

VIETNAM GENERAL CONFEDERATION OF LABOR
TON DUC THANG UNIVERSITY
FACULTY OF INFORMATION TECHNOLOGY



**REQUIREMENTS ANALYSIS AND DESIGN
FINAL PROJECT**

**MOBILE STORE MANAGEMENT
SYSTEM**

Instructor: Mr. PHAM THAI KY TRUNG

*Students: NGUYEN VO HOANG – 519H0106
HO QUOC CUONG – 519H0146*

Class: 19H50204

Course: 23

HO CHI MINH CITY, JANUARY 2022

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THANK YOU

During our working on this report, we have confronted with many difficulties but with the help of Mr. Pham Thai Ky Trung, we ourselves could widen more knowledge to make this report better. Therefore, we sincerely thank you for giving us such useful advice and spending your time instructing us.

Though being made by our most carefulness, the report cannot avoid some mistakes. If you find any errors in our report, please give me some advice so that we can be able to make a better report next time.

Once again, sincerely thank you!

PROJECT COMPLETED AT TON DUC THANG UNIVERSITY

I hereby declare that this is my own project and is guided by Mr. Phạm Thái Kỳ Trung; The content research and results contained herein are central and have not been published in any form before. The data in the tables for analysis, comments and evaluation are collected by the main author from different sources, which are clearly stated in the reference section.

In addition, the project also uses some comments, assessments as well as data of other authors, other organizations with citations and annotated sources.

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Ho Chi Minh City, 10th January, 2022

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Nguyen Vo Hoang

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EVALUATION OF INSTRUCTING LECTURER

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Ho Chi Minh city, day month year 2022
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CHAPTER 1 - EXECUTIVE SUMMARY

A customer wants to buy a smartphone but his/her address is too far away from any physical mobile store, therefore it is too time-consuming for him to pick his phone offline.

Similarly, the process of ordering and purchasing at a physical mobile store takes too much time and there has to be a face-to-face interaction among customers and staffs, which is quite inconvenient and dangerous due to the rapid spread of covid-19 virus at the moment.

As a result, my team would like to introduce a new mobile store management system that contains some necessary simple functions such as order, return, purchase process, customer, staff, mobile, system management. We will concentrate on those functions and give a brief description of each function.

CHAPTER 2 - BUSINESS REQUIREMENTS

2.1. Organization Chart

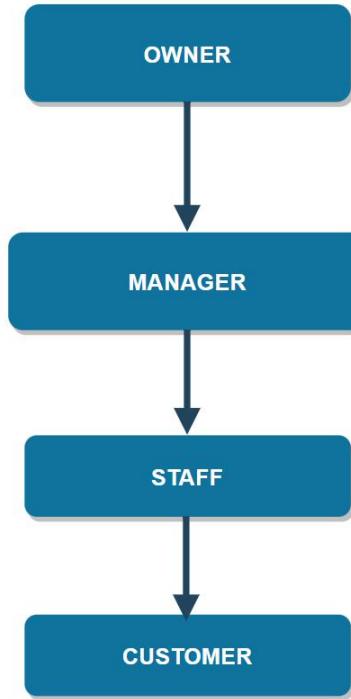


Figure 1 - Organization Chart of Mobile Store System

2.2. Business Modelling / Requirements

❖ User requirements for the new mobile store management system

My team proposed a mobile store management software. The new management system needs to fulfill the following requirements:

- The interface must be good-looking and easy to use
- The software must be suitable for user, can be simply maintained and not too complicated
- The system can manage the process of buying and exchanging/returning in the simple way
- The customer can search fast and clearly
- Data can be access correctly

- The manager is able to restore the essential information
- The customers can simply carry out the procedure of buying, returning and requiring maintenance
- The customer can order and purchase products online

❖ Requirements need to acquire of the new mobile store management system

The new system needs to achieve the following functions:

- Update information:
 1. Information about phones, speaker, phone accessories.
 2. Information about customer .
 3. Information about user (including manager, administrator, staff).
- Administer the process of buying/returning easily
- Search more correctly in a short time
- Be able to backup and restore full data
- Update product's details everyday

2.3. Business Process / Flowchart of Requirements

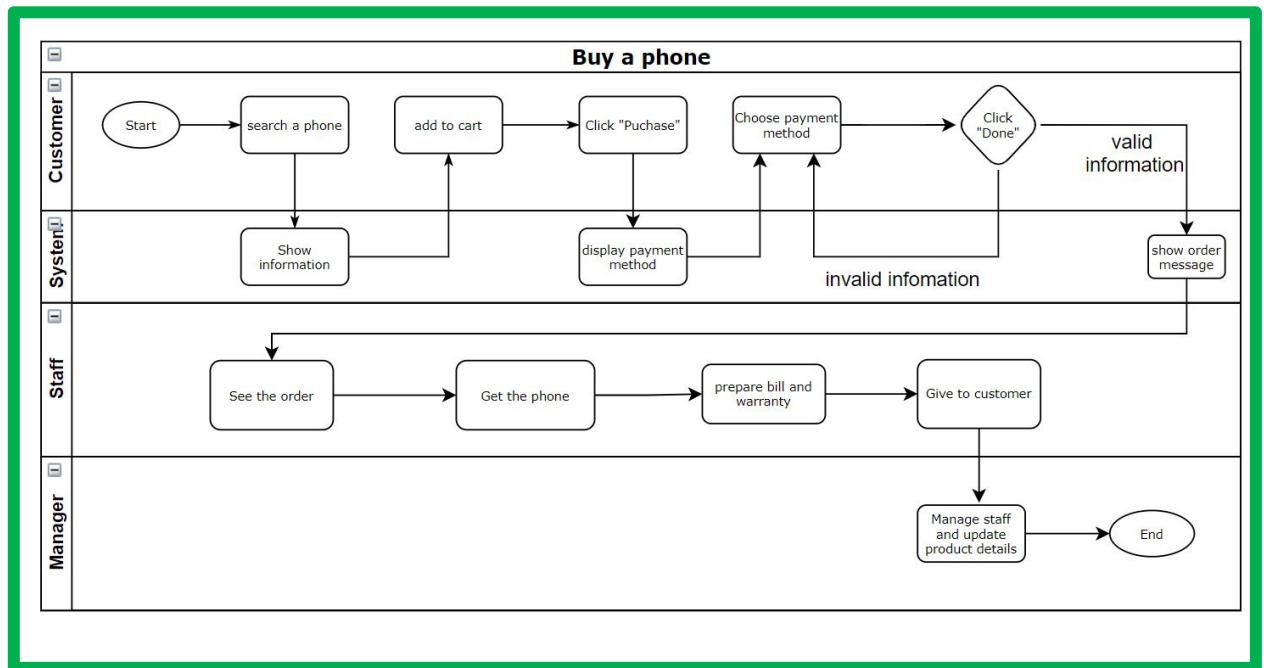


Figure 2 - Flowchart of Buy a phone

2.4. List of Requirements

Requirement	Functional	Nonfunctional
The system must allow administrator to backup and restore data.	X	
The administrator must have the right define user's permission in the system	X	
The manager must have the right to manage staffs like add, edit, delete	X	
The system must permit manager to manage products in store	X	

The system must allow Staff to manage customers by manager's order (add, edit, delete).	X	
The system must allow manager to manage buying (purchase and return product).	X	
The system must allow customer to pay in many methods	X	
The administrator must have the right to manage all the users	X	
The system must allow customer to purchase and return the product online	X	
The system must give users permission to search and buy the product easily	X	
Easy to use system.		X
The system have beautiful interface		X

Table 1 - List of requirements

CHAPTER 3 - SYSTEM REQUIREMENT ANALYSIS

3.1. Translate from Business Use Case

3.1.1. *System Narrative*

- ◆ Order, pay, return phone and require maintenance:
 - ❖ The **customers** want to order a phone online. First they have to login to the system, then search for phones, read phone's infomation and then select any phones they want to order. Next, they are required to fill out an order form containing basic information and then click "next". If they enter correct and valid input, they will be directed to choose payment method. They choose method that they want and click "order". A successful message will be displayed and they just need to wait for **staff** to confirm the order and then their phone will be delivered in a few days.
 - ❖ The **customers** want to return their phone due to various reasons. First they need to view the order that they bought a few days ago, click "Return". They will be required to fill out the reason why they want to return. If they enter valid input, the reason will be sent to the **staff**. If the reason is acceptable, the **staff** will confirm and then the **customers** will send the phone back to the store and get refund.
 - ❖ The **customers** want to have their phone maintained. First, they have to get into "Support" option, click "Require maintenance". Then they will be required to fill out a form containing the reason, type of error and error description. If they enter valid input. The form will be sent to **staff**. Then **staff** will confirm and the **customers** need to send their phone to the store, wait for maintenance and get it back when done fixing.

- ❖ The **manager** will manage the staffs in charge of ordering, returning and maintaining phones
- ❖ The **admin** will decentralize users so that they can use their rights

3.1.2. User goals

User	Goal
Manager	✓ Staff management
Admin	<ul style="list-style-type: none"> ✓ Security ✓ User management (customer, staff and manager) ✓ Data management (Backup, restore) ✓ Full application management
Staff	<ul style="list-style-type: none"> ✓ Customer management ✓ Mobile phone management ✓ Transaction management (order, return, maintenance, payment)
Customer	<ul style="list-style-type: none"> ✓ Order, return, require maintenance, make payment mobile phones ✓ See information of various kinds of phones

Table 2 - Table of User goals

3.1.3. List of Events

Event	Trigger	Source	Use case	Response	Destination
Admin wants to control the system	System inquiry	Admin	System management	System control	Admin
Admin wants to assign permission to user	Decentralization inquiry	Admin	Decentralization	Decentralize successfully	Manager Staff Customer
Admin wants to backup and restore	Backup and restore	Admin	Backup and restore	Backup data successfully/ Restore successfully	System
Staff wants to read customer information	Customer information	Staff	Customer management	Customer information	Staff
Staff wants to add new customer	Add customer	Staff	Add customer	Add successfully	Staff
Staff wants to edit customer information	Edit customer	Staff	Edit customer	Edit successfully	Staff

Staff wants to delete customer	Delete customer	Staff	Delete customer	Delete successfully	Staff
Staff wants to search customer	Search details	Staff	Search customer	Search Result	Staff
Staff wants to read phone information	Phone information	Staff	Mobile Phone Management	Phone information	Staff
Staff wants to add new phone	Add phone	Staff	Add phone	Add successfully	Staff
Staff wants to edit phone information	Edit phone	Staff	Edit phone	Edit successfully	Staff
Staff wants to delete phone	Delete phone	Staff	Delete phone	Delete successfully	Staff
Staff wants to search phone	Search details	Staff	Search phone	Search result	Staff
Staff wants to manage all inquiry	Transaction inquiry	Staff	Transaction management	Transaction	Staff

transaction					
Manager wants to read staff information	Staff information	Manager	Staff management	Staff information	Manager
Manager wants to add new staff	Add staff	Manager	Add staff	Add successfully	Manager
Manager wants to edit staff information	Edit staff	Manager	Edit staff	Edit successfully	Manager
Manager wants to delete staff	Delete staff	Manager	Delete staff	Delete successfully	Manager
Manager wants to search staff	Search details	Manager	Search staff	Search result	Manager
Customer wants to read phone information	Phone information	Customer	Phone management	Phone information	Customer
Customer wants to buy and pay phone	Order and pay phone	Customer	Order and pay phone	Order successfully	Customer

phone					
Customer wants to return phone	Return phone	Customer	Return phone	Return confirmed	Staff
Customer wants to require maintenance	Require phone maintenance	Customer	Require maintenance	Requirement confirmed	Staff
User wants to login	User details	Manager Staff Customer	Sign in	Login successfully	Manager Staff Customer
User wants to register	User details	Manager Staff Customer	Sign up	Sign up successfully	Manager Staff Customer
User wants to log out	User details	Manager Staff Customer	Sign out	Sign out successfully	Manager Staff Customer
User wants to change password	User details	Manager Staff Customer	Change password	Change successfully	Manager Staff Customer

Table 3 - Table of List of Event

3.1.4. List of Actors

Actor	Definition
Manager	Fully monitors and manages all information of their staffs
Admin	Administers all functions of system, secures it from being attacked and be responsible for each information stored in data.
Staff	Manages phones and customers information, receives requirements such as order, return, maintenance,... from customers and confirms.
Customer	Performs operation of order, return, maintenance requirement and payment

Table 4 - Table of List of Actors

3.1.5. List of Use cases

Use case	Meaning
System management	Allow admin to control system
Decentralization	Allow admin to assign permission to user
Backup and restore data	Allow admin to backup and restore data when needed
User management	Allow admin to manage all users
Customer management	Allow staff to manage customer's information
Add customer	Allow staff to add new customer

Edit customer	Allow staff to edit customer's information
Delete customer	Allow staff to delete customer
Search customer	Allow staff to search customer
Mobile phone management	Allow staff to manage phone's information
Add phone	Allow staff to add new phone
Edit phone	Allow staff to edit phone's information
Delete phone	Allow staff to delete phone
Search phone	Allow staff to search phone
Staff management	Allow manager to manage staff's information
Add staff	Allow manager to add new staff
Edit staff	Allow manager to edit staff's information
Delete staff	Allow manager to delete staff
Search staff	Allow manager to search staff
Transaction management	Allow staff to manage all transaction in the system
Order	Allow customer to order phone
Pay	Allow customer to make payment for phone
Return	Allow customer to return phone
Require maintenance	Allow customer to require maintenance for phone

Sign in	Allow user to login the system
Sign up	Allow user to create new account
Sign out	Allow user to logout the system
Change password	Allow user to change password of his/her account

Table 5 - Table of List of Use Cases

3.1.6. Use Case Diagram

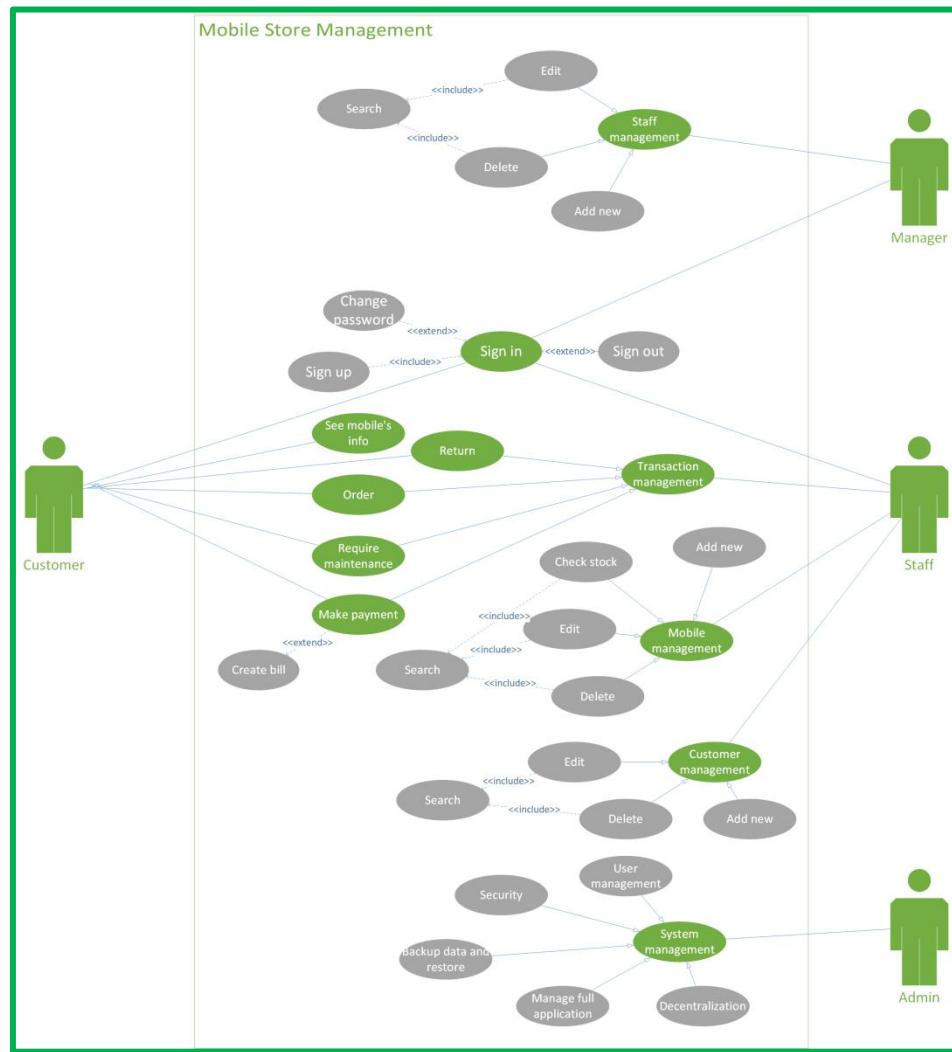


Figure 3 - Use Case Diagram for Mobile Store Management System

3.1.7. Domain Class Model Diagram

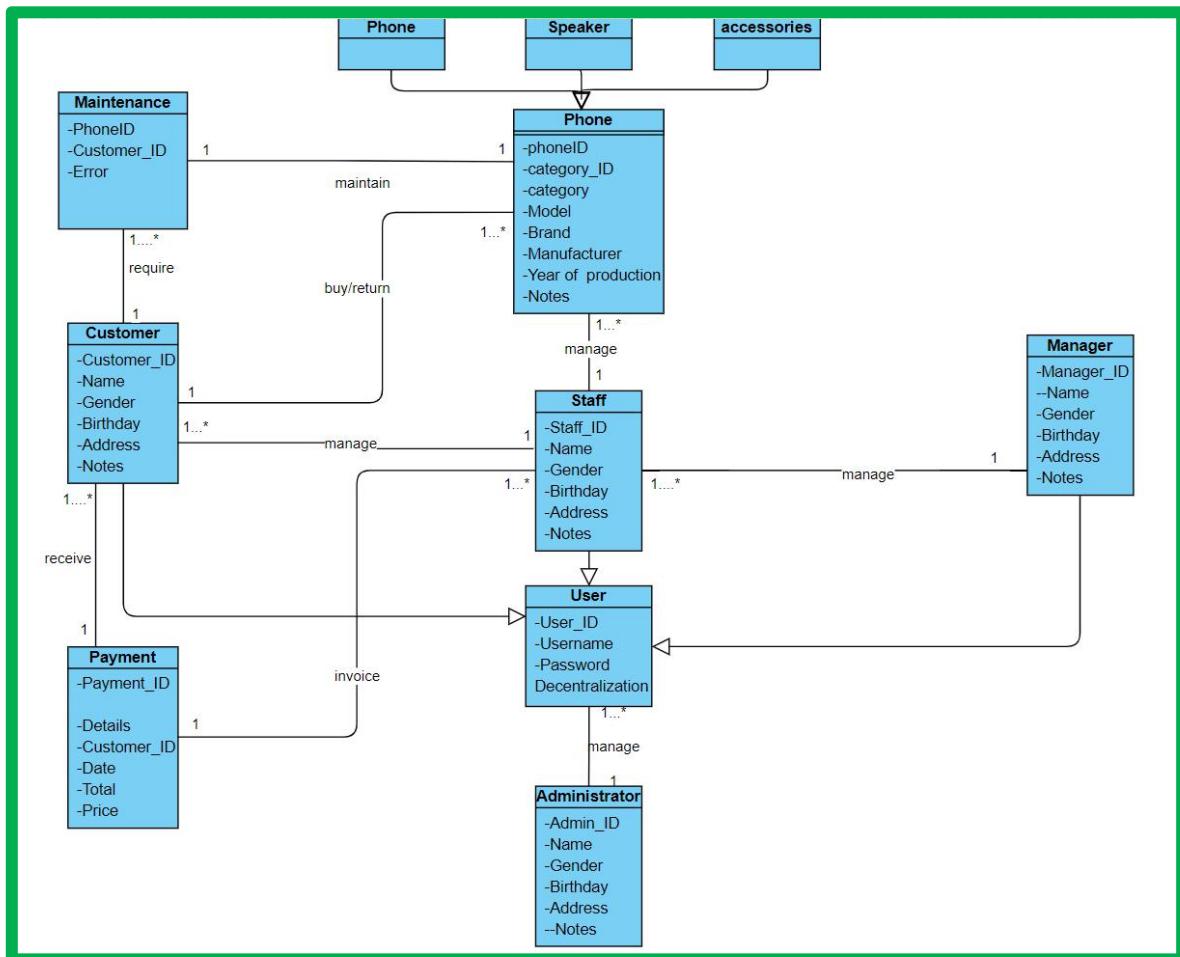


Figure 4 - Domain Class Model Diagram

3.2. Use case description

3.2.1. Use case: Sign in

i. Use case: Sign in fully description

Use case name	Sign in
Scenario	To login to the system
Triggering event	Users want to login to the system
Brief description	Users uses their own username and password to login

Actors	Manager, Staff, Customer									
Related use cases	Use case corresponds to their function									
Stakeholders	Use case corresponds to their function									
Preconditions	Login system must be available and operate properly									
Postconditions	Users must have a registered account									
Flow of activities	<table border="1"> <thead> <tr> <th>Actor</th><th>System</th></tr> </thead> <tbody> <tr> <td>1. Users enters their username and password.</td><td>1.1. The system checks if the inputs are valid or not</td></tr> <tr> <td>2. Users enter wrong or invalid username and password</td><td>2.1. Display error message: “invalid or wrong input”.</td></tr> <tr> <td>3. Users forget the password</td><td>3.1. Display “Change password interface” 3.2. Save new password in database 3.3. Back to login interface</td></tr> </tbody> </table>	Actor	System	1. Users enters their username and password.	1.1. The system checks if the inputs are valid or not	2. Users enter wrong or invalid username and password	2.1. Display error message: “invalid or wrong input”.	3. Users forget the password	3.1. Display “Change password interface” 3.2. Save new password in database 3.3. Back to login interface	
Actor	System									
1. Users enters their username and password.	1.1. The system checks if the inputs are valid or not									
2. Users enter wrong or invalid username and password	2.1. Display error message: “invalid or wrong input”.									
3. Users forget the password	3.1. Display “Change password interface” 3.2. Save new password in database 3.3. Back to login interface									
Exception conditions	1.1. Login information is not available or invalid 2.1. Login system not function properly or failed									

