
Software Requirements and Design Document

for

Courier Management System

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1. Introduction

1.1 Purpose

This system uses software development to track, handle, and deliver parcels and letters reliably and promptly while providing users with an easy-to-use interface to monitor their shipments. The goal is to create a seamless and efficient courier service experience.

1.2 Product Scope

The Courier Management System (CMS) aims to provide end-to-end solutions for efficient courier services. It includes real-time parcel tracking, user-friendly interfaces for customers, couriers, and administrators, automated order processing, optimized dispatching algorithms, route planning, billing and invoicing, inventory management, performance reporting, secure authentication, integration with other systems, scalability, and provisions for future enhancements.

1.3 Title : Courier Management System

Project Aim:

By using this technology, we hope to enhance courier service tracking, delivery, and punctuality. In a developing nation, automation of administration, records, and tracking is essential.

Immediate Solution:

- Offering an interface for tracking mail and registering it.
- Managing a courier office's extensive inventory.
- Using tracking to receive automatic notifications in place of waiting for mail as is customary.
- Allowing users to place orders using an online interface in place of doing it manually, managing staff and conducting online interactions with clients.
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1.4 Objectives

The main objectives for our projects are:

- We will be keeping track of the parcels and letters.
- We will ensure precise and punctual courier deliveries.
- Data processing of courier services will be automated.
- Each user will have they're with which they can track their couriers or letter through the management System.

1.5 Problem Statement

We have decided to take on this project to address the issues and inefficiencies that come with managing the postal system by hand. Data entry, order tracking, and parceling are all manual processes in post offices. This procedure takes a long time and is prone to mistakes. We have chosen to automate the system to resolve the

problem. This would need less time and assist in improving accuracy and efficiency. Additionally, it will improve data security and offer superior client experience. Because users can track their packages through the system, this idea is doable. Post officers will update the user's letters and packages at the same time by entering the data into the system via their own interface. To ensure that users don't have redundant or superfluous functionality, each user will have their own interface.

2. Overall Description

1.1 Product Perspective

This product offers a fresh perspective on the courier service in our nation. The COMASY app that is now accessible is restricted to seeing tracking data and checking updates. We are offering fixes for issues that the present product does not address. It is one of its kind.

1.2 Product Functions

We offer the following features in our product.

- Tracking parcels: Allows users to track parcels.
- User Management: Allows users to register mail for easy mailing.
- Managing inventory: Restocks and tracks used items.
- Customer Support: Provides customers with an online interface to file complaints and inquiries.
- Feedback: Using the program, users can give their feedback.
- Manage Payments: Admin can keep track of each and every transaction in detail.

1.3 List of Use Cases

- Track Parcels
- Manage Users
- Customer Support
- Give Feedback
- Manage Inventory
- Validate Address
- Sort and Route Mails
- Register Mail
- Schedule Delivery
- Payment process.
- Redirect Mail
- Order Supplies
- Generate Report

1.4 Extended Use Cases

1.

Use case name:	Track Letters
Scope:	Courrier management system
Level	User Goal
Primary Actor	Customer

Stakeholders and interests:	<ul style="list-style-type: none"> Post office employee: Can view and edit the tracking reports. Customer: Can track their parcels Postman: can notify customers that their delivery is on the way 	
Main Success scenario	Actor actions	System Response
	1. Customer tracks their mail	
	2. Customer enters the tracking code provided to them.	
		3. System searches the database for the code and fetches the information associated
		4. The information is displayed on the interface.
	5. Customer checks the displayed information.	
	6. Customers can track other mails by repeating steps 1-4.	
	7. Post office wants to update the tracking information	
	8. Employee gets notified about delivery progress	
	9. Employee enters the progress	
		10. The system updates data
Extensions:	2.1. If a user has previously entered tracking codes, they can check it again through search history. 3.1. System cannot find any tracking information associated with the code. 4.1. If tracking information is not found, error message will be displayed. 10.1. Update failure.	
Pre-Conditions	The destination and other information related to tracking is entered when a mail is registered	

Post conditions	User receives the mail.
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2.

Use case name:	Manage Users	
Scope:	Courrier management system	
Level	User Goal	
Primary Actor	Administrator	
Stakeholders and interests:	<ul style="list-style-type: none"> ▪ Post office employee: Can view and edit their information. ▪ Administrator: Manages users by registering, editing and viewing user information ▪ Postman: Can view and edit their information ▪ Customer: Can register an account and view their information 	
Main Success scenario	Actor actions	System Response
	1. Users register themselves through their respective interface by entering their credentials	
		2. System validates the credentials through a third party system which compares the credentials to a government database
		3. After successful validation, the system saves user credentials associated with a new account.
		4. System notifies Admin about successful registration.
	5. Users can now view and edit their credentials through the employee interface.	
	6. Admin can now edit/ view user information.	
	7. Admin enters the id of the user to edit. view information.	
		8. System fetches information related to the ID entered
		9.
	10. Admin views	

	information	
	11. Admin edits information	
		12. System updates user information
	13. Admin can manage users by repeating step 7-12	
	14. Admin exits the interface.	
Extensions:	1.1. Admin manually registers users. 2.1. Credentials are invalid and third-party organizations return error messages. 2.2. System indicates that credentials are invalid and prompts users to enter correct credentials. 3.1. Registration error caused by any reason. Users will be notified and asked to try again. 7.1. Incorrect ID is entered. 8.1. IF incorrect ID is entered, no information is fetched and error message is displayed. 11.1. Wrong value or information is entered. 12.1. System cannot update information and error messages are displayed	
Pre-Conditions	Users get registered and can now view their information.	
Post conditions		

3.

Use case name:	Customer Support	
Scope:	Courier management system	
Level	User Goal	
Primary Actor	Customer Support Customers	
Stakeholders and interests:	<ul style="list-style-type: none"> Administrator: can view logs and information to help customer support. Customer Support: will help Customers resolve their issues. Customers: Will connect with a customer support representative to get their issues resolved. 	
Main Success scenario	Actor actions	System Response
	1. Customer faces an issue and wishes to get assistance	
	2. Customer opens the customer support interface	
		3. Customer support service starts and connects customer to a customer service representative.
		4. Once connected system

		notifies customer to state their issue.
	5. Customer states their issue in the provided chat box.	
		6. System forwards the issue to the representative
	7. The representative replies to the issue.	
		8. System forwards the reply to the customer.
	9. Customer and representative can communicate through steps 1- 9 until the issue is resolved.	
	10. Customer service representative requests to check a log or information	
		11. System forwards the request to admin
	12. Admin enters required information into search engine	
		13. System fetches data
	14. Admin forwards data to representative	
		15. System forwards the data
	16. Customer service uses the data to assist the customer	
Extensions:	3.1.Connection is unsuccessful 3.2. Due to server issue 3.3. Due to unavailability of customer service 4.1. Customer is notified of connection failure. 6.1. System cannot forward the message to the representative. 6.2. Representative and customer are shown error message. 9.1. System cannot forward the message to the customer. 9.2. Representative and customer are shown error message.	
Pre-Conditions	Users face problems related to mail service.	

Post conditions	User receives help regarding queries.
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4.

Use case name:	Give Feedback
Scope:	Courrier management system
Level	User Goal
Primary Actor	Customer
Stakeholders and interests:	<ul style="list-style-type: none"> Administrator: can view feedback and generate reports through feedback Customers: gives feedback Post office workers: through feedback they can view reports and improve customer service. Postman: through feedback they can view reports and improve customer service.

Main Success scenario	Actor actions	System Response
	1. User wants to give feedback.	
	2. Users enter the feedback forum	
	3. Users enter their feedback regarding either post office employee service or delivery service.	
	4. Information regarding the specific employee or postman is also to be entered.	
		5. System stores feedback in its respective group of feedback
		6. The feedback is forwarded to either the post office employees or the postman mentioned in the

Extensions:	3.1. User enters incorrect information regarding the postman or employee. 5.1. Feedback is stored in wrong group 5.2. Feedback could not be stored due to memory shortage, connection error etc. 6.1. Message could not be forwarded to the recipient.
Pre-Conditions	User visits the post office or receives mail.
Post conditions	Reports are generated and customer service is improved.

5.

Use case name:	Manage inventory
Scope:	Courrier management system
Level	User Goal

Primary Actor	Office Employee	
Stakeholders and interests:	<ul style="list-style-type: none"> Suppliers: Are notified of inventory orders Post Office Employees: Log new and used inventory items. 	
Main Success scenario	Actor actions	System Response
	1. New Inventory items are entered into the inventory manager.	
		2. System logs in the new items.
	3. Employee logs items used.	
		4. System updates the inventory.
		5. If inventory is out of an item, the employee is informed.
	6. Employee is informed of the item restock and orders that item.	
		7. System places order of supply to the suppliers.
	8. Employee searches for a specific item and its information.	
		9. System checks for information and displays information.
Extensions:	2.1. System cannot log information of new item. 2.2. Admin can manually log information regarding inventory items. 4.1. System cannot update information. 4.2. Admin can manually log information regarding inventory items. 7.1. Restock order is unsuccessful. 9.1. Information is not found and the system cannot display.	
Pre-Conditions		
Post conditions		

6.

Use case name:	Validate Address	
Scope:	Courier management system	
Level	Subfunction	
Primary Actor	Office employee	
Stakeholders and interests:	<ul style="list-style-type: none"> Post office workers: get validated addresses validated. Customers: get addresses validate 	
Main Success scenario	Actor actions	System Response
		1. System sends address for validation

		2. System checks if address is complete
		3. Address is checked if there is a valid country, postal code etc entered and no false information is given
		4. Upon validation, System informs user of validation
	5. User checks validation and then continues with registration.	
Extensions:	2.1. Address is incomplete i.e. country, postal code, city etc any if this information is not entered. 3.1. Fake country name, postal code etc is entered. 4.1. System lists problems with the address and displays list to user 5.1. User checks the list and informs the customer of the invalid address.	
Pre-Conditions	Mail is registered and information is valid.	
Post conditions	Address is validated	

7.

Use case name:	Sort and route mails	
Scope:	Courier management system	
Level	User Goal	
Primary Actor	Customer	
Stakeholders and interests:	<ul style="list-style-type: none"> Post Office Employees: They are responsible for entering data to the system. They can manually route or sort mails if needed. 	
Main Success scenario	Actor actions	System Response
	1. The Post Office Employee enters details about the mail. (mailing address, destination address, etc)	
		2. System checks that the details are valid.
		3. System processes the information and accurately sorts and routes the mails.
Extensions:	1. The Post Office Employee enters details about the mail. (mailing address, destination address, etc) 2. System checks that the details are valid. 3. Invalid details. The system displays a message requiring manual intervention and waits till the mail details are	

	updated. 4. The Post Office Employee viewsthe message and updates the details.
Pre-Conditions	Mail destination address is validated. Mail has complete details and is ready to be sorted.
Post conditions	Mails are correctly sorted and routed to their respective destinations

8.

Use case name:	Register Mail
Scope:	Courrier management system
Level	User Goal
Primary Actor	Customer
Stakeholders and interests:	<ul style="list-style-type: none"> Customer: The customer can register mail online by entering the required information and paying the required amount. The mail is collected from thecustomer's mailing address. Post Office Employees: In case a customer chooses to go to the postoffice to register a mail, the post office employee would assist thecustomer to register mail by entering the details themselves

Main Success scenario	Actor actions	System Response
	1. The customer logs into their online post office account.	
	2. Customer selects the "Register Mail" option.	
		3. System displays a form requiring all the details needed to register a mail.
	4. The customer fills in details including the mailing address, package size etc.	
		5. System validates the provided information and checks if the mailing address is in range.
		6. Once validated, the system generates a tracking id.
		7. System informs the customer when the mail will be picked from the mailing address.
	8. Customer confirms registration and pays the required amount	

		9. System updates the database with the details and adds the item as registered.
	10. The customer visits the post office to register mail.	
	11. Post Office employee gives customer the form to fill in details	
	12. Customer fills in details that the post office employee double checks to make sure no detail is missing.	
	13. The post office employee then manually enters the details in the system under the customer's account.	
		14. System validates the provided information.
		15. Once validated, the system generates a tracking id.
	16. Customer pays the required amount to the post office employee.	
	17. The post office employee updates the payment status as paid and provides the customer with a receipt and the tracking number.	
		18. System updates the database with the details and adds the item as registered.
Extensions:	1. The customer logs into their online post office account. 2. Customer selects the "Register Mail" option. 3. System displays a form requiring all the details needed to register a	

	<p>mail.</p> <p>4. The customer fills in details including the mailing address, package size etc.</p> <p>5. System validates the provided information and checks if the mailing address is in range.</p> <p>6. If the mailing address is not in range the system displays a message showing the address is not in range and the customer should go to the nearest post office to register the mail.</p> <p>7. The customer can view the message and act accordingly.</p>
Pre-Conditions	<p>Customer wishes to register a mail.</p> <p>The customer has an account that allows online mail registration.</p> <p>The customer's mailing address is within reach of the post office.</p> <p>Post Office employees are available to assist customers.</p>
Post conditions	<p>The mail item is successfully registered for delivery with all valid details recorded in the database.</p> <p>The registered mail item could be viewed by the customer through their accounts.</p>

9.

Use case name:	Schedule Delivery	
Scope:	Courrier management system	
Level	User Goal	
Primary Actor	Mail carrier	
Stakeholders and interests:	<ul style="list-style-type: none"> The Mail carrier will schedule and manage deliveries effectively. 	
Main Success scenario	Actor actions	System Response
	1. Mail carrier accesses the schedule delivery option	
	2. Mail carrier enters details of the parcels to be delivered by them.	
		3. System then schedules the deliveries and gives the postman a route to deliver all the parcels in an efficient way.
	4. The post person can view the schedule and make manual changes if needed.	
Extensions:	<p>1. Mail carrier accesses the schedule delivery option.</p> <p>2. Mail carrier enters details of the parcels to be delivered by them</p> <p>3. System then schedules the deliveries but there are some clashes.</p>	

	4. The post person can view the schedule and make manual changes as needed.
Pre-Conditions	The deliveries are ready to be scheduled.
Post conditions	The deliveries are scheduled for the designated time and conditions.

