

# **HEALTHCARE UTILITY SERVICES**

**BY**

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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**

**JULY 2020**

## **APPROVAL**

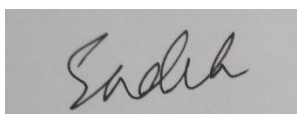
This Project titled “**Healthcare Utility Services**”, submitted by Md. Shah Al Biruni, ID No: 161-15-7028 and Saikot Paul, ID No: 161-15-7484 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the 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 9<sup>th</sup> July, 2020.

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**Professor and Head**  
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Faculty of Science & Information Technology  
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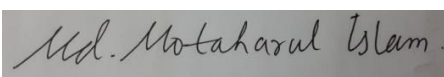
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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Jueal Mia, 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.

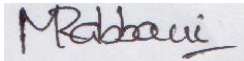
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Finally, we must acknowledge with due respect the constant support and patients of our parents.

## **ABSTRACT**

Our project titled “Healthcare Utility Services” is an android app for health-care guide of Dhaka city. Using this app, user can keep track of their health-care. This application keeps list of Doctor’s name by their field of speciality, Prescription, Appointment, Report in Dhaka city. It has a Wiki, a Diagnose of diseases, disorders and anomalies categorized into Physical, Neurological and Psychological background. From the helpline, people can find information about Blood banks, Hospital, Ambulances and Pharmacies. In modern days, smart-phone has become an essential part of our life. We can’t imagine a single moment without it, let alone leave it. In the smart-phone OS market, Android has the largest share. It has become a multi-purpose media of practical uses. Android OS is mostly open-source and has a huge user-base. Because of this, we thought we should develop an android app that has real life use to the users. And it will help them to find health-care around Dhaka city. Our app will handle all the information related to it. It will save their precious time. This application is very easy to use. After performing all the necessary task and test process, this application proved to be working validly.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

The predominance of displeasing issues faced by patients seem to increase due to insufficiency of proper information. Sadly, managing proper health-care that doesn't take much work and which all begins with one basic idea: **Information**. An Android application can come up with the solution by contributing needed information which will make the life of patients easier. So it's a request of the era to build an android app to handle and transfer information of the health-care system to the patients through the Healthcare Utility Services.

### 1.2 Motivation

In present days, it is noticeable that people who come to Dhaka for treatment purpose can't find proper hospitals or often have been scammed by scammers. Also it is hard to find hospital's contact information altogether in a single place. Not to mention, in most of apps, neurological, psychological disorders/diseases get excluded from the list of priority. That's why we created this app to solve these unpleasant situations.

### 1.3 Objective

We want to develop this app. This app will have these mentioned features-

1. To keep all important information about a healthcare system.
2. To provide prescription, appointment and report.
3. To keep wiki and diagnosing method.
4. To provide various helpline and emergency contact information.
5. To provide unique account of this app for each users.
6. To keep feedback option to meet the purpose of user's need.

## **1.4 Expected Outcome**

By using this app, patients can easily find all the necessary information regarding healthcare system such as finding doctors by their speciality, booking appointment, getting prescription and reports. Besides, they can save their precious time by getting all the information they need, without asking anyone else which is comforting. Critical situations like when blood is needed or Ambulance is needed, they can get their contact information from it. They can also find pharmacies by using this app.

## **1.5 Report Layout**

### **Chapter 1: Introduction**

In this chapter, introduction, objectives, motivation and the expected outcome of our project will be discussed.

### **Chapter 2: Background Study**

Chapter 2 includes the works related with our app, comparative studies and the challenges we had to face to develop this app.

### **Chapter 3: Requirement Specification**

In chapter 3, requirement specification such as business process modeling, requirement analysis and modeling, logical data model and design requirement will be discussed.

### **Chapter 4: Design Specification**

The description of Front-end design, back-end design, interaction design and UX and implementation requirements are given in this section.

### **Chapter 5: Implementation and Testing**

The implementation of database, implementation of front-end design, implementation of interaction, testing implementation, test results and reports are discussed in this chapter.

### **Chapter 6: Conclusion and Future Scope**

Chapter 6 discusses about the conclusion and the future scope of our app.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

An android app that can provide the solution by offering the facility to share issues and information between patients and health-care provider which leads to faster issue resolution and less misunderstanding. The aim of the app is to create a better connection between patients and health-care provider. Healthcare Utility Services app is designed to support the people by providing them detailed information of the doctors, maintaining appointments, prescriptions and reports, educating people about physical, neurological, psychological disorders. Getting all emergency information such as blood bank, hospital location, pharmacy, ambulance services etc altogether from a single app like ours will be an important tool for ensuring a patient's long term future.

#### **2.2 Related Works**

There are sort of android apps nearly similar to our app, Healthcare Utility Services. But those have many distinction with it. Some of them are:

DIMS: This app doesn't provide doctor's information, detailed description of diseases, helpline[1]. Diseases Dictionary: It only has detailed information of diseases but not based on their type[2]. Patient Aid: This app only has medicine list, doctors and helplines but doesn't include any appointment system and detailed information of diseases[3].

## **2.3 Comparative Studies**

Patient Aid app can only be used to show the doctor's list. But in our app, users can take appointments as well as get prescriptions and reports. In our app, there are facilities such as sign up and login for individuals so that each people can have separate services and doesn't mess with others. By using our app, not only users can get unique features mentioned earlier but also can get helpline information like Patient Aid and detailed information of various diseases like Disease Dictionary app. It also discusses about mental issues unlike most other health apps.

