

Android Based Mobile Application E-Medic

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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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DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

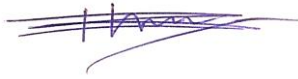
JUNE 2021

APPROVAL

This Project titled “**Android Based Mobile Application E-Medic**”, submitted by Md. Takveer Ahmed and Joy Sutra Dhar and Ankur Das Ananto 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 Tuesday, June 01, 2021.

BOARD OF EXAMINERS

Chairman



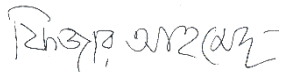
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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Moushumi Zaman Bonny, Senior 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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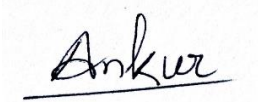


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Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

Bangladesh is an emerging country and we're doing tremendously well in the IT sector. IT has been one of the most important agents of change in recent times, facilitating communication and building new connections. Now-a-days, we are heavily using smartphones rather than other electronic devices. So our plan is, providing a medical service using android-applications & we think this small idea can help the actual needy people. In this project, where we are building a mobile application and which name is "*E-Medic* (Android Based Mobile Application)". We are generating a platform which application can solve the emergency medical situation for rural areas people and by using GPS (Mobile Location) through Google map. We are going to track their location for providing these services. I wanted to mention one thing that is, we are developing two android applications, one for patients & the other for hospital authority. Patients & hospitals should have to register themselves in the applications. Patients can make an appointment or call or communicate with doctors while it's needed. One of the key features of our application is, it can tell us which hospital is located at the nearest distance. Our application has so many features for Patient & Hospital management. To avoid fake & fraud calls or alerts, we are using OTP code every single time when we entered the application. In this app, we can see the nearest hospital list, doctors list, appointments, and previous history. Payment will be made at the time of appointment or after when the service is provided. Our vision is very simple, to enhance our medical care, to deliver doctors and emergency services for all people which will be provided at the doorstep.

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CHAPTER 1

Introduction

1.1 Introduction

Life is excessively diverse. Progress is progressively upgrading. An online application marketplace such as Google Play Store such as Android is open to all. We try to use this advanced innovation as an opportunity, what can we do effectively for others? This is why we are trying to create an application for those who need medical attention. When a person needs emergency medical care but couldn't find anything near his/her home, in that particular situation our application can help the people to get out of those situations. Our system provides trustworthy services they can relay. Our system offers interactive and automatically updated map locations. In our application, patients may check their previous or future appointments. This app provides users with a seamless experience.

1.2 Motivation

We made such an application in order to live a better life and improve our medical care. Our nation is a small nation with a huge population people are currently relying on cell phones and moving forward. People in the Republic of Bangladesh have been influenced by this advanced breakthrough, which is our source of inspiration. In this point of view, we are trying to build up an application which will help the people by providing emergency medical care. Our project will be a simple solution, but we believe that it will be too effective for people.

1.3 Objective

The primary goal of this Android application is to assist one another, which broadly refers to people who are deprived of medical care. Users will be able to easily access services after securely registering with our application. We believe our application can be a great solution for people to help each other by providing medical care.

1.4 Expected Outcome

This section describes the work to be carried out in the future upon release of the application.

1. The pick-up location
 - i) Book an ambulance for now or later(Optional-User demand)
2. Real-time updating current location
3. Show hospitals location
4. Payment options and calls option
5. Review and rating and service history
6. Save destinations

1.5 Report Layout

This report is divided into six chapters, and this segment provides information on all six chapters.

- ❖ 1. The primary chapter gives the Introduction, Motivation, Objective, and Expected outcome about it.
- ❖ 2. In the second chapter, we talked about application background with related work, Comparative research, Scope of the issues, and all the challenges.
- ❖ 3. In the third chapter, we talked about BPMN, Requirement Analysis & Collection, UML diagram, Logical Data Model diagram, and Flowcharts.
- ❖ 4. In the fourth chapter, we have discussed about Design specification. In this section, we talked about Front-end and Back-end Design with Interaction UI.
- ❖ 5. In the fifth Chapter, we had brief the Implementation of the Database about Front-end and Back-end design with Test Results and Report.
- ❖ 6. Finally In the 6th Chapter, we have concluded our report with future scope and Limitations.

CHAPTER 2

Background

2.1 Introduction

The main goal of this project is to design and implement the android based mobile application (namely E-Medic). As a consequence, in countryside areas, people can get the emergency medical service through GPS based Google map approach. Besides, this system will also play an important role in establishing the connection between the hospital and the patient with intellectual management systems.

Alongside, local people face major troubles due to known and unknown health-related problems, however, they can't always reach emergency medical services due to the lack of time. Therefore, we built an android based application called "E-Medic" to solve this rising issue so that the implemented system can provide rapid medical care and reduce suffering.

The main advantage of our system is that it will help you to find out the nearest hospital through Google Maps and receive all kinds of medical services including ambulance from the hospital.

2.2 Related Works

In Google play store, there are many similar applications are available, they are given below

2.2.1 Sebahgar

"Sebahgar" is a digital health service provider app that offers video consultations with reputable doctors. Online doctor consultation is now one of the most important facilities for patients in rural areas. The best way to contact doctors in Bangladesh is through Sebahgar. Experience Bangladesh's best telemedicine facility.[1]

Features:

- ❖ Video calls with doctors
- ❖ Online talk and calls with doctors

- ❖ Private consultations with doctors from home
- ❖ General and health-related advice from doctors
- ❖ Online Doctor's appointment
- ❖ Online Doctor's advice
- ❖ Pill reminder
- ❖ History record



