

E-Care Android Application

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled **“E-Care Android Application”**, submitted by Md. Sadman Shamsuddin and Saiyed Md Manjurul Hoque to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering (BSc) and approved as to its style and contents. The presentation has been held on 2 November, 2017.

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Ms. Tasnim Ahmed, Lecturer, Department of CSE**, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

Medical treatment is one of the human fundamental rights. Govt. is trying to fulfill this right for human. By our proposed project, we have also tried to make a system that can fulfill the right of the human. The proposed project is a digital system that provides users or patient's an easy way of communicating with doctor or booking appointment. In our system, doctor, patient and admin will have their own account. Our system store the information of patient's name, address, phone etc. and history of patient's appointment. It also stores information of doctor's profile. Patient will be able to live chat through our app with doctor and can send required images. We have admin dashboard by which an admin can control the whole system like checking information of requested doctors, patients and accept requested doctors etc.

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Chapter 1

Introduction

1.1 Introduction

Millions of people in our country have no access to minimum secondary and tertiary level care because of their limited financial abilities. There are many villages where people cannot find experienced doctor to show their problems.

In our country, there are lots of applications which provide health care but none of them are digitalized yet.

So to expand the medical treatment, we have developed an application named “E-Care Android Application”.

Once our app is developed, doctor and patient can communicate with each other, doctor can check previous reports of the patient and give online based prescriptions.

1.2 Motivation

The main motivation of our application is communication between doctor and patient. We have individual application for doctor and patient. This applications will handle live chat and show info of the doctors. In many chamber doctor doesn't save patients information and prescriptions but in our app we have a system where doctor can give online base prescriptions. People living in long distance do not need to come Dhaka to communicate with doctors. By our app, they can live chat with doctor and send any image if needed. The application store all information in cloud.

1.3 Objectives

Our goal is to make a system by which both doctors and patients get benefitted by using the applications because of its extra features.

A doctor can earn some extra money by providing proper treatment using the application. Doctor can keep the information of patients, gives his/her scheduled time, and prescribes in online.

A patient can live chat with the doctor, sends image if needed, makes appointment for visiting a doctor and also sends medical reports by taking pictures of them.

In our web application, we have a feature of blood donating where anyone can search for donor, visit donors profile and get information. Anyone can also make a request for being a blood donor.

We hope that, our applications will reduce some problems in medical area in future and make usefulness for both doctor and patient.

1.4 Expected Outcome

Patient and doctor can login into the system and make an appointment. Patient can live chat with doctor. Both can edit their information. There will be a proper and secure storage to access and retrieve information. Doctor can prescribe the patients using digitized way. If any doctor wants to register, then he/she will need to send all real information to the admin and admin will check the info and make him/her as a doctor. An admin will control full system and can change required changes.

1.5 Report Layout

Chapter 1 (Introduction): In chapter 1, we describe about introduction, motivation, objectives, expected outcome and report layout.

Chapter 2 (Background): In chapter 2, we describe background introduction. We represent some related works with comparative studies and discuss about scope of the problem with the challenges we have faced to develop our application.

Chapter 3 (Requirements Specification): In chapter 3, we draw Business Process Model to represent our application's work procedure. Here we have also discussed about

requirement collection. To illustrate our database, we have used Logical Data Model. Final part of this chapter is Use Case.

Chapter 4 (Design Specification): In chapter 4, we represent the Front-end design and Back-end design of our application.

Chapter 5 (Implementation and Testing): In this chapter, we illustrate how we implemented the testing procedure to find whether there is any error or not.

Chapter 6 (Conclusion and Future Scope): This is the final chapter of our report. Here we discuss about the conclusion and also discuss about the future scope of our application.

Chapter 2

Background

2.1 Introduction

A hospital is such a place where people go to for taking treatment. Sometimes people face some sort of problems. Majority of the task are manually done by the receptionist in the paper. A lot of papers are needed to be handled and taken care of.

Doctors need to remember the relevant reasons of previous check-up of a patient. As a result, sometimes they forget the reason and find it difficult to diagnosis the disease.

Though there are quite same related applications are found, they are not usable to maintain a hospital. Most of the hospitals are not online based. With the development of the technology the world has come closer. Online payment system is not developed in any system in hospital management system.

2.2 Related works

We looked through play store and found some apps that is similar to our application but there are some features missing which this type of application need to have. So we combined all the features in our app and added some new features and make it useful with better UI.

Some related works are mentioned below with a short detail:

- Doctor Anywhere: No communication system has been developed. A patient need to go the doctor physically and then the app will be used. UI is not user friendly.
- Doctorola: In this app, there is no option created for doctor. A user can find

hospital, blood donor and make appointment with a doctor but will not get any confirmation.

- IbnSina: A user can see the list of doctors and make appointment.

2.3 Comparative Studies

We studied some similar application and found that they are not same which we are developing. They have some limitations. There is no application which contains all features. In some application, there is no login and signup application which is needed for getting patient and doctor information. But in our application, we have both login and signup and also admin dashboard for monitoring the whole system.

We build a simple and user friendly application for a doctor and a patient. The main goal of the project is to make the system online based and digitalized and do maximum work at minimum time.

2.4 Scope of the problem

By studying the related works and after then comparing with existing applications, some lacking's of feature were found. It is totally a new application which brings doctors and patients site by site by its features. We are facing problems in our every day of life. Similarly, we faced many problems while making the project.

The scopes of the problems are discussed below:

2.4.1 An attractive app for both patients and doctors

The application is designed for making the system online based. So it is very important to make the User Interface user-friendly and efficient.

2.4.2 Online Payment

A patient can pay to a doctor through the application. The transaction information will be kept hidden from outside of the world.

2.4.3 Privacy

Privacy of all users should be maintained strictly. It is important to check the transaction system cautiously and privately. It will only record the user name and his given password to be identify him/her next time. Those data will be also kept safe by admin. If it keeps track of user activities and records it often it will be a strong violation of security.

2.5 Challenges

In every sphere of life there are challenges but we are to overcome the challenges to make something good. The challenges we have faced are given below:

2.5.1 User friendly UI

It was one of the biggest problems for us that we spent a huge time to make the UI user -friendly.

2.5.2 Problem finding

As some related applications have already been made, we tried to find the bugs and missing features that should be in our application.

2.5.3 Real time database

We faced some problems to choose which database management system we will use to build the application. As we need real time database, so we decided to use firebase.

2.5.4 Time management

It was one of the difficult parts to maintain. We always kept in our mind about the deadline. If we could not do it in time, it would be very good for us. Thus we had to divide our time to develop the site part by part.

2.5.5 Dealing with different screen devices

Our users may have devices with different screens. So it is also a challenge to handle the screen size of our application.

2.5.6 Keeping application simple and clean

If the app is very complex and user cannot understand how it works, then the user will uninstall the application and give a negative review. So the functions of the application should be clear and simple.

Chapter 3

Requirement Specification

3.1 Business Process Modeling

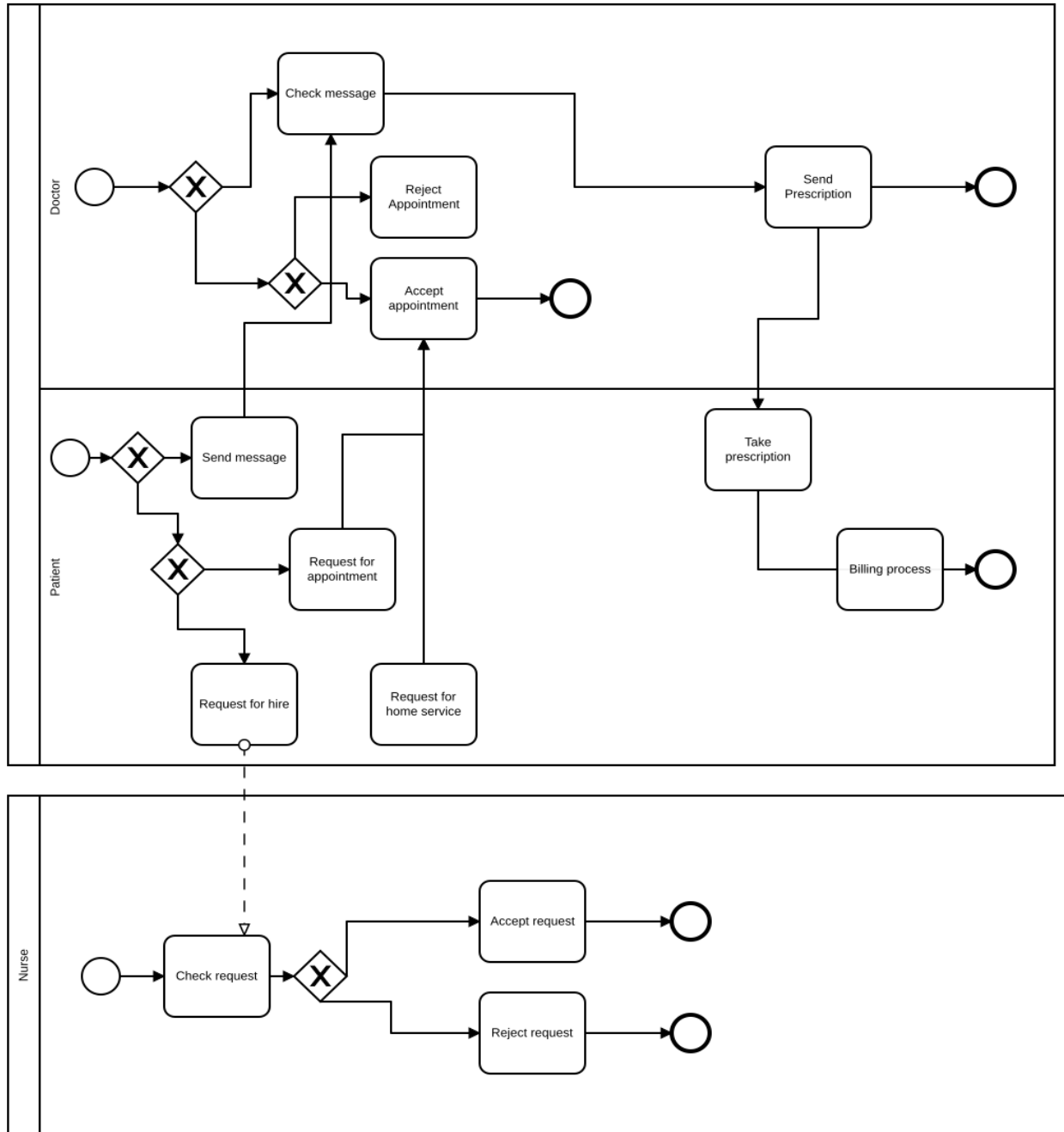


Figure 3.1: Business Process Model

3.2 Requirement Collection and Analysis

Requirement collection is main part to make a successful application. Requirements for a new system should be gathered from end users of the system. The requirements are mentioned below:

1. Patient has to have login and signup system.
2. Doctor have to make a request to the system with proper information and admin will check information.
3. Doctor can make prescription.
4. Patient needs to pay money to see the prescription.
5. Anyone can search for blood donor and can add himself as a blood donor.
6. Patient can make appointment.
7. Patient and doctor can communicate with each other in live chat.
8. Patient can check their report in profile.
9. Patient can send report to doctors in live chat.

3.2.1 Functional Requirements

Admin

The system should allow the admin to see the list of doctors.

The system should allow the admin to see the list of patients.

The system should allow the admin to accept or reject the requested doctors.

The system should allow the admin to view the profile of doctors.

Doctor

The system should allow the doctor to update the profile.

The system should allow the doctor to give services.

The system should allow the doctor can see the given prescriptions.

The system should allow the doctor to see the appointments.

The system should allow the doctor to live chat with patient.

Patient

The system should allow the patient to see the profile of the doctor.

The system should allow the patient to make appointment.

The system should allow the patient to live chat with doctor.

The system should allow the patient to edit profile.

The system should allow the patient to send image in messaging.

3.2.2 Non-Functional Requirements

Non-Functional requirements define the needs in terms of performance, logical database requirements, design constraints, reliability, availability, security, maintainability, and portability.

3.2.3 Performance Requirements

- Performance requirements define acceptable response times for system functionality.
- The load time for user interface screens shall take no longer than two seconds.
- The log in information shall be verified within five seconds.
- The system must support at least 500 users at a time.
- The system must available 24/7.
- The communication between system and server must be encrypted.
- The system should be easy to extend. The code should be written in a way that it favors implementation of new functions.

3.2.4 Hardware & Software Requirement for System

- Before creating the app and site, we need to look after the minimum requirement of hardware and software to run it. There are some requirements to run this application and site properly and efficiently.
- The following requirements are needed to visit our web site:
 1. Browser: Google Chrome, Mozilla Firebox or any browser
 2. RAM: Minimum 1 GB.
 3. Operating System: Windows, Linux
- The following requirements are needed to use the app:
 1. RAM: Minimum 1 GB.
 2. Operating System: Android.
 3. Need Internet Connection

3.2.5 Analysis

We studied a lots of android application and website which are related to our application and discover what features they were missed. Everything we are using is real time so we decided to use firebase as our real time database. And also we decided to use Vuejs (Javascript Framework) for our client site.

3.3 Use Case Modeling and Description

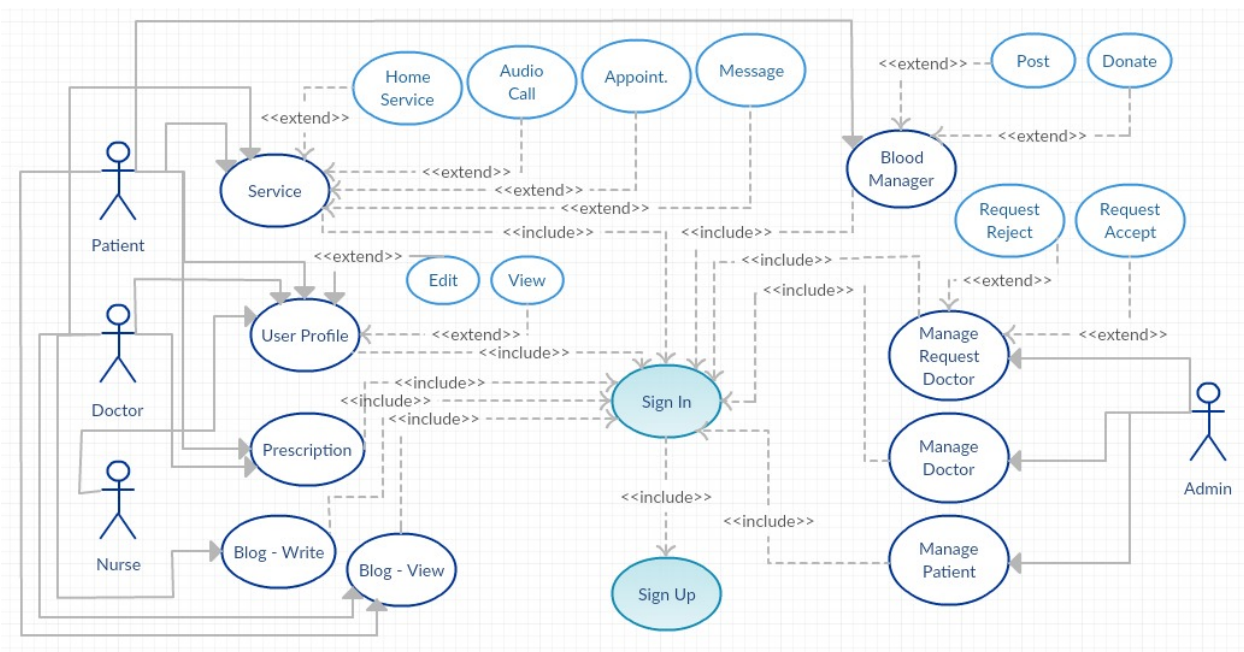


Figure 3.1: Use Case Diagram

Use case description

Table 3.1: Use Case Description of Patient Registration

| | |
|--------------------------|--|
| Use Case Name: | Registration |
| Precondition: | None |
| Actor: | Patient |
| Primary Path: | <ol style="list-style-type: none"> 1) Enter Name 2) Enter Email 3) Enter Password 4) Click Registration 'Button' |
| Exceptional Path: | <ol style="list-style-type: none"> 1.1) Name is required 2.1) Email is required 3.1) Password is required 3.2) Password must be larger than 6 characters |

Table 3.2: Use Case Description of Patient Login

| | |
|--------------------------|--|
| Use Case Name: | Login |
| Precondition: | Registration |
| Actor: | Patient |
| Primary Path: | <ol style="list-style-type: none"> 1) Enter Email 2) Enter Password 3) Click Login 'Button' |
| Exceptional Path: | <ol style="list-style-type: none"> 2.1) Email is required 3.1) Password is required |

| | |
|--|--|
| | 3.2) Password must be larger than 6 characters |
|--|--|

Table 3.3: Use Case Description of Doctor Login

| | |
|--------------------------|---|
| Use Case Name: | Login |
| Precondition: | Registration |
| Actor: | Doctor |
| Primary Path: | 1) Enter Email 2) Enter Password 3) Click Login 'Button' |
| Exceptional Path: | 2.1) Email is required 3.1) Password is required 3.2) Password must be larger than 6 characters |