## **2.4 Scope of the problem**

Since it's an android app, if the users doesn't have an android smart-phone or if they don't know how to operate one, it'll be zero effective for them. We couldn't implement any payment system in it. So if a user face an unfortunate event like hijacking, robbery or kidnapping, they have to be liable for it themselves. Also, providing map facility is a matter of financial concern. Because you have to buy an API key to obtain that facility. Since we are students ourselves, we couldn't afford that.

## **2.5 Challenges**

1. The main challenge is the language barrier which is not our native language that is English. Most of the people of our country don't know it.
2. English is used as the main and only language of our app.
3. The app has internet permissions. So users must have stable internet connections.
4. The next challenge is to implement this app in other districts than Dhaka.
5. To utilize a reliable database that stores all the information as well as handles the back-end design and provide security.

## CHAPTER 3

### REQUIREMENT SPECIFICATION

#### 3.1 Business Process Model

BPM or Business Process Modeling is a schematic depiction of a business process or work-flows, by means of identifying possible improvements. It is generally done through individual graphing methods such as data-flow diagrams, flowcharts etc. In our system, we build a BPM which shows how the data is exchanged among users and the admin. It also shows what will happen if the user put wrong information. If the information is correct, then it will be stored in the database and each entity has a dedicated database table.

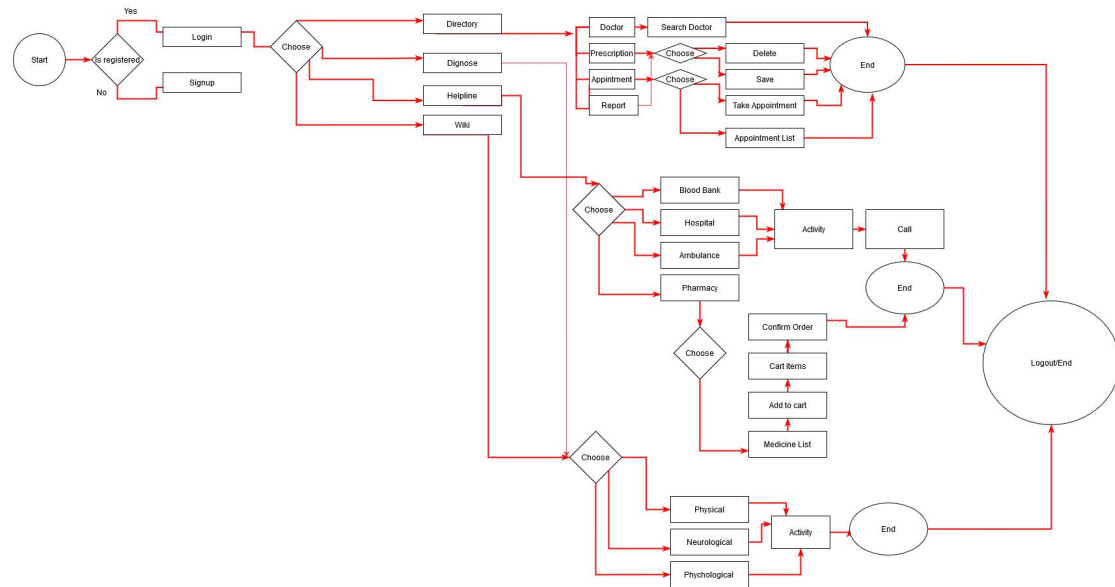


Figure 3.1: Business Process Model

### **3.2 Requirement Collection and Analysis**

Requirement Collection and Analysis are overly significant term to build any particular system or any type of Android app. This fulfills the aim of the users and the admin. As our app focuses on the requirement of the users and the admin, so we went to them and tried to hear what their requirements are for our app. Almost all of them suggested to develop a minimalistic app which they can use at ease. To maintain the necessary information of the health-care system and medical services, this app will provide them a prominent facility. Because if they face any kind of nuisance with getting medical related information, they will think it will be a great process if they can choose the information or service they want.

### **3.3 Use-Case Modeling**

A use-case model is a graphical details of how various types of user interactions with the system to find a solution of the problem. It describes the aims of the users, the inter-connection between the users and the system, the necessary behavior of the system to satisfy these aims. The use case modeling of the app is shown in Figure 3.2.

