Online Doctor Chamber
(A project for ICDDR, B)

Submitted by

Zinnatul Islam

171-35-1957

Department of Software Engineering

Daffodil International University

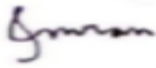**Supervised by**

Anwar Hossen

Lecturer (Senior Lecturer)

Department of Software Engineering

Daffodil International University

A project submitted in partial fulfillment of the requirement for the degree of Bachelor of Science in Software Engineering

APPROVAL

This project titled on **"Online Doctor Chamber"**, submitted by Zinnatul Islam (ID: 171-35-1957) to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to it is style and contents.

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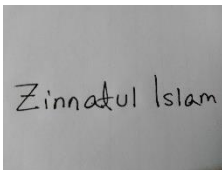**Professor Dr. Md. Nasim Akhtar**
Professor
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DECLARATION

It hereby declares that this project has been done by me under the supervision of **Mr. Md. Anwar Hossen**, Lecturer (Senior Scale), Department of Software Engineering, Daffodil International University. It also declared that neither this project nor any part of this has been submitted elsewhere for the award of any degree.

Zinnatul Islam

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Zinnatul Islam
ID: 171-35-1957
Batch: 22th
Department Of Software Engineering
Faculty of Science and Information Technology
Daffodil International University

Certified by:

30.1.21

\-

Md. Anwar Hossen
Lecturer (Senior Scale)
Department Of Software Engineering
Faculty of Science and Information Technology

ACKNOWLEDGEMENT

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Chapter 1
Introduction

1.1 Project Overview

Due to the corona pandemic we have been locked ourselves for too long. Therefore, we could not go to the hospital on time whenever we felt sick. We cannot get consultation from doctor whenever we feel sick. Therefore, a question may arise, how we can get consultation from a doctor. To solve this problem, we need a virtual environment to get consultation from a doctor.

1.2 Project Purpose

The main purpose of "**Online Doctor Chamber**" is to make an automation system which will be helpful for the current society. It will be a platform where patients can find doctors easily. They can make appointments from home. Doctors can easily create her/his appointments schedule. Doctors can easily create communication with patients through audio/video calls and finally can write prescriptions.

1.3 Project Goal

The goal of this project is to connect doctor and patient remotely. Patient can search for a doctor from the application. Patients can create an appointment with preferable time. Doctors can examine patient through video calling. After examining the patient doctor can prescribe the patient. Patient can pay doctor with bKash.

1.4 Benefits and Beneficiaries

From the application patient and doctor both get benefits. In corona situation patients cannot go to doctors and doctors do not have any patient to examine. So by using this application patients can easily find the specific doctor information. Patients can easily take appointment from the desired doctors. As everything is happening in online doctors and patients can feel safe in this pandemic. Doctor can easily communicate with the patients and save time.

1.5 Stakeholders

There are two type of user use this application (online doctor chamber). Doctor and patient are main user in our application.

1.5.1 Doctor

Doctors play a very major role in the system. They do a large number of activities after login the system. They can create many schedules for appointments. Easily can update her/his profile information. They can communicate with patients and write prescriptions.

1.5.2 Patient

Patients play another very major role in the system. They do a large number of activities after login the system. They can easily find specific doctors based on doctor name or hospital name. Easily can create appointments with doctors and show prescriptions that provide doctors.

Chapter 2

Software Requirement Specification (SRS)

In this chapter we specified about the business requirements, which SDLC we use, functional requirements, and non-functional requirements

2.1 Business requirements

Feature	Definition	Requirement shopping
Individual account	For doctors they need to use BMDC number to create account and for patients they need to use their mobile numbers.	
Pay with bKash	To create appointment patients need to pay specific amount via bKash	
Take appointment	Patients can take appointment for a specific time period of a doctor.	
Communication	Patients and doctor can communication between them through video call.	
Write prescription	After video calling with the patients doctor can write prescription for the patient.	
Secure payment and data	We need to secure the payment process and data in the application as there is some confidential data available in the application.	

2.2 SDLC model

In this project we used Agile model to complete the whole application. We used this model because we needed to communicate with the client in every process. After completing each modules we made sure if the module is okay or not. Based on the client review we some of

our functionality. As this project does not have any specific requirements so we had to use agile process to complete the project.
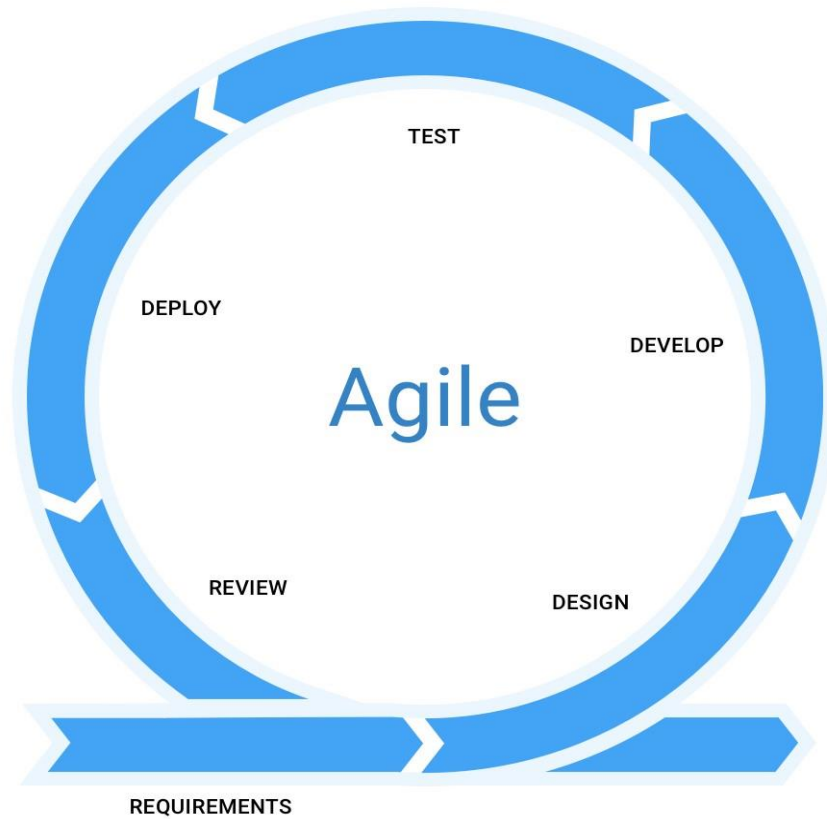
Figure 2. 1: SDLC model (Agile)

2.3

Functional requirements

Functional requirements refer to the function which is a must for the system. They are mandatory to run the application. There is no system without functional requirements. Now, we are going to discuss functional requirements for these projects.

FR ID	Description
FR 01	Create an doctor/patient account

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FR 02	Doctor Id verification
FR 03	Show doctor categories
FR 04	Search for doctors
FR 05	Create an appointment
FR 06	Pay with bKash
FR 07	Get appointment list
FR 08	Video calling between doctor and patient
FR 09	Create a prescription

2.3.1 User account

FR 01	Create an user account
Description	Unregistered users must complete their registration before accessing system functionality.

2.3

Stakeholder	Doctor, Patient

.2 Create an appointment

FR 02	Create an appointment
Description	Patients can take their appointments.
Stakeholder	Patient

2.3.3 Get appointment list

FR 03	Get appointment list
Description	Doctor can check daily appointment list
Stakeholder	Doctor

2.3.4 Video calling between doctor and patient

FR 04	Video calling between doctor and patient

Description	
	Doctors and patients can communicate with each other through the system providing channel.
Stakeholder	Doctor, Patient

2.3

.5 Pay with bKash

FR 05	Pay with bKash
Description	By using an online payment method which is now available in Bangladesh, patients can pay their fees.
Stakeholder	Patient

2.3.6 Create a prescription

FR 06	Create a prescription
Description	After conversion, the doctor will prescribe the patient and the prescription add in the patient profile.
Stakeholder	Doctor, Patient

2.3.7 Show doctor categories

FR 07	Show doctor categories
Description	Doctors will provide his or her specialist area as his or her category. That help patient to find the appropriate doctor for his or her problem

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Stakeholder	Patient

.8 Search for doctors

FR 08	Search for doctors
Description	Patients can search doctors on the basis of doctor Categories, Name and Hospital Name.
Stakeholder	Patient

2.3.9 Doctor Id verification

FR 09	Doctor Id verification
Description	In this position the admin verified the doctor based on his or her doctor government license id .
Stakeholder	Admin

2.4 Non-Functional requirements

NFR ID	**Description**
NFR 01	Performance
NFR 02	User sensitive data will disappear from others

2.3

NFR 03	The system must be available 24x7
NFR 04	Hardware
NFR 05	Response time
NFR 06	Fault Tolerance
NFR 07	Maintenance
NFR 08	Security

2.4.1 Performance

NFR 01	Request and response will appear within a second
Description	This is a mobile application and the responses are fetch from API.
Stakeholder	Doctor, patient

2.4.2 User sensitive data will disappear from others

NFR 02	User sensitive data will disappear from others
Description	System will be designed as per requirement so that it does not harm any human user.

Stakeholder	Doctor, patient

2.4.3 Reliability and Availability

NFR 03	The system must be available 24x7
Description	The system must be available 24 hours a
	day. And it must be updated regularly
Stakeholder	N/A

2.4.4 Hardware

NFR 04	Hardware
Description	Smartphones Android and iOS.
Stakeholder	N/A

2.4.5 Response time

NFR 05	Response time
Description	As much as fast the internet and the device capacity
Stakeholder	N/A

2.4.6 Fault Tolerance

NFR 06	Always updated the system
Description	If any problem occurs, then admin will show zero tolerance and fix it as soon as possible.
Stakeholder	System Admin

2.4.7 Maintenance

NFR 07	
	The system helps to update any Information in any time
Description	The admin changes or updates any information in any situation.
Stakeholder	System Admin

2.4.8 Security

NFR 08	
	Secured the application
Description	For authenticate a user we used JSON Web Token (JWT). In this way non authenticated person cannot request any functionality through the application.
Stakeholder	Doctor and patient

Chapter 3

System Analysis

In this chapter we showed the use case diagrams, use case description, activity diagrams, sequence diagrams of the Online Doctor Chamber.

3.1 Use Case Diagram

In these diagrams we showed the overall process of the doctor and patient including login, registration, appointment, scheduling, prescription, communication etc. We have showed both of the diagrams here and the use case description is down below. **3.1.1 Doctor**
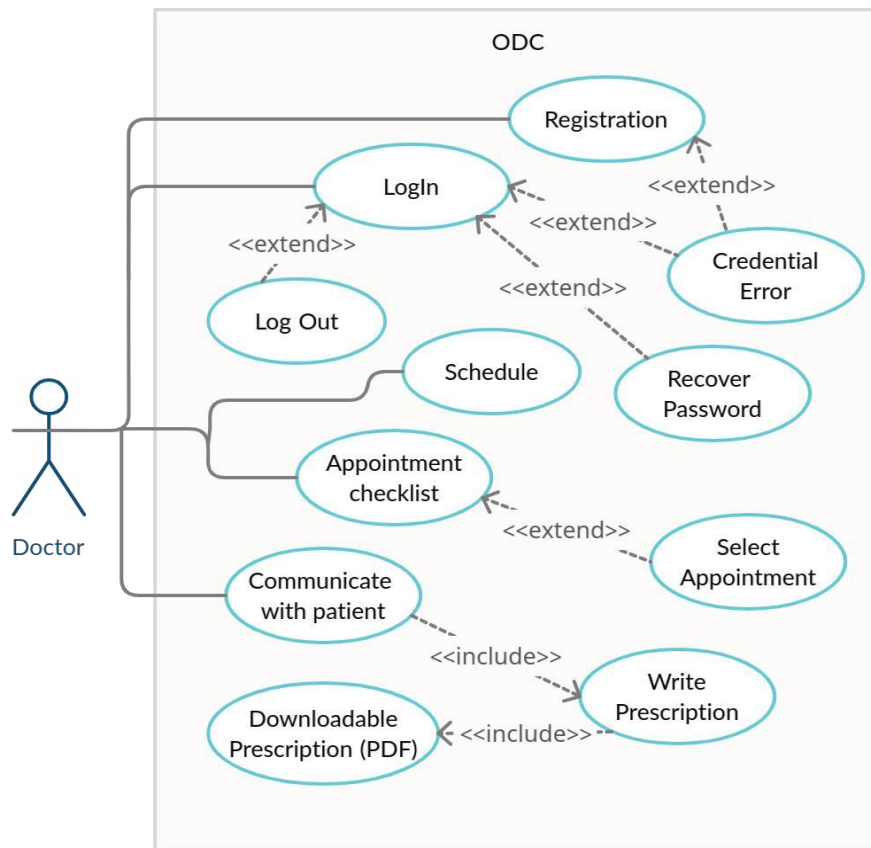
Figure 3. 1: Use Case Diagram for Doctor