10.

Use case name:	Payment process	
Scope:	Courrier management system	
Level	User Goal	
Primary Actor	Customer	
Stakeholders and interests:	<ul style="list-style-type: none"> Customer: The customer is required to make payments for the mails registered or supplies ordered. Banks: The banks need to facilitate the payment process. 	
Main Success scenario	Actor actions	System Response
	1. Customer selects the payment method. (Bank, easypaisa, COD etc)	
		2. The system calculates and displays the payment amount.
	3. Customer provides bank details	
		4. System validates the details and performs transactions if details are valid.
		5. System displays a message if transaction is successful
		6. The status is changed to paid in the database.
	7. The customer can view if the transaction was successful.	
Extensions:	1. Customer selects the payment method. (Bank, easypaisa, COD etc) 2. The system calculates and displays the payment amount. 3. Customer provides bank details 4. System validates the details 5. If details are invalid, the system displays a message informing the customer. No more transactions could be performed. 6. The customer can view the message and re-enter details.	
Pre-Conditions	Customer has registered a mail or ordered a supply	
Post conditions	Payment is processed and the payment status is changed to paid.	

11.

Use case name:	Redirect mail
Scope:	Courrier management system

Level	User Goal	
Primary Actor	Customer	
Stakeholders and interests:	<ul style="list-style-type: none"> Customer: The customer wants to change the delivery address to the mail item. Post Office Employee: The employee can change the delivery address if the customer comes to the post office and asks the employee to change it 	
Main Success scenario	Actor actions	System Response
	1. Customer chooses a registered mail.	
	2. Customer chooses to redirect the mail	
		3. System checks the mail is not out for delivery already
	4. Customer enters new delivery address	
		5. System validates the new address.
		6. If it is a valid address system updates the delivery address in the database.
Extensions:	1. Customer chooses a registered mail. 2. Customer chooses to redirect the mail 3. System checks the mail is not out for delivery already. 4. Mail is out for delivery then the system displays a message saying the mail cannot be redirected.	
Pre-Conditions	The mail is not out for delivery. The new address is a valid one	
Post conditions	The mail item is successfully redirected to the new address.	

12.

Use case name:	Order Supplies	
Scope:	Courier management system	
Level	User Goal	
Primary Actor	Customer	
Stakeholders and interests:	<ul style="list-style-type: none"> Customer: The customer wants to order stamps or other supplies like this from the post office. Vendors: the vendors will receive order requests. Post Office Employee: The employee can order supplies for the post office. 	
Main Success scenario	Actor actions	System Response
	1. Customer logs into their account	

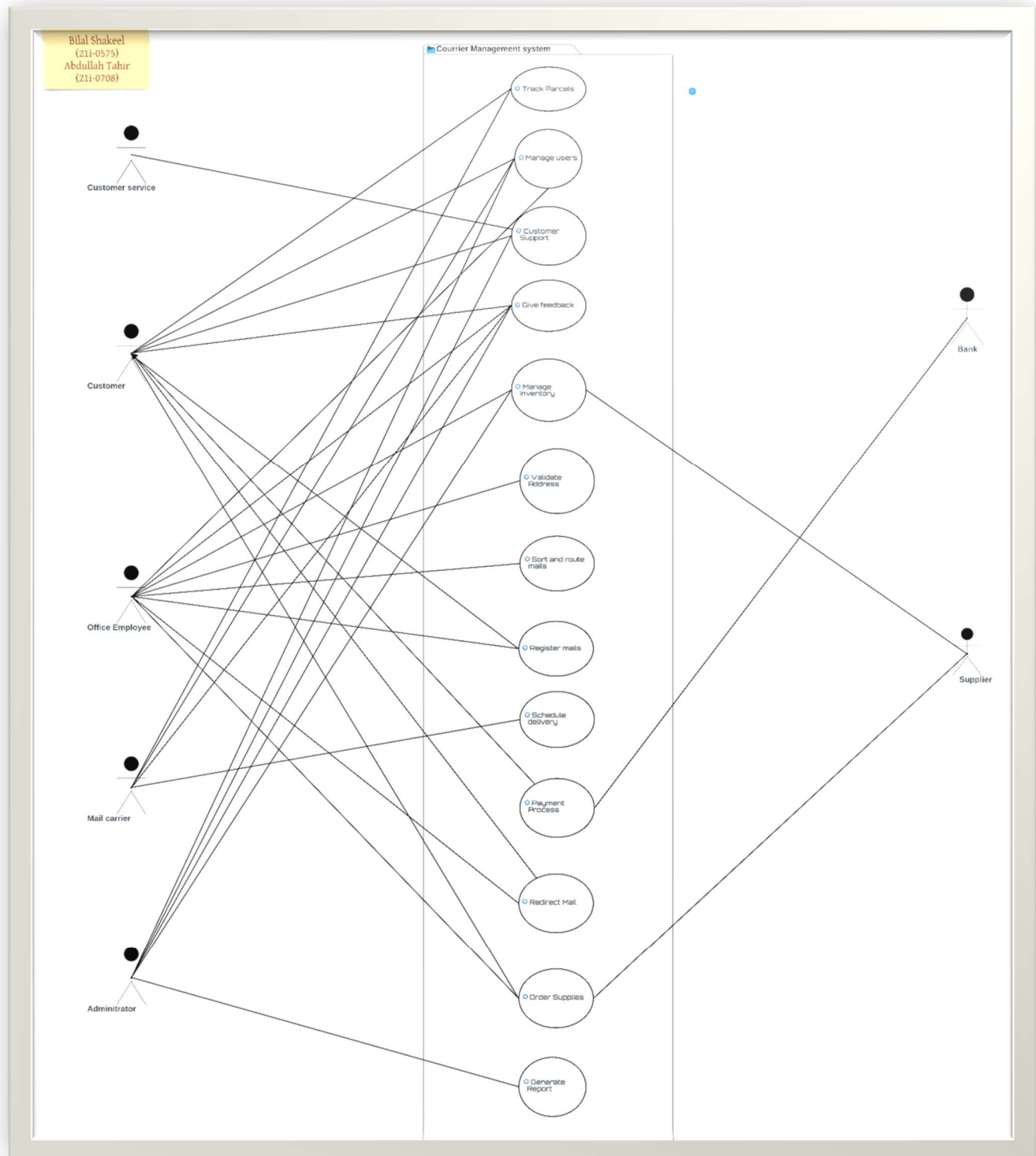
	2. Customers can view the inventory.	
		3. System shows available items with their price and details
	4. Customers can search for an item by entering keywords.	
		5. System would display items that are valid against the keyword.
	6. Customers can select items and add them to cart. Customers can then view the cart and go for checkout.	
		7. System checks availability of all items then asks the customer to enter details like delivery address
	8. Customer will enter details	
		9. System validates the details and checks that the address is in range
	10. Customers can then proceed and pay for the delivery.	
		11. Once payment is done the system will order that item and remove it from inventory.
		12. The system will inform the selected vendor that will then perform the delivery.
		13. The system will inform the customer of the estimated time of delivery.
Extensions:	1. Customer logs into their account. 2. Customers can view the inventory. 3. The system shows available items with their price and details. 4. Customers can search for an item by entering keywords.	

	<ol style="list-style-type: none"> 5. System would display items that are valid against the keyword. 6. Customers can select items and add them to cart. Customers can then view the cart and go for checkout. 7. System checks availability of all items. 8. If an item is unavailable the system will inform the customer that the order for that item could not be placed.
Pre-Conditions	Customer has an online account. The delivery address is within range. The item is available in inventory.
Post conditions	The item is successfully delivered to the customer

13.

Use case name:	Generate Reports	
Scope:	Courier management system	
Level	User Goal	
Primary Actor	Administrator	
Stakeholders and interests:	<ul style="list-style-type: none"> ▪ Administrator: The administrator needs access to reports for operational and managerial purposes. 	
Main Success scenario	Actor actions	System Response
	1. Administrator accesses the report generating facility	
	2. The administrator selects the type of report he wants to generate from the available reports	
		3. System gathers the required information and generates the report.
	4. The administrator can view the report.	
Extensions:	<ol style="list-style-type: none"> 1. Administrator accesses the report generating facility 2. The administrator selects the type of report he wants to generate from the available reports 3. System fails to generate the required report due to lack of information or any other issue. 4. System informs the administrator that the report could not be generated 	
Pre-Conditions	Administrator required a specific report to be generated.	
Post conditions	The required report is generated and could be viewed by the administrator.	

1.5 Use Case Diagram



3. Other Nonfunctional Requirements

1.1 Performance Requirements

Among the performance criteria would be:

1. Ensuring an efficient response time for tracking information retrieval and payment procedures.
2. Security procedures for encrypting user data ought to exist.
3. The system ought to manage enormous amounts of data and traffic.
4. The system ought to respond to requests round the clock.

1.2 Safety Requirements

The risk of mail and content getting lost or misplaced is linked to potential loss resulting from using this product.

1.3 Security Requirements

The security of personal data, including name, address, and bank account information, is not guaranteed by this version. The implementation of more security is necessary.

1.4 Software Quality Attributes

Our primary goals in creating this program were reliability and accessibility. For the time being, we prioritized consistency over speed in this application.

1.5 Business Rules

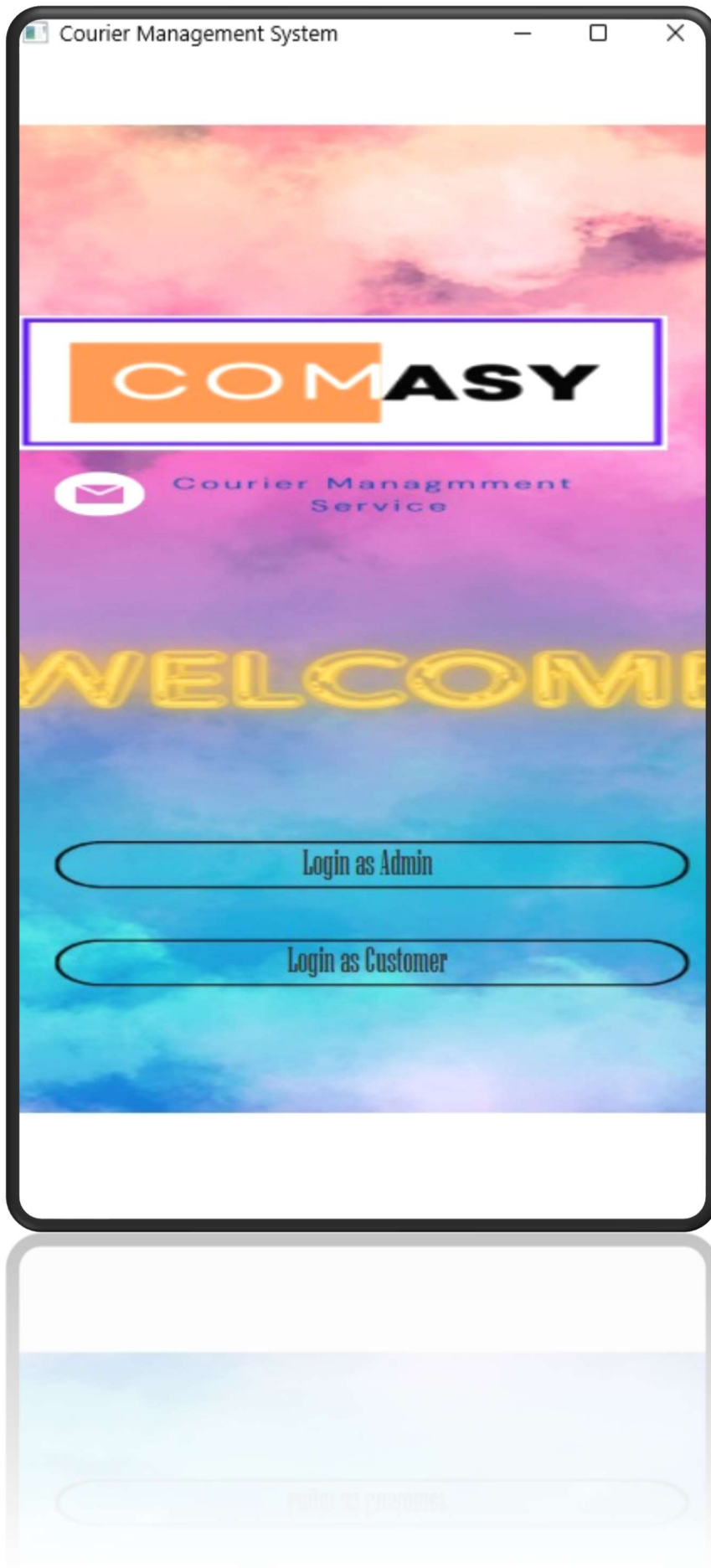
Customers and workers of the courier office are the intended users of this program as it is. The consumer can track parcels, register mail, place orders for supplies, and contact customer service using the customer interface. However, staff members are able to update the tracking data and manage inventory.