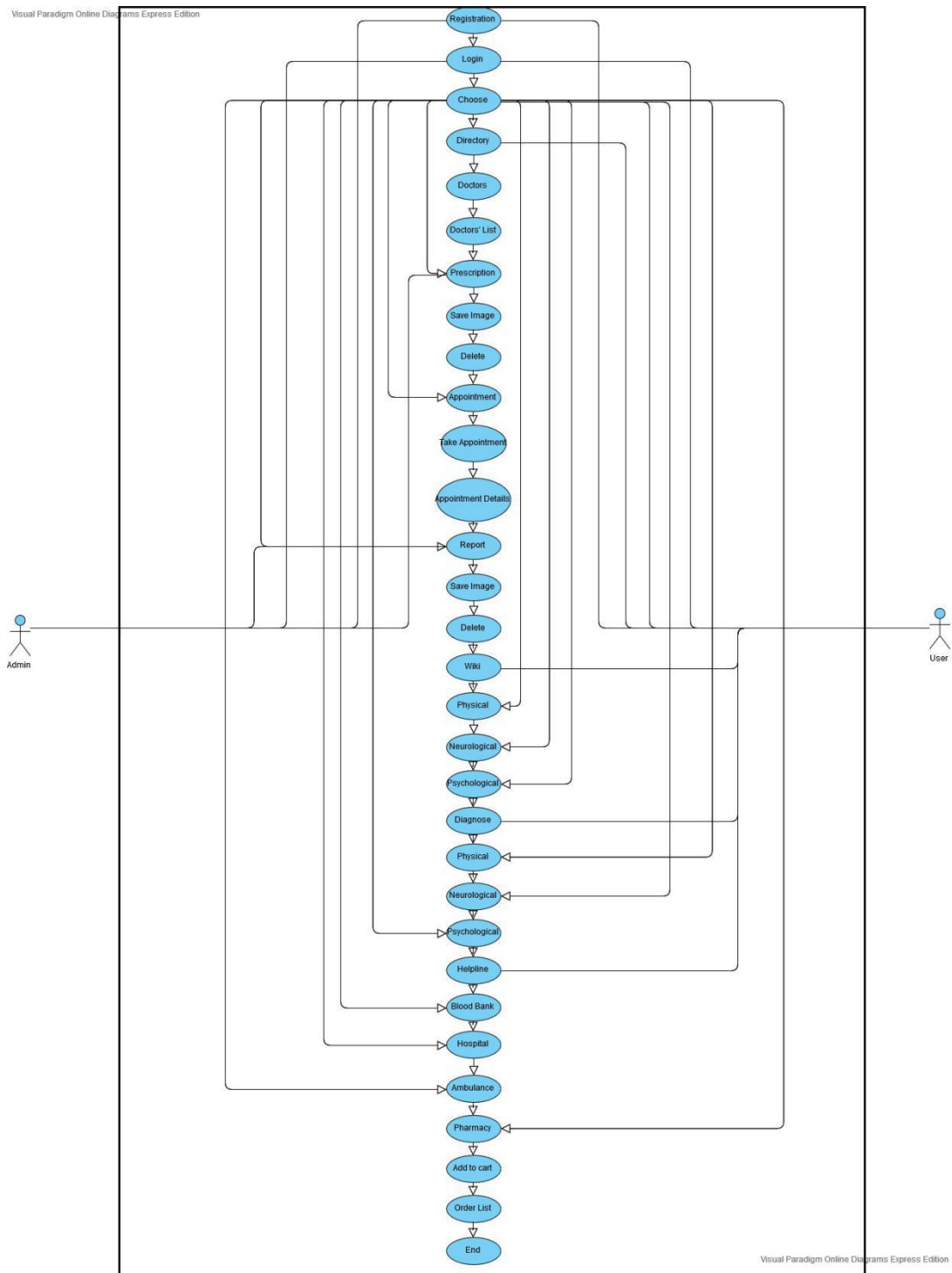


Figure 3.2: Use Case Model



**Use Case:** User Registration

**Actor:** User

**Precondition:** None

**Primary Path:**

1. Enter Username
2. Enter Email
3. Set a password

**Use Case:** User Login

**Actor:** User

**Precondition:** Registration

**Primary Path:**

1. Enter Email
2. Enter password
3. Click on “Login” button

**Alternate Path:**

1. Enter correct login details

**Use Case:** Fill login credentials

**Actor:** User

**Precondition:** Login

**Primary Path:**

1. Login Successful

**Alternate Path:**

1. Field can not be empty

**Use Case:** Healthcare

**Actor:** User

**Precondition:** Login

**Primary Path:**

1. Directory

**Alternate Path:**

1. Select Wiki
2. Select Diagnose

### 3. Select Helpline

**Use Case:** Directory

**Actor:** User

**Precondition:** Choose

**Primary Path:**

1. Select Doctors

**Alternate Path:**

1. Select Prescription
2. Select Appointment
3. Select Report

**Use Case:** Doctors

**Actor:** User

**Precondition:** Directory

**Primary Path:**

1. Doctors' List

**Use Case:** Appointment

**Actor:** User

**Precondition:** Directory

**Primary Path:**

1. Write appointment details
2. Click on “appointment”

**Alternate Path:**

1. Appointment List

**Use Case:** Prescription

**Actor:** User

**Precondition:** Directory

**Primary Path:**

1. Prescription List

**Alternate Path:**

1. Delete

## 2. Save Image

**Use Case:** Report

**Actor:** User

**Precondition:** Directory

**Primary Path:**

1. Report List

**Alternate Path:**

1. Delete
2. Save Image

**Use Case:** Wiki

**Actor:** User

**Precondition:** Choose

**Primary Path:**

1. Physical

**Alternate Path:**

1. Neurological
2. Psychological

**Use Case:** Diagnose

**Actor:** User

**Precondition:** Choose

**Primary Path:**

1. Physical

**Alternate Path:**

1. Neurological
2. Psychological

**Use Case:** Physical

**Actor:** User

**Precondition:** Wiki

**Primary Path:**

1. Activity

**Use Case:** Neurological

**Actor:** User

**Precondition:** Wiki

**Primary Path:**

1. Activity

**Use Case:** Psychological

**Actor:** User

**Precondition:** Wiki

**Primary Path:**

1. Activity

**Use Case:** Physical

**Actor:** User

**Precondition:** Diagnose

**Primary Path:**

1. Activity

**Use Case:** Neurological

**Actor:** User

**Precondition:** Diagnose

**Primary Path:**

1. Activity

**Use Case:** Psychological

**Actor:** User

**Precondition:** Diagnose

**Primary Path:**

1. Activity

**Use Case:** Helpline

**Actor:** User

**Precondition:** Choose

**Primary Path:**

1. Blood Bank

**Alternate Path:**

1. Hospital
2. Ambulance
3. Pharmacy

**Use Case:** Blood Bank

**Actor:** User

**Precondition:** Helpline

**Primary Path:**

1. Activity

**Use Case:** Hospital

**Actor:** User

**Precondition:** Helpline

**Primary Path:**

1. Activity

**Use Case:** Ambulance

**Actor:** User

**Precondition:** Helpline

**Primary Path:**

1. Activity

**Use Case:** Pharmacy

**Actor:** User

**Precondition:** Helpline

**Primary Path:**

1. Add to cart

**Alternate Path:**

1. Order List

**Use Case:** Order List

**Actor:** User

**Precondition:** Pharmacy

**Primary Path:**

1. Activity

### 3.4 Logical Data Model

Our app's logical data model has relational tables named Admin, User, Database and App. Below, we described the connection of the entities with each other. The full relational model is shown below.