3.1.2 Patient
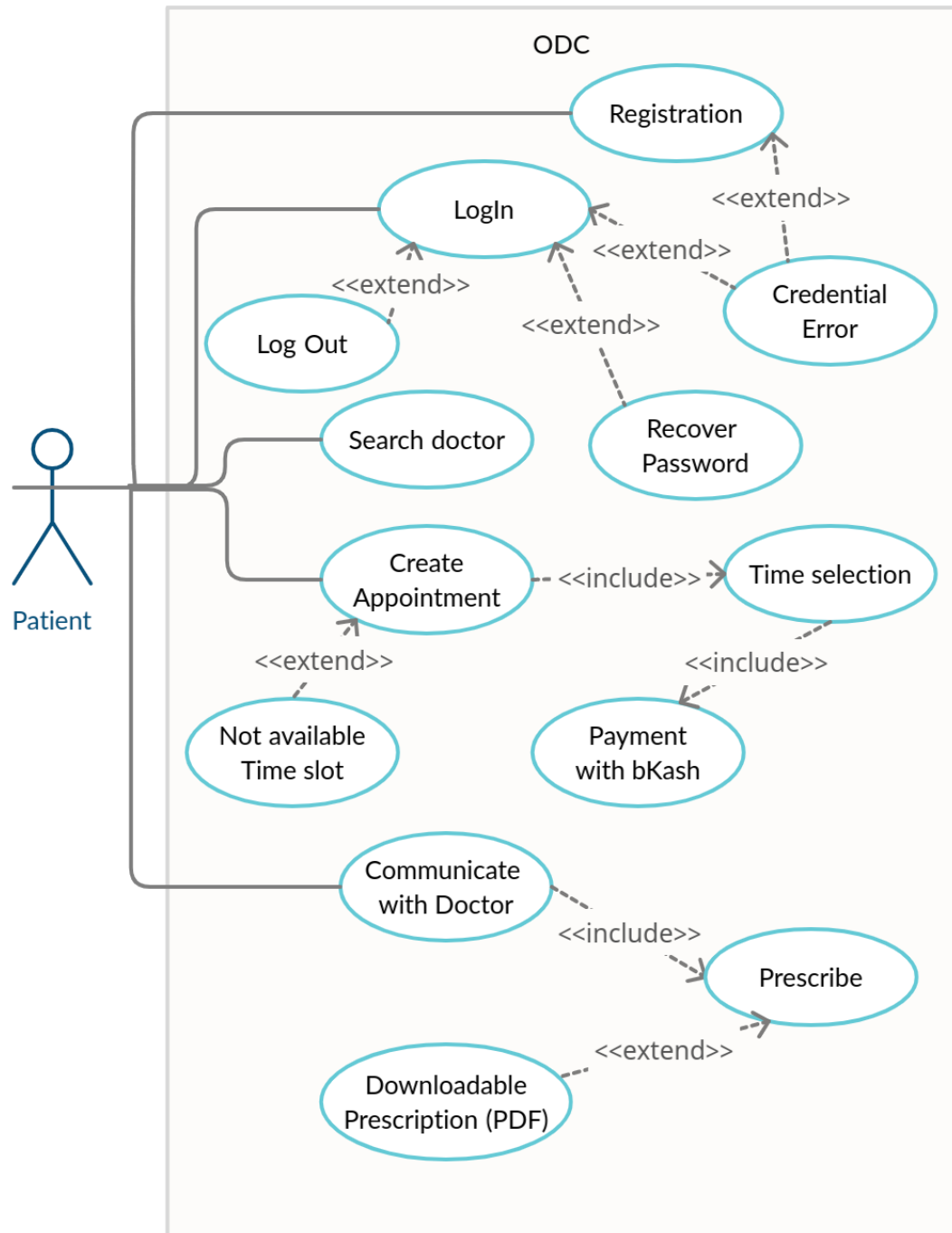
Figure 3. 2: Use Case Diagram for Patient

3.2 Use Case Description

3.2.1 Registration with token based authentication for doctor

Use Case	Registration with token based authentication.
Goal	Doctors will be able to login into the system.
Predictions	The doctor has to fill up the registration form.
Success end condition	The doctor gets access to the login page.
Failed end condition	Has to fill up the registration for again with correct information.
Primary actors: **Secondary actors:**	Doctor Super Admin
Trigger	The system is ready for login.

Description	Step	Action
	1	Fill up the registration form properly.
	2	Doctors will be able to login into the system.

Alternative Flows	Step	Branching Action
	1	Registration form may not fill up properly.

	2	System may take time to load.
Quality Requirements	**Step**	**Requirement**
	1	Has to fill up each and every detail.

3.2.2 Login for Registered Doctor

Use Case	Login for Registered Doctor	
Goal	Doctors will get access to the system.	
Predictions	The doctor has to have the bmdcId and password.	
Success end condition	The doctor gets access to the system.	
Failed end condition	Has to get the authorization again to have accessing credentials.	
Primary actors:	Doctor	
Secondary actors:	Super Admin	
Trigger	System is accessed by the doctor.	
Description	**Step**	**Action**
	1	Input username and password.

	2	System gives access.
Alternative Flows	**Step**	**Branching Action**
	1	Username or password can be forgotten.
	2	Unauthorized person may try to login.
Quality Requirements	**Step**	**Requirement**
	1	Two step authentication.
	2	Account recovery.

3.2.3 Check Appointment List

Use Case	Check Appointment List
Goal	Doctors will be able to check the list of appointments made by the patients.
Predictions	By checking the appointment list the doctor calls the patient one by one.
Success end condition	The doctor calls a patient and checks the remaining patients for a day.

Failed end condition	The patient may not receive the call on time.	
Primary actors: **Secondary actors:**	Doctor Super Admin	
Trigger	Doctor calls the patient.	
Description	**Step**	**Action**
	1	Doctor will check the appointment list.
	2	Doctors will call the patients according to the appointment list.
Alternative Flows	**Step**	**Branching Action**
	1	Patient may not receive the call.
	2	The call may be disconnected because of poor internet speed.
Quality Requirements	**Step**	**Requirement**

	1	
		Doctor has to maintain the serial of the appointment list.

3.2.4 Select Appointment

Use Case	Select Appointment
Goal	Doctors will be able to check single appointments made by the patients.
Predictions	By checking the appointment the doctor calls the patient.
Success end condition	The doctor calls a patient and checks the remaining patients for a day.
Failed end condition	The patient may not receive the call on time.
Primary actors:	Doctor
Secondary actors:	Super Admin
Trigger	Doctor calls the patient.

Description	Step	Action

	1	Doctor will check the appointment.
	2	Doctor will call the patient according to the appointment.
Alternative Flows	**Step**	**Branching Action**
	1	Patient may not receive the call.
	2	The call may be disconnected because of poor internet speed.
Quality Requirements	**Step**	**Requirement**
	1	Doctor has to maintain the serial of the appointment.

3.2.5 Conversation with patients

Use Case	Conversation with patients
Goal	Doctors will be able to prescribe about a patient.
Predictions	The doctor has to make a prescription for a patient if needed.

Success end condition	The doctor makes a prescription and sends it to the patient.	
Failed end condition	Doctor has to make a prescription again.	
Primary actors:	Doctor	
Secondary actors:	Super Admin	
Trigger	A prescription is made by the doctor for the patient.	
Description	Step	Action
	1	Input the required prescription for a patient.
	2	Send it to the patient.
Alternative Flows	Step	Branching Action
	1	System may crash because of the internet.
	2	Doctors may make a mistake by pressing the send button before making the prescription.

Quality Requirements	Step	Requirement
	1	The prescription has to contain the detailed information of the patient.

3.2.6 Write prescription

Use Case	Write prescription
Goal	Doctors will be able to write a prescription
Predictions	The doctor has to make a prescription for a patient.
Success end condition	The doctor makes a prescription and sends it to the patient.
Failed end condition	Doctor has to make a prescription again.
Primary actors:	Doctor
Secondary actors:	Super Admin
Trigger	A prescription is made by the doctor for the patient.

Description	Step	Action

	1	Input the required prescription for a patient.
	2	Send it to the patient.
Alternative Flows	**Step**	**Branching Action**
	1	System may crash because of the internet.
	2	Doctors may make a mistake by pressing the send button before making the prescription.
Quality Requirements	**Step**	**Requirement**
	1	The prescription has to contain the detailed information of the patient.

3.2.7 Log Out for Registered Doctor

Use Case	Log Out for Registered Doctor
Goal	Doctor can log out of their account
Predictions	Doctor is logged into the system
Success end condition	Doctor logs out of their dashboard

Failed end condition	Cannot access system	
Primary actors:	Doctor	
Secondary actors:	Super Admin	
Trigger	Doctor click on the "LogOut" button	
Description	**Step**	**Action**
	1	Doctor clicks on the "LogOut" button
	2	Member gets log out of the system
Alternative Flows	**Step**	**Branching Action**
	1	Cannot access the system
Quality Requirements	**Step**	**Requirement**
	1	N/A

3.2.8 Registration with token based authentication for patient

Use Case	Registration with token based authentication
Goal	Patients will be able to login into the system.

Predictions	The patient has to fill up the registration form.
Success end condition	The patient gets access to the login page.
Failed end condition	Has to fill up the registration for again with correct information.
Primary actors:	Patient
Secondary actors:	Super Admin
Trigger	The system is ready for login.

Description	Step	Action
	1	Fill up the registration form properly.
	2	Patients will be able to login into the system.

Alternative Flows	Step	Branching Action
	1	Registration form may not fill up properly.
	2	System may take time to load.

Quality Requirements	Step	Requirement

	1	Has to fill up each and every detail.

3.2.9 Login for Registered patients

Use Case	Login for Registered patients
Goal	Patients will get access to the system.
Predictions	The patient has to have the username and password.
Success end condition	The patient gets access to the system.
Failed end condition	Has to get the authorization again to have accessing credentials.
Primary actors: Secondary actors:	Patient Super Admin
Trigger	System is accessed by the patient.

Description	Step	Action
	1	Input bangladeshi phone number and password.
	2	System gives access.

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Alternative Flows	Step	Branching Action
	1	Username or password can be forgotten.
	2	Unauthorized person may try to login.
Quality Requirements	Step	Requirement
	1	Two step authentication.
	2	Account recovery.

3.2.10 Search Doctor List

Use Case	Check Doctor List
Goal	Patients will be able to check the list of available doctors
Predictions	By checking the doctor list the patient can view doctor information.
Success end condition	The patient views doctor information.
Failed end condition	The patient may not view expected information

Primary actors:	Doctor	
Secondary actors:	Super Admin	
Trigger	Patient view doctor information	
Description	**Step**	**Action**
	1	Patient will check the doctor list.
	2	Patient view expected doctor information
Alternative Flows	**Step**	**Branching Action**
	1	Patient may not view expected doctor information
Quality Requirements	**Step**	**Requirement**
	1	N/A

3.2.11 Create appointment

Use Case	Create appointment

Goal	Patients will be able to make appointments against the doctors.
Predictions	Patients are successful to make appointments.
Success end condition	Patients make appointments.
Failed end condition	The patient may not get the available schedule of a doctor and is unable to make the appointment.
Primary actors: Secondary actors:	Patient Super Admin
Trigger	Appointment is made in the expected time schedule..

Description	Step	Action
	1	Patients will check the available doctors.
	2	Patients will make appointments of the desired doctor.
Alternative Flows	Step	Branching Action

	1	Patients may not find the available schedule of a doctor.
	2	Patients may not find the desired doctor.
Quality Requirements	**Step**	**Requirement**
	1	The patient has to be available on the scheduled time.

3.2.12 Communicate with doctors

Use Case	Communicate with doctor
Goal	Patients will be able to communicate with doctors by voice/video calling. Patients will be able to see the prescription that has been made by the doctor.
Predictions	The patient communicates with the doctor and gets the prescription that has been made by the doctor.
Success end condition	The patient has got his/her prescription after consultancy.
Failed end condition	The patient may have poor internet speed that will be interrupted at the time of voice/video calling. The doctor forgot to make a prescription.

Primary actors:	Patient	
Secondary actors:	Super Admin	
Trigger	The patient can see the prescription.	
Description	Step	Action
	1	After consultancy with the doctor the patient will get a prescription.
	2	Download the PDF of the prescription.
Alternative Flows	Step	Branching Action
	1	System may crash because of the internet.
Quality Requirements	Step	Requirement
	1	The patient has to be able to get the prescription in PDF format.

3.2.13 View prescription

Use Case	View prescription

Goal	Patient will be able to view a prescription
Predictions	The patient has to view the prescription
Success end condition	The patient views the prescription that provide the doctor
Failed end condition	Patient has to view the prescription again.
Primary actors:	Patient
Secondary actors:	Super Admin
Trigger	A prescription view by the patient.

Description	Step	Action
	1	Click view button and view prescription

Alternative Flows	Step	Branching Action
	1	System may crash because of the internet.