1.6 Operating Environment

The ideal operating environment for this application is Windows running on x86 architecture. The minimum space required is
5 MB

1.7 User Interfaces

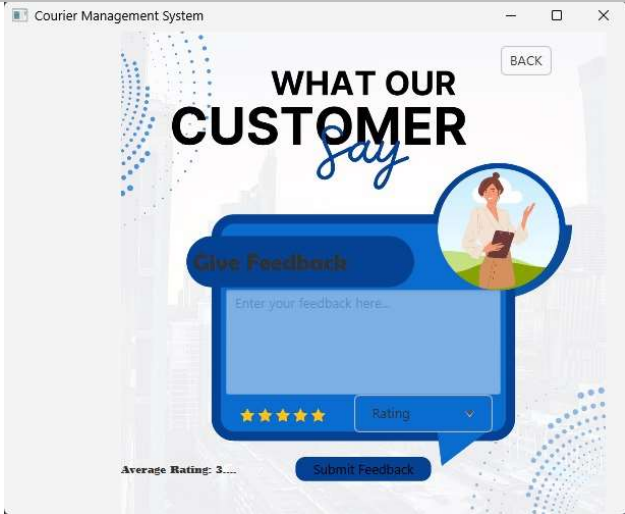
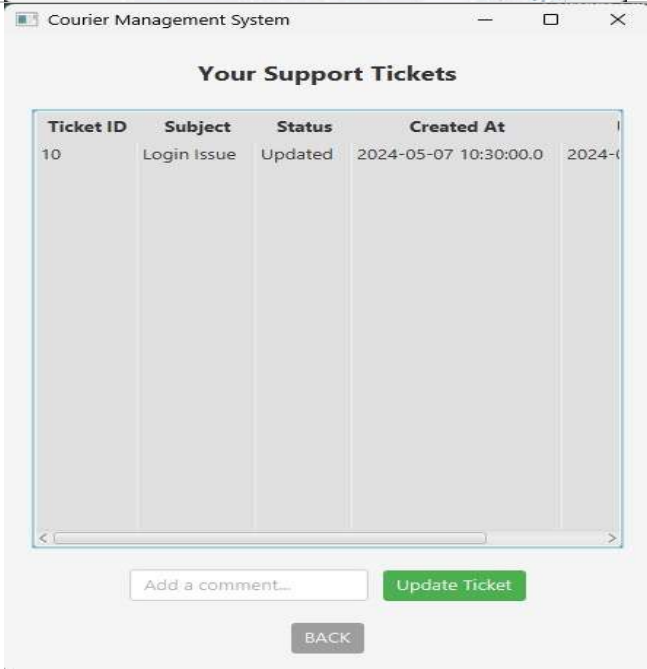
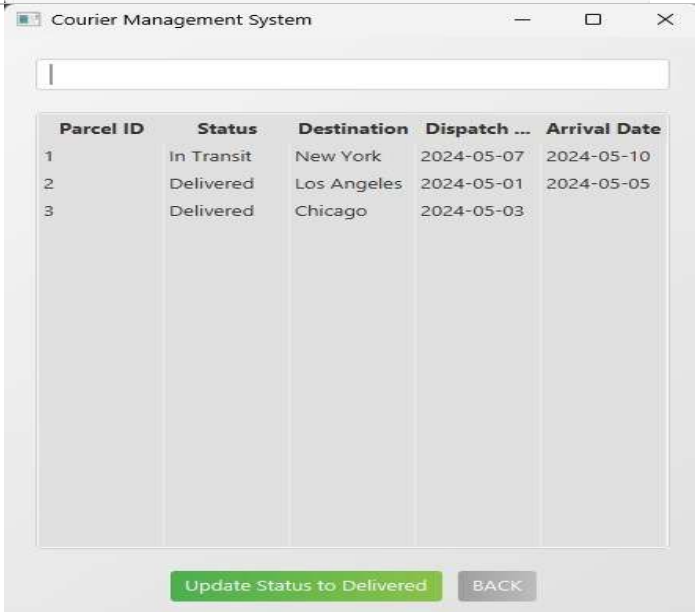
The interface is divided into two modules one if for customers and the other one is for Admin but at first you will be prompted with login screen below:



➤ **Customer Interfaces:**

After you login to customer interface you will be prompted to select a use case like this:



<p>Feedback: You can give feedback and rating to your parcel. You will also be viewed with average feedback for that product</p>	
<p>Customer Support: You can add ticket or update a comment to your use case.</p>	
<p>Track Parcel: From this panel you can track your parcel view status and destination of each. You can also update their status after they are delivered.</p>	

➤ **Admin Interfaces:**

After you login to Admin interface you will be prompted to select a use case like this:



Payment**management:**

Admin can keep track of all the payments and filter them by their status.

Payment ID	Amount	Status	Method	Date
1	150.0	Completed	Credit Card	
2	200.5	Pending	PayPal	
3	99.99	Refunded	Debit Card	

Inventory**Management:**

Admin can add, update or delete items from inventory according to the delivery status.

Item ID	Name	Quantity	Location	Description
1	mobile1	1	islamabad	123
3	phone	2	islamabad	aifon

Name:

Quantity:

Location:

Description:

Add New Item Update Item Delete Item BACK

User**Management:**

Admin can add delete or update user details. Admin can also search specific user by their email or username.

User ID	Username	Password	Email	Role	Contact Nun
1	bilal	bilal	bilal@gmail.com	customer	123465789
5	Abdulla	Abdullah	a@fds.com	Admin	21312313123
6	Sir Majid	SDA	asd@gm.com	HOD	285786436

Username:

Password:

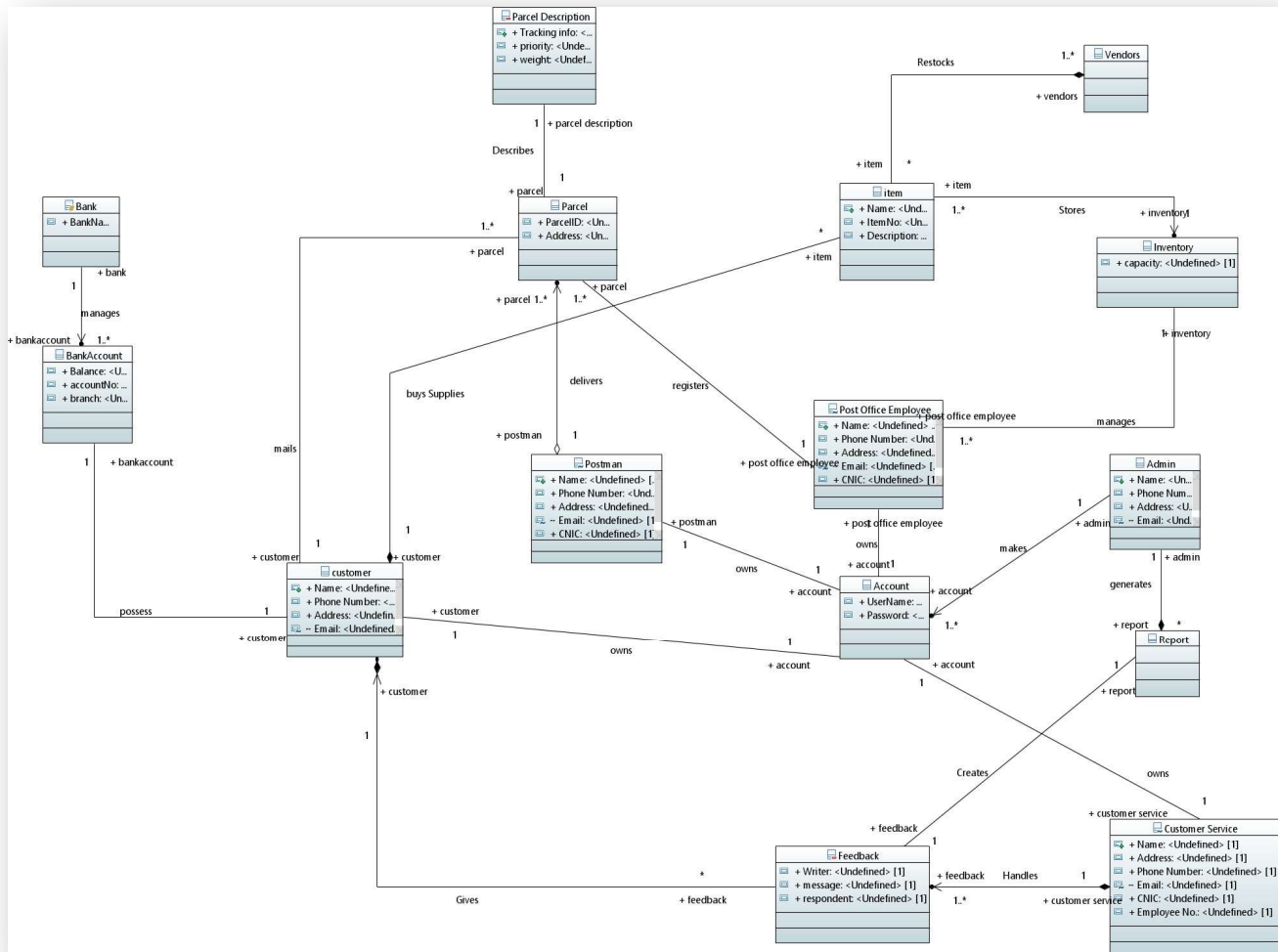
Email:

Role:

Contact Number:

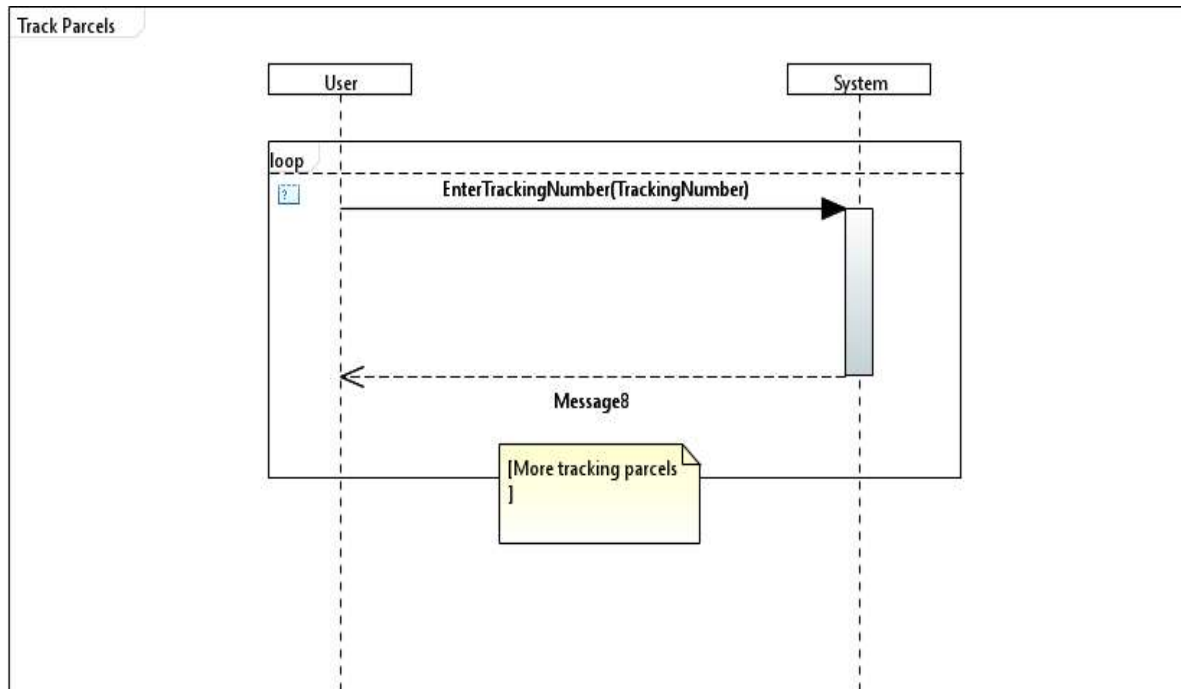
Add New User Update User Delete User BACK

