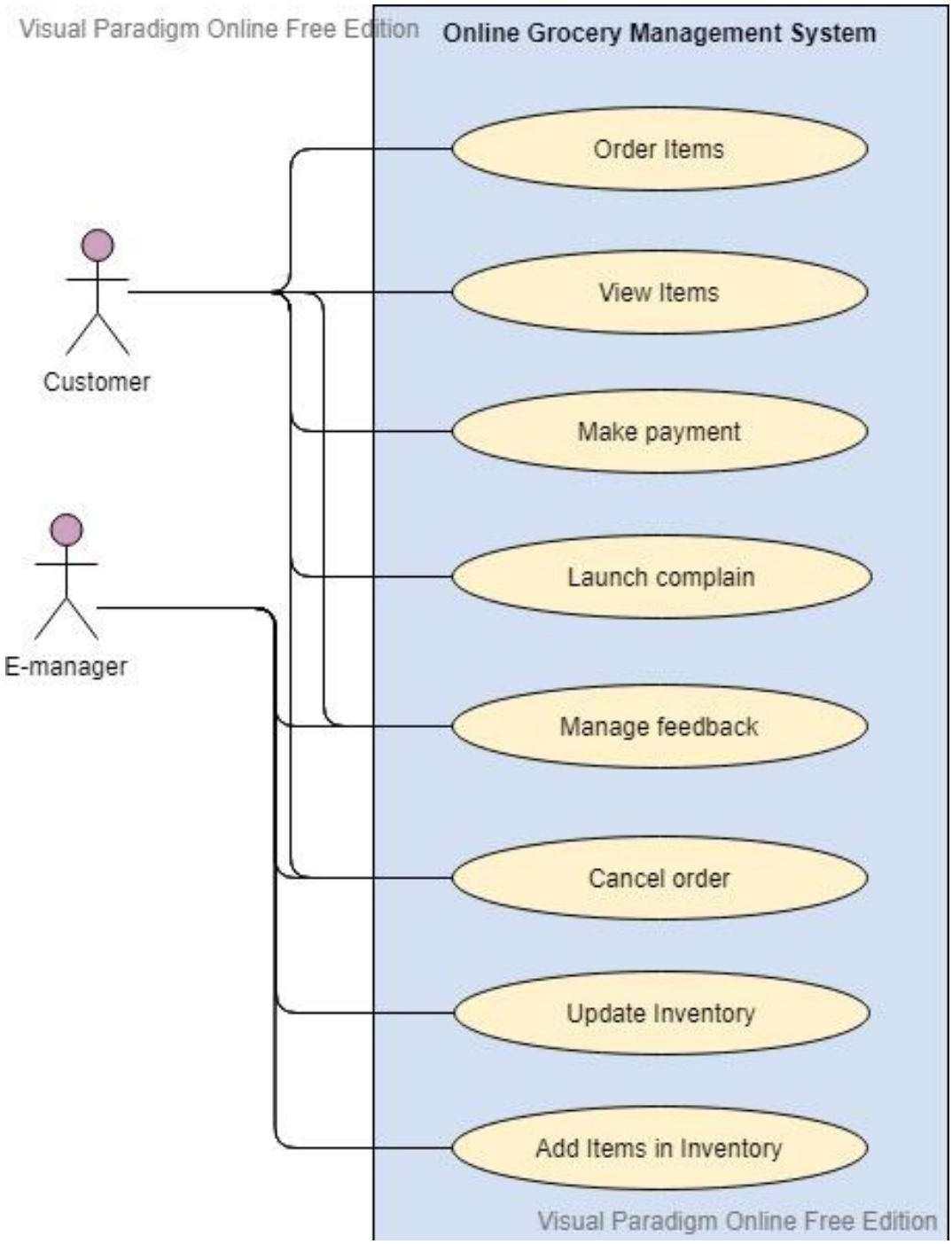
The product we're making is a website so the only performance requirement is a stable internet connection while using application.

ii. Software Quality Attributes

This website will be regularly updated to keep track of customer reviews. Managers will be responsible for adding and updating all the new incoming and available items in store. The website will be accessible from any location as long as a stable internet connection is provided. The UI and functionality of the application is highly user friendly with every button and screen clearly explaining what it does.

3. DESIGN AND ANALYSIS

i. Use Case Diagram



ii. High Level Use Cases

1. View Item

ID: UC1

Actors: Customer

Scope: Online Grocery System

Level: User-goal level

Stakeholders: Customer; wants easily visible display of items shown or entered bycustomer.
Preconditions: Customer is already registered i.e. has a verified account madeand authenticated.
Summary: Customer goes to the site to view the items. Customer can search thespecific item by providing its details

Main Success Scenario:

Actor Action	System response
1. Customer opens the site to view grocery items.	
2. Customer searches the specific item.	
	3. System provides list of available items.

Alternate Scenario:

When the item searched is not available in the list

Actor Action	System response
1. Customer opens the site to view grocery items.	
2. Customer searches the item.	
	3. System provides list of relevant items against the search.

2. Order Item

ID: UC2

Scope: Online Grocery System

Level: User-goal level

Actors: Customer

Stakeholders: Customer; want to order grocery items and get them delivered attheir doorstep.

Preconditions: Customer is already registered i.e. has a verified account madeand authenticated.

Post conditions: Sale is saved. Bill is calculated. Inventory is updated. Receipt isgenerated.

Summary: Customer goes to the site and searches for the specific item by providing its details. System starts new sale and checks availability of the item customer is looking for. Customer selects the item, adds it to the cart and proceeds with the order. System changes the status of the item and asks for details from customer. System then presents the total bill and details. Customerconfirms the order. System updates the status in the inventory and presents receipt.

Main Success Scenario:

Actor Action	System response
1. Customer opens the site and provides identification details.	
	2. System validates the provided details.
	3. System starts a new sale.
4. Customer enters the specific item to search.	
	5. System checks the availability of required item and presents a list of available items.
6. Customer selects the item from the displayed list and adds it in the cart.	
	7. System updates the status of item in the inventory.
Iterate over step 6 and 7 until done.	
8. Customer proceeds with the order.	
	9. System logs the item information (name, quantity), order date and time. 10. System asks for the address of the customer and other details. 11. System calculates the bill and presents other details.
12. Customer confirms the details.	
	13. System presents a receipt, order tracking details and updates the inventory and status of the items.

Alternate Scenario:

System fails at any time.

Actor Action	System response
1. E-manager restarts the system, logsin by providing identification details and requests system for recovery of previous state.	
	2. System reconstructs prior state.If system detects any error, then it signals back to the E-manager.
3. E-manager allows the system to start a new session.	

Item not identified by the system

Actor Action	System response
	1. System could not find the item in the inventory.
E-manager responds to the error message by manually entering the item ID.	
	System identifies the item and displays it.

3. Cancel Order

ID: UC3

Scope: Online Grocery System

Level: User-goal level

Actors: Customer

Stakeholders:

Customer: wants to cancel the order.

Pre-Conditions: Customer has already logged in the system and filled items in cart. The items that are present in the cart have ‘in cart’ status. The items that areavailable in inventory have ‘in inventory’ status. The items that are sold out have‘sold’ status.

Post Conditions: Customer cancels his order and the cart is emptied again.

Summary: Customer cancels the order instead of confirmation. System emptiesthe cart and updates the item status in inventory

Main Success Scenario:

Actor Actions	System Response
	1. System asks for confirmation of the order.
2. Customer denies the confirmation andcancels the order.	
	3. System asks for the confirmation to cancel the order and empty cart.
4. Customer provides confirmation.	
	5. System empties the cart, changes the products status back to available in inventory.
	6. System calls 'view products' use case.

Alternate Scenario:

2a. Customer doesn't cancel the order here but proceeds till make payment use case and then cancels there when system asks for paymentconfirmation.
4a. Customer denies the confirmation to cancel the order and continues on with the same order.

4. Launch Complaint

ID: UC4

Scope: Online Grocery System

Level: User-goal level

Actors: Customers, E-Manager

Stakeholders: Manager

Customers: Customer want to launch the complaint against the product.

E-Manager: Looks for the complaint and give possible solutions to the Customer against the Complain

Pre-Condition: Customer has Received the order.

Post Condition: Customer Successfully launched the complaint and replaced order is received to the Customer.

Summary: Customers launch the complain about the product.

Main Success Scenario:

Actor Action.	System Response.
1. Customer Opens the online grocery store to launch complain.	
2. Customer selects the Order item from the list of orders and add complain.	
	3. System add the Complaint against the complaint ID and set status “unresolved”
4. E-Manager look for the key words in the complaint and suggest the possible solutions against the complaint.	
5. Customer selects the options.	
6. E-manager solves the complaint by considering the preference of the Customer	
	7. Systems set the Status as “Resolved”

Alternate Scenario:

Actor Action.	System Response.
1. Customer Opens the online grocery store to launch complain.	
2. Customer selects the Order item from the list of orders and add complain.	
	3. System add the Complaint against the complaint ID.
4b. E-Manager ask the Customer to return the product and to select any other item form the Store.	
5b. Customer selects the new product and deliver the old product to the Store.	
	6. System Confirm the delivery of the product. And give the estimated delivery time to the Customer.
7. Customer Receive the Product.	

5. Give FeedBack

ID: UC5

Scope: Online Grocery System

Level: User-goal level

Actors: Customers

Stakeholders:

Customer: Customer wants to give the feedback of the product.

Pre-Condition: Customer has Received the order.

Post Condition: Customer has successfully given review for the product.

Summary: The product is received and user enters the feedback for the received product.

Main Success Scenario:

Actor Action.	System Response.
1. Customer Opens the online grocery store to give Feedback for the Product.	
2. Customer selects for the order he want to give Feedback.	
	3. System record the feedback against the Order Number.

Alternate Scenario:

Actor Action.	System Response.
1. Customer Opens the online grocery store to give Feedback for the Product.	
2b. Customer give feedback about the availability of the items.	
	3.System record the feedback against the User ID.

6. Update Inventory

ID: UC6

Scope: Online Grocery System

Level: User-goal level

Actors: E-manager, vendor

Stakeholders: E-manager; want to add items in the inventory so that items aremade available to the customers.

Preconditions: System must be logged in E-manager mode.

Post conditions: Inventory will be updated.

Summary: Items are supplied by the vendor. E-manager updates the inventory byentering the item details in the system.

Main Success Scenario:

Actor Action	System response

1. Vendor will supply the items. 2. E-manager will enter the details of item (name, quantity) in the system.	
	3. System will add the item in the inventory, update the status of item.
Iterate over step 2 and 3 until done.	

Alternate Scenario:

After the items have been updated in the inventory, defected items cometo notice.

Actor Action	System response
1. Vendor will supply the items. 2. E-manager will enter the details of item (name, quantity) in the system.	
	3. System will add the item in the inventory, update the status of item.
Iterate over step 2 and 3 until done	
4. E-manager will enter the details ofitem to be removed from the inventory and settle it with the Vendor.	
	5. System will remove the item and update the inventory.

7. *Add Items in Inventory*

ID: UC7

Scope: Online Grocery System

Level: User-goal level

Actors: E-manager

Stakeholders:

E-manager: wants to add more items in the inventory.

Pre-Conditions: E-manager has already logged in the system and is on theinventory page.

Post Conditions: E-manager adds items/products in the inventory.

Summary: E-manager logs in to the system and starts adding new item details in the inventory. System verifies the details of added items and asks for confirmationfrom manager. E-manager confirms the change. System updates the inventory status.