Quality Requirements	Step	Requirement

	1	
		The prescription has to contain the detailed information of the patient.

3.2.14 Log Out for Registered Patient

Use Case	Log Out for Registered Patient	
Goal	Patient can log out of their account	
Predictions	Patient is logged into the system	
Success end condition	Patient logs out of their dashboard	
Failed end condition	Cannot access system	
Primary actors: Secondary actors:	Patient Super Admin	
Trigger	Patient click on the "LogOut" button	
Description	**Step**	**Action**
	1	Patient clicks on the "LogOut" button
	2	Member gets log out of the system
Alternative Flows	**Step**	**Branching Action**

	1	Cannot access the system
Quality Requirements	**Step**	**Requirement**
	1	N/A

3.3 Activity Diagram

3.3.1 Doctor

3.3.1.1 Activity Diagram for Registration

This figure represents the registration part of the Online Doctor Chamber.
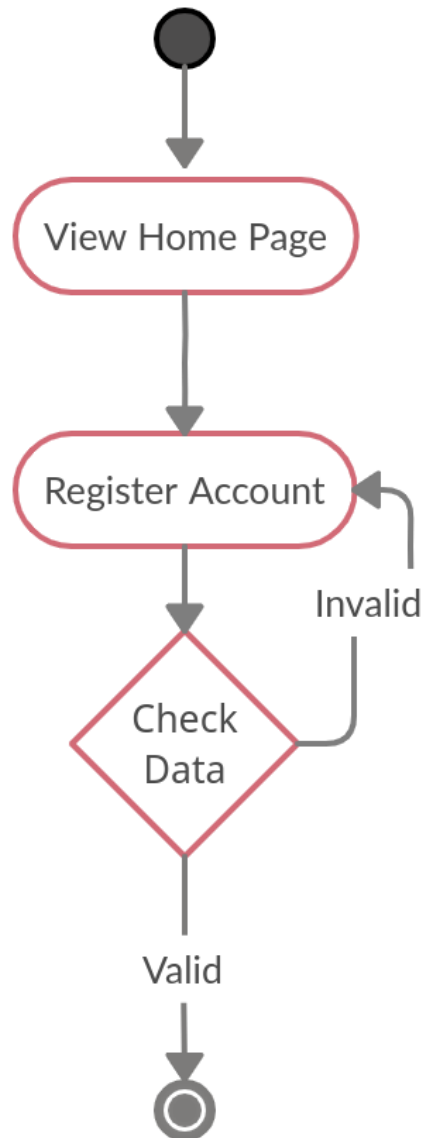

Figure 3. 3: Activity Diagram for Registration

3.3.1.2 Activity Diagram for Log In
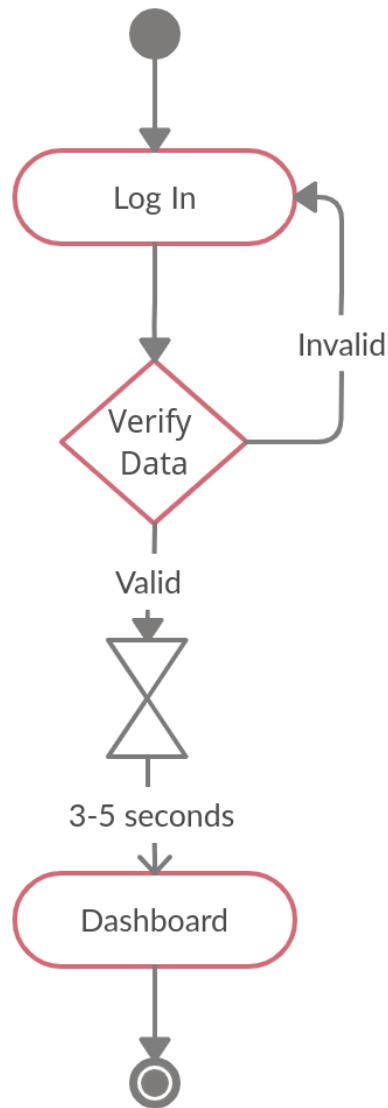This figure represents the login part of the Online Doctor Chamber.

Figure 3. 4: Activity Diagram for Login

3.3.1.3 Create Schedule
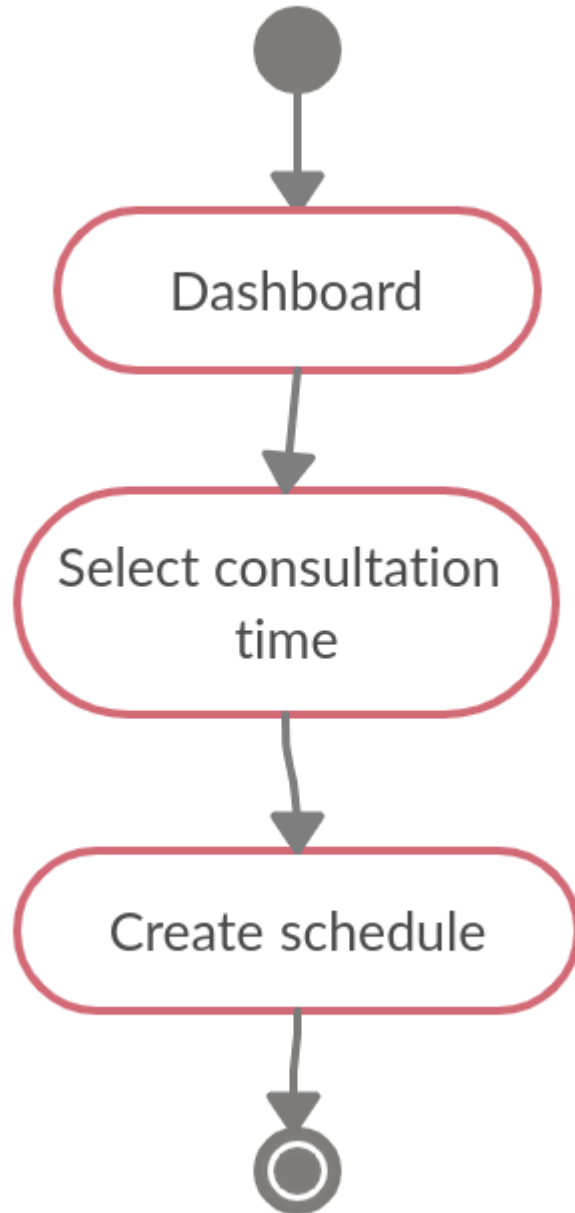This figure represents the appointment part of the patients

Figure 3. 5: Create schedule

3.3.1.4 Check appointments list for doctor
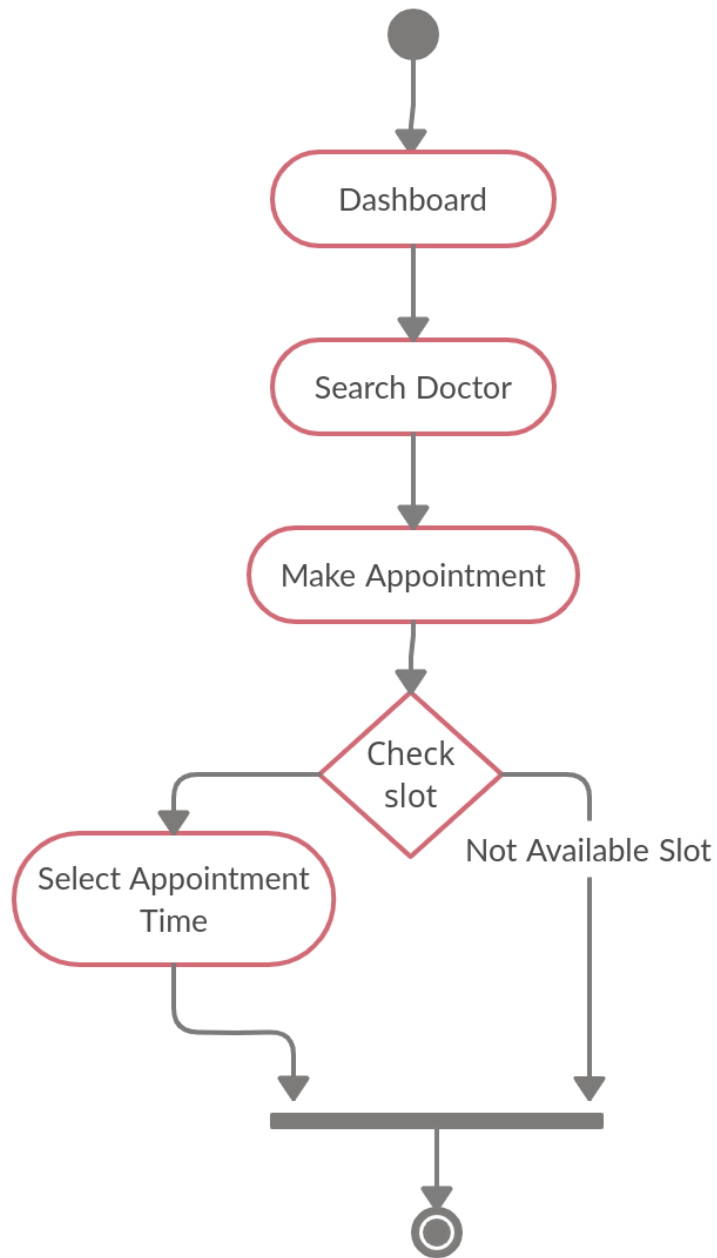This figure represents the appointment part of the patients

Figure 3. 6: Check appointments list for doctor

3.3.1.5 Communication between Doctor and Patient
This figure represents the communication part between doctor and patients.
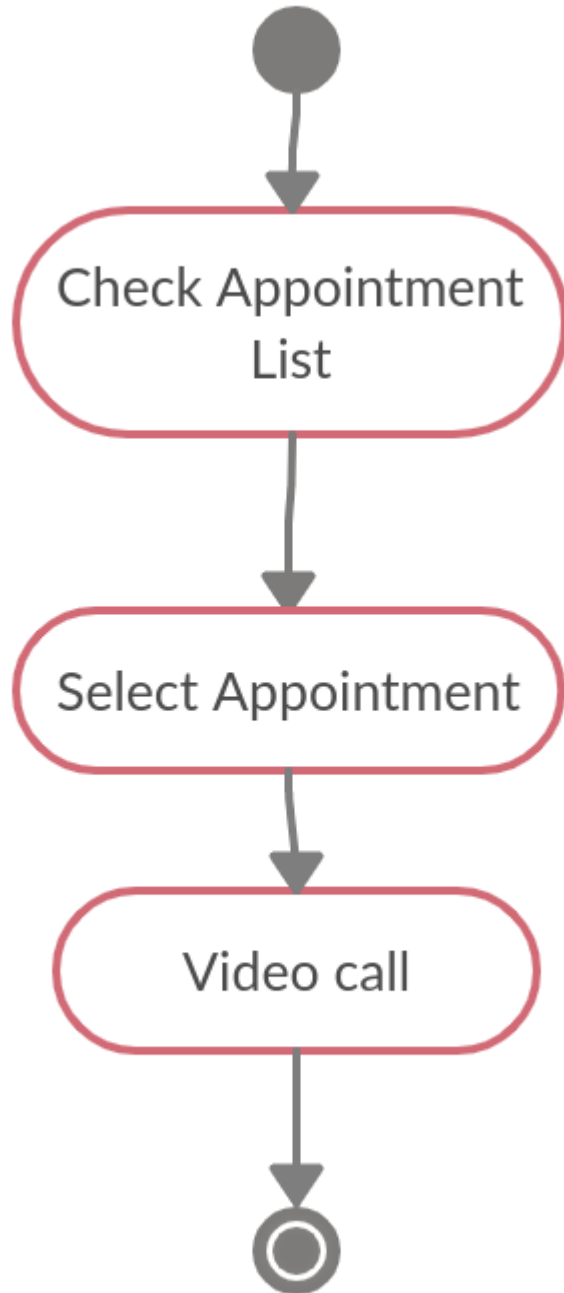
Figure 3. 7: Communication between Doctor and Patient

3.3.2 Patient

3.3.2.1 Create Appointment by patient
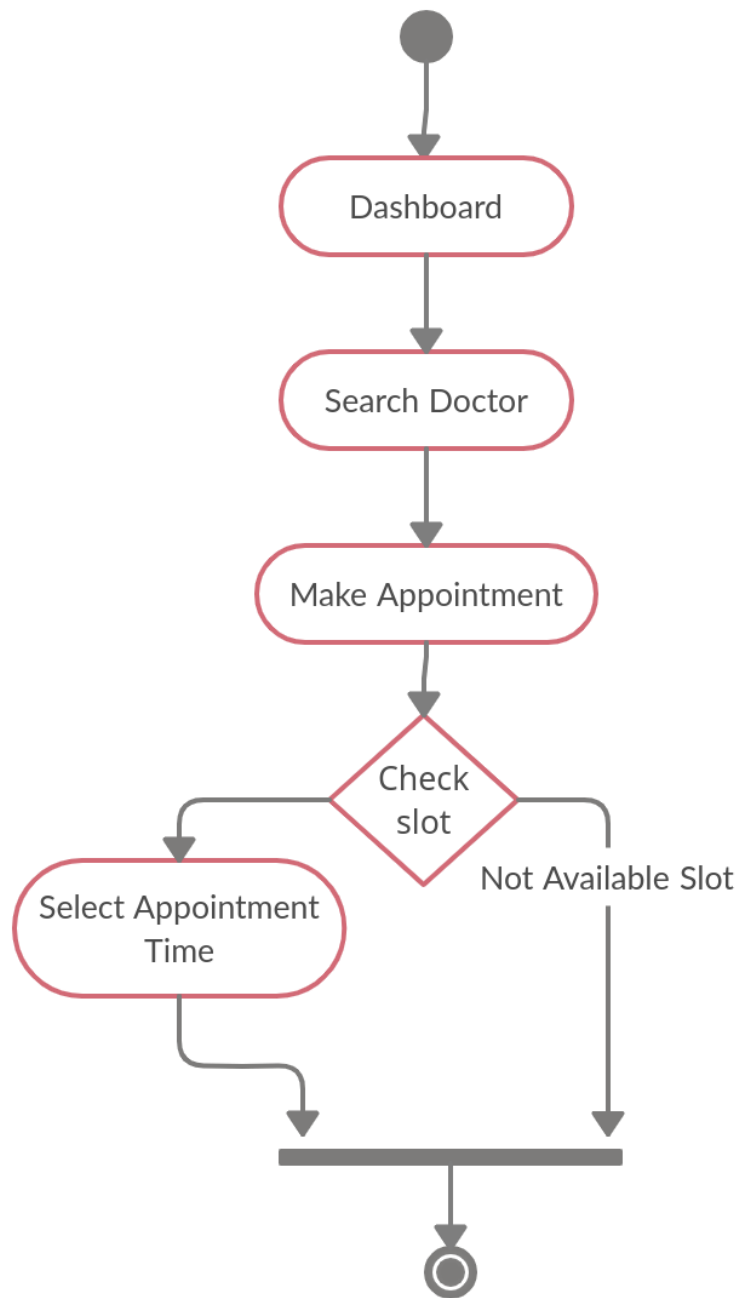
Figure 3. 8: Create Appointment by patient

3.3.2.2 Payment by patient
This figure represents the payment procedure using bKash gateway of the Online Doctor Chamber.