4. Domain Model

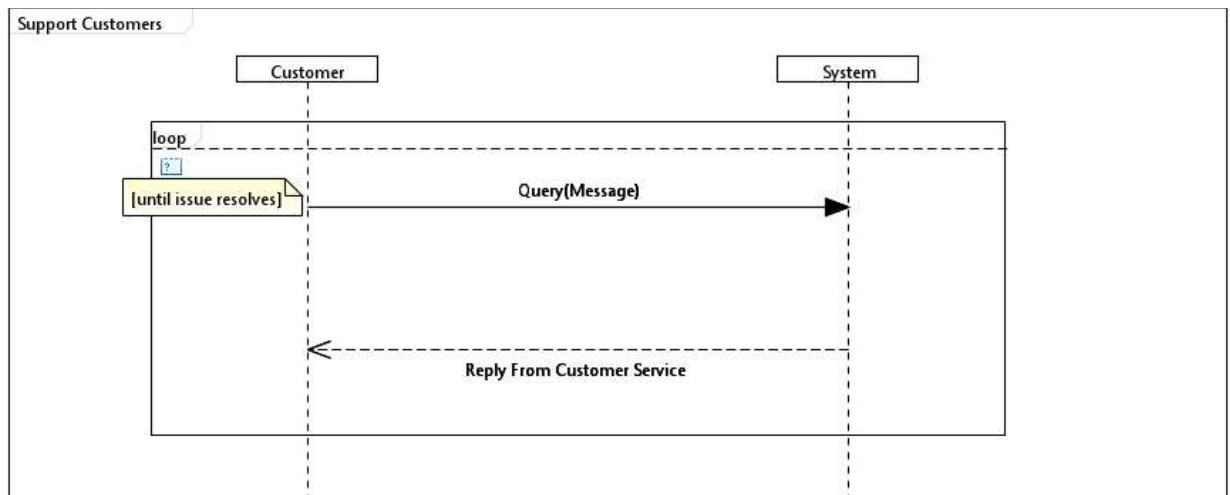


5. System Sequence Diagram

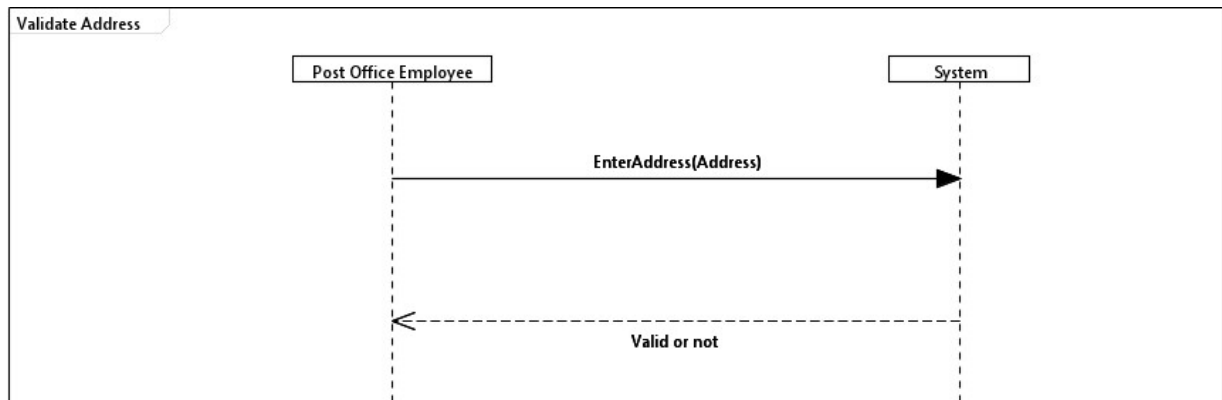
1.1 Track Parcels



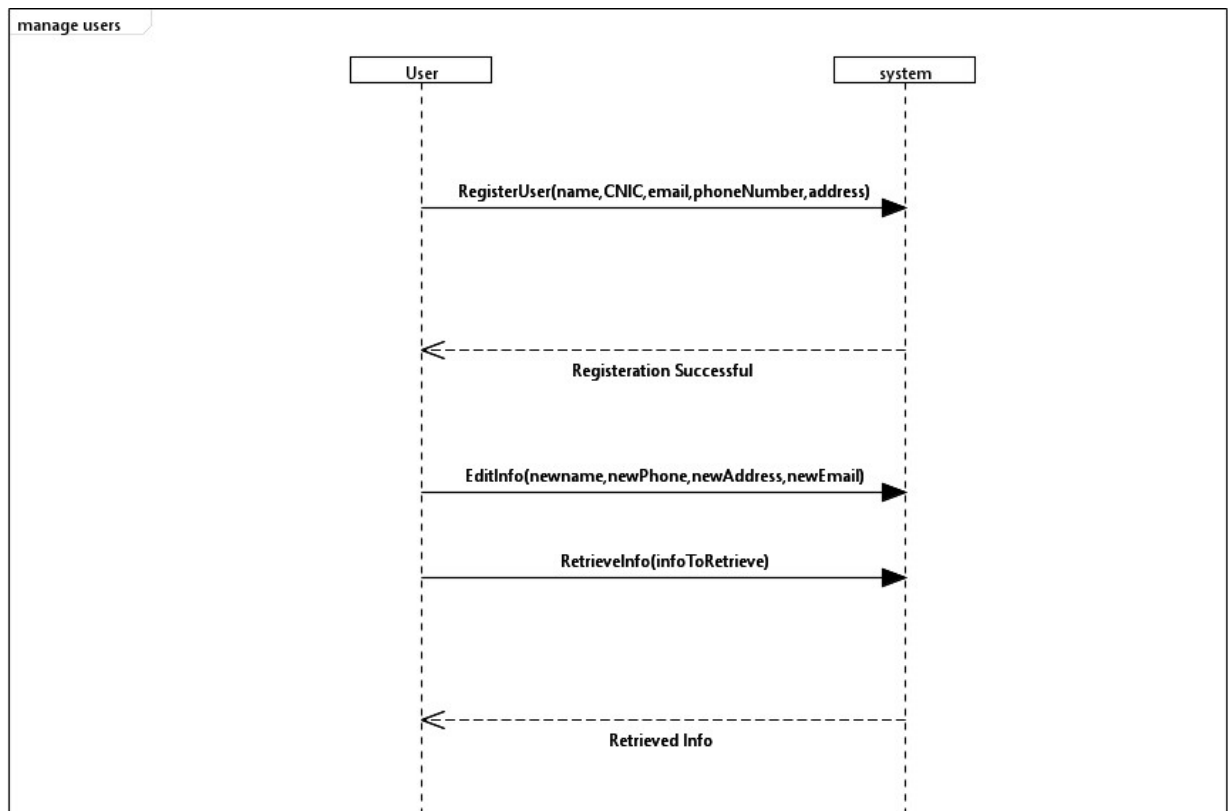
1.2 Support Customers



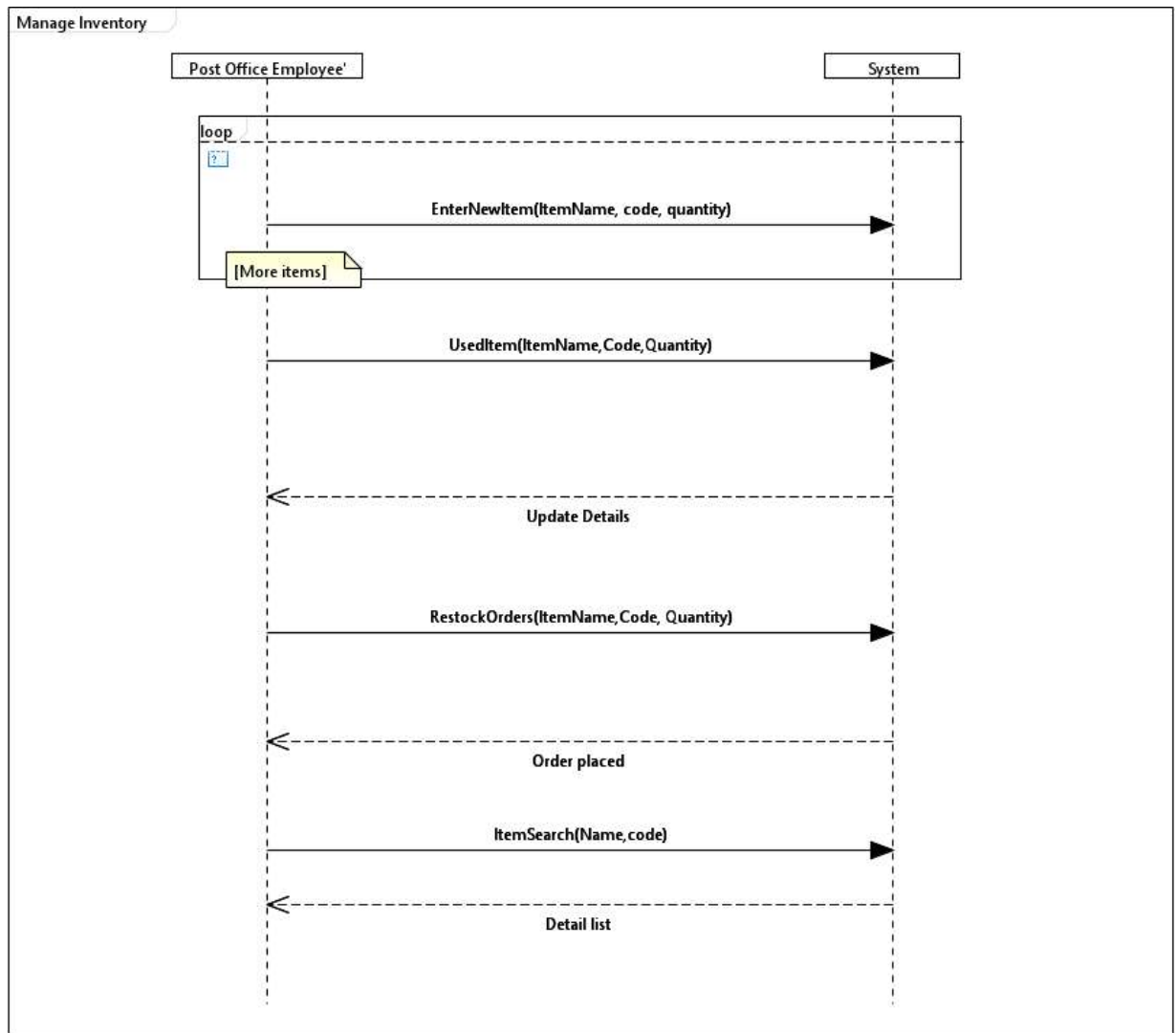
1.3 Validate Address



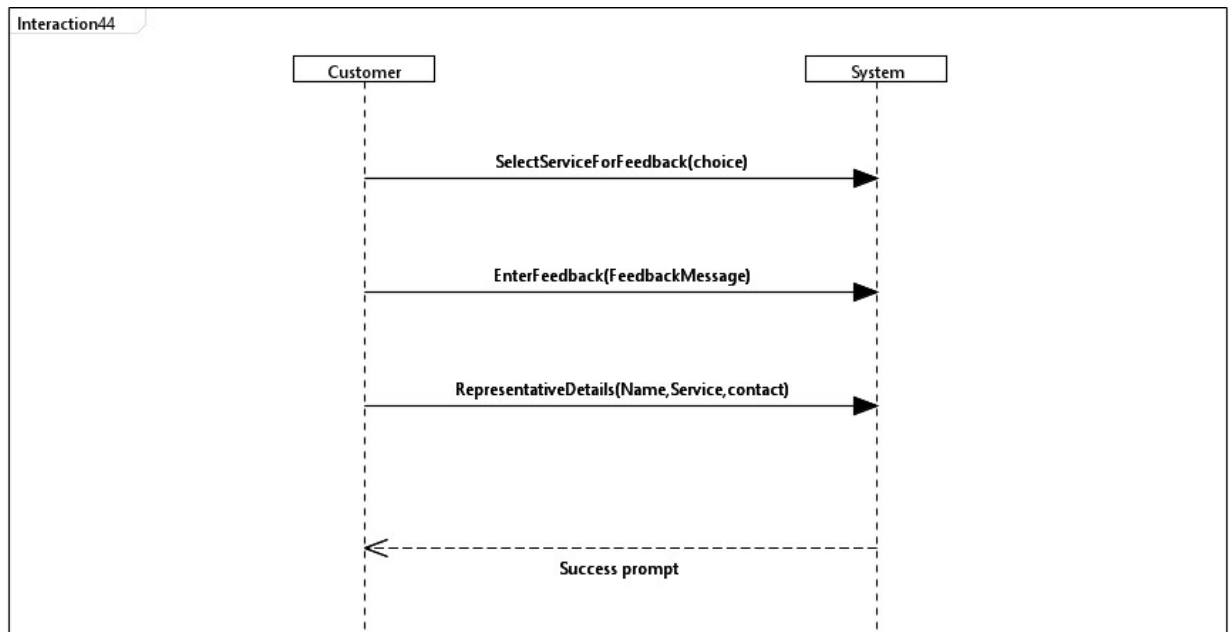
1.4 Manage Users



