CareHUB Health Care System

SRS

Introduced by : SE2018G10

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1. Introduction

Healthcare is changing with a new emphasis on patient-centeredness. Fundamental to this transformation is the increasing recognition of patients role in health care delivery and design. Medical appointment scheduling, as the starting point of most non-urgent health care services, is undergoing major developments to support active involvement of patients. By using the Internet developments to support active involvement of patients. By using as a medium, patients are given more freedom in decision making about their preferences for the appointments and have improved access.

1.1 Purpose

Many hospitals -even governments- turned to website-based appointment service WAS and these are some examples of them:

Chinese government:
As a part of nationwide healthcare reforms, the Chinese government launched web-based appointment systems (WAS) to provide a solution to problems around outpatient appointments and services. These have been in place in all Chinese public tertiary hospitals since 2009.

1.2 Scope

CareHub Health Care System is a system that enables patients to accomplish three tasks easily:
1) Find the right health provider to get treatment.
2)Retrieve medical records, such as test results and other health information.
3)Book appointments and scans easily with a button click.

Imagine the amount of effort that'll be saved, all the hassle of looking for the right doctor, and having to book appointments on ground, all this will be available from home through this website.

All the needed information about the hospital will be available for the user.

1.3 Definitions, Acronyms, and Abbreviations.

Patients - are the online users which have the need to make a appointment in the hospital online.

Doctor - the user responsible to add the prescriptions and important scans to each patient.

Receptionist - The User responsible to make the appointments on field.

Backlog - A Log that contains all recent activities done by/on the patient.

Rating - a scoring system done to value each doctor's work.

1.4 References

(1) *https://en.wikipedia.org/wiki/Health_management_system*
(2) *https://web.cs.dal.ca/~hawkey/3130/srs_template-ieee.doc*
(3) *https://www.asianhhm.com/healthcare-management*

1.5 Overview

This document introduce Health Care System product's SRS. It introduces general description, technical description

2. The Overall Description

The idea is to simply provide a service that facilitates patient care from home, The patient will be provided with hospital info to help him reach the suitable service for him, he'll have a profile with his full medical record and it'll be updateable with his blood test results, and any prescriptions he takes.

The website will enable patients to know the hospital's available services, doctors, and clinics. It'll also enable the patient to book appointments.

The patient will be able to rate the hospital's doctors, to provide continuous feedback to the hospital's staff.

There will be a Receptionist user that can use the system in the hospital to book for patients on ground.

2.1 Product Perspective

The health care website provides ability to the hospital to serve the patients easily and makes the reservation processes a lot easier, it's a self-contained product that organises the hospital system online and at the real ground.

The difference between it and any other health care system is that it's not only reviewing the hospital info only, it contains the patient records stored in it's database. updateable with doctors information to reach them and rate them. reservation of the clinics in the hospital and makes you aware of the available surgeries.

Business Objectives

- *Offer easy and effective online Health Care Services.*
- *Offer online hospital system for medical institutions.*
- *Offer flexibility for patients to reserve their service.*
- *Offer an organized way to record the information*
- *Offer an upgraded online system.*

2.1.1 System Interfaces

The patient Interface: the patient with all the info he needs about the hospital.
It allows the patient to view the available clinics in details including the clinic's doctor, the available time slots, and the price of each examination with every doctor in the staff. After that, the patient will be able to book an appointment in the desired clinic.
He will be provided with the price of each scan, the hospital can provide. He will be able to book the the desired scan or the desired blood test. He will be updated with the available time slots of the hospital's scan rooms.
As each doctor will write a small brief about himself and his specialization, The patient will be able to view the staff of the hospital, which includes the doctors. He'll be able to see their info(mail, mobile number), their specialization, and their rank/rate.
The patient can rate the doctors after appointments, the quality of the scans and the service provided by the hospital. He will be able to add his feedback to describe the treatment he had from the doctors, he dealt with and show the positives or negatives he noticed.
The patient will be provided with the working hours of the hospital's pharmacy and a way of communication between him and them -mail or phone number-.
Each patient can create his own account on the site. He will get access to all the information and services, described before.

The receptionist interface: the receptionist to book appointments for patients in the hospital (on ground, not online).
The Receptionist will get access to each doctor's time schedule. He will have limited ways to edit to them. He will get access also to every patient's reservation whether it is scan or doctor examination.