Main Success Scenario:

Actor Actions	System Response
1. E-manager opens the inventory screen and goes to 'add items'.	
	2. System asks to enter the items details and quantity.
3. E-manager provides the required details.	
4. E-manager adds the item to inventory.	
	5. System asks for confirmation to add items to the inventory.
6. E-manager confirms the update.	
7. Iterate steps 2-5 until all required items added.	

Alternate Scenario:

5a. E-manager cancels the action. System returns to the step 2.

8. *Make Payment*

ID: UC8

Scope: Online Grocery System

Level: User-goal level

Actors: Customers

Stakeholders:

Customer: Customer wants to give the feedback of the product.

Pre-Condition: Customer has ordered the item.

Post Condition: Cusatomer has sucessfully paid for the Order

Summary: The payment for the order has been sucessfully made.

Main Success Scenario:

Actor Action.	System Response.

1. Customers ask for the payment against the order	
	2. System displays the payment details against the order.
3. Customer enters the credentials for the VISA Card	
	4. System verify the credentials
	5. System checks for the available credit in the visa account
6. Customers confirms the payment	
	7. Systems withdraw the amount from the account. And update it.

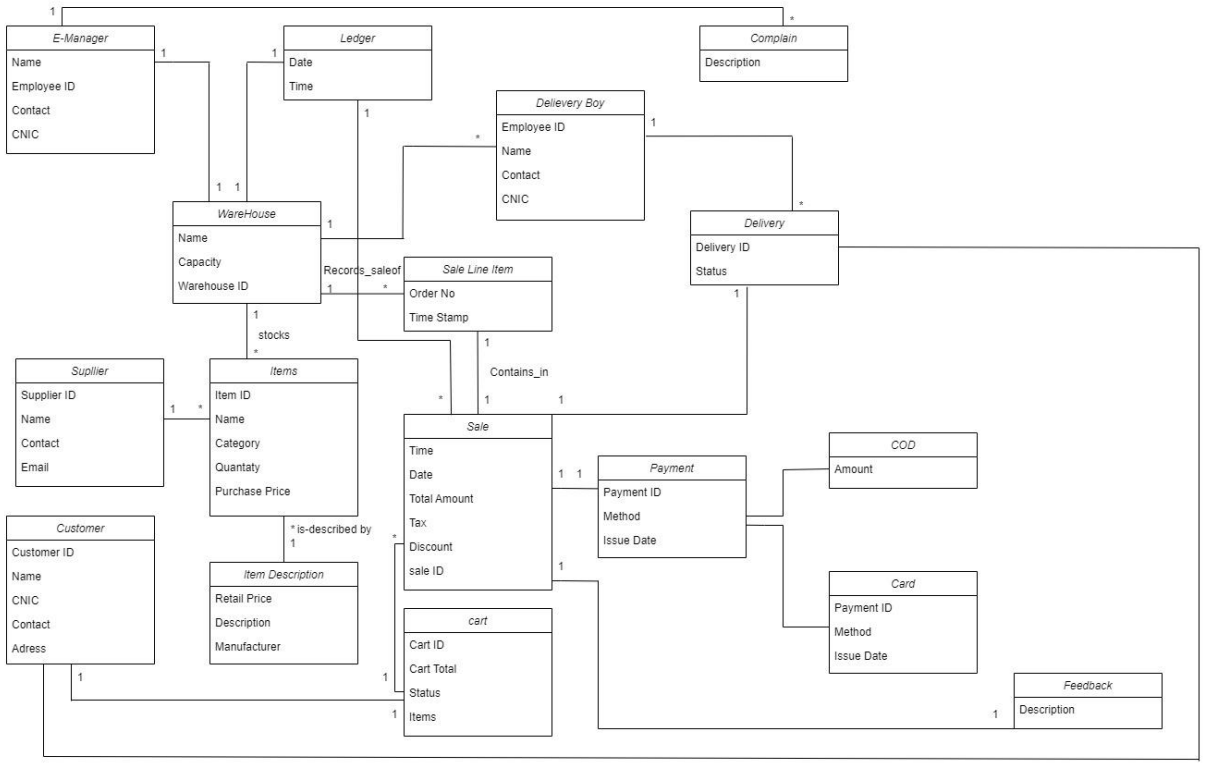
Alternate Scenario:

Actor Action.	System Response.
1.Customers ask for the payment against the order	
	2.System displays the payment details against the order.
3b.Customer enters the credentials for the Master Card	
	4.System verify the credentials
	5b.System checks for the available credit in the mastercard account
6.Customers confirms the payment	
	7.Systems withdraw the amount from the account. And update it.

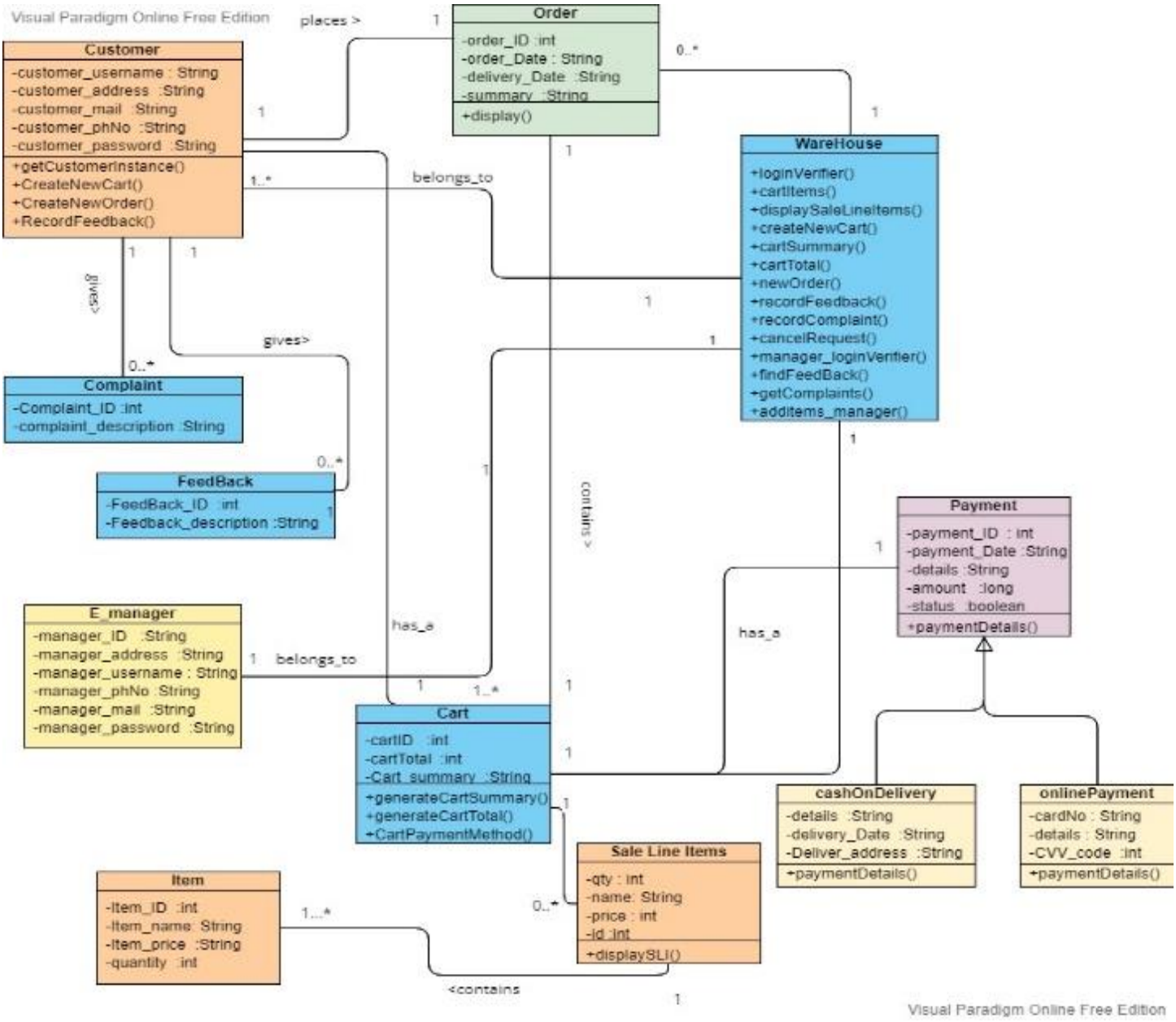
iii. Domain Model

Domain Model

Online Grocery Store.