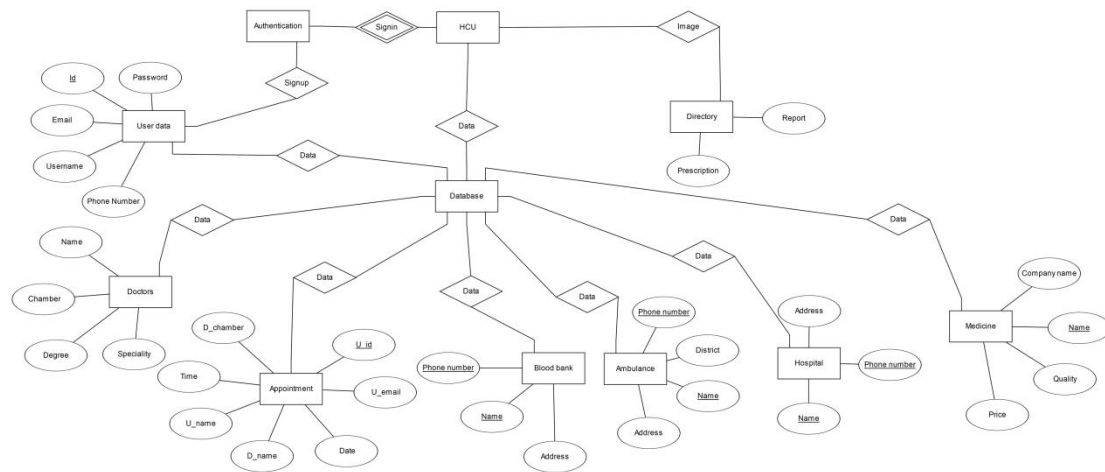


Figure 3.3: Logical Data Model

### 3.5 Design Requirement

A well-designed android application is delightful to use. Our app provides service to the local citizens and the health-care to maintain a good relationship about medical related service in Dhaka city. Since the users of our app are the local people, we tried to make the interface of the app user-friendly. A good design of an android application is very important. But we ought to concentrate to the output to attract its user base first. User generally want a quick service, so to make their app experience great, simplifying the UI is our primary objective.

## **CHAPTER 4**

### **DESIGN SPECIFICATION**

#### **4.1 Front-end Design**

Front-page of an android app must capture the attention of the users. To make the app appealing to the user-base we used some Graphical User Interface (GUI) elements. We designed our project with minimalist approach so that the users can operate it at ease. There is a link to the registration page and a login option. To log in the application, user must have to register at first.

#### **4.2 Back-end Design**

Back-end design is only noticed by the developer/developer-team. How will the app associate with the users is implemented in the back-end. Users can not connect with the back-end design. If there is any necessity to change or update any information or data, they can do within the front-end. As our project carries on the information that is send by the system, we need to build a database to save this information. We also deliver the unique id for each user. We used Firebase to create the database. The following figures give details on how we designed the back-end of our app. Figure 4.1 shows the back-end design for the user. This authentication function shows all the users who signed up in the database by using our app. When a user logs in this app, a database is automatically generated for the user.

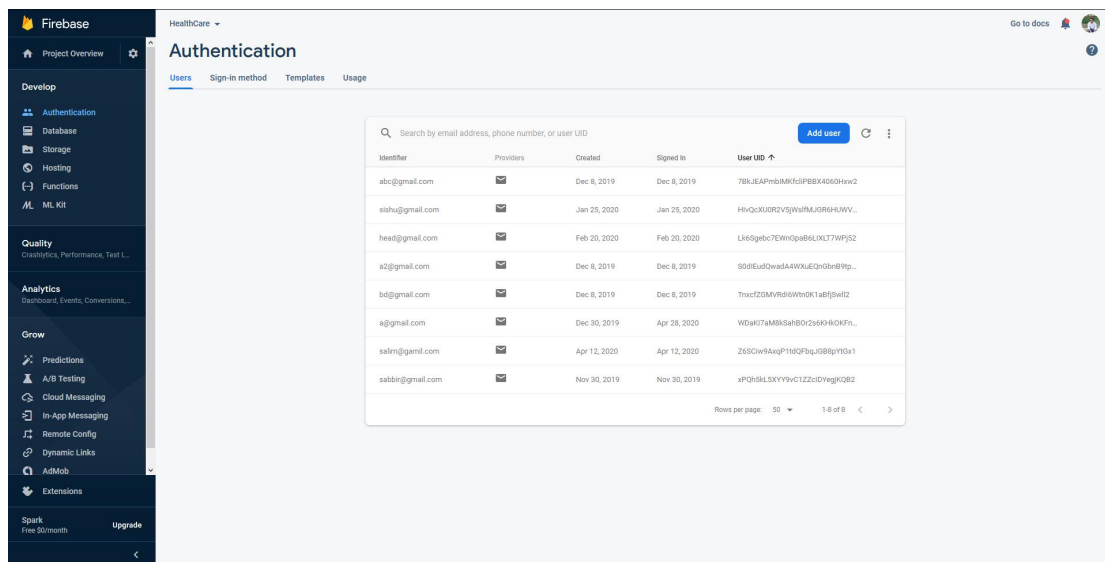


Figure 4.1: Users list

Figure 4.2 shows all the sub-databases that are created in our project. All the sub-databases accommodate different kinds of information of individual user. This supplies the personal distinctive key for the each user by which the information of discrete person are handled.