2.1.2 Interfaces

Patient Interface: It is a must to sign in or up before starting browsing anything in the website, will have the ability to go to services(clinics-surgeries-scans-pharmacy), doctors profiles, and his profile. he had the ability to edit his medical record and rate the doctors.
Receptionist Interface: It is a must to sign in before any process. he has only the access to reserve clinics and scans to the patient in the ground.

2.1.3 Operations

Sign up: It's the operation needed from the user to make an account for him and save his info and medical record to the Database.

Sign in: It's the operation needed from the user to make to access the hospital info, doctors info, and his own profile, Also to give him the ability to book his appointment in the clinics.

The operation is same for receptionist but he has only access to schedules and can add to it for the patient in the ground.

Rating: Patient with profiles only can rate the doctors to make it obvious for the hospital how is the doctors work. And this rating is saved to the database and every time someone rate them it accumulates on it.

Reservation: The Patient has the ability to book all the hospital services online. This reservation is saved in the database which can be accessed by the admin (hospital receptionist) and he can reserve time slots for the patients who visit the hospital not only online.

2.1.4 Site Adaptation Requirements

1) *The Online user should be registered as a patient before requesting an appointment.*
2) *The On Field user will be assigned as a Guest user to avoid conflict with online users.*

2.2 Product Functions

User Management

• User management enables admins to control user access and on-board and off-board users to and from IT resources.

Observe Hospital information

• The user has the ability to observe the hospital's history and information like contact numbers, hospital's stay and environment, visiting hours and patient's rights.

Registration

• The patient can sign up or sign in to the website to be able to access the hospital services and information and to be able to save his information to the database of the hospital and reuse it when it's needed.

Staff

• This section will show all the doctors with their specialization from the data base of the site. The patient can also get more details about the doctor if he clicked on him. • The patients can search for a specific doctor or a certain specialization. They can also see the staff of the hospital. • The system will frequently upload the patients feedback about doctors.

Doctor's rating

• It's a feature by which the patient can rate their doctors and give them feedback about their satisfaction in the appointment. The hospital can observe the rating of the doctors so it can change the staff to improve the hospital's performance.

Clinics

Through this section the patient can know whether the doctor is available in the clinic or not. The patient can also see the available slots on any day and if a slot is taken by patient (x) , it will not appear to any other patient. However, the doctor would still appear to be available on that day.

Pharmacy

• It provides a feature to the user that he can know whether the pharmacy is open and available at this time or closed and provide the working hours and the off days

Scans

• The user has the ability to know the available scans (MRI, X RAYS, CT, and Ultrasound) in the hospital and the cost of each scan, also he has the ability to book an appointment for a certain scan.

Profile

• Patients Profile will display their personal information in addition to their medical Information, and medical condition.
• Patients Profiles will only be accessible by doctors or admins to provide privacy to the patient.
• Patient Profile will contain their contact info.
• There'll be a Medical chart for the patient

Reservation

• The Patient has the ability to book all the hospital services online. This reservation is saved in the database which can be accessed by the admin (hospital receptionist) and he can reserve time slots for the patients who visit the hospital not only online.

Surgery

• The patient has the ability to know what surgeries are available in the hospital and the doctors who perform each surgery.

Patient's Backlog

•A Log that provides the patient with all previous prescription and interactions with either a doctor or a hospital, Will also save the reservations done.

2.3 User Characteristics

All users must -at least- know the basics of using the internet.
There is no certain educational level for patients but they must know to read and write well.

Our main target to make patients spend less time in reservations and avoid going to the hospital then don't find any free slots

The web site will be user-friendly anyone can find everything he needs easily without exerting any effort

2.4 Constraints

1- Access to the database of the pharmacy and the medicine inside it will be very difficult to do so we changed its function to be only tell the patient whether the pharmacy is open or closed

2- The user can only know the available clinics , scans and reserve in a slot

3-The user can know the available operations only

4- The web site will be a product sold to hospitals to manage all its stuff online

2.5 Assumptions and Dependencies

Assume that the website is a product can be bought to serve only one hospital at a time. It would give the owner a control panel to add or delete or edit in the product he bought.

Assumes that there will be a database of medical records hosted by a server. The server assumes it will be installed with a high-speed Internet connection to communicate with users.

Assume that the receptionist at the hospital has an interface for them to the website could let them book slots to patient. to make sure that the info is updated to the database at the server.