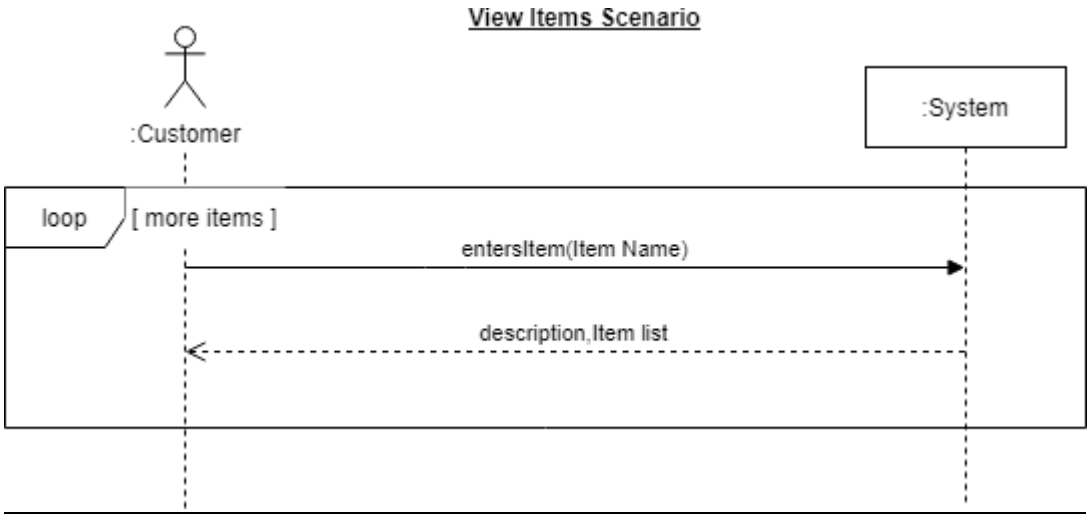


iv. Class Diagram

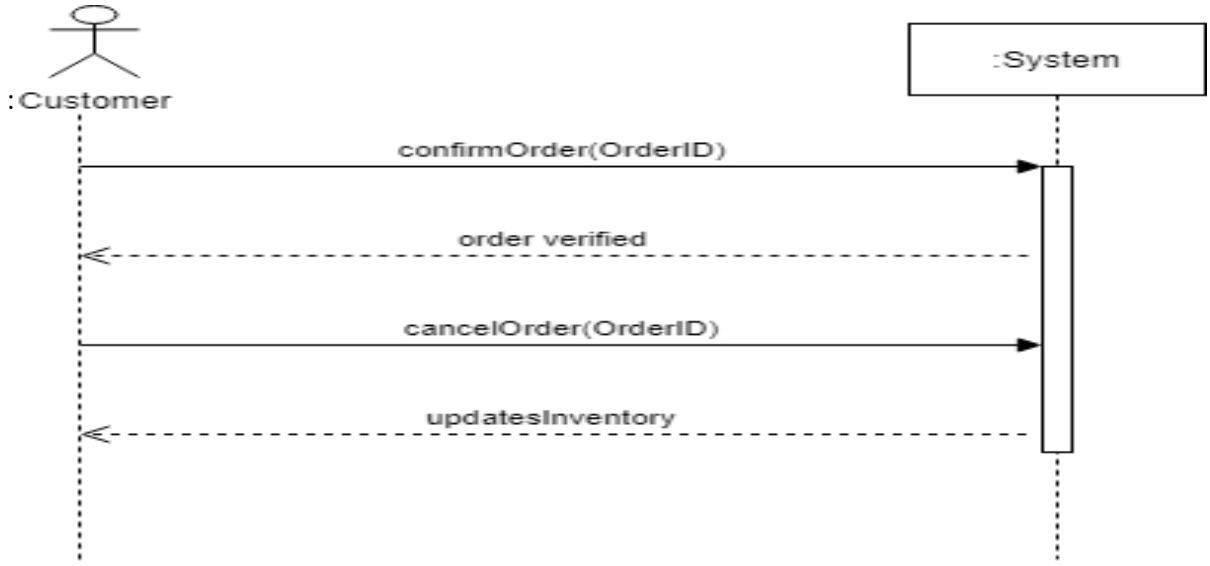


v. System Sequence Diagram

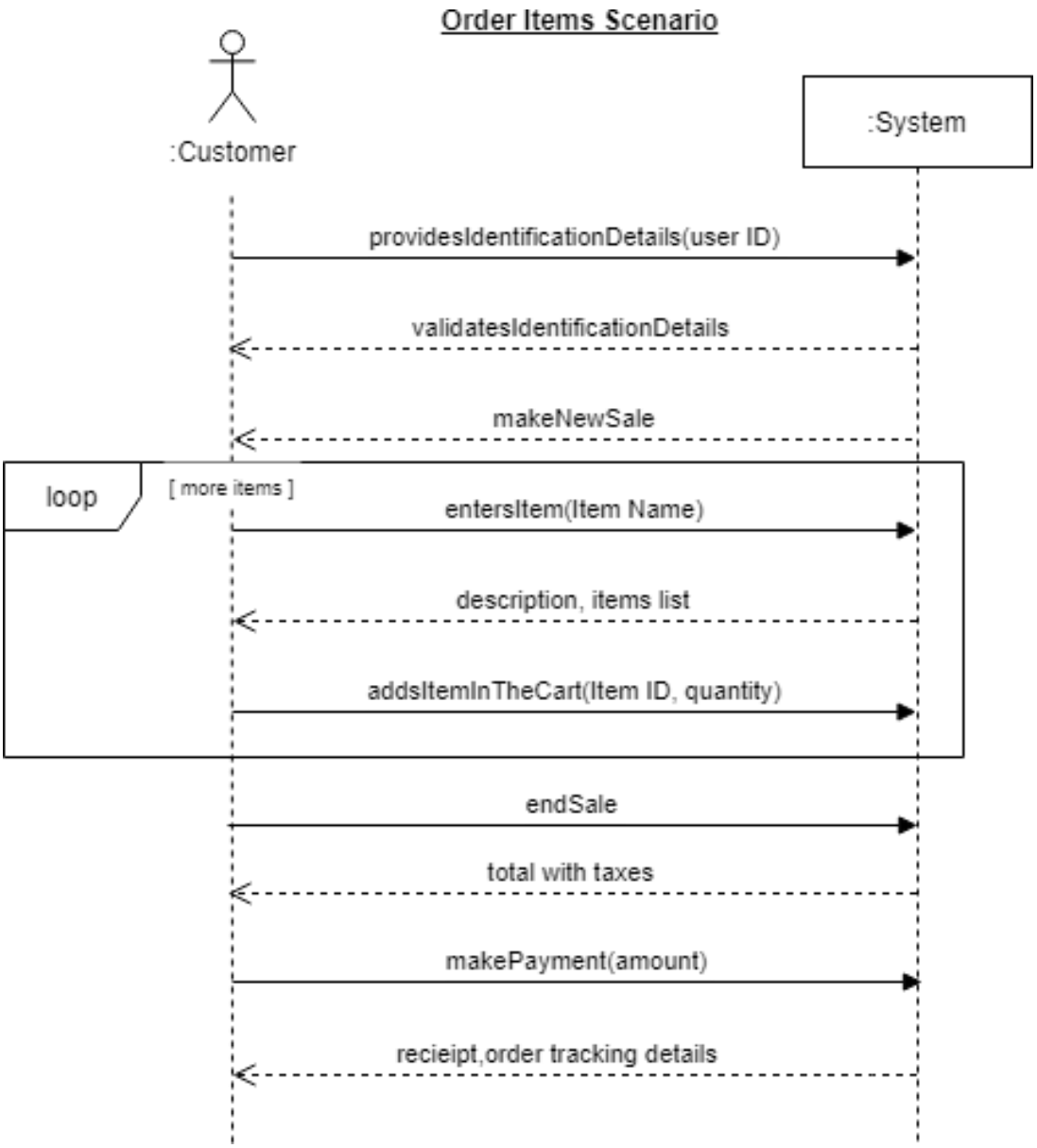
5.1: View Item



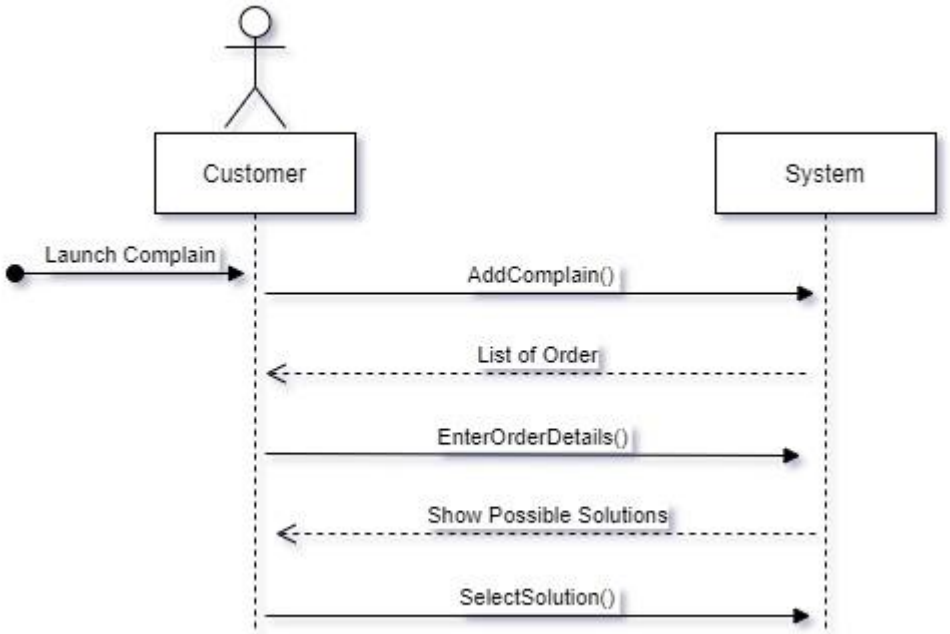
5.2: Cancel Order



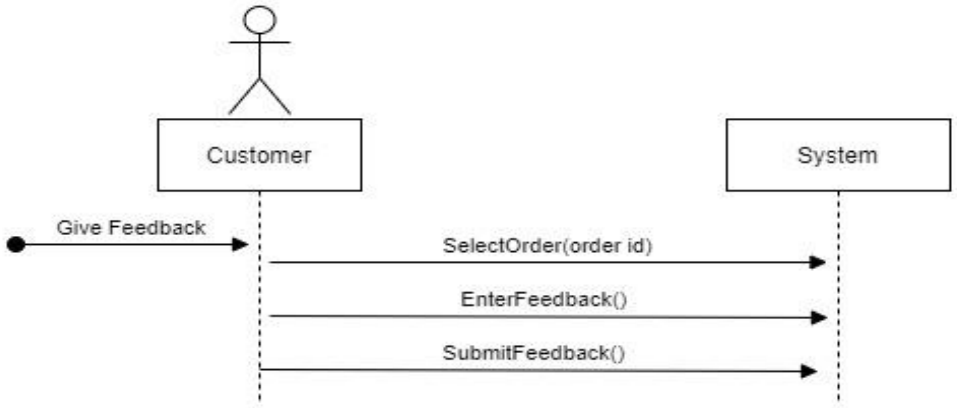
5.3: Order Item



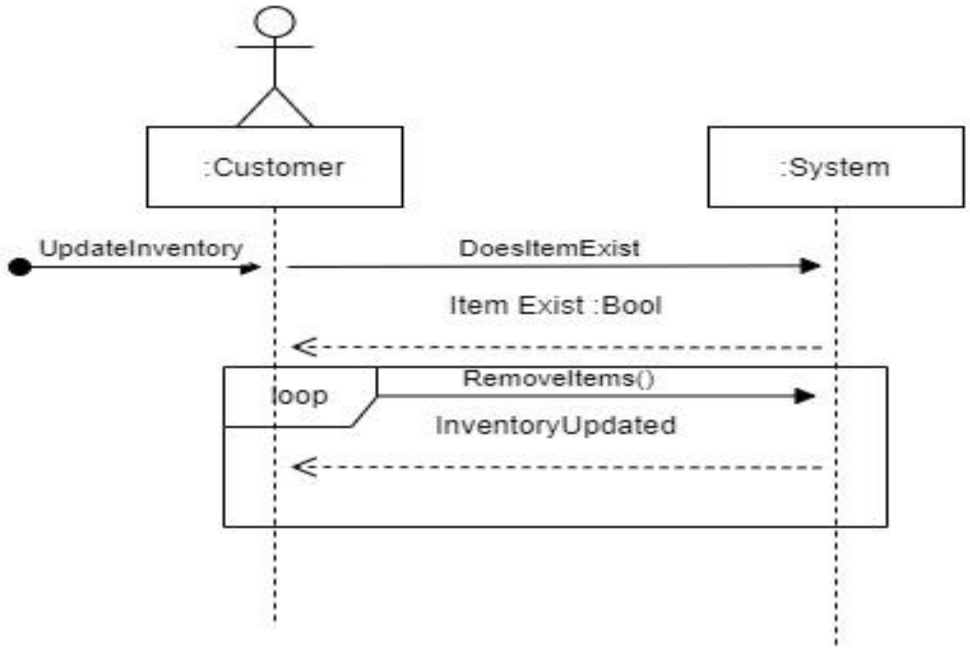
5.4: Launch Complain



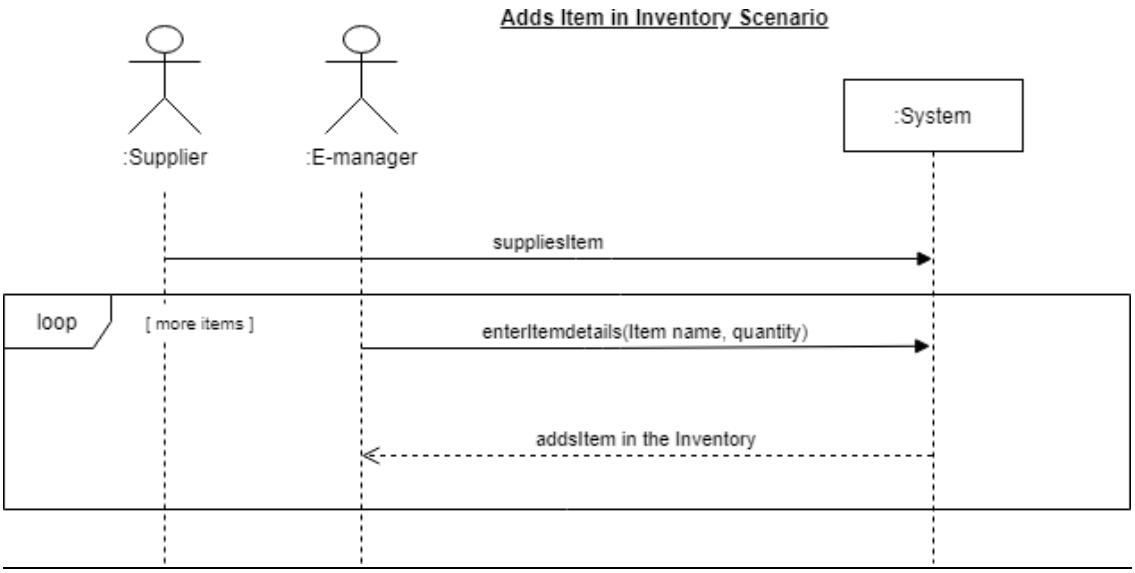