Table 6 - Use case: Sign in fully description

ii. Activity diagram for Use case: Sign in

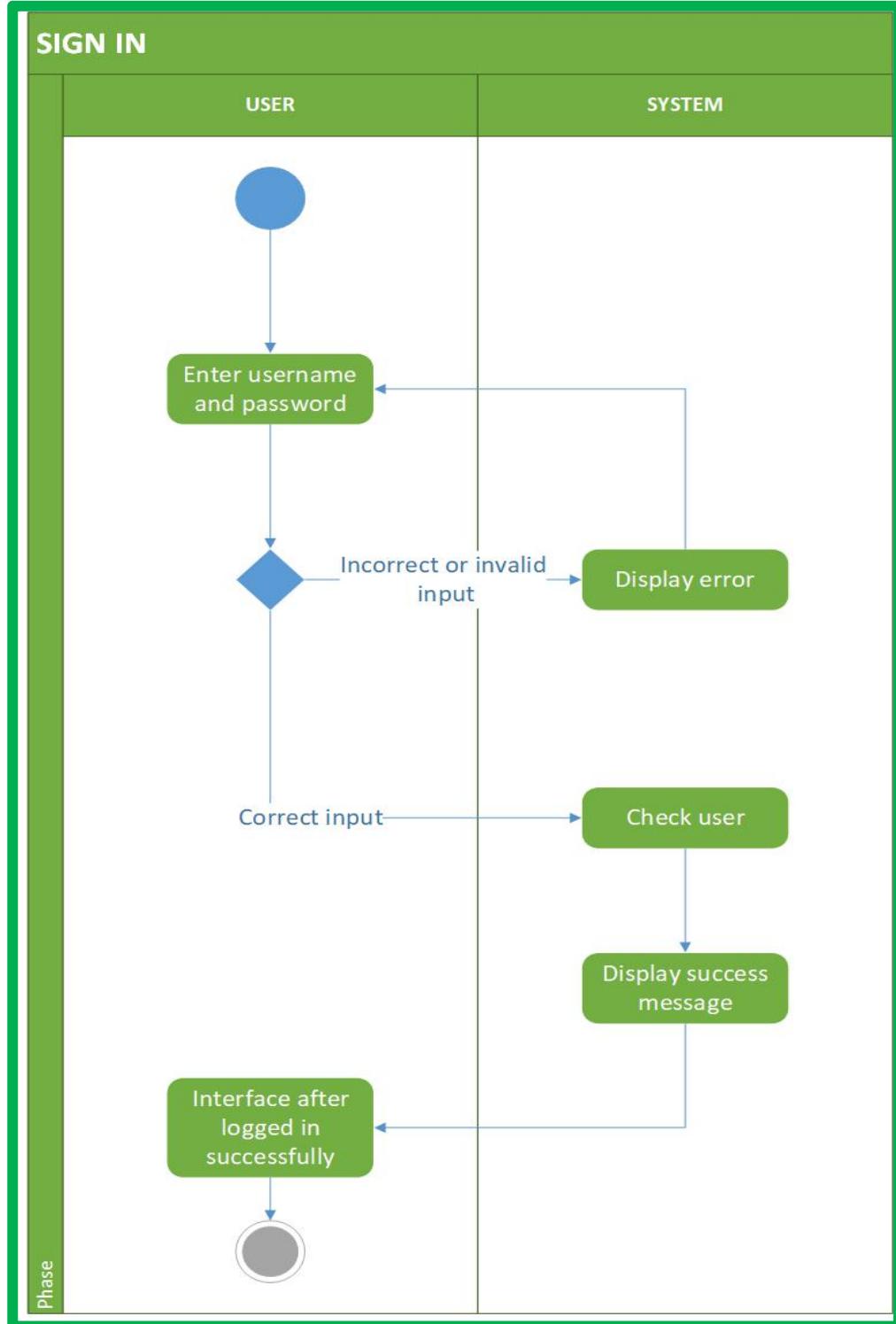


Figure 5 - Activity diagram for Use case: Sign in

iii. System sequence diagram for Use case: Sign in

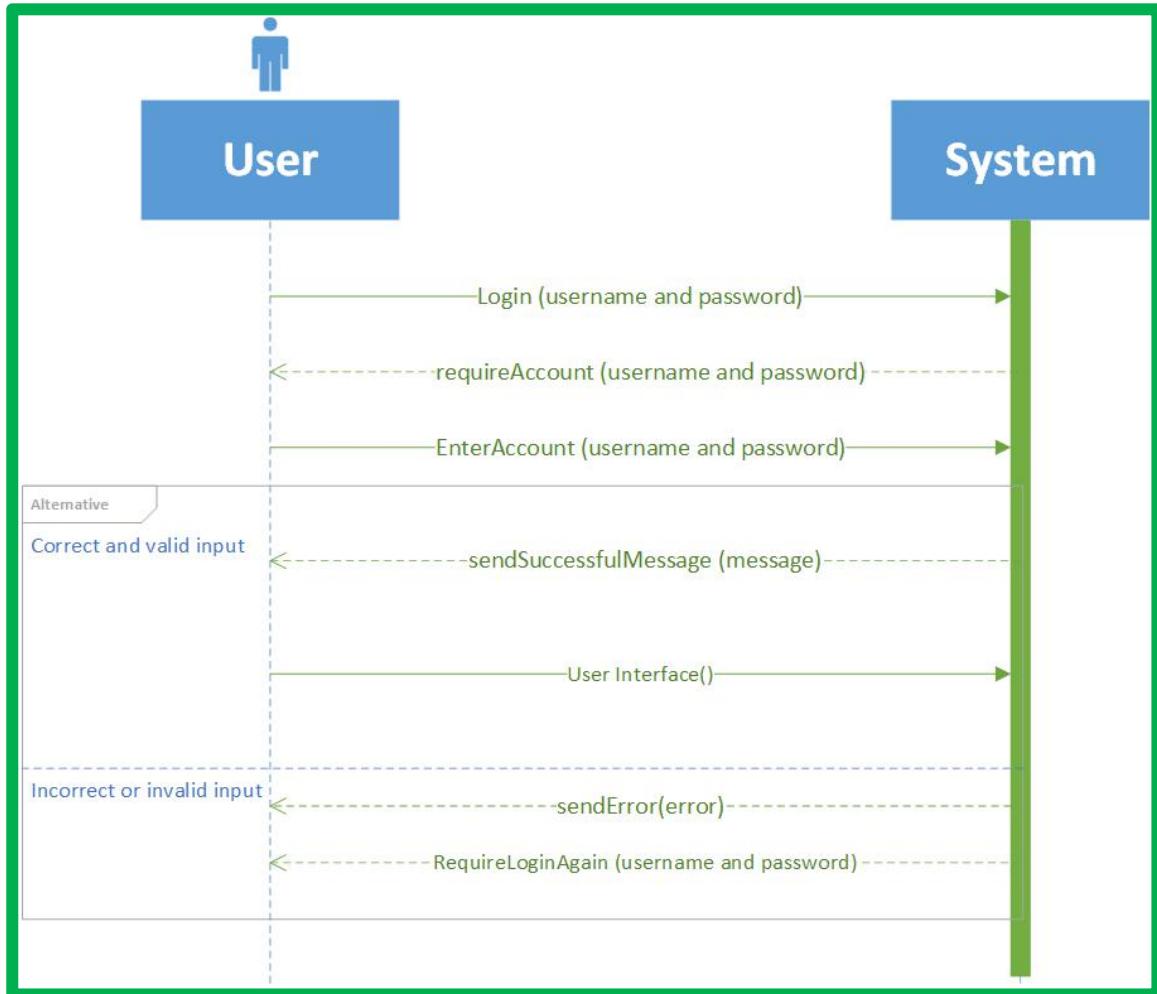


Figure 6 - System sequence diagram for Use case: Sign in

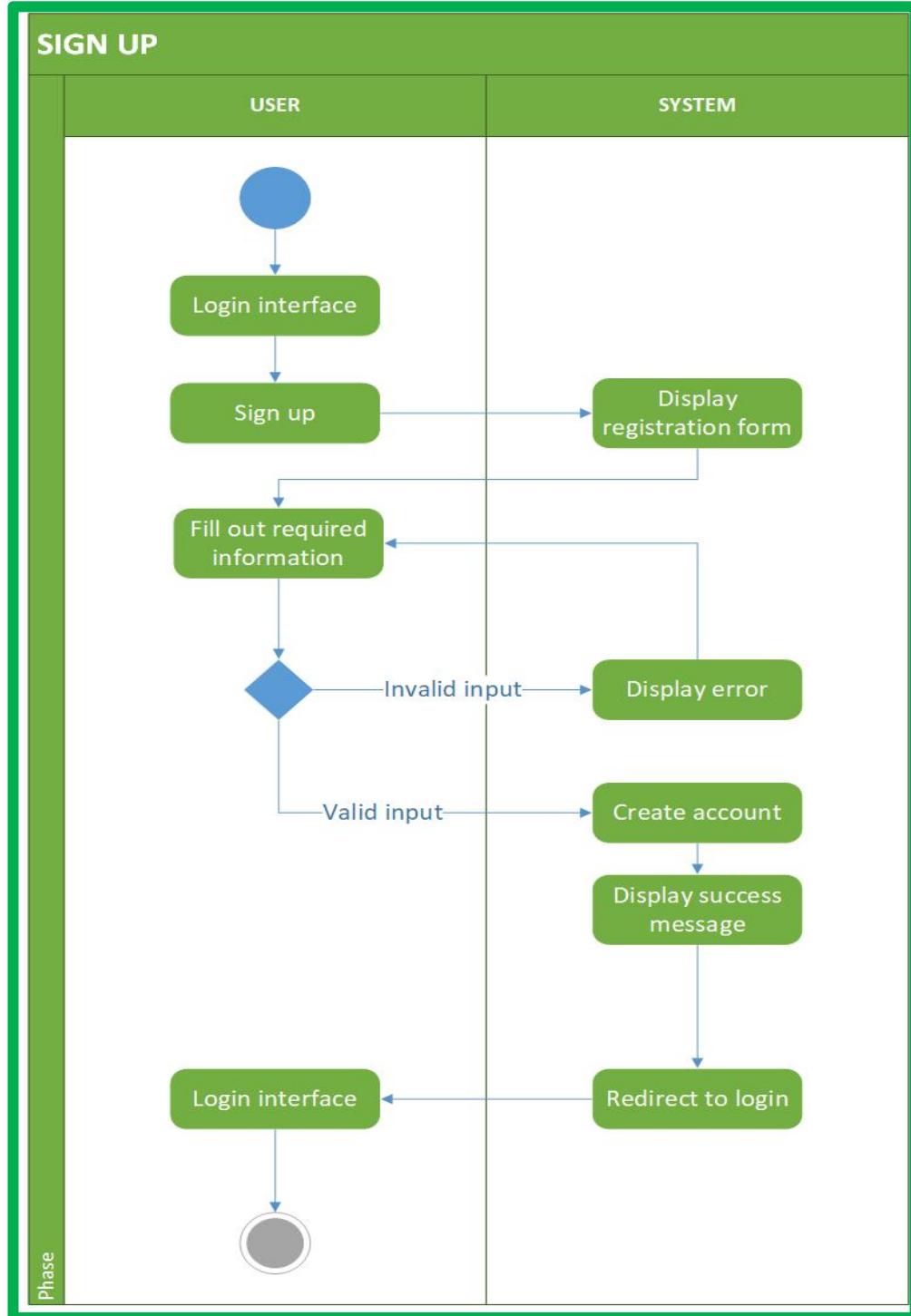
3.2.2. Use case: Sign up

i. Use case: Sign up fully description

Use case name	Sign up
Scenario	Create new account
Triggering event	Users want to register new account
Brief description	Users creates their own accounts after filling out the

	registration form	
Actors	Manager, Staff, Customer	
Related use cases	Use case corresponds to their function	
Stakeholders	Can be invoked by use case “sign in”	
Preconditions	Sign up system must be available and operate properly	
Postconditions	Users must enter valid and exact basic information	
Flow of activities	Actor	System
	1. Users fill out the registration form.	1.1. The system checks if the inputs are valid or not 1.2. The system creates a new account and save it in database 1.3. Back to login interface
	2. Users enter wrong or invalid inputs	2.1. Display error message: “invalid or wrong input”.
Exception conditions	2. Users let the form be empty	2.1. The system requires to fill out the form
	1.1. Some basic data are unavailable or incomplete 2.1. Sign up system not function properly or failed	

Table 7 - Use case: Sign up fully description

ii. Activity diagram for Use case: Sign up*Figure 7 - Activity diagram for Use case: Sign up*

iii. System sequence diagram for Use case: Sign up

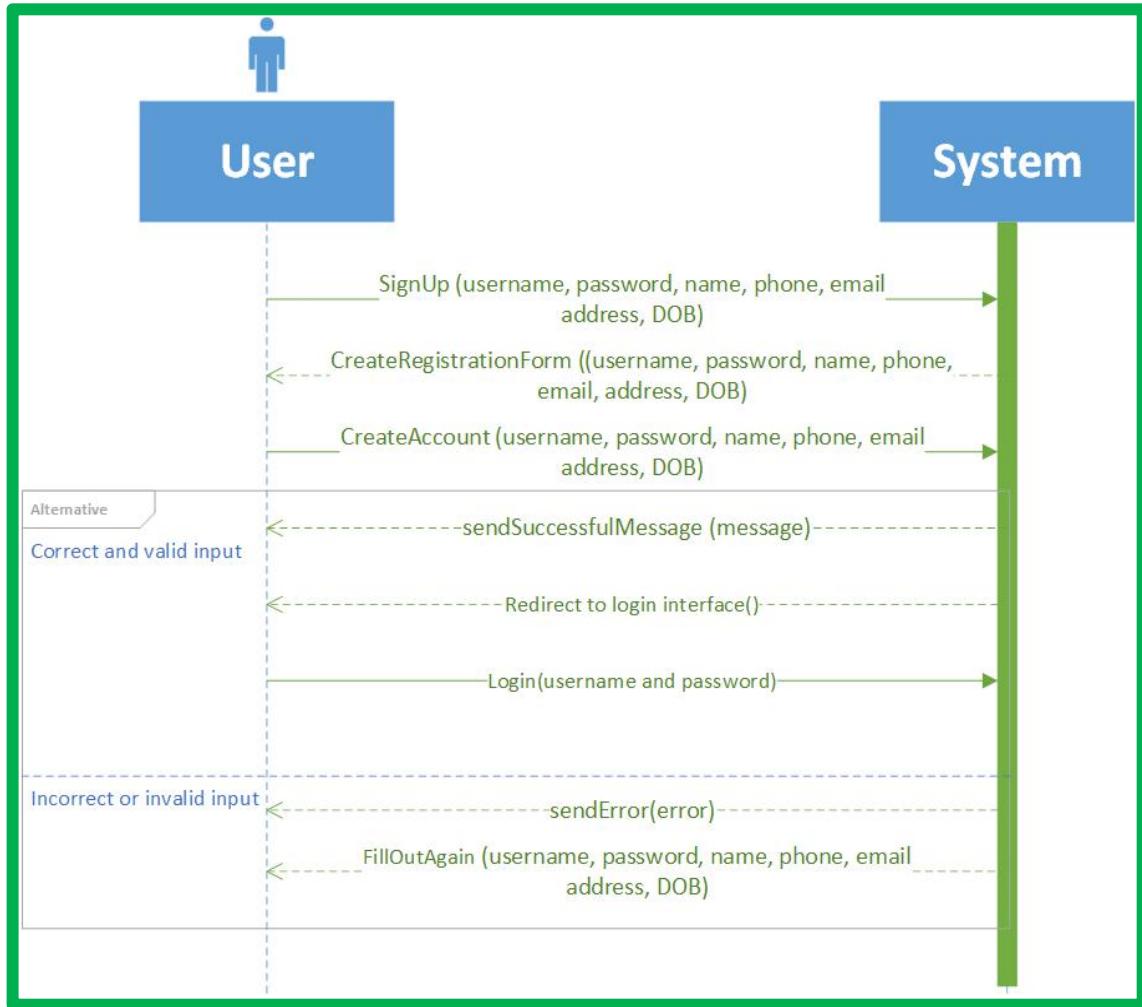


Figure 8 - System sequence diagram for Use case: Sign up

3.2.3. Use case: Change password

i. Use case: Change password fully description

Use case name	Change password
Scenario	Change password
Triggering event	Users forget the password or want to change to a new password

Brief description	Users will enter the new password	
Actors	Manager, Staff, Customer	
Related use cases	Can be invoked by use case “sign in”	
Stakeholders	Use case corresponds to their function	
Preconditions	Change password subsystem must be available and operate properly	
Postconditions	Users must enter new password twice and save it	
Flow of activities	Actor	System
	1. Users choose method and enter verified code.	1.1. The system send a verified code to authenticate user 1.2. Then the system redirect to “change password” interface
	2. Users enter new password	2.1. The system checks if the password is valid and save it in database 2.2. Display successful message 2.3. Redirect to login interface
	3. Users don't enter new password	2.2. The system requires to fill out new password

Exception conditions	1.1. Change password system not function properly or failed
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Table 8 - Use case: Change password fully description

ii. Activity diagram for Use case: Change password

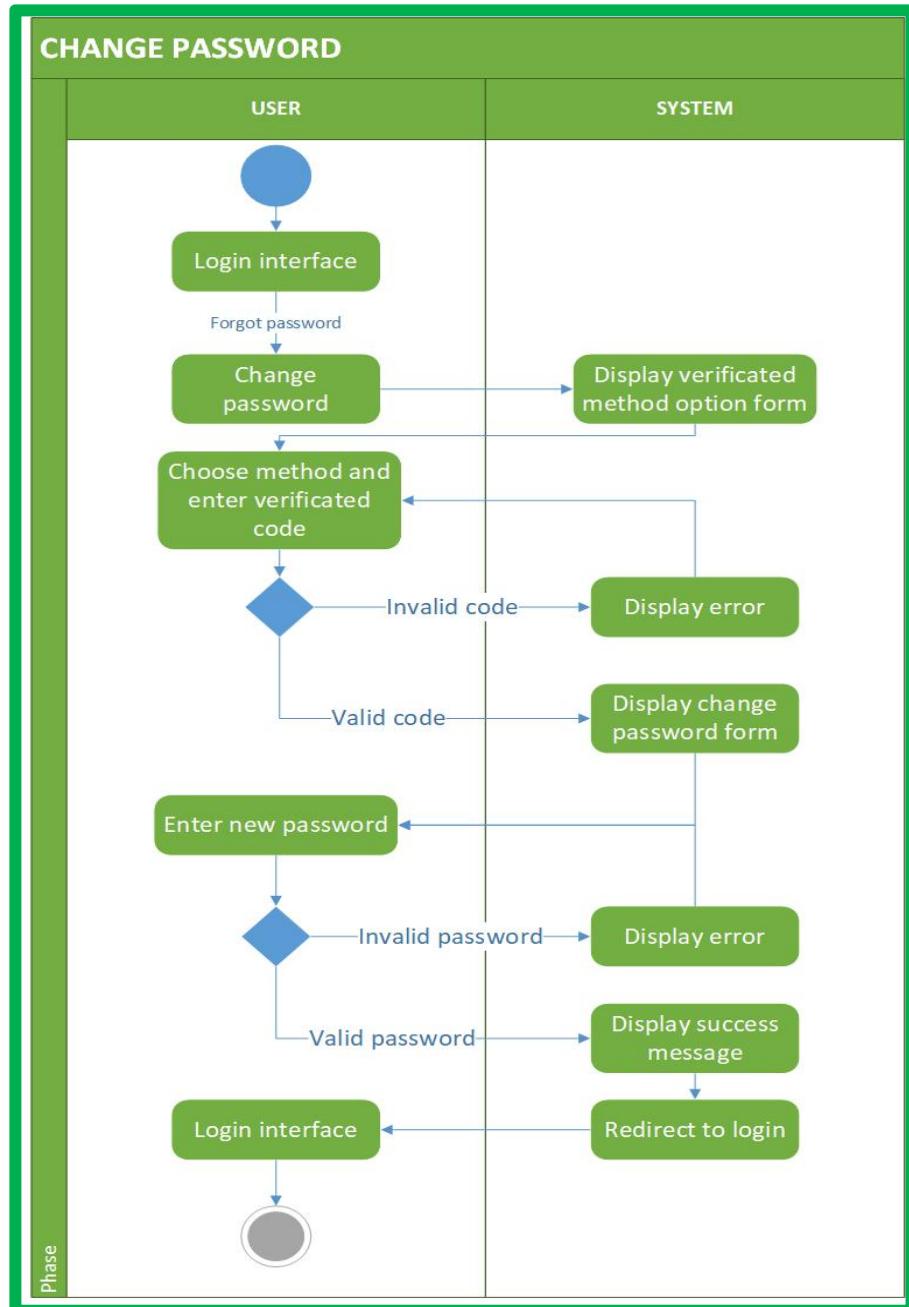


Figure 9 - Activity diagram for Use case: Change password

iii. System sequence diagram for Use case: Change password

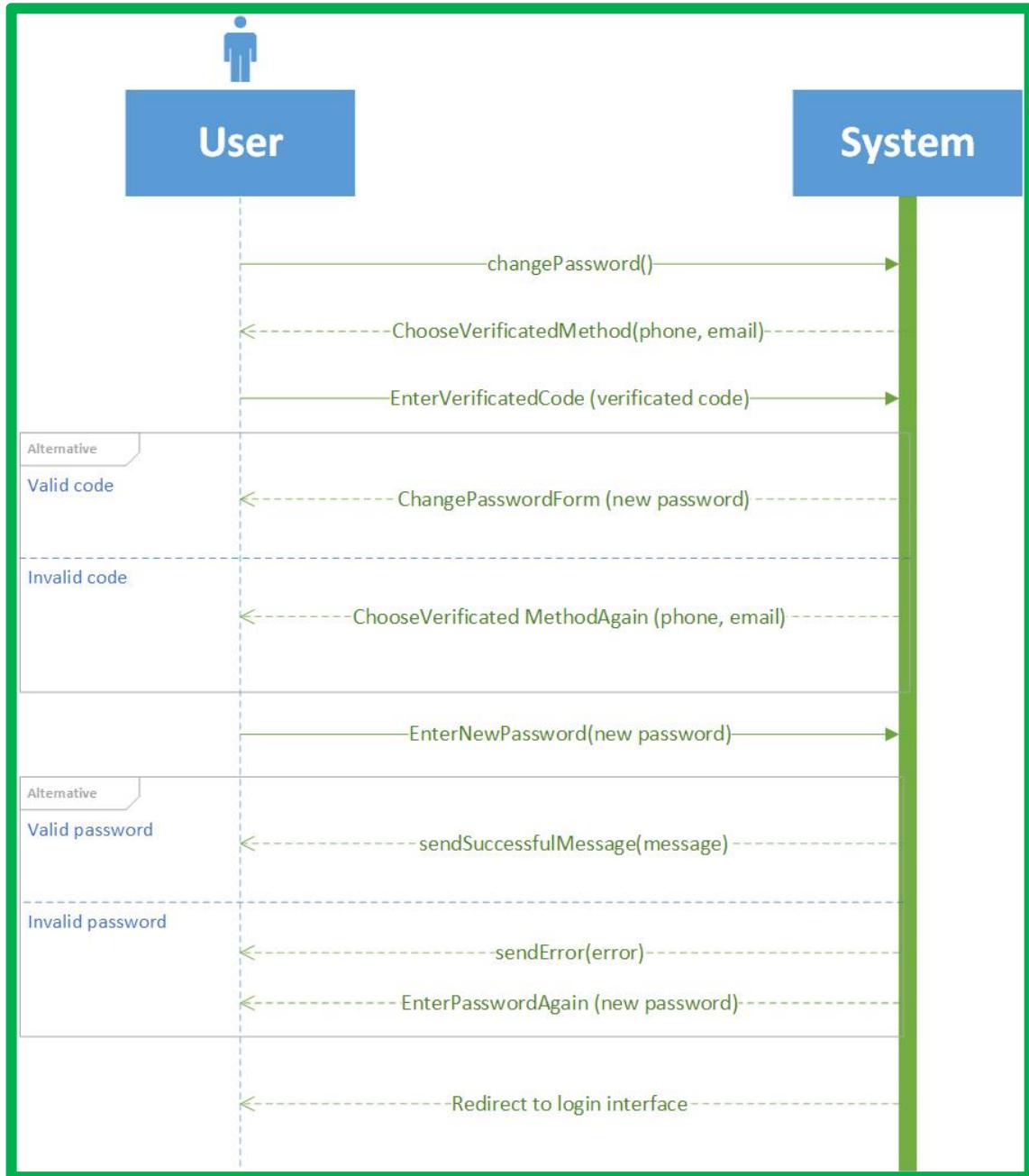


Figure 10 - System sequence diagram for Use case: Change password

3.2.4. Use case: Customer management (include Use Case: Add customer, Edit customer, Delete customer, Search customer)

i. Customer management (include Use Case: Add customer, Edit customer, Delete customer, Search customer) fully description

Use case name	Customer management
Scenario	Check customer's information and operate basic functions (add, edit, delete, search)
Triggering event	Staff wants to check customer's infomation Staff wants to add a new customer Staff wants to edit customer's information Staff wants to delete a customer Staff wants to search a customer
Brief description	Whenever a new customer buy any products, staff will fill out some basic information that customer provides ans add it into the system When a customer says that their infomation was wrong, staff will edit and save it When a customer violates store's policy twice or more, staff will delete all information of that customer When staff wants to check any customer infomation, he/she will enter customer's name to search infomation in database
Actors	Staff
Related use cases	No
Stakeholders	Add customer, Edit customer, Delete customer, Search customer
Preconditions	Staff must be granted the rights to manage

	customer's information	
Postconditions	Add customer: Staff must have all required information Edit customer: Staff must have correct information of customer Delete customer: Staff must search correct customer they want to delete	
	Actor	System
	1. Staff wants to add new customer after filling out all required customer's information	1.1. The system checks if the information is valid or not 1.2. Display successful message and save into database
Flow of activities	2. Staff wants to edit information after filling out correct customer's information	2.1. The system checks if the information is valid or not 2.2. Display successful message and save into database
	3. Staff wants to delete a customer after checking correct information of that customer	3.1. The system display that customer's information 3.2. Display successful

		message
	<p>4. Staff enters customer's information to search</p> <p>5. Staff enters invalid or wrong information when adding, editing or searching</p>	<p>2.3. Display customer information matching with the input</p> <p>5.1. Display error message: "invalid or wrong input".</p>
Exception conditions	<p>1.1. Staffs aren't granted the right to manage customer or they have revoked their rights</p> <p>2.1. The customer management system not function properly or failed</p>	

Table 9 - Use case: Customer management fully description

ii. Activity diagram for Use case: Customer management (include Use Case: Add customer, Edit customer, Delete customer, Search customer)

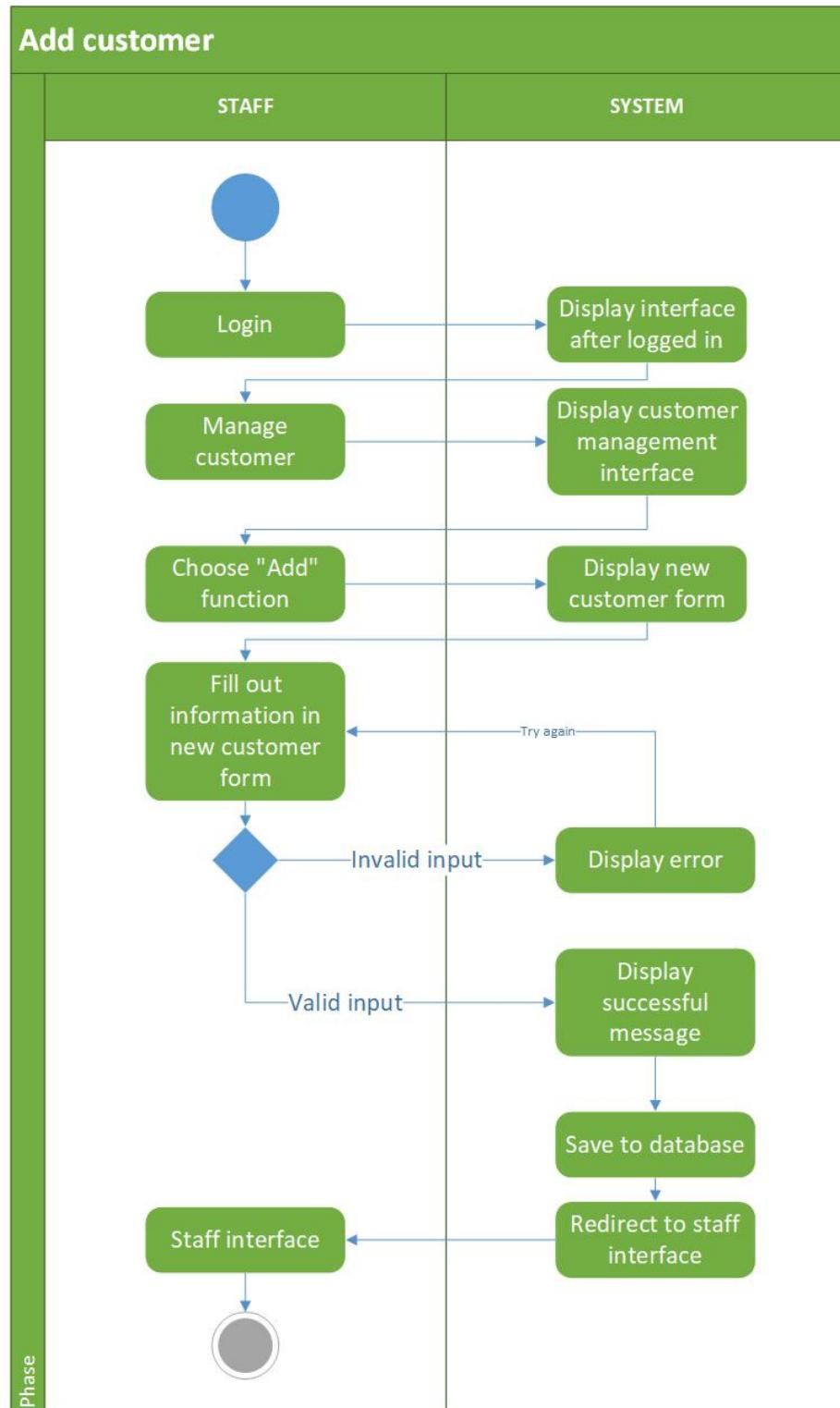


Figure 11 - Activity diagram for Use case: Customer management - Add customer

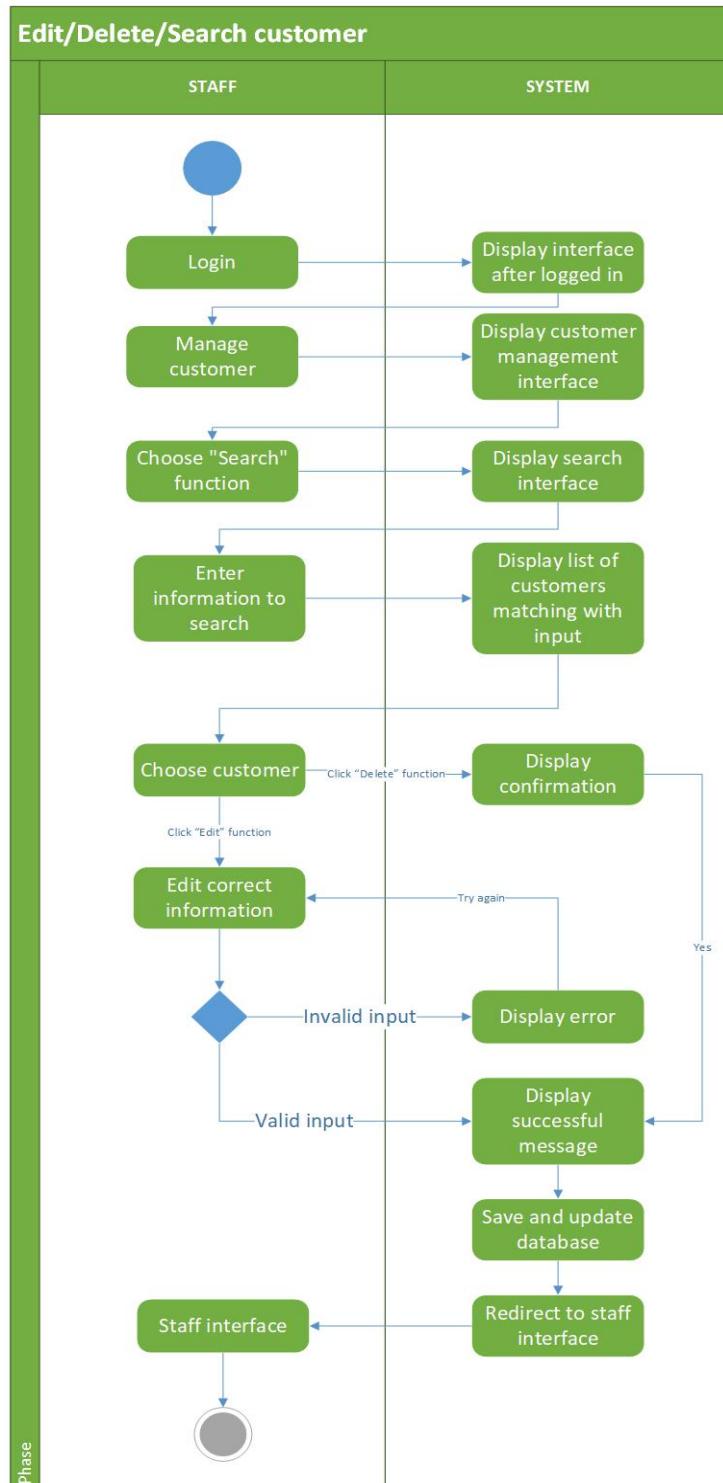


Figure 12 - Activity diagram for Use case: Customer management - Edit, Delete and Search customer

*iii. System sequence diagram for Use case: Customer management
(include Use Case: Add customer, Edit customer, Delete customer,
Search customer)*

