

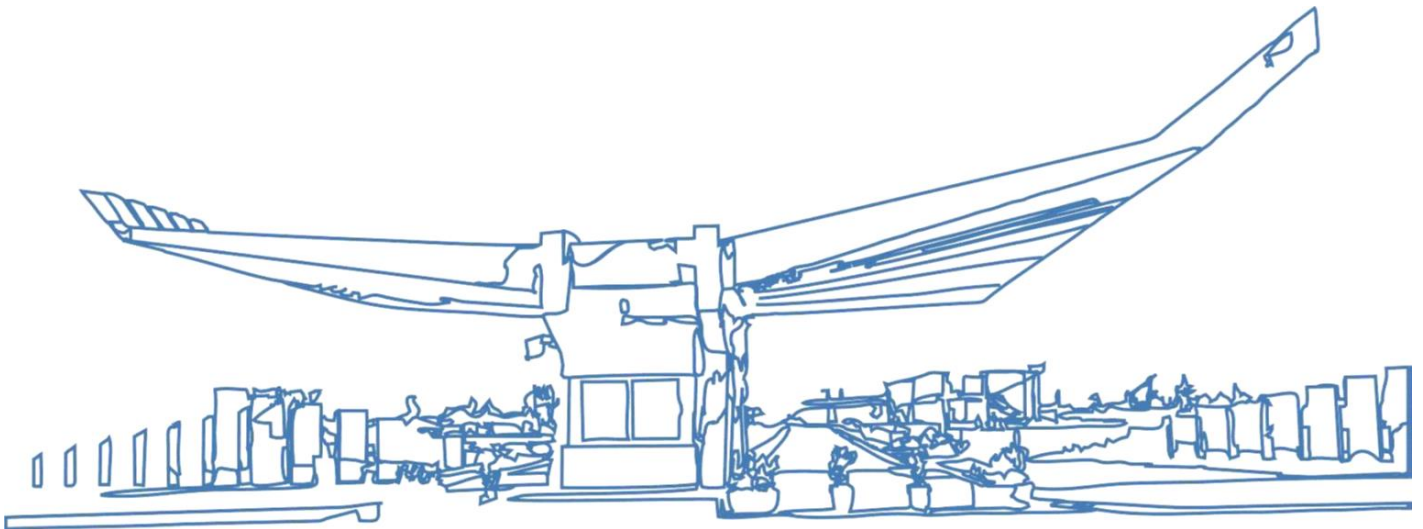


Epoka University

Faculty of Engineering and Architecture

Department of Computer Engineering

SWE202 – Software Engineering



Polyclinic Management System Requirements Specification

July 04, 2022

Polyclinic Management System

Requirements Specification

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1. Executive Summary

1.1 Project Overview

1.2 Purpose and Scope of this Specification

2. Product/Service Description

2.1 Product Context

2.2 User Characteristics

There are three types of users that will interact with the system:

1. Patient:

- Can look at general information about the polyclinic (main page)
- Can log in his account
- Can read his personal information
- Can look at the medical visits created by the doctor
- Can download his medical visits in PDF files
- Can request appointments
- Can change his account password
- Can log out

2. Doctor:

- Can look at general information about the polyclinic (main page)
- Can log in his account
- Can choose the polyclinic where he/she is actually working
- Can read his personal information
- Can see a list of all his patients
- Can search in his patients' list
- Can sign online prescriptions
- Can declare the vaccination state of the patient
- Can send the prescription code automatically to patient phone numbers
- Can check and fill the medical visit forms for each patient
- Can view the profiles of his patients
- Can view the list of all patients
- Can add patients
- Can delete patients
- Can cancel appointments
- Can view the examination records of his patients
- Can download a specific examination record of a patient in a PDF file

- Can change his account password
- Can log out

3. Receptionist:

- Can look at general information about the polyclinic (main page)
- Can log in his account
- Can read his personal information
- Can choose the polyclinic where he/she is actually working
- Can view the list of all patients
- Can view the profiles of patients
- Can view the examination records of the patients
- Can change personal information of a patient
- Can export the files of a patient, which can be sent to another polyclinic or hospital
- Can create a visit and allow the doctor to fill the form for the current examination
- Can search for a patient
- Can view the list of all doctors
- Can view the profiles of doctors
- Can check personal information of a doctor
- Can add a new doctor
- Can delete an existing doctor
- Can search for a doctor
- Can make new entries for people who come for an emergency
- Can check and edit the doctor's shift timetable
- Can change his account password
- Can log out