Table 3.4: Use Case Description of Live Chat

| | |
|-----------------------|---|
| Use Case Name: | Live Chat |
| Precondition: | Login |
| Actor: | Patient, Doctor |
| Primary Path: | 1) Enter Message 2) Send Image 2) Click Send 'Button' |

| | |
|--------------------------|-------------------------------|
| Exceptional Path: | 1.1) Message body is required |
|--------------------------|-------------------------------|

Table 3.5: Use Case Description for writing blog post

| | |
|--------------------------|--|
| Use Case Name: | Blog post |
| Precondition: | Login |
| Actor: | Doctor |
| Primary Path: | 1) Enter text 2) Click Add 'Button' |
| Exceptional Path: | 1.1) Text is required |

Table 3.6: Use Case Description for Prescribing Patient

| | |
|--------------------------|---|
| Use Case Name: | Prescribing Patient |
| Precondition: | Login |
| Actor: | Doctor |
| Primary Path: | 1) Enter medicine name 2) Enter how many times 3) Click Add 'Button' |
| Exceptional Path: | 1.1) Medicine name is required 2.1) How many times in a day is required 2.2) How many times must be integer |

Table 3.7: Use Case Description for viewing prescriptions

| | |
|--------------------------|---------------------------------|
| Use Case Name: | View Prescriptions |
| Precondition: | Login |
| Actor: | Patient |
| Primary Path: | 1) Click View Prescription menu |
| Exceptional Path: | None |

Table 3.8: Use Case Description of nurse's patient request

| | |
|--------------------------|--|
| Use Case Name: | Handle Patient Request |
| Precondition: | Login |
| Actor: | Nurse |
| Primary Path: | 1) List of request from patient's 2) Click Accept Button or 3) Click Reject Button |
| Exceptional Path: | None |

Table 3.9: Use Case Description for applying as blood donor

| | |
|-----------------------|-----------------------|
| Use Case Name: | Apply for Blood donor |
| Precondition: | None |

| | |
|--------------------------|--|
| Actor: | Anonymous |
| Primary Path: | 1) Enter Name 2) Enter Age 3) Enter Phone number 4) Enter Weight 5) Enter Blood Group 3) Click Add "Button" |
| Exceptional Path: | 1.1) Name is required 2.1) Age is required 3.1) Phone is required 3.2) Phone must be valid 4.1) Weight is required |

Table 3.10: Use Case Description of Patient Appointment

| | |
|--------------------------|-----------------------------|
| Use Case Name: | Appointment |
| Precondition: | Login |
| Actor: | Patient |
| Primary Path: | 1) Click appointment Button |
| Exceptional Path: | None |

3.4 Logical Data Model

3.5 Design Requirements

Android Studio

Android studio is an IDE to build an android application. It is much efficient than others Android IDE. It has some build in features and supports incredible library tools which help anyone to build application easily and effectively.

XML

XML stands for Extensible Markup Language. It is needed to design the android application. It is like a markup language which defines a set of rules for encoding in a format like which likely both readable for developer and system.

CSS

CSS means Cascading Style Sheet. Style sheet refers to the document itself. CSS is used to make the web pages more interactive and well looked.

Bootstrap

It is a CSS framework. It is needed to make our website responsive so that user can browse from mobile easily.

Vuejs

Vuejs is JavaScript frontend framework. We used it for making our web application and admin dashboard user friendly.

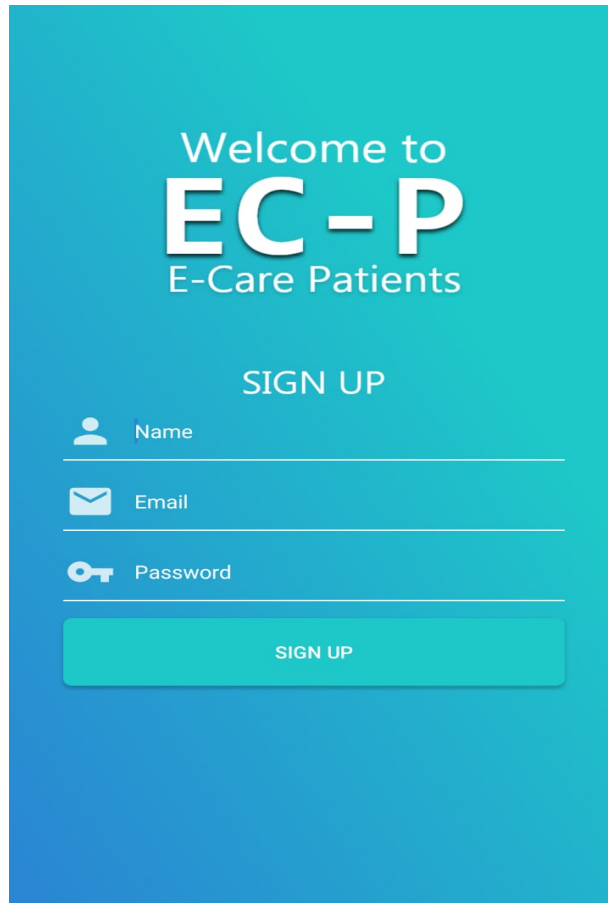
Chapter 4

Design Specification

4.1 Front-end Design

Front-end design is one of the essential part for developing any dynamic web application. It's good practice to make any application user friendly with the interface. Here is our application user interfaces:

The figure [4.1] is given below is signup interface for patient. Patient must enter name, email, and password for registration as patient.



Welcome to
EC-P
E-Care Patients

SIGN UP

Name

Email

Password

SIGN UP

Figure 4.1: Signup for patient

The figure [4.2] is given below is sign in interface for patient. Patient must enter email, and password for login.

The figure [4.3] is given below is sign in interface for doctor. Doctor must enter email, and password for sign in.

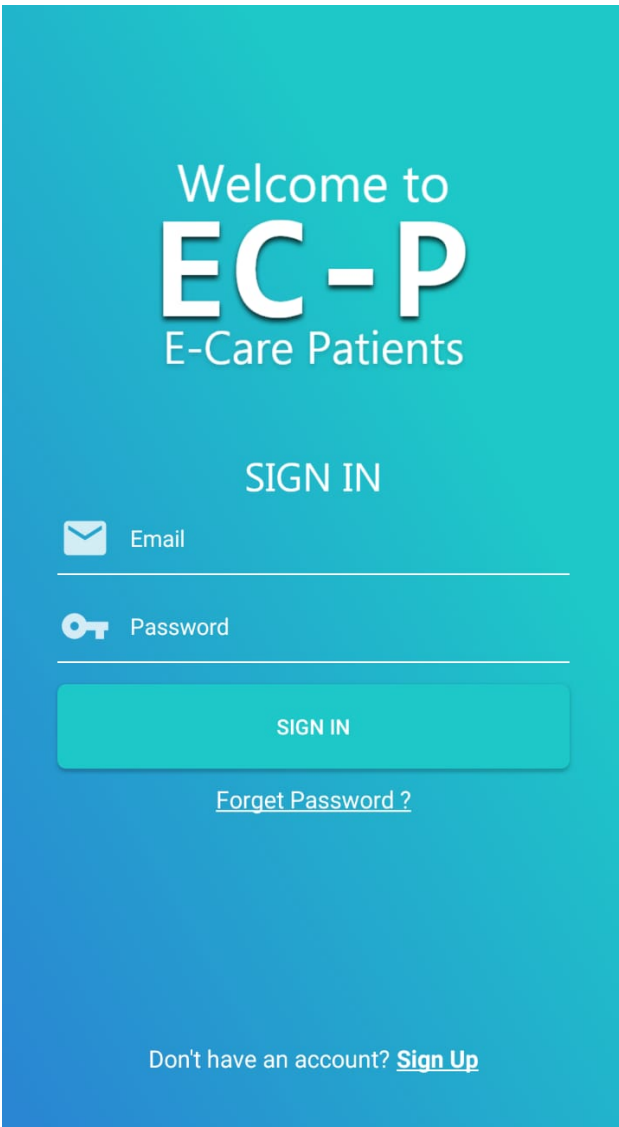


Figure 4.2: Sign in for patient

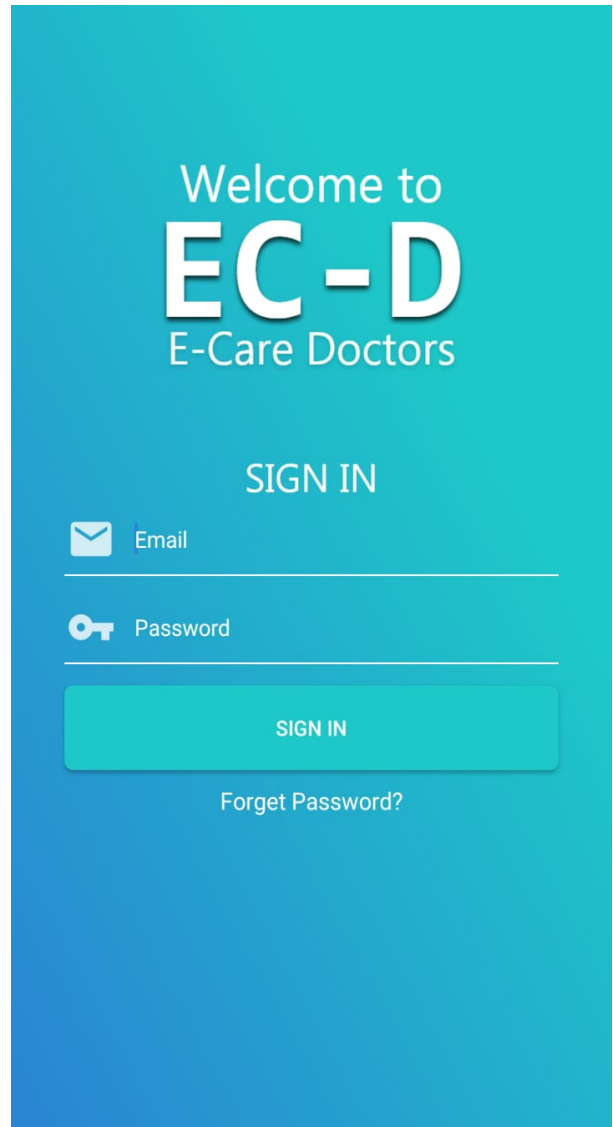


Figure 4.3: Sign in for doctor

The figure [4.4] is given below is dashboard interface for patient. Doctor must enter email, and password for sign in.

The figure [4.5] is given below is service interface. Patient can select any service and take the advantages of that service.

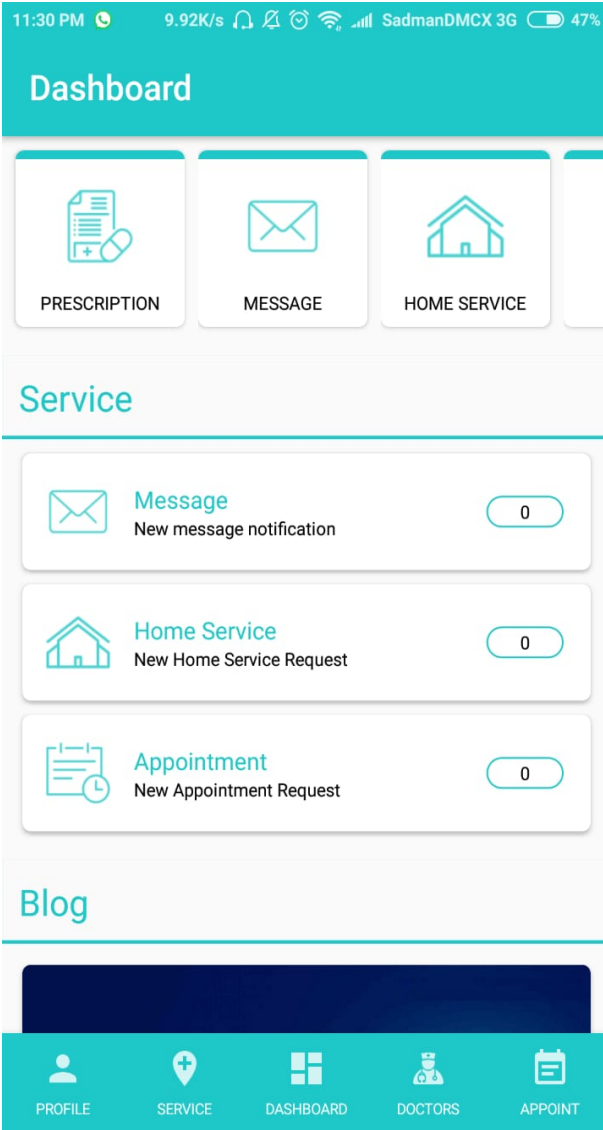


Figure 4.4: Dashboard for Patient

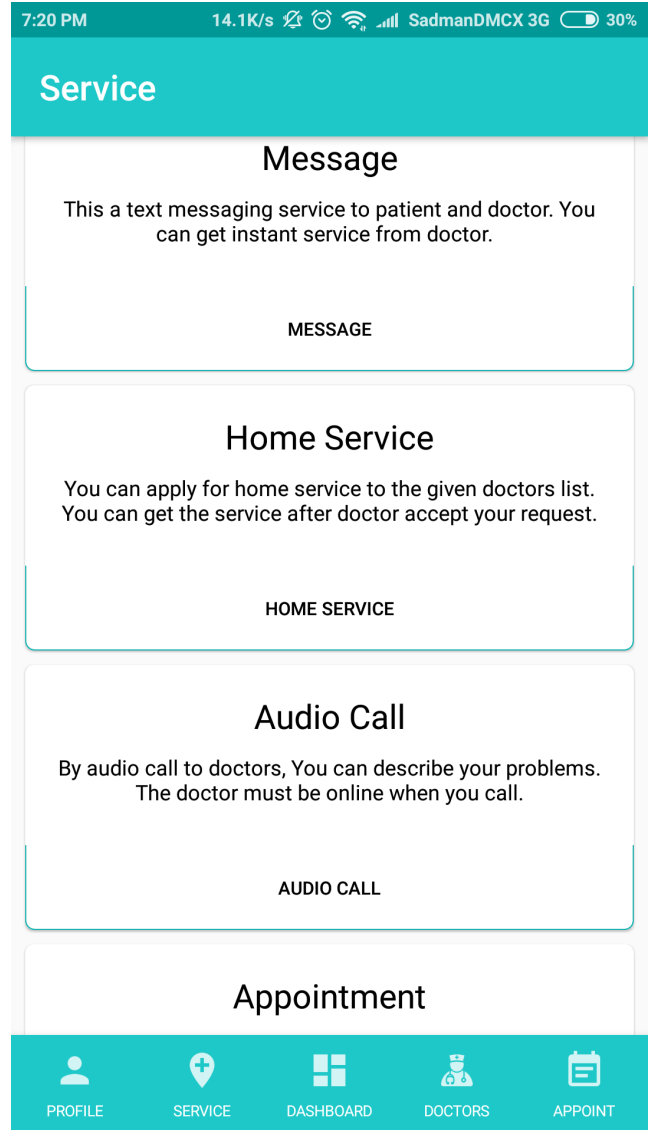


Figure 4.5: Services

The figure [4.6] is given below is patient profile interface. Patient can see his/her profile info and click update icon to go to the update page.

The figure [4.7] is given below is patient profile update interface. Patient can update his/her the info.