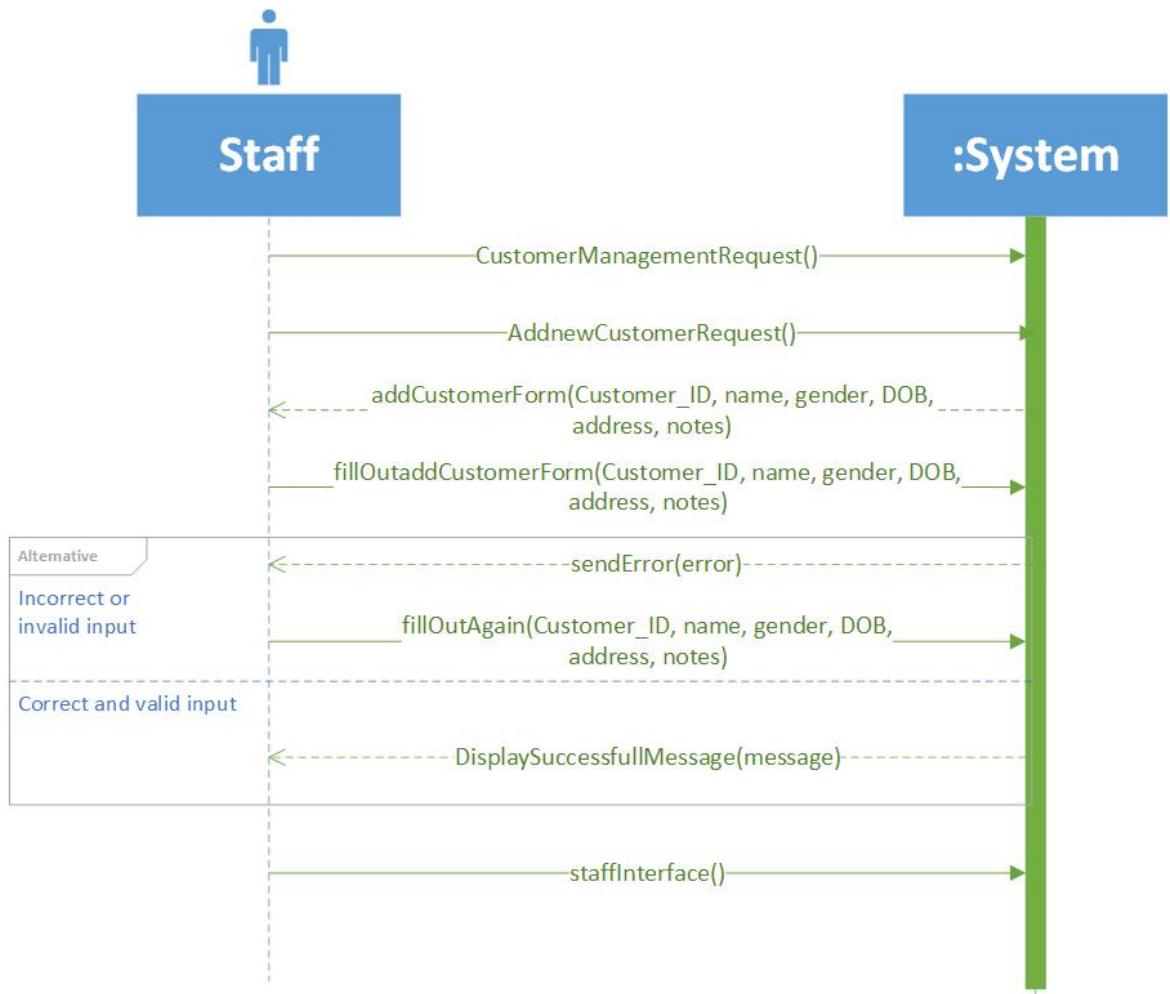


Figure 13 - System sequence diagram for Use case: Customer management - Add customer

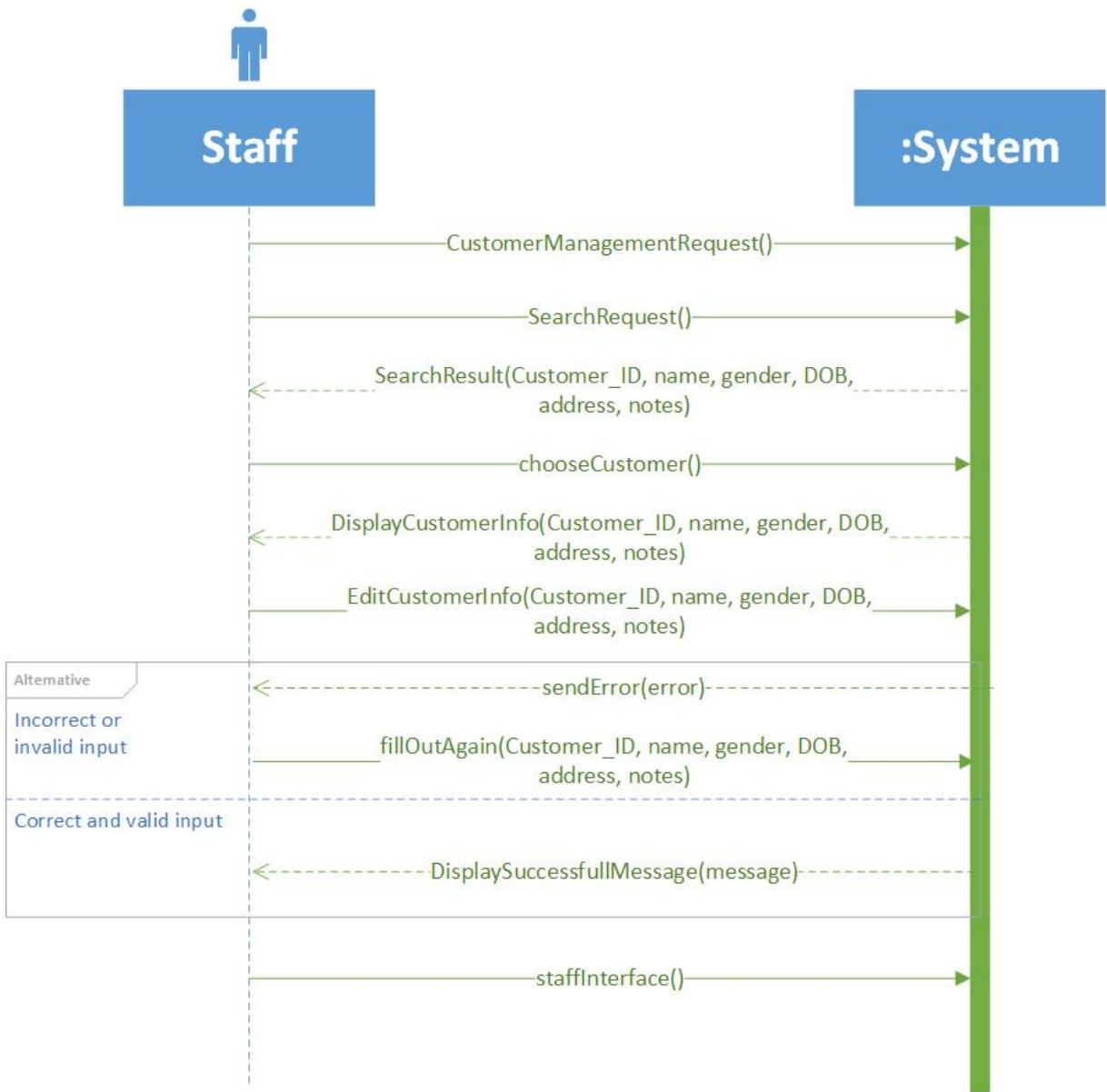


Figure 14 - System sequence diagram for Use case: Customer management - Search and Edit customer

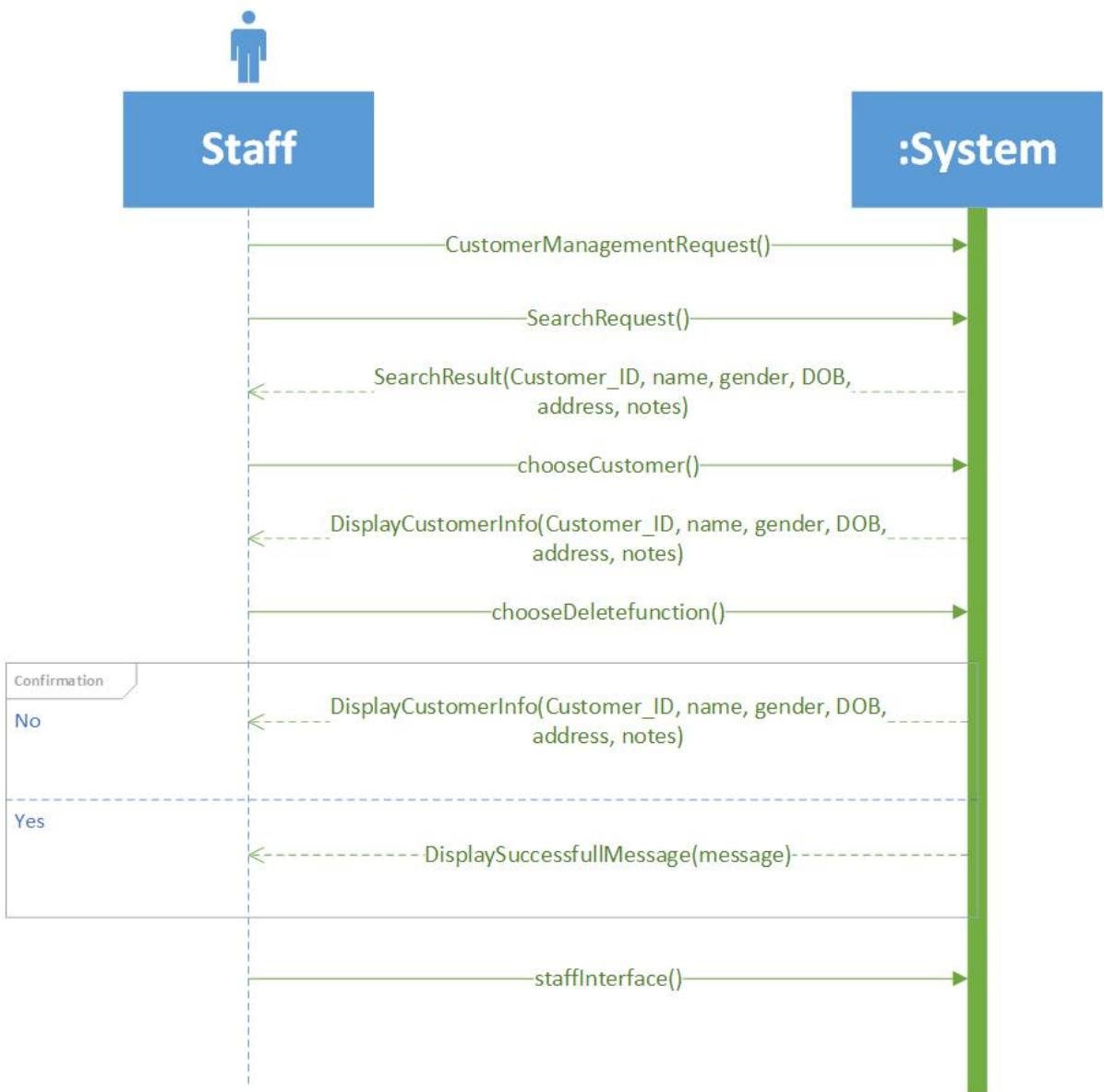


Figure 15 - System sequence diagram for Use case: Customer management - Search and Delete customer

3.2.5. Use case: Staff Management (include Use Case: Add staff, Edit staff, Delete staff Search staff)

i. Use case: Staff Management (include Use Case: Add staff, Edit staff, Delete staff Search staff) fully description

Use case name	Staff management
Scenario	Check staff's information and operate basic functions (add, edit, delete, search)
Triggering event	<p>Manager wants to check staff's infomation</p> <p>Manager wants to add a new staff</p> <p>Manager wants to edit staff's information</p> <p>Manager wants to delete a staff</p> <p>Manager wants to search a staff</p>
Brief description	<p>Whenever a new staff is recruited, Manager will fill out some basic information that staff provides and add it into the system</p> <p>When a staff says that their infomation was wrong, Manager will edit and save it</p> <p>When a staff violates store's policy too many times or a staff quits, Manager will delete all information of that staff</p> <p>When Manager wants to check any staff infomation, he/she will enter staff's name to search infomation in database</p>
Actors	Manager
Related use cases	No
Stakeholders	Add staff, Edit staff, Delete staff, Search staff
Preconditions	Manager must be granted the rights to manage staff's information
Postconditions	Add staff: Manager must have all required information

	<p>Edit staff: Manager must have correct information of staff</p> <p>Delete staff: Manager must search correct staff they want to delete</p>	
	<p>Actor</p>	<p>System</p>
Flow of activities	<p>1. Manager wants to add new staff after filling out all required staff's information</p>	<p>1.1. The system checks if the information is valid or not</p> <p>1.2. Display successful message and save into database</p>
	<p>2. Manager wants to edit information after filling out correct staff's information</p>	<p>2.1. The system checks if the information is valid or not</p> <p>2.2. Display successful message and save into database</p>
	<p>3. Manager wants to delete a staff after checking correct information of that staff</p>	<p>3.1. The system display that staff's information</p> <p>3.2. Display successful message</p>
	<p>4. Manager enters staff's information to search</p>	<p>4.1. Display staff's information matching with the input</p>

	5. Manager enters invalid or wrong information when adding, editing or searching	5.1. Display error message: “invalid or wrong input”.
Exception conditions	1.2. Managers aren't granted the right to manage staffs or they have revoked their rights 2.1. The staff management system not function properly or failed	

Table 10 - Use case: Staff management fully description

ii. Activity diagram for Use case: Staff Management (include Use Case: Add staff, Edit staff, Delete staff Search staff)

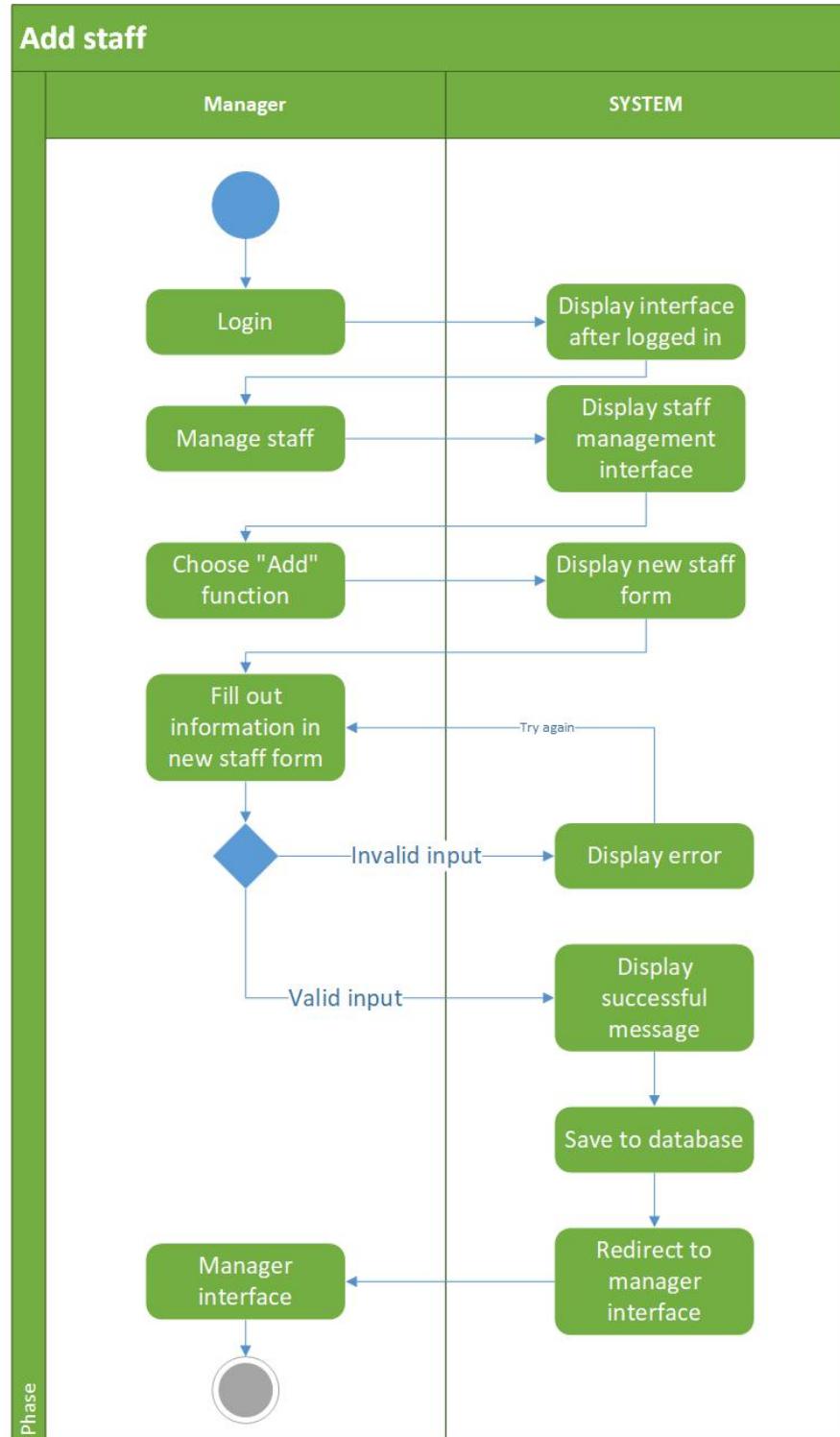


Figure 16 - Activity diagram for Use case: Staff management - Add staff

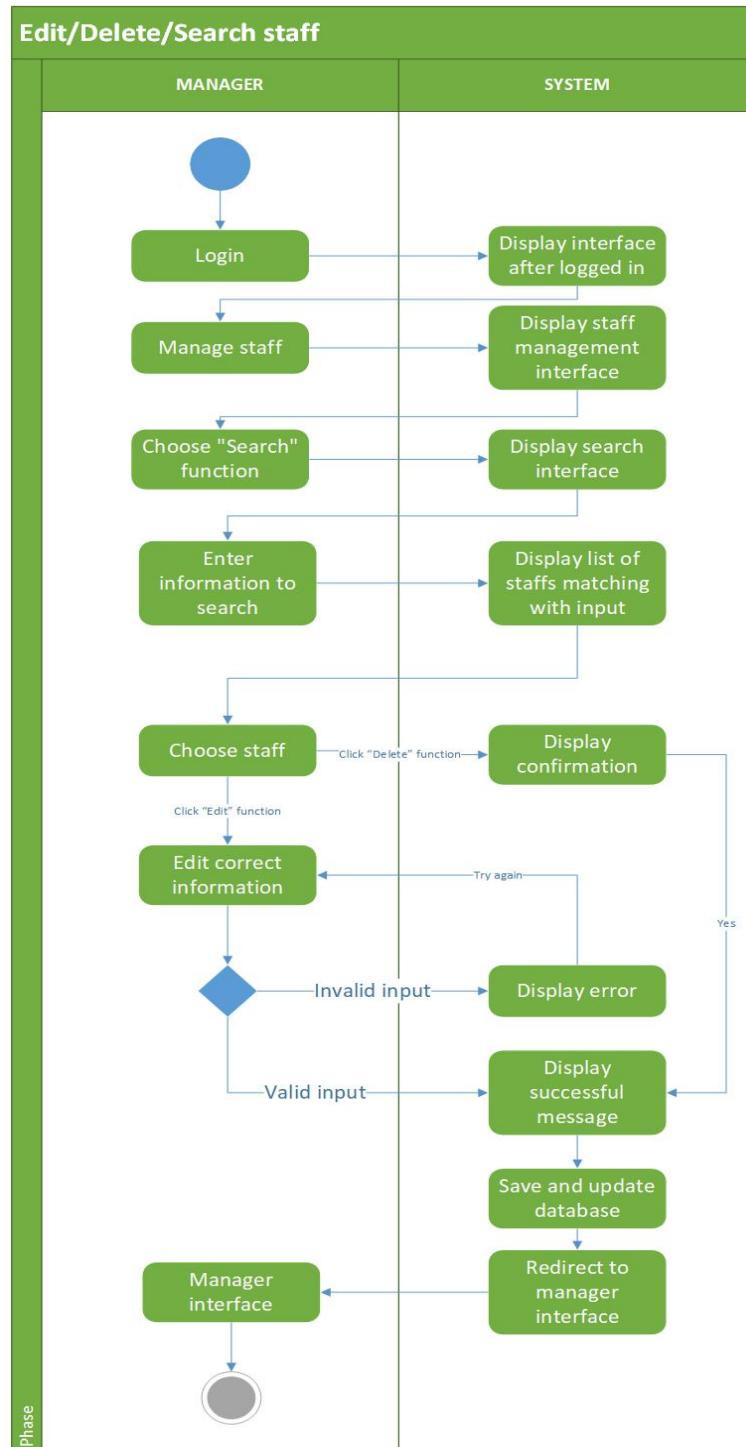


Figure 17 - Activity diagram for Use case: Staff management - Edit, Delete and Search staff

iii. System sequence diagram for Use case: Staff Management (include Use Case: Add staff, Edit staff, Delete staff Search staff)

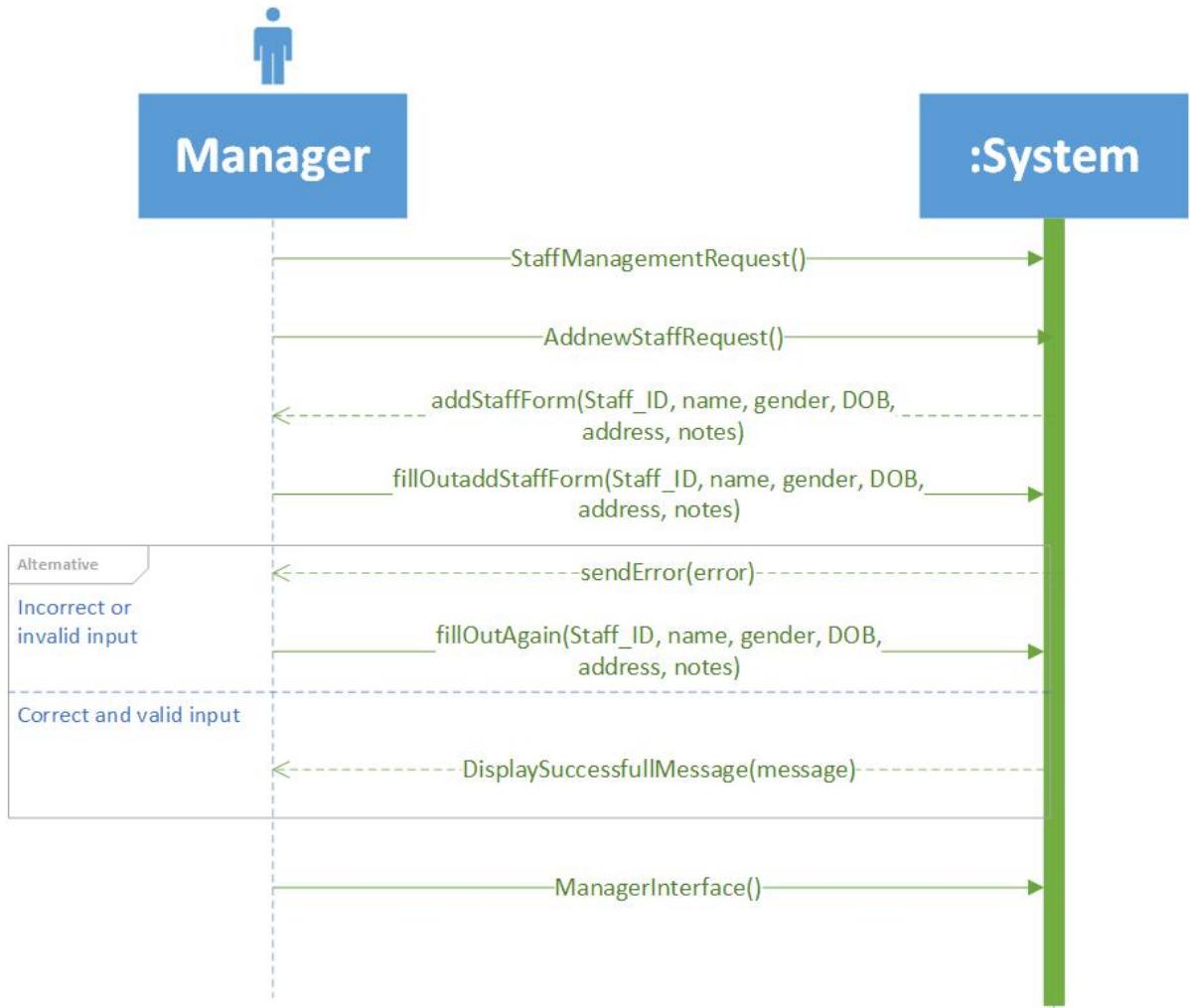


Figure 18 - System sequence diagram for Use case: Staff management - Add staff

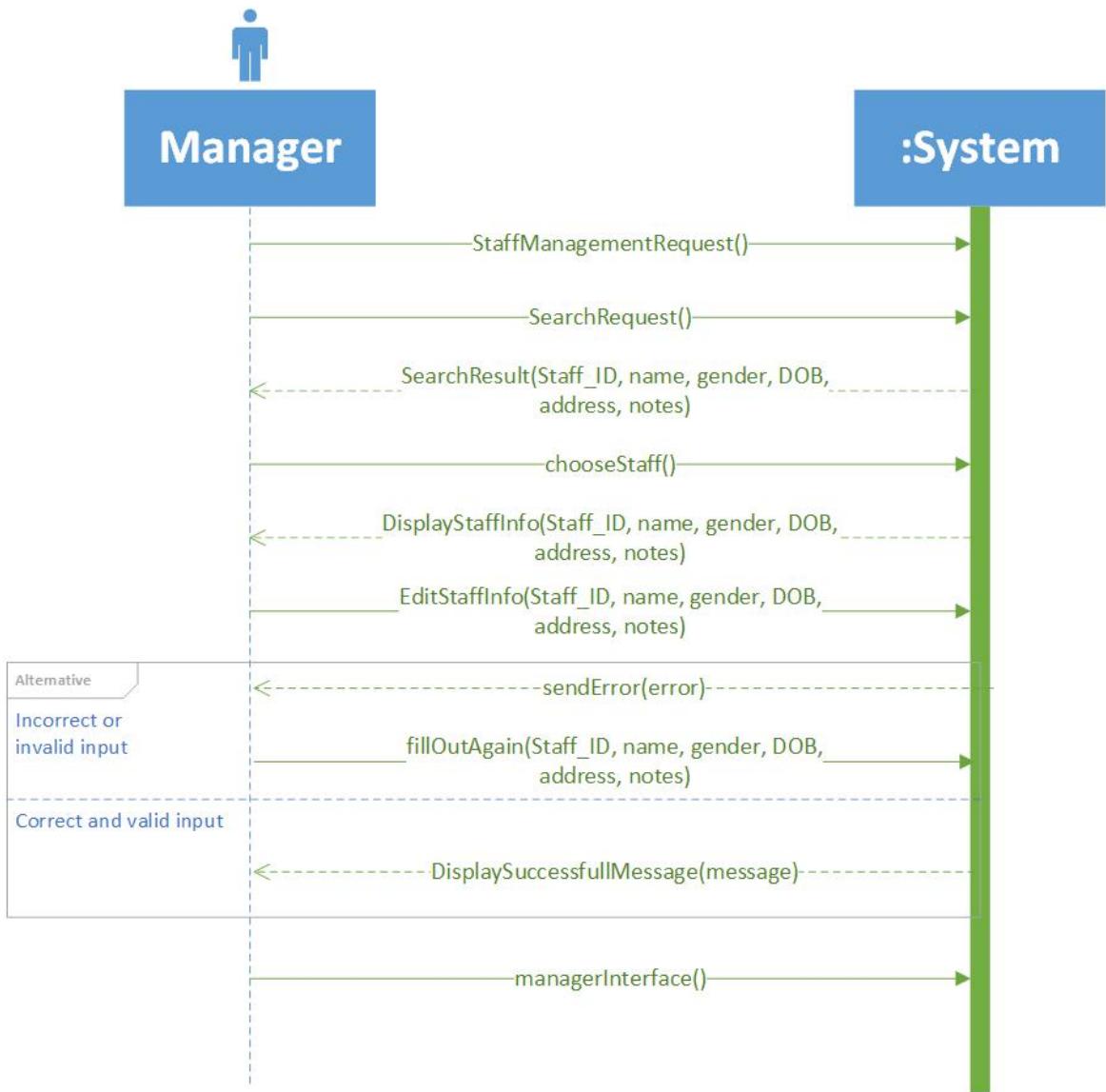


Figure 19 - System sequence diagram for Use case: Staff management - Search and Edit staff