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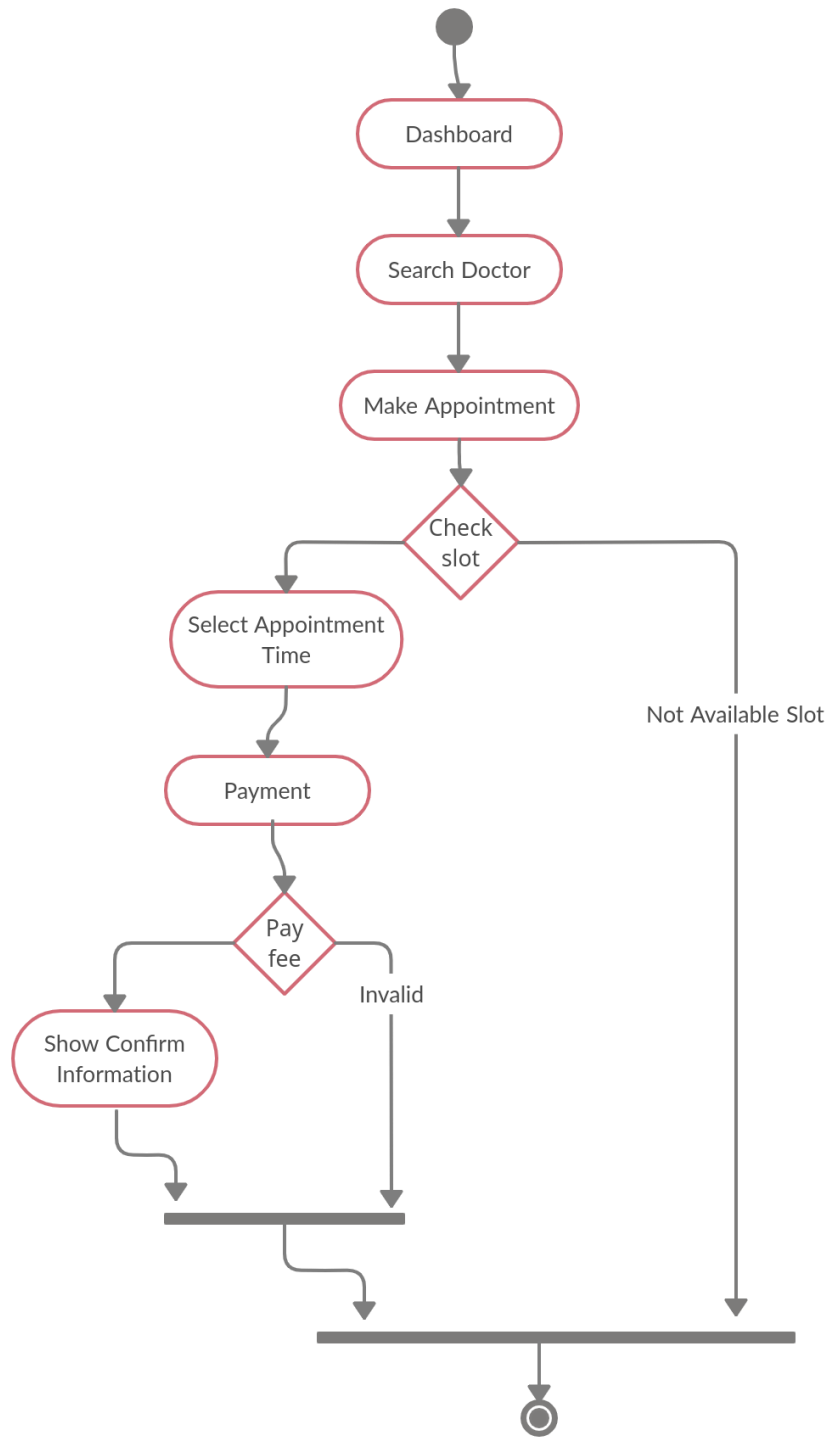
3.3.2.3 Write prescription
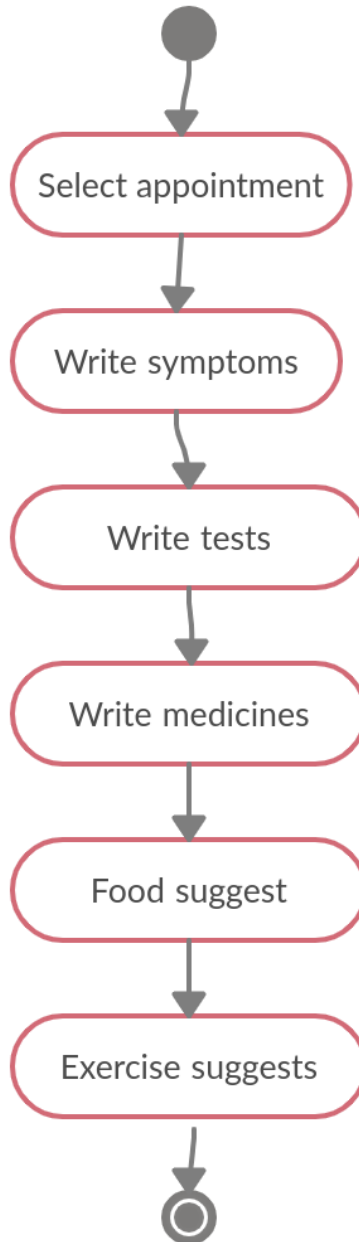
Figure 3. 10: Write prescription

3.4 Sequence Diagram

3.4.1 Doctor

3.4.1.1 Sequence Diagram for Doctor Registration
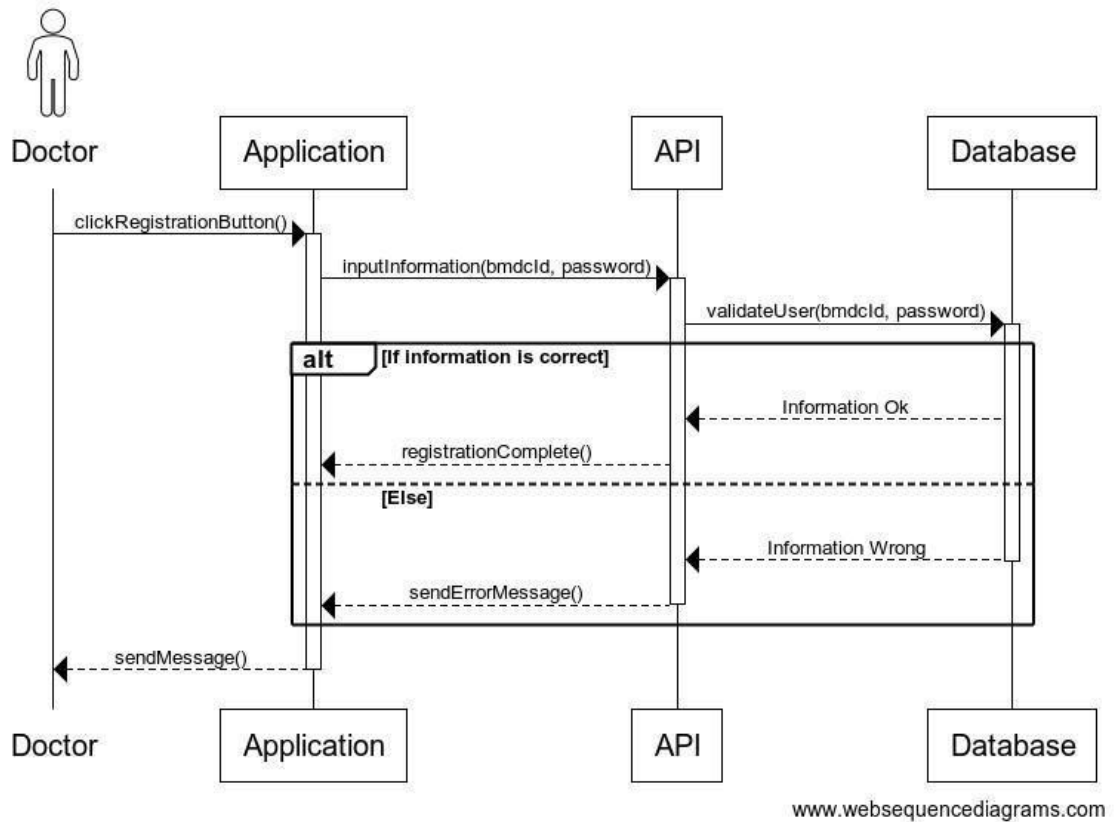
Figure 3. 11: Sequence Diagram for Registration

3.4.1.2 Sequence Diagram for Doctor LogIn
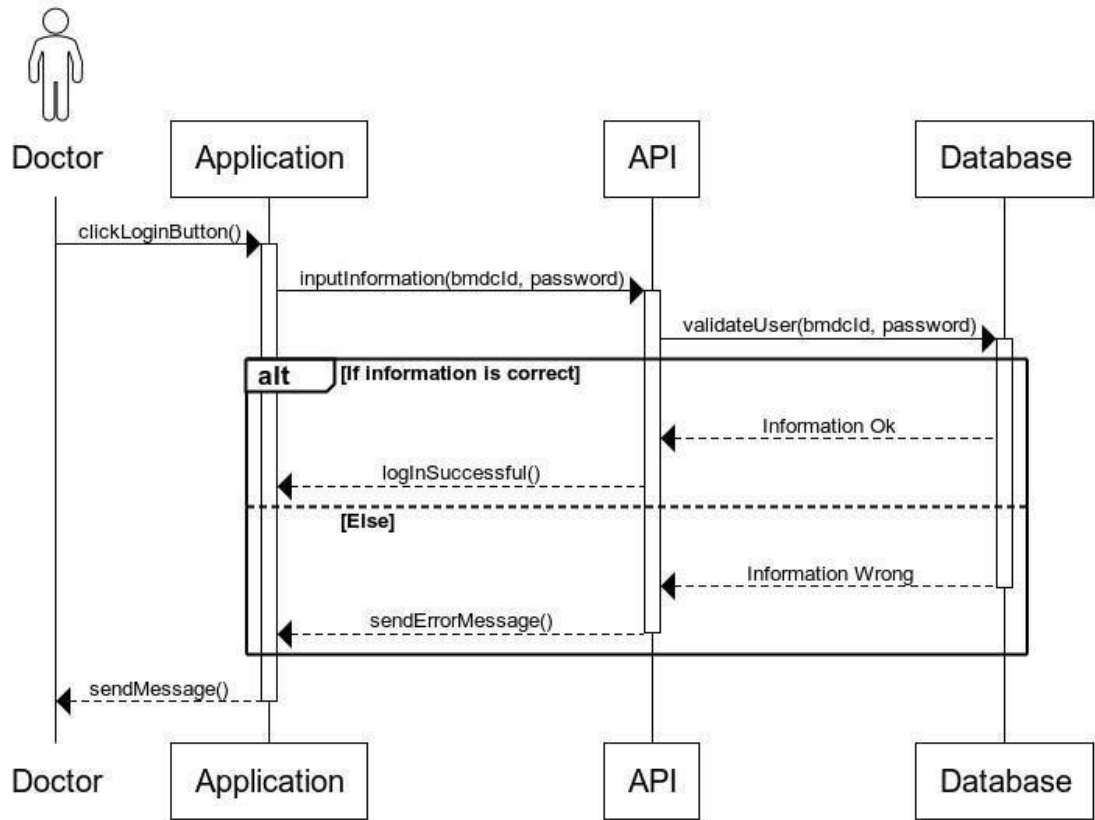
Figure 3. 12: Sequence Diagram for LogIn