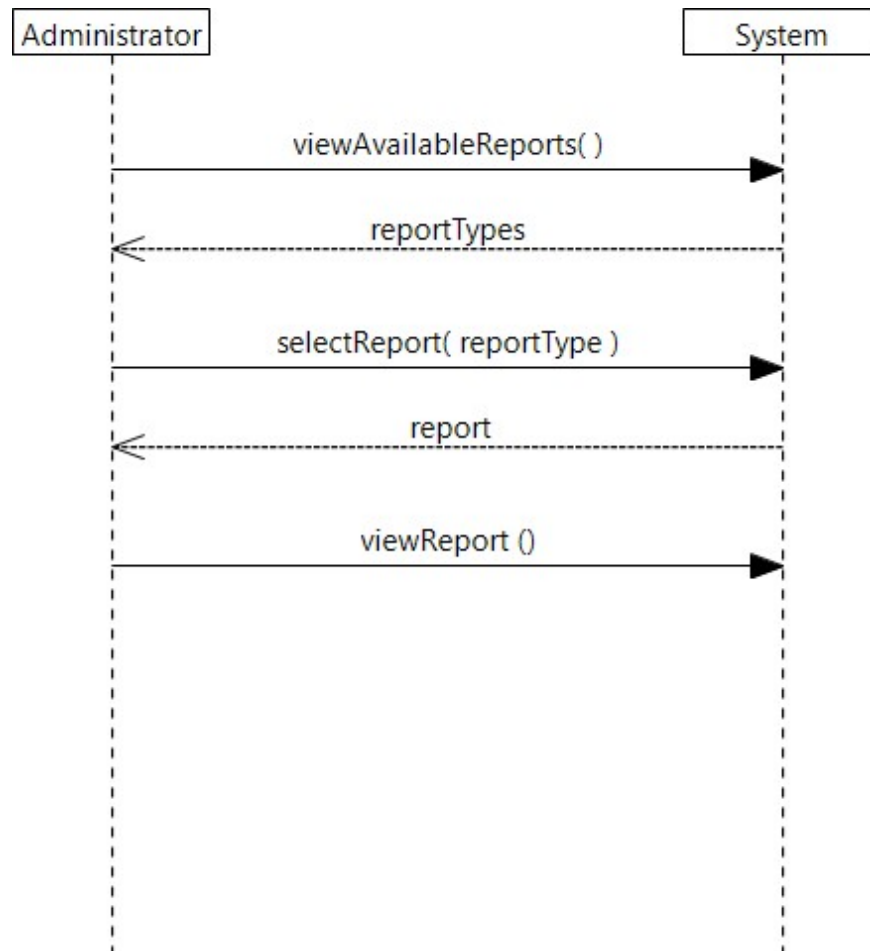
1.5 Magnate Inventory



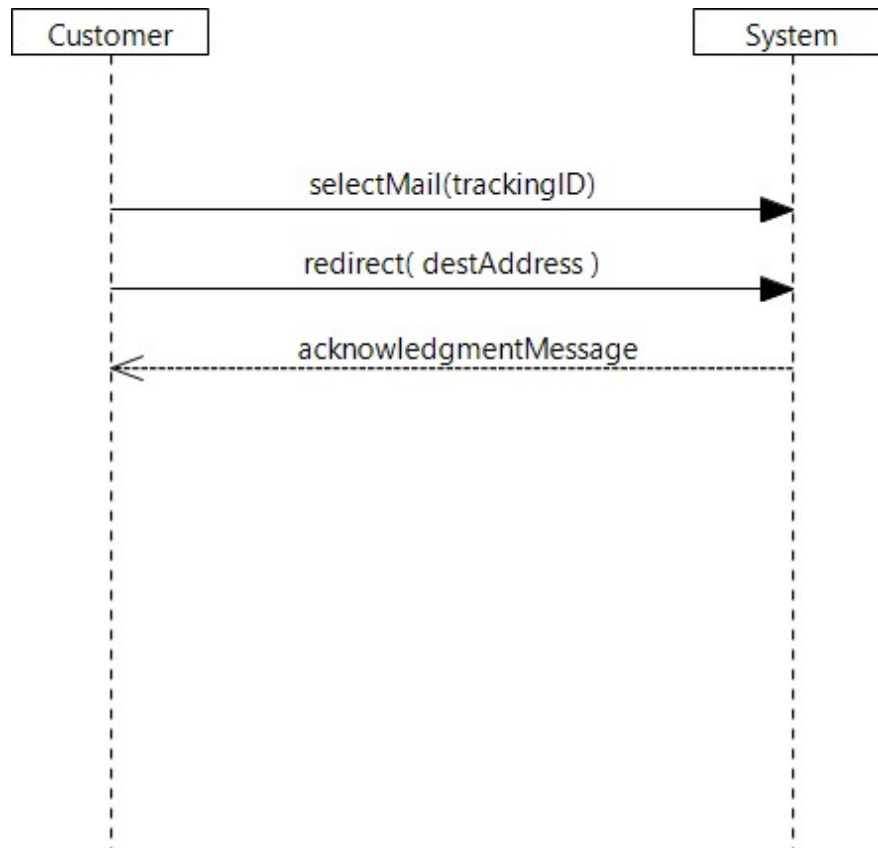
1.6 Give Feedback



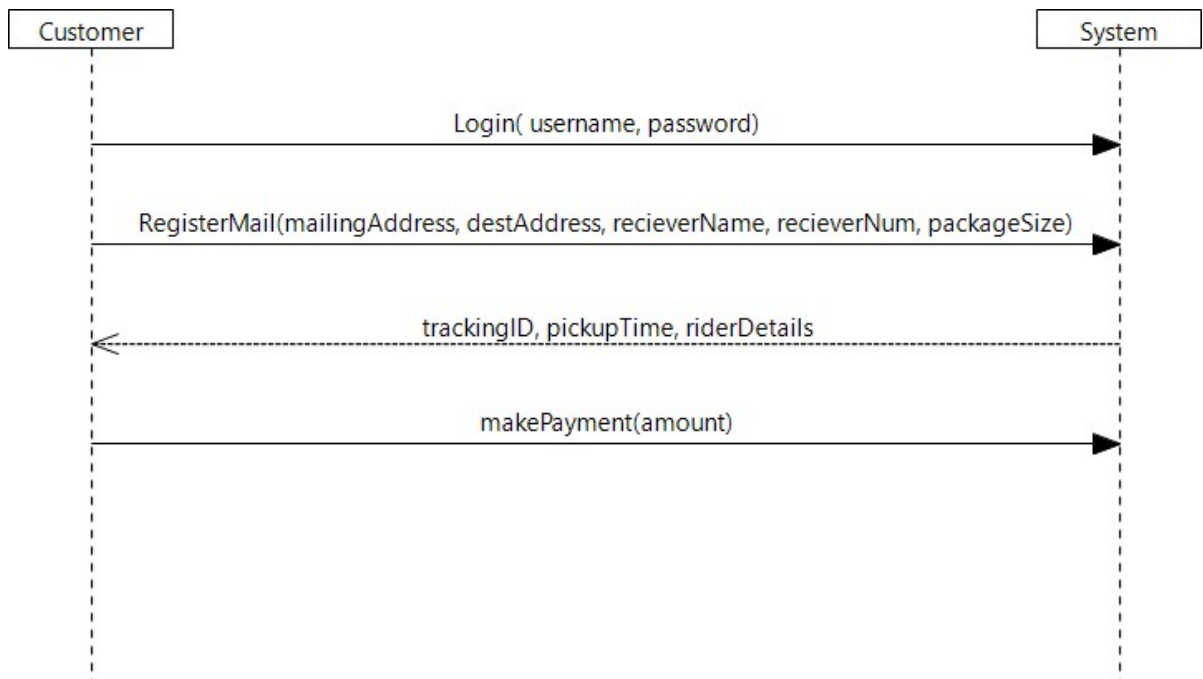
1.7 Generate Reports



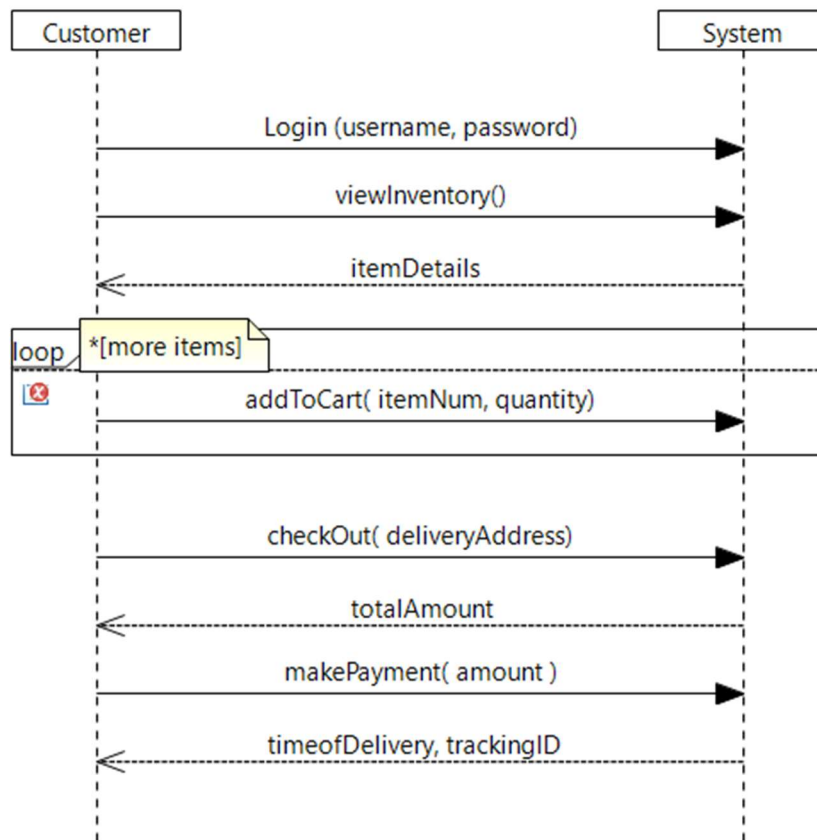
1.8 Redirect Mail



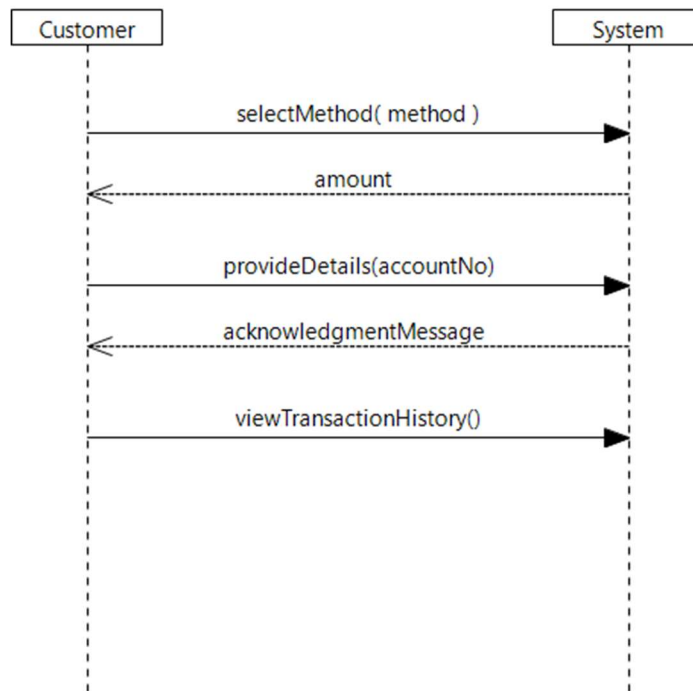
1.9 Register Mail



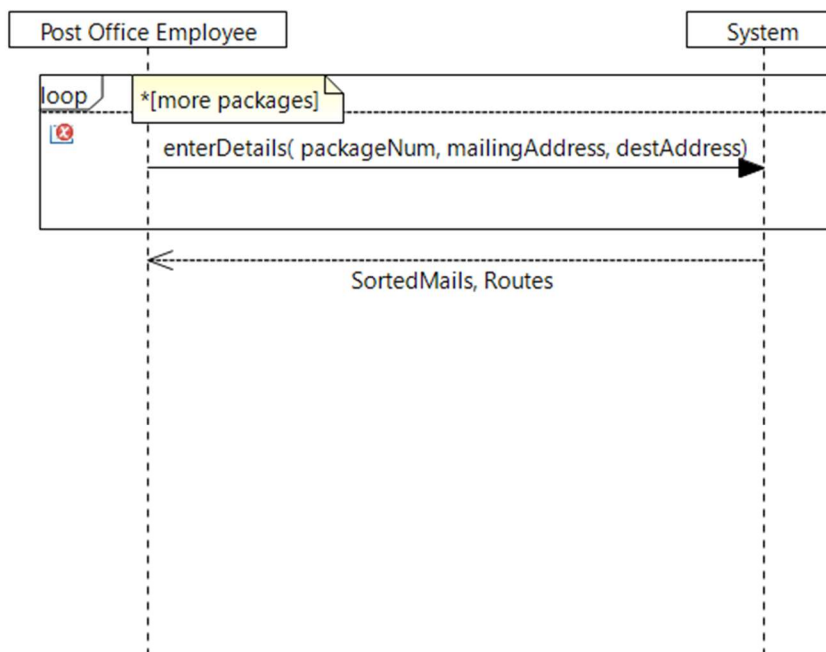