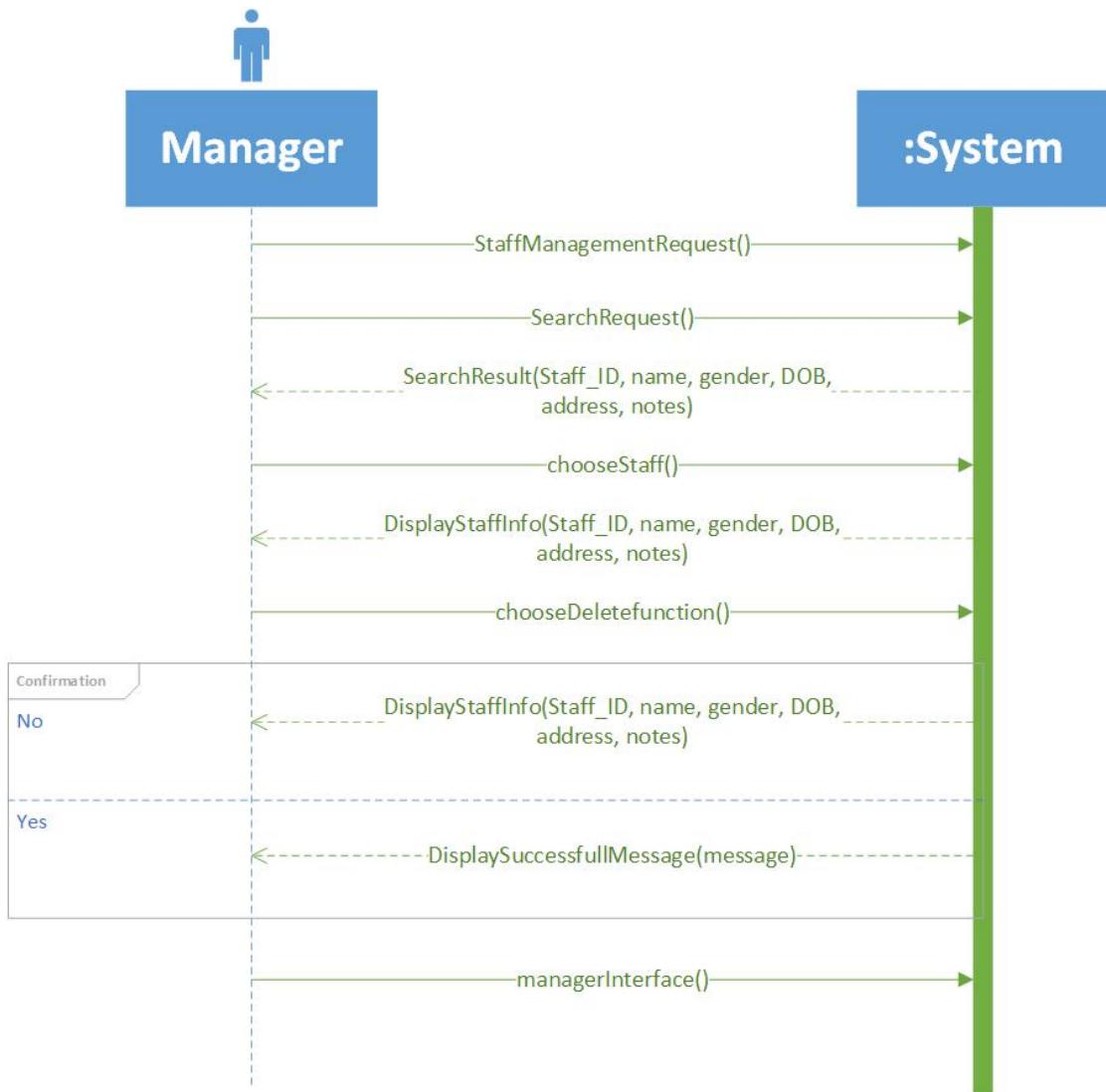


Figure 20 - System sequence diagram for Use case: Staff management - Search and Delete staff

3.2.6. Use case: Mobile phone management (include Use Case: Add mobile phone, Edit mobile phone , Delete mobile phone, Search mobile phone)

- i. **Use case: Mobile phone management (include Use Case: Add mobile phone, Edit mobile phone , Delete mobile phone, Search mobile phone) fully description**

Use case name	Mobile management
Scenario	Check mobile phone's information and operate basic functions (add, edit, delete, search)
Triggering event	<p>Staff wants to check mobile phone's infomation</p> <p>Staff wants to add a new type of mobile phone</p> <p>Staff wants to edit mobile phone's information</p> <p>Staff wants to delete a mobile phone</p> <p>Staff wants to search a mobile phone</p>
Brief description	<p>Whenever a new mobile phone is imported, Staff will fill out some basic information that mobile phone and add it into the system</p> <p>When any of mobile phone's infomation was wrong, Staff will edit and save it</p> <p>When a mobile phone is out of stock or no longer supported, Staff will delete that mobile phone</p> <p>When Staff wants to check any mobile phone's infomation, he/she will enter mobile phone's name to search infomation in database</p>
Actors	Staff
Related use cases	No
Stakeholders	Add mobile phone, Edit mobile phone, Delete mobile phone, Search mobile phone
Preconditions	Staff must be granted the rights to manage mobile phone's information
Postconditions	Add mobile phone: Staff must have all required information of specific type of mobile phone

	Edit mobile phone: Staff must have correct information of mobile phone Delete mobile phone: Staff must search correct mobile phone they want to delete	
	Actor	System
Flow of activities	1. Staff wants to add new mobile phone after filling out all its required information	1.1. The system checks if the information is valid or not 1.2. Display successful message and save into database
	2. Staff wants to edit information after filling out correct mobile phone's information	2.1. The system checks if the information is valid or not 2.2. Display successful message and save into database
	3. Staff wants to delete a mobile phone after checking correct information of that phone	3.1. The system display that mobile phone's information 3.2. Display successful message
	4. Staff enters mobile phone's information to	4.1. Display mobile phone's information

	search 5. Staff enters invalid or wrong information when adding, editing or searching	matching with the input 5.1. Display error message: “invalid or wrong input”.
Exception conditions	1.3. Staffs aren't granted the right to manage mobile phones or they have revoked their rights 2.1. The mobile phone management system not function properly or failed	

Table 11 - Use case: Mobile phone management fully description

ii. Activity diagram for Use case: Mobile phone management (include Use Case: Add mobile phone, Edit mobile phone , Delete mobile phone, Search mobile phone)

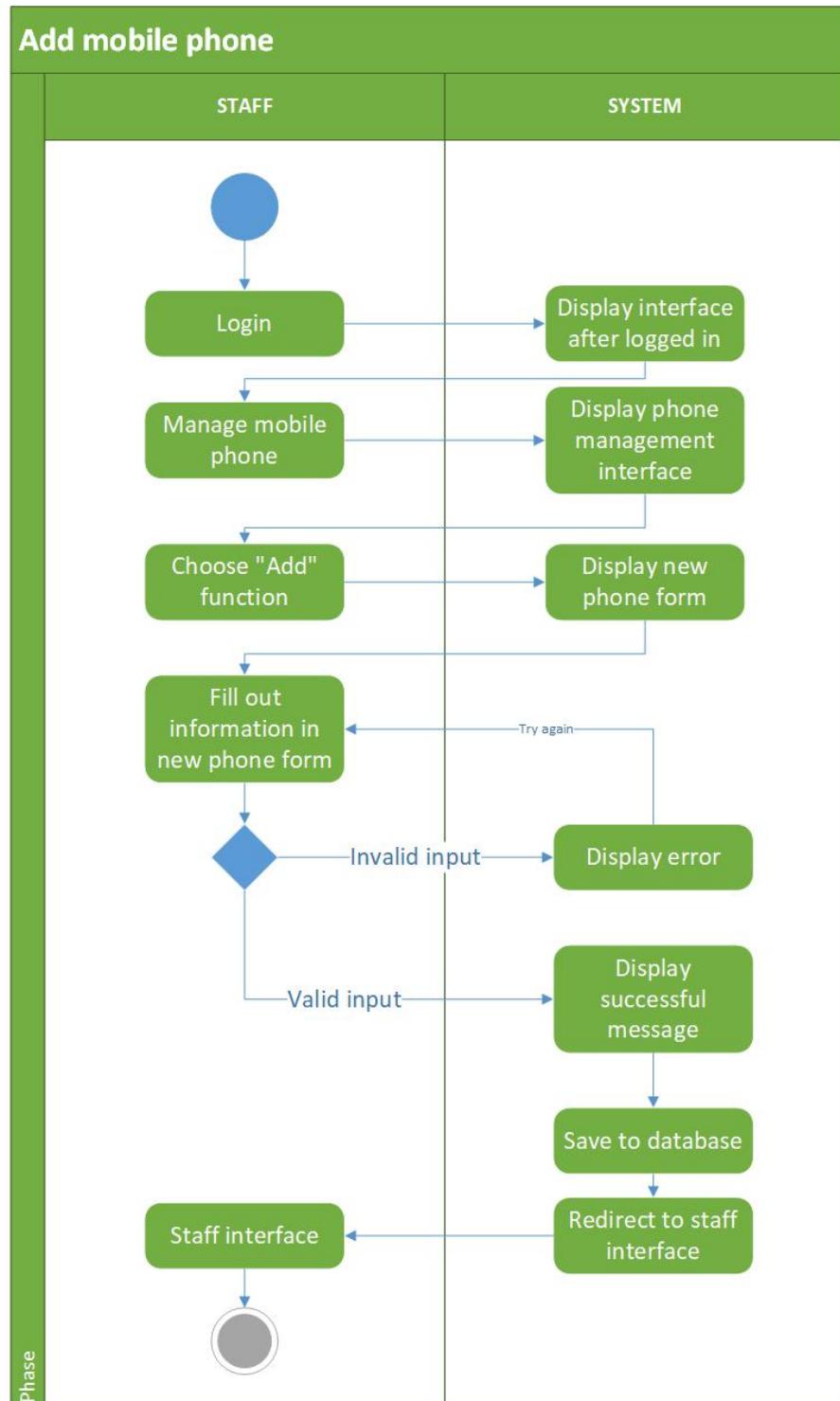


Figure 21 - Activity diagram for Use case: Mobile phone management - Add mobile phone

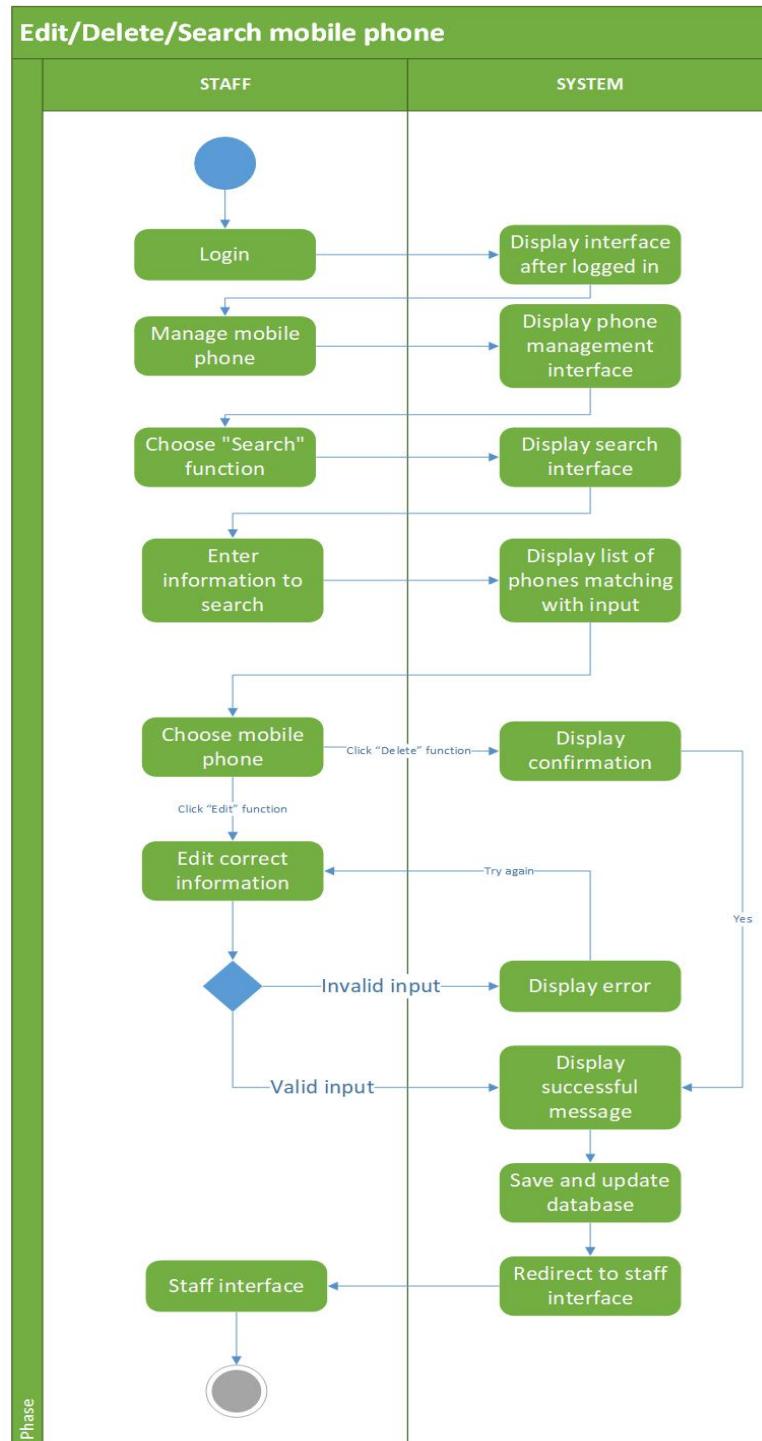


Figure 22 - Activity diagram for Use case: Mobile phone management - Edit, Search and Delete mobile phone

*iii. System sequence diagram for Use case: Mobile phone management
(include Use Case: Add mobile phone, Edit mobile phone , Delete
mobile phone, Search mobile phone)*

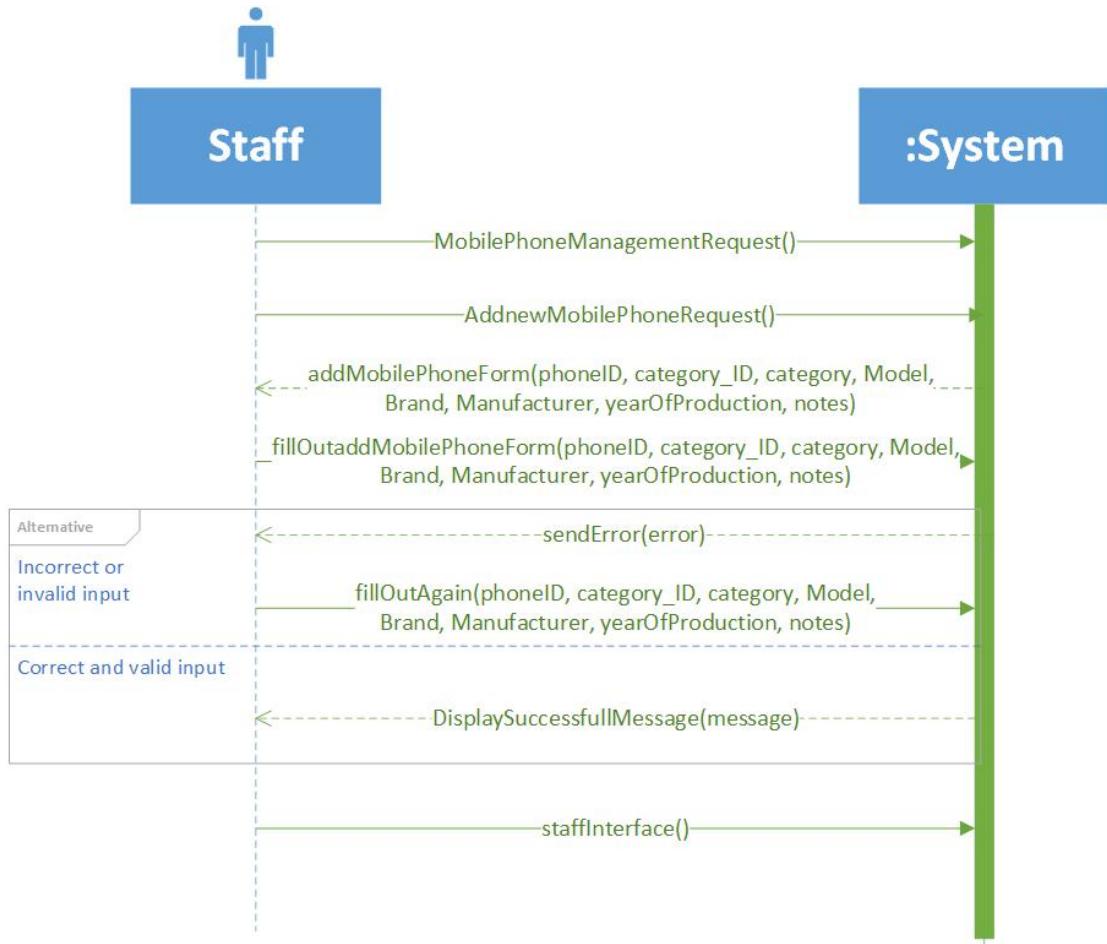


Figure 23 - System sequence diagram for Use case: Mobile phone management - Add mobile phone

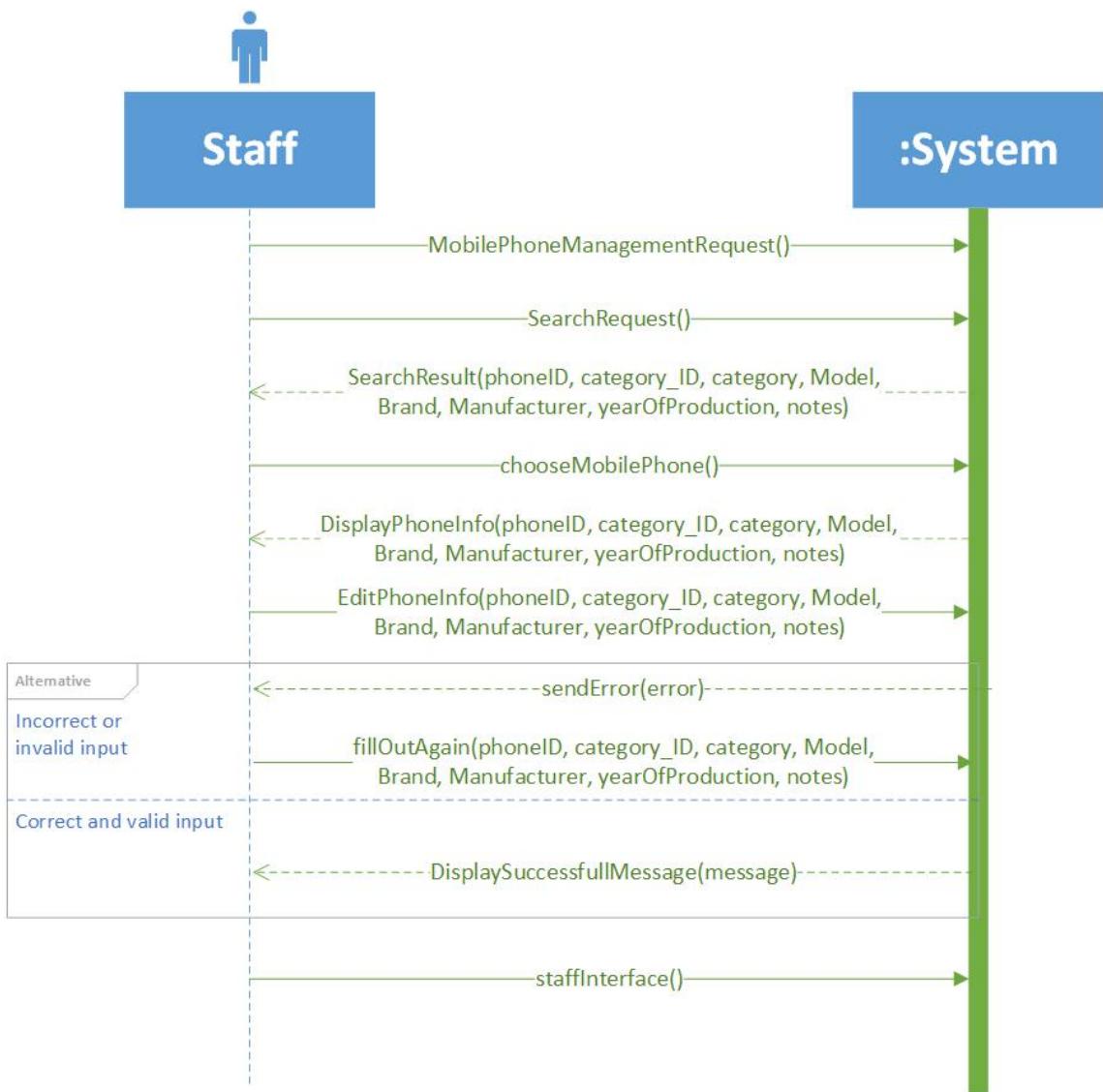


Figure 24 - System sequence diagram for Use case: Mobile phone management - Search and Edit mobile phone

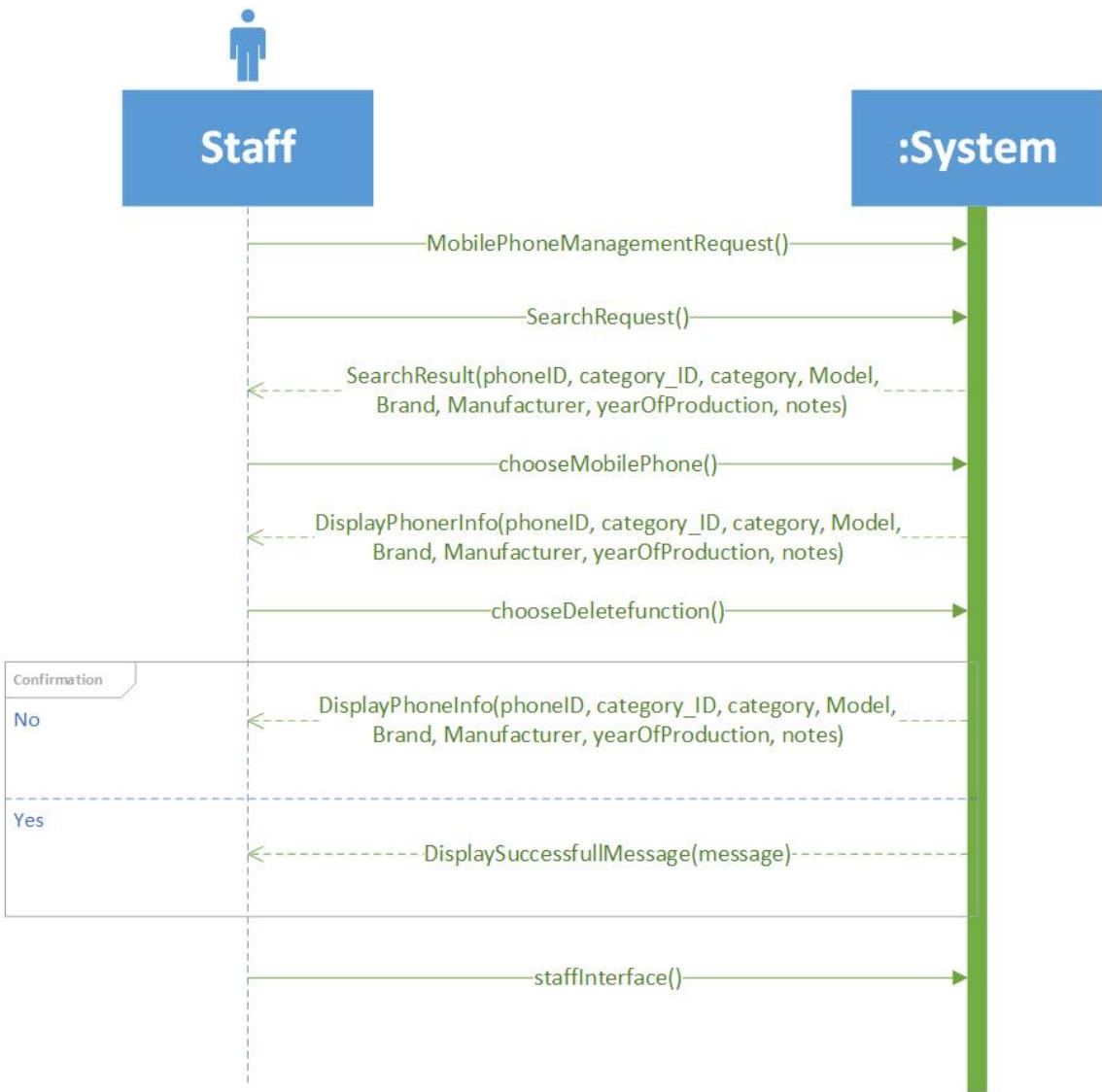


Figure 25 - System sequence diagram for Use case: Mobile phone management - Search and Delete mobile phone

3.2.7. Use case: Transaction management

- i. Use case: Transaction management - Order and pay mobile phone fully description

Use case name	Order and pay for a mobile phone							
Scenario	Allows Staffs to manage all ordered bills Allows Customers to order and pay for a mobile phone they want to buy							
Triggering event	Customer wants to buy a mobile phone							
Brief description	Customers login to the system, search and choose a mobile phone they like, see its information, click “order”, fill out information in order form and then choose payment method to pay Staffs will receive orders from customers and confirm orders, then send it to customer.							
Actors	Customer, Staff							
Related use cases	Can be invoked by use case “Mobile phone management”							
Stakeholders	Return mobile phone							
Preconditions	The system must display mobile phone's information Order and pay subsystem must be available and operate properly							
Postconditions	Customer must login to the system							
Flow of activities	<table border="1"> <thead> <tr> <th>Actor</th> <th>System</th> </tr> </thead> <tbody> <tr> <td>1. Customer checks mobile phone's information</td> <td>1.1. The system display mobile phone's information</td> </tr> <tr> <td>2. Customer wants to</td> <td>2.1. The system display</td> </tr> </tbody> </table>	Actor	System	1. Customer checks mobile phone's information	1.1. The system display mobile phone's information	2. Customer wants to	2.1. The system display	
Actor	System							
1. Customer checks mobile phone's information	1.1. The system display mobile phone's information							
2. Customer wants to	2.1. The system display							

	<p>order after filling out basic information in order form</p> <p>3. Customer chooses payment method</p> <p>4. Staff confirms orders</p> <p>5. Customer doesn't fill out basic information in order form or doesn't choose payment method</p>	<p>order form</p> <p>2.2. Direct to payment method</p> <p>3.1. The system display payment method</p> <p>3.2. Display successful message and then display bill</p> <p>4.1. The system changes order status in customer-side</p> <p>5.1. The system requires to fill out information or choose method</p>
Exception conditions	1.1. Order and pay system not function properly or failed	

Table 12 - Use case: Transaction management - Order and Pay fully description

ii. Use case: Transaction management - Return mobile phone fully description

Use case name	Return mobile phone
Scenario	<p>Allows Staffs to manage return requirement</p> <p>Allows Customers to return a mobile phone</p>

