American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science &Technology (FST)

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CSC 2210 Object Oriented Analysis and Design (OOAD)

Section: F

Group No: 05

DISTANT HEALTH CARE SYSTEM

An Object-Oriented Analysis and Design (OOAD) project submitted

By

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CHAPTER 1: PROBLEM DOMAIN

1.1 Project Background and Analysis

- **Motivation and Background Study:**

As we are passing through tough time during COVID-19, we have witnessed online health care services are contributing significantly. Online healthcare services are anything and everything that can be delivered without actually meeting a doctor and get examined. This service also helps patients find doctors near their location, and connect with them instantly. This is a one-stop destination for appointments, consultations, health records, insurance, and ordering medicines online. Users can call for emergency medical response and assistance with just one tap on the mobile app. It is a healthcare mobile app that connects people who need emergency responses with qualified medical, safety, rescue, and assistance professionals. Not everyone has the time or inclination to visit a doctor to discuss their healthcare need especially when it comes to potentiality embarrassing problems. Developing countries like Bangladesh, where most of population living in rural areas have no or minimum access to proper healthcare system. Whereas people living in urban areas like Dhaka, has to tackle traffic situation everyday & it can be a serious problem when there is an emergency situation. A healthcare emergency can strike anyone, anytime, anywhere & it can be a life threatening if proper consulting can’t be taken from the expert in minimum time. Distance and travel time between patients and care providers can limit access to care. These are the common problem for middle income country like Bangladesh.

With limited resources and much of the population living in remote and rural areas, Distant/online healthcare service has the potential to revolutionize the delivery of healthcare. Bangladesh is a small developing country of South Asia with a huge number of populations. About 75% people live in rural areas where the healthcare facilities are very inadequate in contrast to the urban areas of Bangladesh. The healthcare facilities can effectively be given to this huge number of rural people through distant healthcare system.

1.2 Project Solution and Feasibility Analysis:

- *What are the solutions you are going to propose to deal with the problem? why is this solution is particularly appropriate to solve the problem? Is the solution feasible to the meet the business objective?*

-To deal with the problem we are going to propose some solutions which is given below:

1. The project objective will be focused on developing an Distant Health Care System to ensure treatment for patients.
2. The treatment can be done without the need of any kind of physical presence. It will also help the patients to get informed about all types of diseases and to take precautionary measures.

- *Provide a short description of the software being specified and its purpose, including relevant benefits, objectives, and goals?*

-Here the software which is being specified is Distant Health Care.

In this project we've shown that how an distant health care system works and its process step by step through Use Case diagram, Class diagram, Sequence diagram, State chart diagram and Activity diagram.

Purpose: The purpose of this project is to create an object-oriented model for Distant Health Care System.

Benefits: The benefits of this project is the system will offer a complete online health care system that integrated with the patients and doctors to provide a faster online medical response and facilities.

1. The system provides an online interface to the user where they can get service when there are physically far away from each other.
2. Provide a communication platform between the patients and doctors.
3. it will be lot cheaper than normal medical system.
4. Survice will be one tap away, or you can say on your hand.

Objectives: The main objective of creating the document about the software is to know about the list of the requirement in the software project part of the project to be developed. It specifies the requirement to develop a processing software part that completes the set of requirements. The cores of objectives of the project are followings:

1. To propose an online distant health care System.
2. To identify the user requirement for online distant health care System.

Goal: We know that world going throw a huge medical digester because of Covid-19. In this time some people are getting proper treatment but the rural people are being neglected as always because they don't have those mentioned things as most cases

So main target for creating these application to reach out those distant people so that they can get the proper health in their home or village. And also our another main theme was to make a system that will cheaper than our traditional medical system.

- *Existing studies presented in the problem area. What are the existing software solutions are available to solve the aforementioned problem?*

-There are many existing software solutions are available to solve the aforementioned problem in our surroundings. If we look into some Governmental online health care, we can see that they use one online platform where patients do not get proper treatment from through the application. As our first priority is patient, our Distant Health Care System is committed to provide quality treatment for the patients.