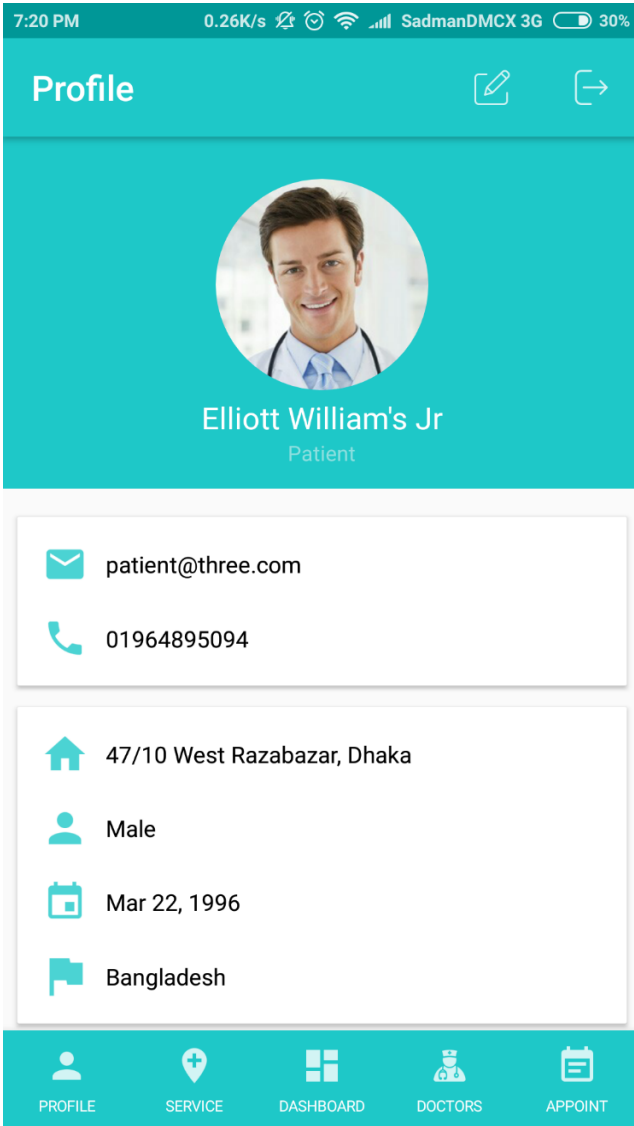


Figure 4.6: Patient Profile

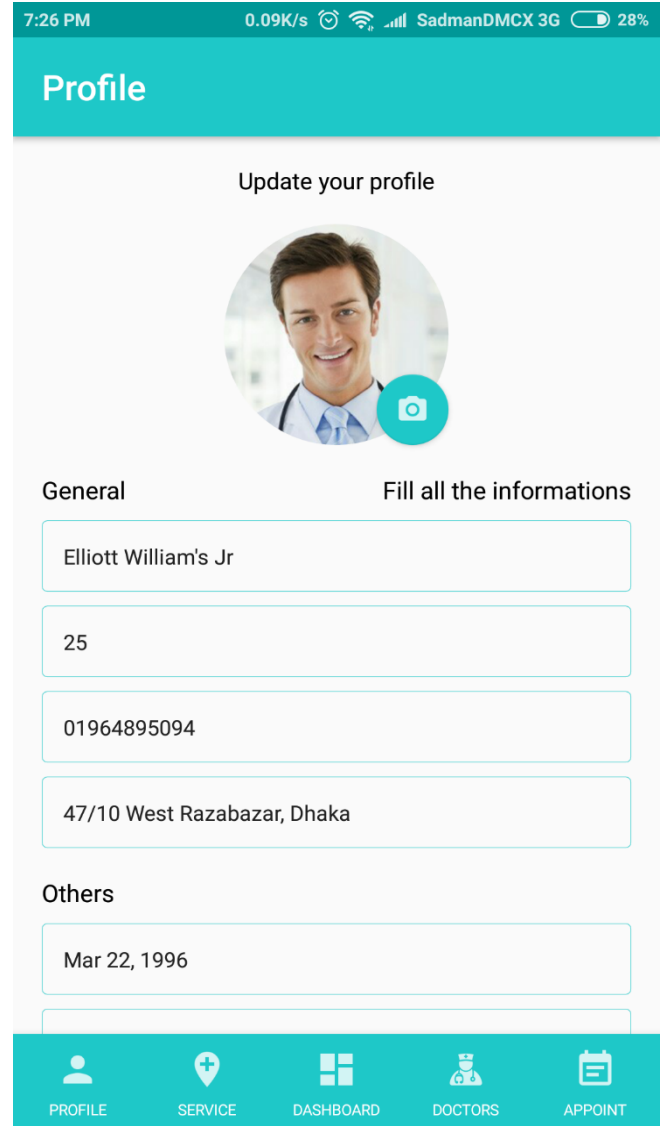


Figure 4.7: Patient Profile Update

The figure [4.8] is given below is doctor list for messaging interface. Patient can see list of doctors and click any for sending message.

The figure [4.9] is given below is live chatting interface. Patient can communicate with doctor via live our live chat feature and get prescription.

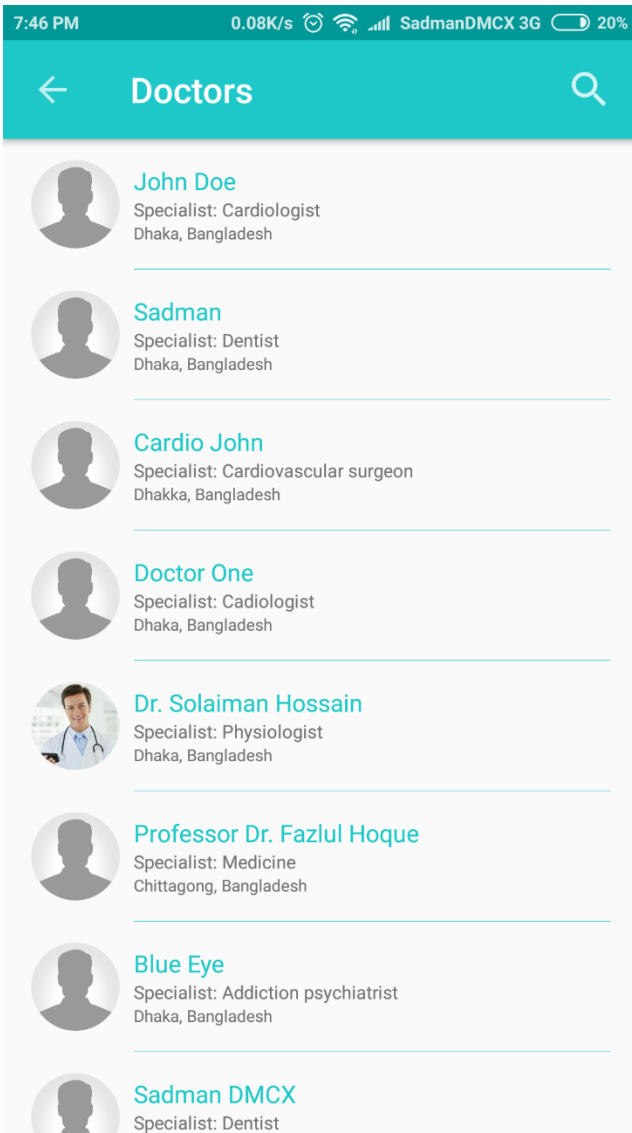


Figure 4.8: Doctor List

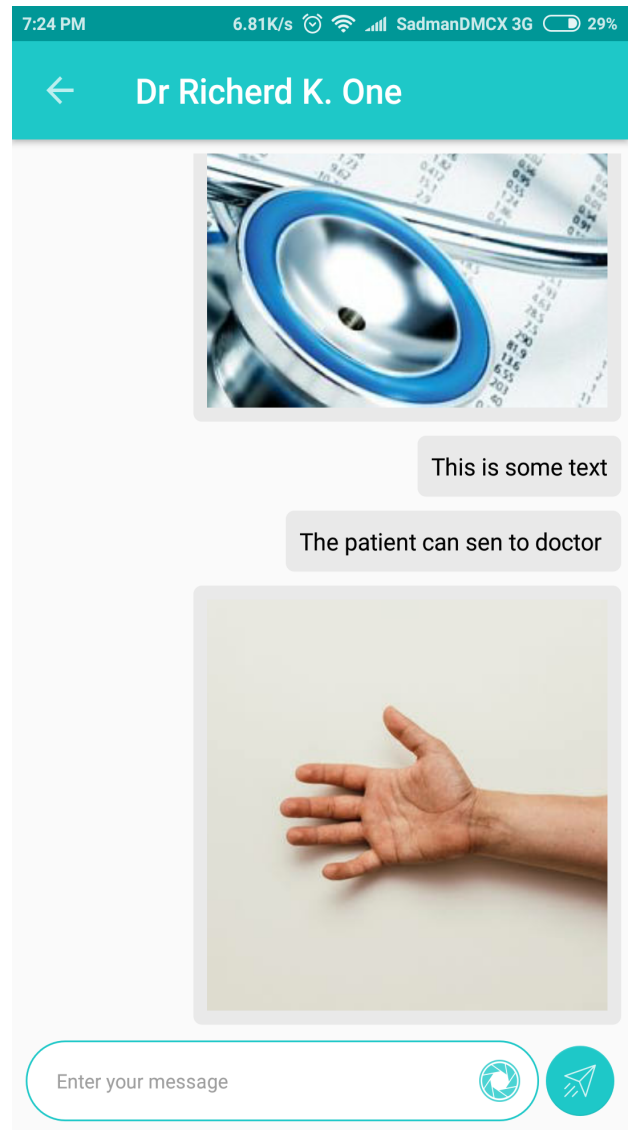


Figure 4.9: Live chatting

The figure [4.10] is given below is appointment creation interface. Patient can appointment request by clicking plus (+) icon on the screen and doctor will receive patient request.

The figure [4.11] is given below is verified doctors interface. Patient can see a list of doctors which is verified by respected admin and can see doctor full profile with useful information's.

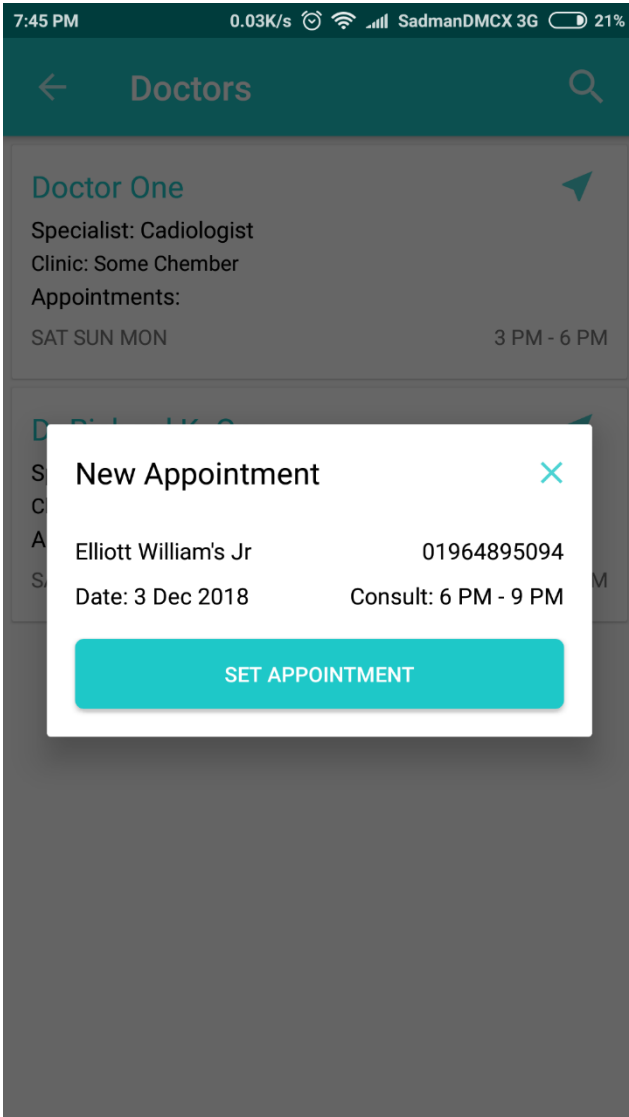


Figure 4.10: Create Appointment

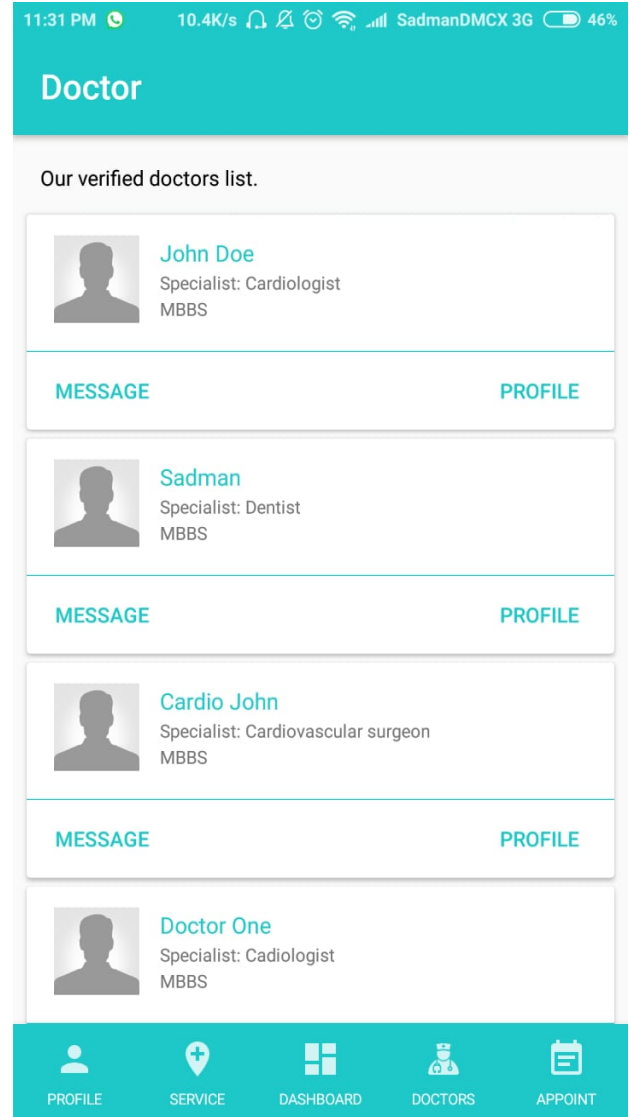


Figure 4.11: Verified Doctors

The figure [4.12] is given below is list of messages interface. List of doctor's name which patient chat before.

The figure [4.13] is given below is the interface for searching hospital.

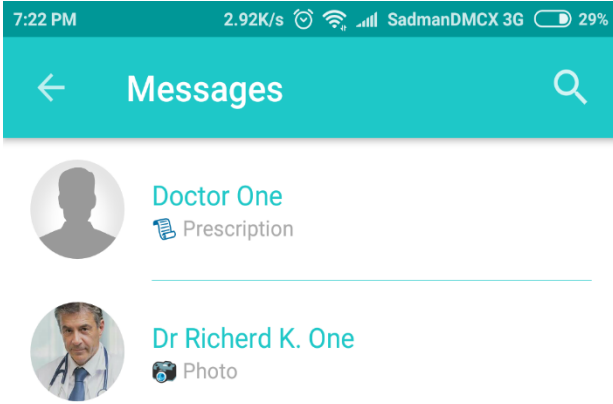


Figure 4.12: Messages



Figure 4.13: Search Hospital

The figure [4.14] is given below is the interface for searching doctors.

The figure [4.15] is given below is doctor dashboard interface.