4. Nurse:

- Can look at general information about the polyclinic (main page)
- Can log in his account
- Can read his personal information
- Can view the profiles of patients

- Can change medical personal information of a patient
-

3. Requirements

3.1 Functional Requirements

Table 1. Functional Requirement

Req#	Requirement	Comments	Priority	Date	Reviewed/ Approved
FR_01	The software should have different views for different user levels.	The view for patient, receptionist, doctor, nurse and administrate will be different.			
FR_02	A reCaptcha should be used for security issues while trying to log in.	To verify that you are not a robot, you should fill the reCaptcha.			
FR_03	The user accounts have to be secured by passwords.	Ethics will be maintained by hashing the passwords before saving them in database.			
FR_04	After the user has taken the password he/she can edit it, but he/she can't edit the username.	Editing usernames is not available since it is decided that the format that will be used will be the same for everybody.			
FR_05	The doctor, nurse and receptionist should choose the polyclinic where they are actually working, and the city.	In order to log in to their accounts, the doctor, nurse and receptionist, should choose the right option to have a valid log in, otherwise it will give an error.			
FR_06	The doctor should fill the right personal information.	It is important that all the information entered is accurate.			

FR_07	The receptionist should be able to check and edit shift timetable of the staff.	It is important for the receptionist to have access at the timetable, in order to inform patients and set right appointments.			
FR_08	The receptionist should be able to make new entries for people who come for an emergency.	There will consist a separate part for the emergency section of the hospital where the receptionist is going to hold records when the patient comes.			
FR_09	The receptionist should be able to view the full profile of a patient.	In order to verify things when needed or to make the necessary updates, the receptionist should be able to view the current information of the patient.			
FR_10	The receptionist should be able to export the medical file of a patient. The system should be able to generate an XML or PDF file.	The receptionist is the only user responsible for exporting the medical file of a patient, in order to send it to another polyclinic or hospital when needed.			
FR_11	The receptionist, doctor, nurse or administrate should be able to view all the patients of that polyclinic in a list.	All the patients of the polyclinics can be listed in order for the receptionist, doctor, nurse or administrate to see them.			

FR_12	The receptionist, doctor, nurse or administrate should be able to search for a specific patient.	The polyclinic will have many patients, so it would be efficient to have a search tool.			
FR_13	The receptionist should be able to add a new doctor.	The receptionist is responsible for adding a new doctor.			
FR_14	The receptionist should be able to edit the personal information of a doctor.	The receptionist and the doctor are responsible user for editing the information of a doctor.			
FR_15	The receptionist should be able to delete an existing doctor.	The receptionist is the only responsible user for deleting an existing doctor.			
FR_16	The receptionist should be able to view the full profile of a doctor.	In order to verify things when needed or to make the necessary updates, the receptionist should be able to view the current information of the doctor.			
FR_17	The receptionist should be able to view all the doctors of that polyclinic in a list.	All the doctors of the polyclinic can be listed in order for the receptionist to see them.			
FR_18	The receptionist should be able to edit the personal information of a patient.	The receptionist, doctor and the nurse are responsible user for editing the information of a patient.			

FR_19	The doctor should be able to sign online prescription.	The doctor needs to write a prescription, so signing and writing it online is going to be easier.			
FR_20	The doctor should be able to view all his patients.	The doctor needs to have a list of his patients.			
FR_21	The doctor should be able to view or even download the full profile of his patients.	In order to verify things when needed, the doctor should be able to view the current information of the patient.			
FR_22	The doctor should be able to view all the patients that are waiting to be examined.	The doctor needs to have a list of the patients that are waiting to be examined.			
FR_23	The doctor should be able to fill a form while examining a patient and save that new record.	The doctor should create a new record in his patient's file every time he examines him/her. However, this has to be allowed by the receptionist first.			
FR_24	The doctor should be able to declare vaccination status of the patient.	The doctor needs to declare the vaccination status of every patient and add it at his medical records. Also, he/she should specify the vaccination date.			