3.4.1.3 Communication between Doctor and Patient
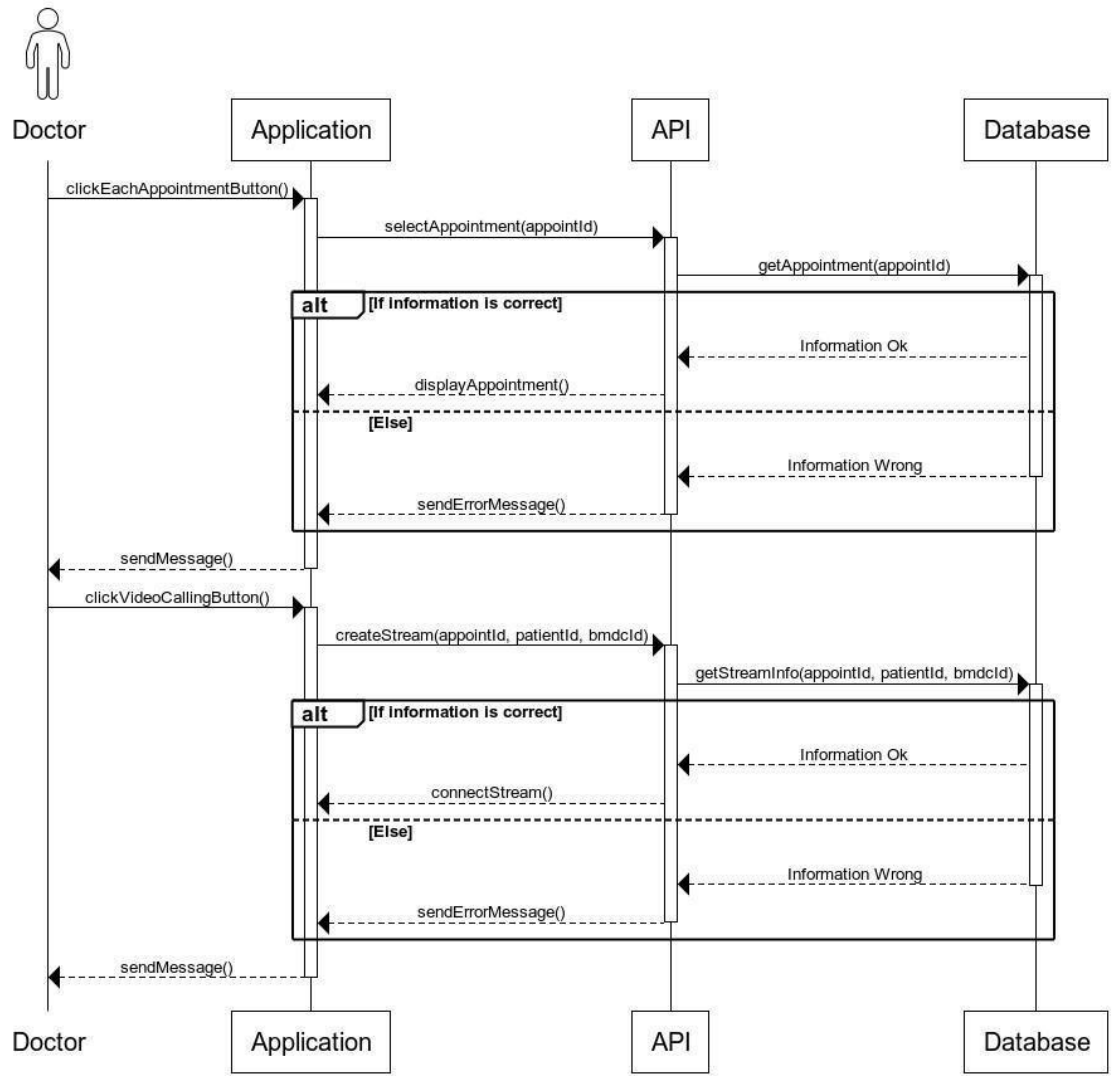
Figure 3. 13: Communication between Doctor and Patient

3.4.2 Patient

3.4.2.1 Sequence Diagram for Patient Registration
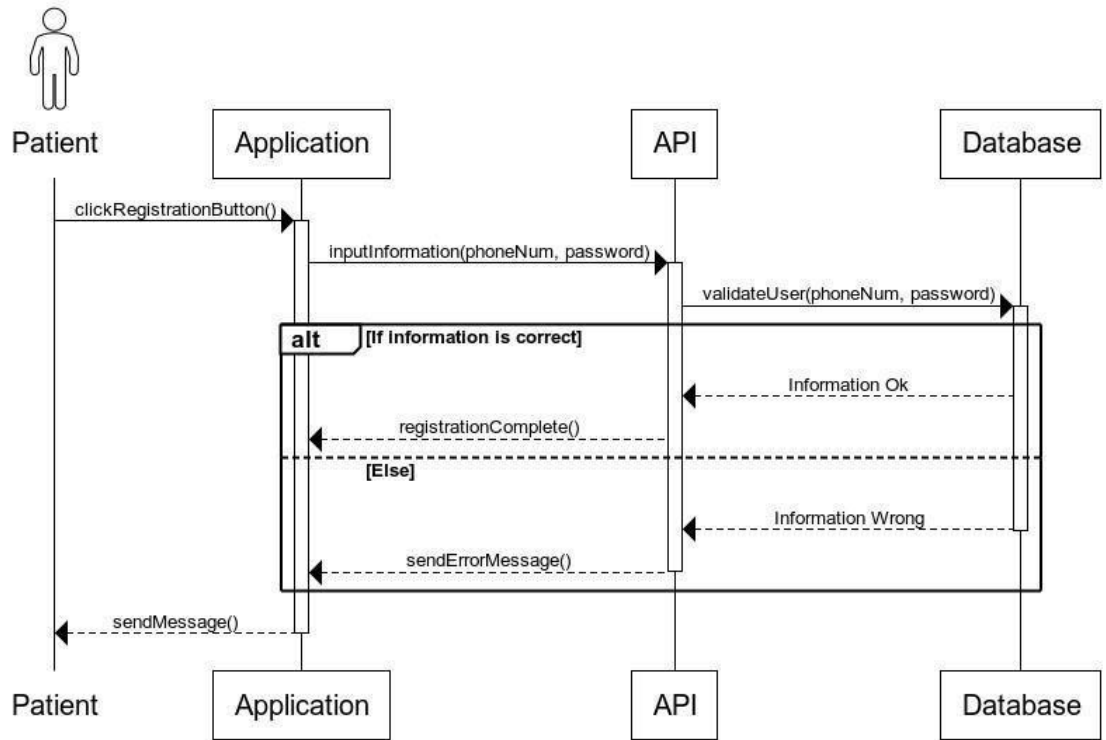
Figure 3. 14: Sequence Diagram for Registration

3.4.2.2 Sequence Diagram for Patient LogIn
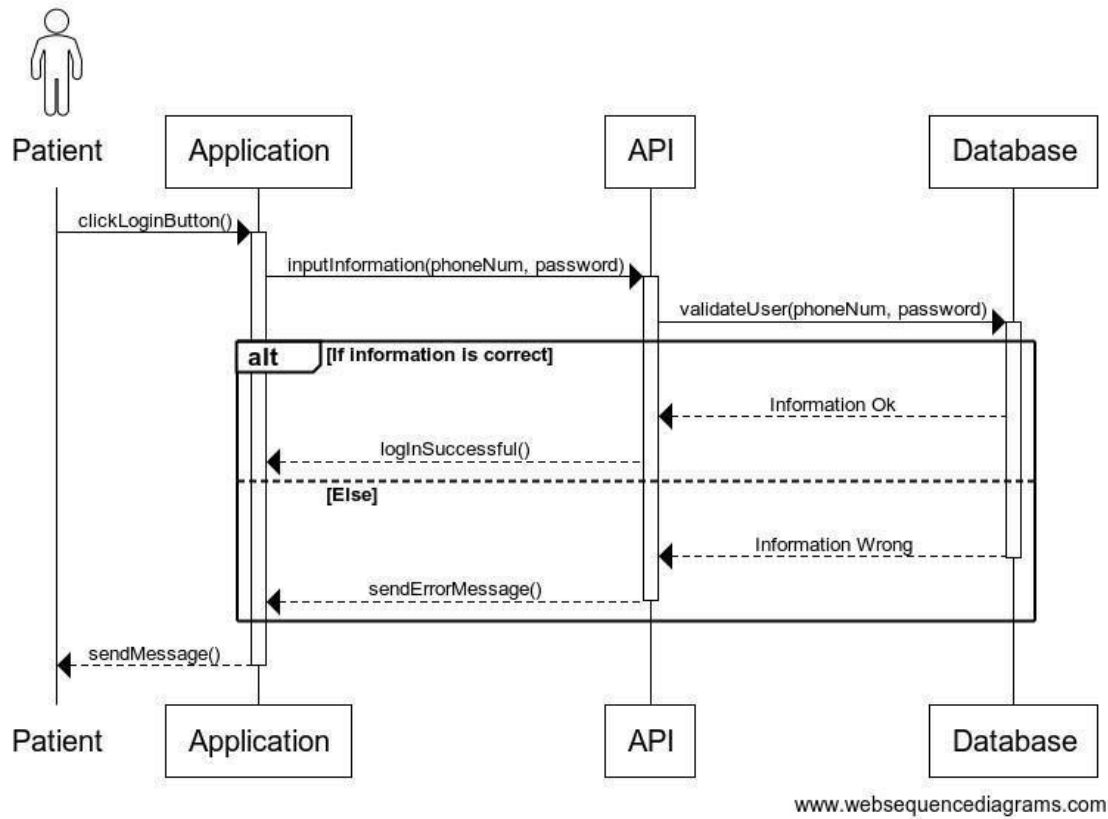
Figure 3. 15: Sequence Diagram for Patient LogIn