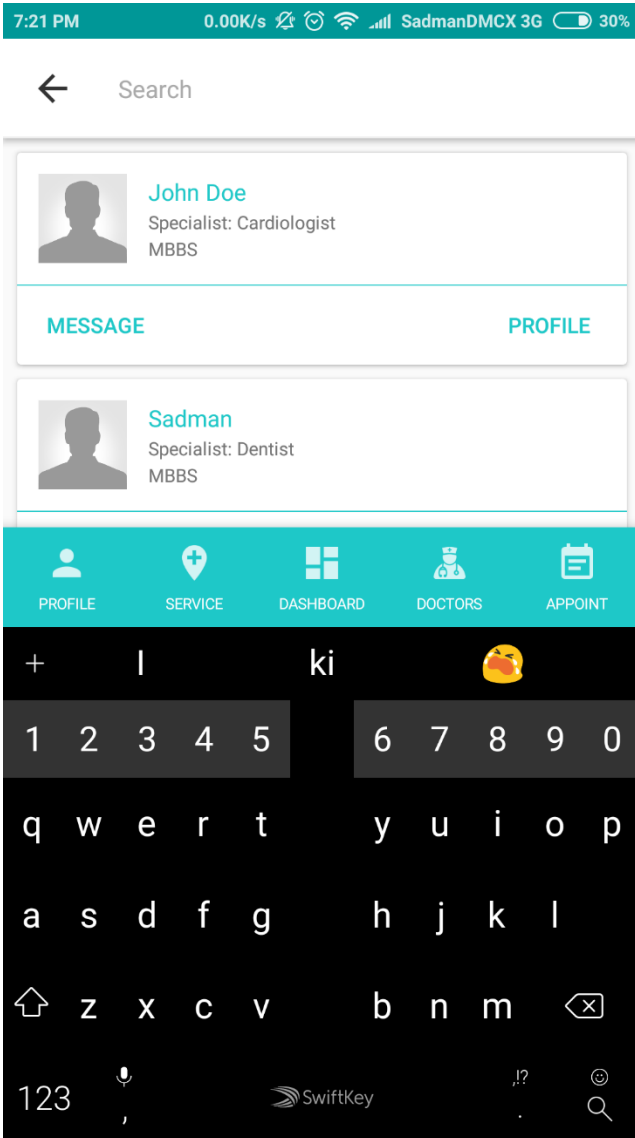


Figure 4.14: Search Doctor

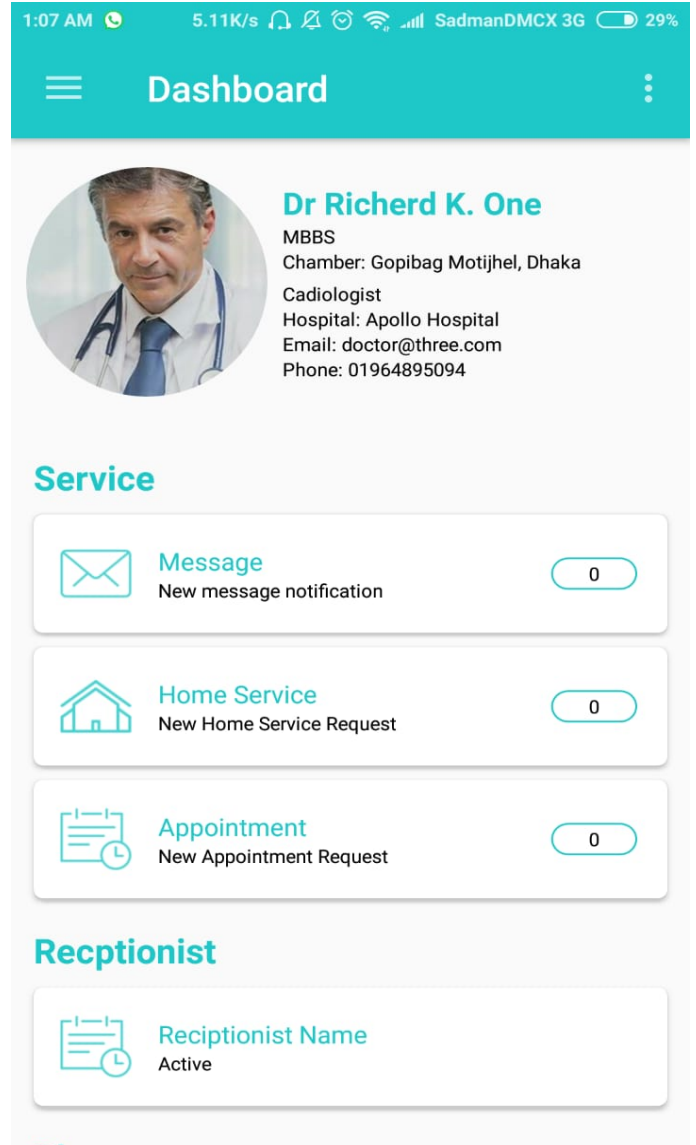


Figure 4.15: Doctor Profile

The figure [4.16] is given below is list prescription interface.

The figure [4.17] is given below is list of appointment to doctor interface. Doctor can remove any appointment or call the patient who made the appointment.



Figure 4.16: Prescription

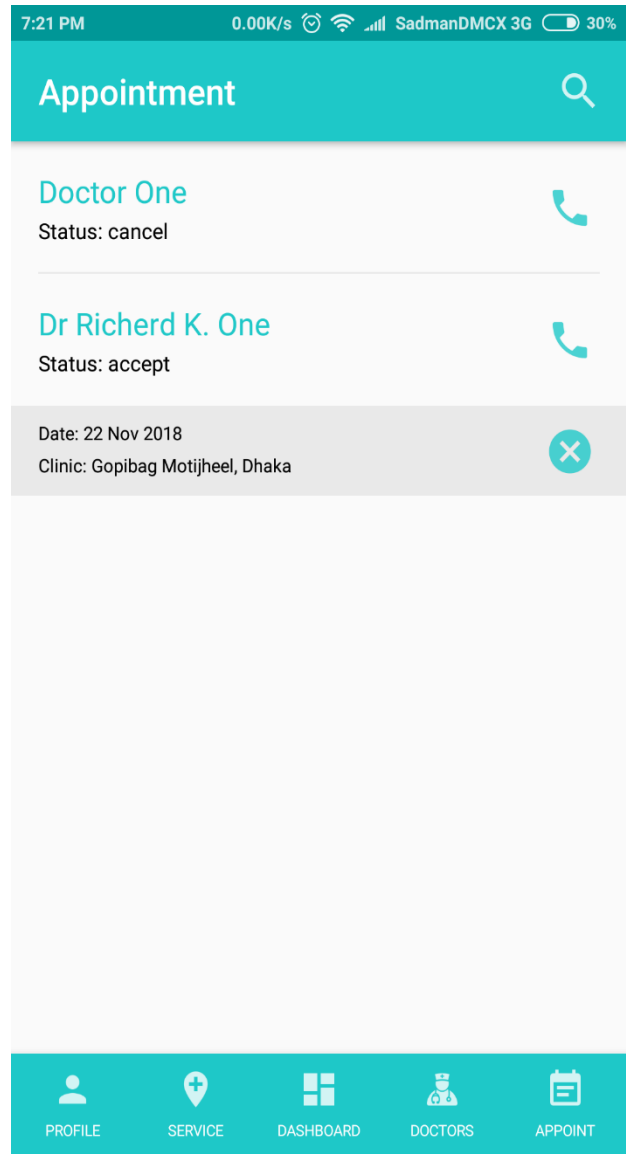


Figure 4.17: List of Appointment to Doctor

The figure [4.18] is given below is home service and patient can call the doctor.

The figure [4.19] is given below is call screen when a patient call a doctor.

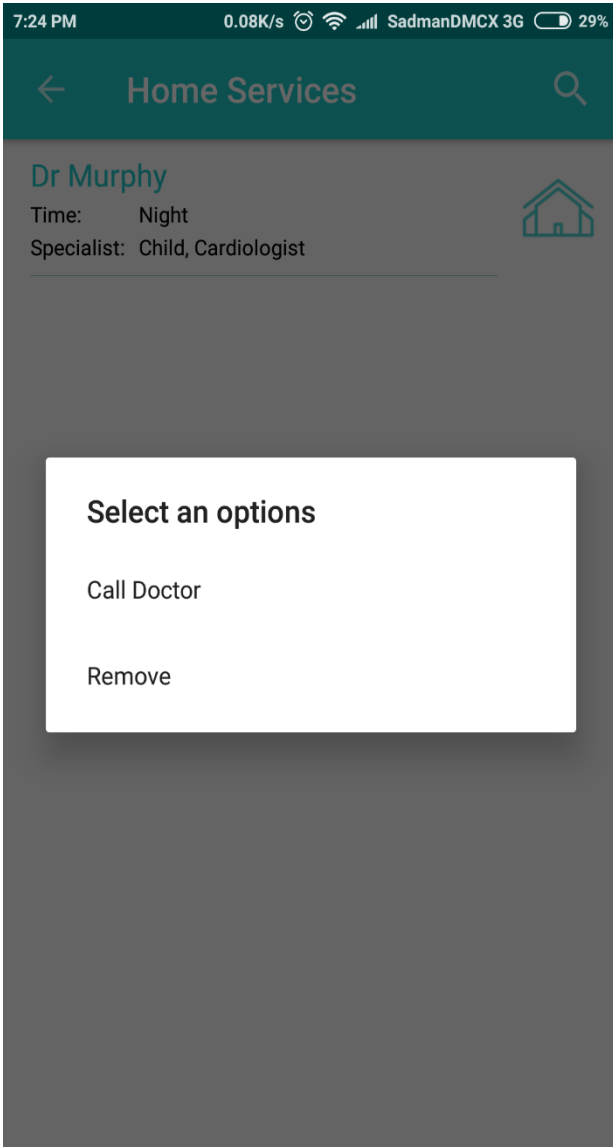


Figure 4.18: Home Service

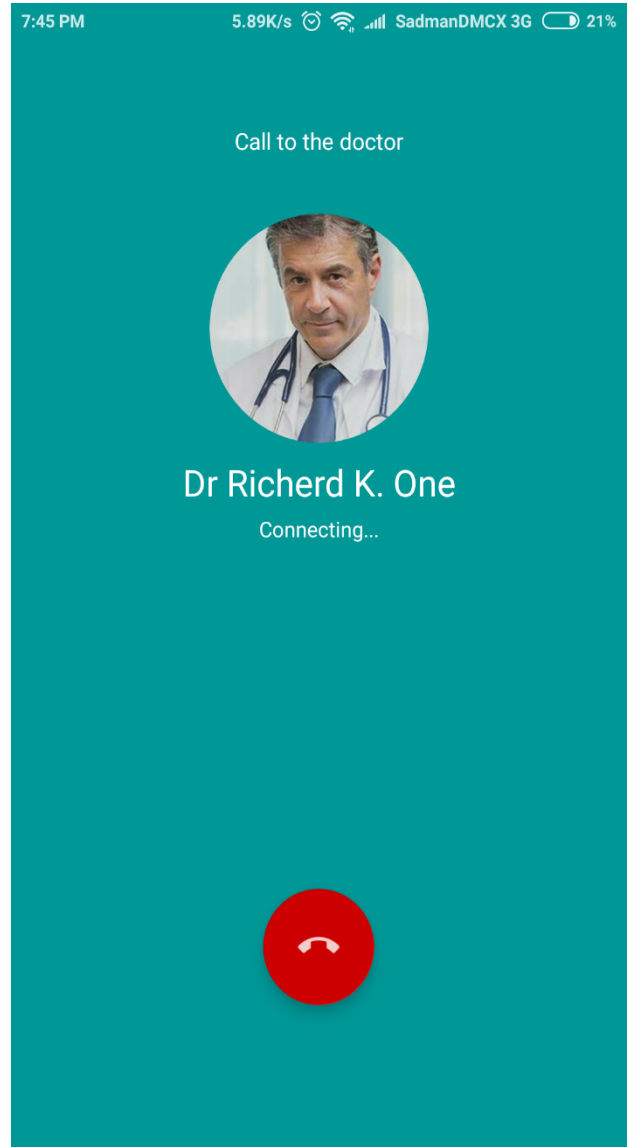


Figure 4.19: Call Screen

The figure [4.20] is given below is blog where doctor post anything related to medical science.

The figure [4.21] is given below is nurse list. Patient can call the nurse and ask for service.

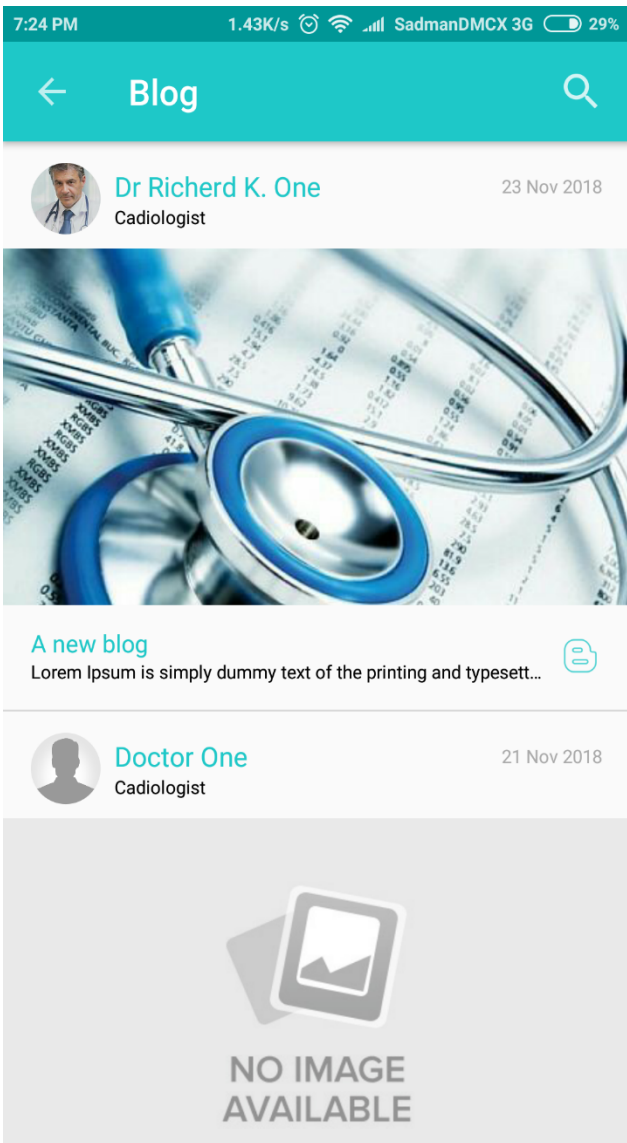


Figure 4.20: Blog

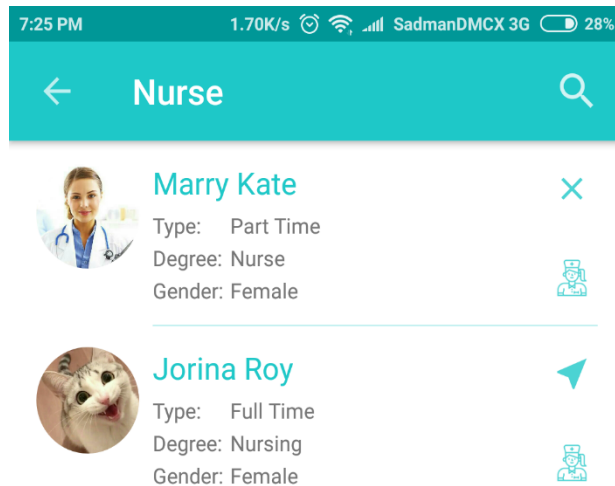


Figure 4.21 : Call Screen

The figure [4.22] is given below is blood donors list.

The figure [4.23] is given below add as a new blood donor.

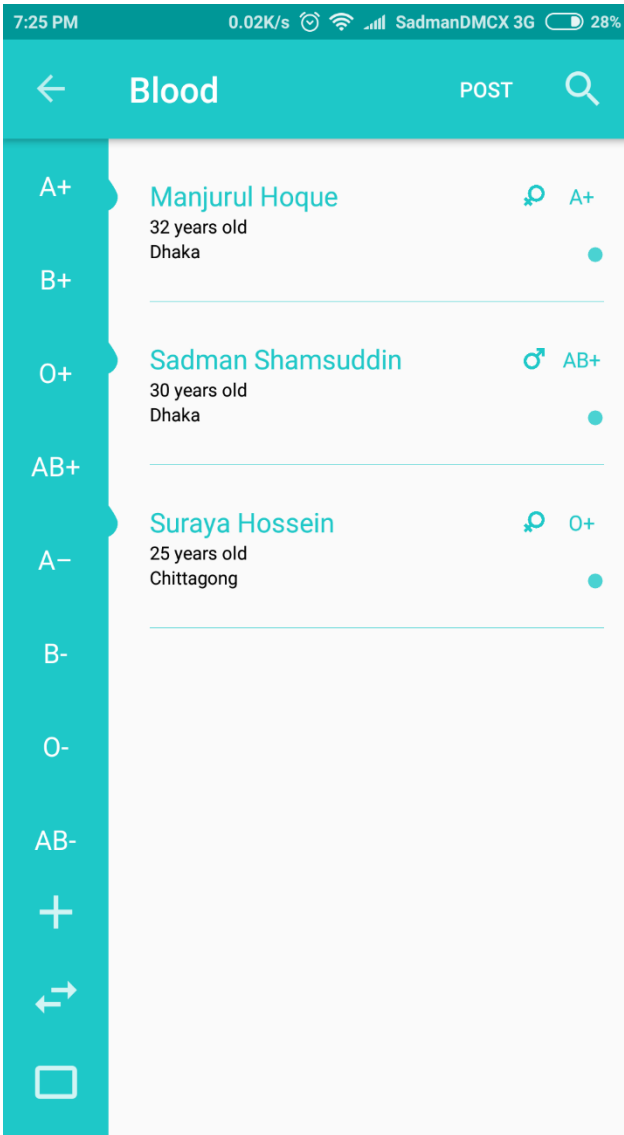


Figure 4.22: Blood Donors

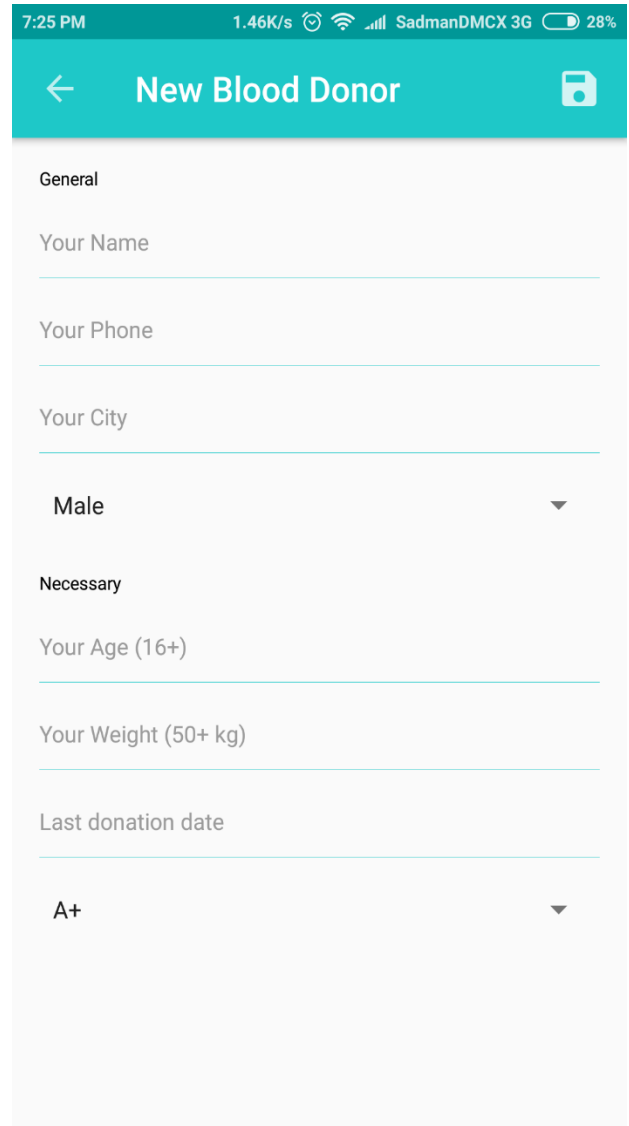


Figure 4.23: Call Screen

The figure [4.24] is given below is post for blood.