FR_25	The patient should be able to view his personal information and medical visit records.	The system should be transparent and the patient can see everything that the doctor writes for him.			
FR_26	The patient should be able to download a PDF file of his records.	The patient may want to have a hardcopy file of his records.			
FR_27	The patient should be able to contact the doctor.	An email or phone message will be sent to his doctor.			
FR_28	The patient should have only one physician.	A patient has only to do with his family's doctor.			
FR_29	The patient should be able to change his/her physician.	A patient should be able to get transferred to another doctor if his circumstances requires so.			
FR_30	Each user should be able to look at the general information of the polyclinic.	All users can see the general information of the polyclinic.			
FR_31	The web application has to be responsive.	The users should be able to access this web application from many devices.			

4. Software Design / Diagrams

4.1 Requirements Analysis

4.1.1 User Scenarios

4.1.1.1 User Scenarios List

Nr	Name	Description
US_01	User logs in	<i>All users can log in using username and password</i>
US_02	Change password	<i>Users: patients, receptionist, doctors, nurses, administrators change their password</i>
US_03	Add a new patient user	<i>Receptionist, doctor, nurses creates an account for a new patient</i>
US_04	View shift timetable	<i>Receptionist opens the page to check the doctors timetable</i>
US_05	Add a new doctor user	<i>Receptionist creates an account for a new doctor</i>
US_06	Patients' list	<i>View all the patients</i>
US_07	Doctors' list	<i>Receptionist, doctors, nurses, administrators views all the doctors of the polyclinic</i>
US_08	Sign up	<i>Users can sign up if they are not signed up already</i>
US_09	Search a doctor	<i>Receptionist searches for a specific doctor</i>
US_10	Update user patient	<i>Receptionist updates personal information of a specific patient</i>
US_11	Update user doctor	<i>Receptionist updates personal information of a specific doctor</i>
US_12	Delete user	<i>Receptionist can delete an account of an existing patient or doctor</i>
US_13	Choose city	<i>All users should choose the city where the polyclinic that they work is located in order to log in</i>
US_14	Choose polyclinic	<i>All users should choose the polyclinic where they work in order to log in</i>
US_15	Fill the medical records	<i>Doctor creates a profile for the patients that he owns and fills in his medical records for every visit</i>
US_16	Export user	<i>Receptionist exports user information (an xml file) which will be sent to another polyclinic or hospital</i>
US_17	View profile	<i>All users can view their profiles</i>

US_18	View patient's examinations	<i>Patients can view all of their examinations from this polyclinic. Doctors can view their patients' examinations. Receptionist can view examinations of all patients of the polyclinic.</i>
US_19	Patient contacts doctor	<i>Patient can contact the doctor by completing a form and an email will be sent to his doctor</i>
US_20	Download patient's examinations	<i>Receptionist can download the examinations of all patients. Doctor can download the examinations of his patients. Patient can download his examinations.</i>
US_21	Request appointment	<i>The patient can request an appointment, and the receptionist has the possibility to set it. The doctor can cancel the appointment if not available</i>
US_22	Sign prescriptions	<i>The doctor can sign online prescriptions for his patients regarding to his monthly medical records</i>
US_23	User logs out	<i>All users can log out from their accounts</i>

Table 2. User scenarios list

4.1.1.2 User Scenarios Extended

1. US_01 – User logs in

- User chooses his user type: patient/receptionist/doctor/nurse/administrator
- User is redirected to the log in page
- User enters his username and password
- User selects the polyclinic where they work
- User selects the city where the polyclinic is located
- User checks the reCaptcha 'I am not a robot'
- User presses the log in button
- If data is correct the user is redirected to his profile page
- If data is not correct an error message will be shown and user repeats the process from step b.

2. US_02 – Change password

- User logs in following the steps in **US_01**.
- User chooses the menu "Change Password"
- User types his old password and his new password (2 times)
- User presses the button "Save Changes"
- If the old password is correct and if the new password is the same in both fields the user is alerted: "Password was changed successfully!"
- In case the old password is wrong or the new password is not the same in both

fields then user is alerted: "Password was not changed. Please try again."

3. **US_03** – Add a new patient user

- a. Receptionist logs in following the steps **US_01**
- b. Receptionist clicks on "Add a New Patient"
- c. Receptionist fills all the empty fields
- d. Receptionist double checks if the data entered is correct
- e. Receptionist clicks the button "Add Patient"
- f. Alert: Are you sure you want to continue? YES/ NO
- g. If NO, do nothing, we stay at the same page
- h. If YES, system validates data according to the specified requirements
- i. If validation is passed successfully, the data is saved in the database and the account is created. An informative message "Patient added successfully!" will be shown and the receptionist is redirected to his/her home page.
- j. If validation is not passed successfully, informative messages will show where the problem is, so the receptionist can fix it and continue again from step d.