2.6 Apportioning of Requirements.

There is some functionality that currently lies outside of the scope of the current project, but could possibly be included in later releases. Two such options are the ability to include the pharmacy database and purchase from it online. contact the doctor online at emergency.

3. Specific Requirements

Website Requirements
-It must allow a user to login.

-It must allow a user to logout.
-All information must be viewable on the website.
-All information must be updatable on the website.
- It must allow a user to download a backup of their medical information.

Server Requirements
-A correct combination of username and password is required for a user to login.
-A user must be logged on to be able to view or edit any medical information.
-Medical Records cannot be edited, only replaced by a new revision.

User Accounts
-Each account must securely store all of its data.
-Each account must have a separate identifying account number.
-Data must always be related to an account, and a user cannot view data he/she does not own.

Basic Information That Must be Stored
1.Username
2.Password
3.Address
4.Phone Number
5.First Name
6.Last Name
7.Middle Name
8.Date of Birth
9.Gender
10.Height
11.Weight
12.Blood Type

Complex Data That Must be Stored
-Health Care Providers
-Medical History
    a)Medical Conditions
    b) Medications
    c)Procedures
-Tests
    a) Labs
    b)Tests

3.1 Functions

The System shall be divided into 4 areas in each area several functions should be provided.

Patient's Area

In this area the system shall provide the user with the following functions.

-An Interface which Grants an access to all Doctor's Profiles,Their Rates and Working hours, The Interface will be completely static.

-An Appointment Section where they can choose a date and time for a given clinic. It should be flexible taken times can't be appointed more than tonce

-A Backlog Sections gets updated with each action taken by the user or on the user such as prescriptions or scans,Inputs are from the Other Areas while the output is visible by the user.

-A Rating System following to each action taken by the user as appointments, scans and prescriptions through a Star System the input will be given by the user and the Output will be visible to the Other Area.

Receptionist's Area

In this area the system shall provide the user with the following functions.

-An Interface that provides the user the access to present appointments to set their time and date for guests, This User has higher Privilege than patient's as this user reserves on-field, Errors are handled in the database by limiting the interface with the non-reserved times, each reservation is checked in case of any error to prevent overwriting problems.

Doctor's Area

In this area the system shall provide the user with the following functions.

-An Interface is provided to upload files as Prescriptions or scas to certain users backlog, the input is from the user while the output is seen in the Patient's backlog.

-An Editing Area to Edit the static information visible to the Patients.

Admin's Area

In this area the system shall provide the user with the following functions which ca be done under the superuser abilities in django.

-Full control of the users of other areas
-can access and edit all static information in the site
-can edit the privilage of each user

3.2 Non functional requirement

3.2.1 Availability

The system is fully available for the users for 24 hours that the users can go to the system anytime they want.It is also available through browsers and mobiles.

3.2.2 Security

our website must be secure so we care about the privacy of the information that the user has on his/her page, so we locked his/her data that he/she only can get accessed to it and consequently:

- *patients' data is invisible to other patients.*
- *only doctors and super-users are allowed to view patients' data.*
- *the system protects the user's privacy.*

3.2.3 Usability

The system should be easy to use by medical staff and should be organized in such a way that user errors are minimized.Medical staff shall be able to use all the system functions after four hours of training. After this training, the average number of errors made by experienced users shall not exceed two per hour of system use.
The website must be user friendly to facilitate user's interactions and usage of the website. The users will be able to use this website easily,no need for dense training on using the website also the system work on mobiles ,browsers as:google chrome-firefox-etc.
The system shall have a single login to access all content so it's user friendly.
It also have a good UI to attract users to the website.

3.2.4 Portablity

The website is modern,clean and responsive.The user can acess it through the mobile and it will be responsive,also access it through PCs and laptops only he/she needs an internet access so:

- *The website must support Mobility (e.g., phones and tablets).*
- *The website must support all current versions and any previous supported versions of modern web browsers including Internet Explorer, Firefox, Chrome and Saf*ari.

3.2.5 Performance

-The system is fast and responsive but if it takes initial load time this will be due to s internet connection strength of the user-side which also depends on the media from which the system is run.

3.2.6 Safety

-The system is safe for users to add their medical records as it will be only seen by the doctors that treats them,so no worry that another patient can see these information.

3.2.7 Reliability

-The system is available all the time so users can rely on it also it has min times of failures.