- *What makes this project new, innovative, interesting, or otherwise distinct from other similar projects? Does the project duplicate functionality already available in the market?*

-Distant Health Care System is a digital and innovative project. Treatment without any hassle in an online platform with one device is kind of a blessing for patients. As we know there are some online platform available to provide health care. But almost all the platforms do not give proper service to their patients. Here we are different from others. Our service providers have to show accountability for any kind of irregularity in our rules and regulations. So that patients get proper treatment without delay.

CHAPTER 2: UML DIAGRAM

1. USE CASE DIAGRAM

- Does the use case narrative represent the Scenario of the use case diagram?

-Yes, here the use case narrative represents the Scenario of the use case diagram.

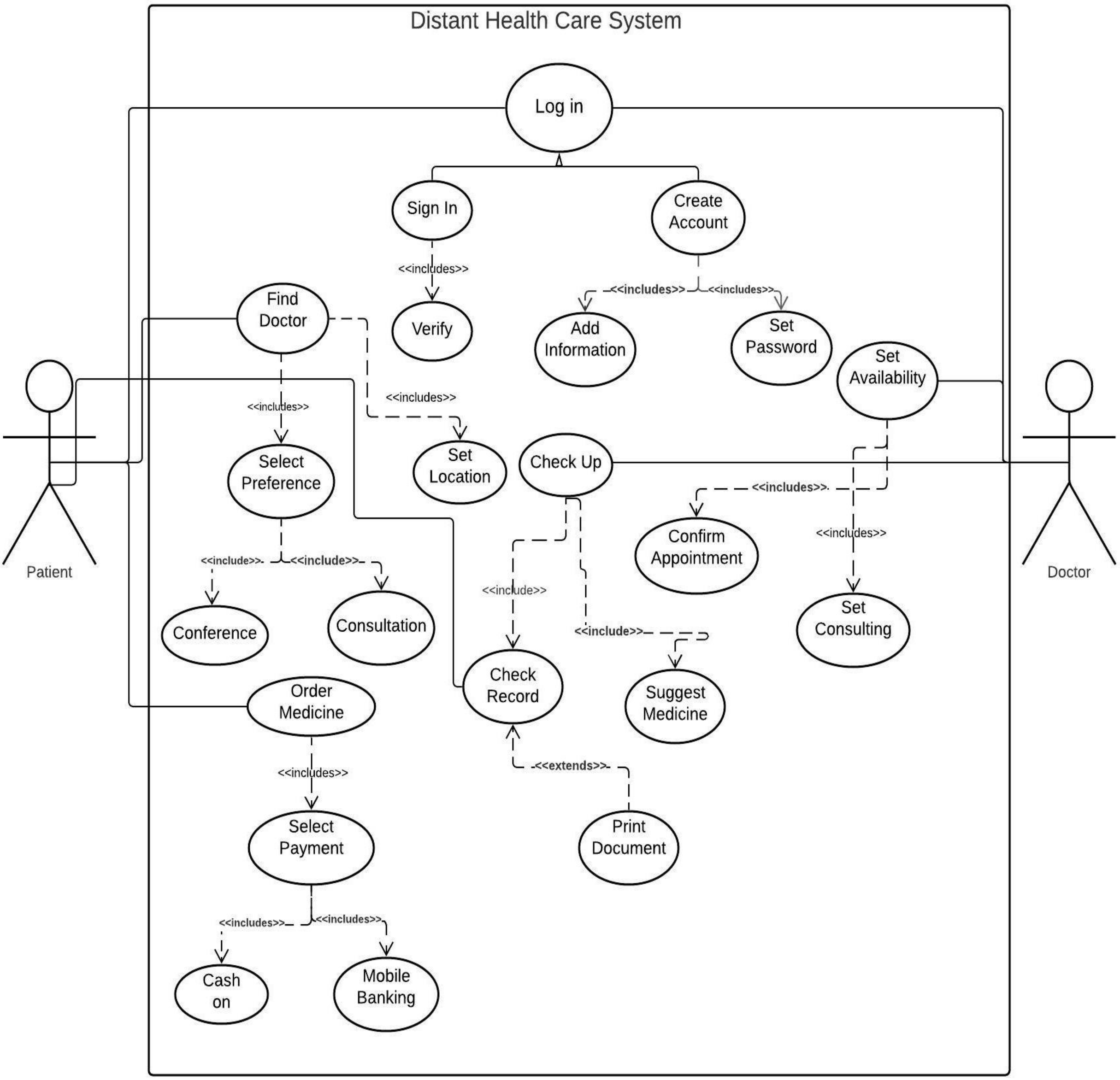
- Does the Use Case diagram include the major use cases, actors who perform the use cases and the relationships among the use cases needed to deliver by the system?