1.10 Order supplies



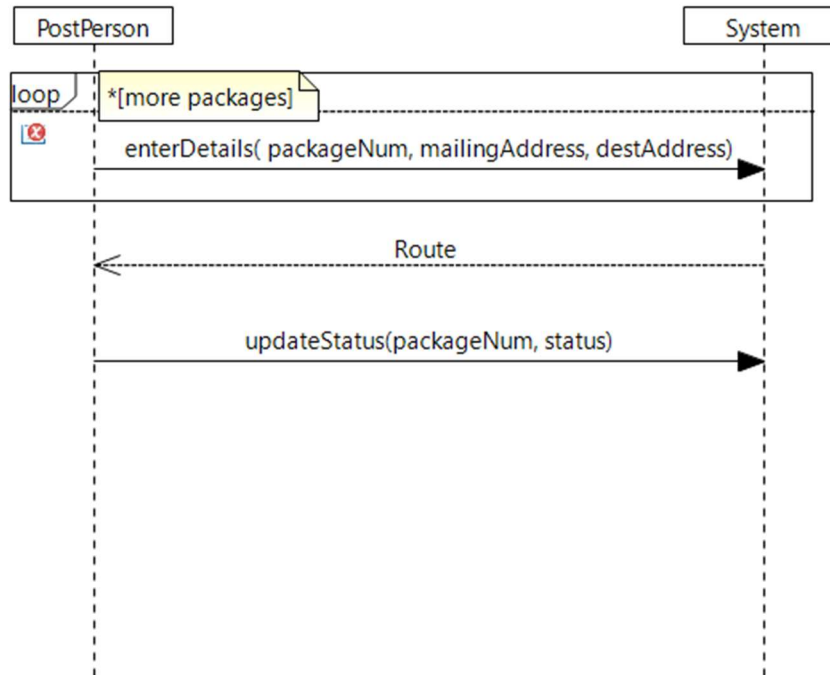
1. 11 Process payments



1. 12 Sort and route mails

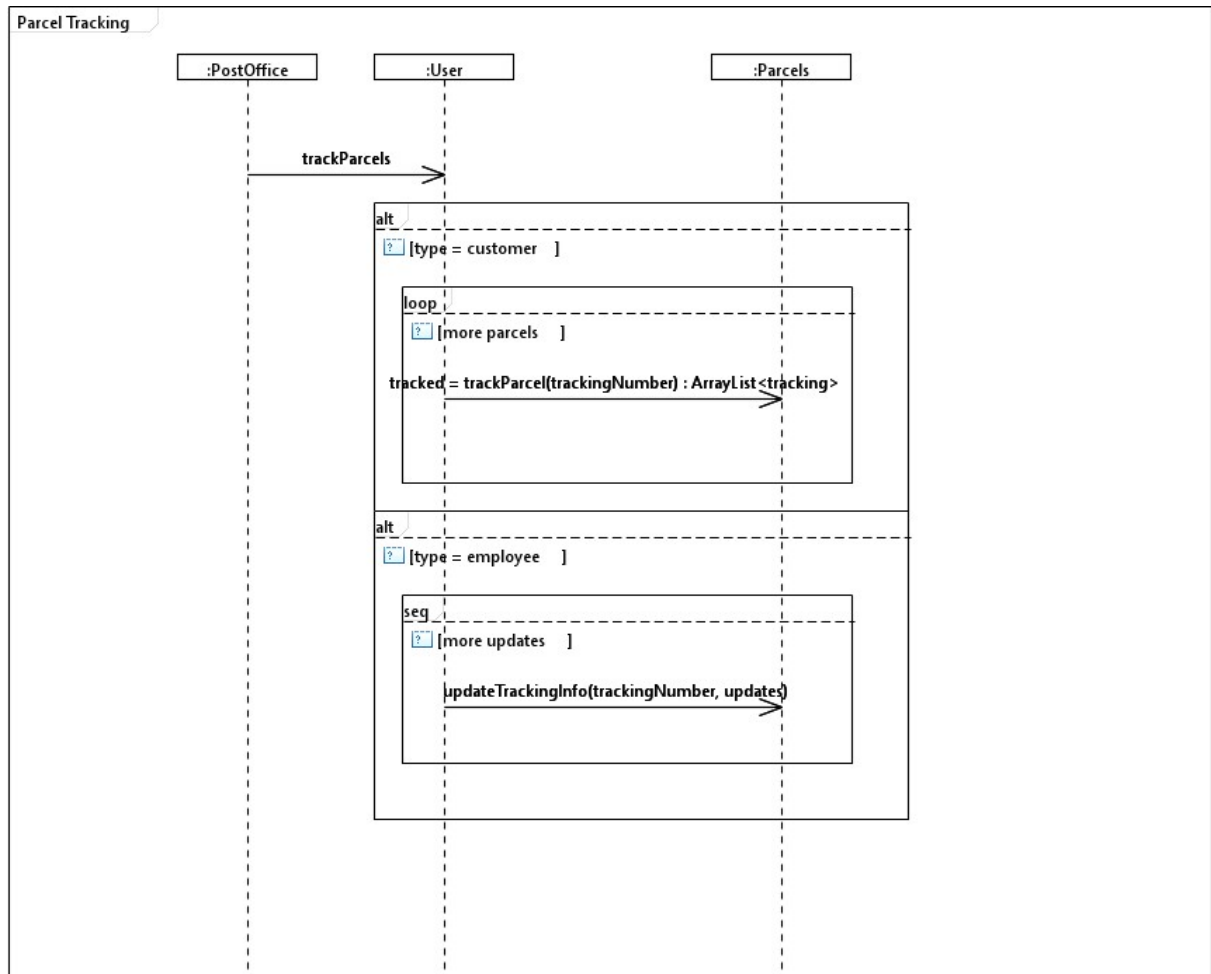


1. 13 Schedule delivery

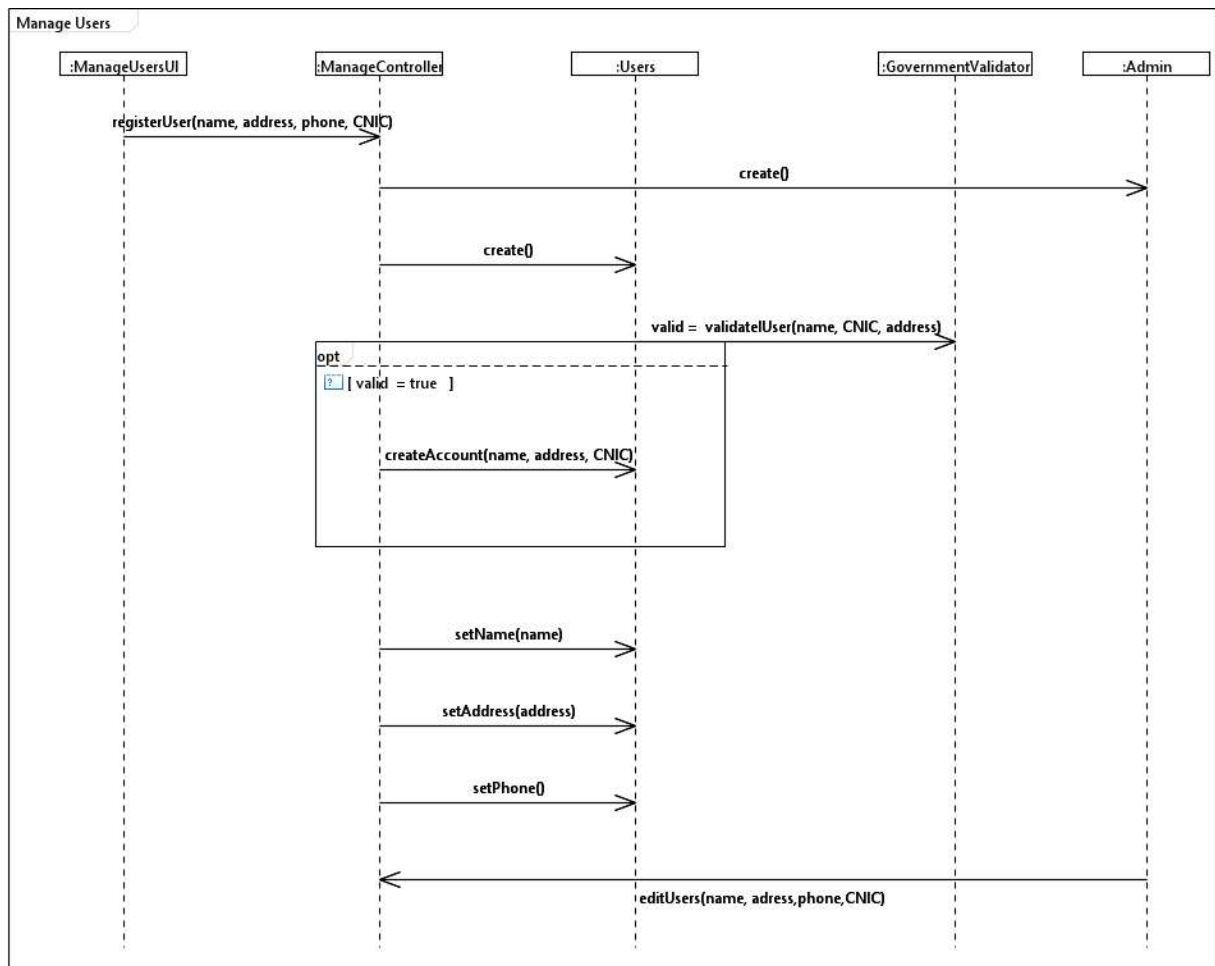


6. Sequence Diagram

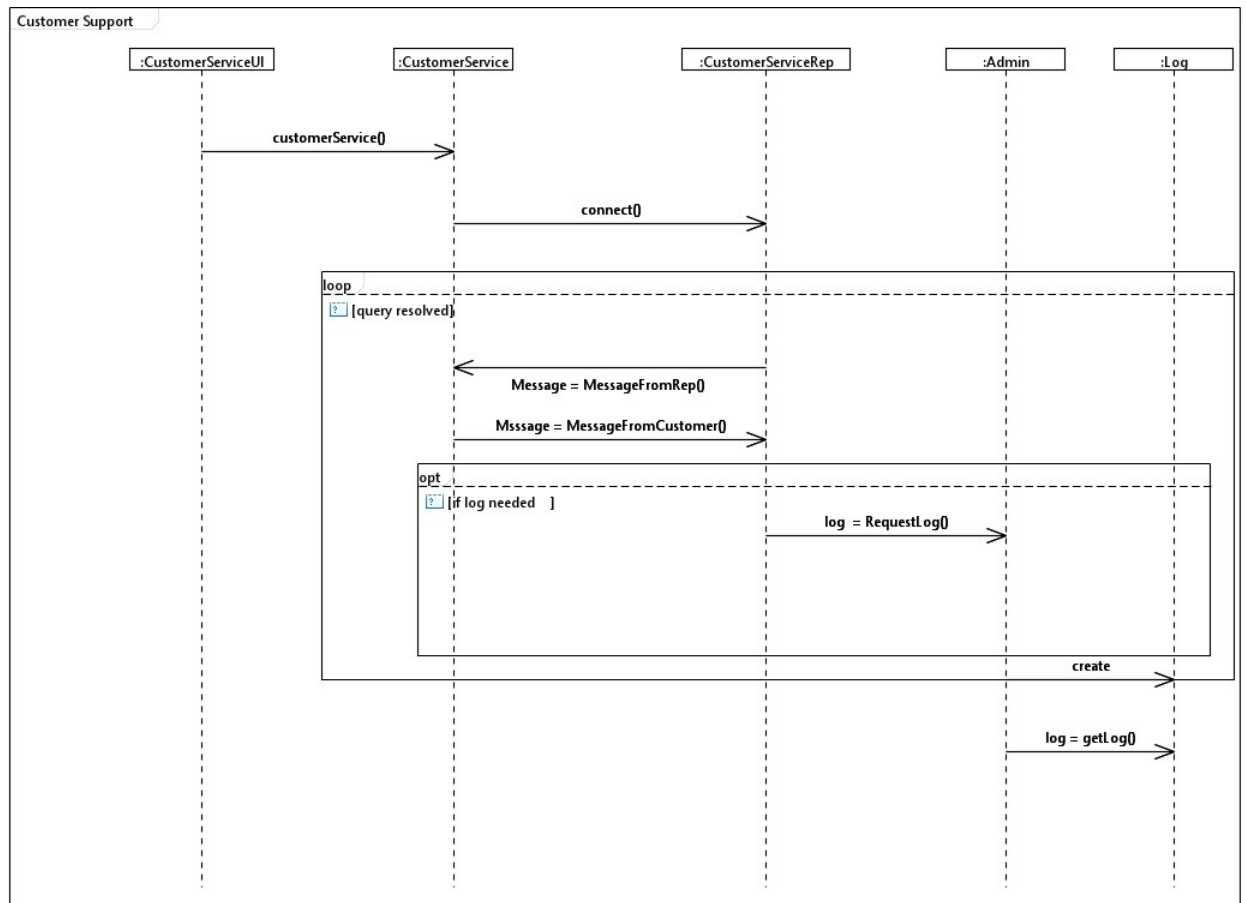
1. 1 Tracking Parcels



