Software Requirements Specifications

For

E-Medical Platform

2022-04-09

Version: 1.0

Prepared by:

Jihyun Ahn, Alley Chaggar, Subeen Kang, Danielle Mhiingan,
Que Thi Nguyen

Table Of Contents

1. Introduction

1.1. Purpose

1. This new software will provide convenience for people with health problems who cannot go to the hospital because of Covid19 or other situations by serving online-medical treatments and will be integrated into each hospital system, this is version 1.0.0.

2. Patients can choose symptoms among categories or write down symptoms themselves or take a picture of their symptoms. Then a list of available doctors is presented on the screen and you can choose the doctor and time. This new software can shorten the time of patients and increase effectiveness.

3. After the medical examination, people can choose the option of medicine delivery with an extra charge because this software is linked to the delivery application. This software can be useful for people having physical difficulty going to a pharmacy.

4. Patients can write a review according to their satisfaction with the examination of the doctor. When choosing an available doctor, they can check some reviews of certain doctors. This review system also makes doctors do their best in dealing with patients.

1.2. Document Conventions

-Table of Acronyms used in the document:

Acronyms	Description
WebRTC	Web Real Time Communication
DB	Database

SQL	Sequential query language
ER	Entity Relationship
IEEE	Institute of Electrical and Electronics Engineers

-The basic font of the SRS is "Times New Romans", important words or sentences are in bold type, and Italic fonts are used in the reference section.

1.3. Intended Audience and Reading Suggestions

This SRS document is intended for document writers, end-users, developers, project managers, and testers.

Document Writers: SRS (Software Requirements Specification) is normally written by a technical writer, a systems architect, or a software programmer. They try to make the document more explicit, measurable, complete, viable, flexible, verifiable, consistent, and accurate.

End-users: The end-users are people actually using software or a product and use the SRS to understand the software. In this document, our end users are people who have difficulties going to the hospital physically because of a lack of time, or a definite diagnosis of the Covid-19. They can use this software for efficiency and a prompt examination of doctors.

Developers: Software developers do their roles by engaging in identifying, designing, installing, and testing a software system. They
should help in updating and maintaining the program to ensure that all security problems are fixed by operating with databases.

Project managers: Project managers are in charge of planning, executing, scheduling, and monitoring the overall software project implementation process. They ensure the successful completion of all software projects by distributing the task to the team leaders and overseeing the people performing work on the projects.

Testers: Testers are in charge of conducting the quality assurance stage of software development and deployment. They ensure the software by doing

manual and automated tests to check if any bugs were removed before getting deployed to users and check whether it fits for purpose or not.

1.4. Project Scope

Due to the covid19 which has been lasting for over 3 years, people experience difficulties accessing medical services physically. At the same time, changes are taking place in the form of hospital treatment in line with the era of advanced technology.

The difference from existing software is that our software enables quick and accurate consultations between individuals and doctors in hospitals, using simple video call equipment at home, rather than just patients going directly to the hospital.

Moreover, our software provides a differentiated service by allowing patients to have prescribed drugs delivered to their homes after paying the delivery fee. If they upload a prescription written by a doctor and personal information, they can receive delivery after the delivery driver is matched. Because this system is integrated into each hospital system they can apply directly to the hospital when requesting an insurance claim.

1.5. References

AGCAS editors. (n.d.). *Software tester job profile | Prospects.ac.uk*. Prospects. Retrieved December 2020, from https://www.prospects.ac.uk/job-profiles/software-tester

Burak, A. (2021, August 19). *How to Write a Software Requirement Specification (SRS) in 2021*. Relevant Software. https://relevant.software/blog/software-requirements-specification-srs-document/

Haron, A., Sahibuddin, S., Harun, M., Taib, M. Z. M., & Botok, A. G. (2014). SRS Development Procedure : The Roles and Responsibility of Key IT Personnel in Requirement Engineering Process. *International Journal of Computer and Electrical Engineering*, *6*(2), 105–109. https://doi.org/10.7763/ijcee.2014.v6.803

The Role of a Software Developer | Technojobs UK. (n.d.). Technojobs. https://www.technojobs.co.uk/info/developer-guides/the-role-of-a-software-developer.phtml

Wikipedia contributors. (2021, November 17). *Software requirements specification*. Wikipedia. https://en.wikipedia.org/wiki/Software_requirements_specification

2. Overall description

2.1. Product Perspective

1. This is a new software

2.2. Product Features (Functions)

1. The product must collect data on patients
2. Must connect to the internet
3. Client must be able to connect to a physician
4. Client should be allowed to cancel appointments up to 24 hours without any penalties
5. Clients must be able to type their symptoms or show pictures of their symptoms
6. System should accept debit and credit card payment

2.3. User classes and Characteristics

Patients: Should be able to book appointments with a physician, update their medical records and interact with physicians online
Physician: Should be able to look up medical records of patients and interact with patients online
System Administration: Will reset password when needed

2.4. Operating Environment

1. Operating system: Windows 7 - 11, and macOS …..
2. Mobile versions supported: IOS and Android
3. Web browsers supported: Chrome, Firefox, and Safari
4. Programming language: python
5. Database: SQL+ database

2.5. Assumptions and Dependencies

It is assumed that patients' data will be available for the hospital and doctors. The users should be familiar with the internet browser when using a web page with adequate internet connectivity, or users can download the application to be offered this service. In addition, to get a delivery service, users should request a prescription from the doctor after medical examination to use as proof. There could be some problems regarding the fabrication of prescriptions and reviews. However, it's fairly common in the Canadian health care setting prescriptions are faxed directly to a patient's chosen or "home" pharmacy to avoid fabricated or falsified RX slips.