-Yes, the Use Case diagram include the major use cases, actors who perform the use cases and the relationships among the use cases needed to deliver by the system. Here we've two actors in our project: Doctor and patient. The relationship among the use cases is clearly shown by the features.

Case Study:

A patient or a doctor can login to the system by verification. If the user does not have any account then he can login to the system after creating account by adding information and setting password. A patient can find doctor after selecting preference and setting up the desired location. In the case of selecting preference patient will be provided with two options: video conference and consultation. A patient can also order medicine using the system by selecting payment method. both the doctor and the patient have the option to print the documents

There are two options, cash on delivery and mobile banking. After logging, a doctor can set his/her availability by confirming appointments and setting consulting hours. During checkup, a doctor must check records of the patient. A patient can also check his/her records and both the doctor and the patient have the option to print the documents.


Distant Health Care System
Log in
Sign In
Create Account
<<includes>>
Verify
<<includes>>
<<includes>>
Add Information
Set Password
Find Doctor
<<includes>>
<<includes>>
Set Availability
Patient
Select Preference
Set Location
Check Up
Doctor
<<includes>>
<<includes>>
<<include>>
<<include>>
Confirm Appointment
<<includes>>
Conference
Consultation
<<include>>
<<include>>
Set Consulting
Check Record
Suggest Medicine
Order Medicine
<<extends>>
<<includes>>
Select Payment
Print Document
<<includes>>
<<includes>>
Cash on
Mobile Banking

2. CLASS DIAGRAM:

- Does the class narrative represent the Scenario of the class diagram?