4. **US_04** – View shift timetable

- a. Receptionist logs in following the steps in **US_01**
- b. Receptionist clicks on "Timetable"
- c. Receptionist selects the one of the options
- d. If the receptionist clicks doctor, the page will show the timetable of doctor's shifts.
- e. If the receptionist clicks nurse, the page will show the timetable of nurse's shifts.
- f. If he does not click anything it will remain on the page "Timetable"

5. **US_05** – Add a new doctor user

- a. Receptionist logs in following the steps in **US_01**
- b. Receptionist clicks on "Add a New Doctor"
- c. Receptionist fills all the empty fields
- d. Receptionist double checks if the data entered is correct
- e. Receptionist clicks the button "Add Doctor"
- f. Alert: Are you sure you want to continue? YES/ NO
- g. If NO, do nothing, we stay at the same page
- h. If YES, system validates data according to the specified requirements
- i. If validation is passed successfully, the data is saved in the database and the account is created. An informative message "Doctor added successfully!" will be shown and the receptionist is redirected to his/her home page.
- j. If validation is not passed successfully, informative messages will show where the problem is, so the receptionist can fix it and continue again from step d.

6. **US_06** – Patients’ list

- Receptionist
 - a. Receptionist logs in following the steps in **US_01**
 - b. Receptionist clicks on “Patients’ list”
 - c. A table with all the patients of the polyclinic will be shown
- Doctor
 - a. Doctor logs in following the steps in **US_01**
 - b. Doctor clicks on “My Patients” menu
 - c. A table with all his/her patients will be shown
- Nurse
 - a. Nurse logs in following the steps in **US_01**
 - b. Nurse clicks on “Patients” menu
 - c. A table with all his/her respective doctor’s patients will be shown

7. **US_07** – Doctors’ list

- a. Receptionist, doctors, nurses, patients, administrators logs in following the steps in **US_01**
- b. Receptionist, doctors, nurses, patients, administrators clicks on “Doctors’ list”
- c. A table with all the doctors of the polyclinic will be shown

8. **US_08** – Sign up

- Receptionist, doctor, nurse, administrator, patient
 - a. Person opens the webpage
 - b. If it is not signed up, selects the option SIGN UP
 - c. A form with all the required details is going to be shown
 - d. User must choose the user type, fill in the username and password, confirm the password and select save.
 - e. If results were valid, the page is going to go back to the main page in order to log in
 - f. If result were not valid, the page will show an alert which requires you to fill in the details in the proper way

9. **US_09** – Search a doctor

- a. Receptionist logs in following the steps in **US_01**
- b. Receptionist clicks on “Doctors’ list”
- c. A table with all the doctors will be shown and a search box above it
- d. Receptionist fills the name, the surname or both of the fields
- e. If results were found, they will be shown in the table
- f. If no result was found, the table will be shown empty

4.1.2 User Cases

Name	User logs in
Summary	User enters personal information to access his account.
Actor	Patient / Receptionist / Doctor/ Nurse/ Administrator
Description	User gains access on his account after typing his correct username and password.
Precondition	User must have an active account and should choose one of the alternatives (patient/ receptionist/ doctor/ nurse/ administrator) before logging in.
Alternatives	The user can access only one account at time and can have only one role (patient/ receptionist/ doctor/ nurse/ administrator), but they can have two accounts because they can also be patients.
Post Condition	User is logged on his account.

UC_01 – US_01 - User logs in

Name	Change password
Summary	User goes to the corresponding page to change his password.
Actor	Patient / Receptionist / Doctor/ Nurse/ Administrator
Description	User types the old password and the new one in order to make the change.
Precondition	The user should be logged in. The old password should be typed correctly and both fields with the new password should match. Also the new password should be different from the old one and it should follow the validation rules.
Alternatives	If the fields are not filled correctly (validation rules not passed successfully), then information cannot be saved. The user is allowed to try again.
Post Condition	After pressing the “Save” button, the old password is replaced with the new one.