Figure 2.1: Shebaghor Home Page

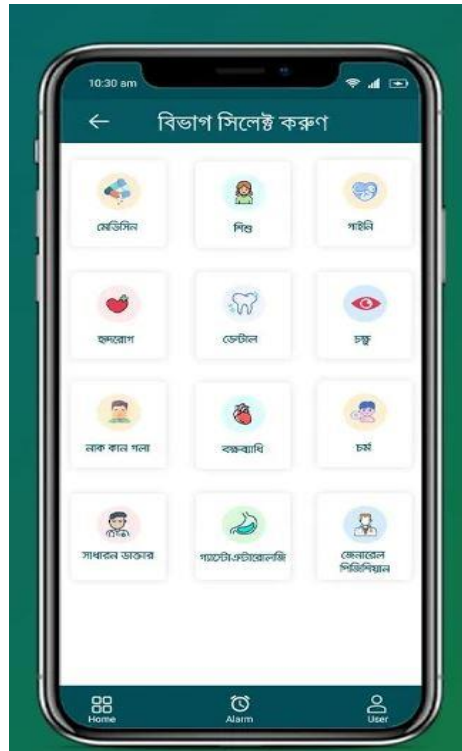


Figure 2.2: Shebaghor Dashboard

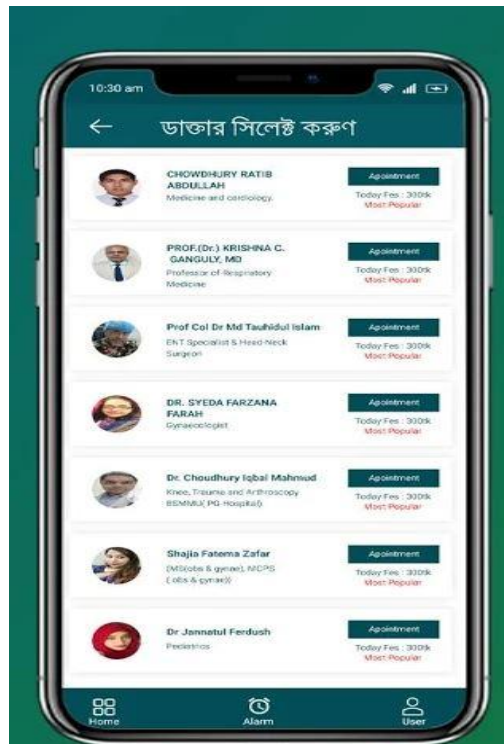


Figure 2.3: Shebaghor Doctors List

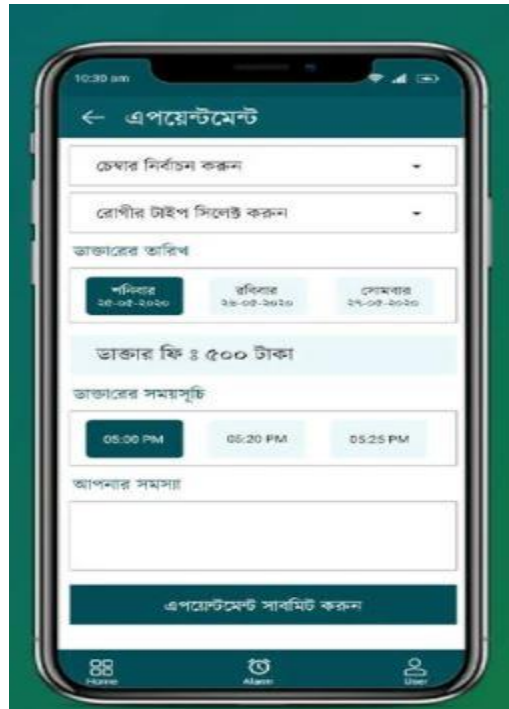


Figure 2.4: Shebaghor Appointment Page

2.2.2 Medical Service of BD

Medical Service of BD is the leading management program for scheduling doctor's appointments. This software allows you to schedule appointments with a specific doctor from the comfort of your own home. People used to go to the hospital or make an appointment by phone, but now it's time for home service. Make a consultation with a personal doctor. Users will be able to see specifics such as doctors' degrees and the direction in which they will spread. Each consumer can see the costs of a doctor's visit.[2]

Features:

- ❖ User-friendly GUI
- ❖ Safe and simple
- ❖ Scheduling appointments
- ❖ Login and logout



Figure 2.5: Medical Service of BD Home Page

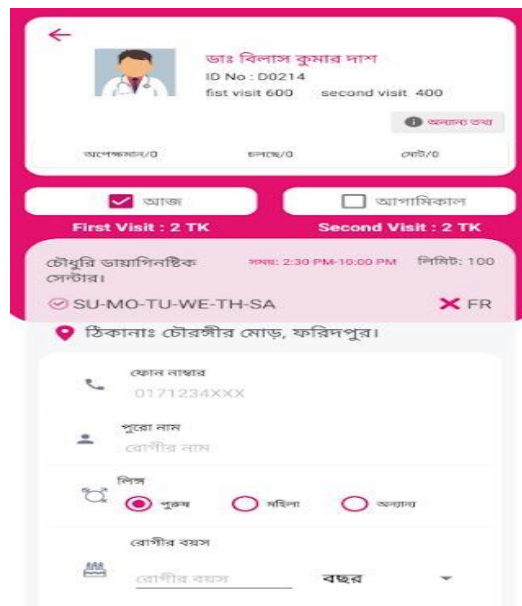


Figure 2.6: Medical Service of BD Doctors' Appointments



Figure 2.7: Medical Service of BD Doctors Profile

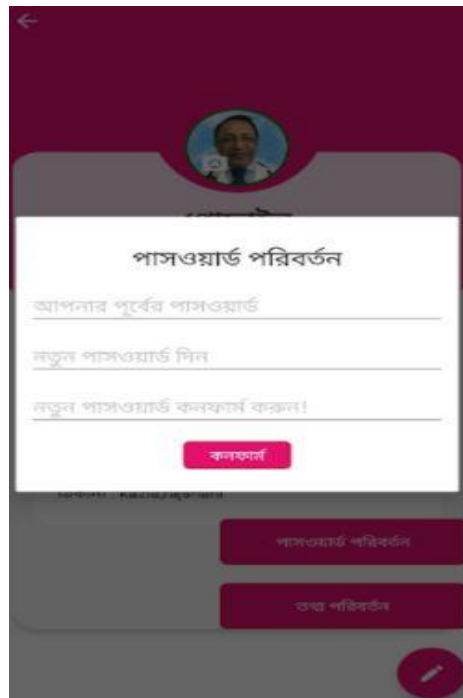


Figure 2.8: Medical Service of BD Doctors Edit Profile Page

2.2.3 BD Hospitals

BD Hospitals is an extremely useful and insightful app. It is extremely beneficial to all Bangladeshis. People nowadays are very serious about their health and fitness. Anyone can quickly locate their destination hospital, emergency ambulance number, specialist physicians, and doctor's chamber phone numbers using this app. You simply search for the doctors you want and call to schedule an appointment. You will also locate local clinics, pharmacies, physicians, and other attempts.[3]