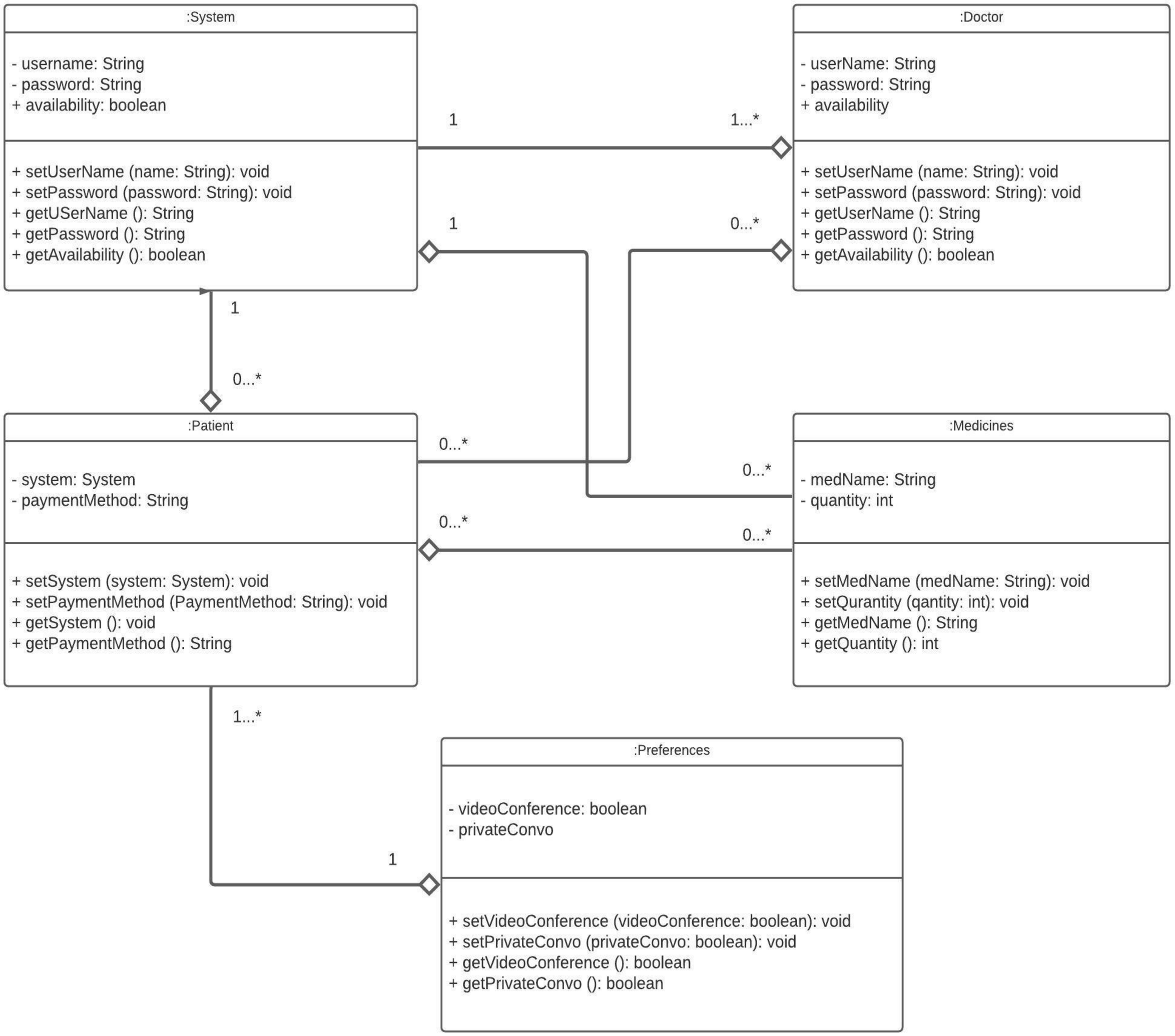
-Yes, the class narrative represents the Scenario of the class diagram.

- Does the Class diagram include the major classes (attributes, operations) and the relationship among the classes needed to deliver by the system?

-Yes, the class diagram includes five major classes like System, Doctor, patient, medicines, preferneces. Here the class diagram includes the relation among the classes needed to deliver by the system.

Case Study:

The Distant Health Care System consists of 5 classes with some attributes and methods. Every class has set methods and get methods. A system can have one or many doctors but a doctor can be part of only one system. Again, a patient can be a part of only one system but the system can have many patients. A patient must have one preference. But a preference can be selected by many patients. A patient can consult with many doctors and vice versa. A medicine can be bought by many patients or none. Also, a patient can buy many medicines or none. A system can have many medicines stored but a medicine can only be a part of one system.


:System
- username: String
- password: String
+ availability: boolean
+ setUserName (name: String): void
+ setPassword (password: String): void
+ getUSerName (): String
+ getPassword (): String
+ getAvailability (): boolean
:Doctor
- userName: String
- password: String
+ availability
+ setUserName (name: String): void
+ setPassword (password: String): void
+ getUserName (): String
+ getPassword (): String
+ getAvailability (): boolean
1
1...*
1
0...*
1
0...*
:Patient
- system: System
- paymentMethod: String
+ setSystem (system: System): void
+ setPaymentMethod (PaymentMethod: String): void
+ getSystem (): void
+ getPaymentMethod (): String
0...*
0...*
0...*
0...*
:Medicines
- medName: String
- quantity: int
+ setMedName (medName: String): void
+ setQurantity (qantity: int): void
+ getMedName (): String
+ getQuantity (): int
1...*
1
:Preferences
- videoConference: boolean
- privateConvo
+ setVideoConference (videoConference: boolean): void
+ setPrivateConvo (privateConvo: boolean): void
+ getVideoConference (): boolean
+ getPrivateConvo (): boolean

3. SEQUENCE DIAGRAM:

- Does the sequence narrative represent the Scenario of the sequence diagram?