The figure [4.25] is given below all blood posts.

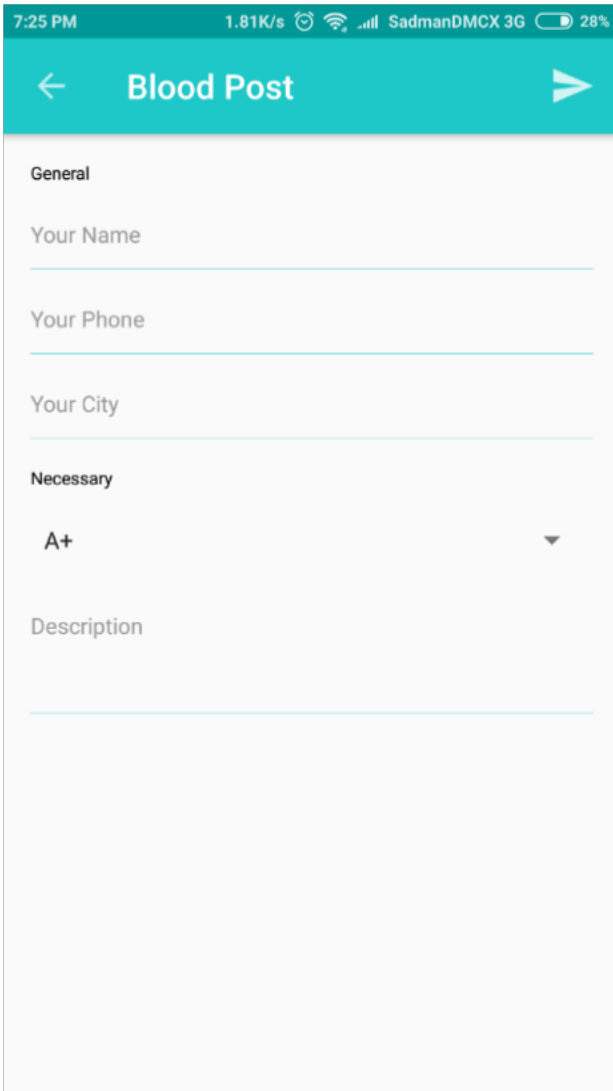


Figure 4.24: Blood Post

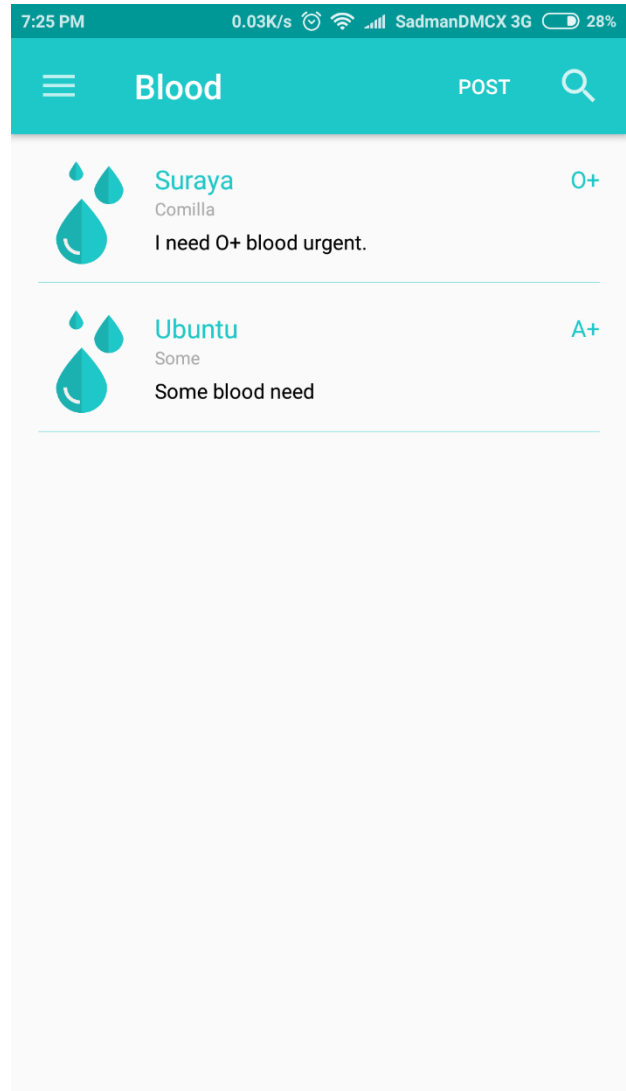


Figure 4.25: Posts For Blood

The figure [4.26] is given below is appointment list. Doctor can approve or reject the appointment.

The figure [4.27] is given below is sending new message to patient.

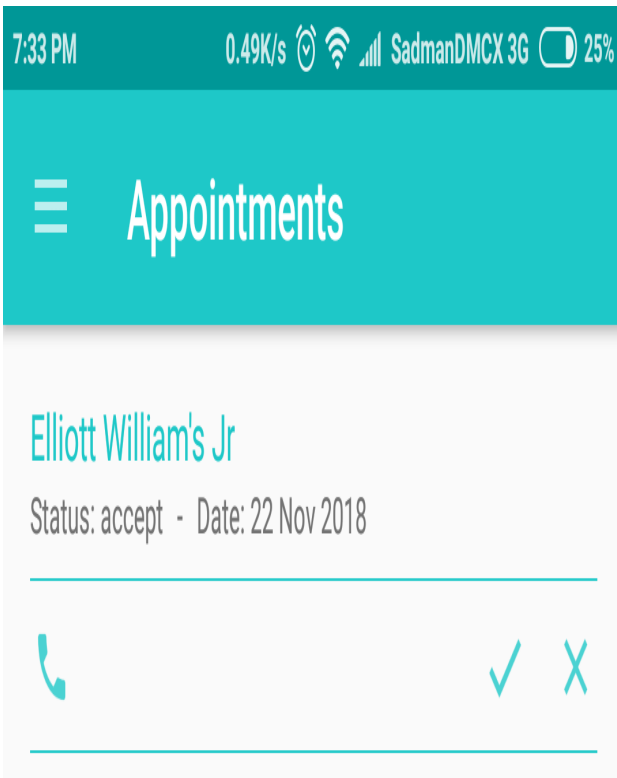


Figure 4.26: Appointment List

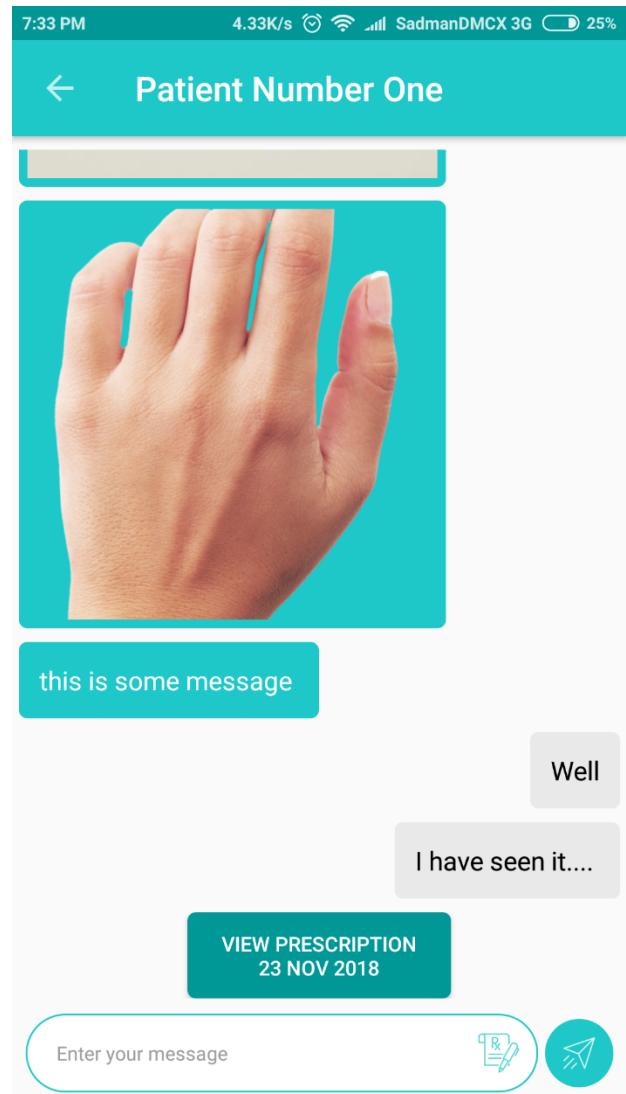


Figure 4.27: Message

The figure [4.27] is given below is audio call history.

The figure [4.28] is given below is list of medicine which a doctor gave.



Figure 4.27: Audio Call History

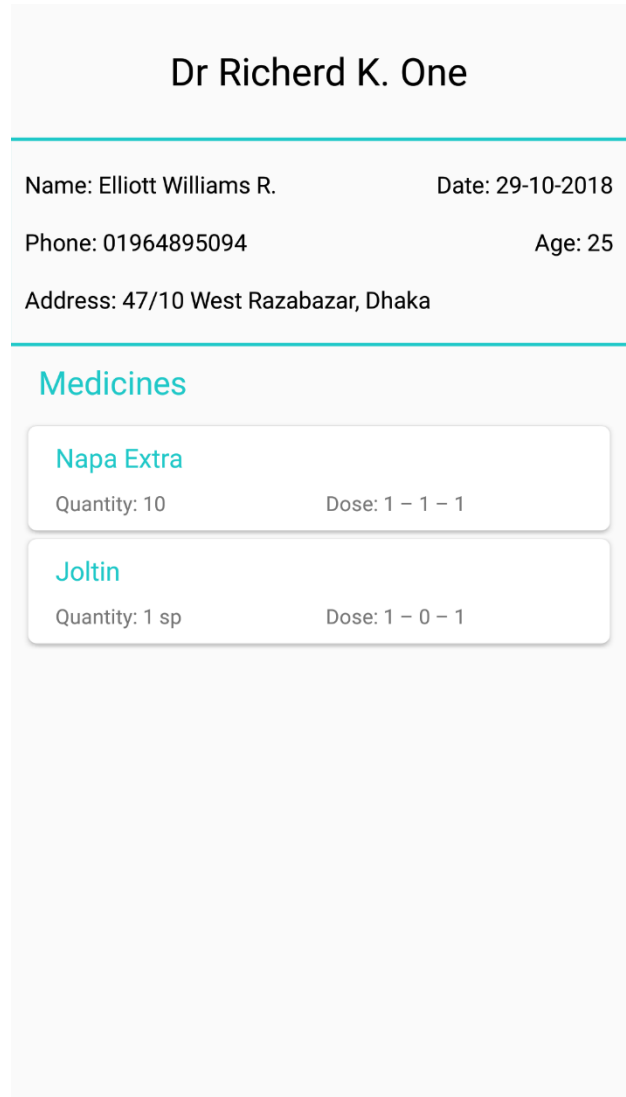


Figure 4.28: Medicine List

The figure [4.29] is given below is for making new assistant.

The figure [4.30] is given below is assistant profile. Doctor can remove the assistant also.

7:38 PM 0.00K/s SadmanDMCX 3G 23%

New Assistant

Assistant Information

General

Name (Required)

Phone (Optional)

Address (Optional)

Assistant

Authenticaiton

Email (Required)

Password (Required)

Your Information

Authentication

doctor@three.com

Figure 4.29: Make New Assistant

7:36 PM 0.00K/s SadmanDMCX 3G 24%

Assistant

Sofia Carolina
Receptionist
offline

Information

Email: sofi@gmail.com

Phone: 0101010101

Address: 45 Back Street, Uttora, Dhaka

Note! Add some note for your assistant/
receptionist

DELETE THIS ACCOUNT

Figure 4.30: Medicine List

The figure [4.31] is given below is for adding appointment time as doctor.

The figure [4.32] is given below is for removing as appointment doctor.

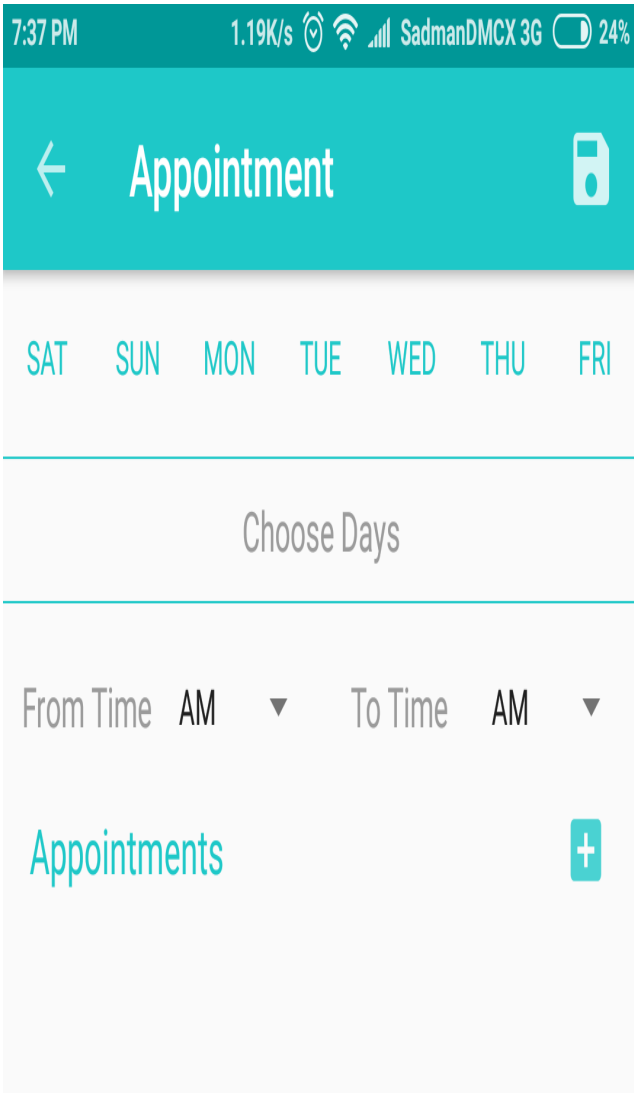


Figure 4.31: Add Appointment Time

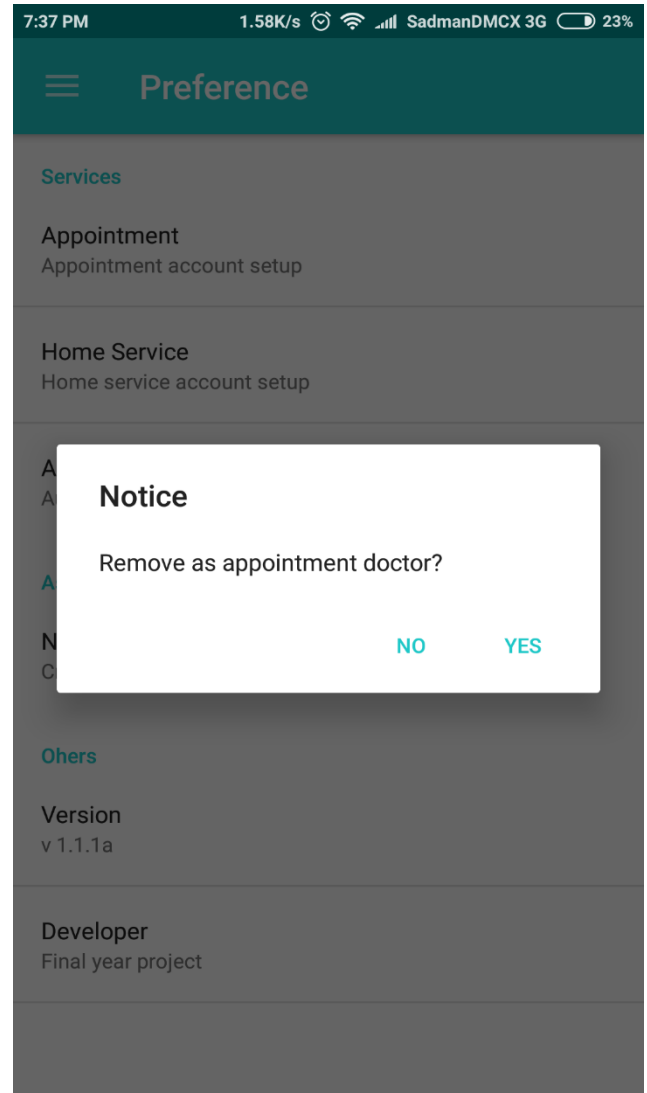


Figure 4.32: Remove as Appointment Doctor

The figure [4.33] is given below is sign in screen for nurse.