Triggering event	Customer wants to return mobile phone									
Brief description	<p>Customers have received mobile phone they ordered, but it doesn't function properly or it is damaged during delivery. Therefore customer wants to return it</p> <p>Staffs will check if the feedback is right or not and then confirms return requirement.</p>									
Actors	Customer, Staff									
Related use cases	Can be invoked by use case "Mobile phone management"									
Stakeholders	Order and pay mobile phone									
Preconditions	Return subsystem must be available and operate properly									
Postconditions	Customer has bought and received mobile phone from the store									
Flow of activities	<table border="1"> <thead> <tr> <th>Actor</th> <th>System</th> </tr> </thead> <tbody> <tr> <td>1. Customer wants to return mobile phone after filling out reason and evidence</td> <td>1.1. The system display return form 1.2. Display successful message</td> </tr> <tr> <td>2. Staff confirms return requirement</td> <td>2.1. The system change status in customer-side</td> </tr> <tr> <td>3. Customer doesn't fill out reason or provide</td> <td>3.1. The system requires to fill out reason and</td> </tr> </tbody> </table>	Actor	System	1. Customer wants to return mobile phone after filling out reason and evidence	1.1. The system display return form 1.2. Display successful message	2. Staff confirms return requirement	2.1. The system change status in customer-side	3. Customer doesn't fill out reason or provide	3.1. The system requires to fill out reason and	
Actor	System									
1. Customer wants to return mobile phone after filling out reason and evidence	1.1. The system display return form 1.2. Display successful message									
2. Staff confirms return requirement	2.1. The system change status in customer-side									
3. Customer doesn't fill out reason or provide	3.1. The system requires to fill out reason and									

	evidence	provide evidence
Exception conditions	1.1. Return subsystem not function properly or failed	

Table 13 - Use case: Transaction management - Return mobile phone fully description

iii. Use case: Transaction management - Maintain mobile phone fully description

Use case name	Maintain mobile phone
Scenario	Allows Staffs to manage maintenance requirement Allows Customers to require maintenance
Triggering event	Customer wants to have mobile phone maintained
Brief description	Customers have used their mobile phones after a period of time and they want to require maintenance to check whether their phones have something wrong or not by click “Support options”, choose “maintenance” and filling out maintenance form. Staffs will confirm maintenance requirement and receive the phone to fix and then send it again to customer.
Actors	Customer, Staff
Related use cases	Can be invoked by use case “Mobile phone management”
Stakeholders	Order and pay mobile phone
Preconditions	Support subsystem must be available and operate properly
Postconditions	Customer has bought, received and used mobile

	phone for a while	
	Actor	System
Flow of activities	1. Customer wants to have mobile phone maintained after filling out maintenance form 2. Staff confirms maintenance requirement 3. Customer doesn't fill out maintenance form	1.1. The system display maintenance form 1.2. Display successful message 2.1. The system change status in customer-side 3.1. The system requires to fill out all information in maintenance form
Exception conditions	1.1. Support subsystem not function properly or failed	

Table 14 - Use case: Transaction management - Maintain mobile phone fully description

iv. Activity diagram for Use case: Transaction management

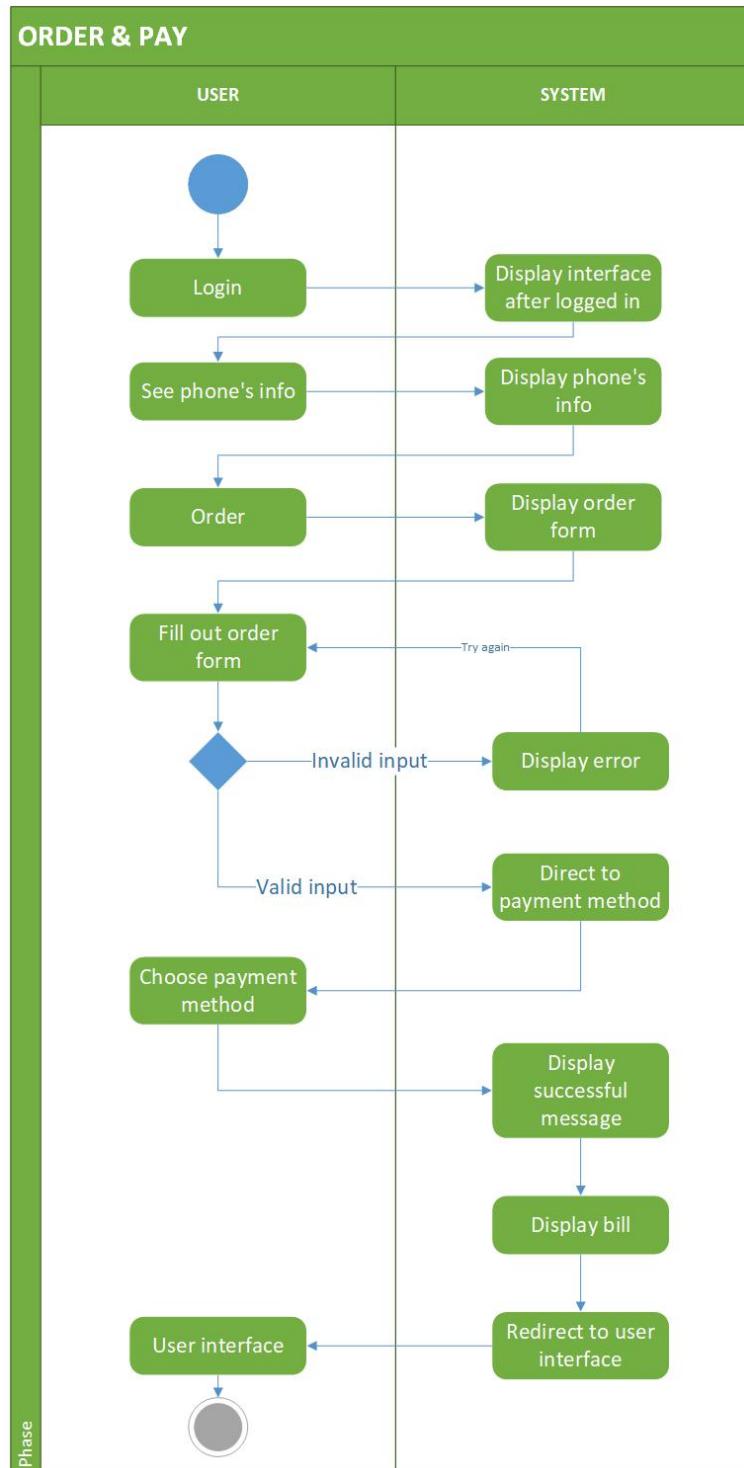


Figure 26 - Activity diagram for Use case: Transaction Management - Order and Pay
Mobile Phone

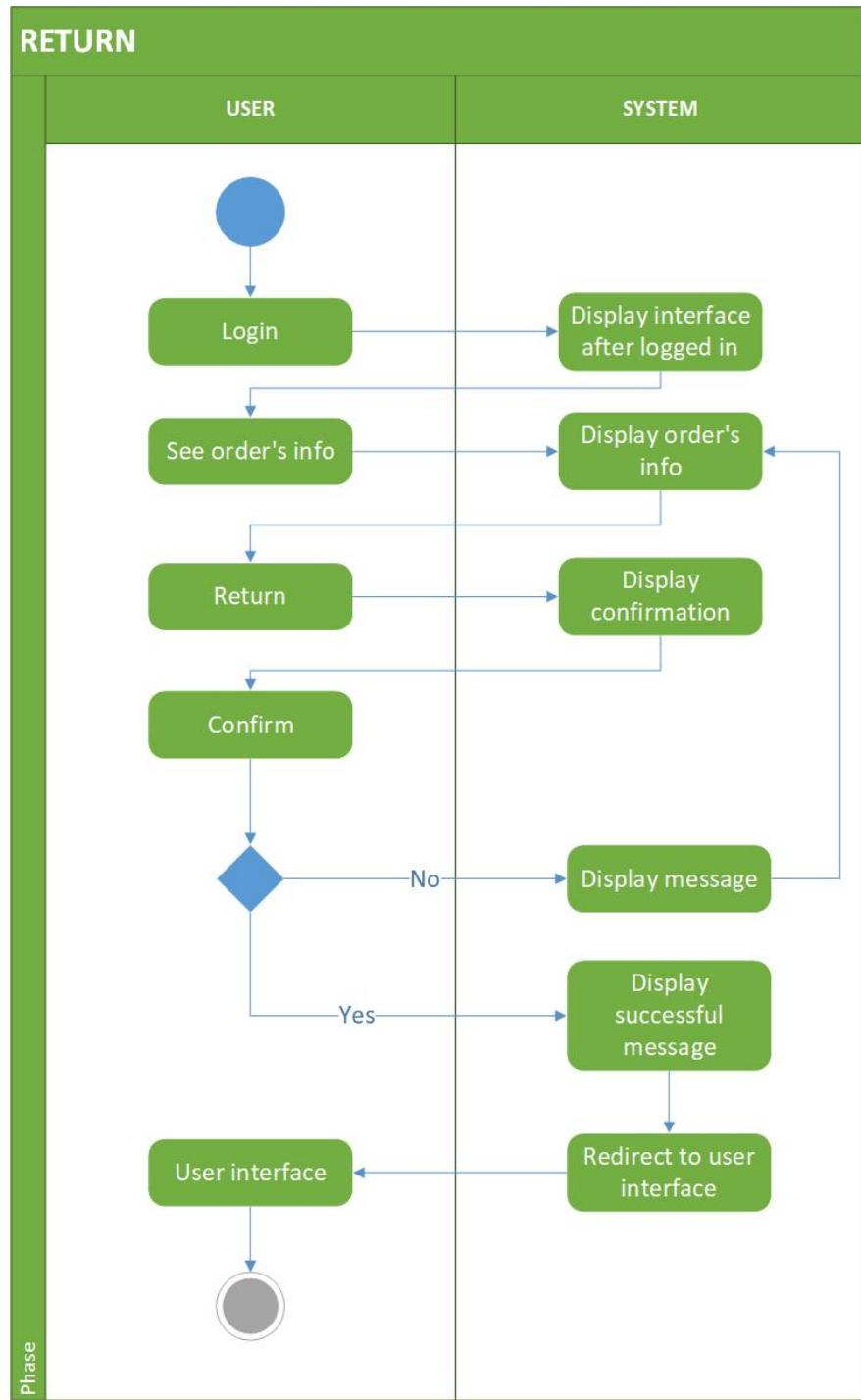


Figure 27 - Activity diagram for Use case: Transaction Management - Return Mobile Phone

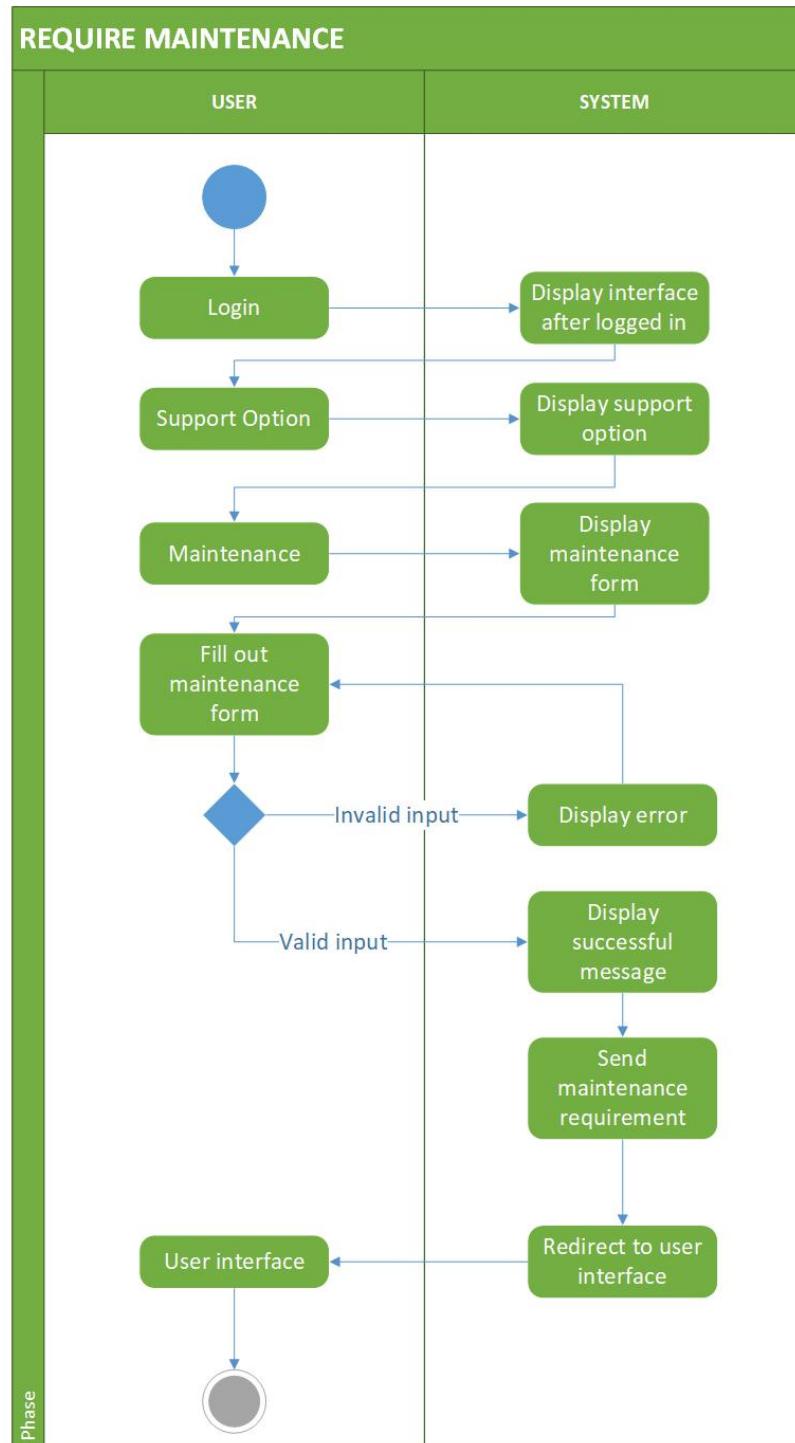


Figure 28 - Activity diagram for Use case: Transaction Management - Maintain Mobile Phone

v. System sequence diagram for Use case: Transaction management

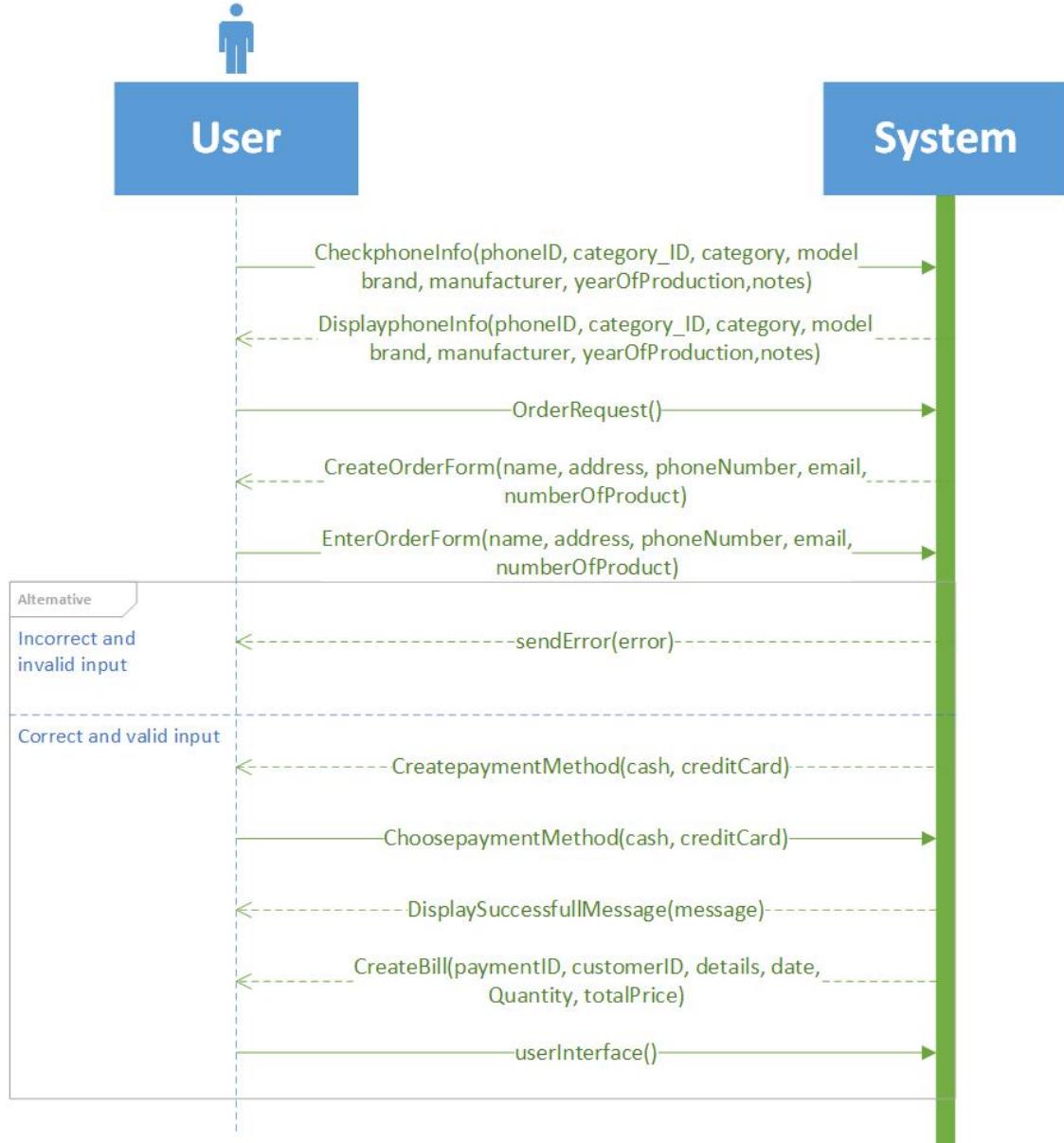


Figure 29 - System sequence diagram for Use case: Transaction management - Order and Pay mobile phone

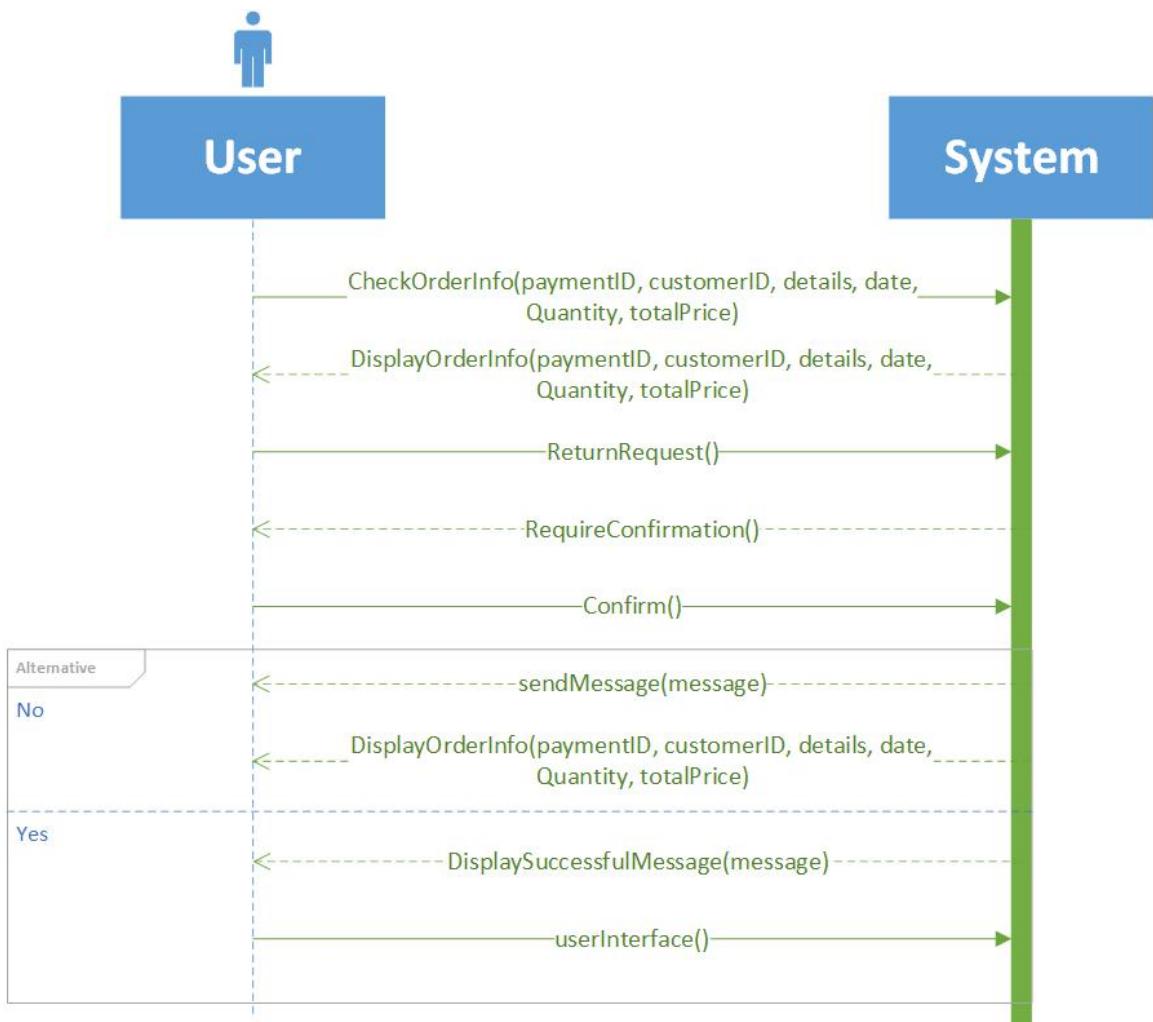


Figure 30 - System sequence diagram for Use case: Transaction management - Return mobile phone

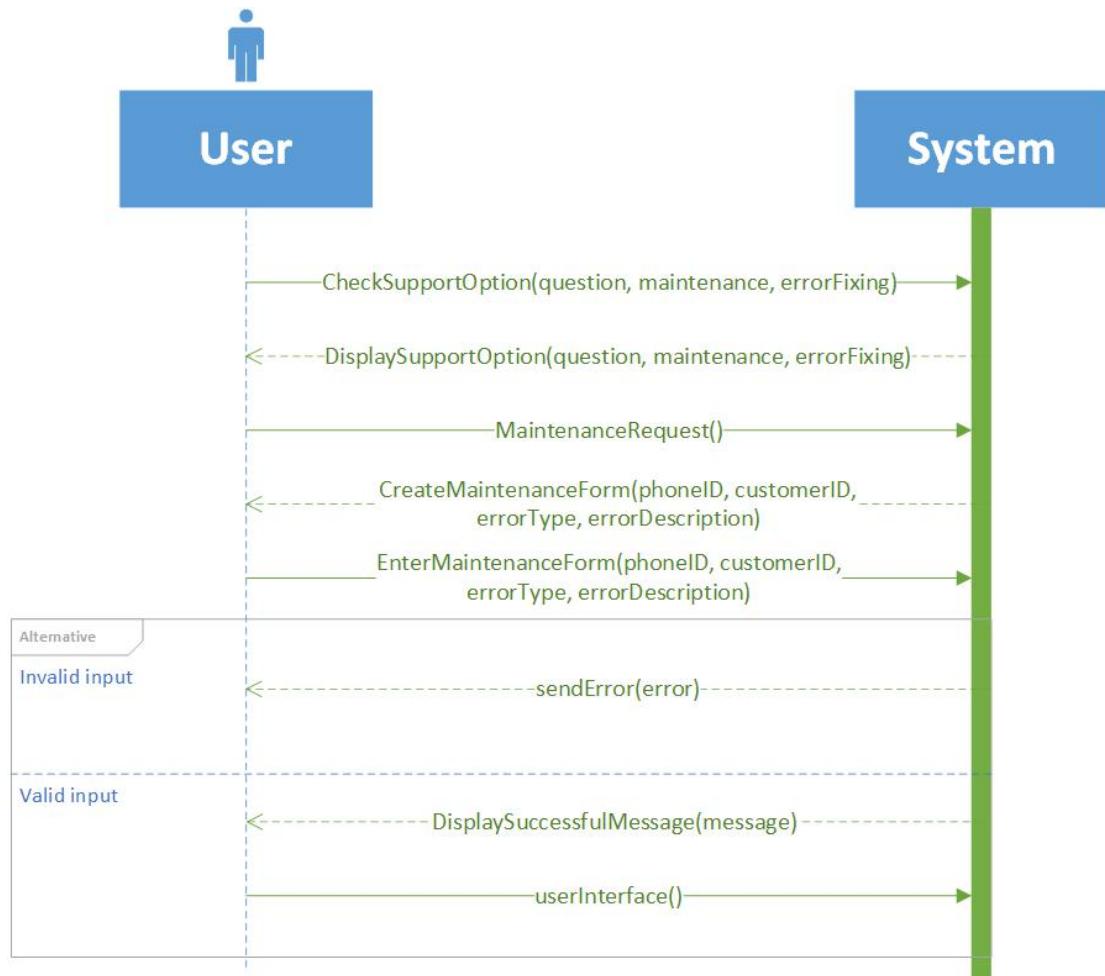


Figure 31 - System sequence diagram for Use case: Transaction management - Maintain mobile phone

3.2.8. Use case: System management

i. Use case: System management - Decentralization

fully description

Use case name	Decentralization
Scenario	Admin assigns permissions to each type of users (Manager, Staff, Customer)
Triggering event	Admin wants to delegate permissions to each type

	of users in the system	
Brief description	Each type of users has different roles and rights so admin will assign permissions to them	
Actors	Admin	
Related use cases	All use case in the system	
Stakeholders	All function in the system	
Preconditions	Decentralization subsystem must be available	
Postconditions	Admin has acknowledged all functions of each type of users	
Flow of activities	Actor	System
	1. Admin choose user to assign permission	1.1. Display list of users 1.2. Display successful message and give permission to that user
Exception conditions	1.1. Decentralization subsystem not function properly or failed	

Table 15 - Use case: System management - Decentralization fully description

ii. Use case: System management - Backup and Restore

fully description

Use case name	Backup and Restore
Scenario	Backup and restore data
Triggering event	Admin wants to backup or restore data
Brief description	In case losing all data, admin needs to backup data so that all lost data can be restored. Admin will save backup data file in a safe place and choose it to restore data

Actors	Admin							
Related use cases	No							
Stakeholders	System management							
Preconditions	System must have enough disk space to contain backup file							
Postconditions	Admin has saved backup file before something goes wrong							
Flow of activities	<table border="1"> <thead> <tr> <th>Actor</th> <th>System</th> </tr> </thead> <tbody> <tr> <td>1. Admin saves backup file</td> <td>1.1. Create and save backup file 1.2. Display successful message</td> </tr> <tr> <td>2. Admin chooses backup file to restore</td> <td>2.1. The system restores all backup data</td> </tr> </tbody> </table>	Actor	System	1. Admin saves backup file	1.1. Create and save backup file 1.2. Display successful message	2. Admin chooses backup file to restore	2.1. The system restores all backup data	
Actor	System							
1. Admin saves backup file	1.1. Create and save backup file 1.2. Display successful message							
2. Admin chooses backup file to restore	2.1. The system restores all backup data							
Exception conditions	1.1. Not enough space to save backup file 2.1. Not found backup file							