UC_02 – US_02 - Change password

Name	Add a new patient user
Summary	The receptionist can add a new patient user.
Actor	Receptionist
Description	Receptionist clicks on “Add Patient” menu, fills the information for the new patient and then clicks “Add Patient” button.
Precondition	Receptionist should be logged in and the patient must possess the necessary documents to be registered in the polyclinic. The new patient’s unique information should not match with any other patient in the database, so one patient cannot have two accounts.
Alternatives	If the receptionist is sure he/she should press YES to continue saving, if not then he/she should press NO and go back to the previous page. If when pressing YES, the validation of the fields is not successful, the receptionist is allowed to make the necessary changes.
Post Condition	A new patient is added on the database

UC_03 – US_03 – Add a new patient user

Name	View shift timetable
Summary	It is important for the receptionist to have access at the timetable, in order to check the doctor’s shifts to inform patients and set right appointments.
Actor	Receptionist
Description	Receptionist clicks on “Timetable” menu, clicks on “doctor” button and then the page displays the shifts of doctor’s timetable.
Precondition	The receptionist should be logged in, in order to open the page.
Alternatives	The receptionist can also check the shift timetable for nurses.
Post Condition	The receptionists can set appointments.

UC_04 – US_04 – View shift timetable

Name	Add a new doctor user
Summary	The receptionist can add a new doctor user.
Actor	Receptionist
Description	Receptionist clicks on “Add Doctor” menu, fills the information for the new doctor and then clicks “Add Doctor” button.
Precondition	Receptionist should be logged in and the doctor must possess the necessary documents to be registered in the polyclinic. The new doctor’s unique information should not match with any other doctor in the database, so one doctor cannot have two accounts.
Alternatives	If the receptionist is sure he/she should press YES to continue saving, if not then he/she should press NO and go back to the previous page. If when pressing YES, the validation of the fields is not successful, the receptionist is allowed to make the necessary changes.
Post Condition	A new doctor is added on the database.

UC_05 –US_05 – Add a new doctor user

Name	Patients’ list
Summary	Access the list of patients.
Actor	Receptionist / Doctor/ Nurse/ Administrator
Description	In the receptionist’s version he/she logs in then clicks on “Patients’ list”, to access the list of all patients of the polyclinic. In the doctor’s version, he/she logs in and clicks on “My Patients”, to access the list of his/her patients. In the nurse’s or administrator’s version he/she logs in then clicks on “Patients’ list”, to access the list of all patients of the polyclinic.
Precondition	To access this list you should be logged in as a receptionist, doctor, nurse or administrator. Patients have no access onthe list.
Alternatives	Receptionists, doctors, and administrators can view the whole list of the patients of the polyclinics. Nurses can view only their respective doctor’s list. If there is no patient registered yet, an informative message will be shown.
Post Condition	A table with the list of the patients is shown.

UC_06 –US_06 – Patients’ list

Name	Doctors' list
Summary	Access the list of the doctors of the polyclinic.
Actor	Receptionist / Doctor/ Nurse/ Administrator/ Patient
Description	User logs in then clicks on "Doctors' List", to access the list of all doctors of the polyclinic.
Precondition	To access this list you should be logged in. Patients and nurses can view only the list of the doctors of their polyclinic.
Alternatives	Receptionist, doctors and administrators can view the whole list of the doctors of the polyclinics. If there is no doctor registered yet, an informative message will be shown.
Post Condition	A table with the list of the doctors is shown.

UC_07 – US_07 –Doctors' list

Name	Sign up
Summary	A new user is going to be created.
Actor	Receptionist / Doctor/ Nurse/ Patient/ Administrator
Description	<p>Person opens the webpage. Since it is not signed up, selects the option SIGN UP. A form with all the required details is going to be shown. User must choose the user type, fill in the username and password, confirm the password , select the polyclinic and the city and select save.</p> <p>If results were valid, the page is going to go back to the main page in order to log in. If result were not valid, the page will show an alert which requires you to fill in the details in the proper way</p>
Precondition	User must select a type.
Alternatives	User can be either a receptionist ,doctor, nurse, patient or an administrator
Post Condition	If results were valid, now he can log in successfully.