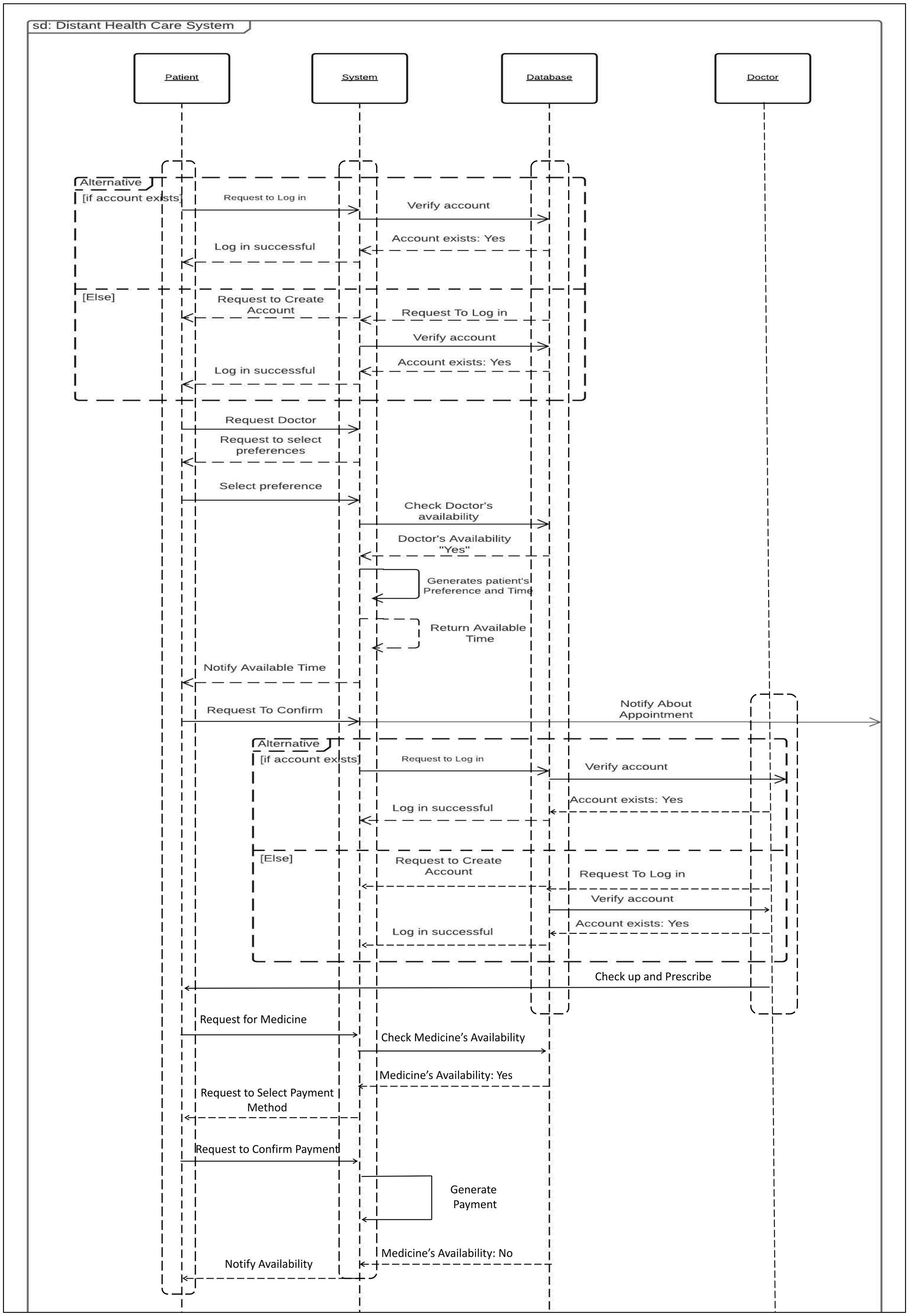
-Yes, the sequence narrative represents the Scenario of the sequence diagram.