The figure [4.34] is given below is sign up for nurse.

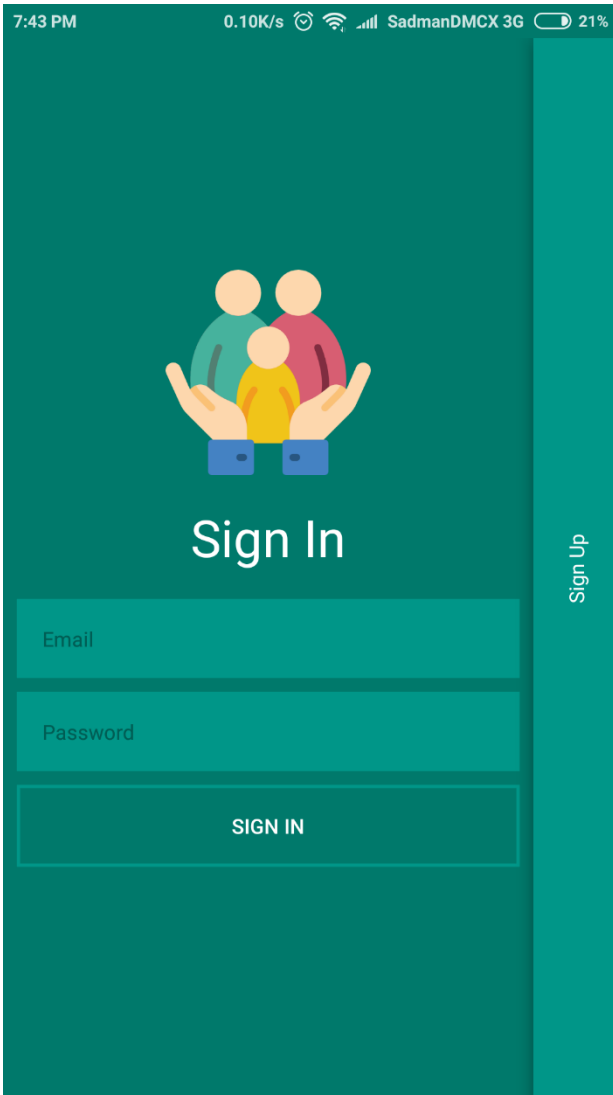


Figure 4.33: Nurse Sign in

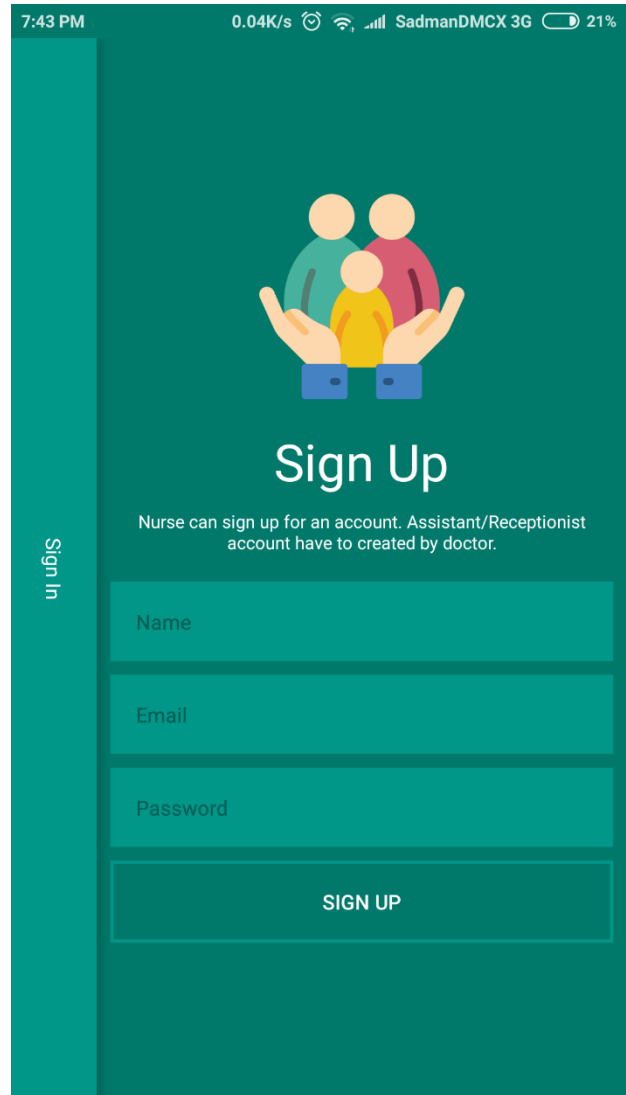


Figure 4.34: Nurse Sign Up

The figure [4.35] is given below is assistant profile.

The figure [4.36] is given below is assistant profile edit.

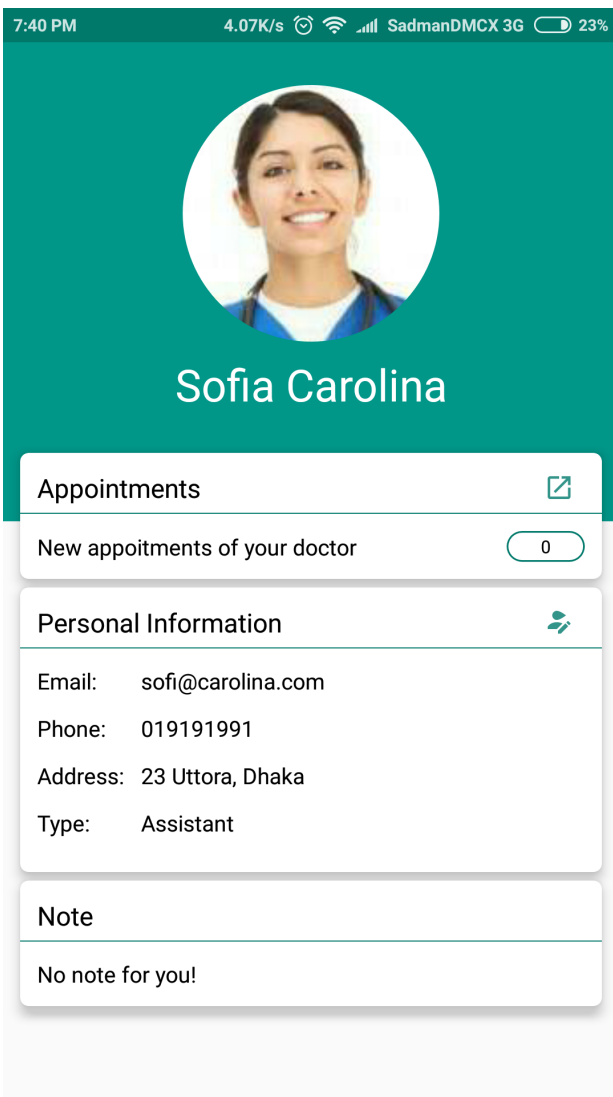


Figure 4.35: Assistant Profile

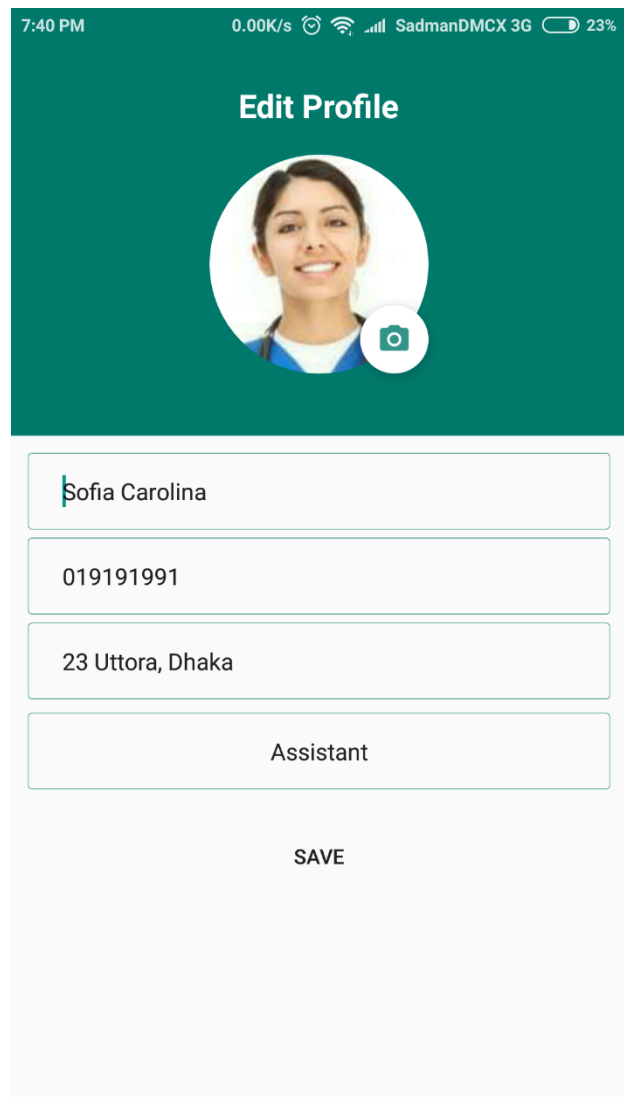


Figure 4.36: Assistant Profile Edit

The figure [4.37] is given below is appointment list for an assistant.

The figure [4.38] is given below is nurse profile.

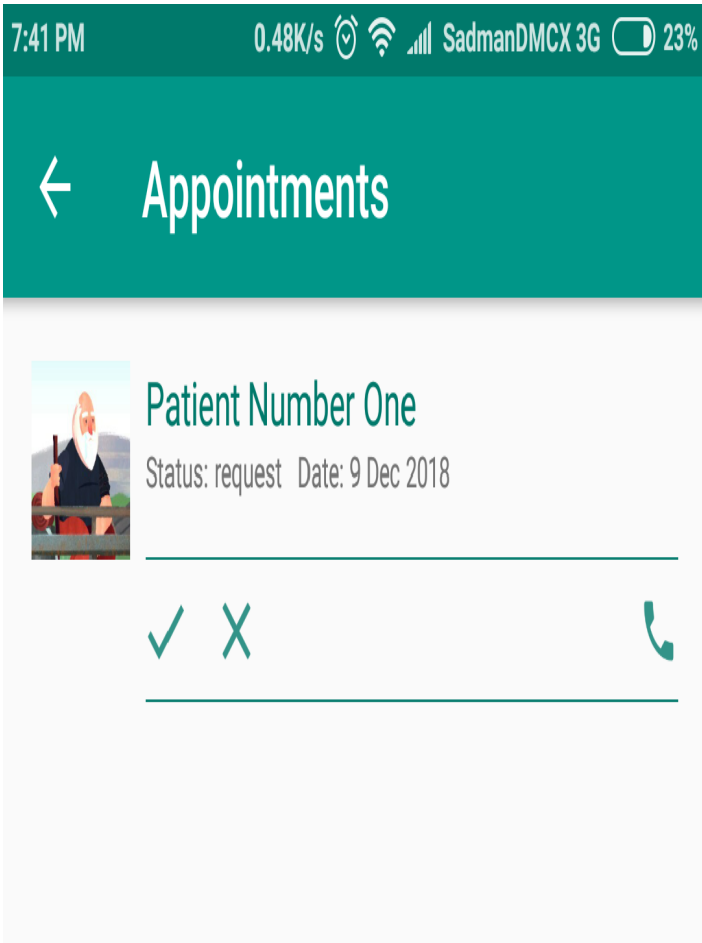


Figure 4.37: Appointment List

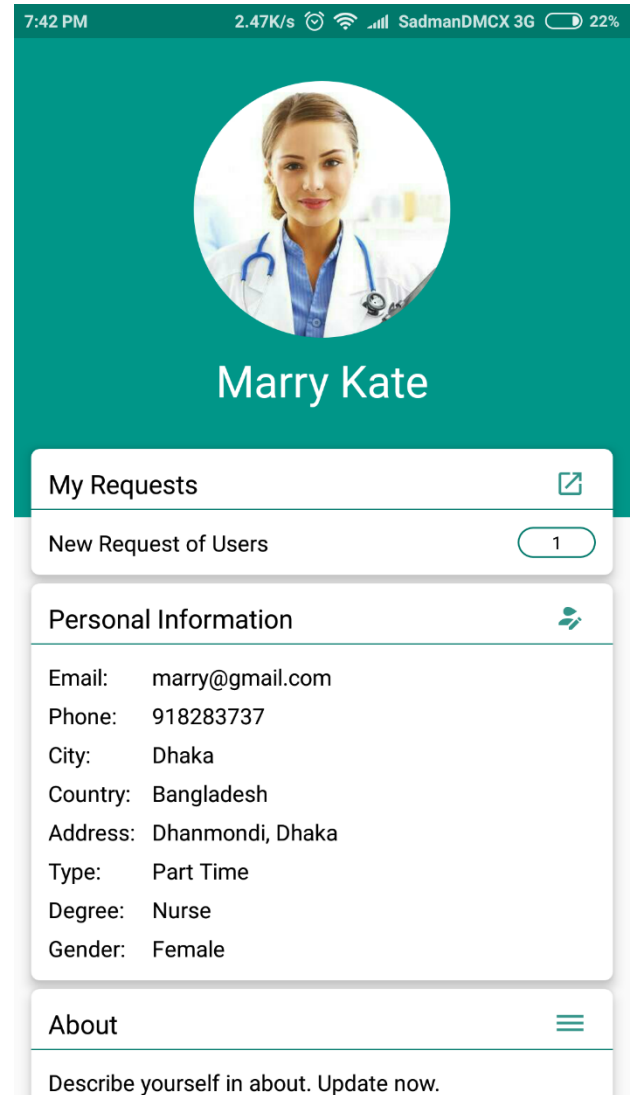


Figure 4.38: Nurse Profile

The figure [4.39] is given below is list of request.

The figure [4.40] is given below is nurse profile edit.