3.2.8 Ethical

we ensure that the system will be acceptable to its users and the general public.we will respect property rights for other organizations.

4.0 System Models

4.1 Use Case Diagrams:

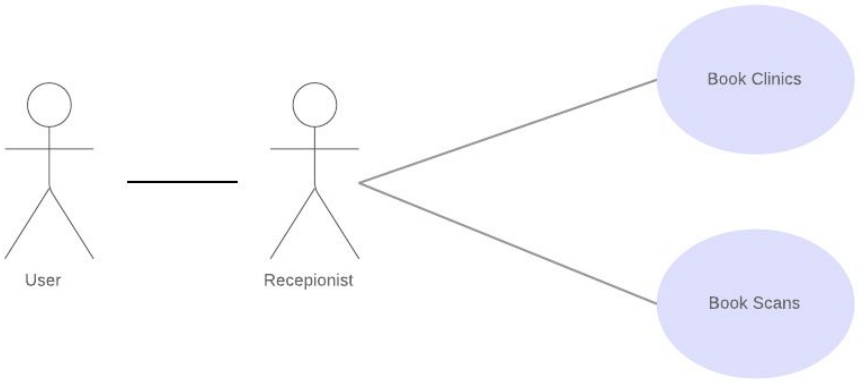


Figure 1:show use-case where a patient come to book at the hospital

Figure 1 shows a use case for Recepionist interaction with careHub system from the hospital. he/she can book an appointment for the patient through a his interface. he can also book scans and see the info of the doctors in the hospital.

