



Daffodil International University
Department of Software Engineering
SWE-431 Final Year Project / Thesis

Project Documentation

Doctor-Dekhao: An online based doctor appointment system

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Approval

Acknowledgment

First of all, thanks to the almighty for accomplishing my four-year academic journey successfully. I have been learning the core knowledge of software engineering from my university. Our honorable teachers teach us the core knowledge of software engineering, give us proper guideline. For accomplishing my degree, a huge amount of credits goes to our honorable teachers. I am thankful and grateful to all of my teachers.

I am so much grateful to my honorable supervisor **Tapushe Rabaya Toma** Ma'am for giving me a proper guideline to complete my project. Her wisdom and proper guideline made my works so easy. Without her guideline, I could not finish the project properly.

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Chapter 1: Introduction

1.1 Project Overview

At present, every sector is merged into information technologies. For example: education, finance, healthcare etc. During the pandemic situation, the world has realized that combining every piece of work with technologies are really needed. Taking online doctor appointment will give great impact on our society. Both, patient and doctor will be benefitted from this online system. We face many difficulties while taking the appointment of doctors.

To reduce facing problem during doctor appointment in real time, I was supposed to make a web application which will be made a bridge between patient and doctors. This web application is Called 'Doctor-Dekhao' and it is basically an online based appointment system. By using this system, user can easily book the appointment date. This system is secured and user friendly for everyone.

This system will be directly operating by two type users. First one is patient or users, second is system admin. Registered users can see the doctors list and can take the appointment. System admin can see the appointment request from users, approve the appointment or discard the appointment to user. System admin can also add doctors, update doctor's information. The system maintenance is operated by system admin. General user can predict the disease by giving some polls answer.

1.2 Project Purpose

When patients take appointment in physical appearance, they have to face some common problems. Such as: doctor not available, waiting for a long time, traffic jam issue etc. To reduce these problems, online appointment system will be great for all types of patients. To ensure that patients can take appointment from doctors safely and easily.

1.3 Background

During covid-19 pandemic situation, all diagnostic centers were closed because of lockdown situation. That's why many patients who were suffering from major diseases can not consult with doctor. Many patients went worse level of health because of the following situation. Patients also suffer many difficulties when they go to diagnostic centers for appointment.

1.4 Benefits & Beneficiaries

After analyzing the purpose of project and background we have found many benefits. These are given below:

- Patients can take appointment easily & take the consultation.
- Patients can take emergency service in 24/7 if they need.
- Doctors can see the patients remotely.
- Patients can take suggestion from the system which doctor will be suitable for them.
- Patients can see when doctors are available or not. That's why they can take decision for taking appointment.
- If any user/patient predict his/her disease, then there will be given a section to predict the disease.

1.5 Goals

To build a project there should be reasons behind the scene. I have also goals to build this project. Basically, I have realized in next few years all types of services will merge into IT. Because, it reduce our complexity and enhance our productivity. By doing this project, I want to ensure that people will be benefitted from using this project. In this project, there is three stakeholders. They are:

- General User / Patient
- System Admin
- Doctor

Brief about the stakeholders are given below.

General User / Patient: In this system, registered user can see the doctors list, choice desired doctor and finally take the appointment from the empty slot. User also can be notified through email for his/her appointment.

System Admin: System admin can add doctor, remove doctor and update doctor info. System admin also can approve the appointment request which is sent by registered user. System admin maintenance the overall system.

Doctor: Every doctor will be notified when patient take the appointment. Doctor can see and consult their patients in their scheduled time.

1.6 Project Schedule

When a software / system is being developed, it has to maintain time schedule. I also try to maintain the time schedule for developing the system. I follow the SDLC (Software Development Lifecycle) while developing the system. It is known that SDLC contains planning, requirement analysis, system design, implementation, testing and maintenance phase. I tried my best to follow the SDLC pattern for my project scheduling.

1.6.1 Gantt Chart

Maintaining my project schedule, I used Gantt chart. Gantt chart is basically used for project scheduling. To obtain the maximum level of output, project scheduling is must. So, a Gantt chart for my project is created. It will show the total project scheduling.

Activities	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10	W-11	W-12	W-13	W-14	W-15	W-16
Planning	■	■														
Requirement Analysis			■	■	■	■										
System Design							■	■	■							
Implementation										■	■	■	■			
Testing														■	■	
Maintenance																■

1.6.2 Release Plan or Milestone

The release plan of entire system is given below

Activities	Duration in Week	Total Week
Brainstorming	Week 1	1
Problem Identification	Week 1, Week 2	2
Requirement Specification	Week 3, Week 4	2
Requirement Analysis	Week 5, Week 6	2
Design Specification	Week 7, Week 8	2
Database Design	Week 9	1
Client Side Implementation	Week 10, Week 11	2
Server Side Implementation	Week 12, Week 13	2
White Box Testing	Week 14	1
Black Box Testing	Week 15	1
Software Release	Week 16	1

Chapter 2: Software Requirement Specification

2.1 Functional Requirement

Functional Requirement are mandatory for any system/software. Basically, functional requirement is an explanation of the service that software must provide. Functional requirement is vary from software to software. It is captured in use case diagram. Functional requirement of my project is given with explanation.

2.1.1 User can login in system

Requirement ID	FR-01
Requirement Title	User can login in system
Description	Registered users of this system can login. Users have to go to the system/web-application browsing the URL. Then users should give input credentials to login the web-application.
Stakeholders	Admin, Doctor, Patients

2.1.2 Register as a valid user

Requirement ID	FR-02
Requirement Title	Registration and validation
Description	Users should be done by completing registration form to be an authorized user. Mainly, doctors and patients have to register to be authorized users.
Stakeholders	Doctor, Patients

2.1.3 Find Doctor

Requirement Id	FR-03
Requirement Title	Find Doctor
Description	Registered patients can find the doctors for him/her. Patients can find a doctor by searching the keywords. Such as: doctor name, specialization, disease name
Stakeholders	Patients

2.1.4 Taking appointment from doctor

Requirement Id	FR-04
Requirement Title	Taking appointment from doctor
Description	After selecting the doctor, patients can take appointments at their convenient time. There should be several time slots for each doctor.
Stakeholder	Patients

2.1.5 Approve appointment

Requirement Id	FR-05
Requirement Title	Approve appointment
Description	After requesting the appointment, the system admin will monitor it and approve the appointment time.
Stakeholder	Admin, Patients

2.1.6 Prescribe Medicine

Requirement Id	FR-06
Requirement Title	Prescribe Medicine
Description	During the consultation, the doctor gives the medic to the patients and the prescription will be sent to the patient's profile.
Stakeholder	Doctor, Patients