5.5: Give Feedback



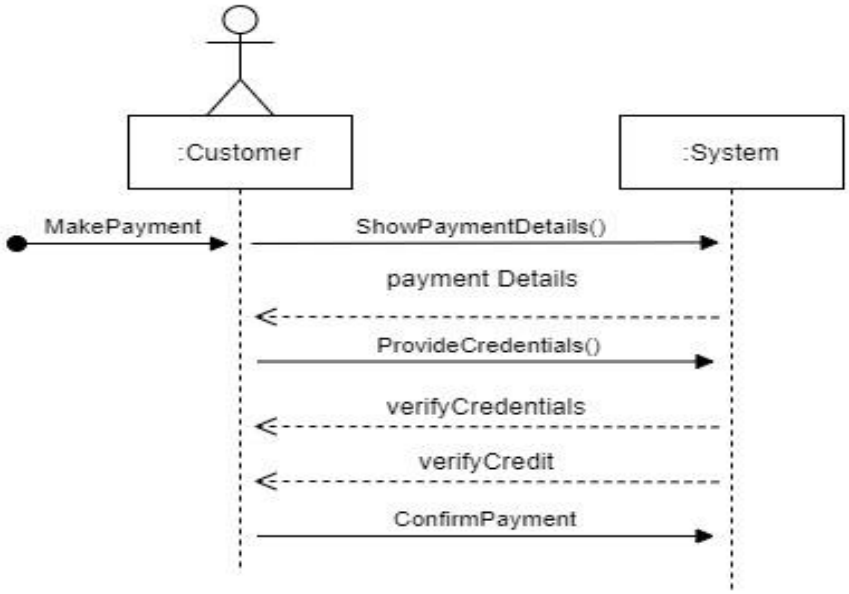
5.6 . Update Inventory



5.7. Add Items in Inventory

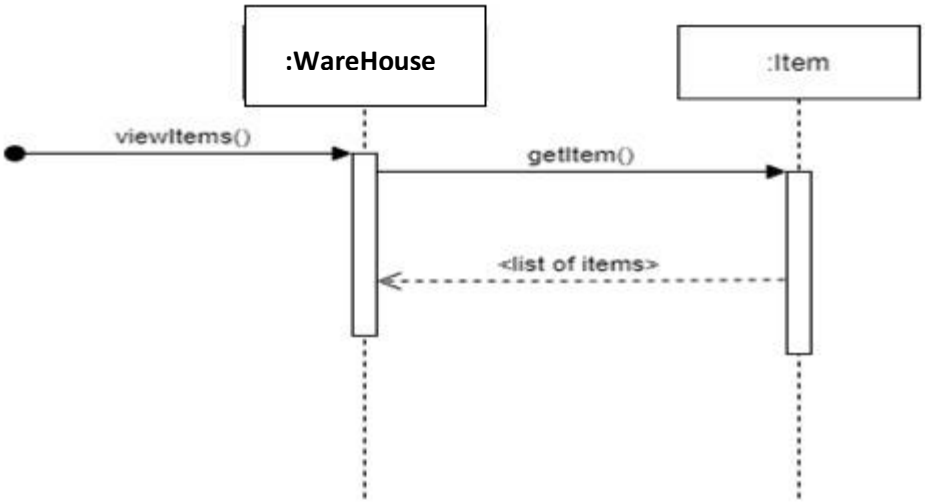


5.8. Make Payment.



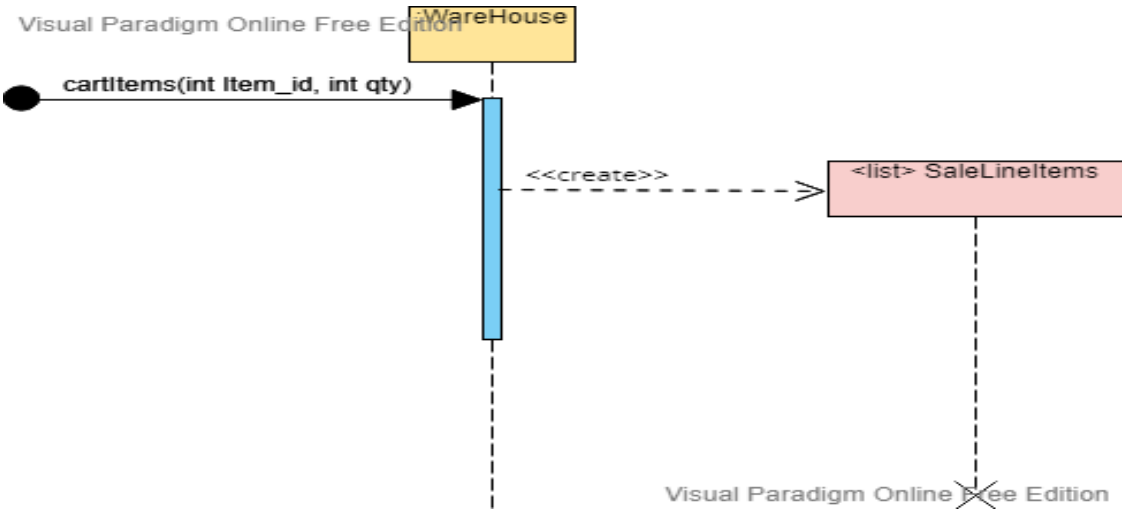
vi. Design Sequence Diagram

6.1. View Item

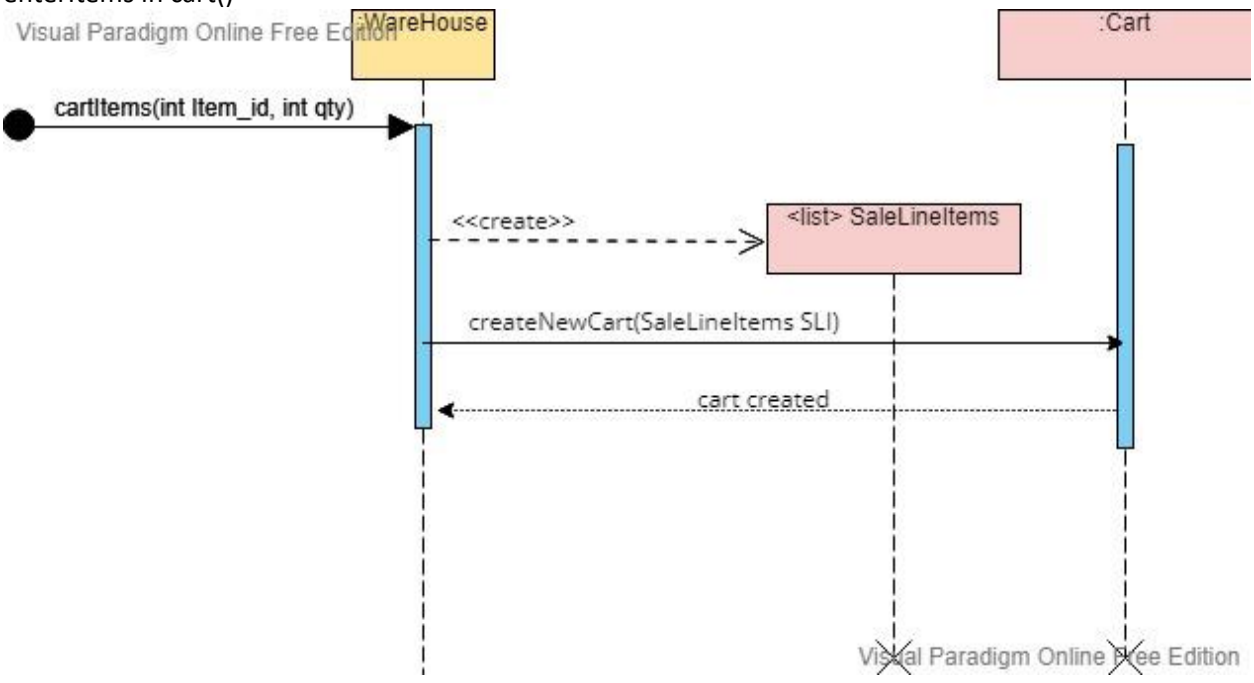


6.2. Order Item

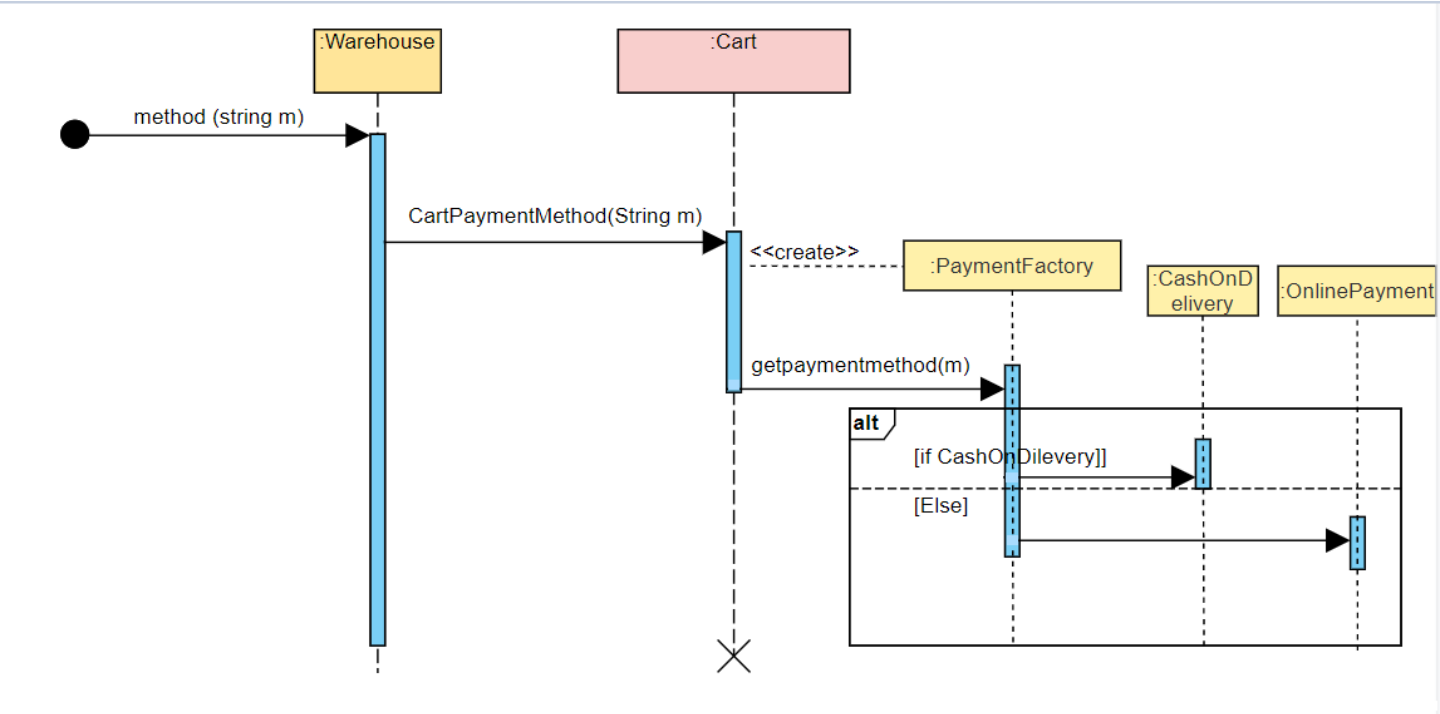
makeNewSale ()