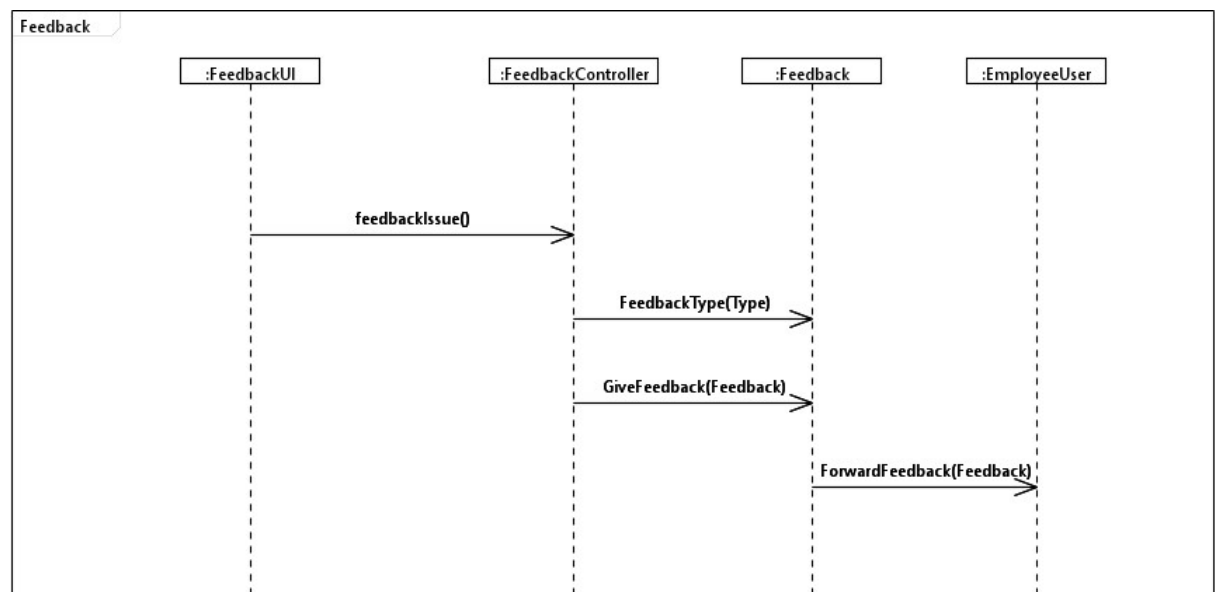
1.2 Manage User



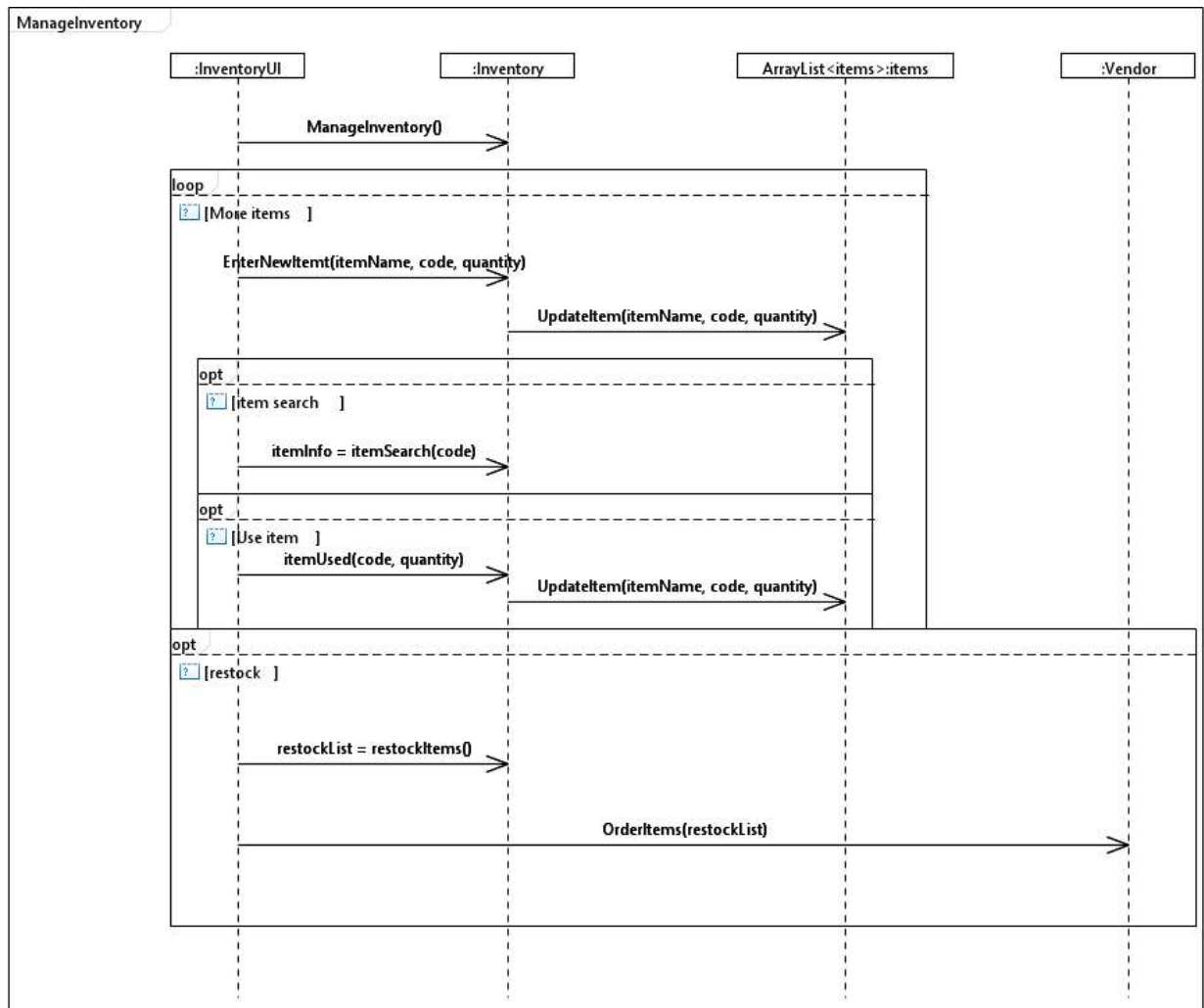
1.3 Customer Support



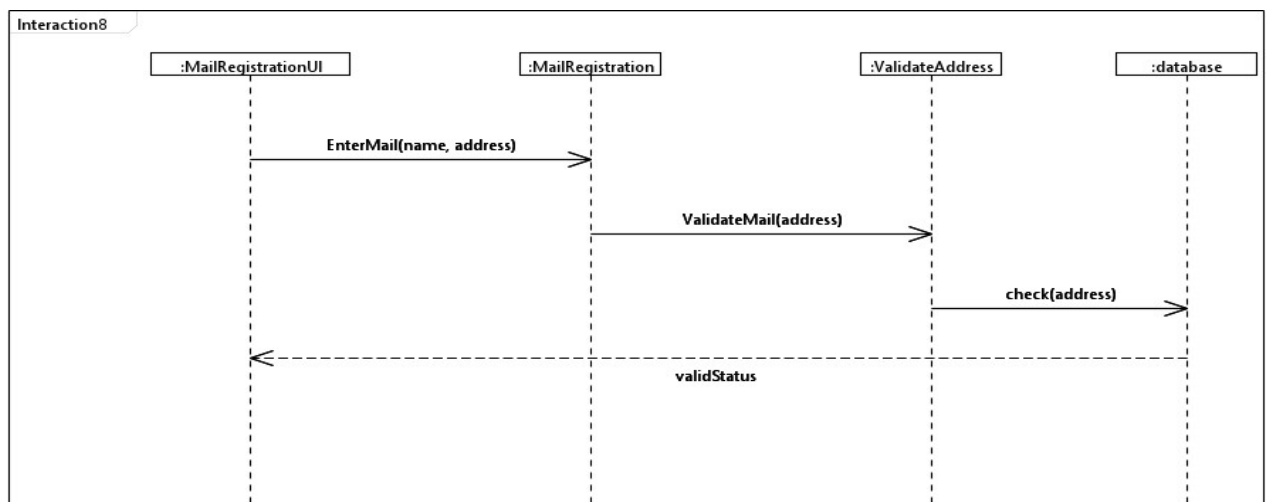
1.4 Feedback



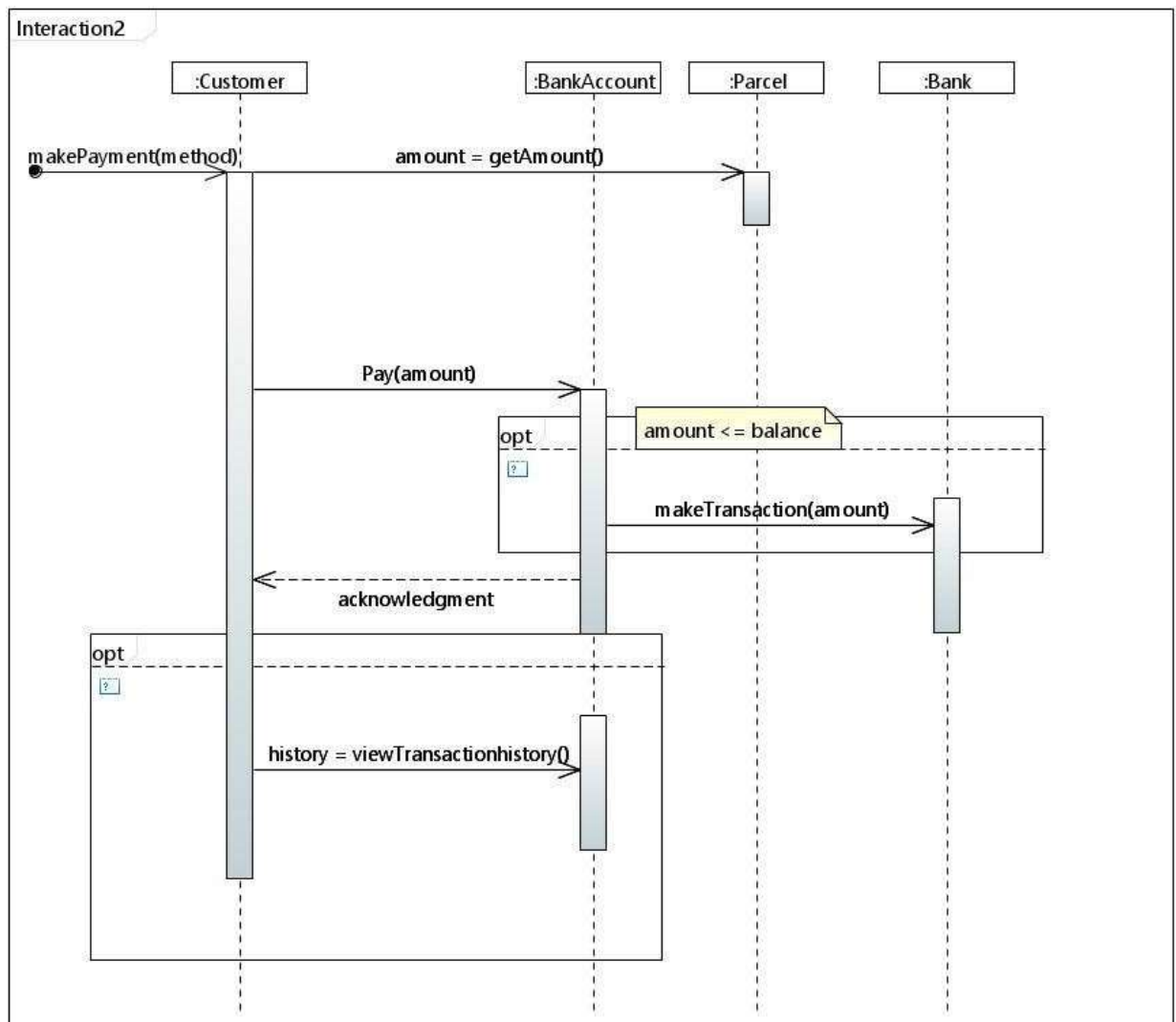
1.5 Manage Inventory



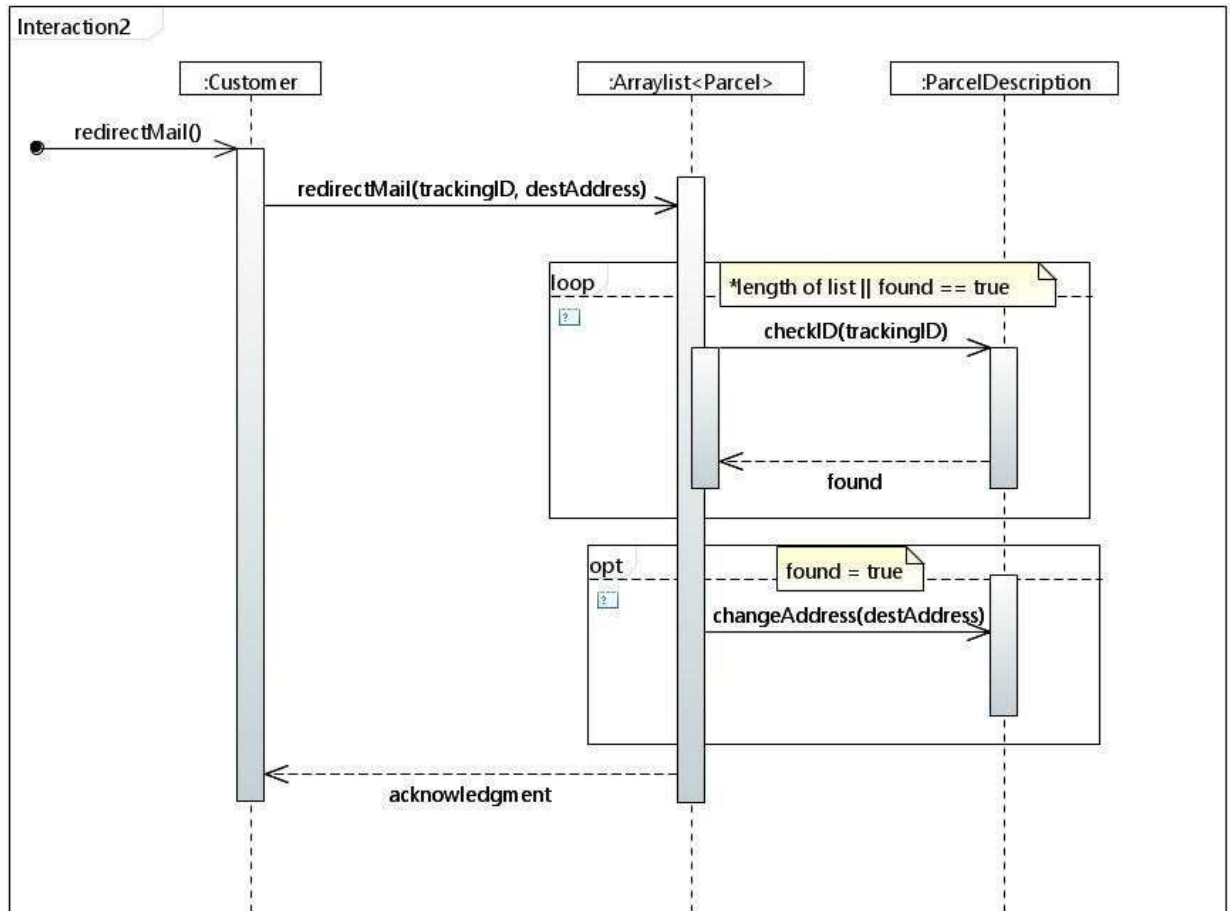
1.6 Validate Address



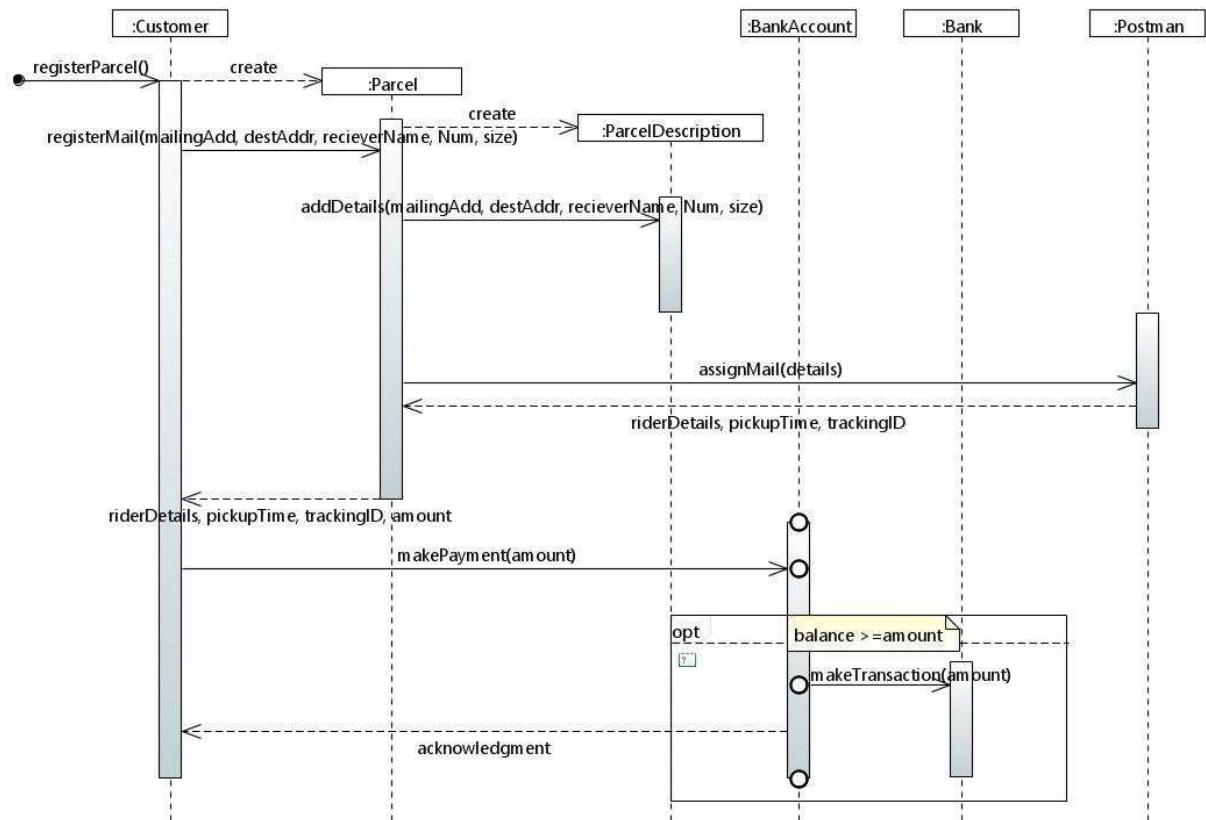