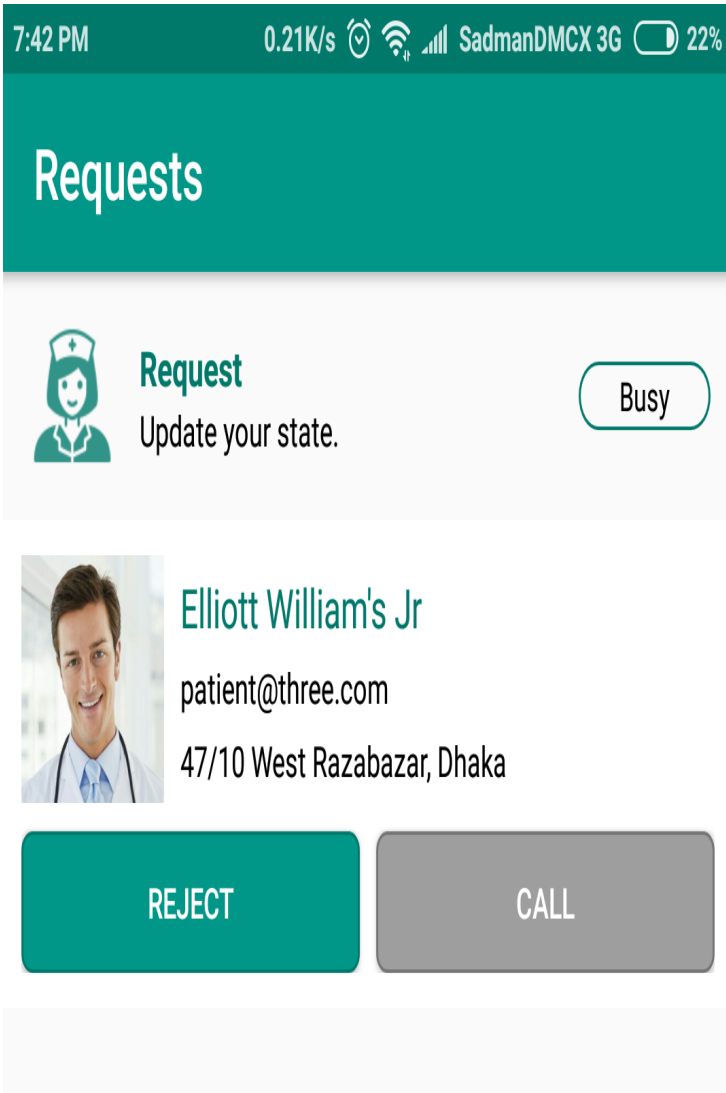


Figure 4.39: All Requests of Nurse

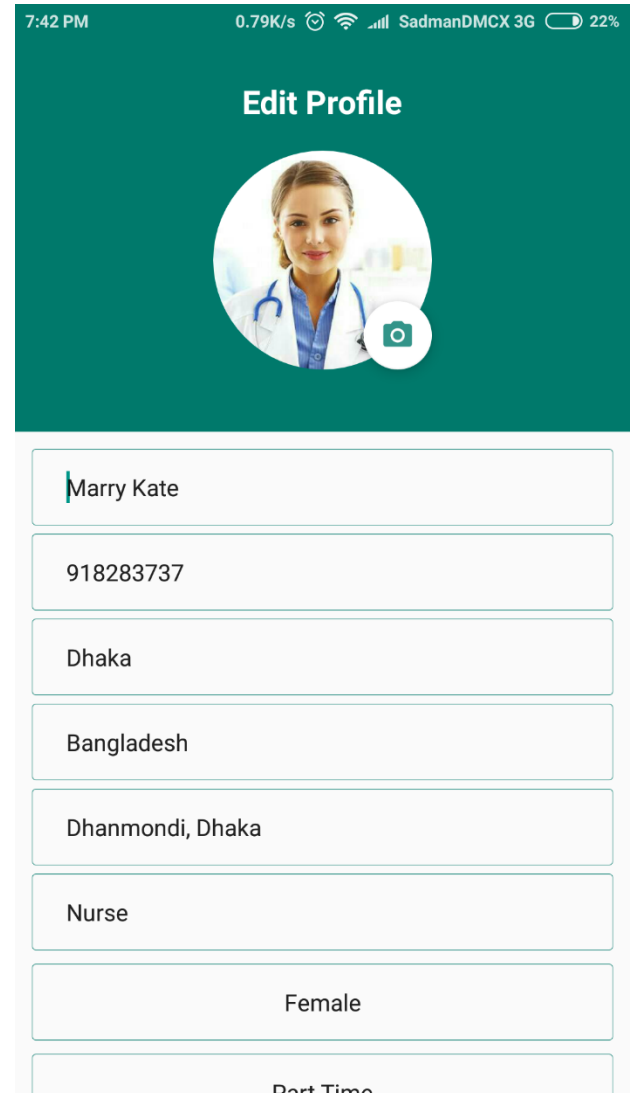


Figure 4.40: Nurse Profile Edit

The figure [4.41] is given below is blood donation web application. Here user can search for blood donor by city or specific blood group and see donors information.

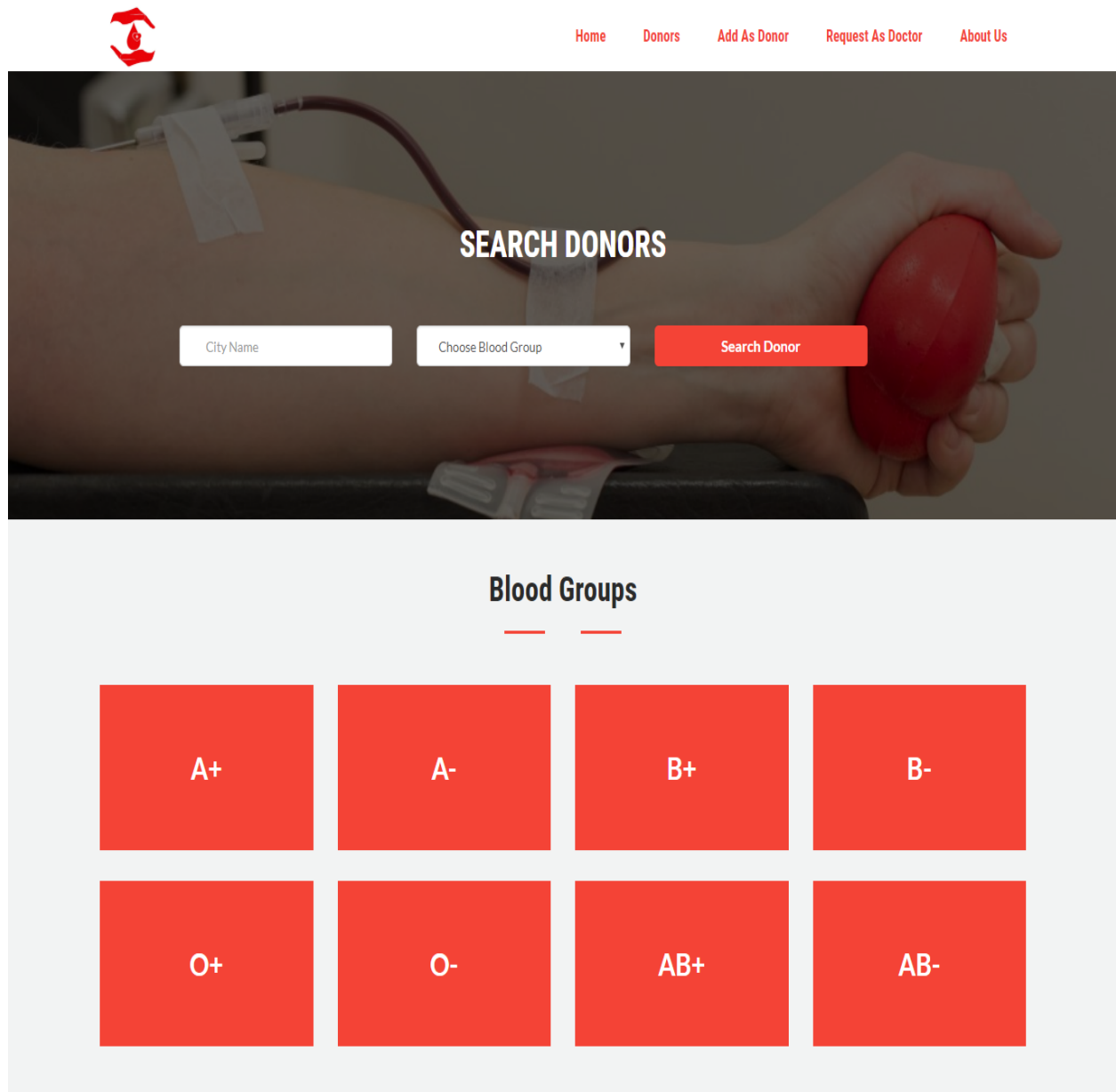


Figure 4.41: Blood Bank Web Application

The figure [4.42] is given below is a list of blood donors interface.

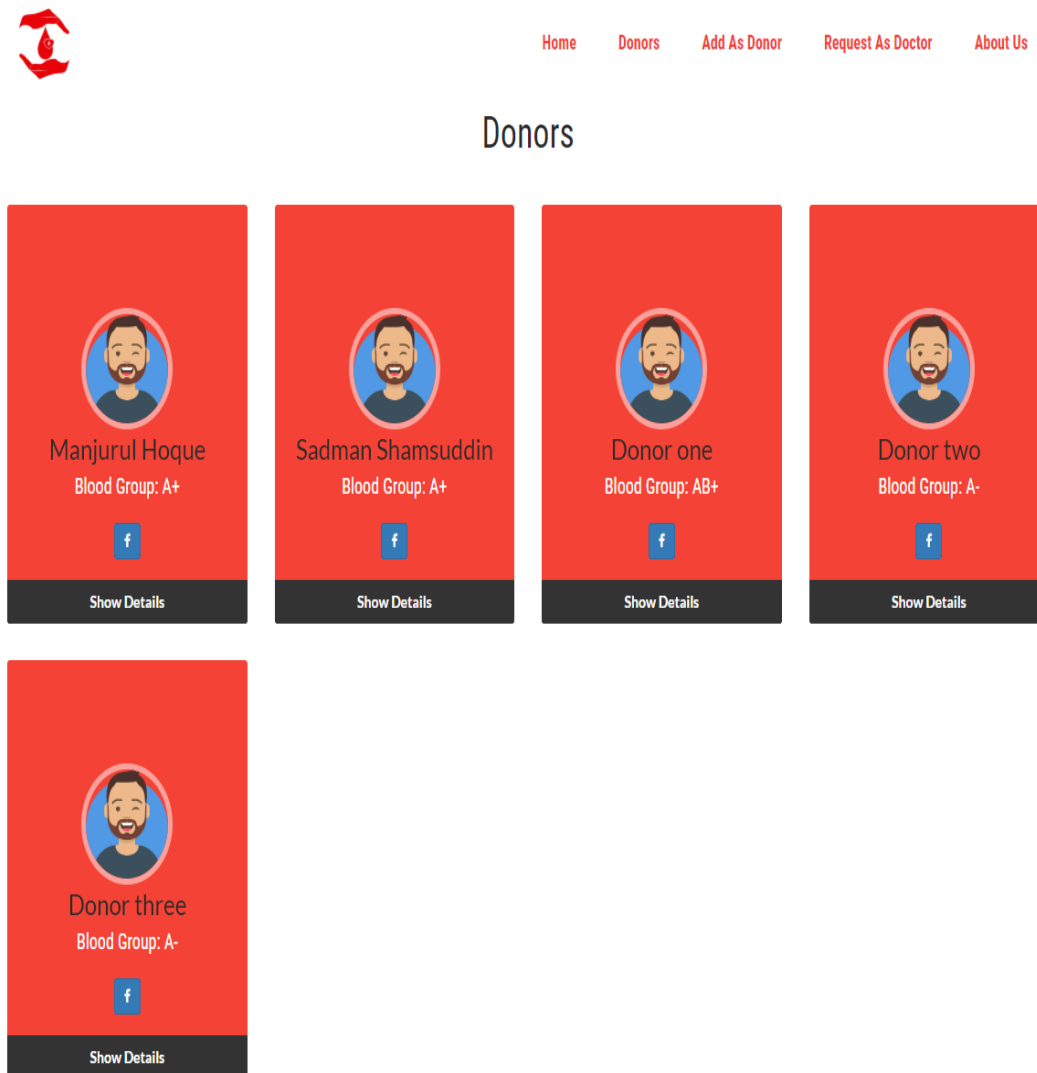


Figure 4.42: List of Donors

The figure [4.43] is given below is for adding as blood donor interface.

Home Donors Add As Donor Request As Doctor About Us

Send us a your information

Name:

Phone:

City:

Age:

Weight:

You blood group:

Send

Figure 4.43: Request as Donor

The figure [4.44] is given below is for adding as doctor interface. This request will submitted to the admin and will check every information and accept the request and then doctor can login into the system.

Home Donors Add As Donor Request As Doctor About Us

Send us a your information for signing up as a doctor

Name:
Your Name *

Email:
Your Email *

Chamber:
Your chamber *

Degree:
Your degree *

Address:
Your address *

Specialist:
Specialist *

Phone:
Your Phone Number *

Registration Number:
Your Registration Number *

Send

Figure 4.44: Request as Doctor

The figure [4.45] is given below is admin dashboard interface.

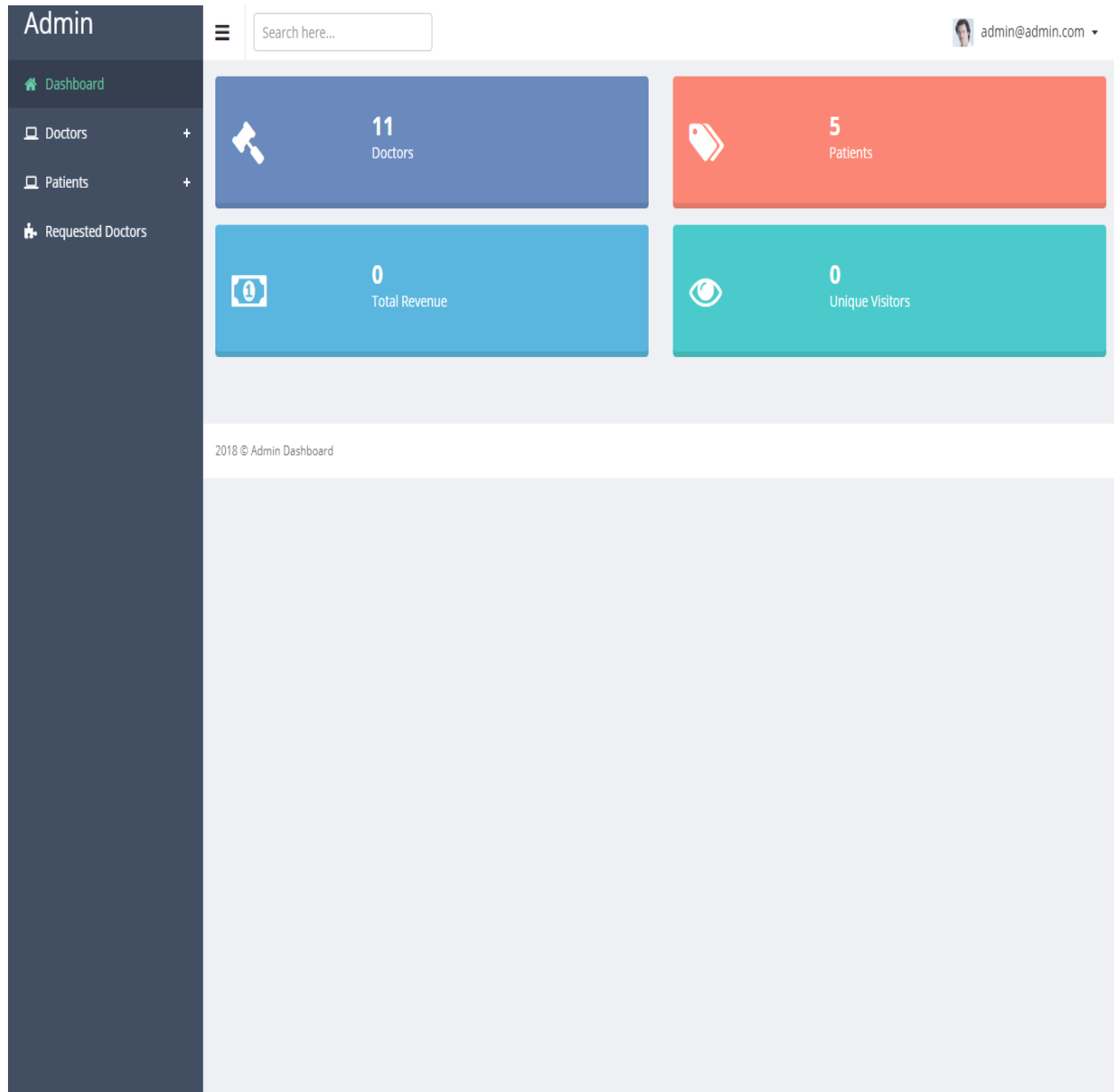


Figure 4.45: Request as Doctor

The figure [4.46] is given below is list of requested doctors. Admin will check all the information and then accept the doctor.

| Name | Email | Degree | Address | Phone | Registration Number | Actions |
|----------------------------|---------------------|-------------------------------|---|-------------|---------------------|---------------|
| Manjurul Hoque | doctor@two.com | dbdg | sfdg | 1212323 | 2335 | Accepted |
| Manjurul Hoque | dfdh@gmail.com | dgdn | thryhry | 23434 | 78781 | Accept Delete |
| Sadman | sadman@gmail.com | rry | dgdgn | 238787 | 97897 | Accept Delete |
| doctor-three | doctor@three.com | MBBS | Dhaka | 1235656 | 21896 | Accept Delete |
| doctor-four | doctor@four.com | mbbs | Farmgate, Dhaka | 5676776 | 1289 | Accept Delete |
| doctor-five | doctor@five.com | Dentist | West dhanmondi | 87553232323 | 6796 | Accept Delete |
| John Doe | john@gmail.com | MBBS | Sahabhag | 999053424 | 2567 | Accept Delete |
| Sadman DMCX | dmcx@gmail.com | Dentist | Barishal | 878793224 | 5673 | Accept Delete |
| Blue Eye | blue-doctor@six.com | MBBS | Dhaka | 999976555 | 5672 | Accepted |
| Cardio John | doctor@seven.com | MBBS | India | 880332326 | 3431 | Accepted |
| Professor Dr. Fazlul Hoque | doctor@eight.com | MBBS, FCPS, FRCP (Edinburgh), | House # 84, Road # 8/A (New)Dhanmondi, Dhaka - 1209 | 454545 | 2346 | Accepted |
| dbdg | doctor@ten.com | dgndgn | dgndgn | 232422 | 89543 | Accept Delete |

Figure 4.46: List of Requested Doctor

The figure [4.47] is given below is list of patients interface.