Table 16 - Use case: System management - Backup and Restore fully description

iii. Activity diagram for Use case: System management

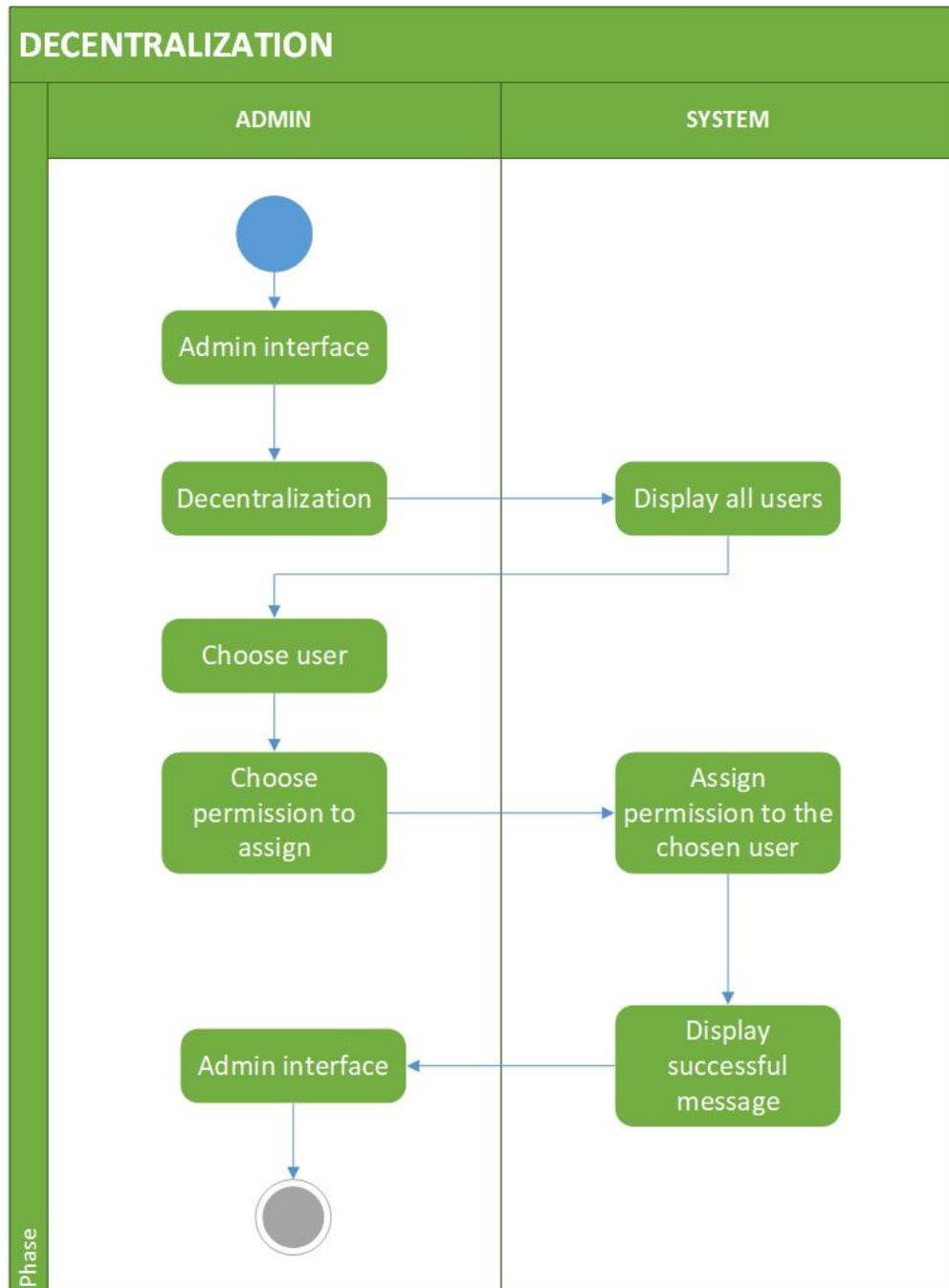


Figure 32 - Activity diagram for Use case: System management - Decentralization

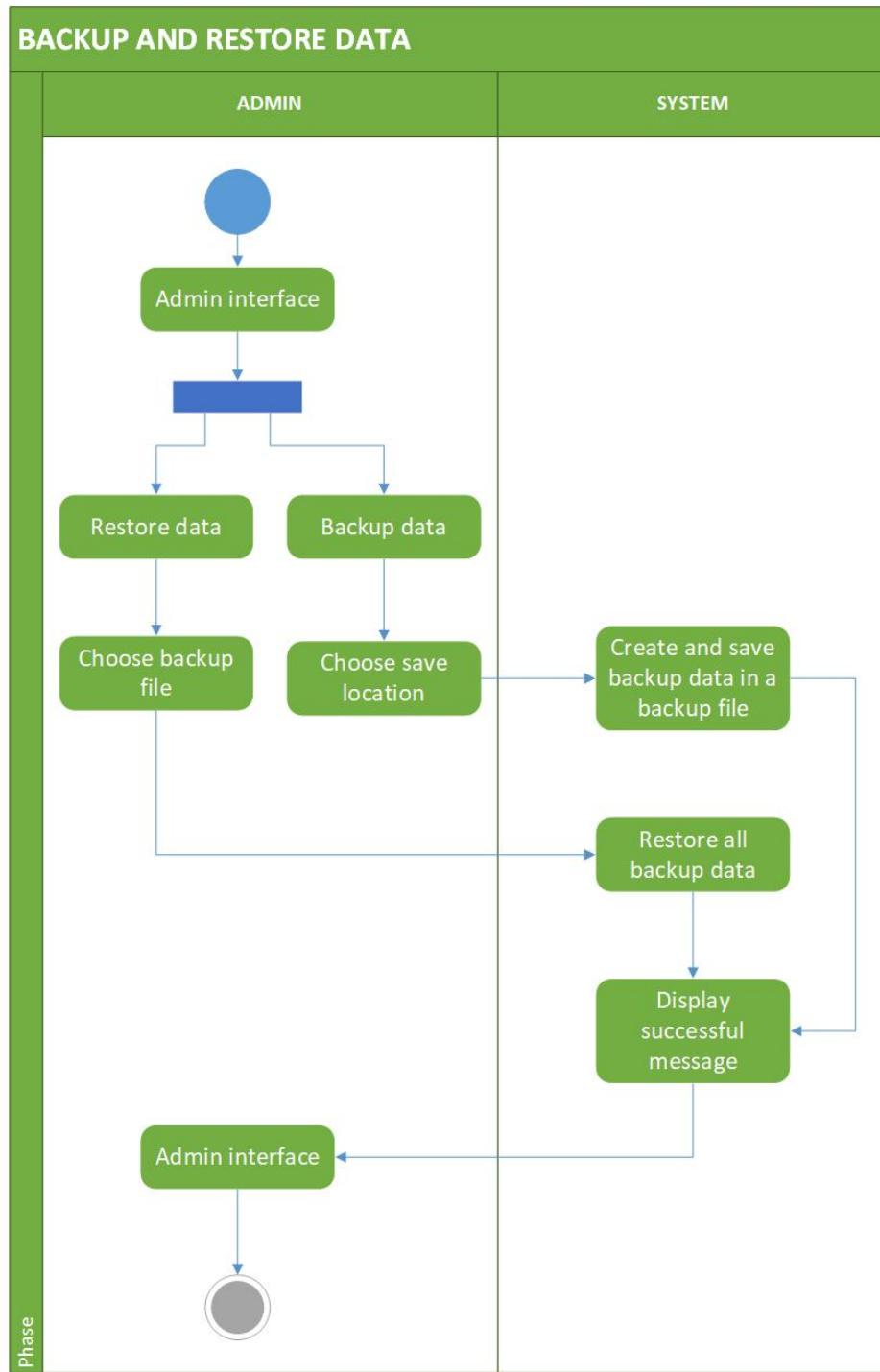


Figure 33 - Activity diagram for Use case: System management - Backup and Restore data

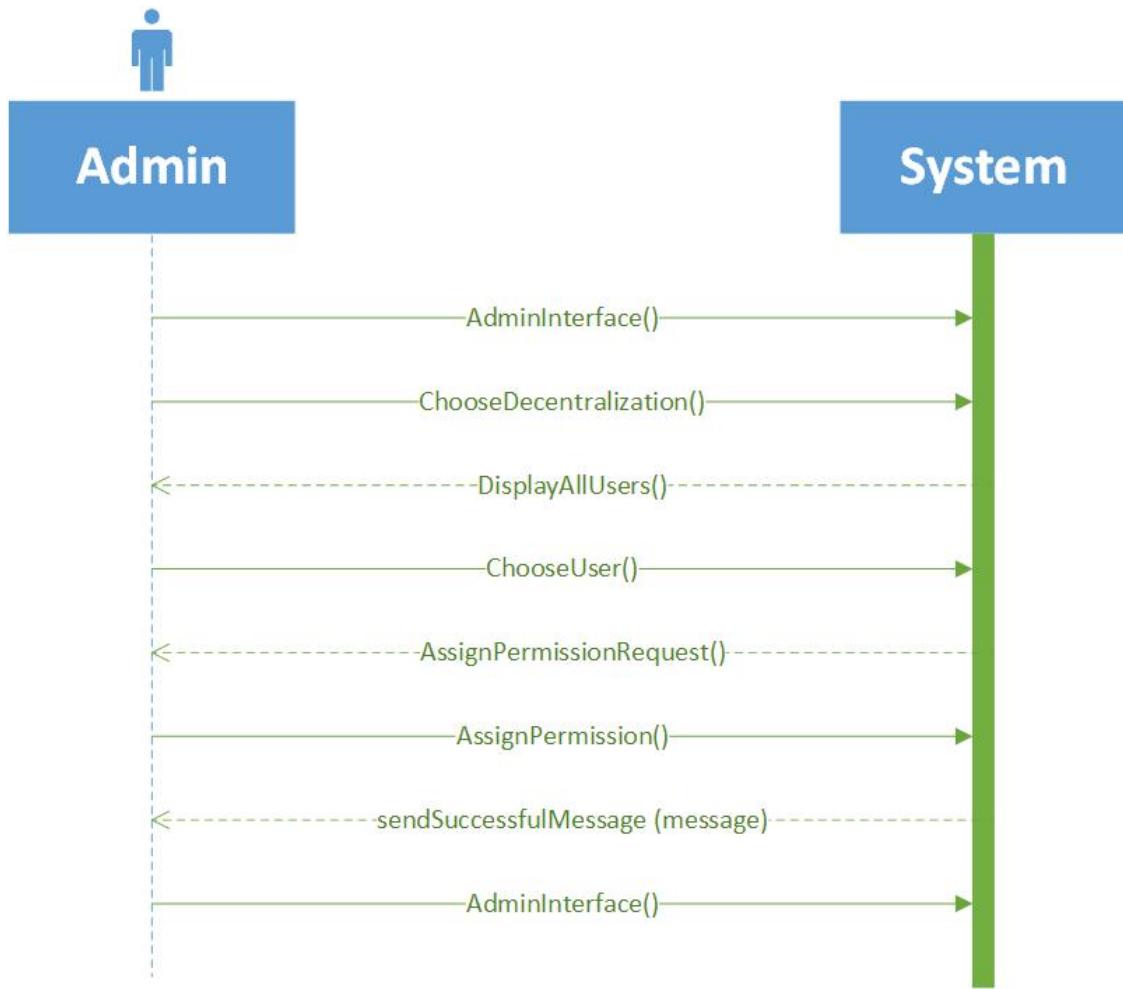
iv. System sequence diagram for Use case: System management

Figure 34 - System sequence diagram for Use case: System management - Decentralization

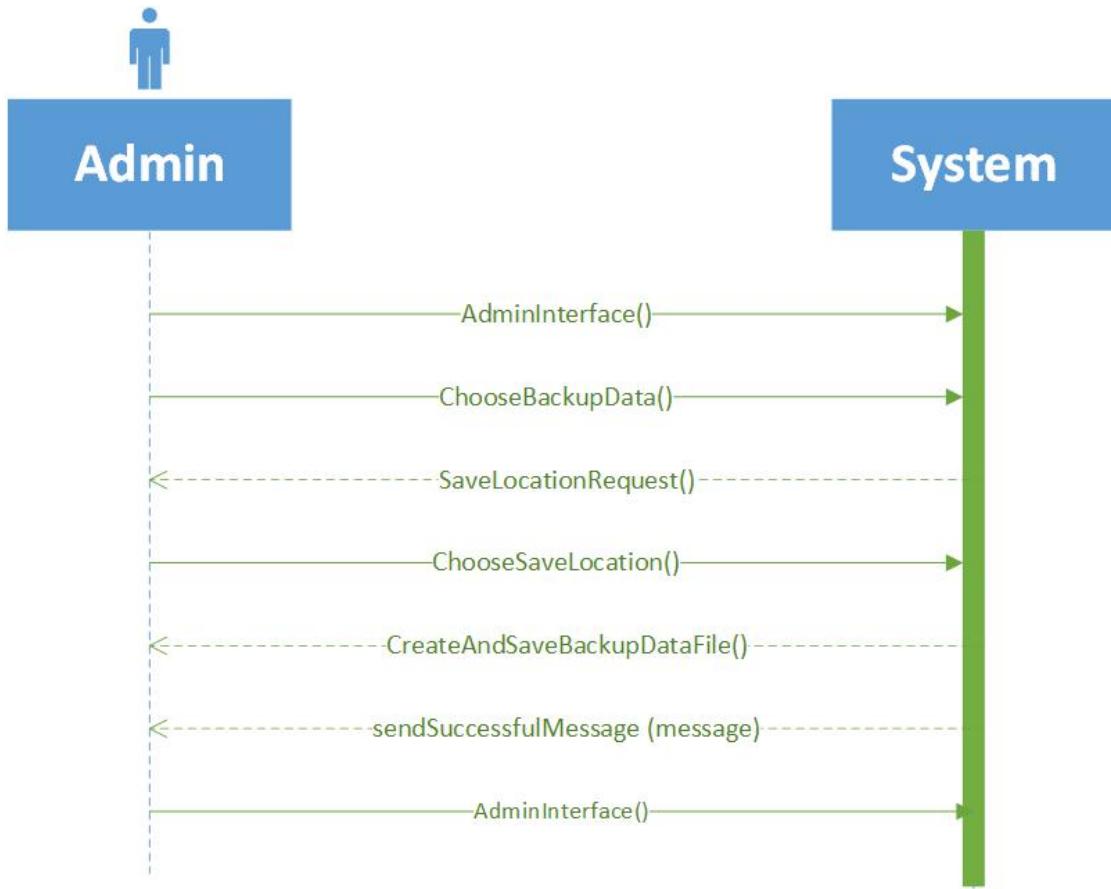


Figure 35 - System sequence diagram for Use case: System management - Backup data

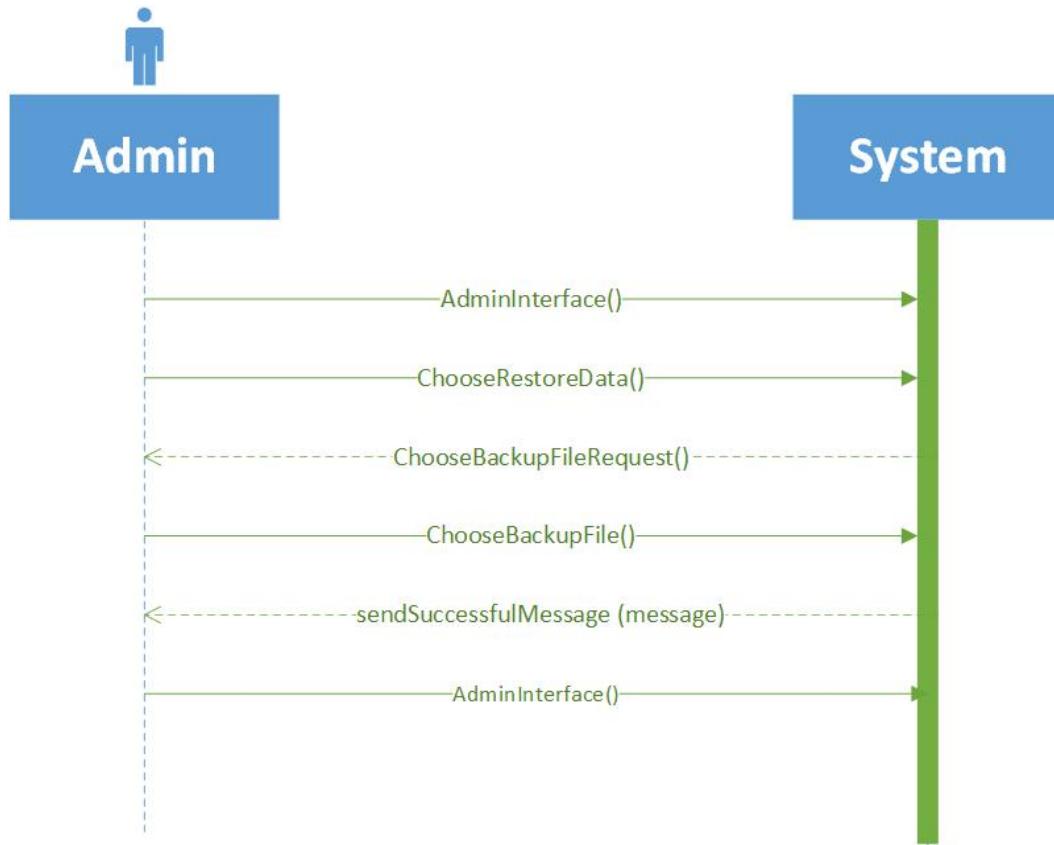


Figure 36 - System sequence diagram for Use case: System management - Restore data

3.3. Verifying use cases for Actor

3.3.1. Verifying use case for Admin

Data entity	C R U D	Verified use case
Admin	Create	Create backup file
	Read	Read user information
	Update	Update system
	Delete	Delete users, including their permissions

Table 17 - Verifying use case for Admin

3.3.2. Verifying use case for Manager

Data entity	C R U D	Verified use case
Manager	Create	Add staff
	Read	Read staff information
	Update	Edit staff information
	Delete	Delete staff information

Table 18 - Verifying use case for Manager

3.3.3. Verifying use case for Staff

Data entity	C R U D	Verified use case
Staff	Create	Add customer/phone
	Read	Read customer /phone information
	Update	Edit customer /phone information
	Delete	Delete customer /phone information

Table 19 - Verifying use case for Staff

3.3.4. Verifying use case for Customer

Data entity	C R U D	Verified use case
Customer	Create	Create customer account
	Read	Read phone information
	Update	Update personal information
	Delete	Delete phone from cart