2.1.7 Suggestion for doctor finding

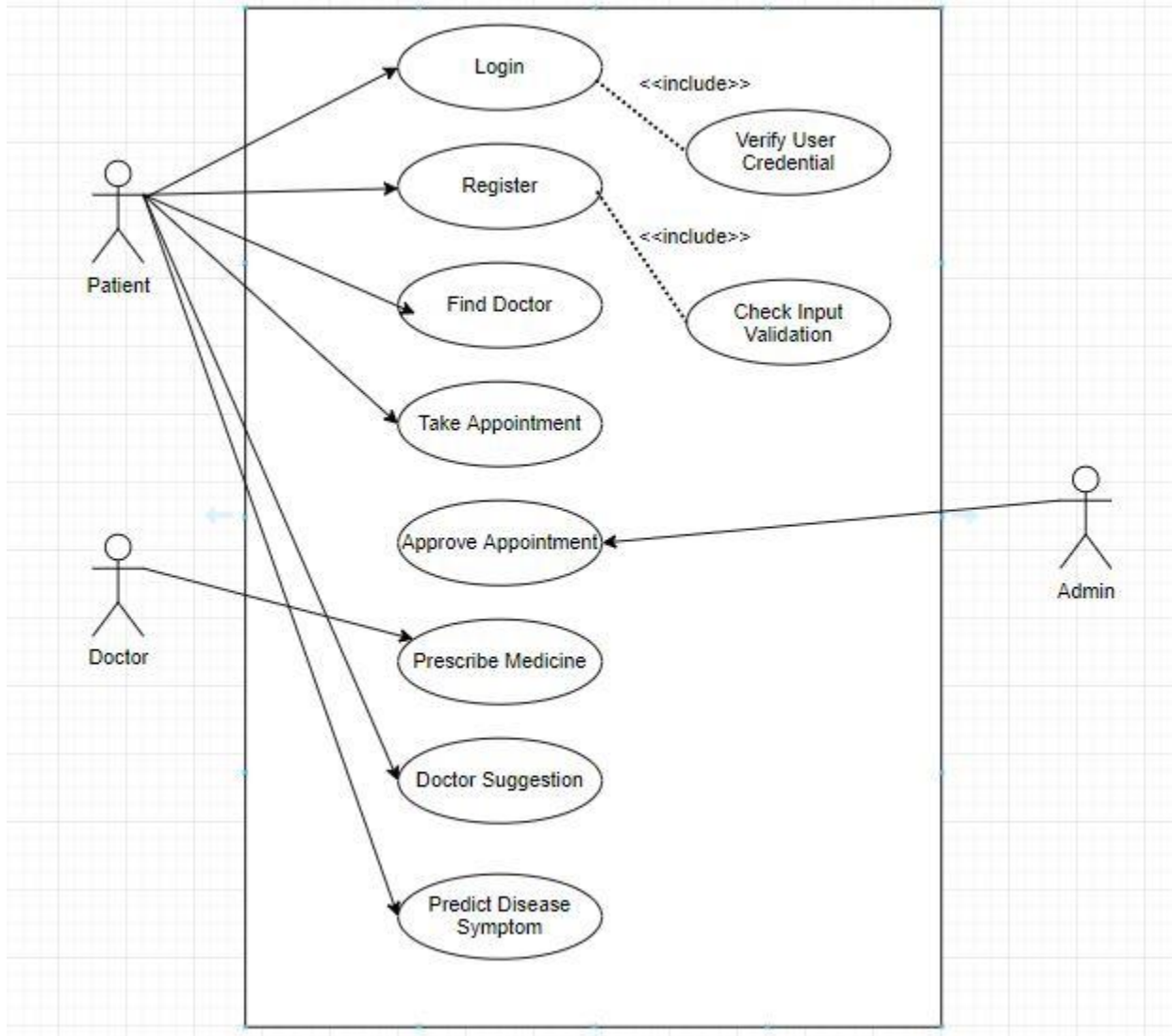
Requirement Id	FR-07
Requirement Title	Suggestion for doctor finding
Description	This feature is for those patients who cannot make enough decisions which specialist doctor should be appropriate for him/her to make an appointment. So, patients should answer several questions. After evaluation, some specialist doctors will be advised for the patients.
Stakeholder	Patients

2.1.8 Predict diseases symptoms

Requirement Id	FR-08
Requirement Title	Predict diseases symptoms
Description	Registered patients can figure out by using this feature. Patients have to answer some questions for specific diseases. Such as: Covid-19, Dengue Fever, Viral Fever, Food poisoning etc. after answering, feature will give the predicted output
Stakeholder	Patients

Chapter 3: Requirement Analysis

3.1 Use Case Diagram



3.1.1 User Login

Use Case Title	User Login
Goal	Access the system by the authorized users
Preconditions	<ul style="list-style-type: none">• User must be authorized• User must give valid email and password• Press login button
Success End Condition	User can enter the system
Failure End Condition	User becomes fail to enter the system
Description	Registered user or admin enter the system url. After that, give valid email and password to sign in the system.

3.1.2 User Register

Use Case Title	User Register
Goal	Input required information for being authorized
Preconditions	<ul style="list-style-type: none">• Give the required information• Give the valid data• Press login button
Success End Condition	User can be registered
Failure End Condition	User becomes fail to register the system
Description	User who will use the protected functionalities has to be done the register. To fulfill it user has to give some required data.

3.1.3 Find Doctor

Use Case Title	Find Doctor
Goal	Access the functionality by the authorized users
Preconditions	<ul style="list-style-type: none">• User must be authorized• User must be logged in
Success End Condition	User can use the functionality
Failure End Condition	User becomes fail to use the functionality.
Description	Registered user can easily find out doctors demand on their situation. But main condition to use this functionality is user has to be logged in this system.

3.1.4 Take Appointment

Use Case Title	Take Appointment
Goal	Access the system by the authorized users
Preconditions	<ul style="list-style-type: none">• User must be authorized• User must be logged in
Success End Condition	User can use the functionality
Failure End Condition	User becomes fail to use the functionality
Description	After selecting the doctor, patients can take appointments at their convenient time. There should be several time slots for each doctor.

3.1.5 Approve Appointment

Use Case Title	Approve Appointment
Goal	Approve the pending appointment by admin
Preconditions	<ul style="list-style-type: none">• Admin must be logged in
Success End Condition	Admin can approve the appointment condition
Failure End Condition	Admin becomes fail to approve the appointment
Description	After requesting the appointment, the system admin will monitor it and approve the appointment time.

3.1.6 Predict Diseases Symptoms

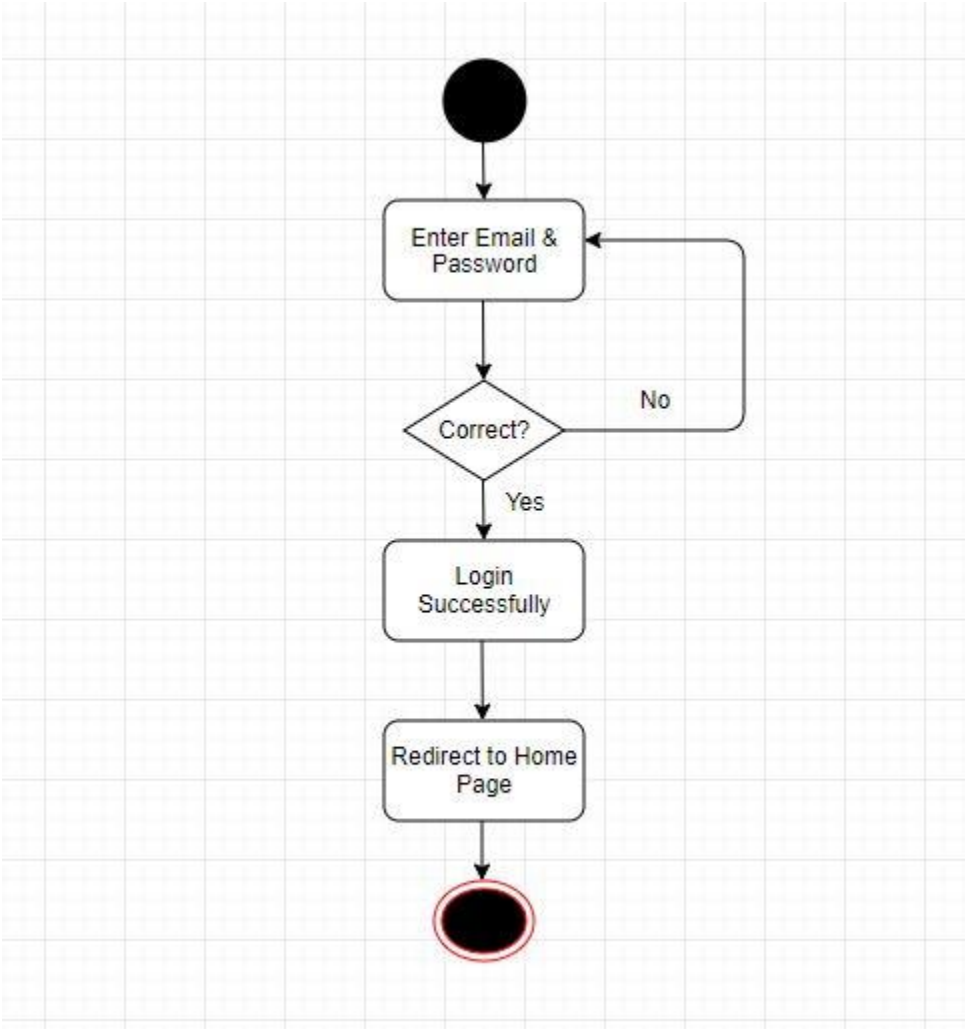
Use Case Title	Predict Diseases Symptoms
Goal	Identify the disease by answering some general questions
Preconditions	User should go the system through url
Success End Condition	User can use the functionality properly