3.4.2.3 View Available Doctor List
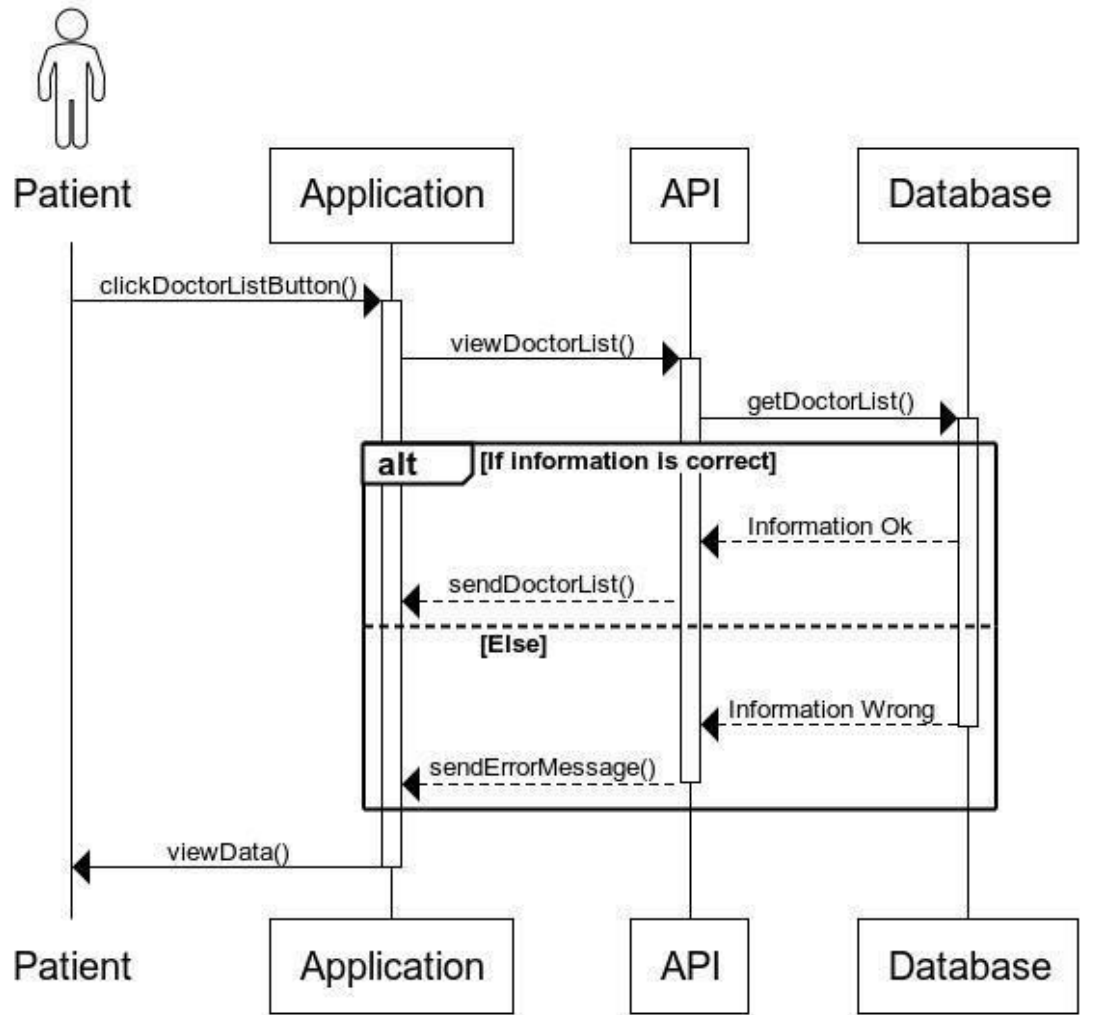
Figure 3. 16: View Available Doctor List

3.4.2.4 Create appointment
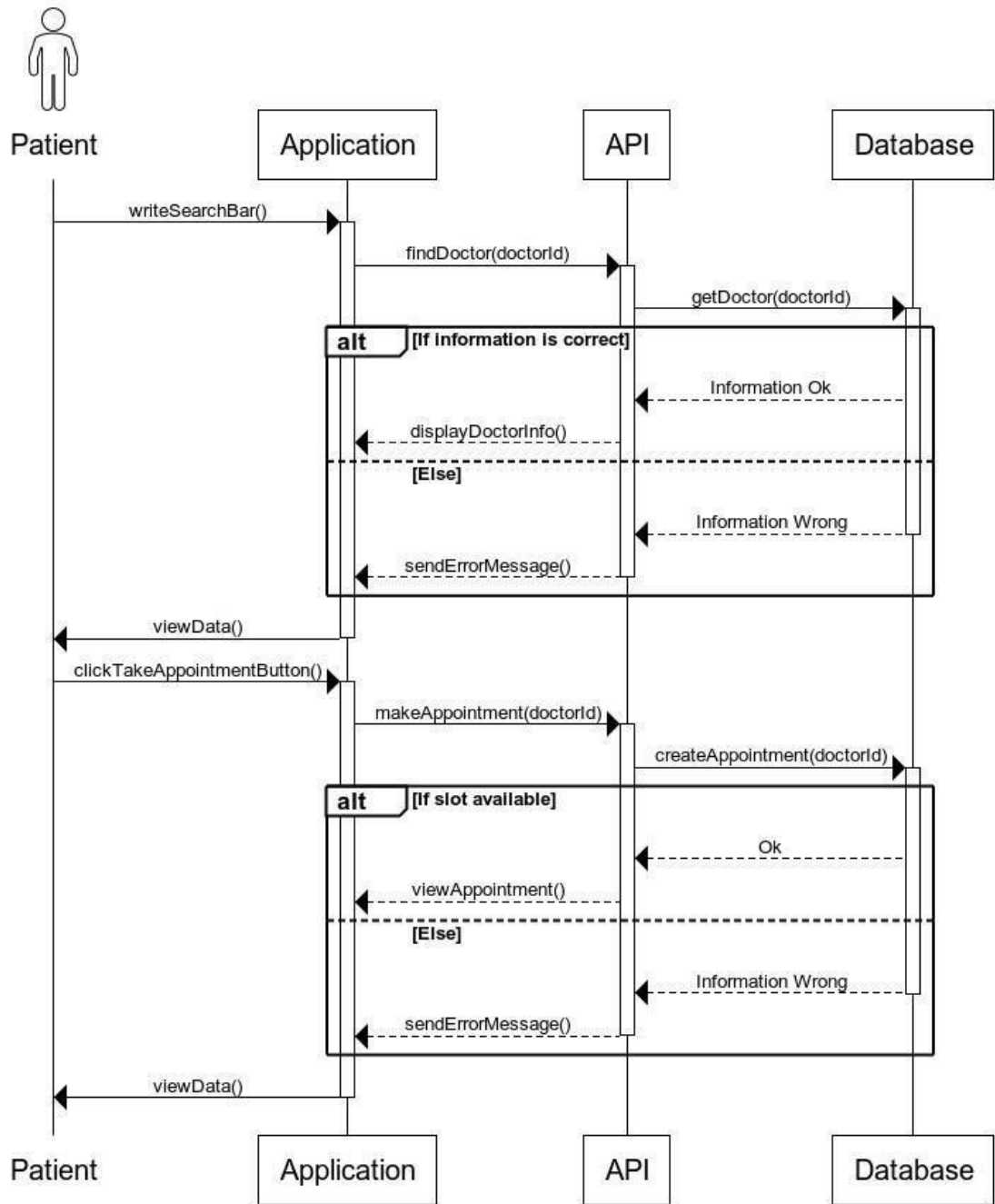
Figure 3. 17: Create appointment

3.4.2.5 Create payment for appointment
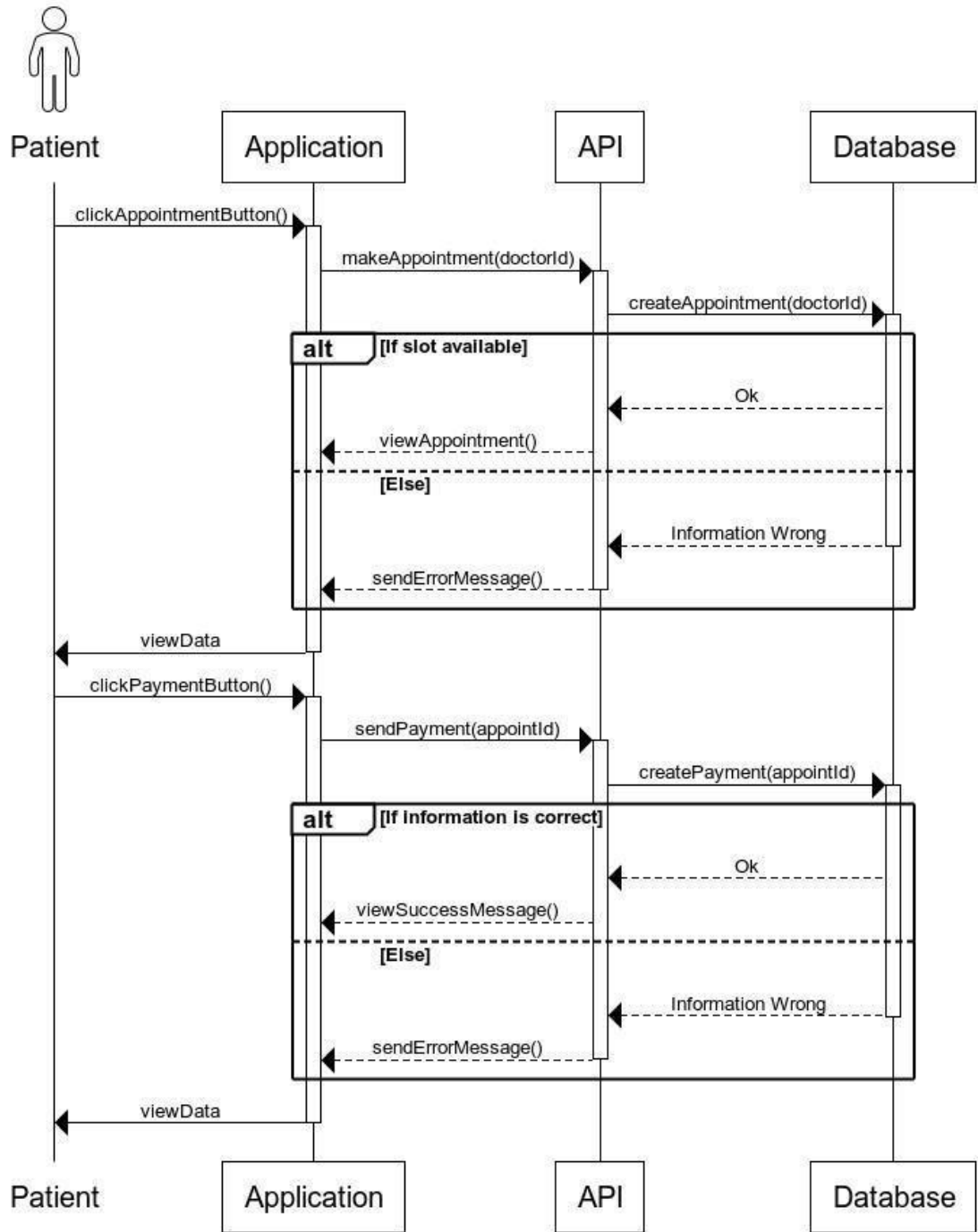
Figure 3. 18: Create payment for appointment

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Chapter 4 System Design Specification (SDS)

In this chapter we talked about the stack that we used for making Online Doctor Chamber, tools, class diagram, entity relationship diagram.

4.1 Development Tools and Technologies

4.1.1 API Development Technology

4.1.1.1 JavaScript (ES6+)

JavaScript is a scripting or programming language that allows you to implement complex features on web applications. **ES6** stands for ECMAScript 6. ECMAScript was created to standardize JavaScript. It is a major enhancement to the JavaScript language.

4.1.1.2 Node.js

Node.js is an open source server environment. Node.js runs on various platforms like Linux, Mac OS, and Windows etc. It is a JavaScript runtime built on Chrome is V8 JavaScript engine.

4.1.1.3 Express.js

Express is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications **APIs**.

4.1.1.4 Swagger

Swagger allows you to describe the structure of your **APIs** so that machines can read them. Swagger **doc** does this by asking your API to return a **JSON** that contains a detailed description of your entire API.

4.1.1.5 Babel

Babel is an open source JavaScript trans compiler that is mainly used to convert ECMAScript 2015+ code into a backwards compatible version of JavaScript that can be run by older JavaScript engines.

4.1.1.6 JWT

JSON Web Token (JWT) is an open standard (RFC 7519) that defines a compact and selfcontained way for security transmitting information between parties as a JSON object. This information can be verified and trusted because it is digitally signed

4.1.1.7 Jest

Jest is a JavaScript testing framework designed to ensure correctness of any JavaScript codebase.

4.1.1.8 Nodemon

Nodemon is a utility that will monitor for any changes in your source and automatically restart your server. Perfect for development.

4.1.1.9 MongoDB

MongoDB is the most popular database for modern applications. It is a cross-platform document-oriented database program. Classifier as a NoSQL database program,

MongoDB uses JSON-like documents with optional schemas.

4.1.2 API Development Tools

4.1.2.1 Visual Studio Code

Visual Studio Code is an open source editor made by Microsoft for Linux, MacOS,

Windows. Many features include support for debugging, snippets, syntax highlighting,

code refactoring, intelligent code completion, Git etc.

4.1.2.2 Postman

Postman is a great tool, when trying to make and test **RESTful APIs.** It offers a sleek user

interface with which to make HTML requests, without the hassle of writing a bunch of code

just to test an APIs functionality.

4.1.2.3 Compass

MongoDB Compass is the official GUI for MongoDB. It helps users make clever

decisions about the data structure, querying, indexing and many more actions you can

perform on the database.

4.1.2.4 Version Control (Github)

Github is an open source repository hosting service, sort of like a cloud for code. It offers the

distributed version control and source code management functionality of **Git**.

4.1.2.5 Github CI

Github provides a Node.js workflow that will work for most Node.js projects. It is a

workflow to build and test Node.js projects. If continuous integration (CI) tests pass then

you may want to deploy your code. Check your full code and generate a report.

4.1.2.6 Heroku

Heroku is a platform as a service that enables developers to build, run and operate applications

entirely in the cloud. We are deploying our API on this.