3. External Interface Requirement

3.1. User Interfaces

There will be both a mobile version and a computer version. Mobile versions will be in use if the end-user has a mobile device, such as Android or IOS. The end-user will be encouraged to install the software rather than just using the web version on their phone. If the end-user doesn’t install the software and goes to the web browser root then the supported browsers on mobile are Chrome and Safari. For computer end-users such as windows and mac the web browsers supported are Chrome, Firefox, and Safari.

3.2. Hardware Interfaces

- Camera
- Ethernet cable
- Microphone

3.3. Software Interfaces

- Calendar
- Google map
- E-mail

- Prescription software
- Patient profiles
- Admin profiles
- Zoom
- Registration software
- Payment gateway
- Chat (Messenger) software
- Document cloud system
- E-medical delivery system

Use Cases

Use cases			
Use Case name	List of related Requirements ID	Actor (s)	Brief Description
Registering Patients	FR02	New Patients	The actor will have to first register to get an account and use software services. To register the actor will need to press the register now button. It will prompt the actor to fill out health-related questions such as health card number, legal first and last name, date of birth, and major health problems. After they are done the user will be able to make their password and their health card will be their username.
Verifying account	FR02	IT Administrator	The actor will identify the newly registered patients' information accordingly. The actor will verify the account for newly registered patients if the information is correct.
Booking an appointment	FR06	Registered Patients	The actor will click the available date in the calendar to book an appointment with a physician.

Looking up medical records	FR10	Physicians	The actor will click the medical records button on the patient's name, by doing so the actor will be able to update them and or retrieve medical records.
Logging in	FR03	Registered patients	The actor will click on the log-in button, in response, the software will show the actor with a log-in screen. The actor will have to enter their username and password to have access to the software service.
Update profile	FR03	Registered patients	The actor will update his/her profile up to date if there is modification or change of situation.
Entering symptoms	FR13	Registered patients	The actor will enter symptoms prior to meeting a physician. The actor will have to enter specific symptoms into the provided symptom checklist.
Seeing a physician on appointment via video call	FR08	Registered patients and physicians	The actors will meet via zoom meeting. The registered patient actor will tell the symptoms to be diagnosed. The physician actor will diagnose the symptom.
Prescribing drugs	FR05	Physicians	The actor will send a prescription to the local pharmacy the patient wishes or send to the delivery system to get the drugs delivered.
Referring to the specialist	FR12	Physicians	The actor will send a referral request for a specialist if the patient needs to see a specialist for further diagnosis.
Forwarding patients' information to primary care provider	FR14	Healthcare provider	The actor will forward the patient's diagnosed information to the patient's primary health provider to integrate medical history.

Payment required	FR09	Registered patients	The actor will pay the amount due at the end of the session.
Getting prescription from physician	FR05	Pharmacist	The actor will receive the prescription from the physician via e-medical platform and prepare the medicine for the clients.
Pick up prescribed drug	FR05	Registered patients	The actor will pick up the prescribed drug at the local pharmacy where he/she wishes to pick up.
Prescribed drug delivered	FR15	Registered patients	The actor will get prescribed drugs delivered at her/his home.

4. Functional Requirements

ID	Title	Description	Priority	Requester
FR01	Google Map Integration	The system should allow users to search nearby stations for in-person testing as required, or pharmacies nearest to their location to pick-up prescriptions.	Low	Client
FR02	New Client Registration	The system should allow users to self-register for themselves or dependents to be seen by a healthcare provider for non-urgent care. Registration should include designation of payment (provider or direct), a service needed, account information including emergency contact and patient history form.	High	Client
FR03	Profiles	The system should allow users to update their personal profiles to reflect important contact information and level of access to all pertinent information.	Medium	Client Healthcare Provider

ID	Title	Description	Priority	Requester
FR04	E-mail	The system composes automatic messages to patients alerting to upcoming appointments, provided prescriptions, and forms needing to be completed.	Medium	Administrator
FR05	Prescription	The system should allow patients and health care providers to view given prescriptions and if a prescription has been sent to the correct pharmacy.	High	Pharmacist Healthcare provider Client
FR06	Calendar	The system should allow patients to book, view, cancel and reschedule appointments.	High	Client Healthcare Provider
FR07	Zoom integration	System should allow patients and healthcare providers' ability to have face to face appointments.	Medium	Client Healthcare Provider
FR08	Media and Chat function	The system should securely allow clients to provide digital images and other media for health care providers to assess symptoms and health issues.	Medium	Client Healthcare Provider
FR09	Payment	The new app should have a payment system that allows billing/invoicing for insurance providers and other payment methods.	High	Accounting
FR10	Document Repository	The system should allow patients and healthcare providers to upload and download forms.	High	Client Healthcare Provider
FR11	EMR Integration	The system should allow healthcare providers the ability to chart patient records.	High	Healthcare Provider
FR12	Specialist / Referrals to Other Care Providers	The system should allow health care providers facilitate referral for clients to access specialists outside of the E-medical delivery system.	Low	Healthcare Provider
FR14	Family Doctor / Nurse	The system should allow healthcare providers'	Medium	Healthcare Provider