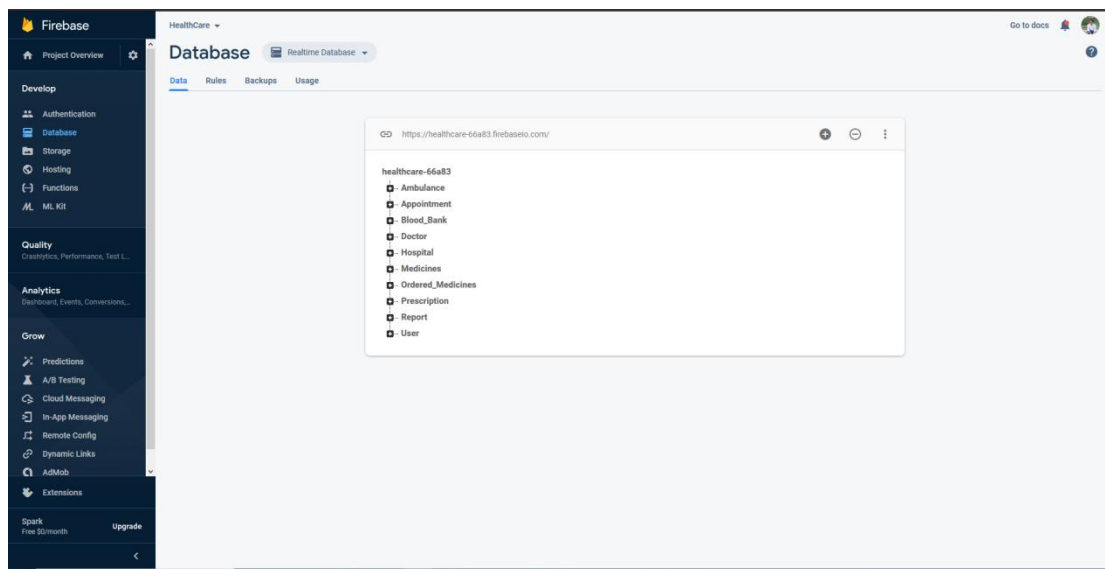


Figure 4.2: Database Creation



### **4.3 Interaction Design and UX**

Interaction design is described by the relationship between our app and the user. The amount of popularity of an android app among the users rests on the interactivity of the app to the users. If the app is trouble-free to use as well as delivers a great result to the user, then it will achieve popularity. Creativity is much important for interaction design. Since mostly, the user-experiences focus on the experiences between the app and the user. From our effort, we tried to build most of the features of our app that can interact with the app-user. Our app is an information oriented one, that's why we tried to provide detailed information to them by using the sign-up option which needed valid email address and password of the user.

UX design or user-experience design is the most demanding portion for a developer. They must have to pay attention to the user experience for using an app and how they can give satisfaction with a product. We kept our focus on this division and tried to execute an app that has decent interface which will be adored by the users.

### **4.4 Implementation Requirement**

To implement a project, we need individual types of components, tools and software. We used some third-party tools and components too to implement our project. Since it is android based application project, we used material design components and tools to implement our app. Here is a brief description of the components and tools that are required to build the app.

#### **4.4.1 Android Studio**

Android Studio is the official integrated development environment (IDE) for google's Android OS based on IntelliJ IDEA and a platform to build Android and Flutter app. It provides useful features and libraries to the developer to implement an Android app. It delivers almost all necessary components and tools and frame-works for building an Android app easily and quickly. We used Android Studio as the main IDE software.

Since it is like an all-in-one tool, developer prefers it more to develop different types of Android apps.

#### **4.4.2 Emulator**

Emulator creates a virtual device on which the application is designed for specifically can be tested and run. It executes the same code in the device based on actual device. We can also use different version of Android in it.

#### **4.4.3 Android SDK**

Android SDK or Software Development Kit plays essential role to develop an Android app. It contains all the design and component libraries for development and the emulator to test the app. We used OpenJDK in the java platform with the SDK.

#### **4.4.4 Firebase**

Firebase is one of the most famous real-time database. Like every other practical softwares and apps, we need a dedicated database to store the information of the users. We used Firebase as the main database of our app to store and manage the information of the users. We also had dedicated data tables for different purpose. It synchronizes the data in real-time to every connected user in the app. It is also used for authentication and registration.

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation of Database

In this section, the implementation of our database is explained. We explained in the earlier chapter that we used Firebase as our main database. Firebase is a real-time database which excludes the need of SQL query to execute the action. Firebase has also some notable features like hosting, cloud-storage authentication, error-reporting and so on. The procedure of using Firebase maintaining our data is recounted below with necessary diagram.