- Does the Sequence diagram include the sequence of the major activities needed to deliver by the system?

-Yes, the sequence diagram includes the sequence of the major activities needed to deliver by the system

Case Study:

A patient request to log in into the system after verifying his/her identity. System confirms if the account exists or not. If the account is available system notifies the patient and after that the patient request for doctor by providing desired preference. The system checks in database if the doctor is available at that time. If the doctor is available, system return the available time and the patient confirm the appointment. And at the same time the system sends notification to the doctor. If the verification is unsuccessful, the system tells the user to create an account and then try to login. A doctor also does the same thing. By verifying identity, doctor log in to the system. Then he/she attend the patient by video conferencing or consultation. Then the doctor prescribes medicines. A patient can also buy medicines using the system. First, he requests for the medicines. System checks if the medicine is available or not. If the medicine is available, system wants the user to confirm payment method and payment. Then the system generate payment. If the medicine is not available system notifies the user about the availability time.


sd: Distant Health Care System
Patient
System
Database
Doctor
Alternative
[if account exists]
Request to Log in
Verify account
Account exists: Yes
Log in successful
[Else]
Request to Create Account
Request To Log in
Verify account
Account exists: Yes
Log in successful
Request Doctor
Request to select preferences
Select preference
Check Doctor's availability
Doctor's Availability "Yes"
Generates patient's Preference and Time
Return Available Time
Notify Available Time
Request To Confirm
Notify About Appointment
Alternative
[if account exists]
Request to Log in
Verify account
Account exists: Yes
Log in successful
[Else]
Request to Create Account
Request To Log in
Verify account
Account exists: Yes
Log in successful
Check up and Prescribe
Request for Medicine
Check Medicine's Availability
Medicine's Availability: Yes
Request to Select Payment Method
Request to Confirm Payment
Generate Payment
Medicine's Availability: No
Notify Availability

4. STATE CHART DIAGRAM:

- Does the state chart narrative represent the Scenario of the state chart diagram?

-Yes, the State chart narrative represents the scenario of the state chart diagram.

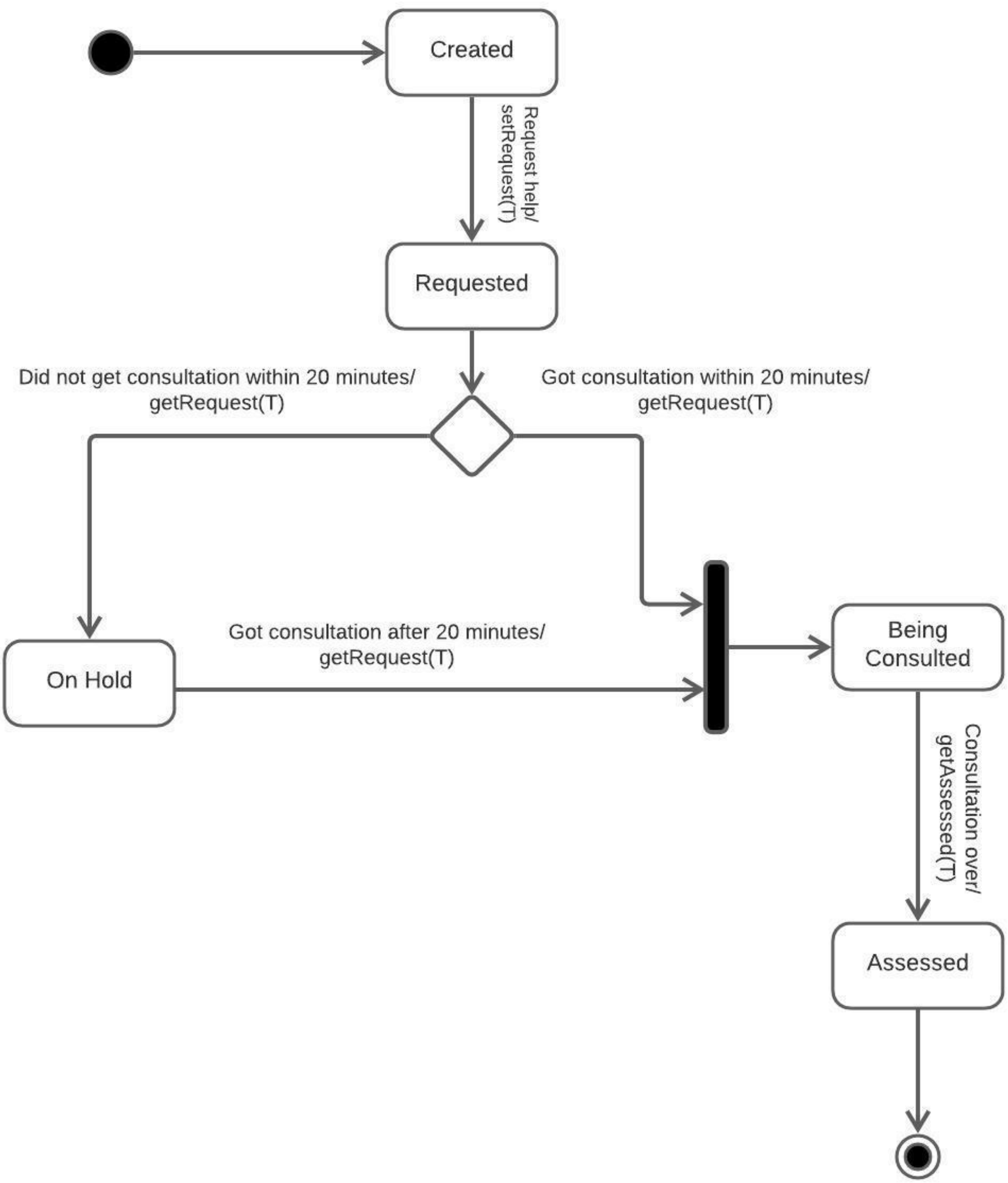
- Does the State chart diagram include the major states needed to deliver by the system?