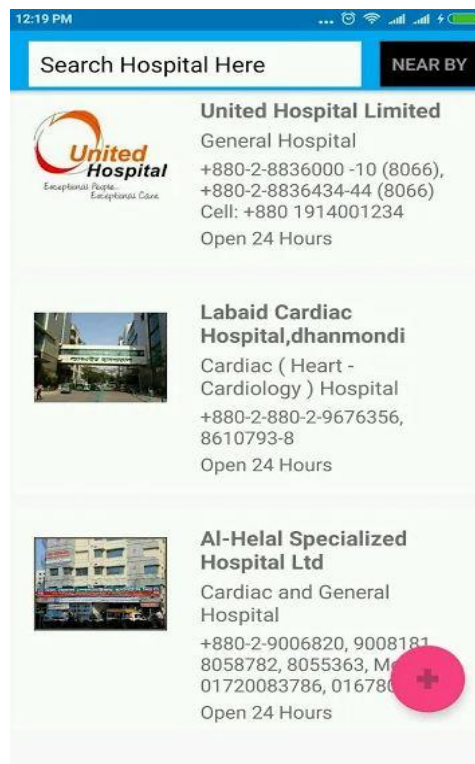


Figure 2.9: BD Hospital Home Page

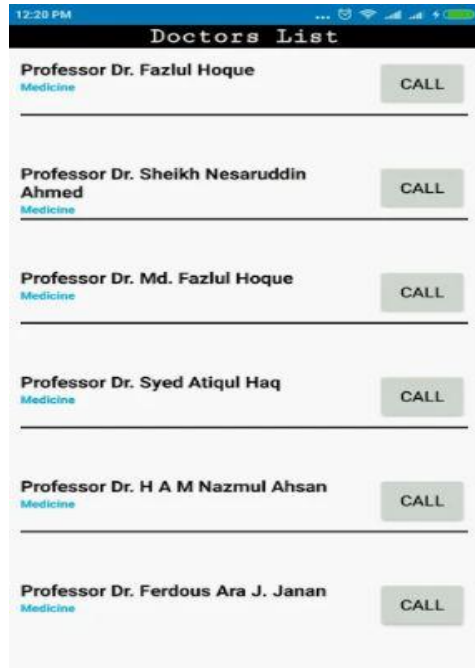


Figure 2.10: BD Hospital Doctors List



Figure 2.11: BD Hospital Map View

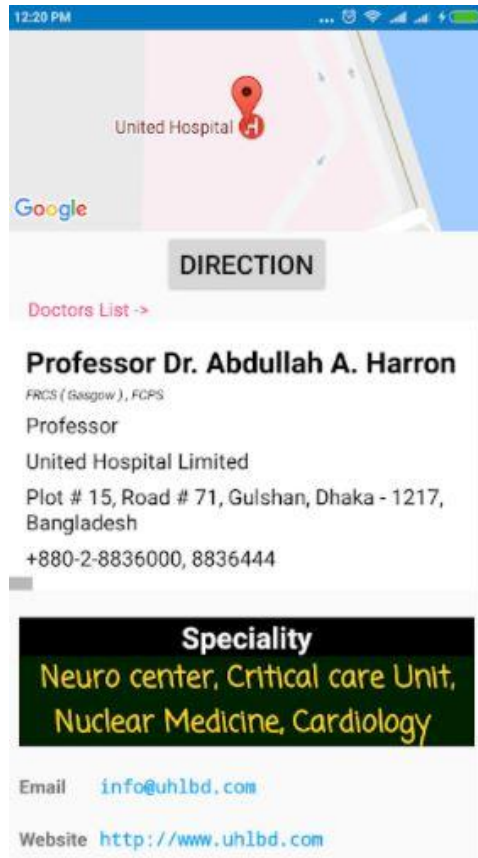


Figure 2.12: BD Hospital Map Direction Page

2.3 Comparative Studies

Google Play Store is a great and famous market for Android applications. Users can easily download and use any required application from the Google Play Store with the help of a smartphone. We want to make our application available to everyone with the help of the Google Play Store. An application is something that makes a smartphone smarter. In the google play store, there are some poor applications that make users unhappy and we believe that our application will not unsatisfy the user.

Our feature:

- ❖ User interface is easy to understand
- ❖ Google maps to find the nearest hospital
- ❖ Can easily add doctor

- ❖ Easy to get an appointment online
- ❖ Ambulance service
- ❖ The convenience of chatting with a doctor
- ❖ Payment options
- ❖ Service history

2.4 Scope of the problem

- ❖ Bed management problem
- ❖ Fake reviews problem
- ❖ Cost-related problem
- ❖ If any fake hospital registered on the application; that's a problem

2.5 Challenges

We faced some challenges while doing the project. There were some known and unknown challenges. We also learned a lot of new things by overcoming the challenges.

Some Challenges we have faced -

- ❖ Purchasing the Google map API
- ❖ To create a user-friendly interface
- ❖ Combining the individual works
- ❖ To build a secure database
- ❖ Fixing the unknown bug of code

CHAPTER 3

Requirement Specification

3.1 Business Process Model (BPMN)

In BPMN management and systems engineering, it is an activity of representing enterprise processes so that the current process can be examined, enhanced, and automated.

BPMN is a picture of the business processes or workflows of a company as a means of identified potential improvements.[6][7]

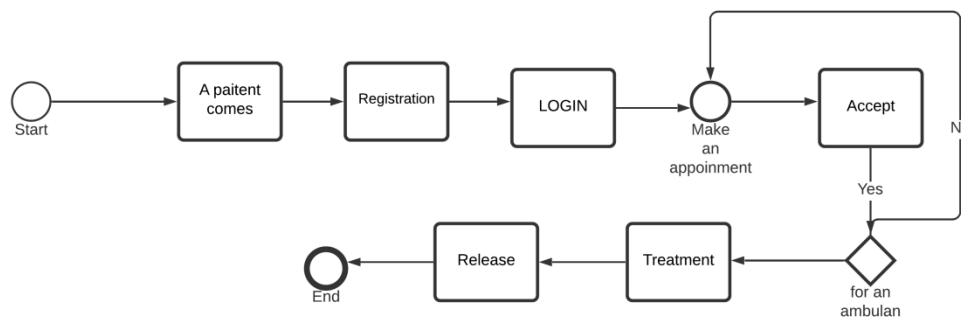


Figure 3.1: Business Process Modeling

There are some advantages to use BPM, they are given below,

- 1) Enhanced agility in business.
- 2) Improve efficiency
- 3) Continuous improvement for better opportunities
- 4) Eliminate redundancies
- 5) Sets an opening and terminating points.

3.2 Requirement Collection and Analysis

Projects must be scheduled and carried out to provide in a timely manner, viable, and relevant a remedy that are so practical. Each project needs to start with a fully validated and approved requirement specification to achieve those objectives. However, it must be collected, organized, and transformed into operational project scope, vision, and work effort before project requirements can be assessed and approved. To consider requirements at all levels and perceptions, the requirements-gathering process must integrate and resolve all of these facts. This is best achieved using standard, consistent steps, but equipped with integrated flexibility.

Methodologies for gathering data:

- a) Questionnaires
- b) Technical observation
- c) Opinion of people

In our project, we use various approaches to gather a complete collection of useful specifications.

- a) Those who took part
- b) Timeline and Scope
- c) Goals

Validating deliverables must be created after requirements data has been compiled, evaluated, and finalized to document requirements for review and acceptance. This is how we keep track of all that makes our project run smoothly.[10][20]

3.3 Use Case Modeling and Description

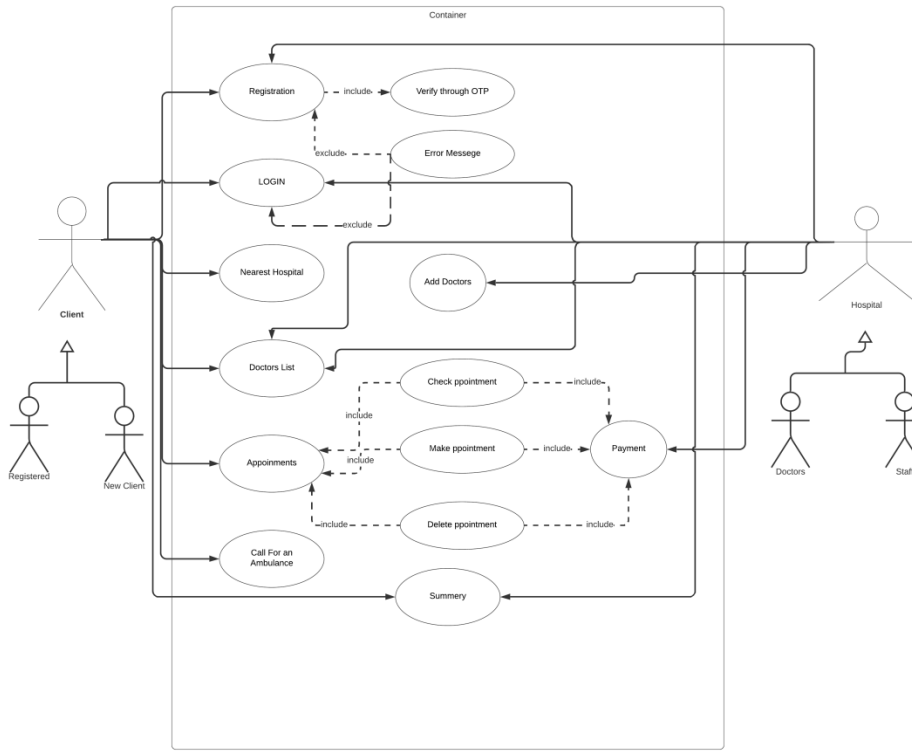


Figure 3.1: Use Case Diagram [16]