Failure End Condition	User fails to use the functionality.
Description	Registered patients can figure out by using this feature. Patients have to answer some questions for specific diseases. Such as: Covid-19, Dengue Fever, Viral Fever, Food poisoning etc. after answering, feature will give the predicted output

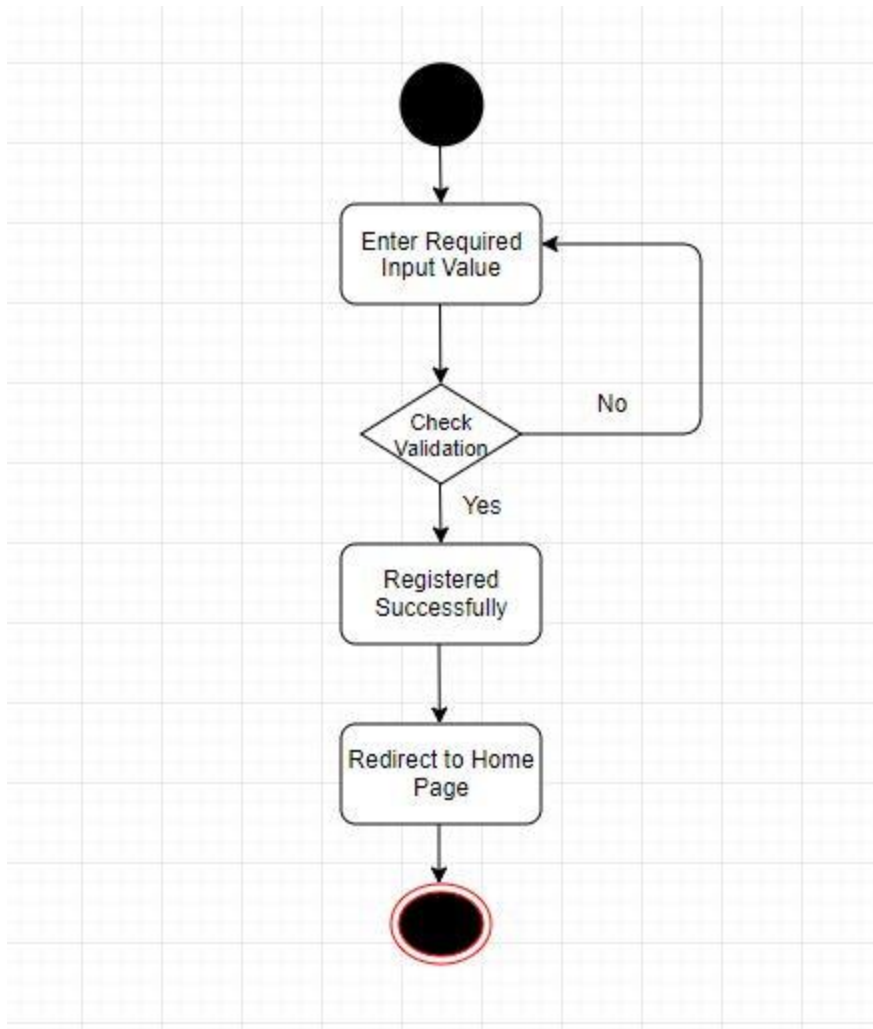
3.2 Activity Diagram

Activity diagram narrates the behavior of a system. We can find the answer of how the core functionalities of a system flows, how the data flows through the system by using activity diagram. Every system requires activity diagram. I have prepared activity diagram from our use case. All of these diagram are indicating the flow of the individual conditions of my project.