4.2 Class Diagram
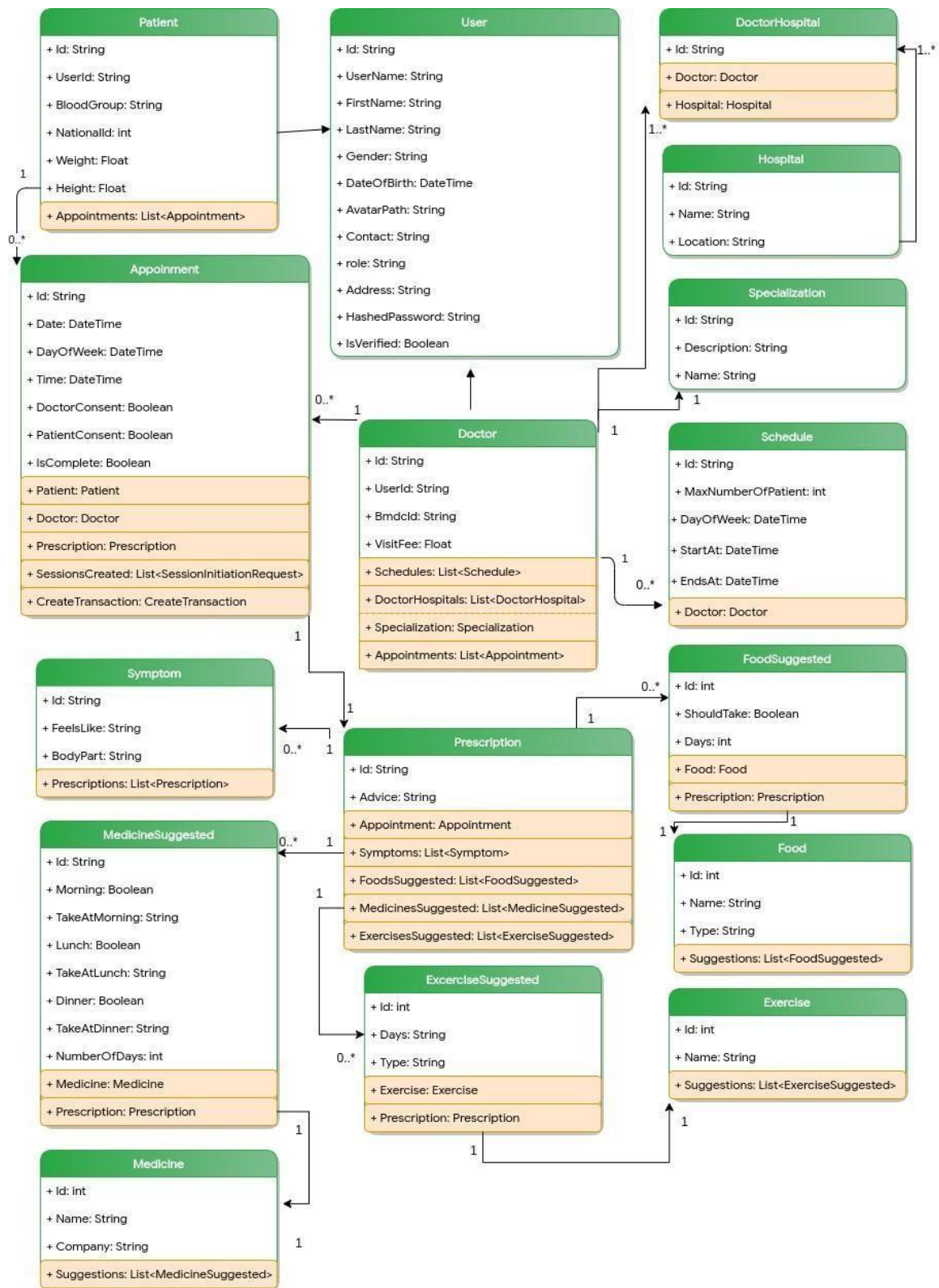
Figure 4. 1: Class diagram

4.3 ER Diagram
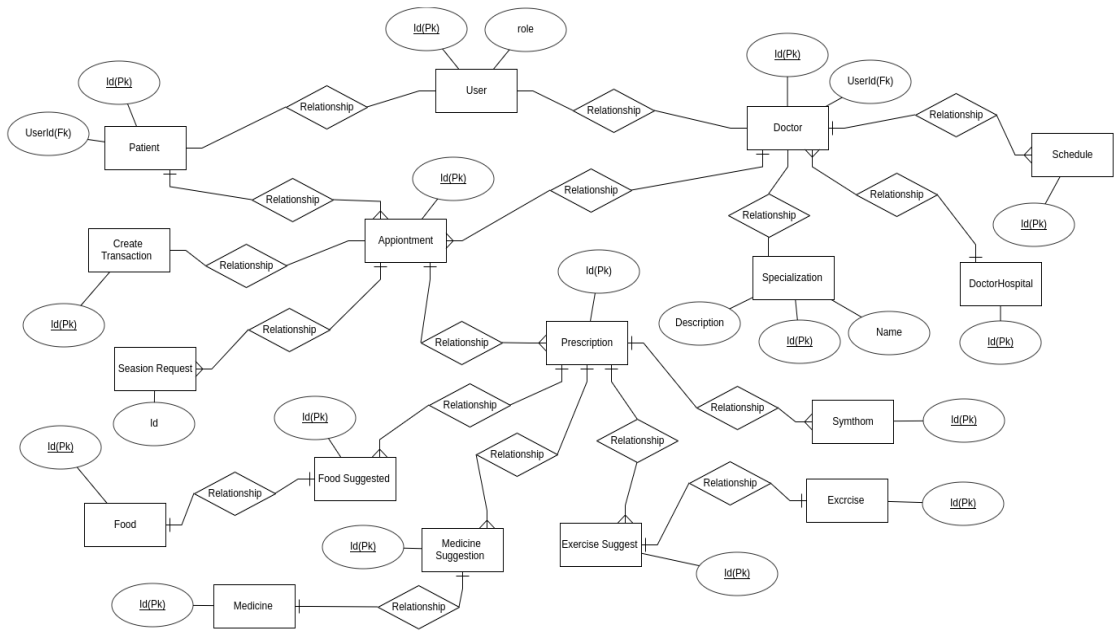
Figure 4. 2: ER diagram

Chapter 5

System Test

5.1 Testing Features

Priority Level
1. Low priority
2. Medium priority
3. High priority

5.1.1 Doctor Features

Feature	Priority	Description
Registration	3	System must validate new registration
Log In	3	System must authentication login information
Modify Profile	3	Must be update doctor profile
Create schedule	2	Doctor need to create her/his schedule
Check appointment list	2	Doctor can view pending / complete appointment list
Communicate with patient	3	Doctor can communicate with patient
Write prescription	2	Doctor can write prescription against each appointment
View each appointment	1	Doctor can view each apointment

	2	
View appointment complete list		Doctor can view complete appointment list

5.1.1 Patient Features

Feature	Priority	Description
Registration	3	System must validate new registration
Log In	3	System must authentication login information
Update Profile	1	Patient can update profile
View doctor list	3	Patient can view today available doctors
Search doctor	2	Patient can search available doctors
Create appointment	3	Patient can create appointment
Payment with bKash	3	Before create appointment, patient need to must pay doctor fee through bKash
Communicate with patient	3	Patient can communicate with doctor

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View old / new prescriptions	2	Patient can view prescriptions
Download prescriptions	1	Patient can download prescriptions

5.2 Test Cases

5.2.1 Account Registration (Doctor)

Test Case: 5.2.1	Test Case Name: Account Registration (Doctor)
System: Online Doctor Chamber	Subsystem:
Designed by: Zinnatul Islam	Design Date:
Executed by:	Execution Date:

Description: Doctor must register to gain access to the create schedule. To register an account, must be provided a valid **BMDC ID** and password.

Pre-condition:
- BMDC ID must be unique.
- Passwords must be between 8 to 30 characters.
- Must contain at least one uppercase letter.
- Must contain at least one lowercase letter.
- Must contain at least one number digit.
- Must contain at least one special character.

Step	BMDC ID	Password	Response	Pass/Fail	Comment

1	1020	sweDIU12$$	Registration successfully	Pass	
2	10203040	pa$$w0rd	Must contain at least one uppercase letter	Fail	
3	10203040	pa$$wkrD	Must contain at least one number digit	Fail	

Post-condition: A new user account has been registered successfully

5.2.2 Account Registration (Patient)

Test Case: 5.2.2	**Test Case Name:** Account Registration (Patient)
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**
Description: Patient must register to gain access to the create schedule. To register an account, must be provided a valid email and password.	

Pre-condition:
- Phone number must be unique.
- Passwords must be between 8 to 30 characters.
- Must contain at least one uppercase letter.
- Must contain at least one lowercase letter.
- Must contain at least one number digit.
- Must contain at least one special character.

Step	Phone number	Password	Response	Pass/Fail	Comment
1	0177777777	pa$$w0rD	Registration successfully	Pass	Figure 6.2
2	0158765485	pa$$w0rd	Must contain at least one uppercase letter	Fail	Figure 6.8
3	0198546522	pa$$wkrD	Must contain at least one number digit	Fail	Figure 6.8

Post-condition: A new user account has been registered successfully

5.2.3 LogIn (Doctor)

Test Case: 5.2.3	**Test Case Name:** Login (Doctor)
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**

Executed by:	Execution Date:

Description: Doctor must login to gain access to the created schedule. The system will check for authentication and authorization

Pre-condition:
- Doctor must input valid BMDC ID and password

Step	BMDC ID	Password	Response	Pass/Fail	Comment
1	10203040	pa$$w0rD	Login successfully	Pass	
2	10203040	pa$$w0rd	Incorrect credential	Fail	

Post-condition: Doctor will successfully log into the system

5.2.4 LogIn (Patient)

Test Case: 5.2.4	Test Case Name: Login (Patient)
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**

<table>
<tr><td colspan="6">Description: Patient must login to gain access to the created appointments. The system will check for authentication and authorization</td></tr>
<tr><td colspan="6">Pre-condition:
• Patient must input valid email and password</td></tr>
<tr><td>Step</td><td>Phone number</td><td>Password</td><td>Response</td><td>Pass/Fail</td><td>Comment</td></tr>
<tr><td>1</td><td>01777777777</td><td>pa$$w0rD</td><td>Login successfully</td><td>Pass</td><td></td></tr>
<tr><td>2</td><td>01955646586</td><td>pa$$w0rd</td><td>Incorrect credential</td><td>Fail</td><td></td></tr>
<tr><td colspan="6">Post-condition: Patient will successfully log into the   m syste</td></tr>
</table>

5.2.5 View Appointment List

Test Case: 5.2.5	**Test Case Name:** View Appointment List
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**
Description: Registered doctor can view her/his appointment list	

Pre-condition:
- Database has at least one appointment information to display

Step	Action	Response	Pass/Fail	Comment
1	Doctor clicks on appointments	System will display appointment list	Pass	

Post-condition: Display all old or new appointments

5.2.6 Modify profile

Test Case: 5.2.6	**Test Case Name:** Modify profile
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**

Description: Registered doctor can modify her/his profile

Pre-condition:
- Must be logged in

Step	Action	Response	Pass/Fail	Comment
1	Fill up all the required boxes and clicks on 'Modify' button	System update selected profile	Pass	
2	Does not fill up all the required boxes and clicks on 'Modify' button	All required boxes must be filled	Fail	

Post-condition: Profile modify successfully

5.2.7 Create schedule

Test Case: 5.2.7	**Test Case Name:** Create schedule
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**
Description: Registered doctor can create her/his schedules	
Pre-condition: • Must be logged in	

Step	Action	Response	Pass/Fail	Comment
1	Fill up all the required boxes and clicks on 'Create' button	System create new schedule	Pass	
2	Does not fill up all the required boxes and clicks on 'Create' button	All required boxes must be filled	Fail	

Post-condition: Create schedule successfully

5.2.8 Write prescription

Test Case: 5.2.8	**Test Case Name:** Write prescription
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**
Description: Registered doctor can create and write prescription against each appointments	
Pre-condition: • Must be logged in	

Step	Action	Response	Pass/Fail	Comment
1	Fill up all the required boxes and clicks on 'Create' button	System create new prescription	Pass	
2	Does not fill up all the required boxes and clicks on 'Create' button	All required boxes must be filled	Fail	

Post-condition: Create prescription successfully

5.2.9 View Doctor List

Test Case: 5.2.9	Test Case Name: View Doctor List
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**

Description: Registered patient can view today available doctor list

Pre-condition:
        Database has at least one doctor information to display

Step	Action	Response	Pass/Fail	Comment

Step	Action	Response	Pass/Fail	Comment
1	Patient clicks on available doctors	System will display doctor list	Pass	

Post-condition: Display all available doctors

5.2.10 Search doctor

Test Case: 5.2.10	**Test Case Name:** Search doctor	
System: Online Doctor Chamber	**Subsystem:**	
Designed by: Zinnatul Islam	**Design Date:**	
Executed by:	**Execution Date:**	

Description: Registered patient can search today available doctors using doctor name or hospital name or specialization name

Pre-condition:
   Database has at least one doctor information to display

Step	Action	Response	Pass/Fail	Comment
1	Patient write doctor name or hospital name or specialization name on search bar	System will display doctors	Pass	

Post-condition: Display all match available doctors

5.2.11 Create Appointment

Test Case: 5.2.11	Test Case Name: Create appointment
System: Online Doctor Chamber	Subsystem:
Designed by: Zinnatul Islam	Design Date:
Executed by:	Execution Date:
Description: Registered patient can create appointment	
Pre-condition: • Must be logged in • Must be pay doctor fee	

Step	Action	Response	Pass/Fail	Comment
1	Fill up all the required boxes and clicks on 'Create' button	System create new appointment	Pass	
2	Does not fill up all the required boxes and clicks on 'Create' button	All required boxes must be filled	Fail	

Post-condition: Create appointment successfully

5.2.12 Payment with bKash

Test Case: 5.2.12	Test Case Name: Payment with bKash
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**

Description: Registered patient can pay doctor fee

Pre-condition: Must be logged in

Step	Action	Response	Pass/Fail	Comment
1	Fill up all the required boxes and clicks on 'Pay with bKash' button	bKash provide payment success information	Pass	

2	Does not fill up all the required boxes and clicks on 'Pay with bKash' button	All required boxes must be filled	Fail	

Post-condition: Show payment successfully message and create new appointments

5.2.13 View old / new prescriptions

Test Case: 5.2.13	Test Case Name: View old / new prescriptions
System: Online Doctor Chamber	**Subsystem:**
Designed by: Zinnatul Islam	**Design Date:**
Executed by:	**Execution Date:**

Description: Registered patient can view old / new prescriptions

Pre-condition:
- Must be logged in
- Database has at least one prescriptions information to display

Step	Action	Response	Pass/Fail	Comment
1	Clicks on 'View' button	Show prescriptions	Pass	

Post-condition: Show payment successfully message and create new appointments

Chapter 6 Conclusion

Due to the corona pandemic situation we could not go to the hospital whenever we felt sick. So, this time we provide a modern solution. You can easily find any available doctor and can take appointments with an expected doctor. Using this application doctor and patient can easily communicate between each other. So, we say that our solution helps our society in a pandemic situation.