ID	Title	Description	Priority	Requester
	Practitioner Forwarding	ability to forward all pertinent information to the client's primary care provider.		
FR13	Symptom Checklist	The system should allow clients to input symptoms related to their appointment to assess severity of condition–and provide a list of urgent care providers nearby if the severity is beyond the purview of the clinic setting.	Medium	Client
FR15	Delivery system	The system prompts to deliver prescribed drugs to the client if the client wishes prescribed drugs to be delivered to their home. The pharmacy we have a contract with will send drugs to client accordingly.	High	Physician Pharmacist Administrator

Use-Case Formal Descriptions

Use case: Registering clients

Iteration: 1

Primary actor: New patient

Goal in context: To be able to have an account and use software services

Preconditions: System must be fully configured before registering new patients.

Trigger: A person has urgent needs of seeing a doctor to be diagnosed.

Scenario:

1. The new patient will press the register now button.
2. The new patient will fill out their legal name, date of birth, and health card number.

3. The new patient will fill out health-related questions.
4. The new patient will enter their preferred email address.
5. The new patient will pick a preferred billing option.
6. The new patient will make a password.
7. The new patient will confirm the password.
8. The new patient will press complete registration.
9. The system will process to see if everything was entered correctly.
10. The system will tell the patient to verify the email address.
11. The patient will verify the email address.
12. The new patient will log into e-medical with their health card number and password.

Exceptions:

1. Registration has information missing
2. Registration has incorrect information
3. Timer runs out if registration takes too long registering

Priority:	High priority.
When available:	First increment
Frequency of use:	Infrequent (Only need to register once for one client)
Channel to actor:	Via PC-based browser, mobile app and Internet connection.
Secondary actors:	Email provider, System administrator

Channels to secondary actors:

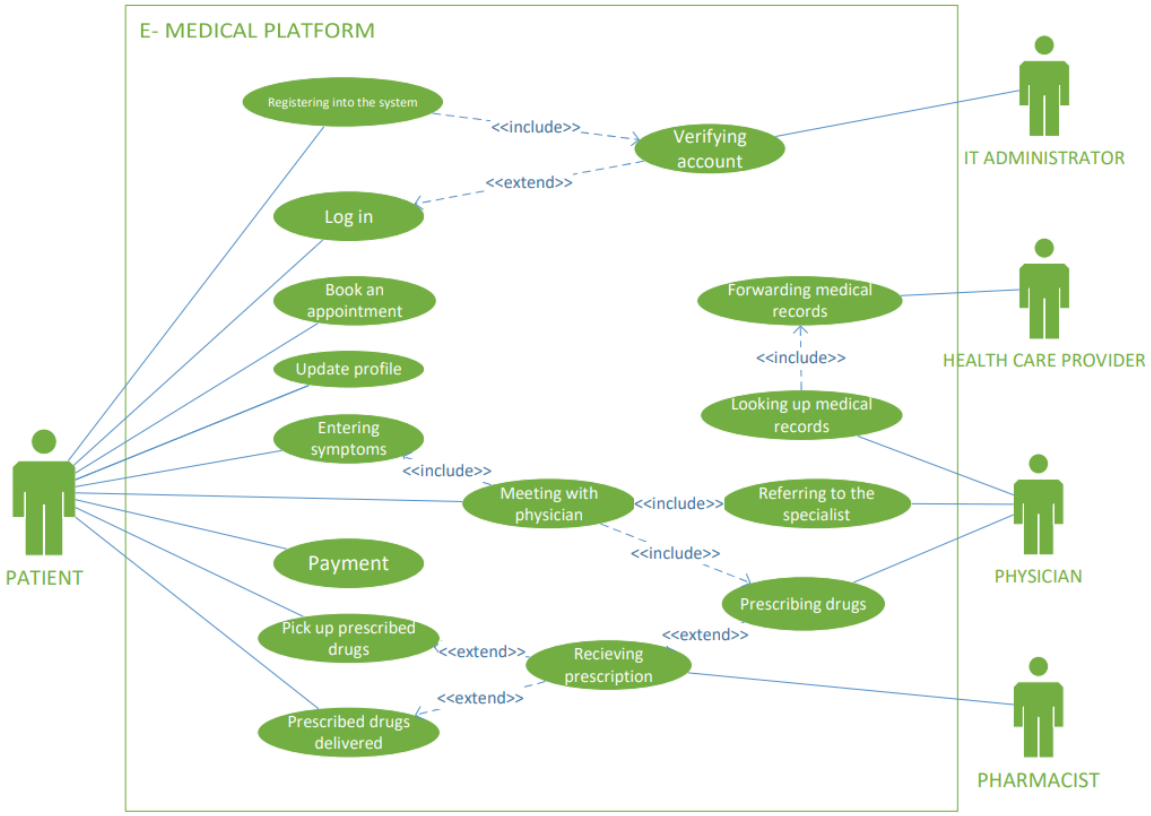
1. Email: Third party website.