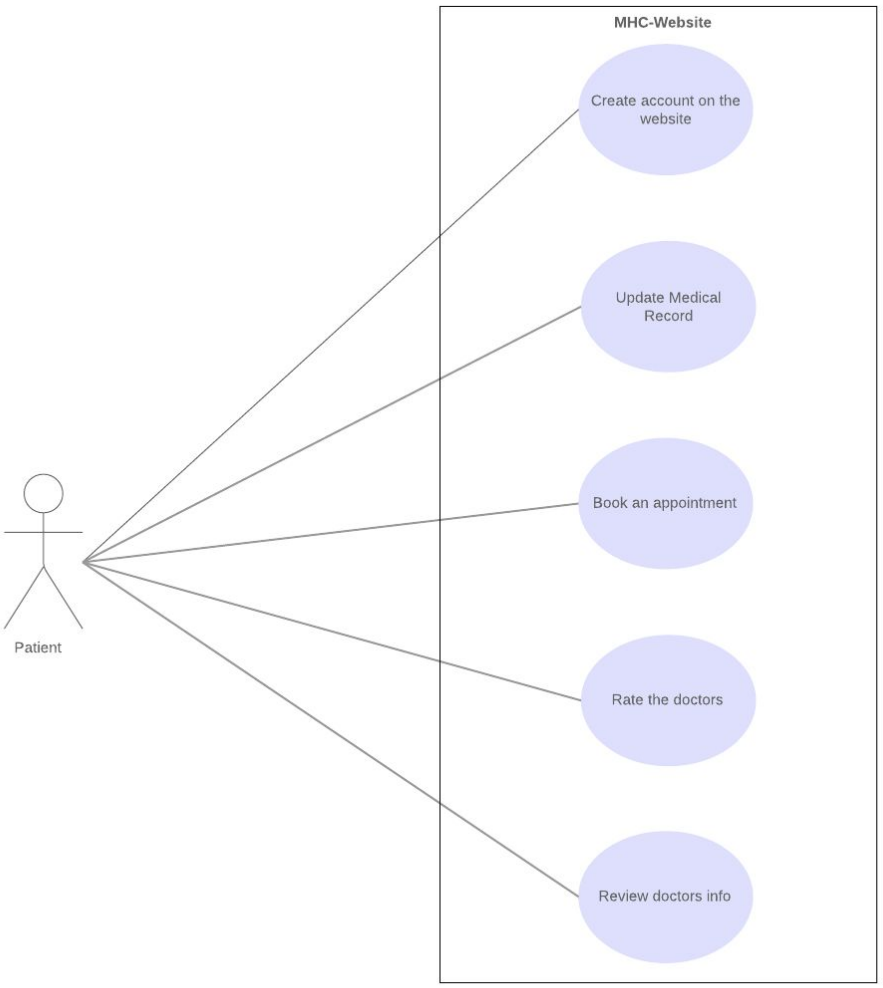


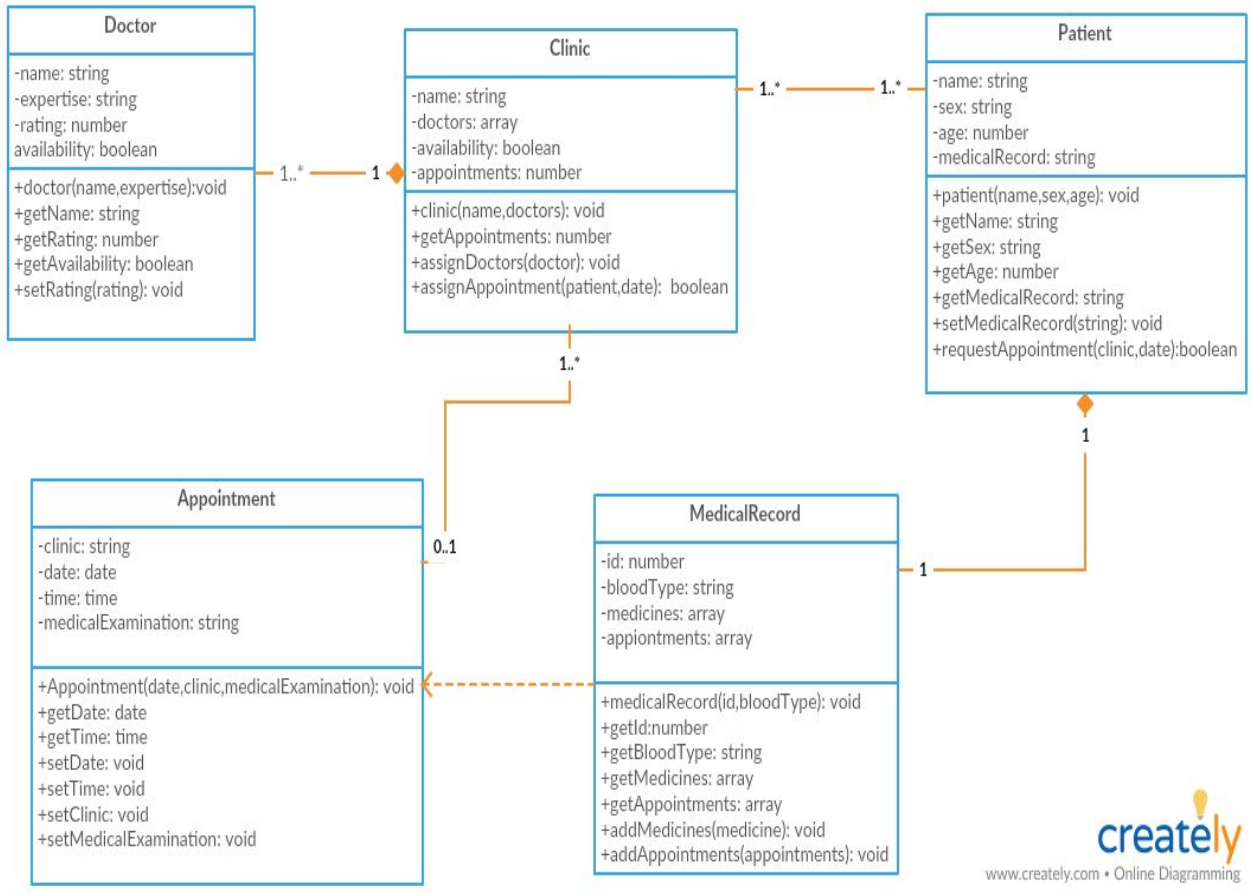
Figure 2:shows how user may interact with the careHub system.

Figure 2 shows a use case for users interaction with careHub system,he/she may have a profile and edit his/her profile with his medical records,this medical records includes his/her blood type, whether he/she has allergy to certain drugs, a history of the treatments and prescriptions and everything that could help any other doctor to treat this patient.
Also he/she patient can rate the doctors after appointments, the quality of the scans and the service provided by the hospital. He/she will be able to add his feedback to describe the treatment he/she had from the doctors, he/she dealt with and show the positives or negatives he/she noticed.
Through careHub the patient can check the available clinics in the hospital and their costs. The patient can also book appointments to the clinics he needs. And reserve his slot of time and day.
The patient can also check the available scans in the hospital and their costs. The patient can book appointment to the scan he needs. And reserve his slot of time and day. In addition to that the patient can check if the pharmacy is available at the mean time and its days off, and working hours.