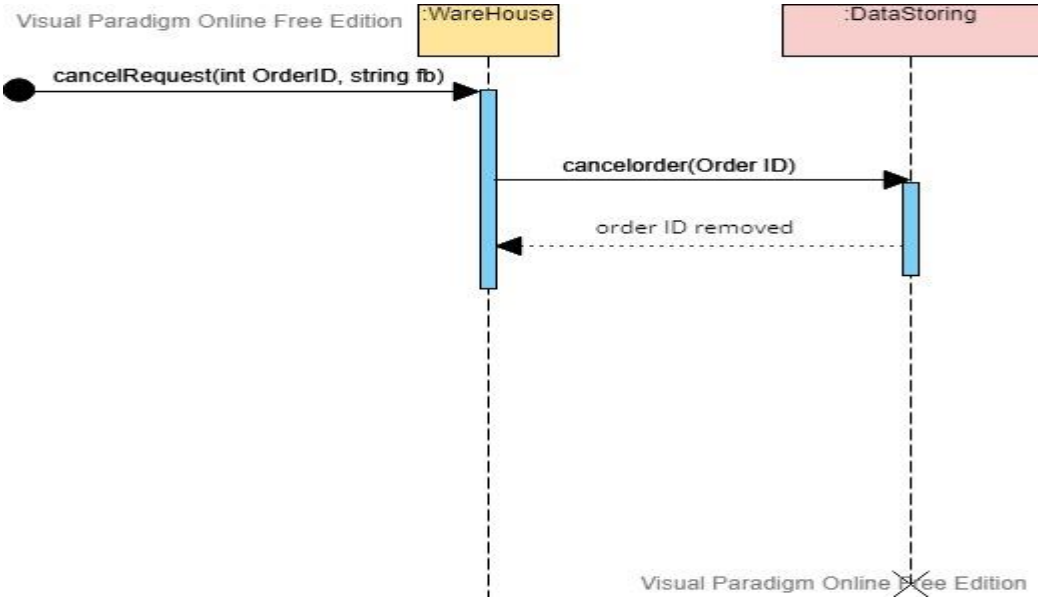
- enterItems in cart()



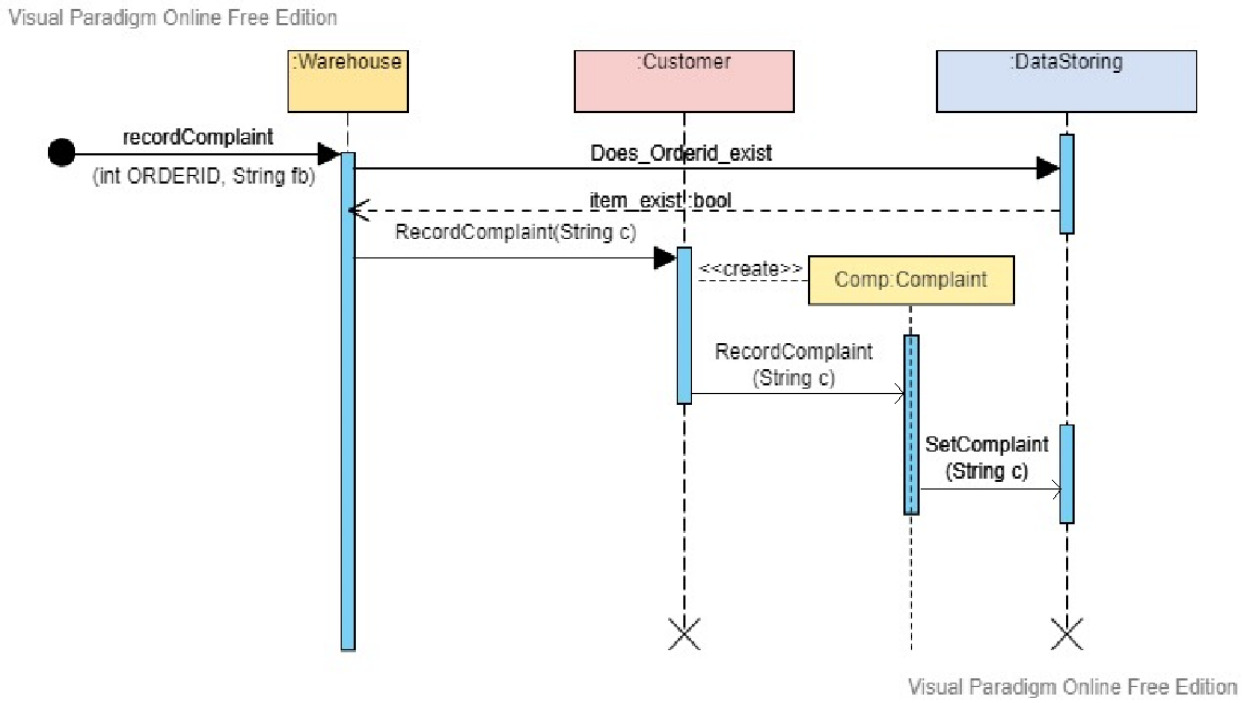
- makePayment()