To save information on the database, the user must have to register and sign-in. To sign-in in our database Firebase gives individual choices to the user. Inside the app, user can sign-in using their email. The authentication option is shown in Figure 5.1

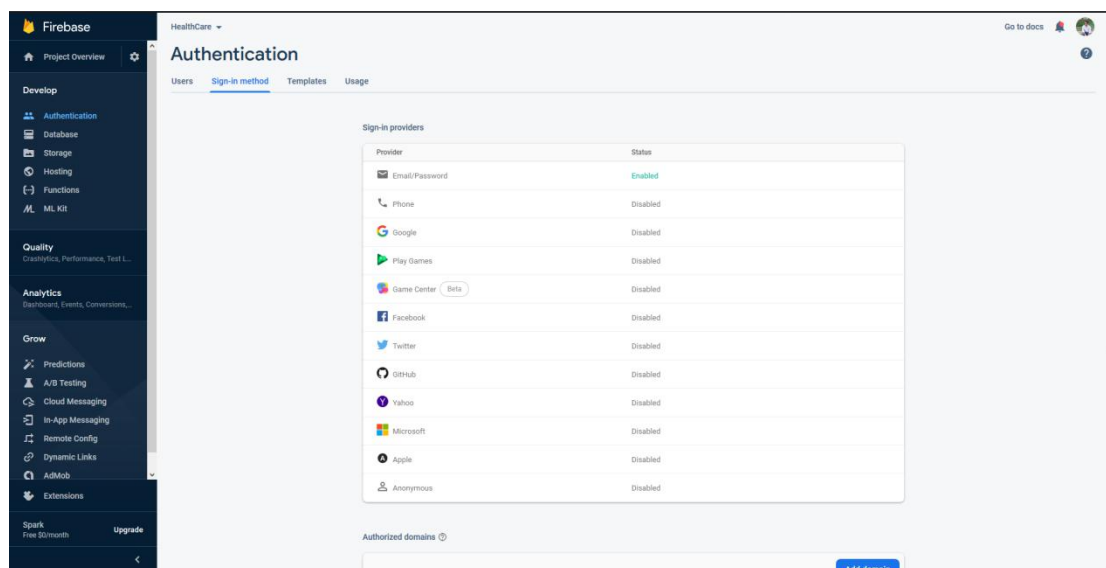
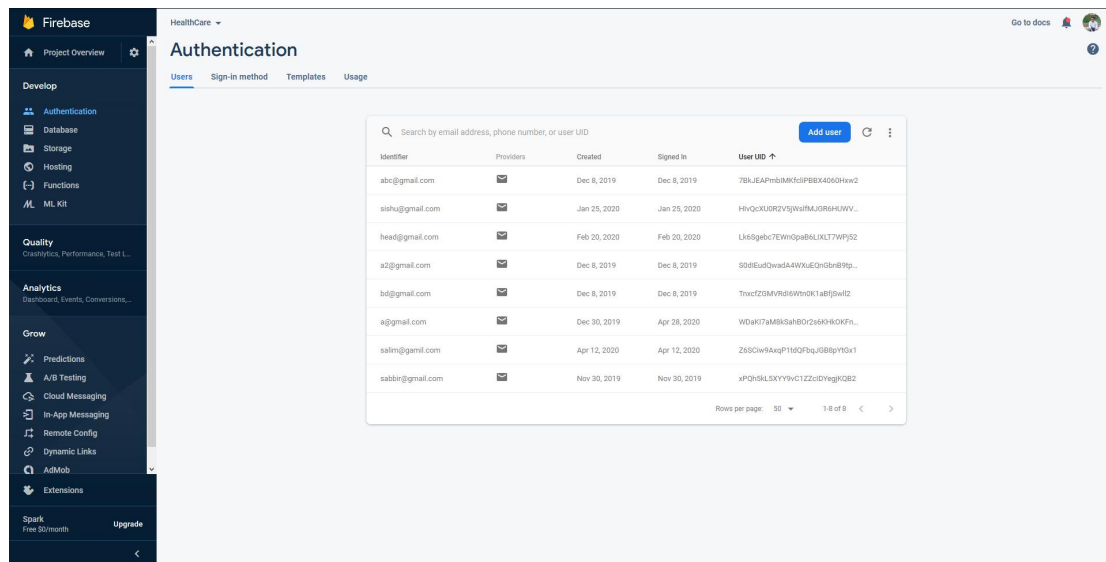


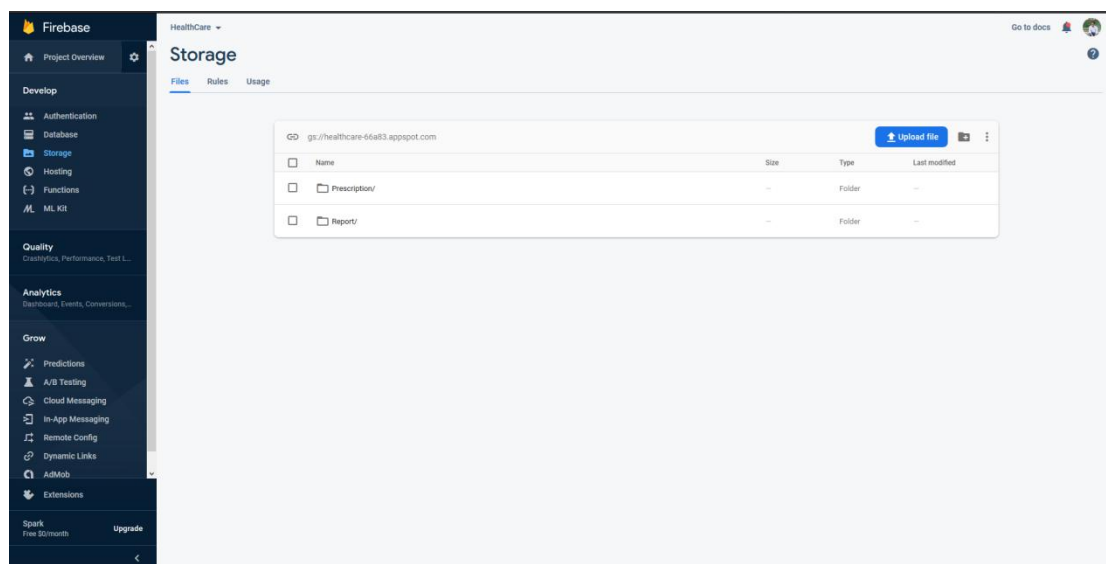
Figure 5.1: Authentication option

In case of signing in, if the user does not provide valid username or password, then he will be unable to sign in. Firebase uses an authentication rule whether the given data are valid or not. All the registered users have their own user table as well as unique user ID. The information that are saved in each unique table is through that ID. When a user signs in, it verifies with the help of firebase.