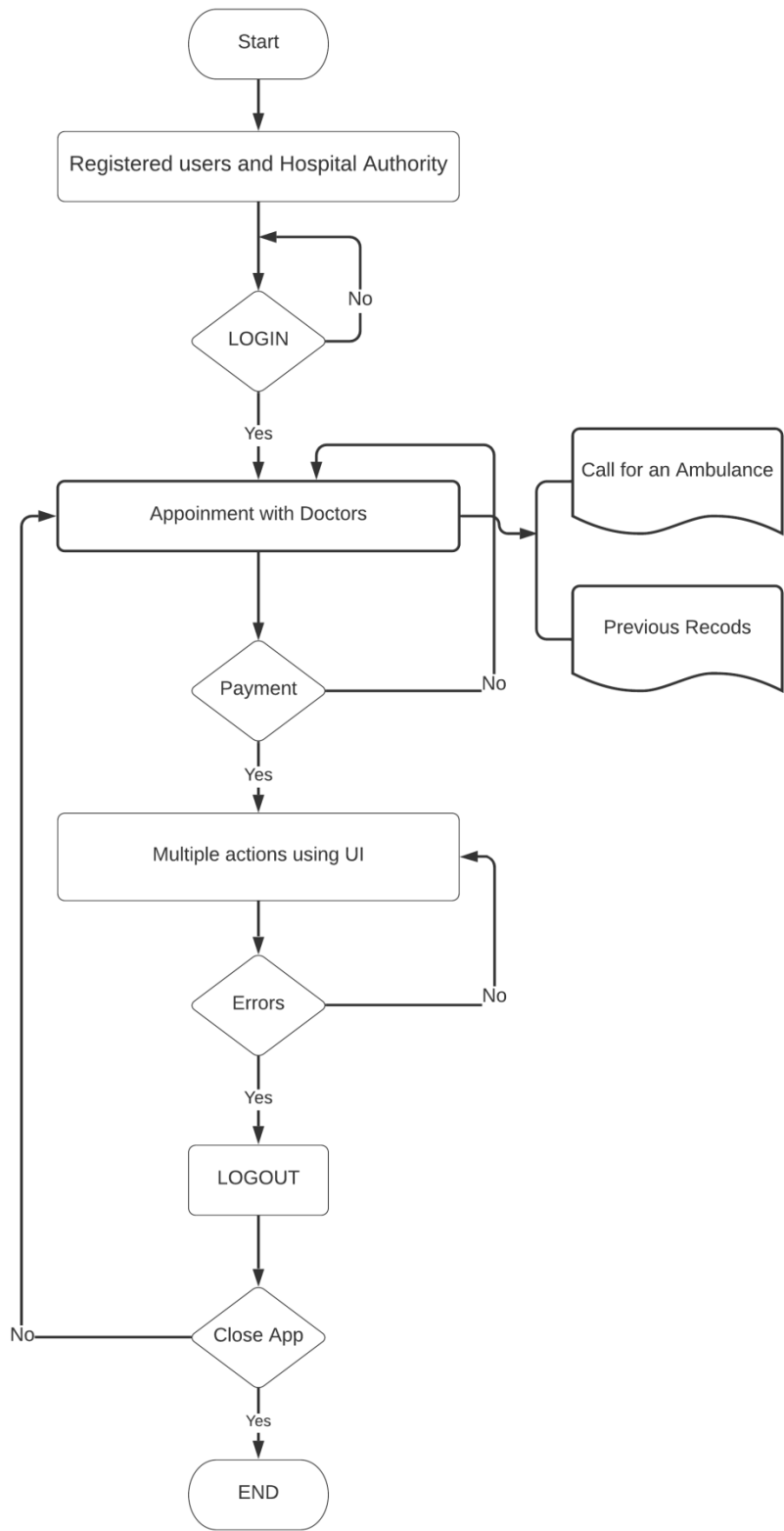


Figure 3.2: Flow Chart Diagram [17]

3.4 Logical Data Model

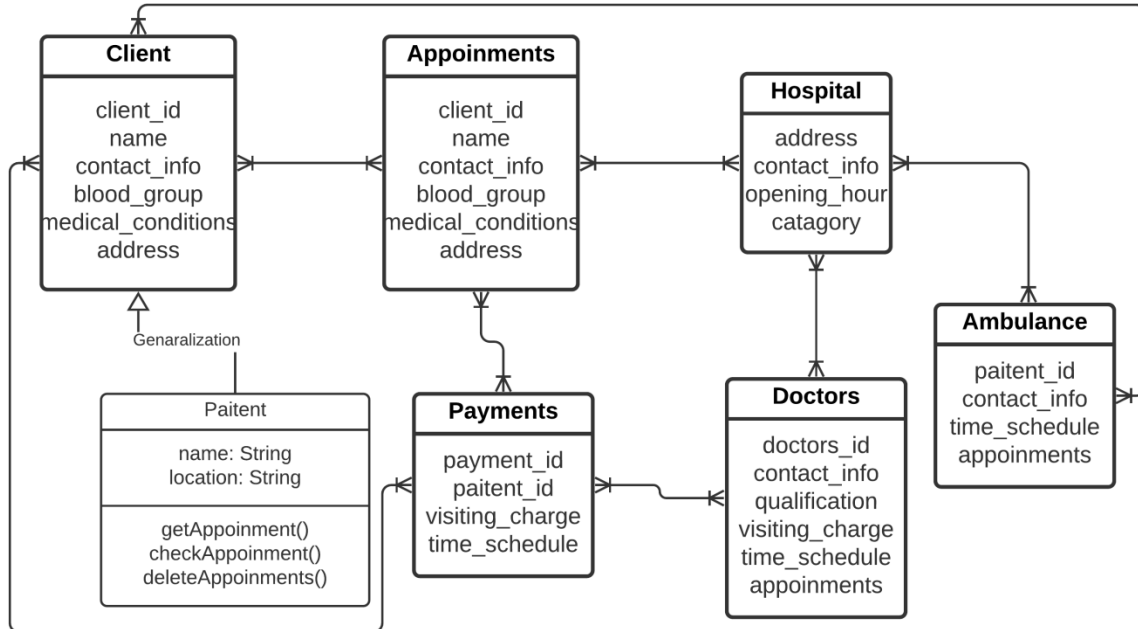


Figure 3.3: Logical Data Model [18]