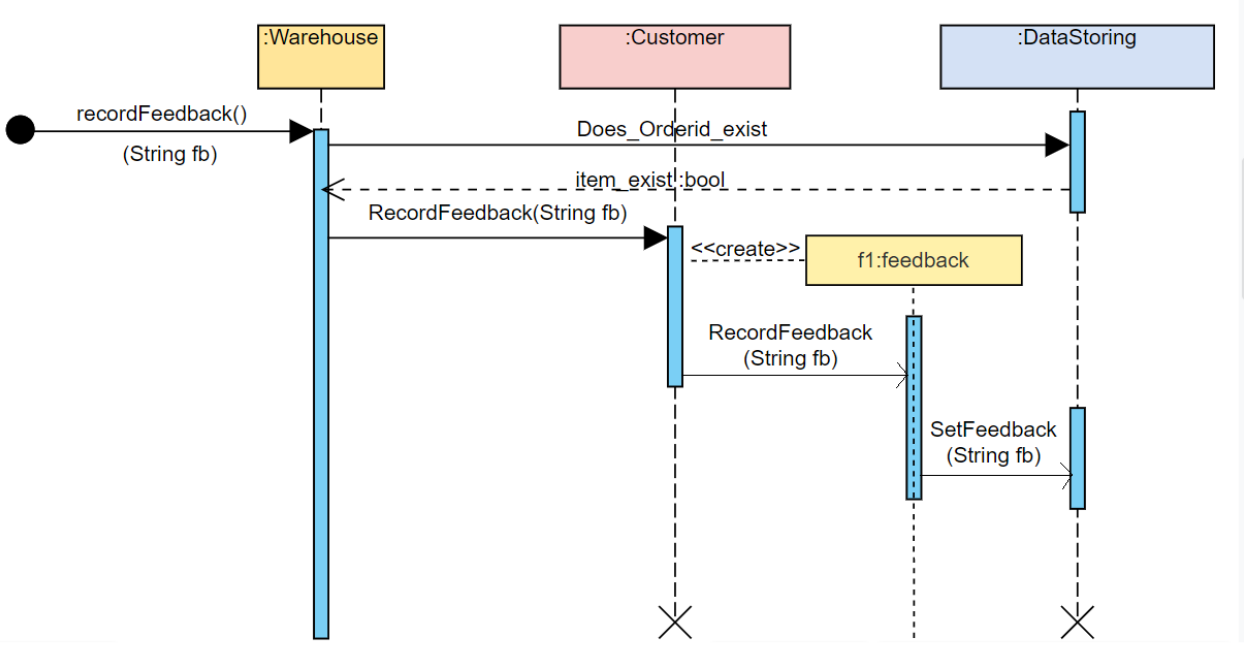
6.3. Cancel Order



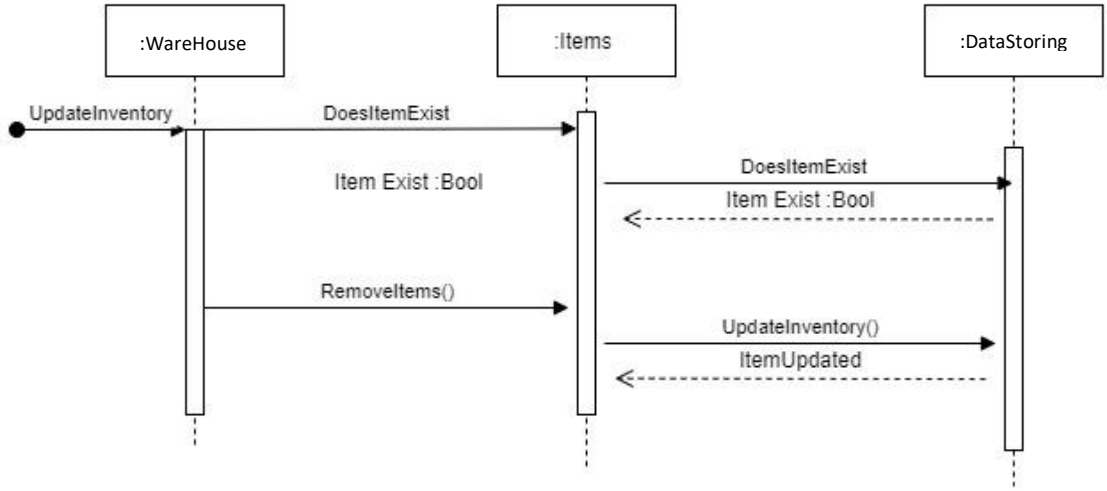
6.4. Launch Complain



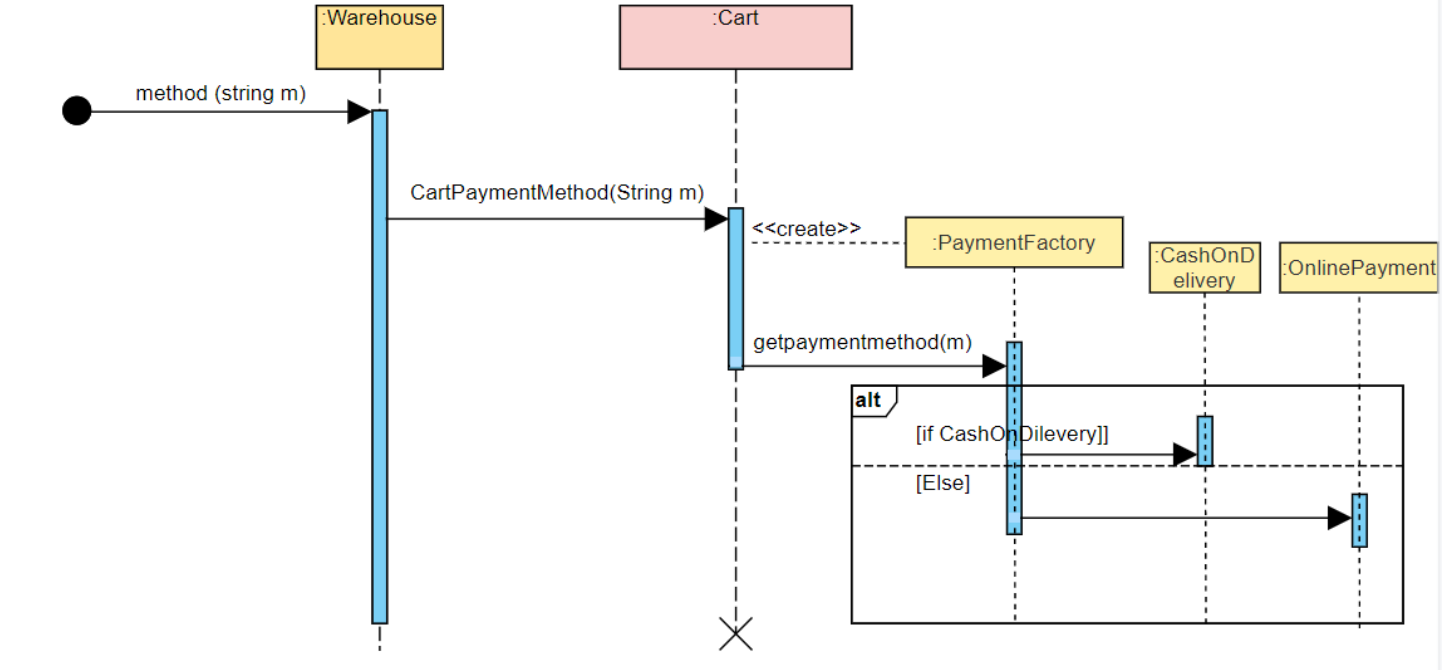
6.5 Give Feedback



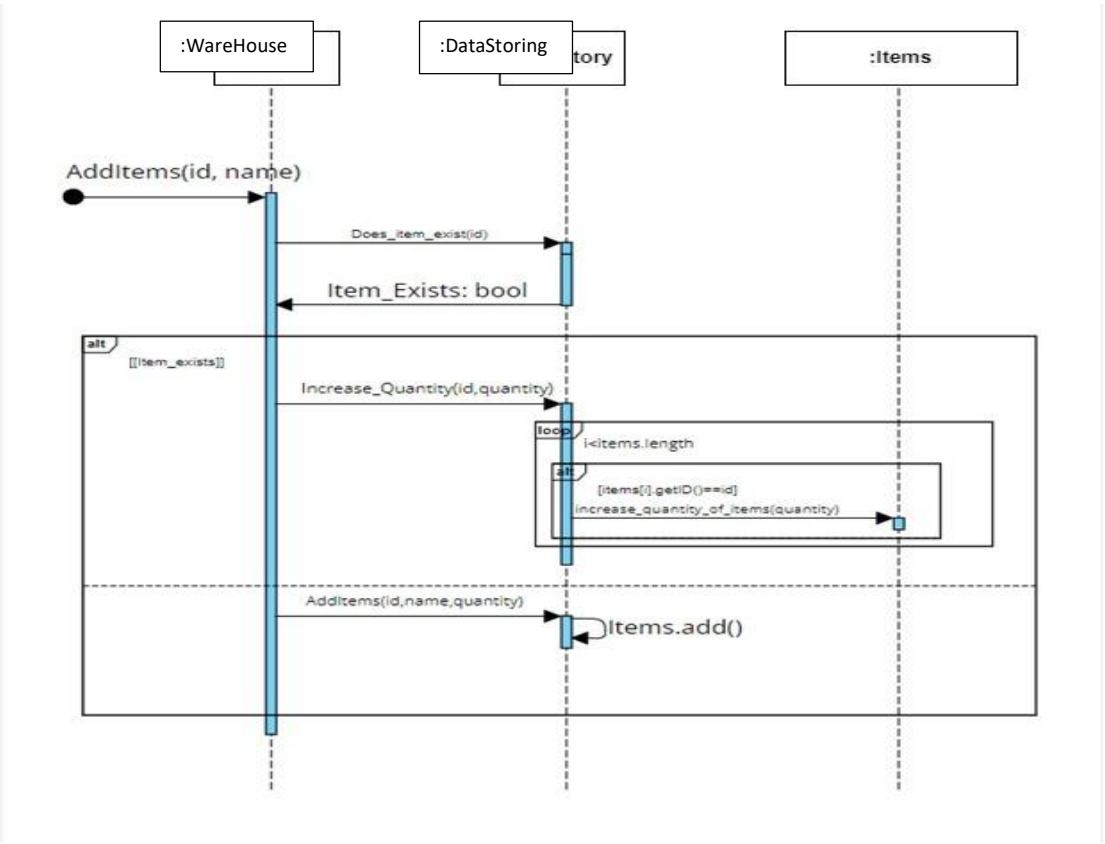
6.6 Update Inventory



6.7 Make Payment



6.8 Add Items in inventory



4. CODE DESCRIPTION

i. Working

In our model, after analyzing our system for creator pattern, the WareHouse class is the creator class. We opted not to have use case controllers because of limited number of use cases implementation, which could be handled by the WareHouse controller class easily without becoming bloated.

We propose a modular design as we designed our classes to have high cohesion i.e. the class is assigned relatable tasks and is not overloaded with too much unrelated work load and they depict low coupling.

We applied the concept of *protected variation* by making a dataStoring interface that manages filehandling and databaseHandling depending upon the option set. Same concept is also used in business layer for payment interface which is implemented by onlinePayment and CashOnDelivery classes. To create one object at runtime we have used *pure fabrication* by creating paymentFactory and DataStoreFactore classes that will make sure only one object is created at a time. The concept of *singleton class* is also used for creating Cart so that one customer can only have access to one cart at a time.

ii. 3-Tier Architecture

a. UI Layer

This layer consists of all the fxml files and is the layer that is directly linked to the user. The layer consists of two UI controller classes- Main_Controller and ManagerController. Main_Controller is responsible for taking all the UI inputs from the Customer side while ManagerController is responsible for taking the manger sides inputs. Both the controller classes send the data to WareHouse (Controller class of Business Layer).

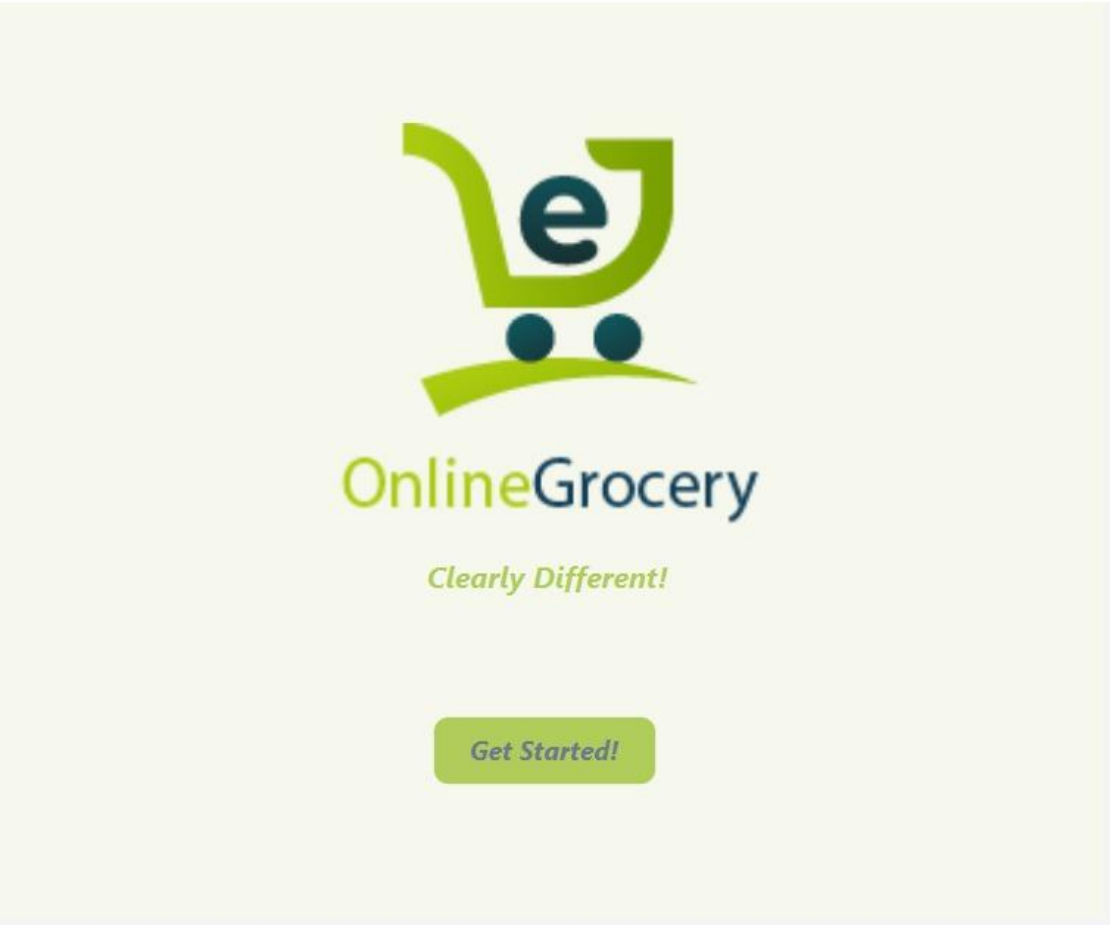
b. Business Layer

This layer consists of the classes that perform all the logical work of the system. The layer also acts as a bridge between the UI Layer and Data Storing Layer by taking the inputs from UI layer and passing reliable data to Data Storing layer to be stored in either files or database. WareHouse is the controller class of this layer that links and send data to respective classes.

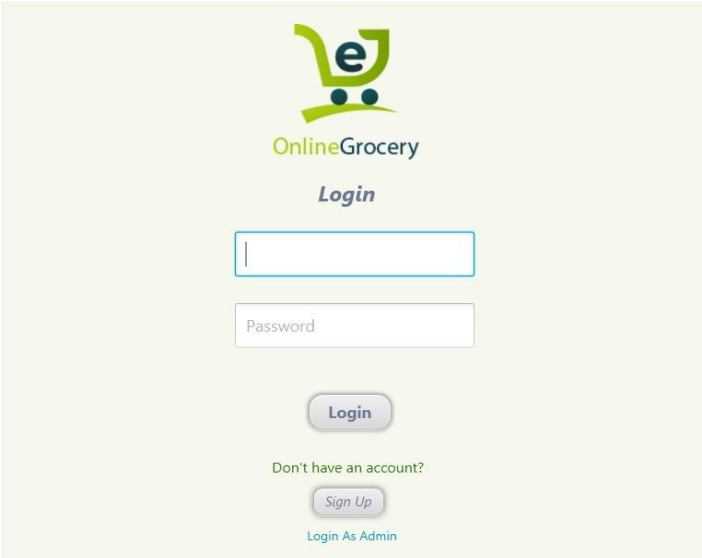
c. Data Storing Layer

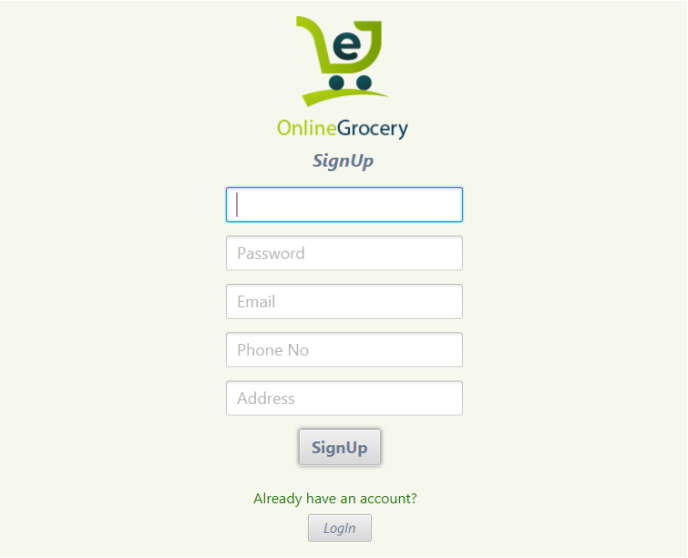
This layer is responsible for taking the data from business layer and storing in either files or database (whatever the selected method is). The layer consists of FileStoring and DatabaseStoring classes that implement the DataStoring interface.