Open issues:

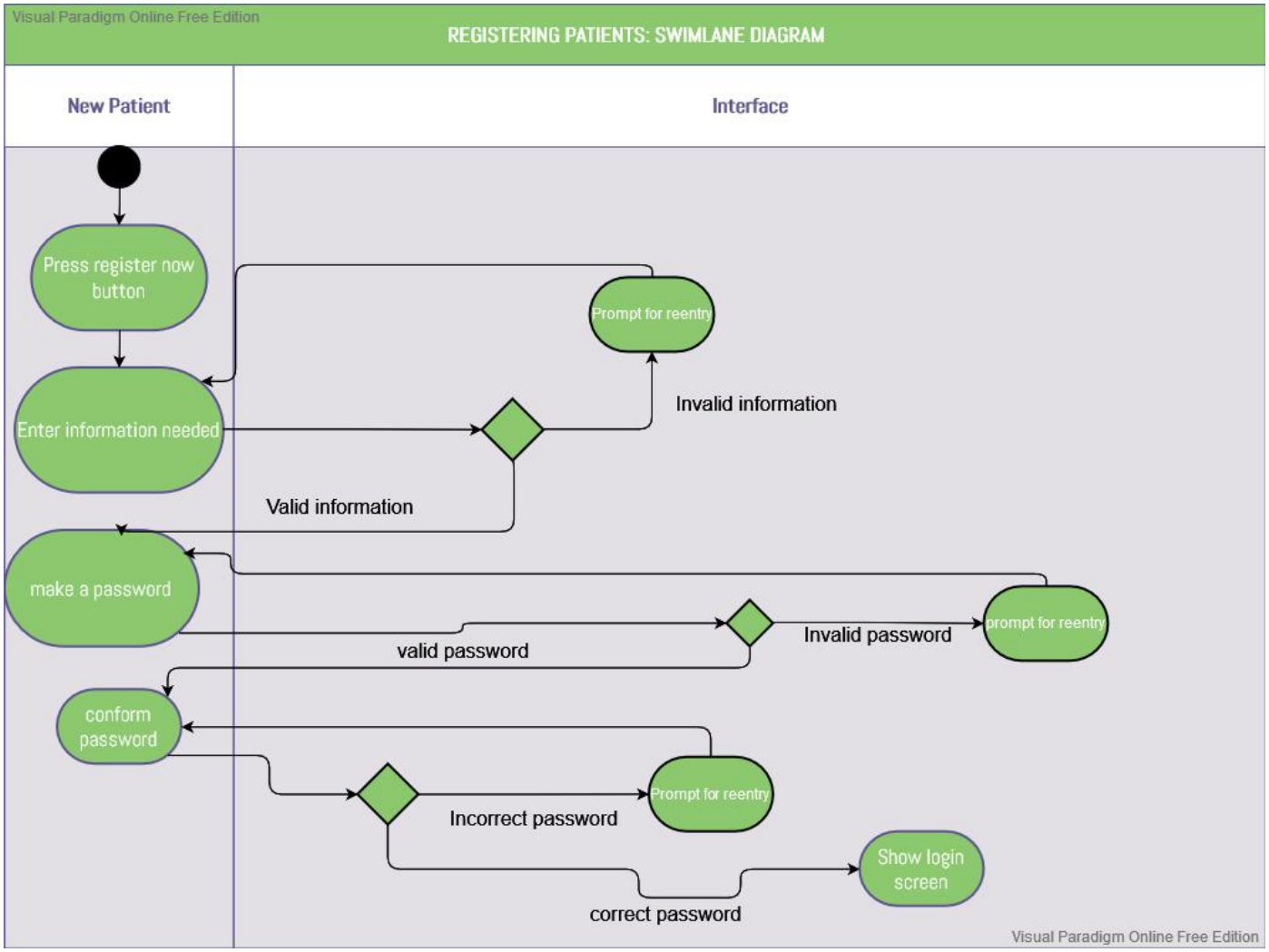
1. Is security sufficient? Hacking into this feature would represent a major invasion of privacy.

2. Will system response via the Internet be acceptable given the bandwidth required for camera views?

4.2 Use Case Diagram



4.3 Swimlane diagram



5. Nonfunctional Requirements

ID	Title	Description	Priority	Requester
NF01	Security	Account creation, password generation, security question answering, account locking, firewall against unauthorized access to medical records.	High	IT security officer
NF02	Mobile compatibility	The system should be compatible with following mobiles: iOs, Android	Medium	IT administrator
NF03	Web browser compatibility	The system should be compatible with the following browsers: Chrome, Firefox, Safari	Medium	Clients
NF04	Capacity	Performance	Medium	IT administrator
NF05	Localization	Legality, math, time zones, currency, pharmacy location.	Low	IT administrator Google Maps
NF06	Usability	System must be straightforward to use, with accessibility in mind.	High	IT administrator
NF07	Compliance	App must comply with legal and regulatory requirements.	High	Healthcare Governor
NF08	Observability	System must be capable of being monitored, traced and recoverable. Logs for access to client charts and other useful information.	High	IT security officer