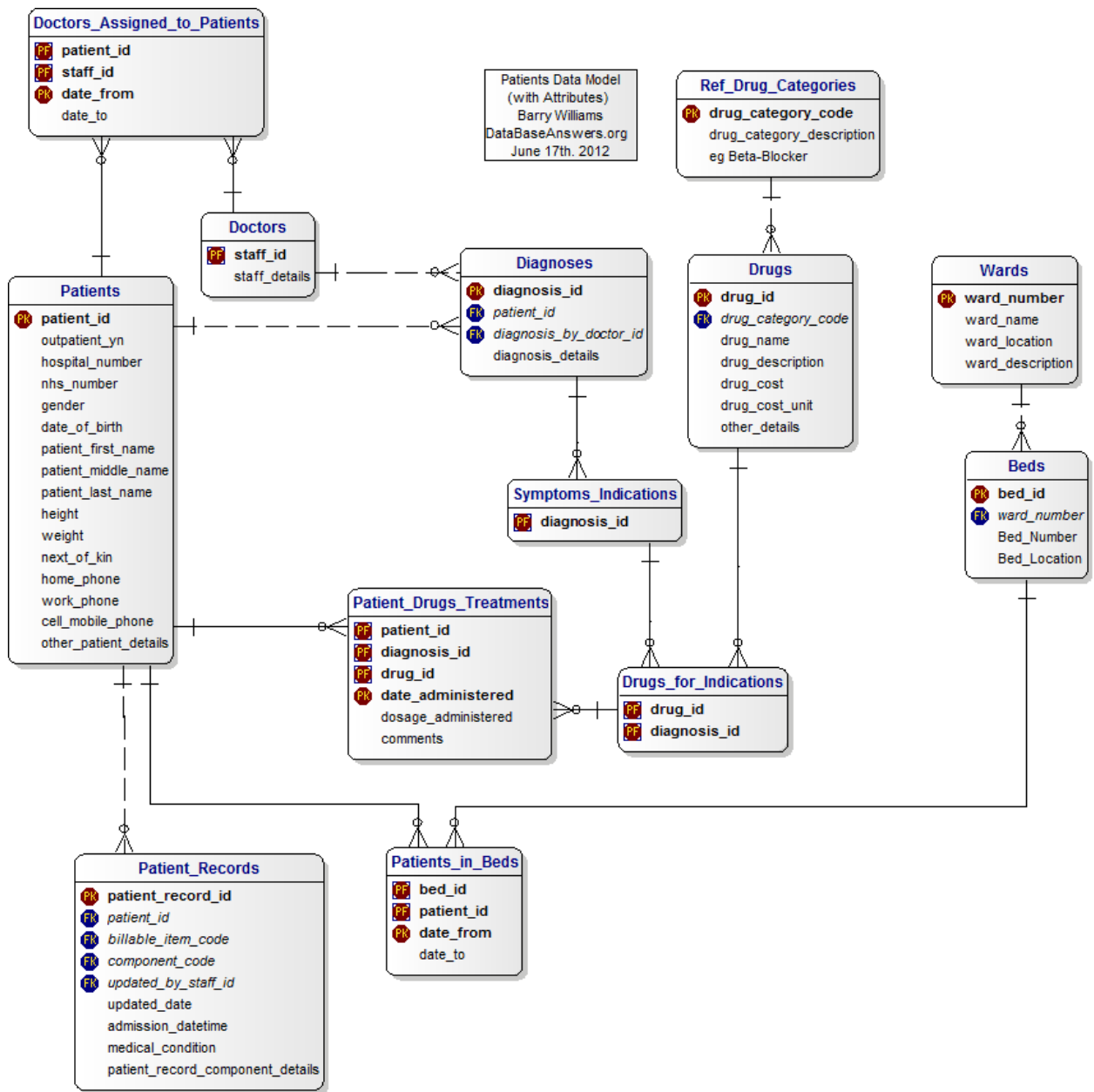


Figure 3.4: Logical Data Model [4]

3.5 Design Requirement

Our project, which is an android application, is based on a goggle map that can be accessed by online. We created our application to provide medical care and making it easy and user-friendly, with all of the specifications readily accessible and in a variety of formats.[15]

CHAPTER 4

Design Specification

4.1 Front-end Design

Frontend design is a nothing but a GUI design. This is a user interface where user can interact with it. For frontend designing we use XML to design. [14]