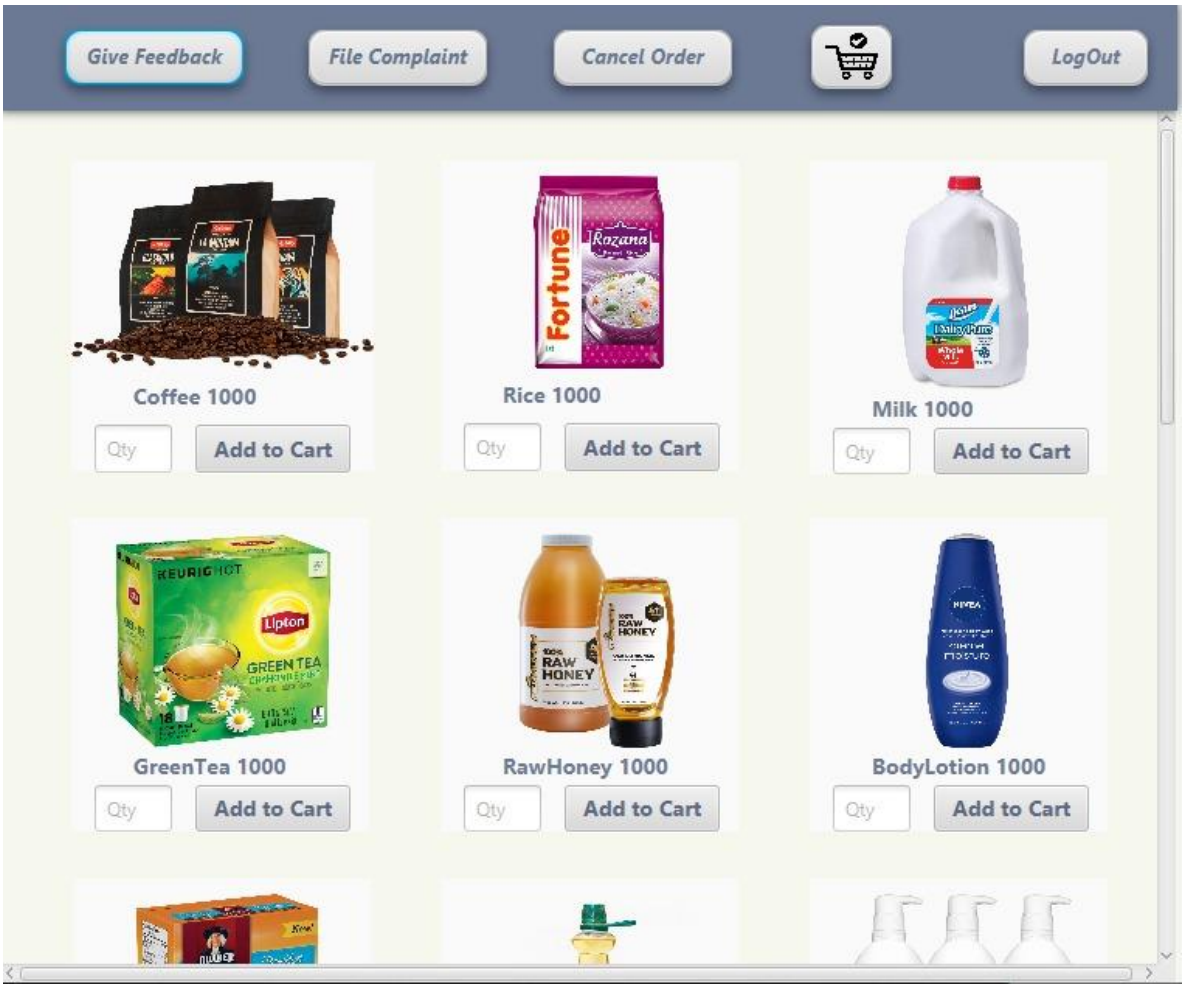
5. USER INTERFACE

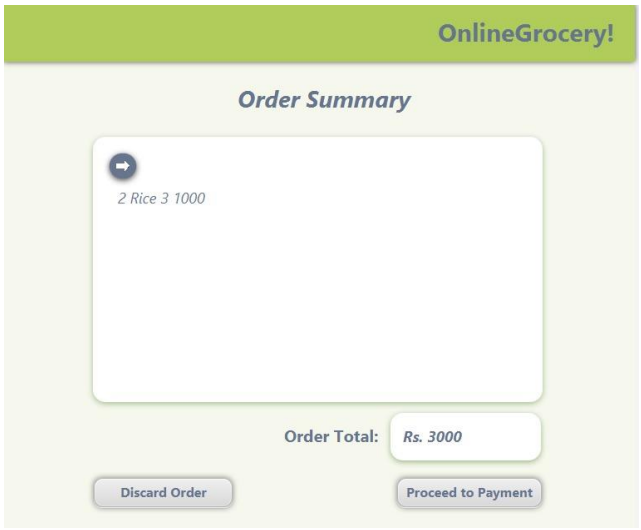


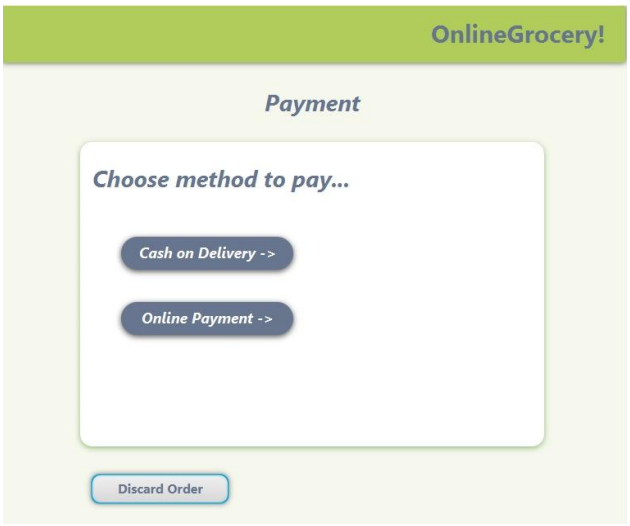
Customer View

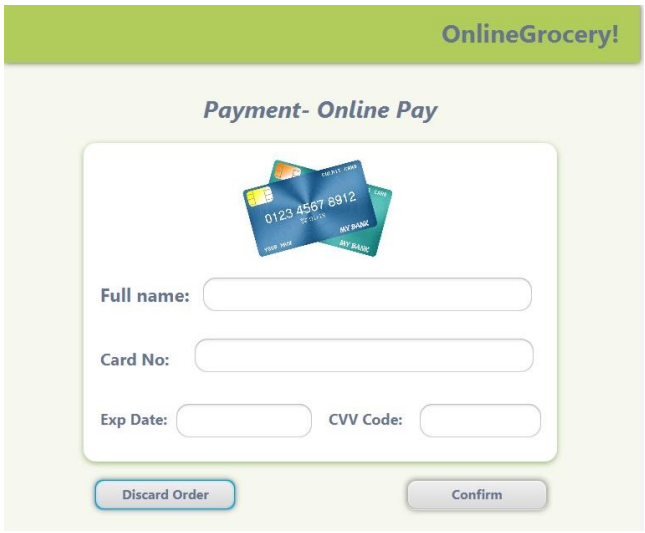


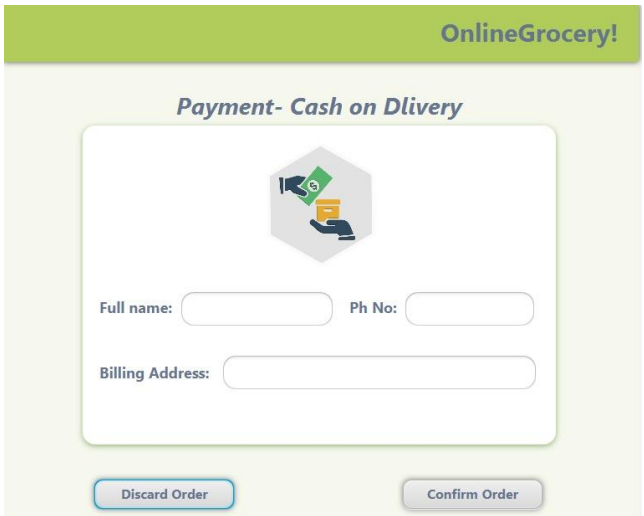


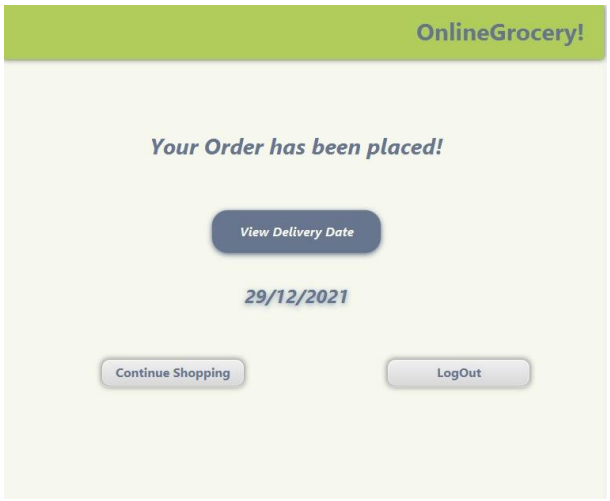


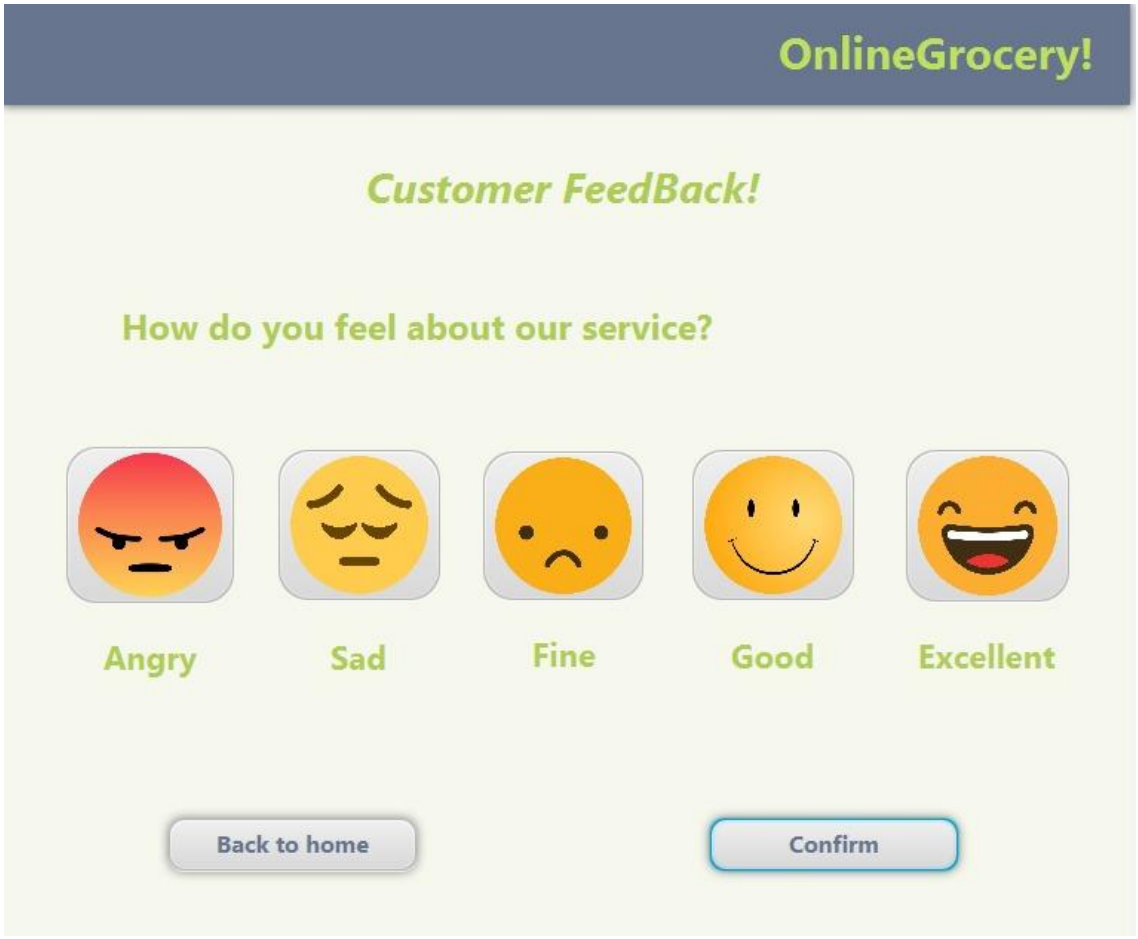

OnlineGrocery!
Order Summary
2 Rice 3 1000
Order Total:
Rs. 3000
Discard Order
Proceed to Payment