Figure 3:shows how admin access to with the system.

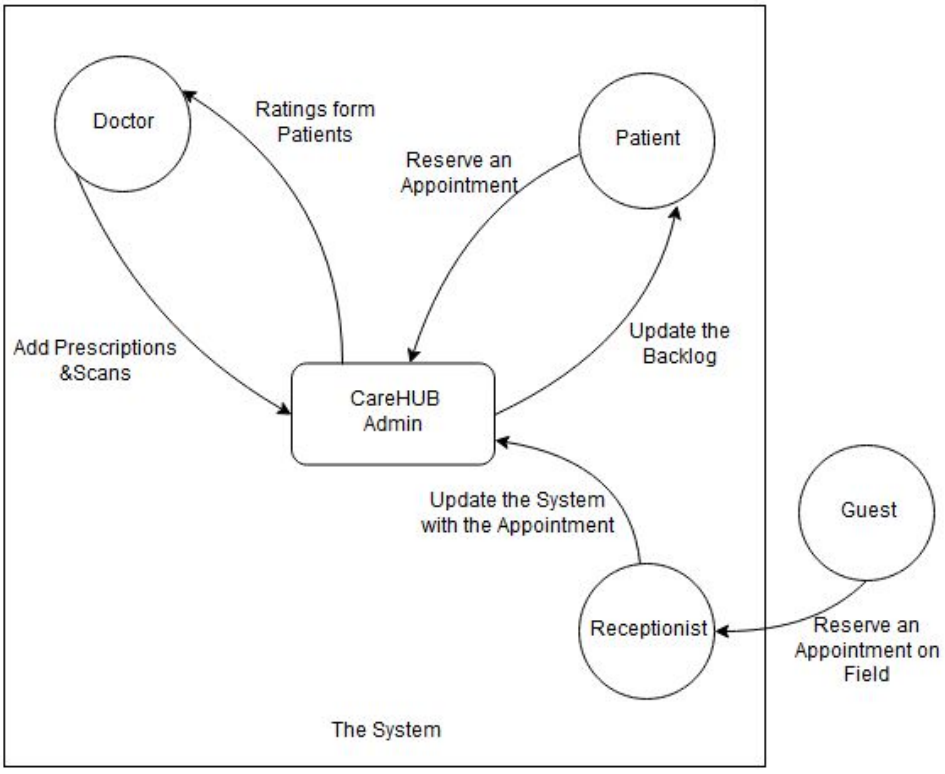
Figure 3 shows a use case for admin interaction with careHub system,he has the access to the system. so he can Add/Remove any component in the website to updated it. he can access the database of the patients and doctors in the system and edit it if it's needed.

4.2 Class Diagram



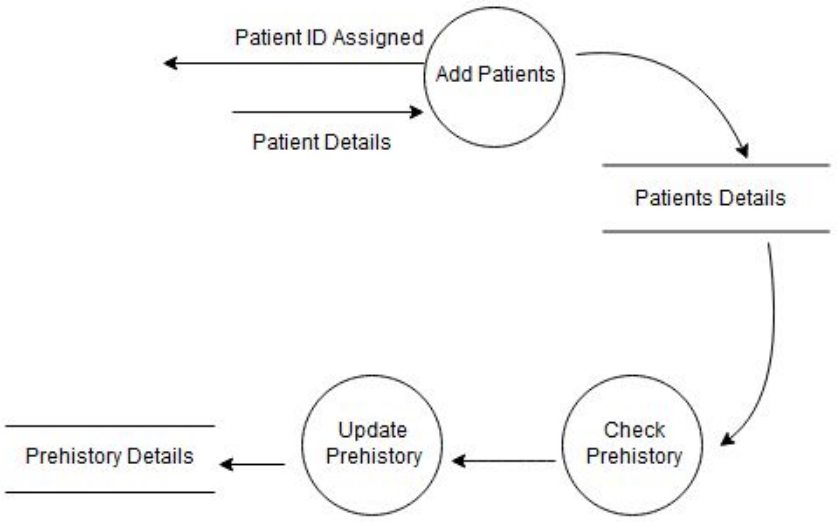
the previous diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