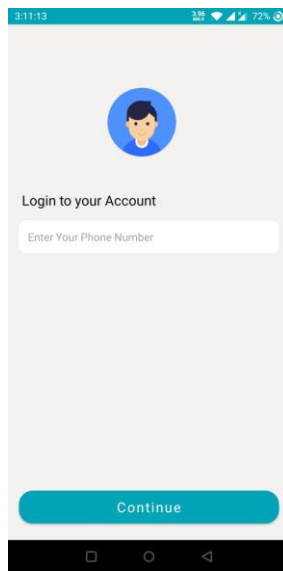


Figure 4.1 User Login

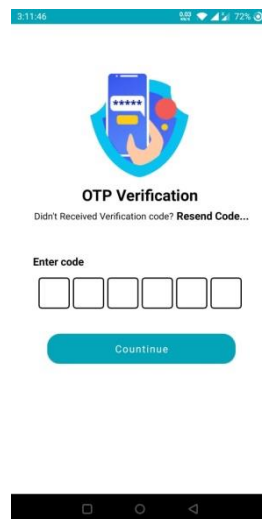


Figure 4.2 OTP

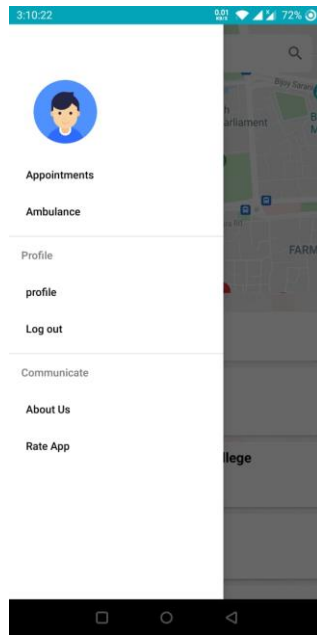


Figure 4.3 User Navigation Bar

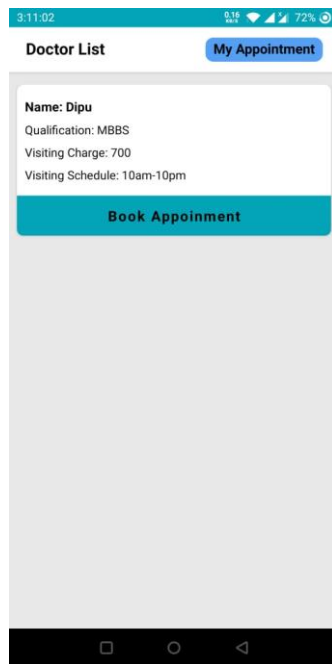


Figure 4.4 User Appointment List



Figure 4.5 My Appointment List

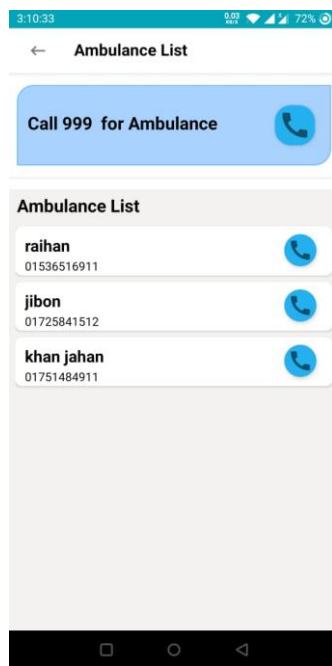


Figure 4.6 Ambulance List



Figure 4.7 User Edit Profile

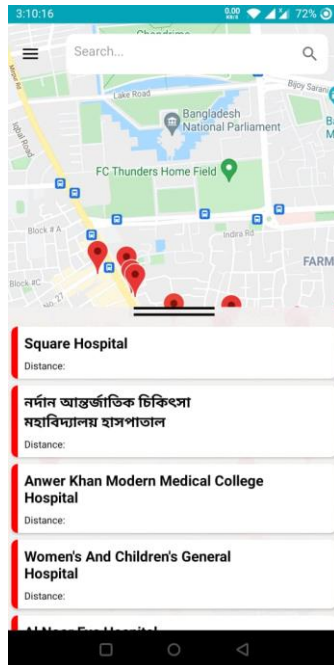


Figure 4.8 User Map view and nearest hospital list

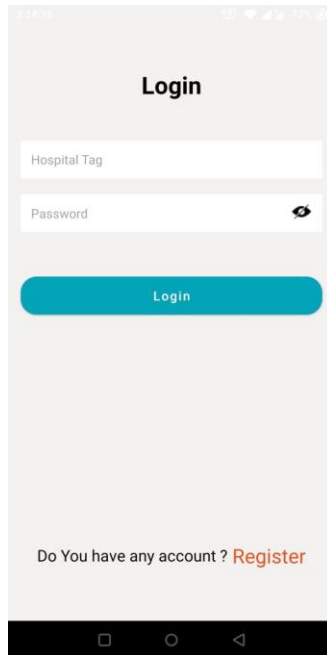


Figure 4.9 Hospital Login page

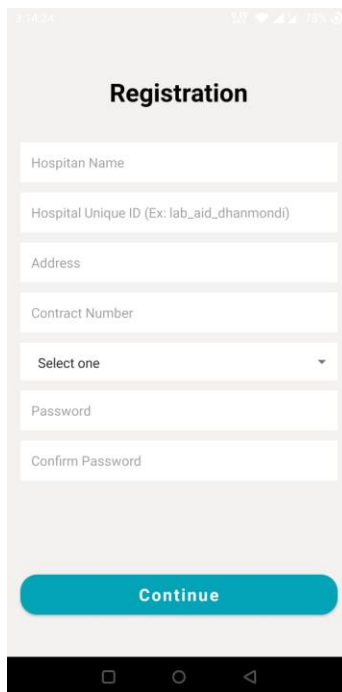


Figure 4.10 Hospital Registration page

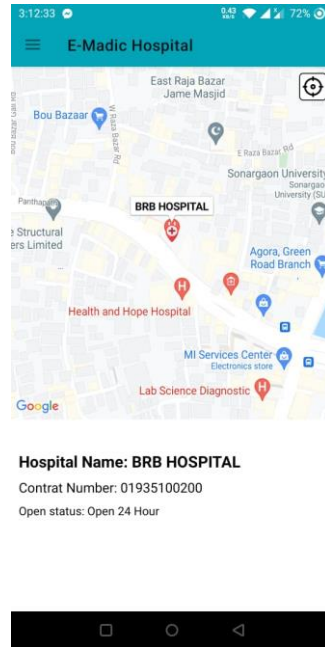


Figure 4.11 Registered hospital info

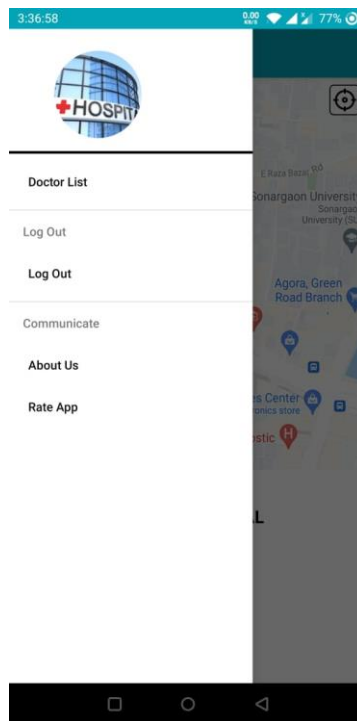


Figure 4.12 Registered hospital app navigation bar

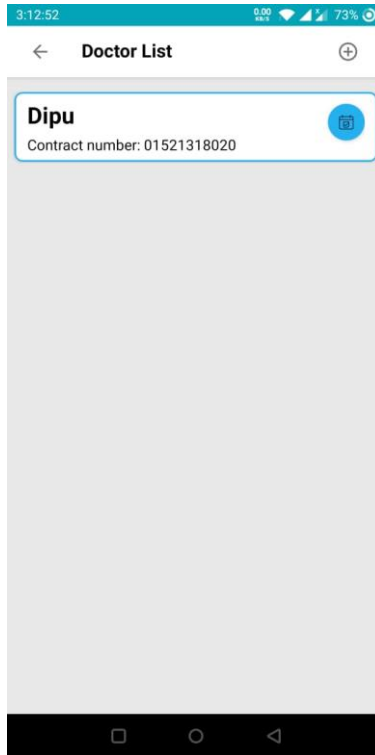


Figure 4.13 Registered hospital doctor's appointment list