The screenshot displays an Admin Dashboard with a sidebar on the left containing navigation links: Dashboard, Doctors, Patients, and Requested Doctors. The main content area features a search bar and a table of patients. The table has columns for Name, Email, Degree, Address, Phone, and Registration Number. The 'Actions' column contains 'Accept' (green) and 'Delete' (red) buttons. A 'Tools' dropdown is located in the top right corner of the table area. The footer of the dashboard reads '2018 © Admin Dashboard'.

| Name | Email | Degree | Address | Phone | Registration Number | Actions |
|----------------------------|---------------------|-------------------------------|---|-------------|---------------------|---------------|
| Manjurul Hoque | doctor@two.com | dbdg | sfdg | 1212323 | 2335 | Accepted |
| Manjurul Hoque | dfdh@gmail.com | dgdn | thryhry | 23434 | 78781 | Accept Delete |
| Sadman | sadman@gmail.com | rry | dgdn | 238787 | 97897 | Accept Delete |
| doctor-three | doctor@three.com | MBBS | Dhaka | 1235656 | 21896 | Accept Delete |
| doctor-four | doctor@four.com | mbbs | Farmgate, Dhaka | 5676776 | 1289 | Accept Delete |
| doctor-five | doctor@five.com | Dentist | West dhanmondi | 87553232323 | 6796 | Accept Delete |
| John Doe | john@gmail.com | MBBS | Sahabhag | 999053424 | 2567 | Accept Delete |
| Sadman DMCX | dmcx@gmail.com | Dentist | Barishal | 878793224 | 5673 | Accept Delete |
| Blue Eye | blue-doctor@six.com | MBBS | Dhaka | 999976555 | 5672 | Accepted |
| Cardio John | doctor@seven.com | MBBS | India | 880332326 | 3431 | Accepted |
| Professor Dr. Fazlul Hoque | doctor@eight.com | MBBS, FCPS, FRCP (Edinburgh), | House # 84, Road # 8/A (New)Dhanmondi, Dhaka – 1209 | 454545 | 2346 | Accepted |
| dbdg | doctor@ten.com | dgndgn | dgndgn | 232422 | 89543 | Accept Delete |

Figure 4.47: List of Patients

4.2 Back-end Design

Back end designs refers to Database design. Figures given below describes how we have designed our database for our application. From the database we fetches our desired data. Here is the figure [4.48] which is the structure of our database.

project-healthcareapp

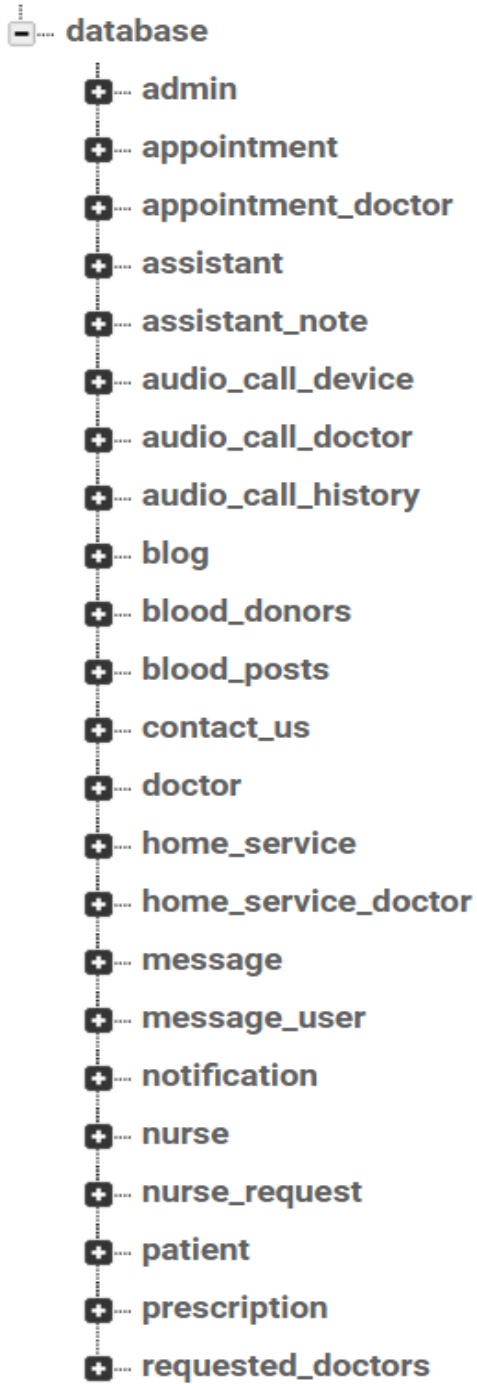


Figure 4.48: Main Database Structure

| Search by email address, phone number, or user UID Add user ↻ ⋮ | | | | |
|--|-----------|--------------|--------------|-------------------------------|
| Identifier | Providers | Created | Signed In | User UID ↑ |
| john@gmail.com | ✉ | Oct 4, 2018 | Oct 4, 2018 | 4Qf2q0NLmgW2oFH2bYVX8kYGS... |
| patient@two.com | ✉ | Sep 25, 2018 | Sep 25, 2018 | 5PbDWBUSYcdRnxBX1LPStQbsRT... |
| sadman@gmail.com | ✉ | Oct 4, 2018 | Oct 4, 2018 | F4rtL0gFdz0LCYx8vAFloGf07ku2 |
| doctor@seven.com | ✉ | Oct 4, 2018 | Oct 4, 2018 | IQ21TwQ3TYfqKt58g5MR2ACG1A... |
| doctor@one.com | ✉ | Sep 28, 2018 | Oct 22, 2018 | lqy9b7QpWddKfDeHXYJDZ6bJteV2 |
| patient@one.com | ✉ | Sep 25, 2018 | Oct 5, 2018 | KAZ9PwwvrRVkiNdWtLZoHQ4LK... |

Figure 4.49: Firebase Authentication Table

```

- appointment
  - ODLFJLviHHaA53aobMICVOEL7x03
    - qsRN26v19eN5RW1azjGTKmy89fi1
      date: "26 Oct 2018"
      doctor_clinic: "Motijheel, Dhaka"
      doctor_name: "Dr One"
      doctor_phone: "09987679788"
      patient_name: "Patient No. Three"
      patient_phone: "defaultx01"
      status: "request"
      time: "6 PM - 8 PM"
      timestamp: "1540563687027"
  
```

Figure 4.50: Appointment Table

```

appointment_doctor
├── qsRN26v19eN5RW1azjGTKmy89fi1
│   ├── appointments: "[{\\"days\\":\\"WED TUE THU \\",\\"time\\":\\"6 PM - 9 PM\\"},
│   ├── clinic: "Motijheel, Dhaka
│   ├── name: "Dr One"
│   ├── passcode: "1234"
│   ├── phone: "09987679788
│   └── specialist: "1234"

```

Figure 4.51: Appointment Doctor Table

```

blood_donors
├── -LOTKgOgPutsoY0GJccb
│   ├── age: "23"
│   ├── city: "Dhaka"
│   ├── group: "A+"
│   ├── name: "Manjurul Hoque"
│   ├── phone: "01938375"
│   └── weight: "65"

```

Figure 4.52: Blood Donors Table

```

contact_us
├── -LOxPKd6WCKBdYPTf9D4
│   ├── email: "rumi@gmail.com"
│   ├── message: "Hello"
│   ├── name: "Manjurul Hoque"
│   └── phone: "01938375"

```

Figure 4.53: Contact Us Table

```

doctor
├── 4Qf2q0NLmgW2oFH2bYVX8kYGSOG3
│   ├── about: "I am good doctor"
│   ├── chamber: "Nilkhet"
│   ├── city: "Dhaka"
│   ├── country: "Bangladesh"
│   ├── degree: "MBBS"
│   ├── email: "john@gmail.com"
│   ├── hospital: "Any hospital"
│   ├── image_link: "image"
│   ├── name: "John Doe"
│   ├── phone: "999053424"
│   ├── rating: "1.0"
│   ├── registration: "2567"
│   └── specialist: "Cardiologist"

```

Figure 4.54: Doctors Table

```

home_service
├── Iqy9b7QpWddKfDeHXYJDZ6bJteV2
│   └── ODLFJLviHHaA53aobMICVOEL7x03
│       ├── doctor_location: "Motijheel, Farmgate"
│       ├── doctor_name: "Dr Murphy"
│       ├── doctor_phone: "00986668888"
│       ├── doctor_specialist: "Child, Cardiologist"
│       ├── doctor_time: "Night"
│       ├── patient_address: "defaultx01"
│       ├── patient_name: "Patient No. Three"
│       └── patient_phone: "defaultx01"

```

Figure 4.55: Home Service Table

| |
|-----------------------------------|
| home_service_doctor |
| Iqy9b7QpWddKfDeHXYJDZ6bJteV2 |
| location: "Motijheel, Farmgate" |
| name: "Dr Murphy" |
| phone: "00986668888" |
| specialist: "Child, Cardiologist" |
| time: "Night" |

Figure 4.56: Home Service Doctor Table

| |
|---|
| message |
| Iqy9b7QpWddKfDeHXYJDZ6bJteV2 |
| -LOjX4Ch8B1eMEaBorAj |
| content: "Ami and I have found that we will ⌚ a little a" |
| from: "KAZ9PwwvvrRVkINdWtLZoHQ4LKg2" |
| timestamp: "1539469496386" |
| to: "Iqy9b7QpWddKfDeHXYJDZ6bJteV2" |
| type: "text" |

Figure 4.57: Message Table

| |
|---|
| message_user |
| Iqy9b7QpWddKfDeHXYJDZ6bJteV2 |
| KAZ9PwwvvrRVkINdWtLZoHQ4LKg2 |
| content: "1539604935096" |
| doctor: "Iqy9b7QpWddKfDeHXYJDZ6bJteV2" |
| patient: "KAZ9PwwvvrRVkINdWtLZoHQ4LKg2" |
| timestamp: "1539604962123" |
| type: "prescription" |

Figure 4.58: Message user Table

| |
|------------------------------|
| patient |
| 5PbDWBUSYcdRnxBX1LPStQbsRT33 |
| email: "patient@two.com" |
| name: "Patient 2" |

Figure 4.59: Patient Table

```

prescription
├── Iqy9b7QpWddKfDeHXYJDZ6bJteV2
│   ├── ODLFJLviHHaA53aobMICVOEL7x03
│   │   ├── -LOxH_uFXUZtbXovyVpy
│   │   │   ├── date: "16-10-2018"
│   │   │   ├── doctor_id: "Iqy9b7QpWddKfDeHXYJDZ6bJteV2"
│   │   │   ├── doctor_name: "Doctor One"
│   │   │   ├── medicines: [{"dose": "0 - 0 - 1", "name": "Napa", "quantity": 1}
│   │   │   ├── patient_address: "defaultx01"
│   │   │   ├── patient_age: "defaultx01"
│   │   │   ├── patient_id: "ODLFJLviHHaA53aobMICVOEL7x03"
│   │   │   ├── patient_name: "Patient No. Three"
│   │   │   ├── patient_phone: "defaultx01"
│   │   │   └── timestamp: "1539700266201"

```

Figure 4.60: Prescription Table

```

requested_doctors
├── -LNTcARhKZXigpDWg7M9
│   ├── address: "sfdg"
│   ├── chamber: "sfd"
│   ├── degree: "dbdg"
│   ├── email: "doctor@two.com"
│   ├── name: "Manjurul Hoque"
│   ├── phone: "1212323"
│   ├── registration: "2335"
│   ├── specialist: "dgdgn"
│   └── status: "accepted"

```

Figure 4.61: Requested Doctor Table

Chapter 5

Implementation and Testing

5.1 Implementation of Database

We used NoSQL as our database. It store data as real time and data is synced across all clients in real time. Data is stored as JSON. We used firebase authentication service to authenticate our users. Firebase Authentication includes a system where developers can enable user authentication with email and password. It supports social login also. We also used firebase storage system as file storage. We can store image, video or any user generated content.

5.2 Testing Implementation, Test Results and Reports

Test case is a combination of conditions or variables that determines whether the software satisfies requirements and functions properly.

Test case includes:

- Title
- Description
- Test Steps
- Expected Result
- Actual Result

Our Test Case results shown in the following tables:

Table 5.1: Test Case of Login

| | |
|-------------------------------|---|
| Test Case ID: Login123 | Test Designed By: Proloy, Sadia, Ruman |
|-------------------------------|---|

| | |
|---|---|
| Test Priority: High | Test Designed Date: 31/10/2018 |
| Module Name: Login Screen | Test Executed By: Sadia, Ruman, Proloy |
| Test Title: Verify login with valid email and password | Test Execution Date: 1/11/2018 |
| Description: Test the application login system | |

Pre-Conditions: User must have valid email and password.

| Steps | Test Steps | Test Data | Expected Result | Actual Result | Status |
|-------|------------------------|------------------------|---------------------------|--|--------|
| 1 | Navigate to Login page | Email=doctor@gmail.com | User should able to login | User logged in and navigate to home page | Pass |
| 2 | Provide valid email | Password=password | | | |
| 3 | Provide valid password | | | | |
| 4 | Click on Login button | | | | |

Post-Conditions: User is validated with the database.

Table 5.2: Test Case of Making Appointment

| | |
|---|---|
| Test Case ID: Appointment123 | Test Designed By: Proloy, Sadia, Ruman |
| Test Priority: High | Test Designed Date: 31/10/2018 |
| Module Name: Login Screen | Test Executed By: Sadia, Ruman, Proloy |
| Test Title: Verify appointment placed | Test Execution Date: 1/11/2018 |
| Description: Test the application appointment system | |

Pre-Conditions: User must be logged in.

| Steps | Test Steps | Test Data | Expected Result | Actual Result | Status |
|--------------|-------------------------------------|---|---------------------------|------------------------------------|---------------|
| 1 | Navigate to Registered doctors page | Email=doctor@gmail.com Time=Current Time Phone=patient number | User should able to login | User navigate to appointments page | Pass |
| 2 | Click plus (+) button | Patient email=patient@gmail.com Status=request | | | |

| | | | | | |
|---|--------------------|--|--|--|--|
| 3 | Appointment Placed | | | | |
|---|--------------------|--|--|--|--|

Post-Conditions: Appointment saved into database and doctor will receive the appointment.

Table 5.3: Test Case of Live Chat

| | |
|---|---|
| Test Case ID: Chat123 | Test Designed By: Proloy, Sadia, Ruman |
| Test Priority: High | Test Designed Date: 31/10/2018 |
| Module Name: Live Chat | Test Executed By: Sadia, Ruman, Proloy |
| Test Title: Verify Sending Message Procedure | Test Execution Date: 1/11/2018 |
| Description: Test the Live Chat Procedure | |

Pre-Conditions: User must be logged in.

| Steps | Test Steps | Test Data | Expected Result | Actual Result | Status |
|-------|----------------------------|--------------------|------------------------------|---------------------------|--------|
| 1 | Navigate to Live Chat page | Text=Hello, Doctor | User should be able to login | User stay at current page | Pass |
| 2 | Enter Text | Text=Hi | | | |
| 3 | Click send button | | | | |

Post-Conditions: Message show in both screen and save into database.

Unit Test: For designing and implementing a development project Unit test is used. It is the smallest testable parts of a software application. It can be individual or independent. Unit testing is applicable for those features whose have vital importance in a software development project. [8]

It is done during the implementation of the coding and sometimes after the completion of whole system. The main result of Unit test is given in Table 5.4.

| Test Case | Expected Result | Actual Result | Status |
|---|------------------------|----------------------|---------------|
| 1. Correct email 2. Correct Password | Login to system | Can login. | Pass |
| 1. Incorrect email 2. Correct password | Login to system | Can not login. | Fail |
| 1. Correct email 2. Incorrect password | Login to system | Can not login. | Fail |

Chapter 6

Conclusion and Future Scope

6.1 Discussion and Conclusion

“E-Care Android Application” is a mobile based application and its admin dashboard is online based which has a beautiful user interfaces. We developed this application for the betterment of communication between doctor and patient. This application stores and provides information about doctors, patient and patient’s prescription. This application includes doctor’s time table. In our web application anyone can add as a blood donor by entering required information and can search for blood donors.

6.1 Scope for Further Developments

Now in our application we covered almost all features but in future we will add some more features like disease identify using Machine Learning, Video calling, and email verification when patient register in our system and beautiful user interface.

References:

[1] "Doctor Anywhere" [Online]

<https://play.google.com/store/apps/details?id=com.doctoranywhere>

[2] "Doctorola" [Online]

<https://play.google.com/store/apps/details?id=com.doctorola>

[3] "Ibn Sina" [Online]

<https://play.google.com/store/apps/details?id=com.ibnsinatrust.ibnsinadr>

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