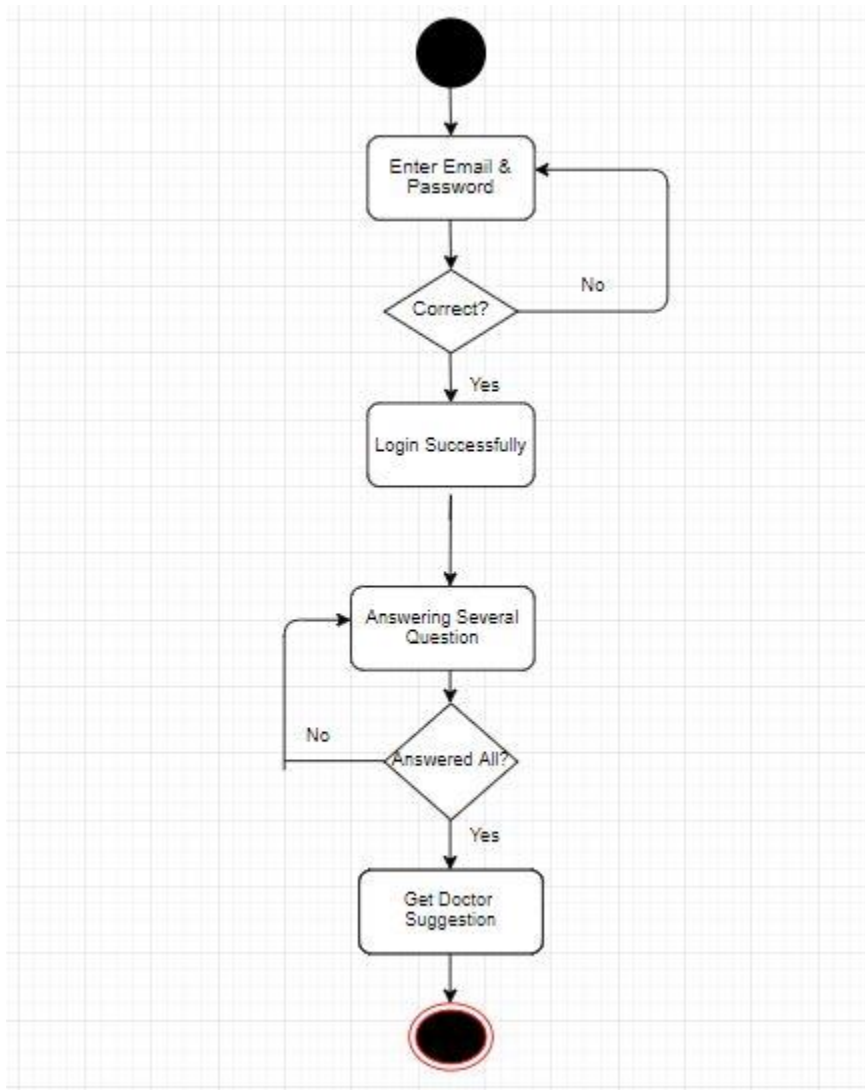
3.2.1 User Login



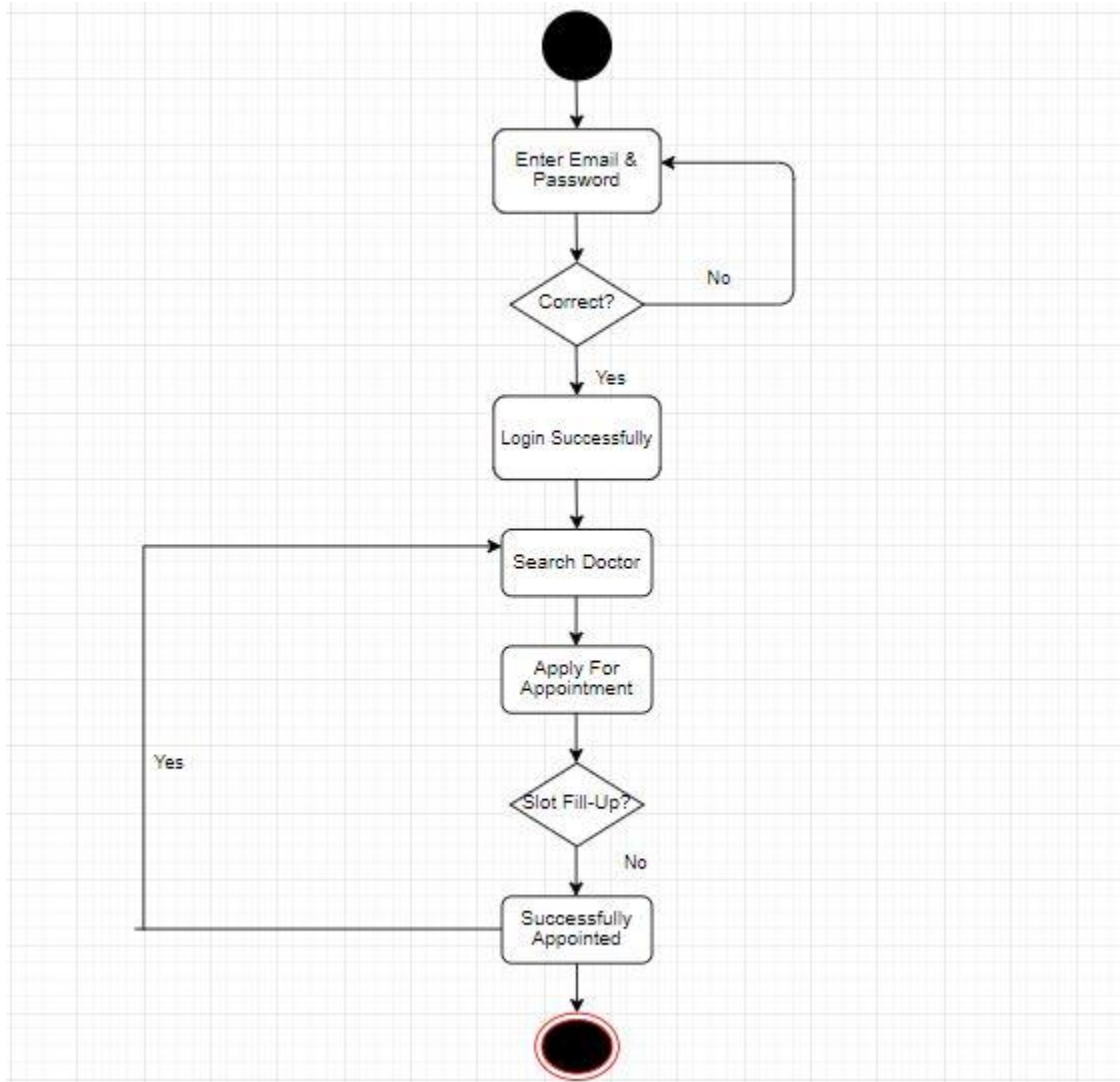
3.2.2 User Register



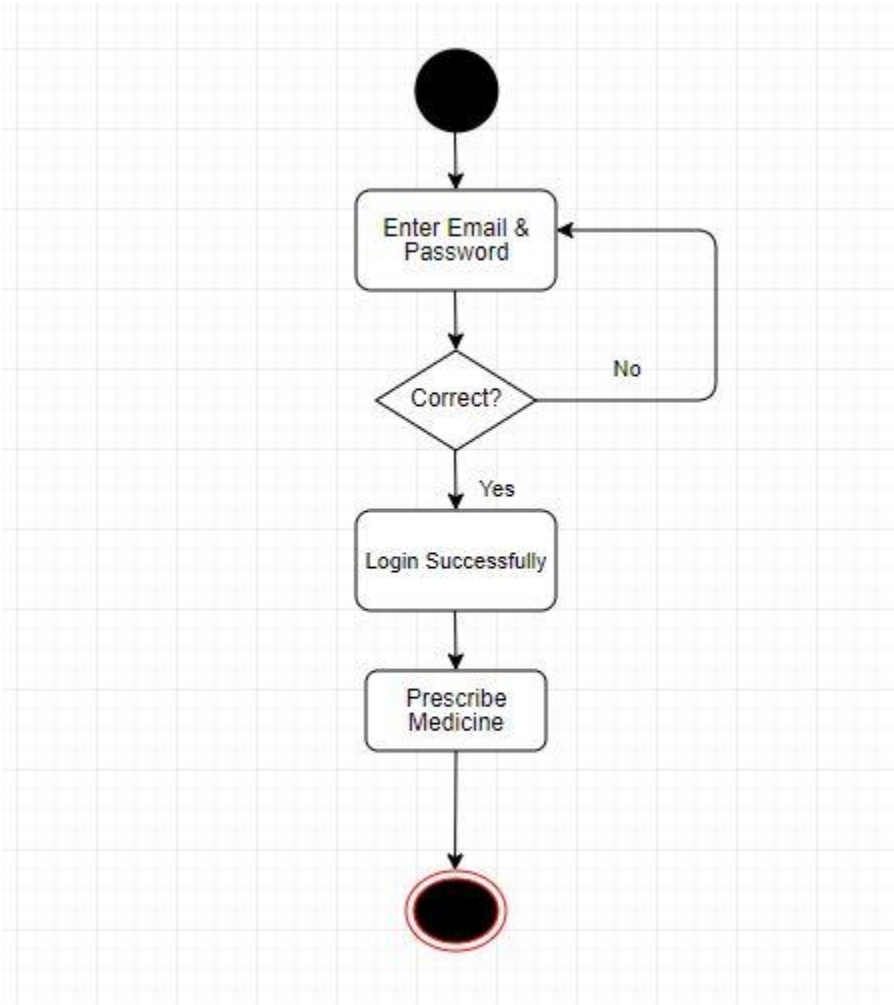
3.2.3 Find Doctor



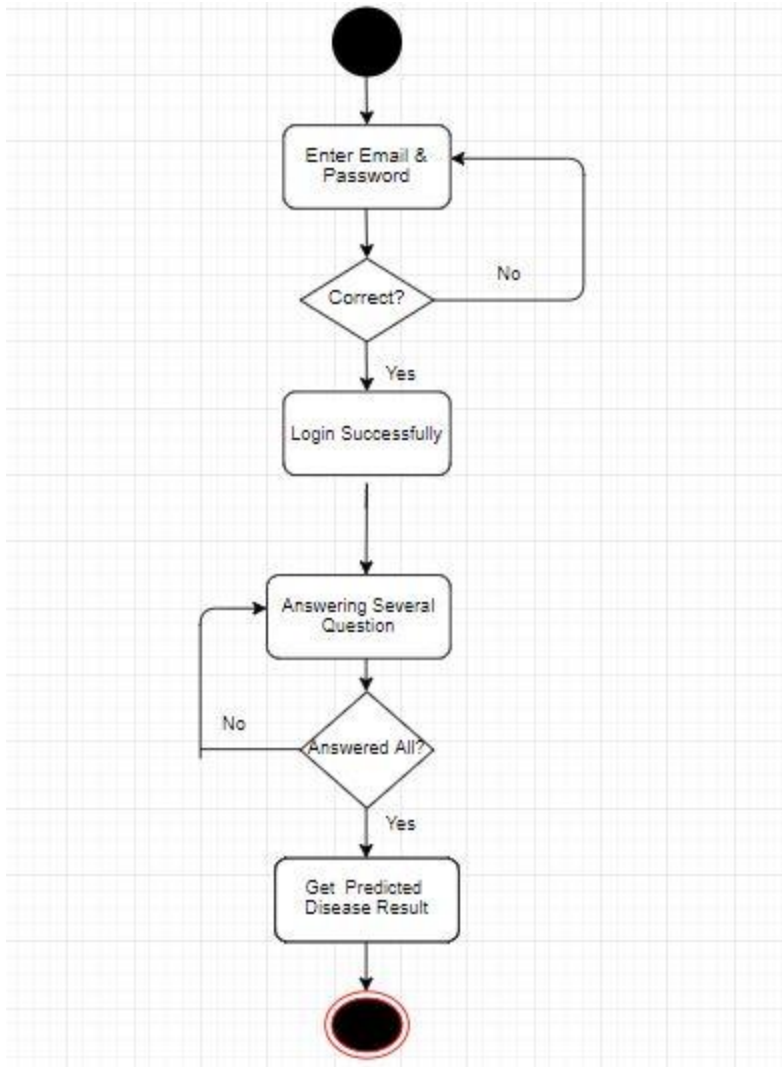
3.2.4 Take Appointment



3.2.5 Prescribe Medicine