Appendix

C. Stakeholder Register

Stakeholder Register					
Stakeholder Name	Stakeholder Position	External/ Internal	Stakeholder Contact Details	Operational /Executive	Interest (High, Medium, Low)
Matthew Keith	Investor	External	mkeith@gmail.com	Executive	High
John Kennedy	IT Administrator	Internal	johnkennedy@hotmail.com	Operational	Medium
Kristen Bell	Marketing officer	Internal	kbell02@gmail.com	Operational	High
Jennifer Mckintosh	Programmer	Internal	jennmckin9@gmail.com	Executive	High
Kate Wang	IT security officer	Internal	katewang98@gmail.com	Operational	Medium
Jason Kim	Customer	External	jkim93@gmail.com	Operational	High
Timothy Evans	Medical Officer	Internal	timevans@gmail.com	Operational	Medium
Angelina Skura	Doctor	Internal	angelskura@hotmail.com	Executive	High
Don Jo	CEO	Internal	dj2000@gmail.com	Executive	High
Edward Jones	Accounting officer	Internal	edwardjones99@gmail.com	Operational	Medium
Tina Young	Pharmacist	External	tinay20@hotmail.com	Operational	Low
Sabrina Wander	Health Care Governor	External	sabrina.wander.08@gmail.com	Executive	Medium
Hannah Walker	UX/UI Designer	Internal	hannah.walker@hotmail.com	Operational	High

Alissa Shoemaker	Customer Service Representative	Internal	alissa.shoemaker@gmail.com	Operational	Medium

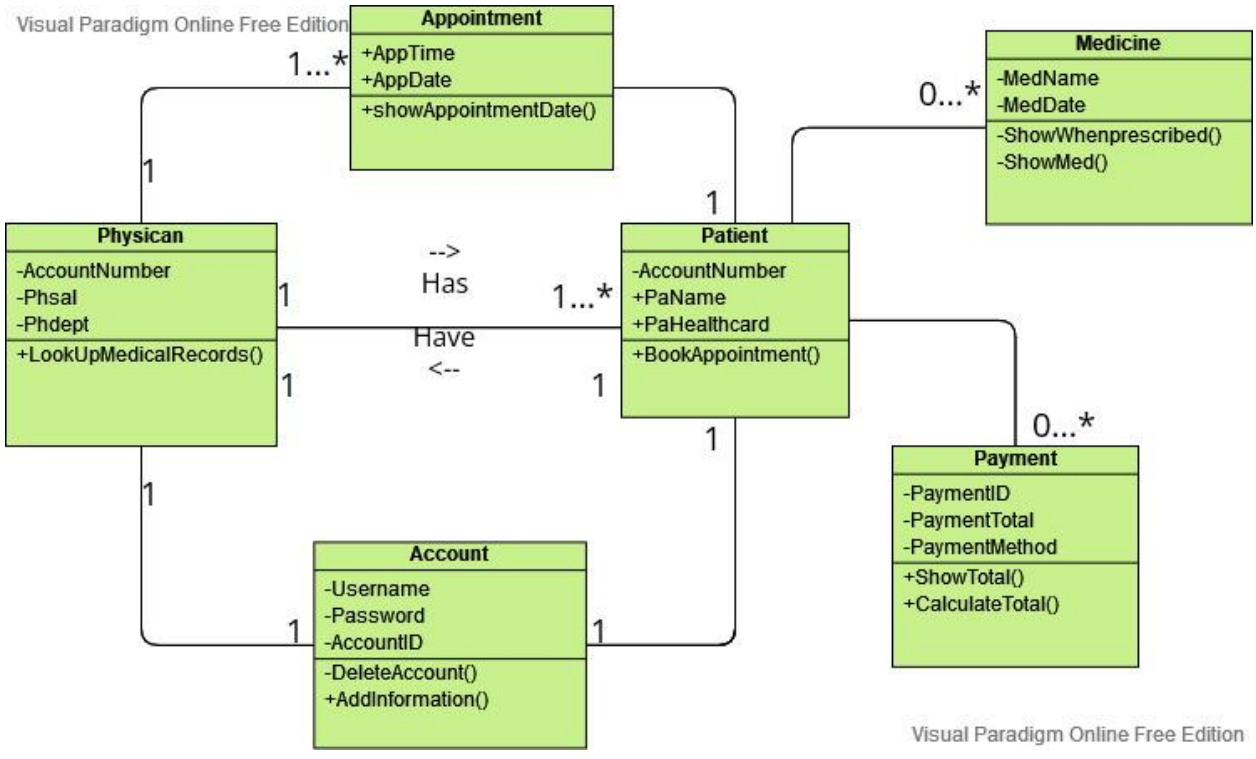
D. Interview Questions

Interview Questions		
Questions	Stakeholder Position	Answer
1) What is a product?	Marketing officer	This new software will provide convenience for people with health problems who cannot go to the hospital because of Covid19 or other situations by serving online-medical treatments and will be integrated into each hospital system.
2) Who are the target users	Marketing officer	According to Statista research department, the main user groups that adults regularly using an app for health emergencies, adults regularly using an app to track illness and medication,
3) What type of data model is used in your company ?	Database Administrator	JSON (JavaScript Object Notation) is a data exchange format. The language is natural to read and write by humans. It uses conventions that enable interpretation in almost programming languages: C#, JavaScript, and Python. For the data model of this project, the patient has his records. The records contain the type of test, the result of the examination, and the date of collection
4) How much does it cost to create the E-medical?	Accounting officer	The cost of developing e-medical can vary significantly: from an IoT-enabled $45000 MVP for a pill reminder to a $160,000 telemedicine solution to a $280,000+ full-cycle practice management platform. And