1.7 Make Payments



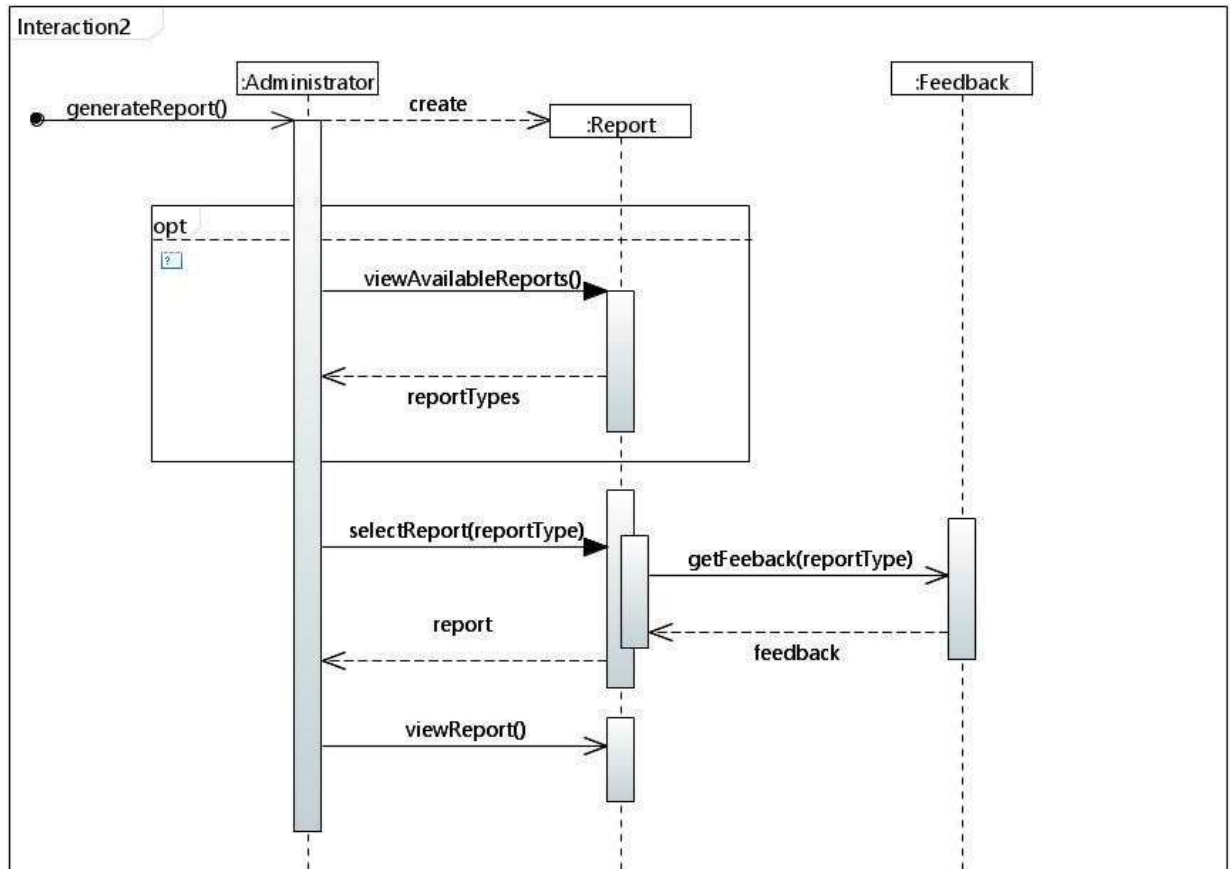
1.8 Redirect Mails



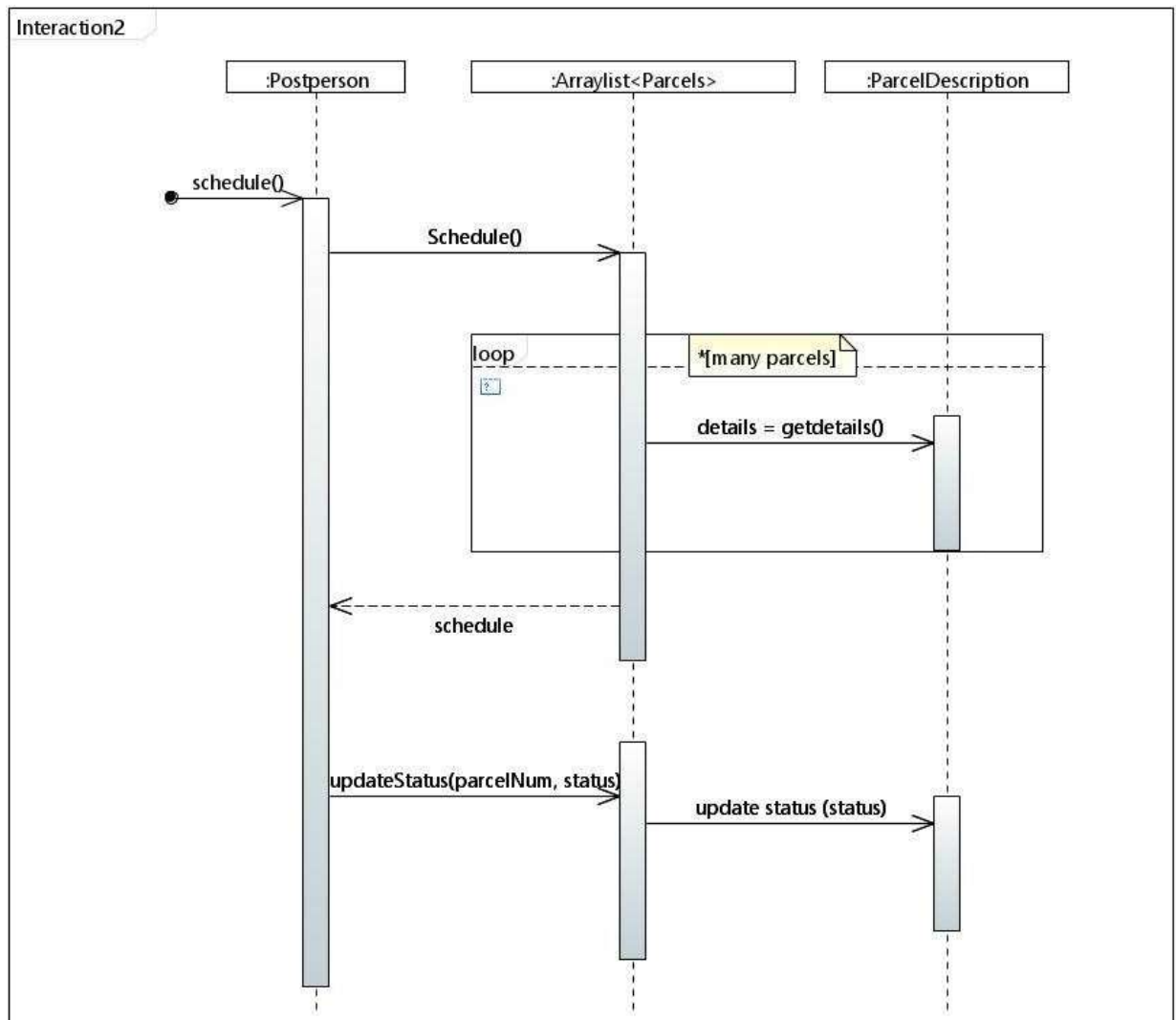
1.9 Register Parcel



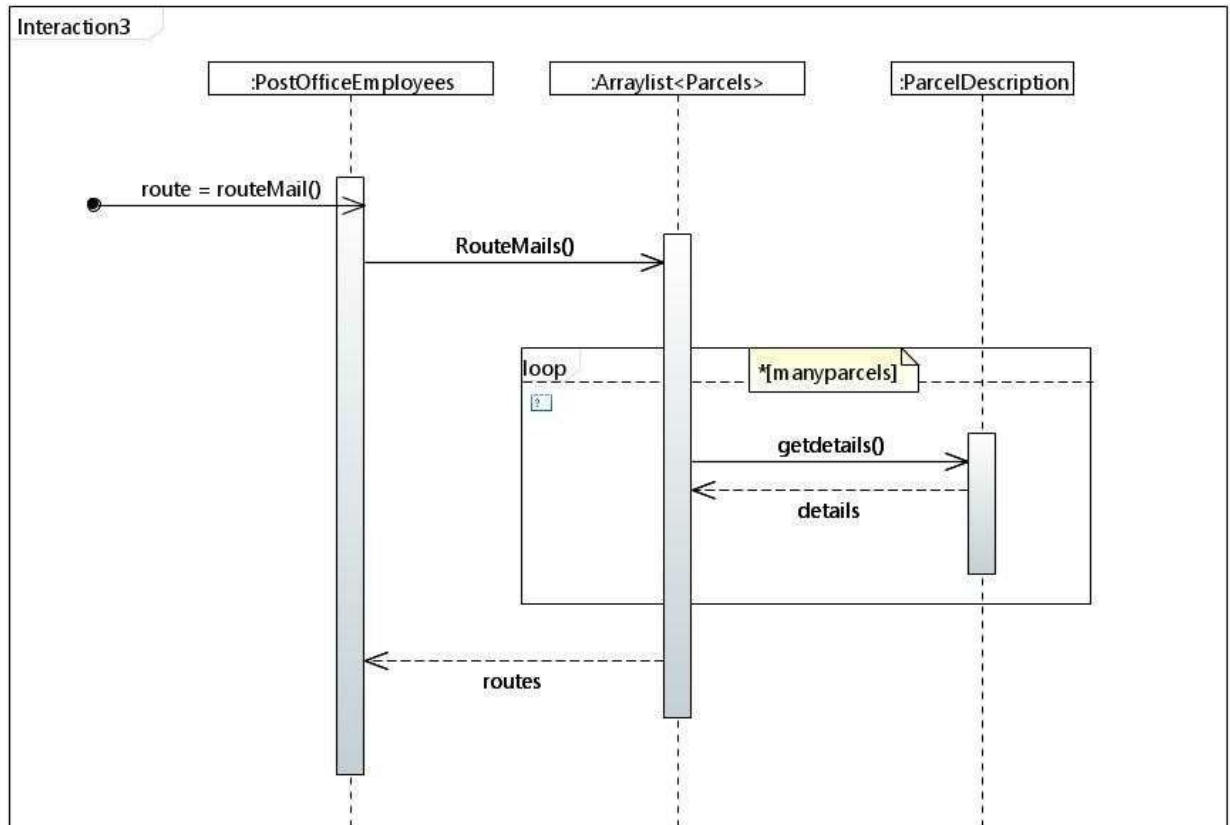
1. 10 Generate Report



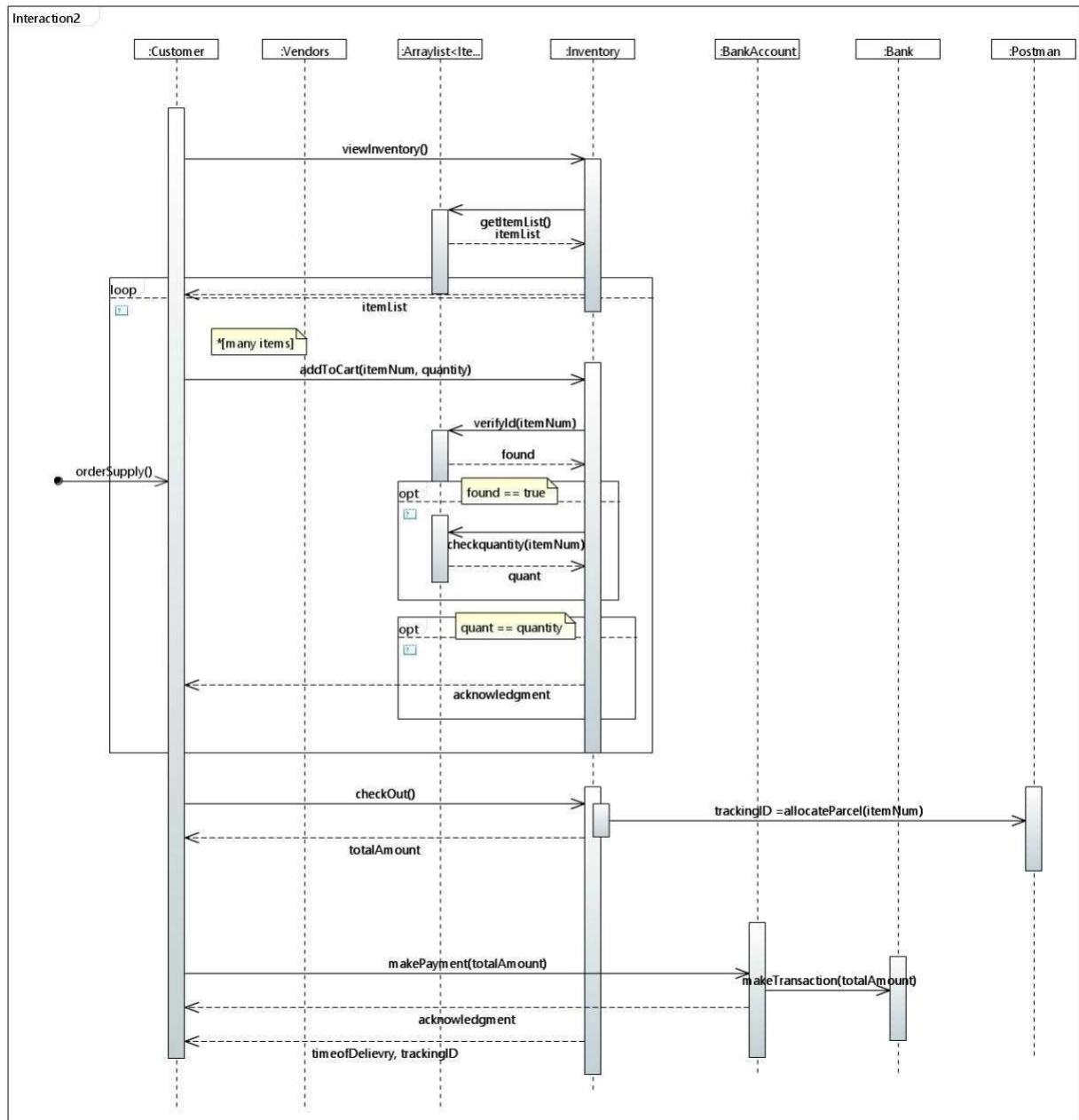
1. 11 Schedule Mails



1. 12 Sort and Route Mails



1.13 Order Supplies



7. Class Diagram