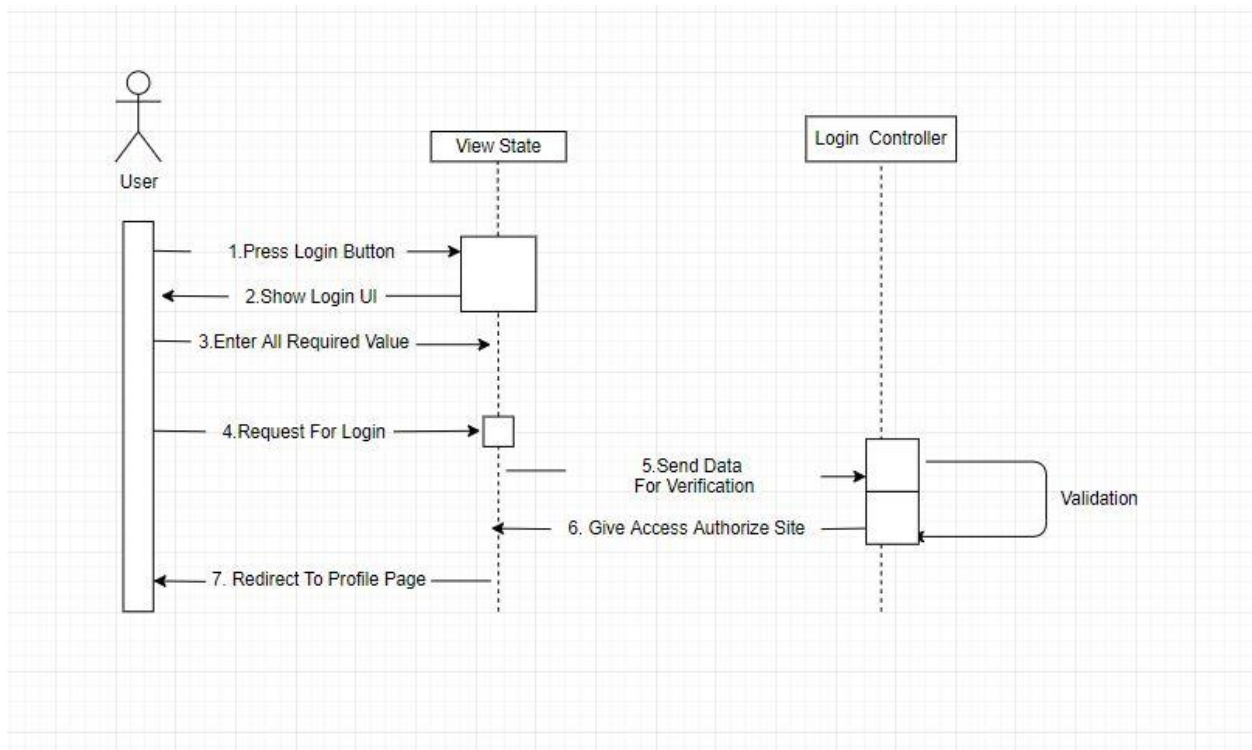
3.2.6 Predict Disease



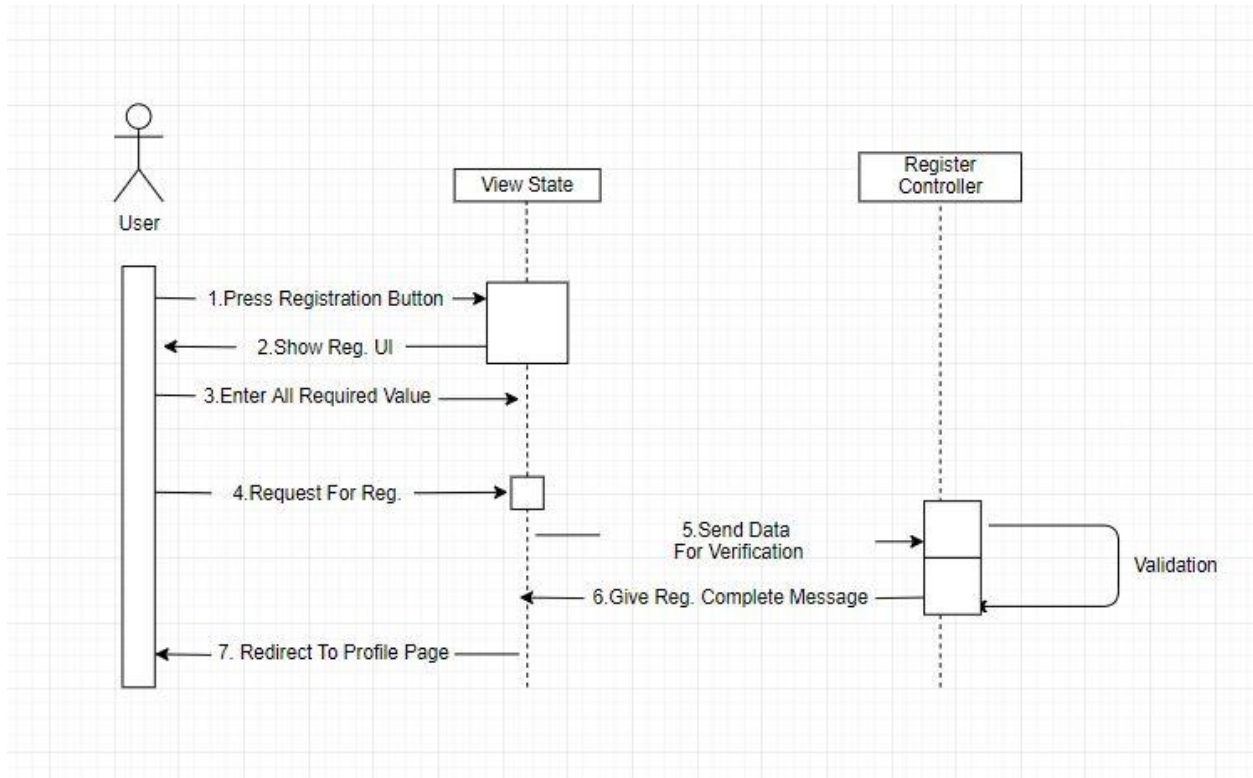
3.3 Sequence Diagram

Sequence Diagram depicts how the data flow in a system from function to function. Sequence Diagrams show elements as they inter-communicate with each other.