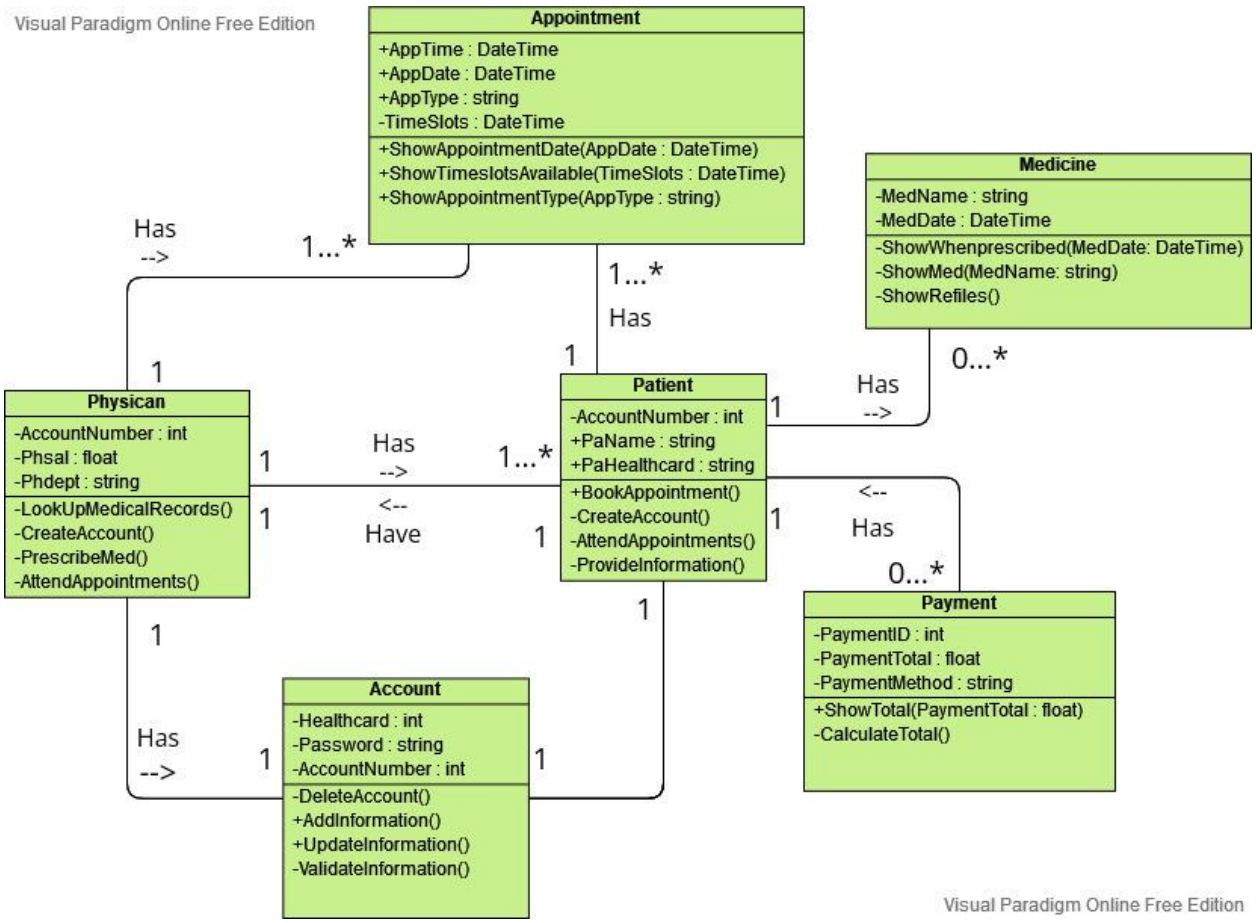
		after we've verified that the solution offers an optimal user experience, we start coding it in the flesh. This approach considerably saves the budget required to create a health platform.
5) What design considerations does the E-medical platform have to work within?	UX/UI Designer	A reference available when coding the platform facilitates the work of the developer. Several programs are available to design prototypes. We chose Adobe XD, a vector-based user experience design tool for apps.

E. Class Diagrams

a. Domain Class Diagram



Updated Version



Party Analysis Pattern

In the Party archetype pattern, for example, the composite pattern can be utilized to describe simple and integrated groups. The analytical or archetypal method's construction component includes a description of how one or more construction patterns might be realized. Their key objectives and ideas summarize the patterns themselves to help identify and comprehend the interrelationships between the four approaches (issue frames, archetype, analysis, and design patterns).