-Yes, the State chart diagram includes the major states needed to deliver by the system.

Case Study:

Case ‘patients’ object

Patients object is initially ‘created’ when a person requires emergency medical service. Then when they choose to have an online consultation they become ‘requested’. Then when the doctor/doctors response to them and consult with them they become ‘being consulted’. If their request is not answered within 20 minutes they become ‘on hold’. If an ‘on hold’ patient is able to consult with a doctor, they become ‘being consulted’. After a consultation is done they become ‘Assessed’.


Created
Request help/
setRequest(T)
Requested
Did not get consultation within 20 minutes/
getRequest(T)
Got consultation within 20 minutes/
getRequest(T)
On Hold
Got consultation after 20 minutes/
getRequest(T)
Being
Consulted
Consultation over/
getAssessed(T)
Assessed

5. ACTIVITY DIAGRAM:

- Does the activity narrative represent the Scenario of the activity diagram?

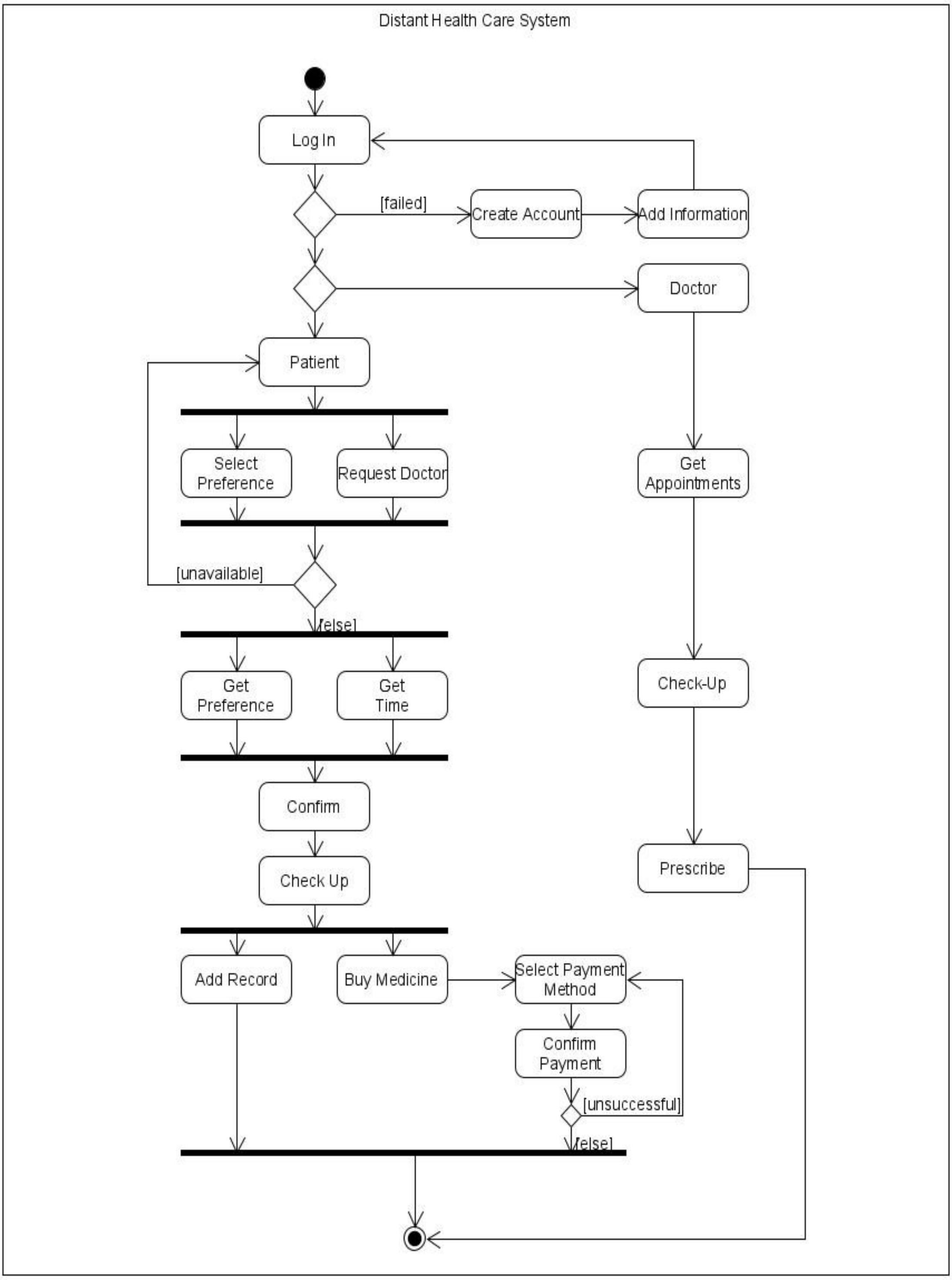
-Yes, the activity narrative represents the scenario of the activity diagram.

- Does the Activity diagram include the major activities needed to deliver by the system?

-Yes, The Activity diagram includes the major activities needed to deliver by the system.

Case Study:

A user attempt to login into the system. If the login is successful (system checks) then the system decides if the account is for patient or doctor. If the login is failed the system wants the user to create an account and add information. If the user is patient, he/she gets to select preference and request for a doctor on required field. If the doctor or selected preference are unavailable, then the system notifies the patient and wants him/her to request for doctor and select a preference again. If successful, the system provides the preferred time and preference of the doctor. Then the patient gets to confirm the appointment and after that he/she does the check-up. After finishing the check-up, patients upload the medical record into the server and then buys medicine by selecting and confirming the payment method. If the payment process is unsuccessful, system wants the patient to do those steps again. If the user is a doctor, then he/she gets the appointment from the system. By following scheduled appointment, the doctor check-ups all the patients one by one and prescribe them.


Distant Health Care System
Log In
[failed]
Create Account
Add Information
Doctor
Patient
Select Preference
Request Doctor
[unavailable]
[else]
Get Preference
Get Time
Confirm
Check Up
Get Appointments
Check-Up
Prescribe
Add Record
Buy Medicine
Select Payment Method
Confirm Payment
[unsuccessful]
[else]