Identifier	Providers	Created	Signed In	User UID
abc@gmail.com	📧	Dec 8, 2019	Dec 8, 2019	78LJEAPmbMkfcP8EX40Ghsw2
sishu@gmail.com	📧	Jan 25, 2020	Jan 25, 2020	HvQcXU0R2V5WuIMJGR6HJWV...
head@gmail.com	📧	Feb 20, 2020	Feb 20, 2020	Lk6Sgebc7Ewn0pa86LXL77Wp52
az@gmail.com	📧	Dec 8, 2019	Dec 8, 2019	S08Eu5QvredA4WVUEQnGn6R9p...
bd@gmail.com	📧	Dec 8, 2019	Dec 8, 2019	TrucfZQMvRd6WmDK1aB9wI2
ag@gmail.com	📧	Dec 30, 2019	Apr 28, 2020	WD8K7AM8Sah8O726KHOKFR...
salm@gmail.com	📧	Apr 12, 2020	Apr 12, 2020	Z66Ciw9AagP18QFbqJ08BpY5x1
sabir@gmail.com	📧	Nov 30, 2019	Nov 30, 2019	xPQH3L5XY9Y9VC1ZCzDyegK0B2

Figure 5.2: Authentication Users



Name	Size	Type	Last modified
Prescription/	—	Folder	—
Report/	—	Folder	—

Figure 5.3: Prescription and Report

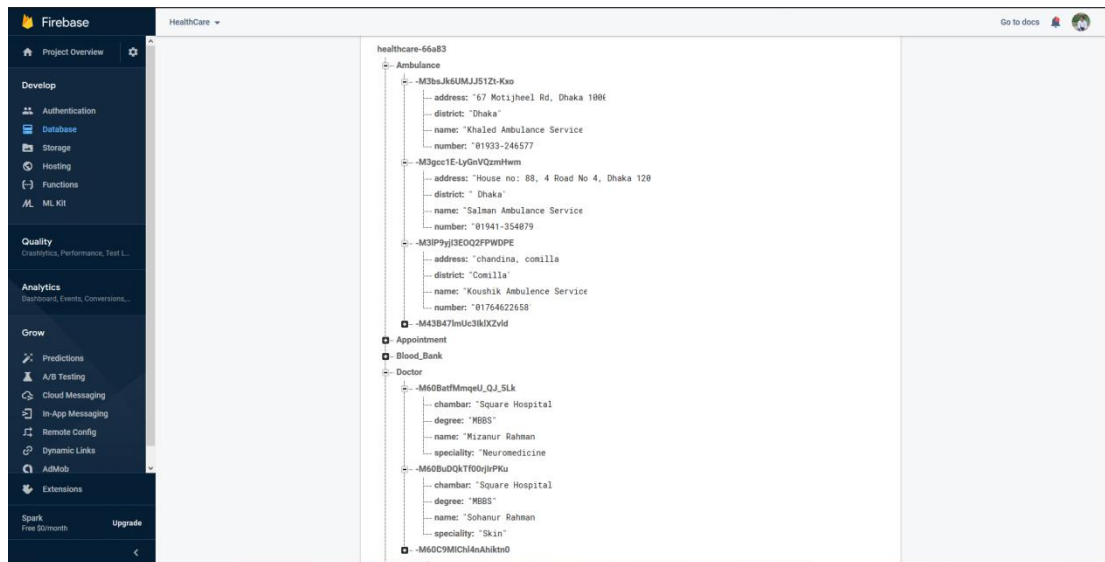


Figure 5.4: Database creation of various tables of the app

When a user wants to use this app, at first they need to sign up in the system with their valid Email address. Then, they can login in the system. While logging in, our authentication option will verify whether their Email and Password are valid or not. If their given information are valid, then it will accept their sign in. If not, it will show a notification saying “Enter correct login details”. After login, user can easily use our app. Our database will keep their information encrypted.

## 5.2 Implementation of Front-end Design

Only the front-end design is observable to the user. So it will be comfortable to look at. It is also user-friendly. We already mentioned that the audiences of our app are the local people. At the front page of our app, we arranged the registration and sign-in option. Figure 5.5 shows how we implemented the front-end of our app.

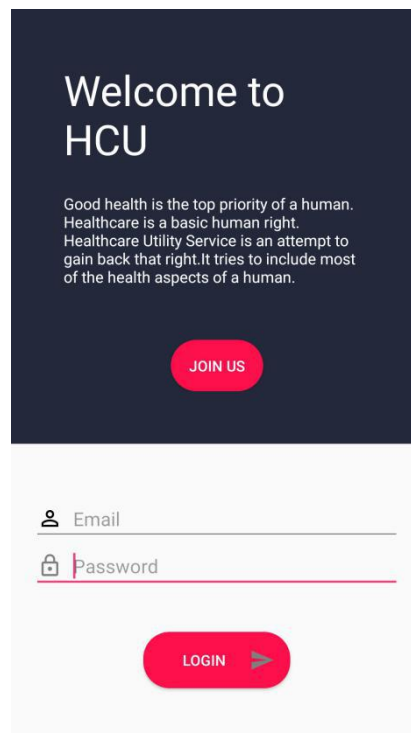
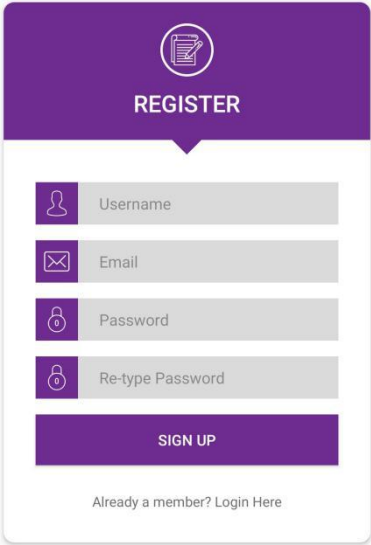


Figure 5.5: Homepage

If any user wants to use our app, he/she needs to register at first using the sign-up option. After clicking Join Us, the following page will appear to the user. User can register into the app by using Username, Email and password.