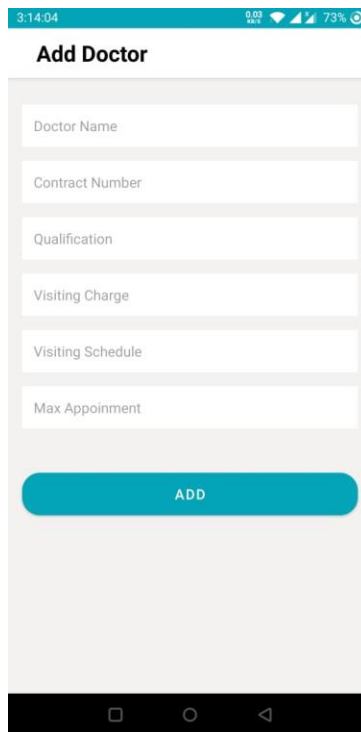


Figure 4.14 Registered hospital add doctor's list page

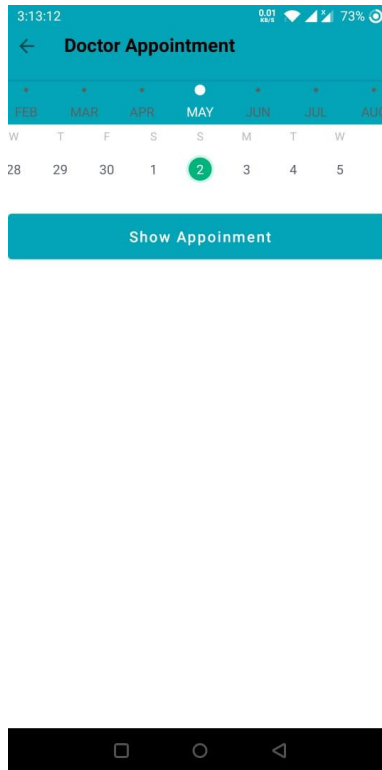


Figure 4.15 Show appointments list for hospital

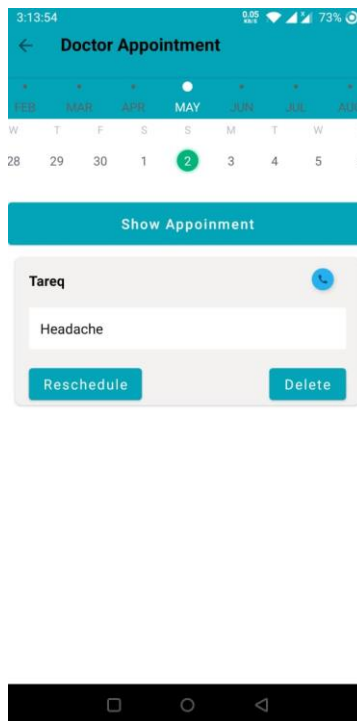


Figure 4.16 Doctors appointment for hospital

4.2 Back-end Design

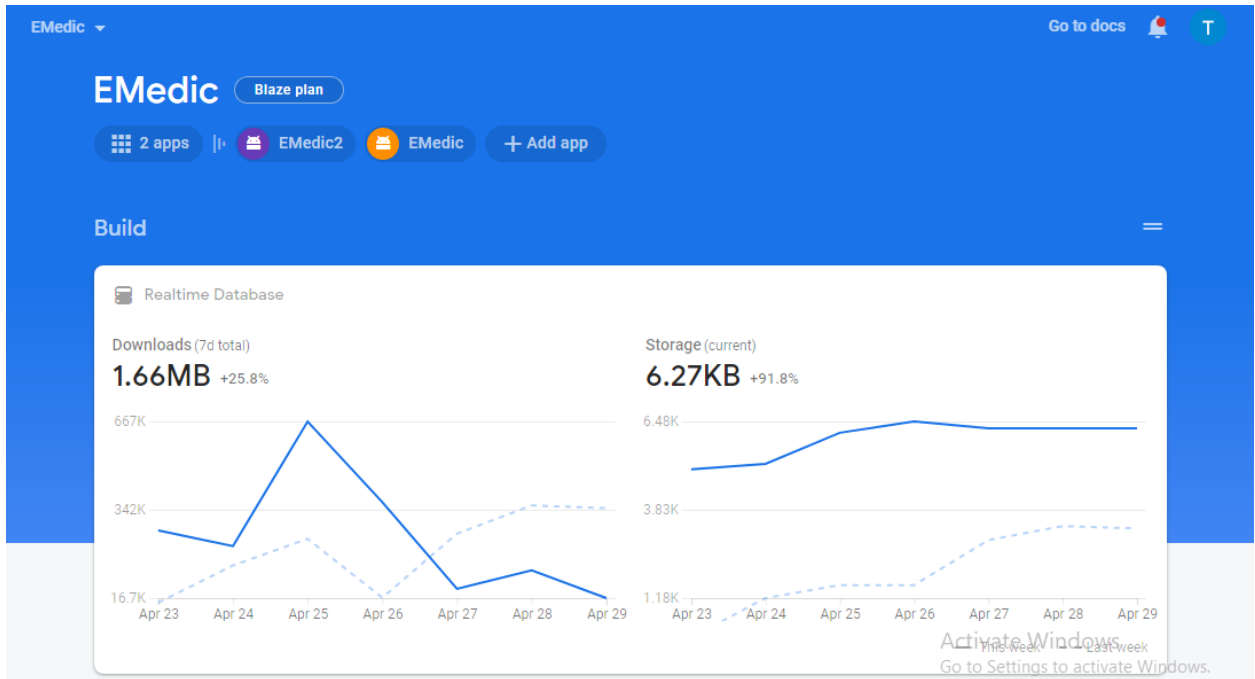


Figure 4.17: Firebase [5]

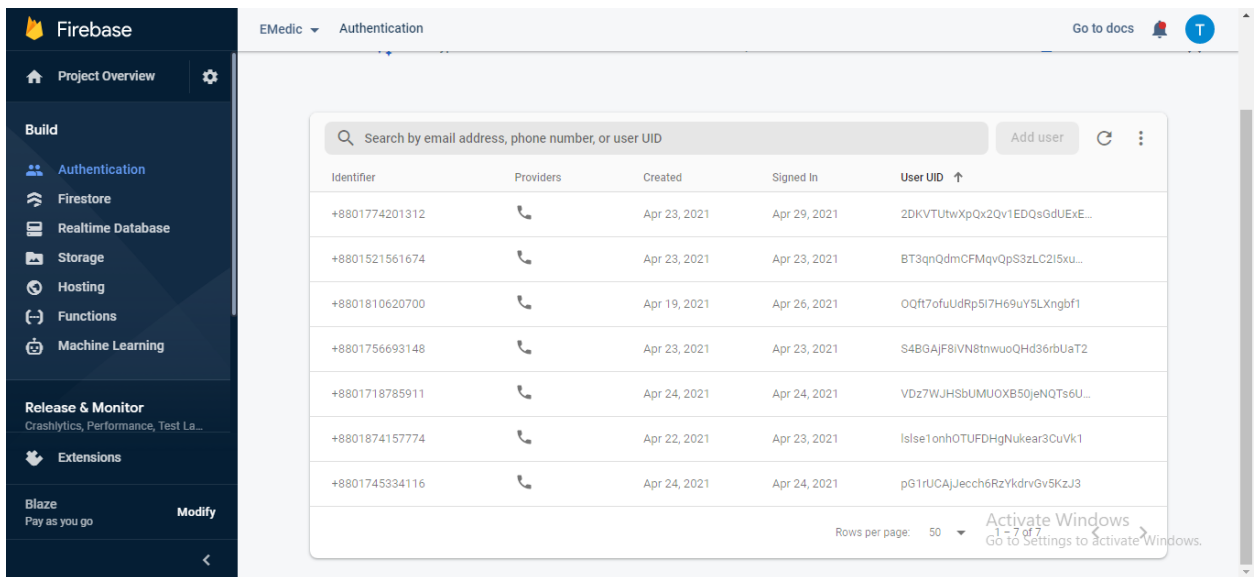


Figure 4.18: Real time Database [5]

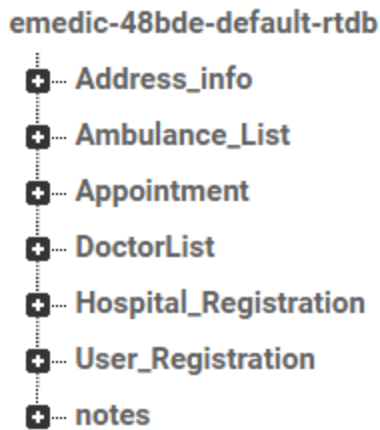


Figure 4.19: Real time Database [5]

4.3 Interaction Design and UX

The design of user interfaces for mobile electronic devices is known as UX design. The basic plan is to design a simple and easy to use interface for the client and complete the requirements. When we designed the UX, then we are precisely focus on accessibility, effectiveness and easy to optimize on the user experiences.[13]

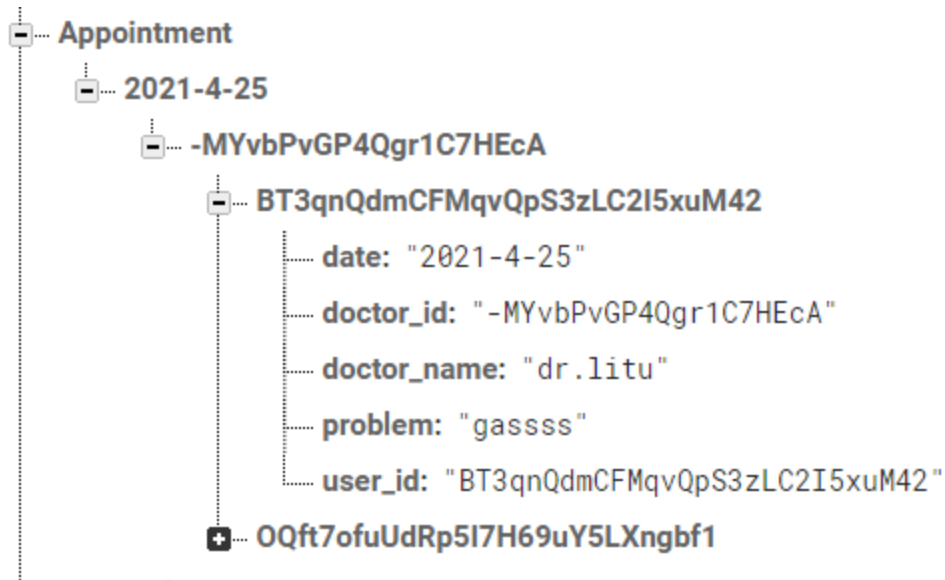


Figure 4.20: User appointed summery (Back-end) [5]