Table 20 - Verifying use case for Customer

CHAPTER 4 - SYSTEM REQUIREMENTS DESIGN

4.1. Design Classes for Use Case - Customer

4.1.1. Design Classes in Detailed Design

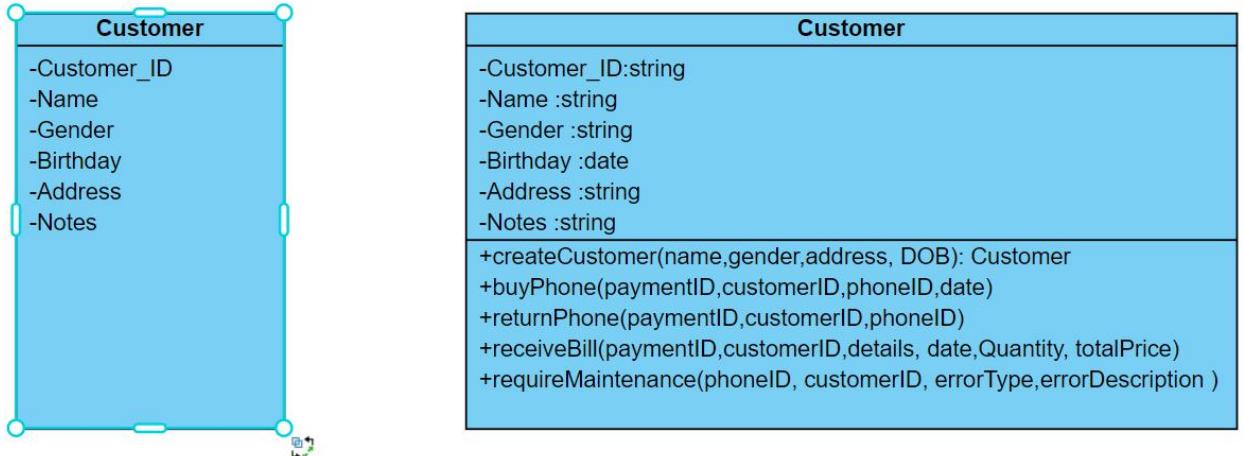


Figure 37 - Design Classes in Detailed Design - Customer

4.1.2. Design Class Diagram - Customer

i. Domain Design Class

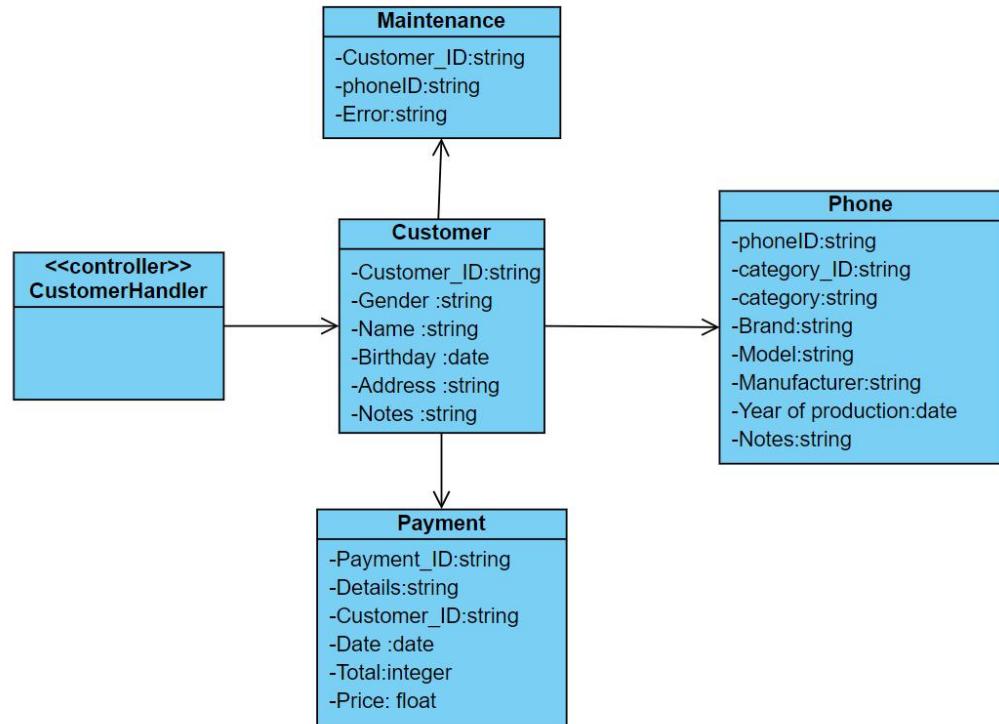


Figure 38 - Domain Design Class - Customer

ii. Controller

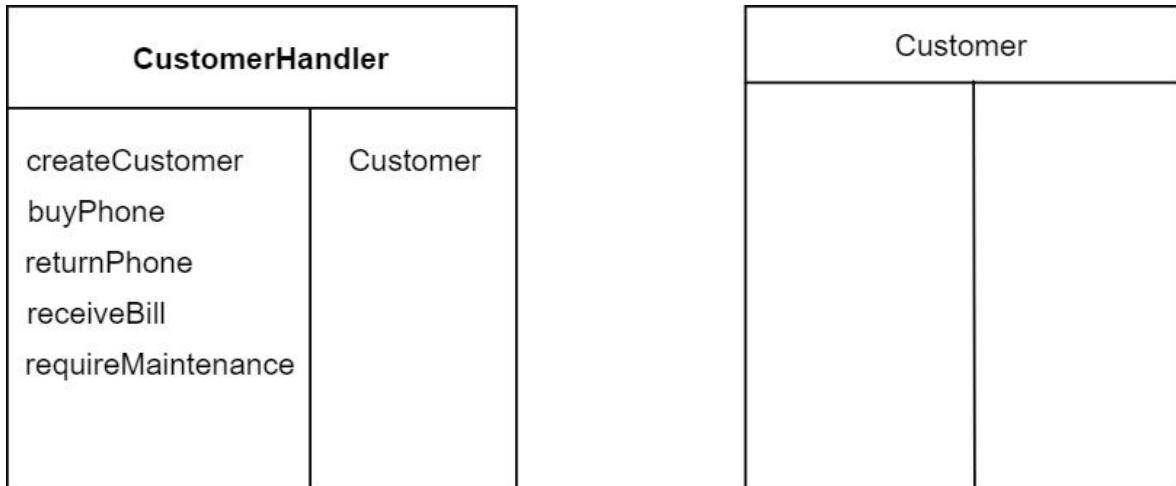


Figure 39 - Controller - Customer

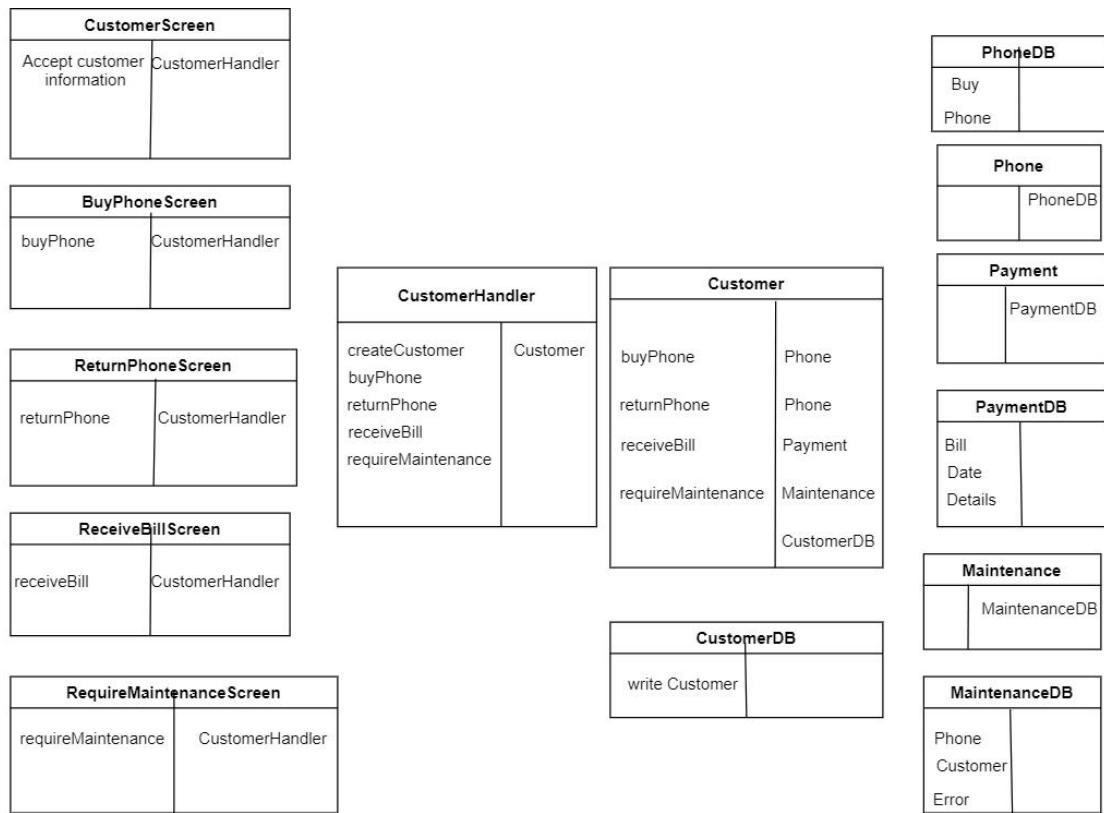
iii. UI

Figure 40 - UI - Customer

iv. Data Access

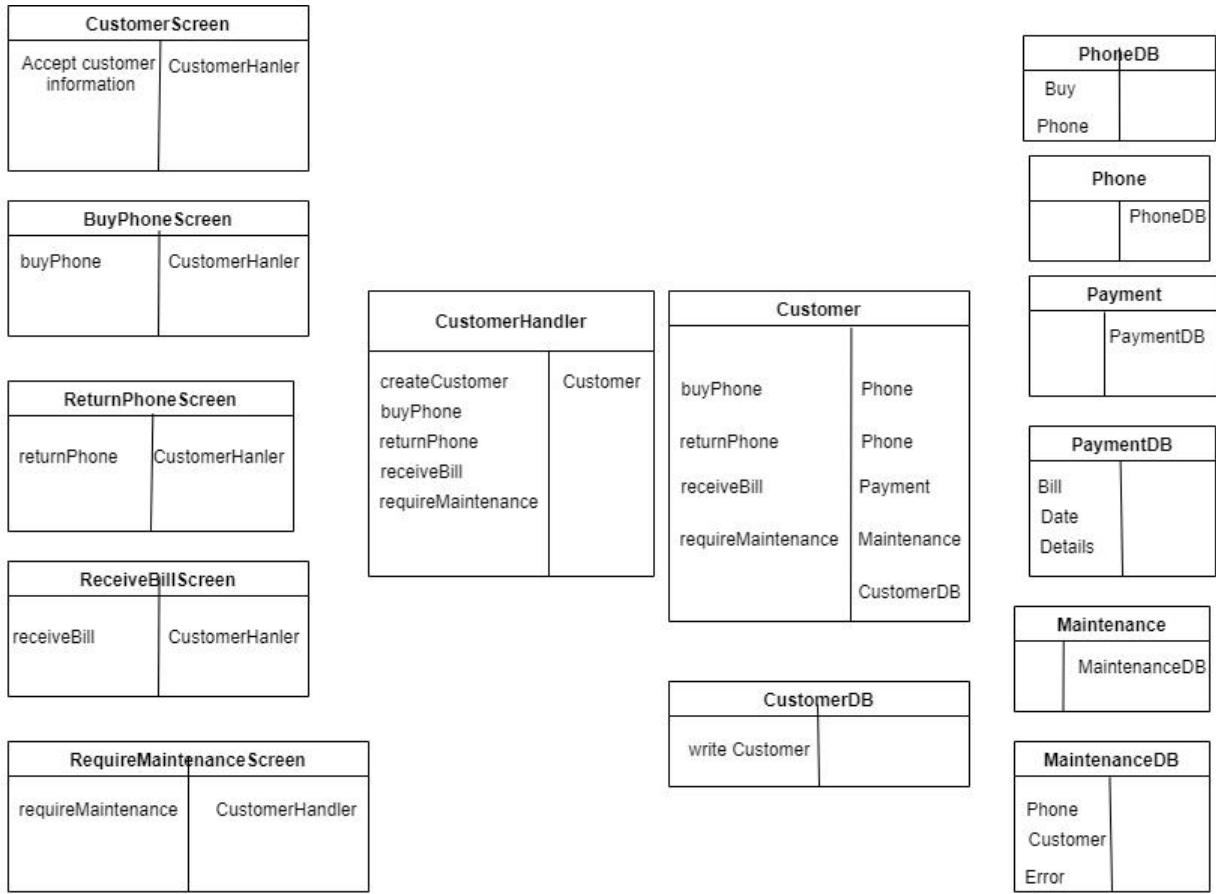


Figure 41 - Data Access - Customer

v. Design Class

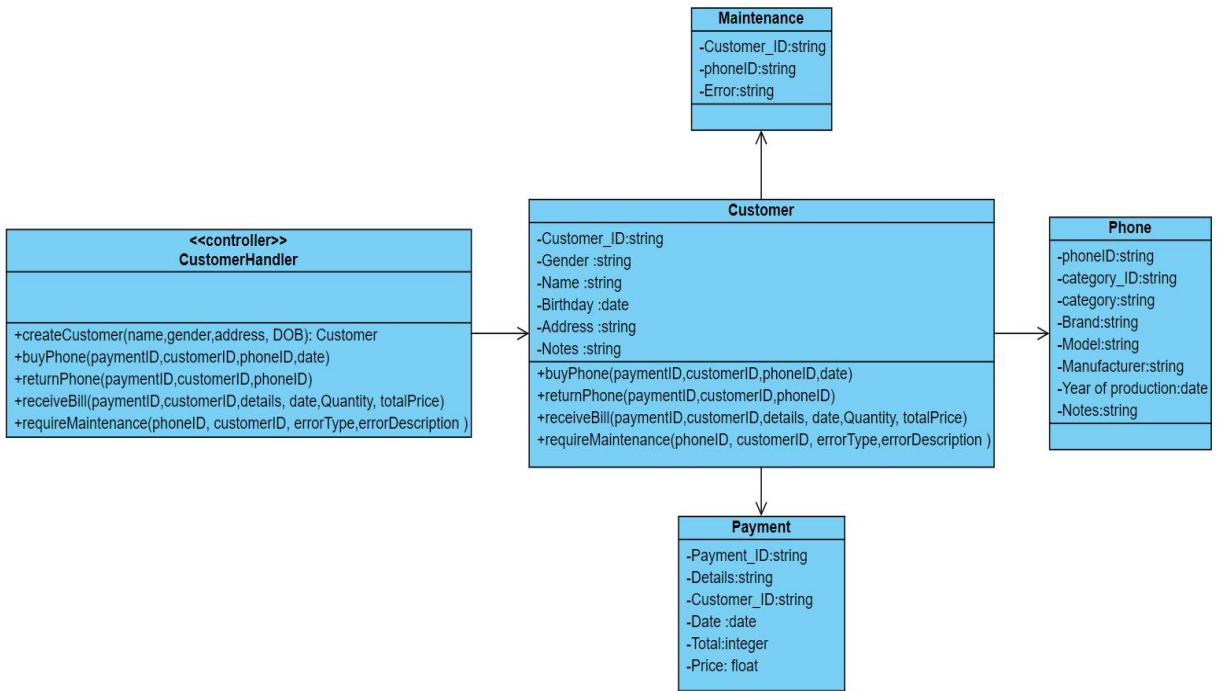


Figure 42 - Design Class - Customer

4.1.3. OOD with Communication

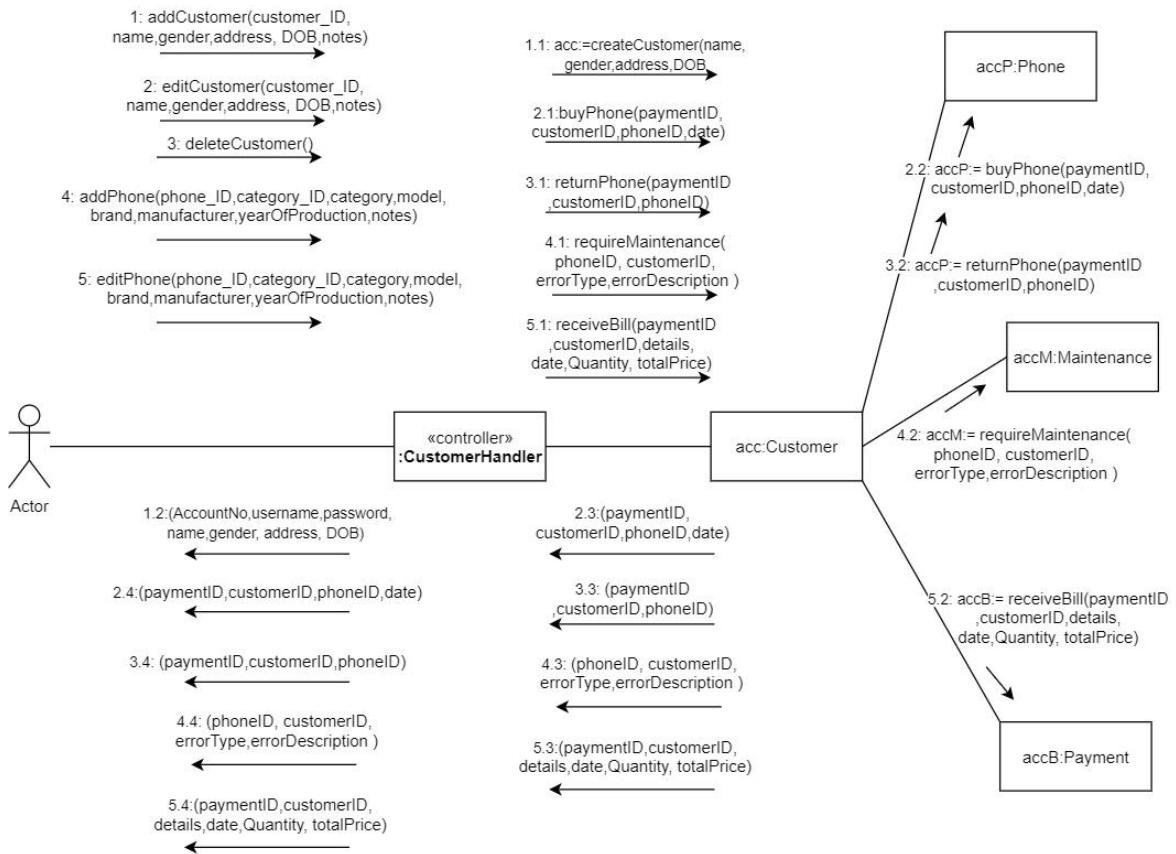


Figure 43 - OOD with communication - Customer

4.1.4. OOD with Sequence Diagram

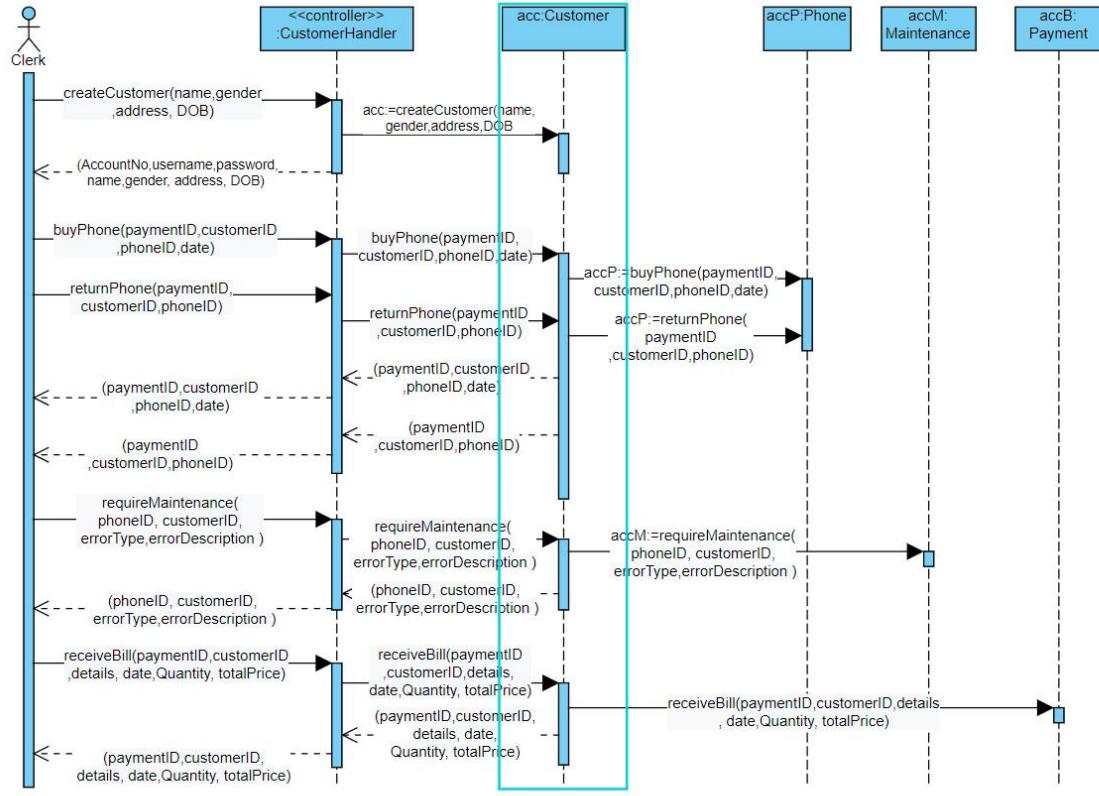


Figure 44 - OOD with Sequence Diagram - Customer

4.1.5. Final Design Class Diagram

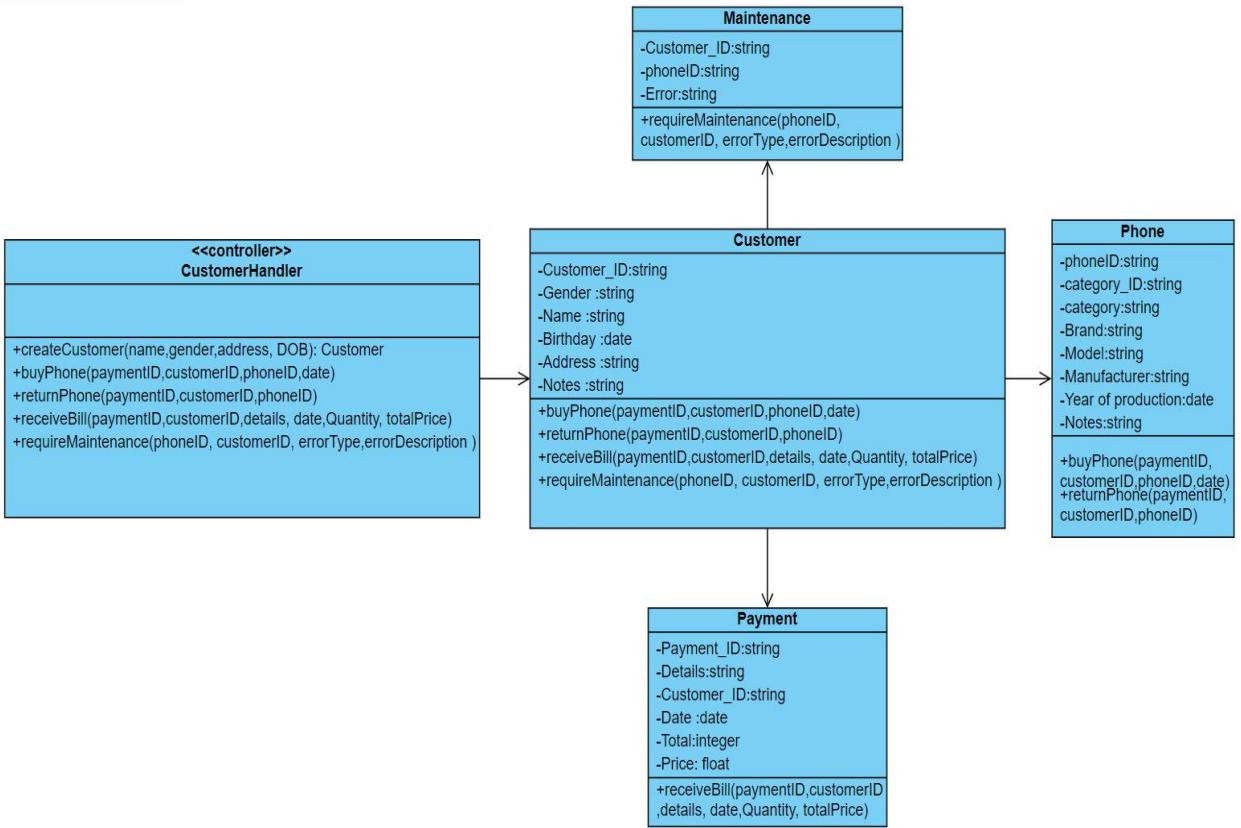


Figure 45 - Final Design Class Diagram - Customer

4.2. Design Class for Use case - Staff

4.2.1. Design Classes in Detailed Design

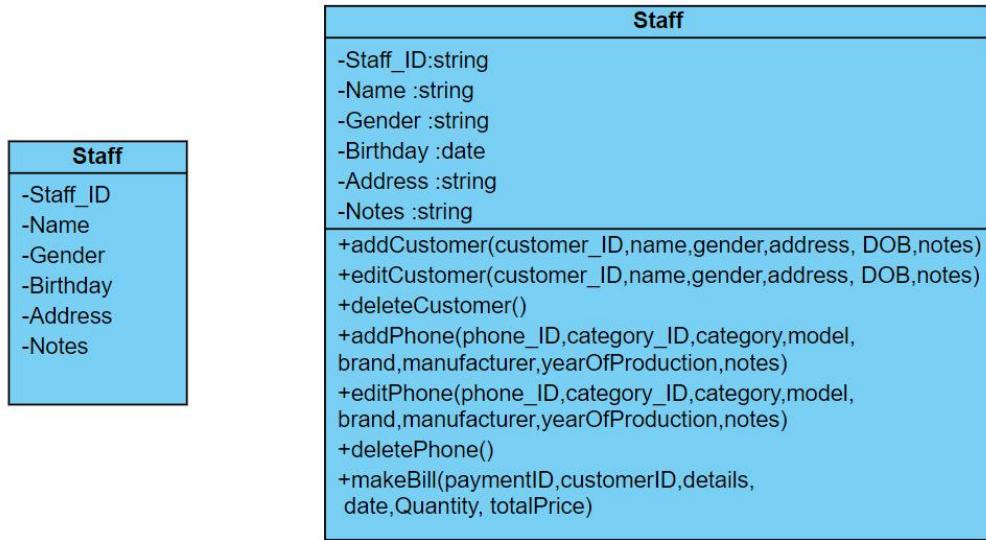


Figure 46 - Design Classes in Detailed Design - Staff

4.2.2. Design Class Diagram

i. Domain Design Class

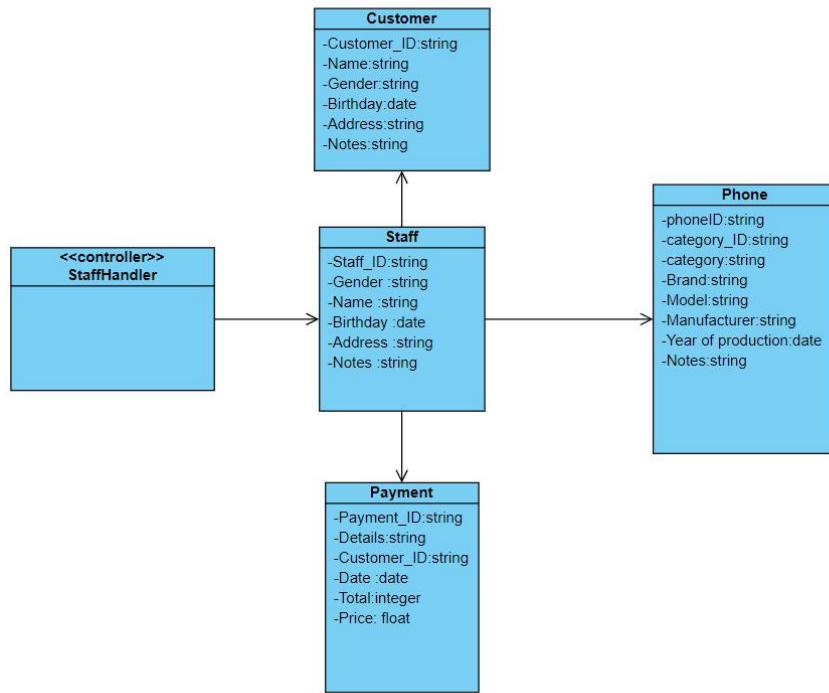


Figure 47 - Domain Design Class - Staff

ii. Controller

StaffHandler	
addCustomer	Staff
editCustomer	
deleteCustomer	
addPhone	
editPhone	
deletePhone	
makeBill	