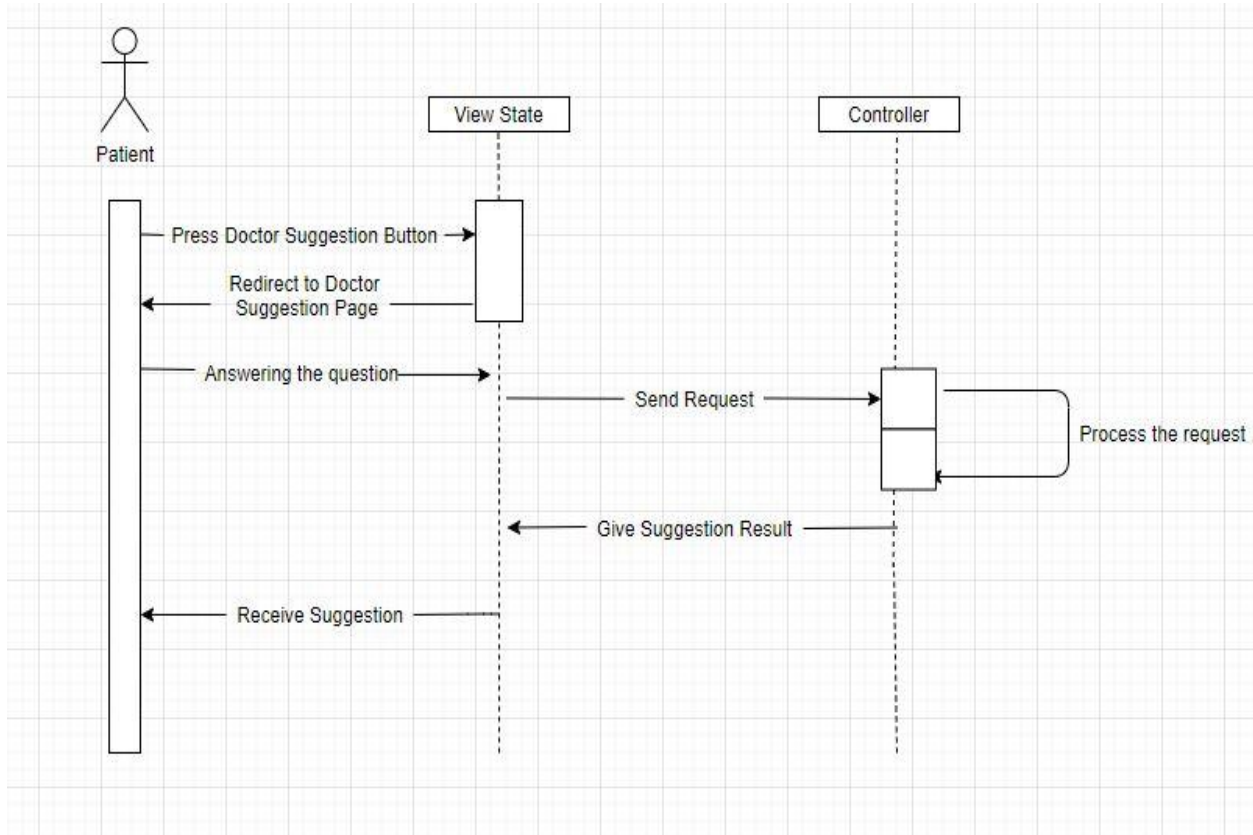
3.3.1 User Login



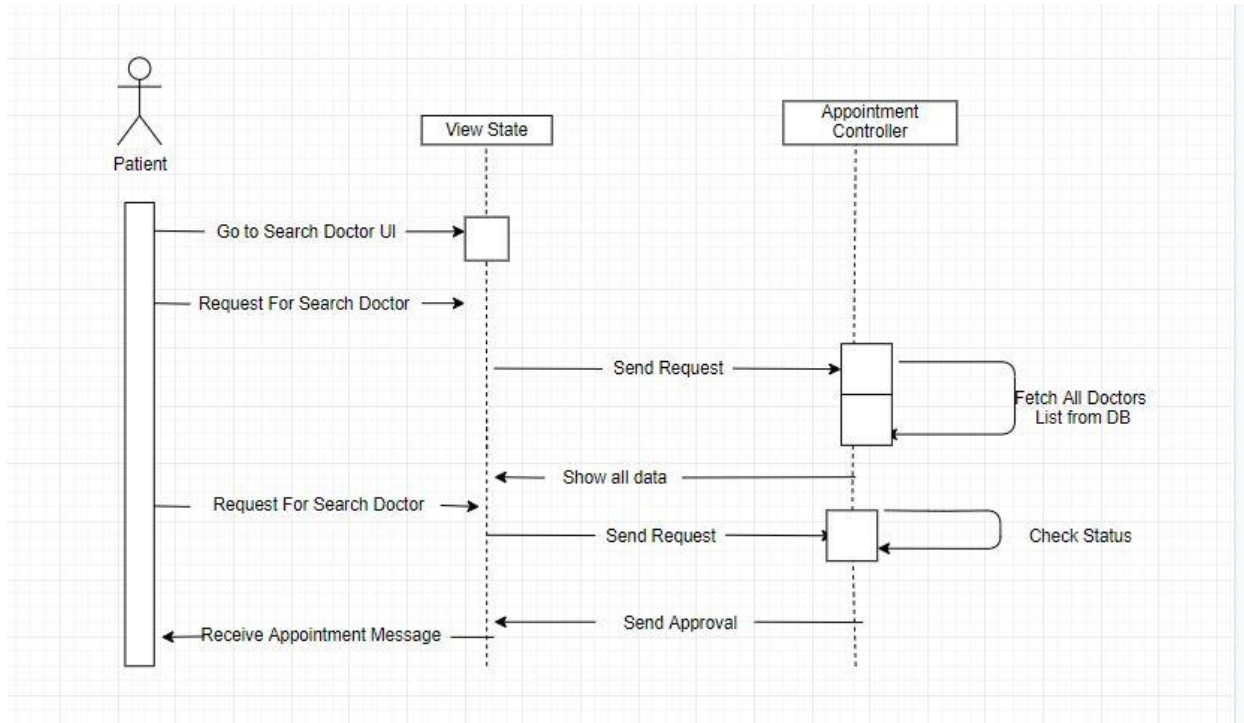
3.3.2 User Register



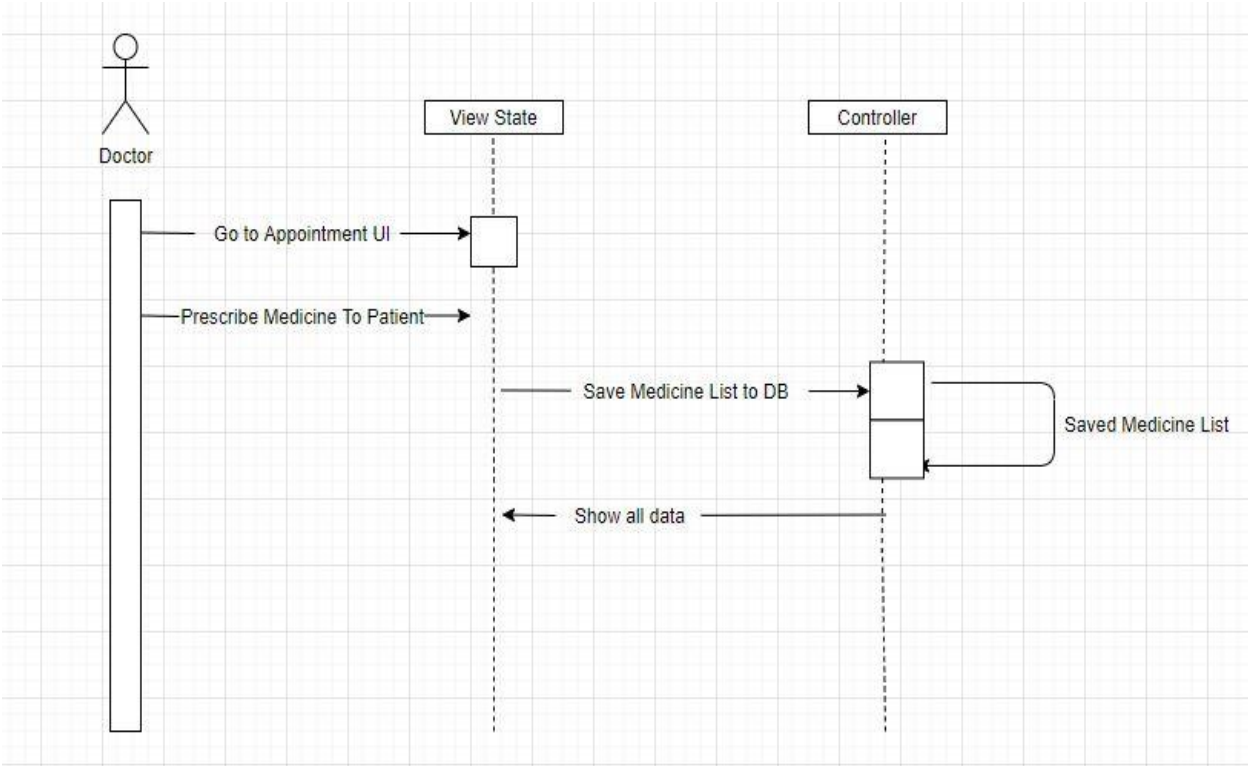
3.3.3 Find Doctor



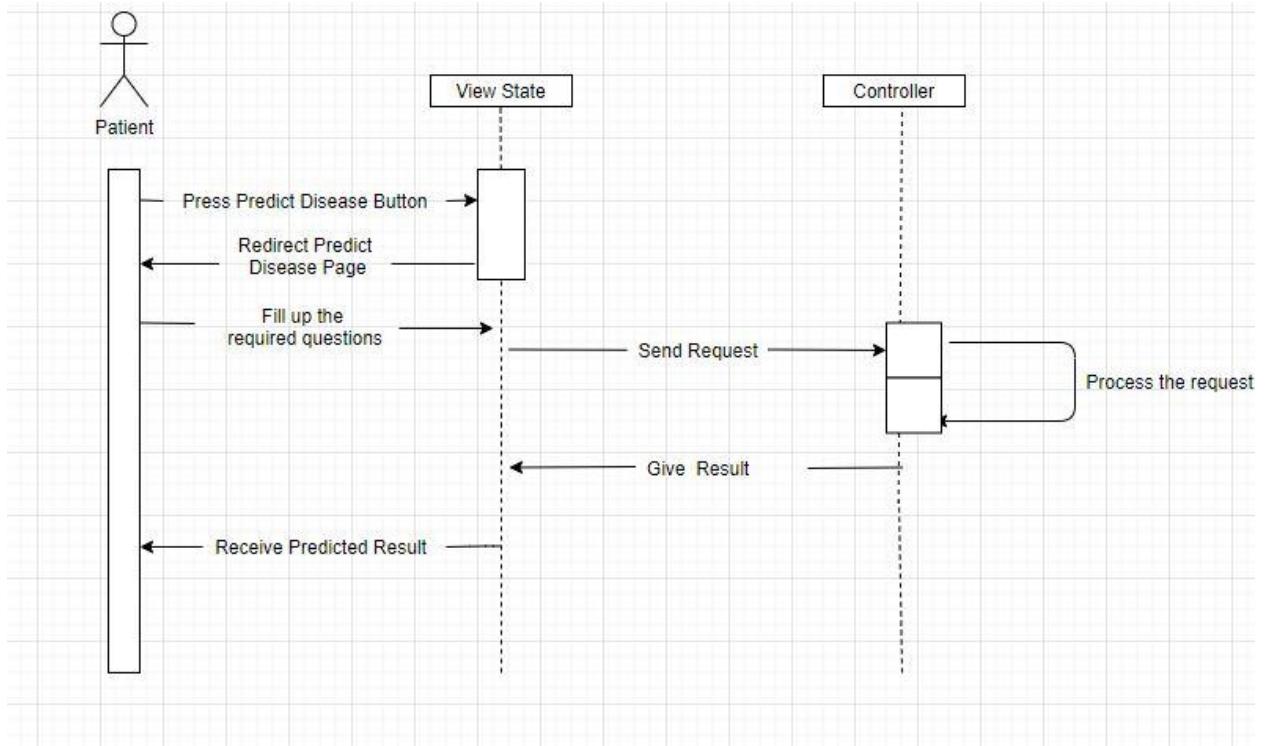
3.3.4 Take Appointment



3.3.5 Prescribe Medicine



3.3.6 Predict Disease



Chapter 4: System Design Specification

4.1. Development tools and technologies

To develop a software system development tools and technologies must be used. There are so many tools and technologies to build software system. Usage of tools and technologies varies from requirement specification, scalability, system complexity level etc. Developers choice the comfortable tools which are comfortable for them. To build my project I used the MERN (MongoDB, Express js, React js, Node js) stack. This technology stack covers both client side and server side.

4.2 User Interface Technology

As my project is built to web based application, so to build up the user interface I used React js library. React js is basically used to build single page application. This library is component based library. I also used Material UI for user interface.