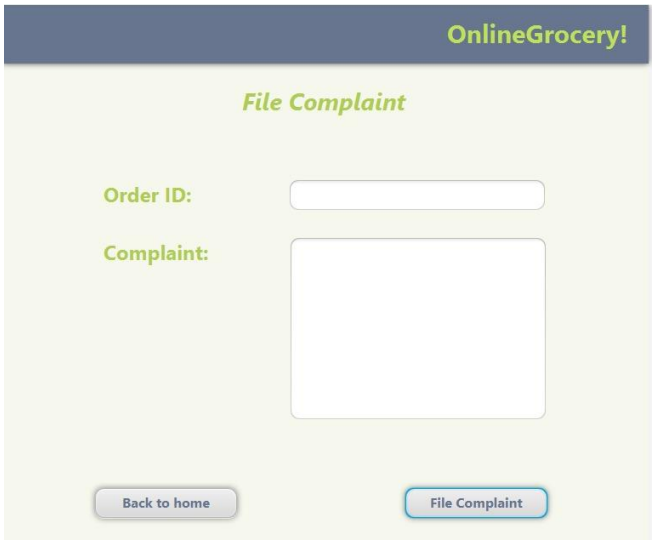

OnlineGrocery!
Payment
Choose method to pay...
Cash on Delivery ->
Online Payment ->
Discard Order

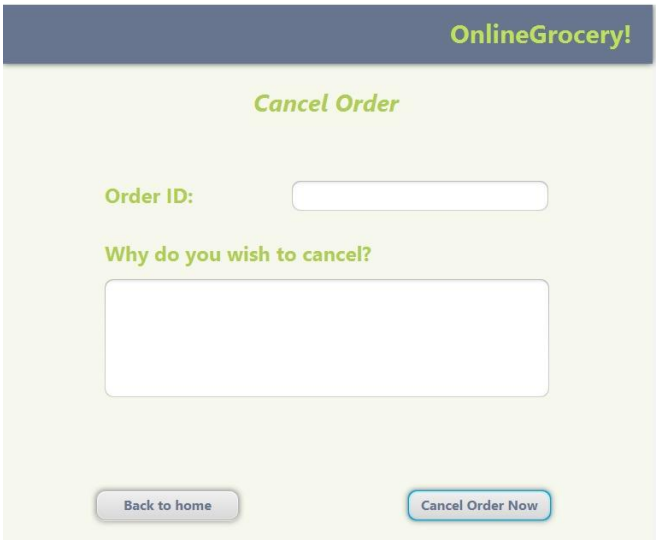

OnlineGrocery!
Payment- Online Pay
0123 4567 8912
Full name:
Card No:
Exp Date:
CVV Code:
Discard Order
Confirm


OnlineGrocery!
Payment- Cash on Dlivery
Full name:
Ph No:
Billing Address:
Discard Order
Confirm Order

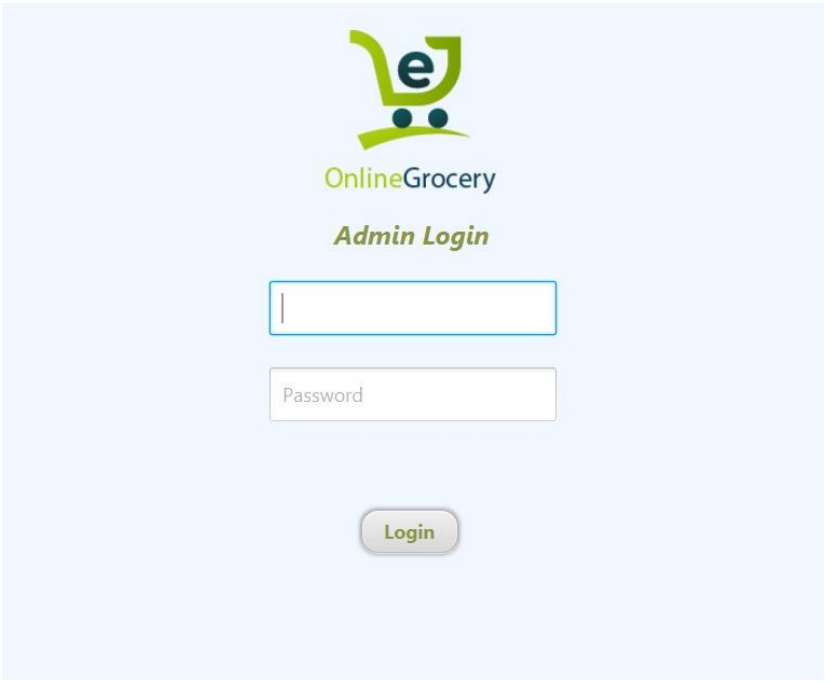

OnlineGrocery!
Your Order has been placed!
View Delivery Date
29/12/2021
Continue Shopping
LogOut

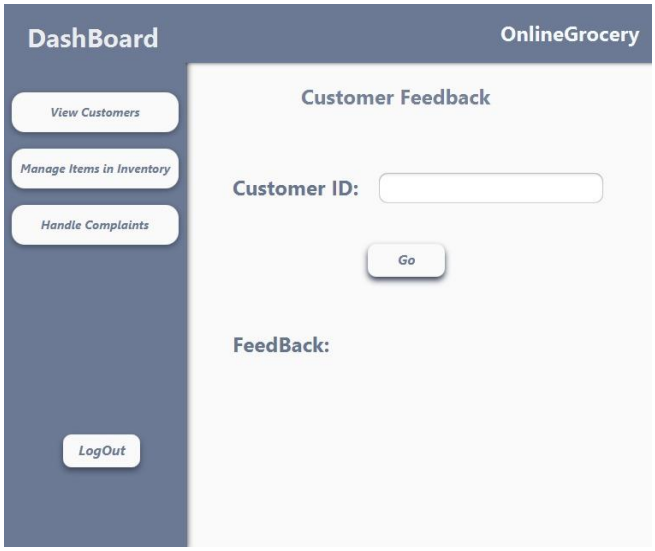

OnlineGrocery!
Customer FeedBack!
How do you feel about our service?
Angry
Sad
Fine
Good
Excellent
Back to home
Confirm

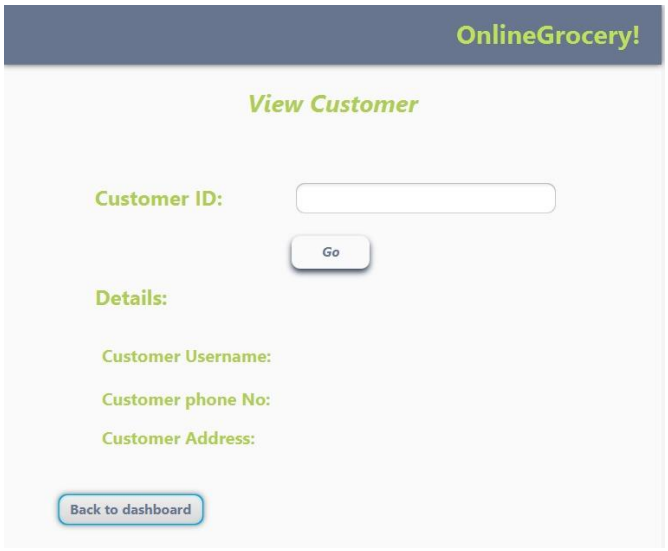

OnlineGrocery!
File Complaint
Order ID:
Complaint:
Back to home
File Complaint

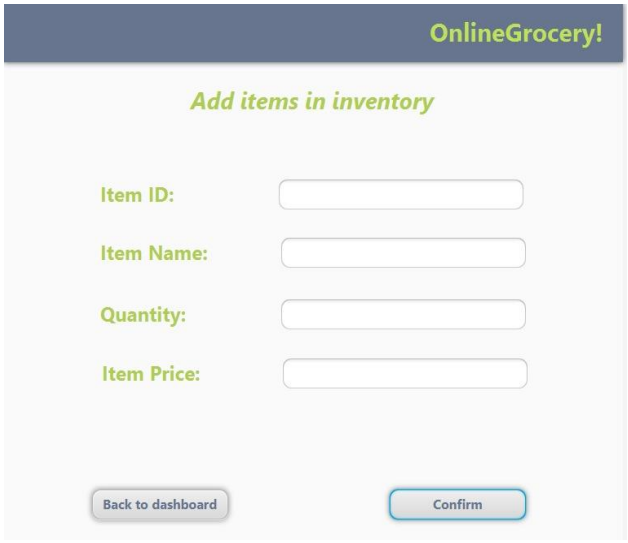

OnlineGrocery!
Cancel Order
Order ID:
Why do you wish to cancel?
Back to home
Cancel Order Now

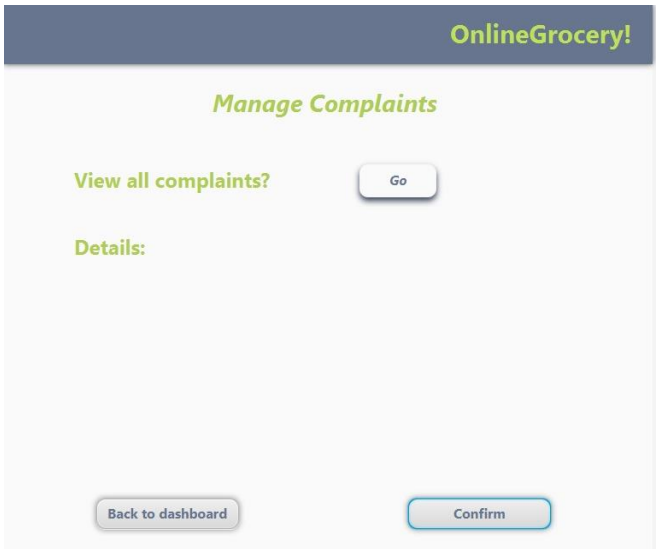
Manager View








OnlineGrocery!
Add items in inventory
Item ID:
Item Name:
Quantity:
Item Price:
Back to dashboard
Confirm


OnlineGrocery!
Manage Complaints
View all complaints?
Go
Details:
Back to dashboard
Confirm