Staff	

Figure 48 - Controller - Staff

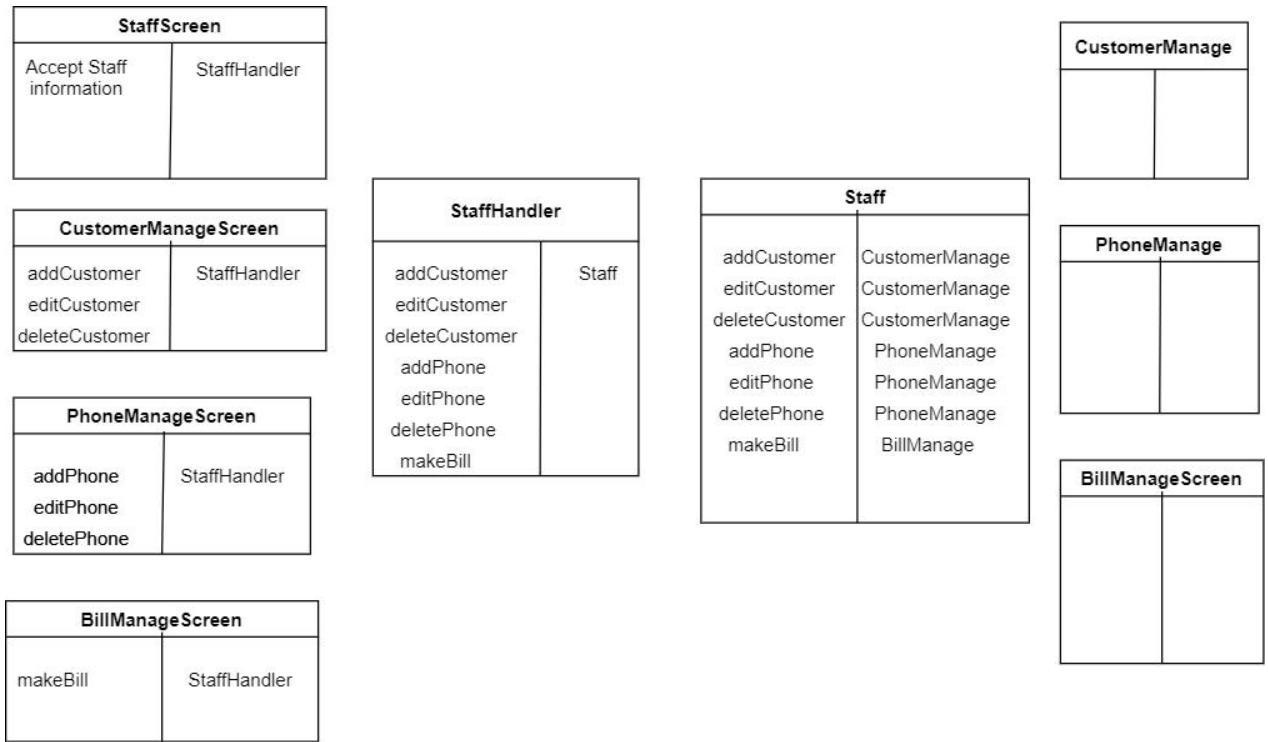
iii. UI

Figure 49 - UI - Staff

iv. Data Access

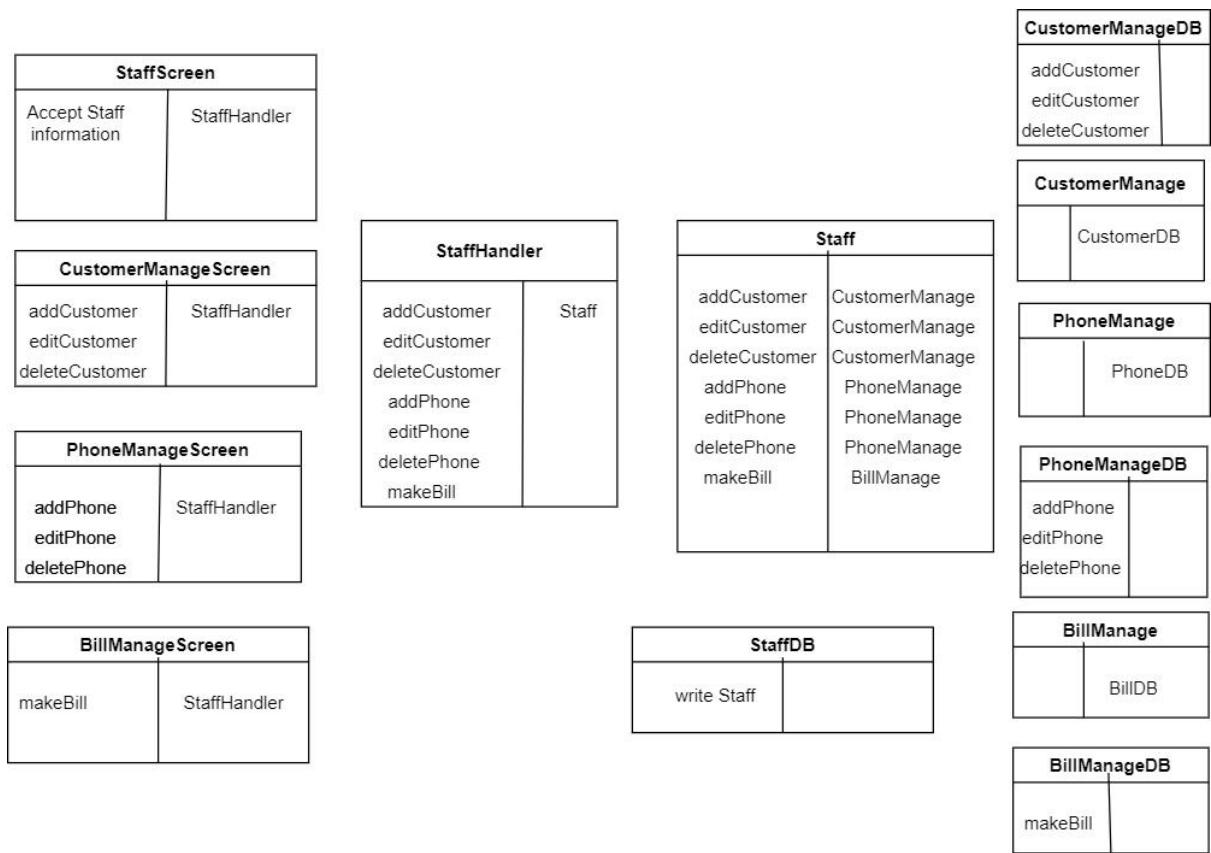


Figure 50 - Data Access - Staff

v. Design Class

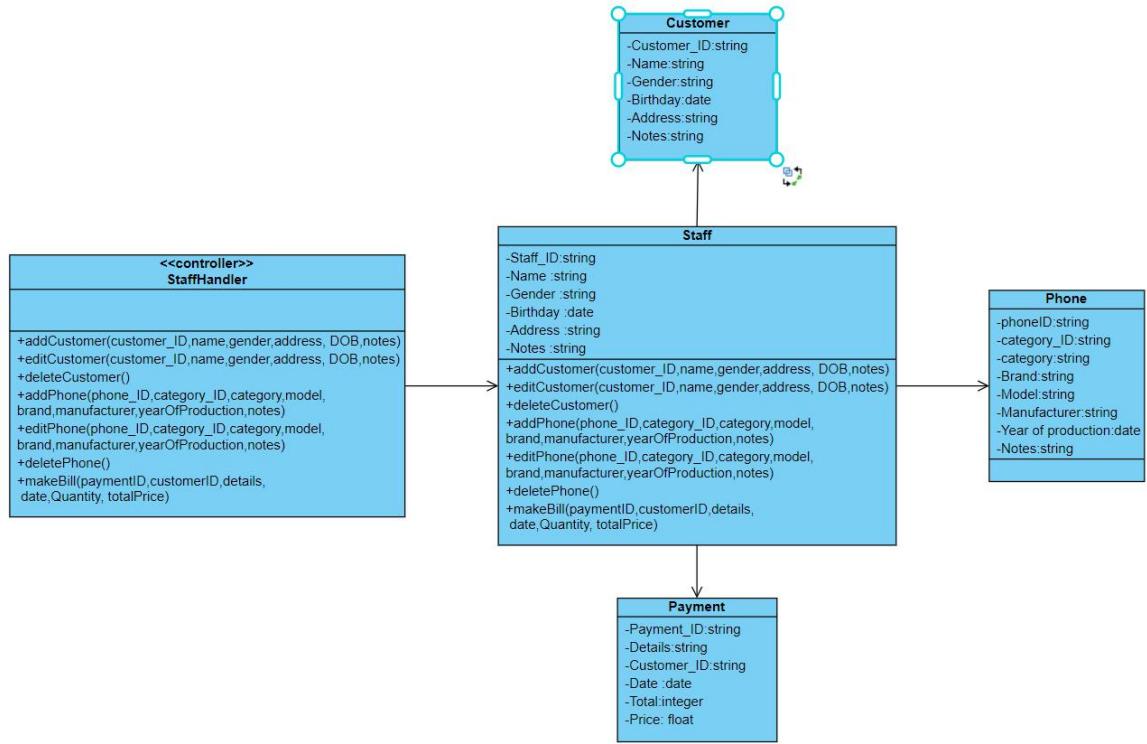


Figure 51 - Design Class - Staff

4.2.3. OOD with Communication

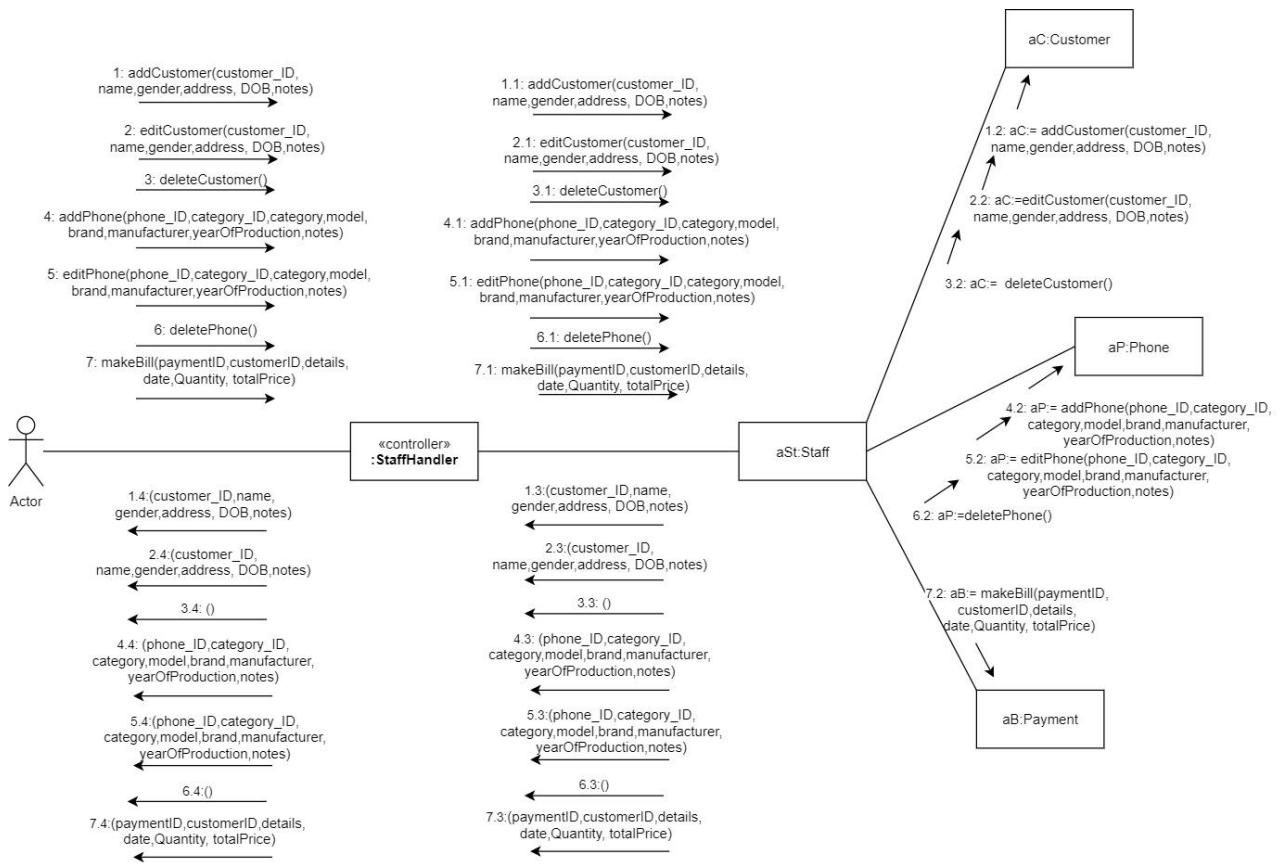


Figure 52 - OOD with Communication - Staff

4.2.4. OOD with Sequence Diagram

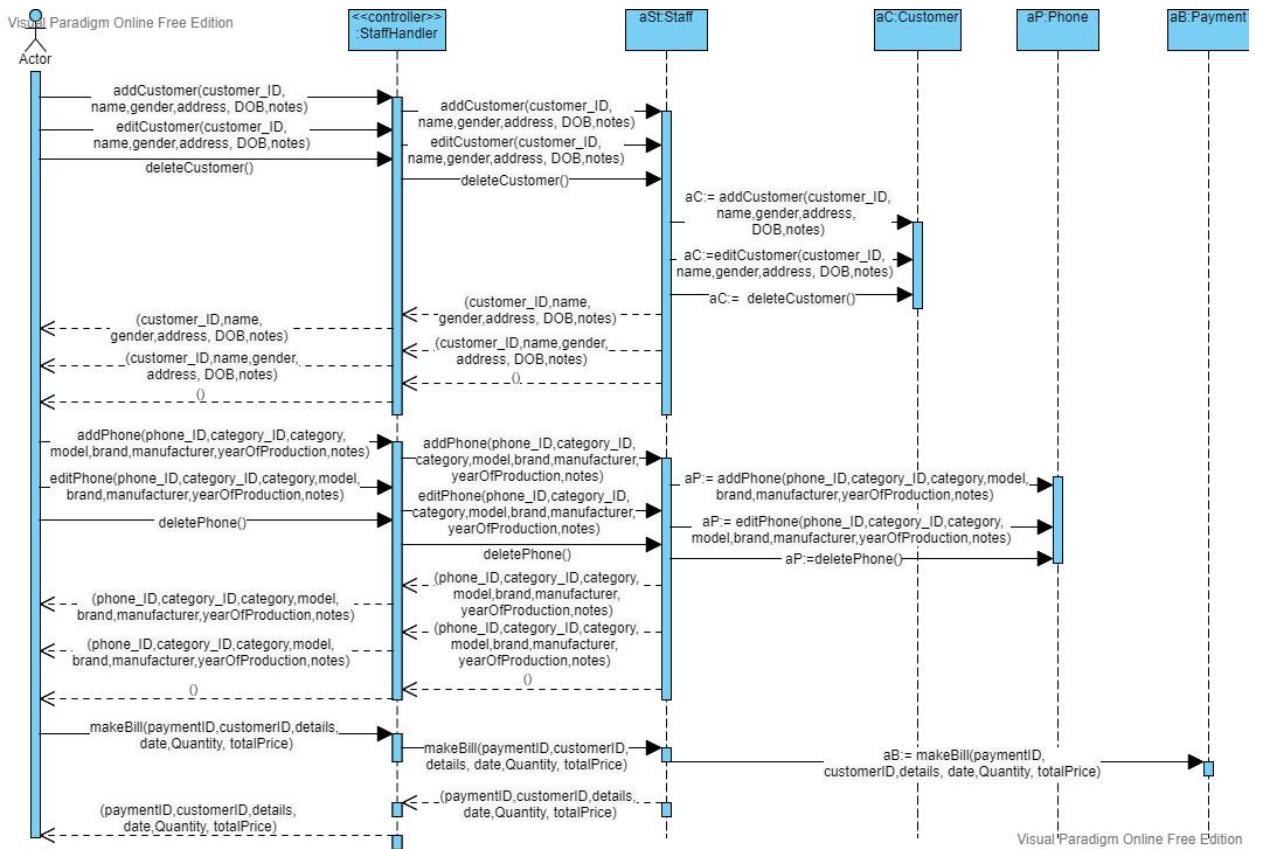


Figure 53 - OOD with Sequence Diagram - Staff

4.2.5. Final Design Class Diagram

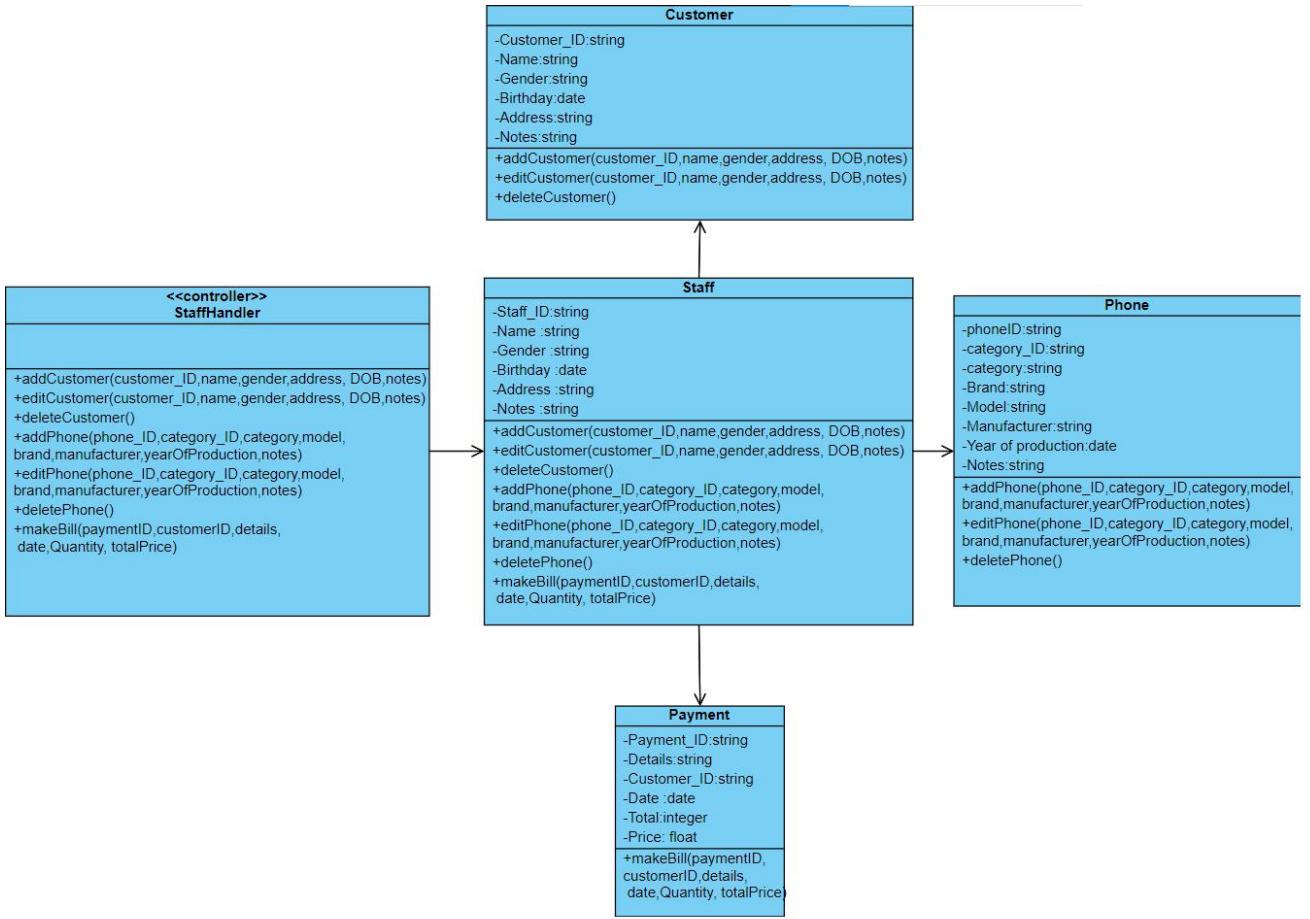


Figure 54 - Final Design Class Diagram - Staff

CHAPTER 5 - SYSTEM REQUIREMENTS IMPLEMENTATION

5.1. Design Class for Sub System (Use cases)

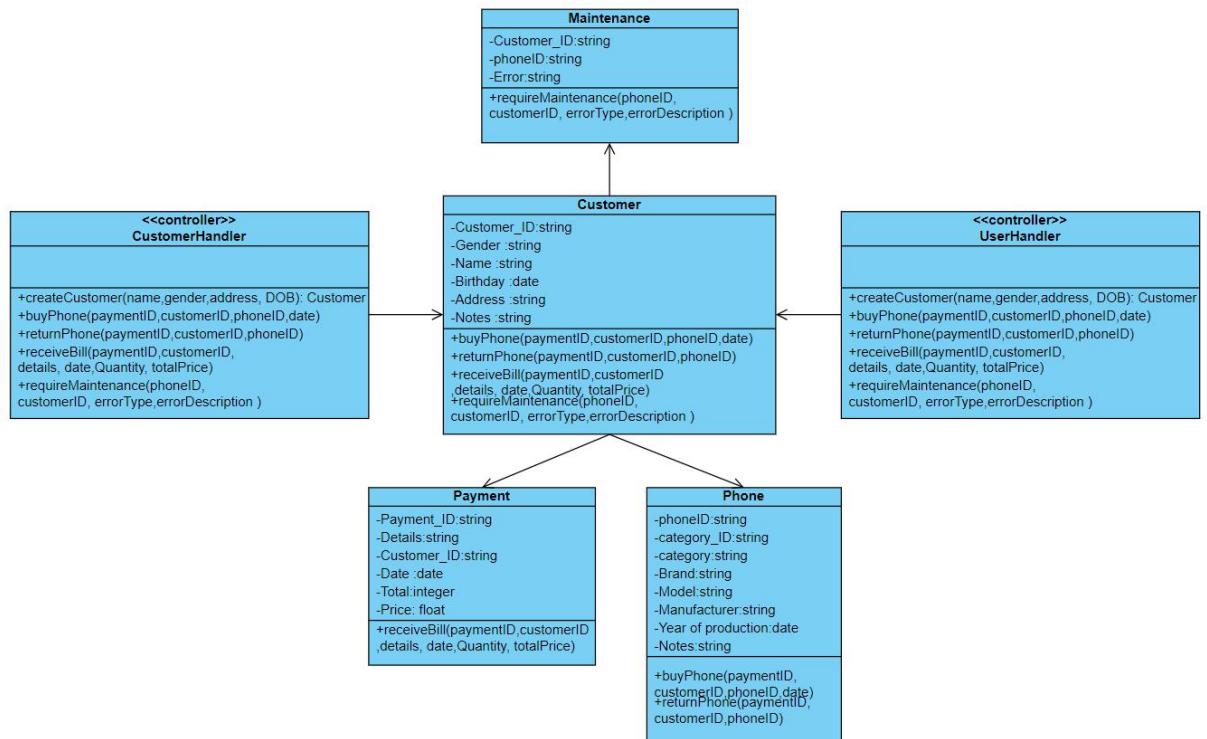


Figure 55 - Design Class for Sub System

5.2. Package Diagram for Sub System

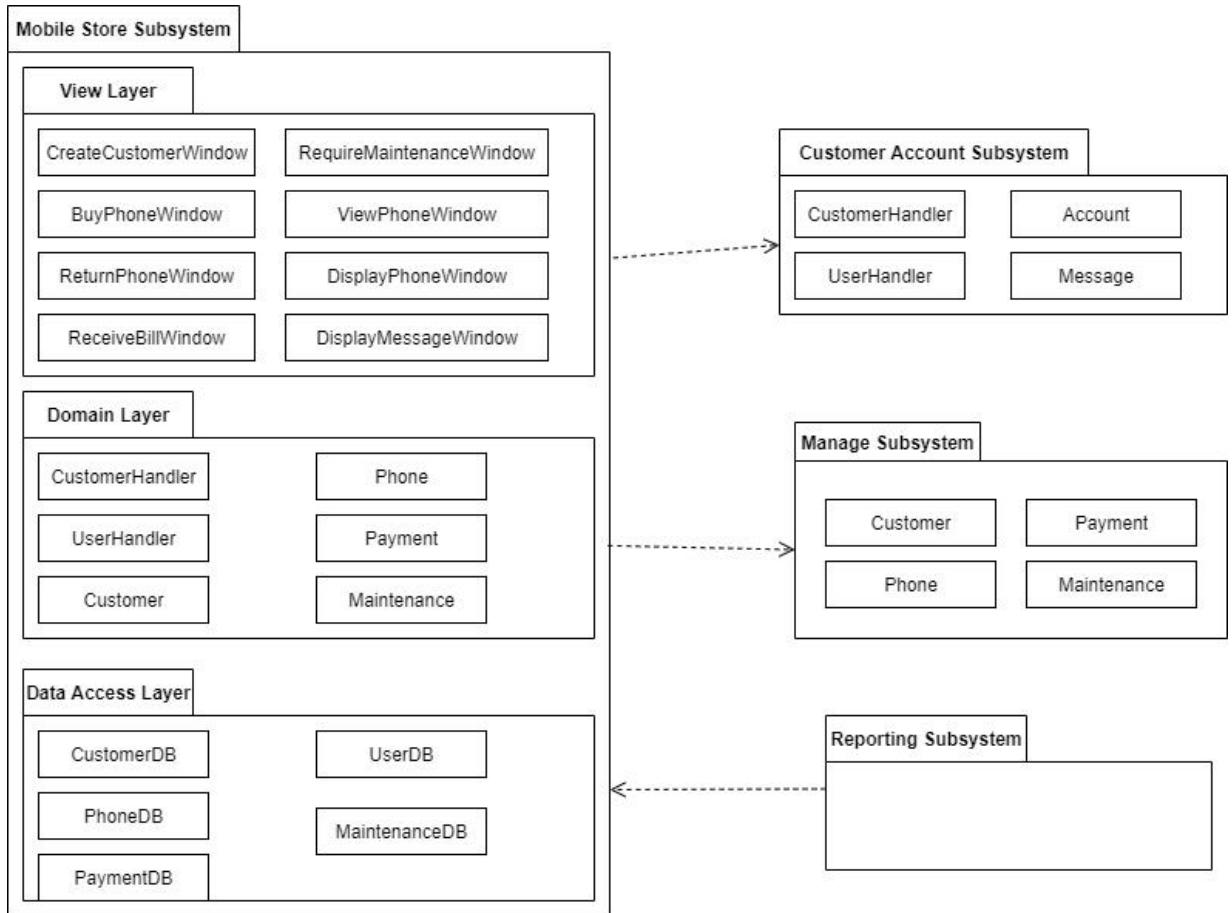


Figure 56 - Package Diagram for Sub system

5.3. Implementation

5.3.1. Map persistent objects to the tables in a database

5.3.2. Modifying sequence diagrams

5.3.3. UI Design

5.3.4. SQL Code

i. Create database

```

CREATE DATABASE DB_MobileStoreManagement ON PRIMARY
(
    NAME = 'DB_MobileStoreManagement',
    FILENAME = 'F:\DB_MobileStoreManagement.mdf' ,
    SIZE = 4096KB ,
    MAXSIZE = UNLIMITED,
    FILEGROWTH = 1024KB )
LOG ON
(
    NAME = 'DB_MobileStoreManagement_log',
    FILENAME = 'F:\DB_MobileStoreManagement_log.ldf' ,
    SIZE = 1024KB ,
    MAXSIZE = 2048KB ,
    FILEGROWTH = 10%)

```

Figure 57 - SQL code - Create database

ii. Create table

```

CREATE TABLE USER_DB
(
    userid varchar(10) NOT NULL,
    username varchar(20) NOT NULL,
    pass varchar (30) NOT NULL,
    role_permission varchar(10) NOT NULL,
    PRIMARY KEY (userid)
)

```

Figure 58 - SQL code - Create table User

	userid	username	pass	role_permission
1	U01	admin	admin	ADMIN
2	U02	manager1	12346	MANAGER
3	U03	staff1	456789	STAFF
4	U04	customer1	789012	CUSTOMER

Figure 59 - Data for table User

```

CREATE TABLE STAFF_DB
(
    Staff_ID varchar(10) NOT NULL,
    Fullname varchar (50) NOT NULL,
    gender varchar(10),
    DOB date,
    Current_address varchar(50)NOT NULL,
    phone_num varchar(15) NOT NULL,
    PRIMARY KEY (Staff_ID)
)

```

Figure 60 - SQL code - Create table Staff

	Staff_ID	Fullname	gender	DOB	Current_address	phone_num
1	S1	Luffy	male	1997-05-05	East Blue	0123456789
2	S2	Zoro	male	1996-11-11	Wano	0112345678
3	S3	Sanji	male	1996-03-02	South Blue	0122345678
4	S4	Nami	female	1995-07-03	East Blue	0123345678
5	S5	Chopper	male	2001-12-24	Drum Island	0123445678

Figure 61 - Data for table Staff

```

CREATE TABLE CUSTOMER_DB
(
    Customer_ID varchar(10) NOT NULL,
    Fullname varchar (50) NOT NULL,
    gender varchar(10),
    DOB date,
    Current_address varchar(50)NOT NULL,
    phone_num varchar(15) NOT NULL,
    PRIMARY KEY (Customer_ID)
)

```

Figure 62 - SQL code - Create table Customer

The screenshot shows a SQL Server Management Studio window with two tabs: 'Results' and 'Messages'. The 'Results' tab is selected and displays a table named 'Customer'. The table has columns: Customer_ID, Fullname, gender, DOB, Current_address, and phone_num. There are 5 rows of data:

	Customer_ID	Fullname	gender	DOB	Current_address	phone_num
1	C1	Robin	female	1991-06-02	West Blue	0123556789
2	C2	Franky	male	1993-03-09	Water Seven	0112346678
3	C3	Usopp	male	1996-04-01	East Blue	0122345778
4	C4	Brook	female	1931-04-03	Florian Triangle	0123345688
5	C5	Jinbei	male	1976-04-02	Fishman Island	0123456799

Figure 63 - Data for table Customer

```
CREATE TABLE CATEGORY_DB
(
    Category_ID varchar(10) NOT NULL,
    Category varchar (30) NOT NULL,
    PRIMARY KEY (Category_ID)
)
```

Figure 64 - SQL code - Create table Category

The screenshot shows a SQL Server Management Studio window with two tabs: 'Results' and 'Messages'. The 'Results' tab is selected and displays a table named 'Category'. The table has columns: Category_ID and Category. There are 5 rows of data:

	Category_ID	Category
1	CAT1	Less than 1M
2	CAT2	From 1M to 3M
3	CAT3	From 3M to 5M
4	CAT4	From 5M to 10M
5	CAT5	More than 10M

Figure 65 - Data for table Category

```

CREATE TABLE PHONE_DB
(
    Phone_ID varchar(10) NOT NULL,
    Category_ID varchar(10) NOT NULL,
    Model varchar(30) NOT NULL,
    Brand varchar(30) NOT NULL,
    Manufacturer varchar(50),
    Production_Year int,
    Price money NOT NULL,
    PRIMARY KEY (Phone_ID),
    CONSTRAINT FK_CATID FOREIGN KEY (Category_ID) REFERENCES CATEGORY_DB(Category_ID)
)

```

Figure 66 - SQL code - Create table Mobile phone

	Phone_ID	Category_ID	Model	Brand	Manufacturer	Production_Year	Price
1	IPHONE01	CAT5	iPhone 11	iPhone	iPhone Company	2021	15490000.00
2	IPHONE02	CAT5	iPhone 13 Pro Max	iPhone	iPhone Company	2021	34990000.00
3	NOKIA01	CAT1	Nokia 110 4G	Nokia	Nokia Company	2021	850000.00
4	NOKIA02	CAT1	Nokia 210	Nokia	Nokia Company	2021	790000.00
5	NOKIA03	CAT2	Nokia 6300 4G	Nokia	Nokia Company	2021	1090000.00
6	OPPO01	CAT4	Oppo A95	Oppo	Oppo Company	2021	6990000.00
7	SAMSUNG01	CAT4	Samsung galaxy A32	Samsung	Samsung Company	2021	6190000.00
8	VIVO01	CAT3	Vivo Y15a	Vivo	Vivo Company	2021	3990000.00
9	XIAOMI01	CAT2	Xiaomi Redmi 9A	Xiaomi	Xiaomi Company	2021	2490000.00
10	XIAOMI02	CAT3	Xiaomi Redmi 10	Xiaomi	Xiaomi Company	2021	3990000.00

Figure 67 - Data for table Mobile phone

```

CREATE TABLE PAYMENT_DB
(
    Payment_ID varchar(10) NOT NULL,
    Customer_ID varchar(10) NOT NULL,
    Phone_ID varchar(10) NOT NULL,
    Date_ datetime NOT NULL,
    Quantity int NOT NULL,
    Total_Price money NOT NULL,
    PRIMARY KEY (Payment_ID),
    CONSTRAINT FK_CUSID1 FOREIGN KEY (Customer_ID) REFERENCES CUSTOMER_DB(Customer_ID),
    CONSTRAINT FK_PID1 FOREIGN KEY (Phone_ID) REFERENCES PHONE_DB(Phone_ID)
)

```

Figure 68 - SQL code - Create table Payment (Bill)

	Payment_ID	Customer_ID	Phone_ID	Date_	Quantity	Total_Price
1	P01	C1	NOKIA01	2021-12-29 00:00:00.000	2	1700000.00
2	P02	C2	XIAOMI01	2021-12-21 00:00:00.000	3	7470000.00
3	P03	C3	XIAOMI02	2021-10-20 00:00:00.000	1	3990000.00
4	P04	C4	IPHONE02	2021-12-30 00:00:00.000	2	6998000.00
5	P05	C5	VIVO01	2021-03-01 00:00:00.000	4	15960000.00

Figure 69 - Data for table Payment (Bill)

CHAPTER 6 - DEMO

CHAPTER 7 - CONCLUSIONS/ RECOMMENDATIONS

Mobile store management system is not too complicated and its functions are quite easy for users to use.

The system's functions work in the same way as other phone selling online systems and ensure the functions of an offline mobile store.

CHAPTER 8 - REFERENCE

Link:

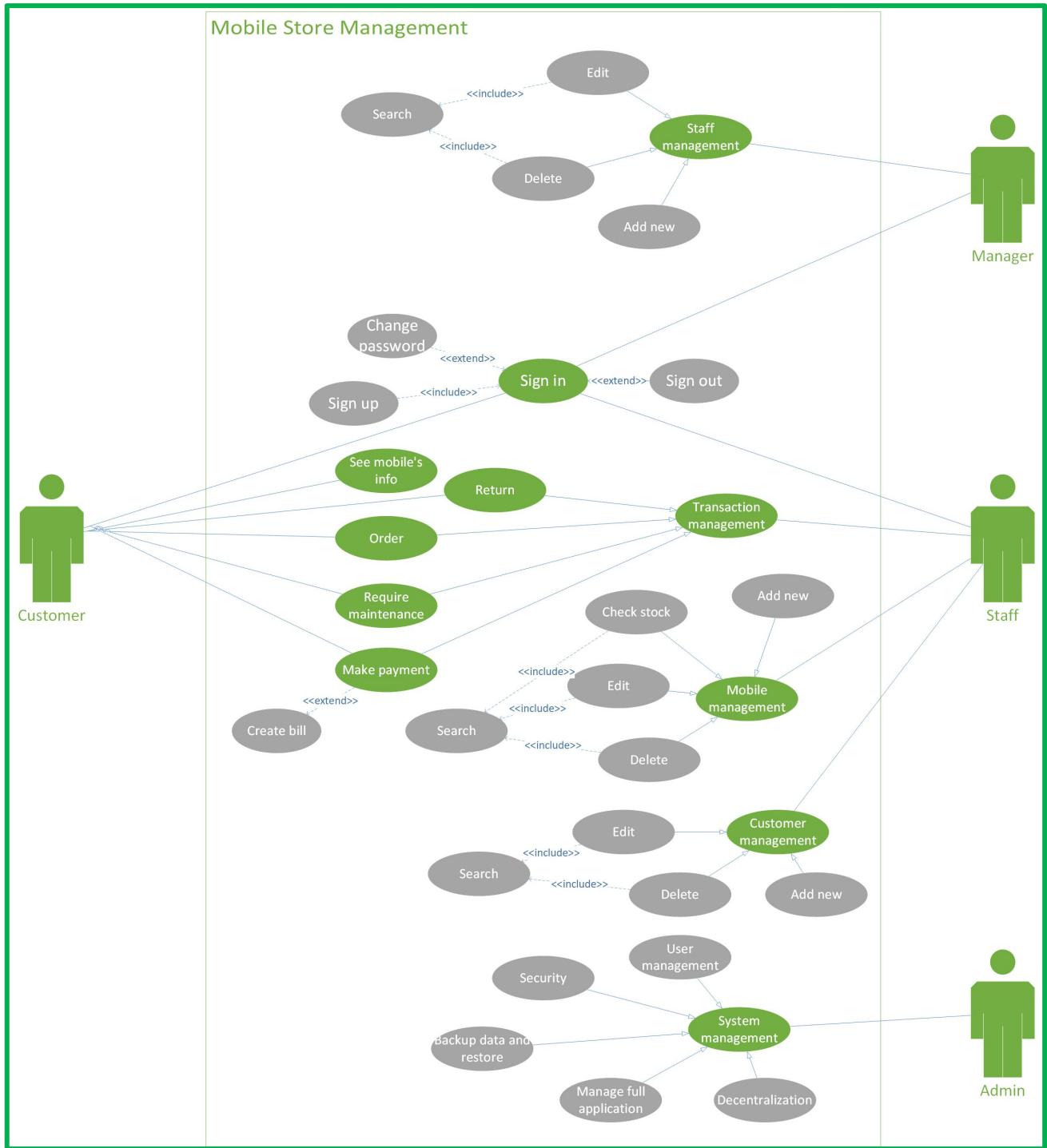
- [1]. <https://www.visual-paradigm.com/guide/uml-unified-modeling-language/uml-class-diagram-tutorial/>
- [2]. <https://www.lucidchart.com/pages/uml-package-diagram>
- [3]. <https://www.uml-diagrams.org/activity-diagrams-examples.html>
- [4]. <https://creately.com/blog/diagrams/use-case-diagram-tutorial/>
- [5]. <https://creately.com/blog/diagrams/class-diagram-tutorial/>

Book:

- [6]. *John Satzinger, Robert Jackson, and Stephen Burd, Systems Analysis and Design In a Changing World, 7th Edition, Cengage Learning, 2016*
- [7]. *Dennis, Alan, Barbara Haley Wixom, and Roberta M. Roth. Systems analysis and design 5th Edition. John Wiley & Sons, 2012*

CHAPTER 9 - APPENDIX

Appendix 1: The full size of Use case Diagram



Appendix 2: The full size of Class Diagram