4.3 State Diagrams



The System & Subsystems and the Environment

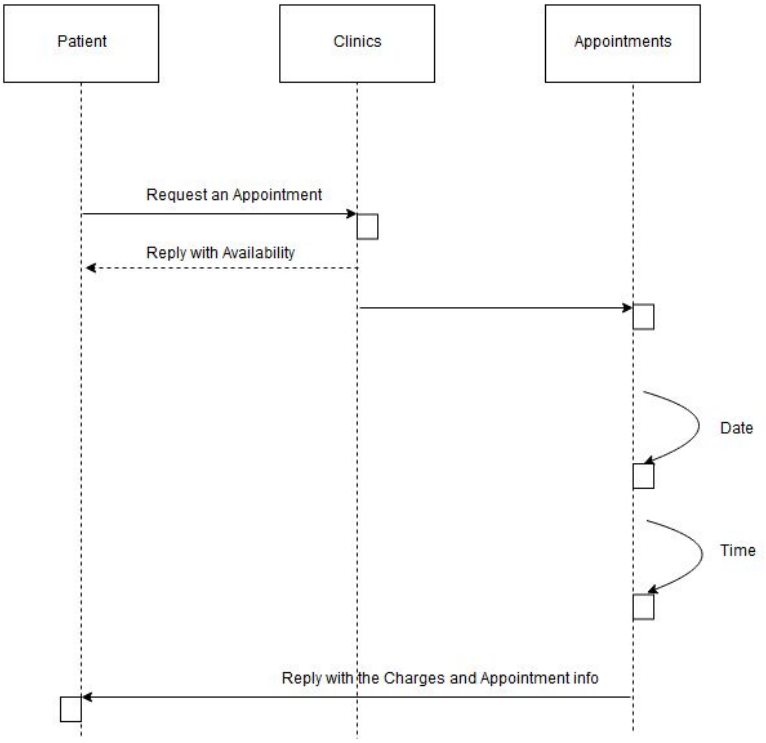
The previous diagram shows the relation between the subsystems and their relations with the outside environment where each subsystem has its own functions and relations to the the main system



Creating a Patient user State Diagram

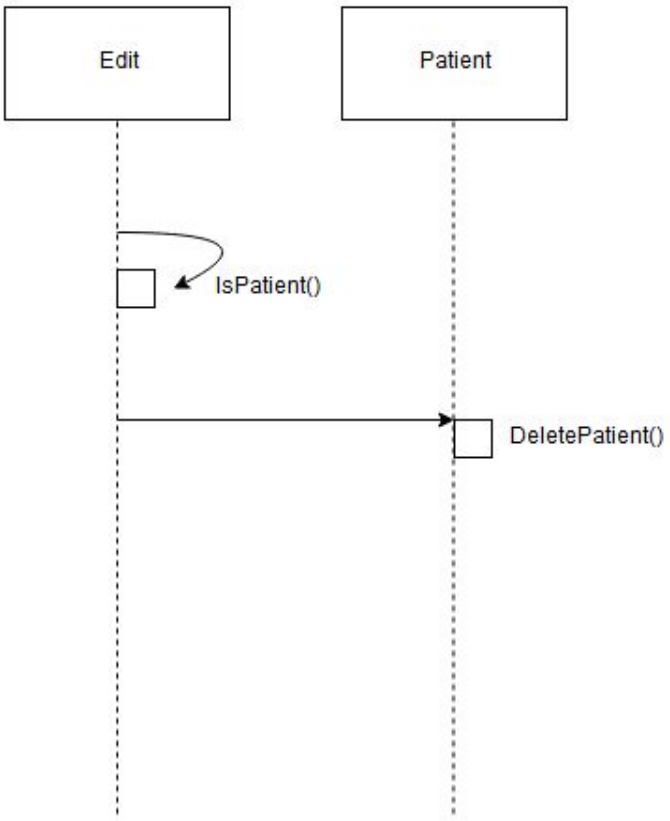
The previous diagram shows the sequence taken to create user of type patient and adding his essential information

4.4 Sequence Diagrams



Sequence diagram to reserve an appointment

The previous diagram shows the process and functions called for a patient user to make an appointment.



Sequence Diagram to Remove a User

The previous diagram shows the functions called to delete a user by the superuser(admin) which can be done similarly to all other user types.