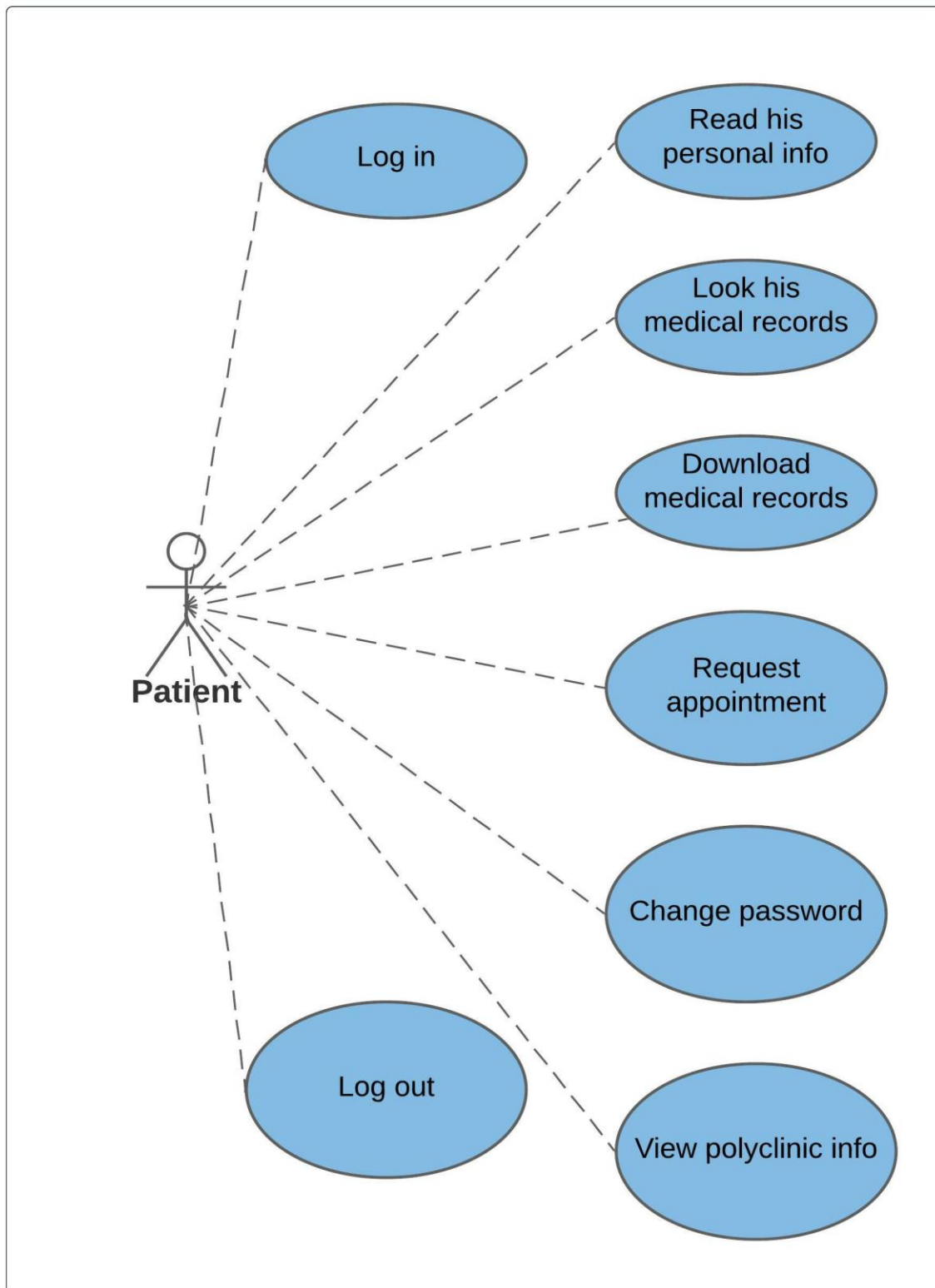
UC_08 – US_08 – Sign up

Name	Search a doctor
Summary	Search a specific doctor in the list.
Actor	Receptionist
Description	In the receptionist's version he/she logs in then clicks on "Doctors' list", to access the list of the patients. At the search box, he/she enters the name, surname (or both) of the doctor he/she is looking for.
Precondition	You should be logged in as a receptionist. Patients and doctors will not have this right.
Alternatives	Receptionist can either type the name, the surname, or both. If there is no doctor found, an informative message will be shown.
Post Condition	If results were found, a table with all the results will be shown.