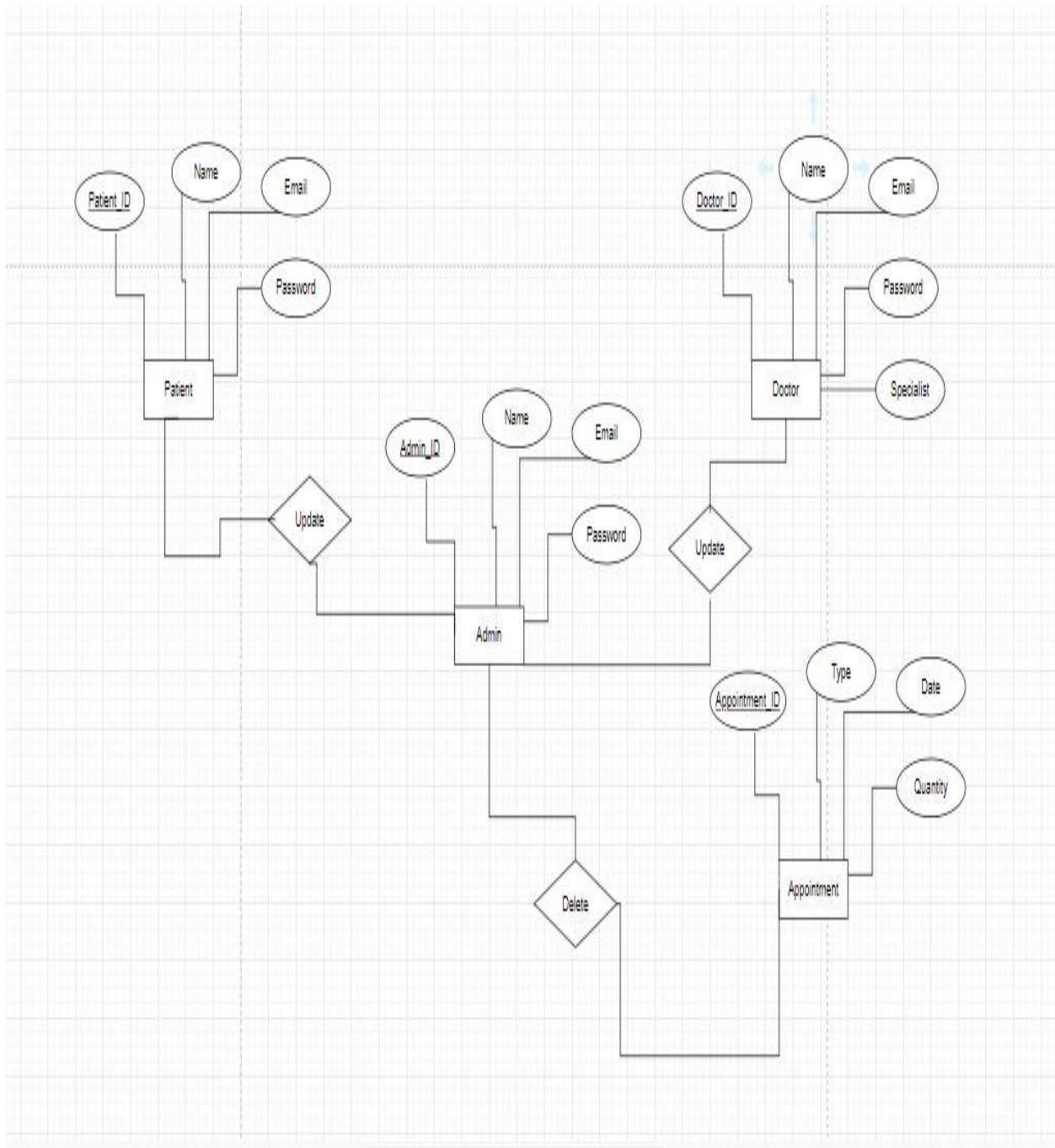
4.2.1 Programming Language

I have used JavaScript to build my project. Most interestingly development tools which are used on my project are also JavaScript based tools and technologies.

4.2.2 Integrated Development Environment

Integrated Development Environment or in short IDE is a software that provided many features for programmers to develop project. Developers use various IDE for their project. To build my project I have used Visual Studio Code (VS code) which is powered and organized by Microsoft.

4.3 ER Diagram



Chapter 5: System Test

5.1 Features Testing

Testing a system is essential and it also included as a phase of SDLC. To test features of system help to find out the bug, error. Also increase the scalability, user experience software system testing is done. There are many features are contained in a system. Every feature is essential and play crucial role indeed. So, to test features is necessary. I will test many features of my project and analyze the test report.

5.2 Testing Strategy

To test any system, there are some strategy for testing the process. Mainly developers use to test some feature which may have error or hacked. After that it should be reviewed by the test team leads. Different kinds of testing strategies can be performed according to the type of application system that need to be tested.

5.2.1 Test Approach

For testing entire system, tester has to take some approach. I am going to show the two testing approach.

- **Automation Testing**

By this technique, test engineers create testing scripts. After that, they use some testing tools to perform and analyze the features.

- **Manual Testing**

Manual testing is another technique to find out the bugs and errors. In this case, test engineers test manually the test cases and find out the bugs and errors.

5.3 Test Cases

When a system is developed, every feature of system is needed to be tested. With manual testing it is greatly needed to make test cases. A test case is a document, which has a set of test data, expected results developed for a particular test scenario to verify the feature. In this project, some test cases are created and also be testified the test result. I have prepared some test cases for testing some of features. Such as: login, registration, appointment booking etc.

5.3.1 Login

Sl No.	Test Case	Input	Expected Output	Actual Output
1	Email Check	Input without @	Invalid email	Email must have @
2.	Email Check	Numeric values	Invalid email	Email should be valid.
3.	Email Check	Blank	Invalid email	Should give email
4.	Password Check	Blank	Invalid password	Correct password should be given
5.	Password Check	Incorrect password	Invalid password	Correct password should be given

5.3.2 User Registration

Sl No.	Test Case	Input	Expected Output	Actual Output
1.	Type user name	Blank	Invalid text field	User name is required
2.	Type E-mail	Input without @	Invalid email	Email must have @
3.	Type Password	Password length is less than 6	Invalid password	Password length should be at least 6
4.	Re-type password	Not same as password	Does not match	Does not match with given password

5.3.3 Appointment Booking

Sl No.	Test Case	Input	Expected Output	Actual Output
1.	Appointment without login	Press appointment button	User should be logged in	Redirect to login page
2.	Appointment with login	Press appointment button	Redirect to appointment page	Redirect to appointment page

Chapter 6: User Manual

6.1 Login Page

User goes to login page through URL and then user has to give the credential to be logged in. User can also log in directly by his/her google account.

Login

E-Mail _____

Password _____

LOGIN

[NEW USER? THEN REGISTER](#)

OR,

[GOOGLE SIGN IN](#)



6.2 Registration Page

Before log in every user should register by giving some basic data. Such as: user name, email, and password. Then user can fulfil his/her registration.

Register

Your Name: _____

Type E-Mail _____

Password _____

Re-Type Password _____

REGISTER

[ALREADY REGISTERED? THEN LOGIN](#)



6.3 Select Appointment Date

After successfully log in, user can go to the appointment page and select the appointment date for user's comfortable date.



6.4 Confirm Appointment Booking

After selecting the date, user can choice his suitable appointment and confirm by fill up the appointment form.

Available Appointment Mon Dec 27 2021

<p>ENT</p> <p>6.00 PM- 7.00 PM</p> <p>20 Spaces Available</p> <p>BOOK APPOINTMENT</p>	<p>Orthopedic</p> <p>7.00 PM- 8.00 PM</p> <p>20 Spaces Available</p> <p>BOOK APPOINTMENT</p>	<p>Child Specialist</p> <p>6.00 PM- 7.00 PM</p> <p>25 Spaces Available</p> <p>BOOK APPOINTMENT</p>	<p>ENT</p> <p>6.00 PM- 7.00 PM</p> <p>20 Spaces Available</p> <p>BOOK APPOINTMENT</p>
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Chapter 7: Conclusion

7.1 Project Summary

I have learnt so many things during developing this project. I had to study about the health-tech sector in Bangladesh, how scope are seen in this sector. I also felt some difficulties when I was doing my project. More specifically, when I was doing software requirement analysis on my project I felt much difficulties.

To develop a full project is very much challenging for any student. But we also have to admit that, we learnt the whole process of SDLC (Software Development Lifecycle) while doing the project. How to gather requirement, then analysis the requirement, design the requirements, implement all of these by using development tools and technologies and test the features of the developed system all of things are learnt very deeply.

7.2 Scope of further development

Online doctor appointment systems will create a revolution in our country, if it is perfectly implemented. Already many of web applications are existing in our real world, but I think this type of application should be more reachable and more available to our people. Because we have lots of opportunities and responsibilities in the health care sector in Bangladesh. From the great aspect of opportunities I have selected to solve this problem into my academic project.

7.3 References

I have to acquire knowledge from various resources while developing my project. I could not develop properly if I could not gain knowledge from those sites. Definitely, I will mention those sites link as references.

- <https://www.youtube.com/c/LearnwithSumit>
- <https://www.youtube.com/c/anisulislamrubel>
- <https://www.w3schools.com/>
- <https://stackoverflow.com/>