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Chapter 7

Appendix A

7.1 Doctor Profile (API response)

```json
{
  "status": "ok",
  "data": {
    "_id": "5ff952d797d90800232816c3",
    "doctor": {
      "_id": "5ff952d697d90800232816c2",
      "firstName": "Md. Harun Ar",
      "lastName": "Rashid Morol",
      "role": "doctor",
      "avatarPath": "https://imgur.com/gallery/6UeMBNT",
      "contact": "01999999999",
      "gender": "Male"
    },
    "bmdcId": "777777777",
    "degree": "MBBS (DMC), FRCS (US), IDKA (USA)",
    "designation": {
      "_id": "5fe9dadabfe1b0139f39945a",
      "designation": "Professor"
    },
    "specialization": {
      "_id": "5fe9dabfbfe1b0139f3993ff",
      "name": "Cardiology",
      "description": "Cardiology specialist must be able to deal with all kinds of cardiovascular problems associated with hypertensive, rheumatic, and congenital heart disease and with cardiomyopathies."
    },
    "hospitals": [
      {
        "_id": "5fe9dad7bfe1b0139f399442",
        "name": "Dhaka Medical College",
        "location": "Dhaka 1000"
      }
    ],
    "schedules": [
      {
        "_id": "5ff953d597d90800232816c6",
        "maxNumberOfPatient": 20,
        "dayOfWeek": "Saturday",
        "startAt": "12.15.00 PM",
        "endAt": "03.30.00 PM"
      }
    ],
    "appoinments": [
      {
        "_id": "5fe9e2cf03560100236634d7",
        "date": "01-09-2021",
        "time": "12.15.00 PM",
        "serialNum": 1,
        "isComplete": true,
        "isSecondTime": false,
        "dayOfWeek": "Monday",
        "prescriptionID": "5fe9e37903560100236634dd",
        "patient": {
          "_id": "5fe9dd5f03560100236634cd",
          "firstName": "MD Jinnatul",
          "lastName": "Morol",
          "avatarPath": "https://i.imgur.com/arfs6v0.jpg"
        }
      }
    ]
  }
}
```

Figure 6. 1: Doctor Profile

7

.2 Patient Profile (API response)

```
{
  "status": "ok",
  "token":
"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjVmZWQ2ZjUwZDJjY2NhMDAyMzY1MzU2OCIsImlhdCI6MTYxMDE3MzY5OS
wiZXhwIjoxNjExNDY5Njk5fQ.ca4kiNdO5g6NhLGf7YIIwYyHIjN3Vl0I2Pnc6l4Wecc",
  "data": {
    "_id": "5fed6f50d2ccca0023653568",
    "patient": {
      "_id": "5fed6f50d2ccca0023653567",
      "contact": "01777777777",
      "firstName": "Md. Jinnatul",
      "lastName": "Morol",
      "role": "patient"
    },
    "appoinments": [
      {
        "_id": "5fed7298d2ccca002365356f",
        "date": "12-31-2020",
        "time": "12.15.00 PM",
        "serialNum": 1,
        "isComplete": false,
        "isSecondTime": false,
        "dayOfWeek": "Thursday",
        "doctor": {
          "_id": "5fed7018d2ccca002365356a",
          "firstName": "Mr.",
          "lastName": "X",
          "avatarPath": "https://imgur.com/gallery/6UeMBNT",
          "degree": "MBBS (DMC), FRCS (US), IDKA (USA)",
          "designation": {
            "_id": "5fe9dadabfe1b0139f39945e",
            "designation": "Sr Consultant"
          },
          "hospitalName": "Al-Biruni Hospital",
          "hospitalLocation": "23/1, Khilzee Road, Shyamoli"
        }
      }
    ]
  }
}
```

Figure 6. 2: Patient Profile

.3 Doctor List (API response)

```
{
  "status": "ok",
  "data": [
    {
      "hospitals": [
        {
          "_id": "5fe9dad7bfe1b0139f39942c",
          "name": "Aysha Memorial Specialized Hospital",
          "location": "74/G, Arjatpara, Mohakhali, Dhaka"
        }
      ],
      "schedules": [
        {
          "_id": "5ff1b108b55b0a0023058a05",
          "maxNumberOfPatient": 15,
          "dayOfWeek": "Sunday",
          "startAt": "08.00.00 PM",
          "endAt": "11.00.00 PM"
        }
      ],
      "appoinments": [
        15
      ],
      "_id": "5fe9de8003560100236634cf",
      "user": {
        "_id": "5fe9de7f03560100236634ce",
        "firstName": "Dr Harun Ar",
        "lastName": "Rashid Morol",
        "role": "doctor",
        "avatarPath": "https://i.imgur.com/pEecbFB.jpg",
        "contact": "01921583285",
        "gender": "Male"
      },
      "bmdcId": "10203040",
      "__v": 30,
      "degree": "MBBS DMC FCPS USA PhD UK",
      "designation": {
        "_id": "5fe9dadabfe1b0139f39945d",
        "designation": "Medical Officer"
      },
      "specialization": {
        "_id": "5fe9dabfbfe1b0139f399403",
        "name": "Dermatology",
        "description": "Dermatology is a varied specialty that addresses benign and malignant disorders
of the skin, mouth, external genitalia, hair, and nails, as well as a number of sexually transmitted
diseases."
      }
    }
  ]
}
```

Figure 6. 3: Doctor List

.4 bKash Payment (API response)

```
// New Patient
{
  "_id": "5fede3d0e398550023ad77c4",
  "paymentID": "4WY6XB11609425849533",
  "createTime": "2020-12-31T15:45:09:633 GMT+0000",
  "updateTime": "2020-12-31T15:45:32:497 GMT+0000",
  "trxID": "7LV504GSQ2",
  "transactionStatus": "Completed",
  "amount": "800",
  "currency": "BDT",
  "intent": "sale",
  "merchantInvoiceNumber": "462eb5a5-2207-4e0f-9f0e-ec1d663a0969",
  "__v": 0
}

// Old Patient
{
  "_id": "5fede3d0e398550023ad77c3",
  "paymentID": "4WY6XB11609425849532",
  "createTime": "2020-12-31T14:44:09:633 GMT+0000",
  "updateTime": "2020-12-31T14:44:32:497 GMT+0000",
  "trxID": "7LV504GSQ1",
  "transactionStatus": "Completed",
  "amount": "500",
  "currency": "BDT",
  "intent": "sale",
  "merchantInvoiceNumber": "462eb5a5-2207-4e0f-9f0e-ec1d663a0959",
  "__v": 0
}
```

Figure 6. 4: bKash Payment

.5 Prescriptions (API response)

```json
{
  "status": "ok",
  "data": {
    "newPrescription": {
      "_id": "5fe6cd58058a9b002388dde1",
      "symptoms": [
        {
          "_id": "5fe6cd58058a9b002388dde2",
          "feelsLike": "Pain",
          "bodyPart": "Hand",
        }
      ],
      "tests": [
        {
          "_id": "5fe6cd58058a9b002388dde2",
          "testName": "Blood",
        }
      ],
      "foodsSuggested": [
        {
          "_id": "5fe6cd58058a9b002388dde3",
          "name": "Fish",
          "type": "Protein"
        }
      ],
      "medicinesSuggested": [
        {
          "_id": "5fe6cd58058a9b002388dde3",
          "medicine": {
            "name": "Napa",
            "company": "Beximco Pharmaceuticals Ltd"
          },
          "suggest": {
            "morning": true,
            "takeAtMorning": 1,
            "lunch": false,
            "takeAtLunch": 0,
            "dinner": true,
            "takeAtDinner": 1,
            "numberOfDays": 7
          }
        }
      ],
      "exercisesSuggested": [
        {
          "_id": "5fe6cd58058a9b002388dde4",
          "exercise": {
            "name": "Walking"
          },
          "suggest": {
            "days": 20,
            "type": "Medium"
          }
        }
      ],
```

```json
    "appointment": {
        "doctorConsent": false,
        "patientConsent": false,
        "isComplete": false,
        "_id": "5fe6ccf4058a9b002388ddde",
        "dayOfWeek": "Saturday",
        "time": "12.45.00 PM",
        "doctor": {
          "hospitalsName": "Ahmed Medical Centre Ltd.",
          "hospitalsLocation": "House # 71, Road # 15-A, (New), Dhanmondi C/A",
          "firstName": "MD. Harun Ar",
          "lastName": "Rashid Morol",
          "avatarPath": "https://imgur.com/gallery/6UeMBNT",
          "degree": "MBBS (DMC), FRCS (US), IDKA (USA)",
          "designation": {
            "_id": "5fe613a08f24d256541b73c0",
            "designation": "Professor"
          }
        },
        "patient": {
          "firstName": "Md. Jinnatul",
          "lastName": "Morol",
          "avatarPath": "https://imgur.com/gallery/6UeMBNT"
        }
      }
    },
    "historyData": [
      {
        "_id": "5fe6cb0d058a9b002388ddd7",
        "symptoms": [],
        "tests": [],
        "foodsSuggested": [],
        "medicinesSuggested": [],
        "exercisesSuggested": [],
        "appointment": {
          "_id": "5fe62603b838f60023559fb6",
          "dayOfWeek": "Friday",
          "time": "12.15.00 PM",
          "doctor": {
            "hospitalsName": "Ahmed Medical Centre Ltd.",
            "firstName": "MD. X",
            "lastName": "Morol",
            "avatarPath": "https://imgur.com/gallery/6UeMBNT",
            "degree": "MBBS (DMC), FRCS (US), IDKA (USA)"
          }
        }
      }
    ]
  }
}
```

Figure 6. 5: Prescriptions

```
{
  "status": "ok",
  "token":
"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjYwMTA0NGMzYWZhODVlMDAyM2M1ZmFkNCIsImlhdCI6MTYxMTg2NTI2MC
wiZXhwIjoxNjEyNDcwMDYwfQ.JtGiwCi1pwrsYg_BfIiuklXVIR47BHFpttS2Wu8a7Hg",
  "data": {
    "_id": "601044c3afa85e0023c5fad4",
    "doctor": {
      "_id": "601044c3afa85e0023c5fad3",
      "firstName": "Md",
      "lastName": "y",
      "role": "doctor",
      "avatarPath": null,
      "contact": "01",
      "gender": "Male"
    },
    "bmdcId": "1020",
    "degree": "aa",
    "designation": {
      "_id": "5ffee247fc83681b0cb469fa",
      "designation": "Associate Professor"
    },
    "specialization": {
      "_id": "5ffee23cfc83681b0cb469a2",
      "name": "Dermatology",
      "description": "Dermatology is a varied specialty that addresses benign and malignant disorders of
the skin, mouth, external genitalia, hair, and nails, as well as a number of sexually transmitted
diseases."
    },
    "hospitals": [
      {
        "_id": "5ffee244fc83681b0cb469c6",
        "name": "Al- Rajhi Hospital",
        "location": "12, Farmgate. Dhaka -1215"
      }
    ],
    "schedules": [
      {
        "_id": "601045baafa85e0023c5fad7",
        "maxNumberOfPatient": 2,
        "dayOfWeek": "Sunday",
        "startAt": "04.00.00 PM",
        "endAt": "06.00.00 PM"
      },
      {
        "_id": "601045fbafa85e0023c5fad9",
        "maxNumberOfPatient": null,
        "dayOfWeek": "Saturday",
        "startAt": null,
        "endAt": null
      }
    ],
    "appoinments": []
  }
}
```

Figure 6. 6: Successfully login

```
{
  "status": "ok",
  "token":
"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjYwMTMxZGRlODE0ZDYxMDAyMzJiNmNkNyIsImlhdCI6MTYxMTg2NTU2Ni
wiZXhwIjoxNjEyNDcwMzY2fQ.9wAgn73a0Ji7JiWqeN9gvQK6oDhafWIDHYdioB4umSs",
  "userId": "60131dde814d6100232b6cd7"
}
```

Figure 6. 7: Create account


```
{
    "status": "failed",
    "message": "Incorrect crediantial."
}
```

Figure 6. 8: Login failed

7.6 Github Link

The source code of "**Online Doctor Chamber**" can be found at Github

Github Link (Private): https://github.com/TeamTigers/remote-doctor-api

7.7 Deploy Link

This API deployed on Heroku service.

Live Server: https://remote-doctor-api.herokuapp.com/

7.8 Future Scope

- Test send to lab
- Referred to another doctor
- Add doctor assistant

Appendix B
Plagiarism Report

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