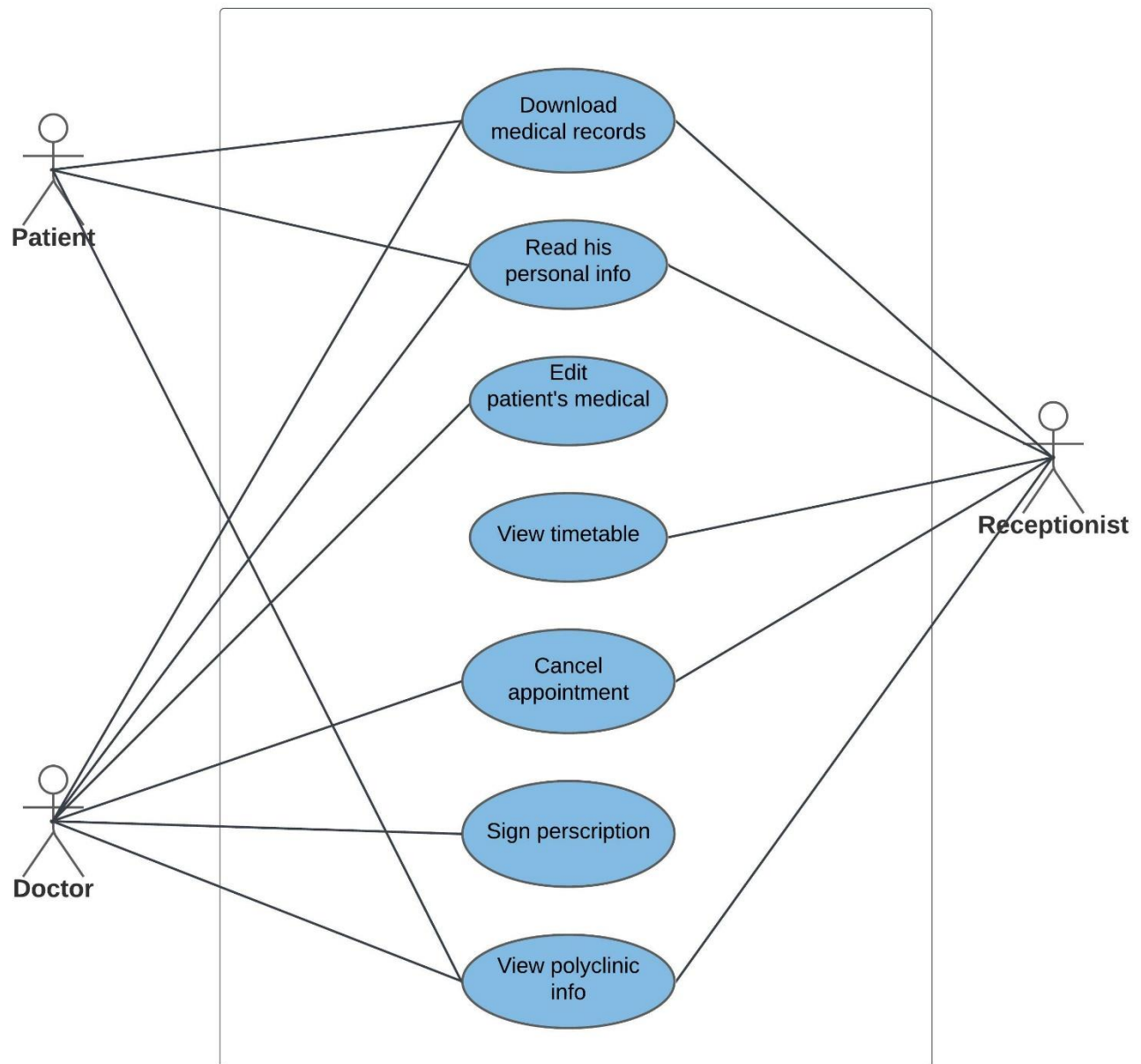
UC_09 – US_09 – Search a doctor

4.2 Behavioral Diagrams

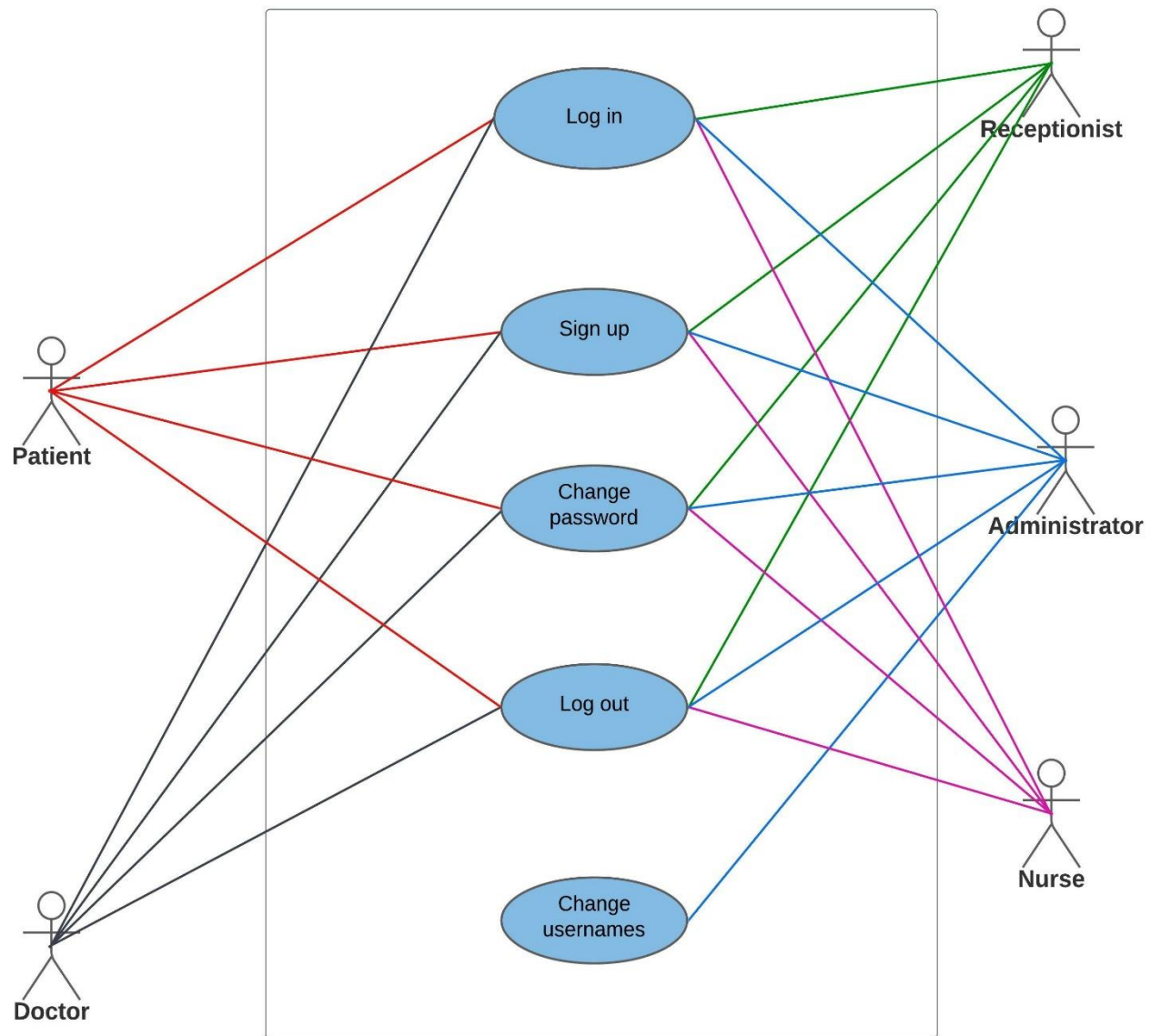
4.2.1 Use Case Diagrams



Patient basic operations



Relationship between patient, doctor and receptionist



Relationship between all users

5. Project Planning

Project Name: Polyclinic Management System

Members: Eva Daçi, Emin Suha Uzun, Qemal Sinaj

start and end days: 2022

Estimated start and end days: 2022

Real total days: # days

Estimated total days: # days

Network Analysis:

Nr	Activity	Duration (Days)	Dependencies
10	Proposed topic for project		
15	Feasibility Study		
20	Project Description		
25	Sketch Designs		
30	Requirements (Functional, Non-functional, Domain)		
35	User scenarios Use cases		
40	Activity Diagram State Diagrams Data Flow Diagram Entity Relation Diagram		
45	Sequence Diagrams Collaboration Diagrams		
50	Class Diagram Object Diagram Component Diagram Deployment Diagram		
55	Detailed Design		
60	Programming		
65	Testing		
70	Installation		