Party analysis pattern is not applied to our project because it only applies when there is a person or organization to be grouped as a party in the diagram. Patients and physicians can not be grouped as a party since they need to be distinguished.

b. CRC Index Cards

Physican	
• RESPONSIBILITIES • Create account • Attend appointments • Prescribe medicine • Look up medical records	• COLLABORATORS • Account • Appointments • Medicine

Patient	
• RESPONSIBILITIES • Create account • Provide Information • Book appointments • Attend appointments	• COLLABORATORS • Account • Appointments • Payment

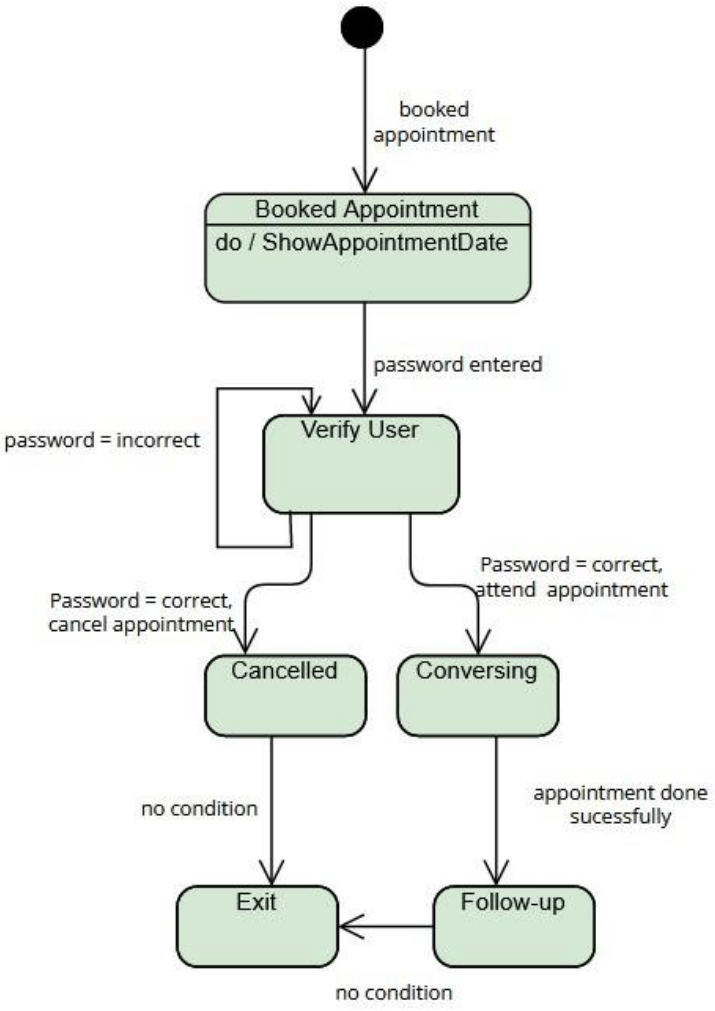
Account	
• RESPONSIBILITIES • Get information • Update information • Validate information • Delete account	• COLLABORATORS • Patient

Payment	
• RESPONSIBILITIES • Calculate total • Show total	• COLLABORATORS

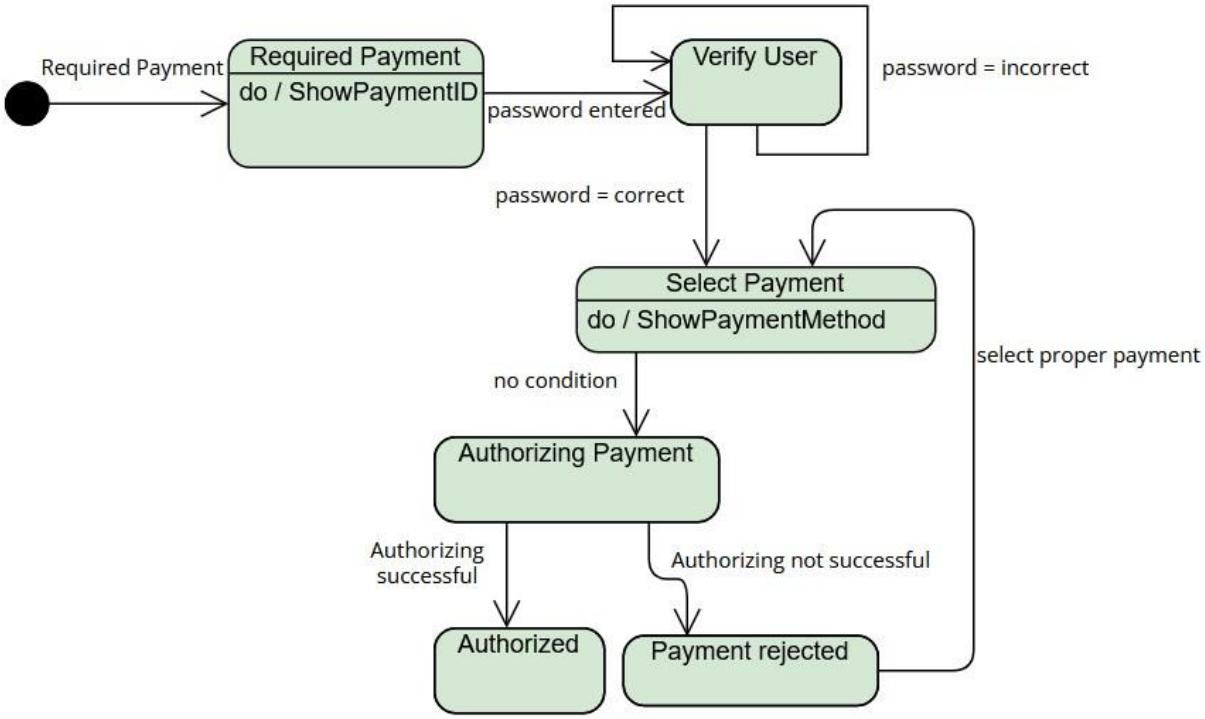
Appointment	
• RESPONSIBILITIES • Show appointment data • Show timeslots available • Show type of appointment	• COLLABORATORS