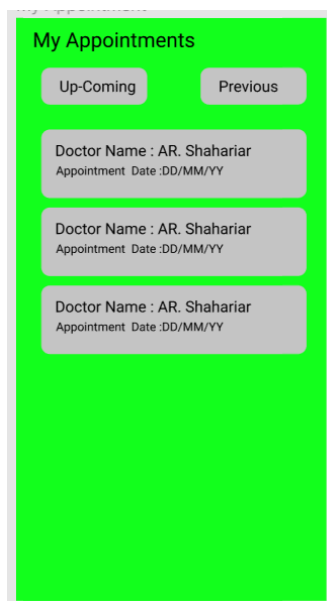


Figure 4.21: User appointed summery (Front-end)

CHAPTER 5

Implementation And Testing

5.1 Implementation of Database

Firestore is a Backend service. It provides us to develop a quality full application with the help of so-many tools. It's a Google's toolkit. It's a NoSQL database program, which stores data with the help of JSON-like documents and that lets us store and sync data in real-time. There are some database like MySQL which is fast and easy to use for small and big business so well but sometimes NoSQL is faster than relational database. It is so flexible and scalable than relational database. The firestore database can be used for searches with limited sorting and filtering functions.

To register in the app with a phone number and others information without this user cannot sign in to the application.

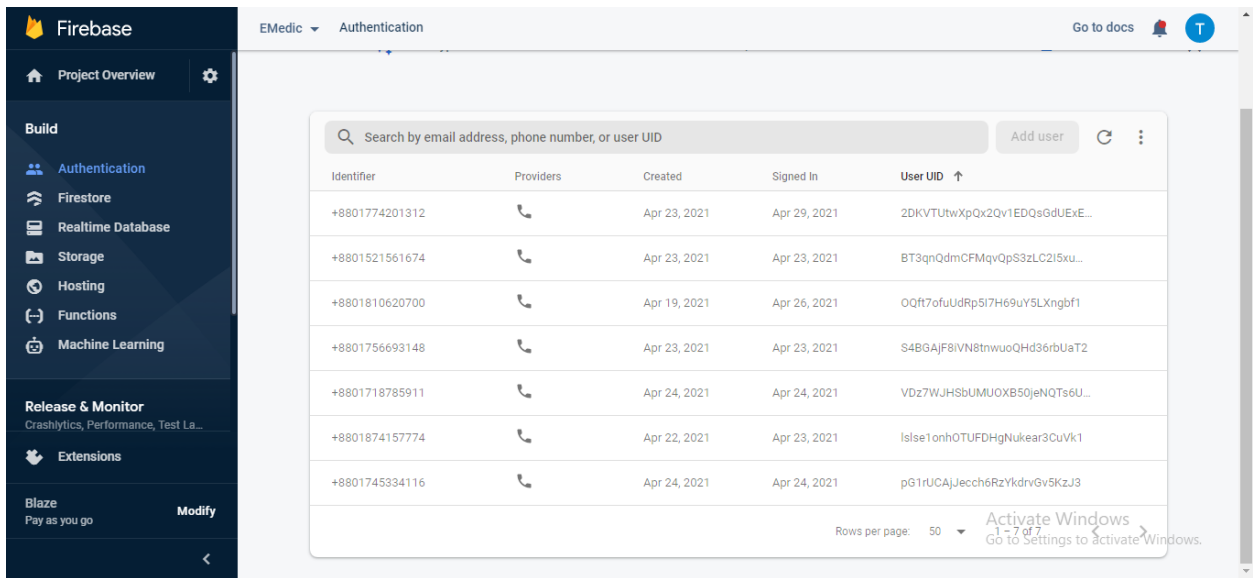


Figure 5.1: Real-time Database-Firebase [5]

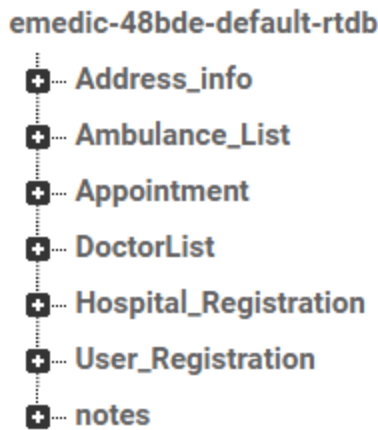


Figure 5.2: Real-time Data base-Firebase [5]

5.2 Implementation of Interaction

Implementation of Interaction describes how the application handles different types of inputs from the actuators. We made our application so lucrative, simple, and user-friendly to the customer. It is the most difficult work to complete this task for client needs. We had done our job with a level of perfection. Our project is well-build and well-implemented with all of the requisite components that a client needs.[11]

5.3 Testing Implementation

Testing Implementation is the main part of applications for testing the apps and checking errors. We tried our level best to develop our project with minimal errors.[12]

These parts are divided into two parts. They are given below,

1. Inner Logic
2. Domain of input and output

Table 5.1: Test case table for “E-Medic” application [19]

Test Case	Test Input	Expected Outcome	Actual Outcome	Result
1.Run application	Uses android phones	Application run successfully	Application run successfully	Passed
2.Sign in without Phone no	Blank input	Can't access without it	Please enter a phone no	Passed
3.Invalid Phone no	Invalid no	Can't access without it	Can't access without it	Passed
4.Without Registration	Blank input	Can't use the services	Need to register	Passes

5.4 Test Result and Reports

Application testing is the most important part of application development. Because we have to test everything that we did and it also provides us with the following advantages that, what we learnt from the errors. We prepared a table that is mentioned above-called the Test case table for "E-medic". From that table, we had done a few numbers of testing & got a legitimate outcome. Therefore, our application is freed from the error.

CHAPTER 6

Conclusion and Future Scope

6.1 Conclusion

Our project aims to improve medical treatment and provide fast services for the vulnerable. First of all, during the implementation of this project we have to face many difficulties. Because we're beginners in this field but we tried our best to achieve our desired result. Afterwards, not for all areas have launched this application, since we are using this application as a platform for that reason, we had tested it, in certain areas and after completing the project, we have received a very good feedback from others. In the end, doing some work for society is very peaceful to us. We can say that, our android-application can reduce a lots of public health risk & death. Quick-response, Security, Provide safe service these are significant feature & services we are providing. This application will be encourage a lot of people because our application is like a bridge connection between needy people & hospital management. This work may be a crucial advancement towards organizing a new platform for healthcare & IT industries. Our initiative is very small to start a new system but we hope , our contribution will be a great inspiration for all IT professionals and in future, who would be contribute their talents in these sector.

6.2 Limitations

Our project has certain constraints,

- i) This application is for the Android platform only
- ii) without an internet connection feature don't work

6.3 Future Works

In the future, we will add certain features

- i) SOS warning via android motion sensor
- ii) Emergency Medicine delivery
- iii) The system will be extended in the near future to include many various features to enhance efficiency and future demand
- iv) Chat box for conversation with doctor

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