Medicine	
• RESPONSIBILITIES • Show medicine name • Show when medicine was prescribed • Show refiles	• COLLABORATORS

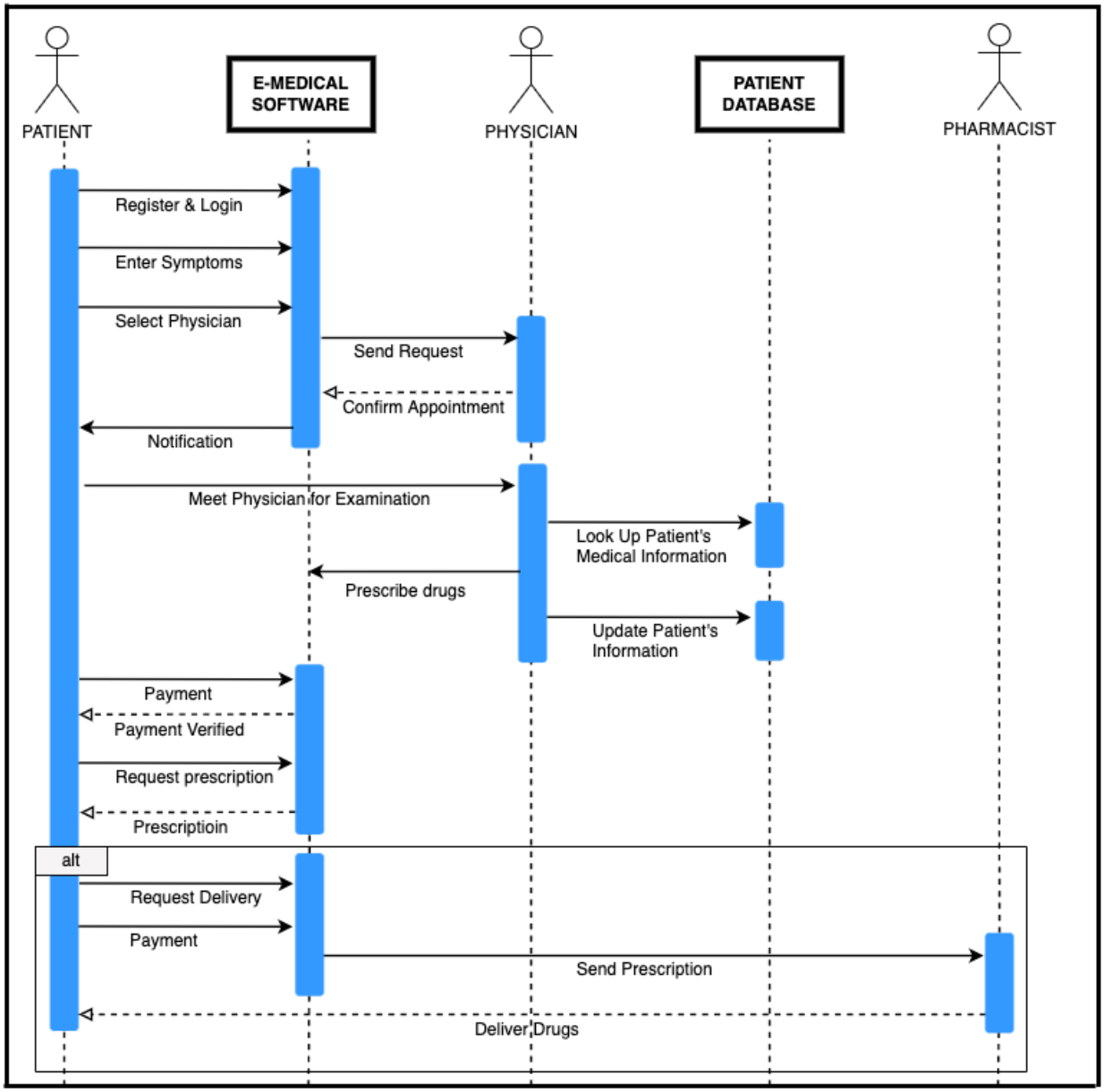
c. State Diagrams
    i. Appointment


booked
appointment
Booked Appointment
do / ShowAppointmentDate
password entered
password = incorrect
Verify User
Password = correct,
attend appointment
Password = correct,
cancel appointment
Cancelled
Conversing
no condition
appointment done
sucessfully
Exit
Follow-up
no condition

ii. Payment



d. Sequence Diagram


PATIENT
E-MEDICAL SOFTWARE
PHYSICIAN
PATIENT DATABASE
PHARMACIST
Register & Login
Enter Symptoms
Select Physician
Send Request
Confirm Appointment
Notification
Meet Physician for Examination
Look Up Patient's Medical Information
Prescribe drugs
Update Patient's Information
Payment
Payment Verified
Request prescription
Prescriptioin
alt
Request Delivery
Payment
Send Prescription
Deliver Drugs