The image shows a mobile app registration screen. At the top, there is a purple header with a white icon of a document and a pencil, and the word "REGISTER" in white capital letters. Below the header, there is a white card with a purple border. Inside the card, there are four input fields, each with a purple icon on the left: a person icon for "Username", an envelope icon for "Email", a lock icon for "Password", and another lock icon for "Re-type Password". Below these fields is a purple button with the text "SIGN UP" in white capital letters. At the bottom of the card, there is a link that says "Already a member? Login Here" in a small, gray font.

Figure 5.6: Register

After login, user can choose either Directory, Wiki, Diagnose or Helpline. Figure 5.7 shows the options present in those.

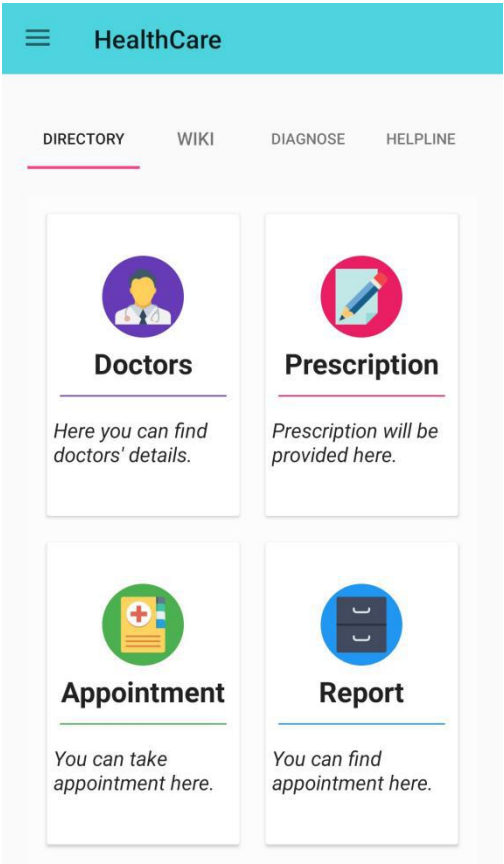


Figure 5.7: Directory

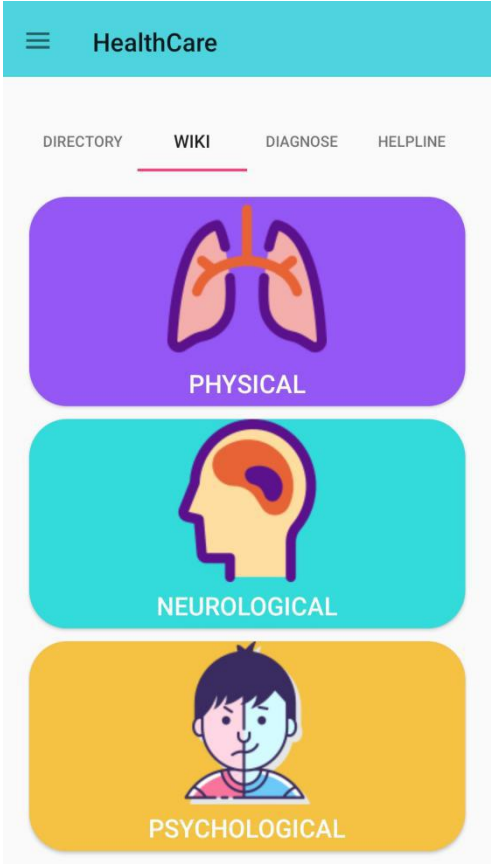


Figure 5.8: Wiki



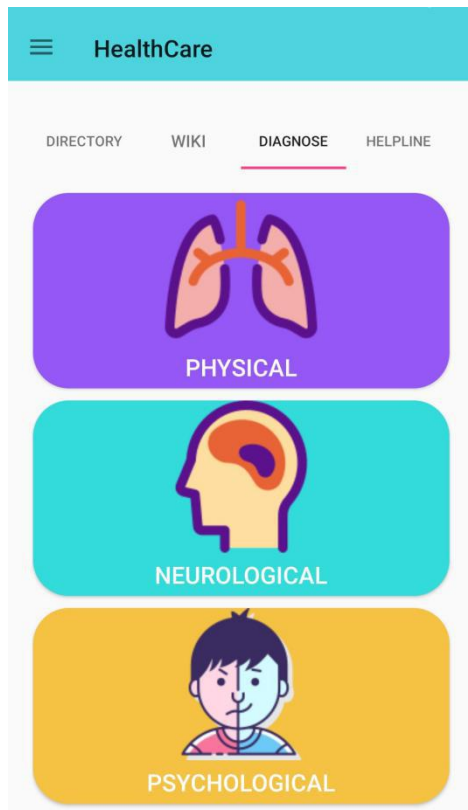


Figure 5.9: Diagnose

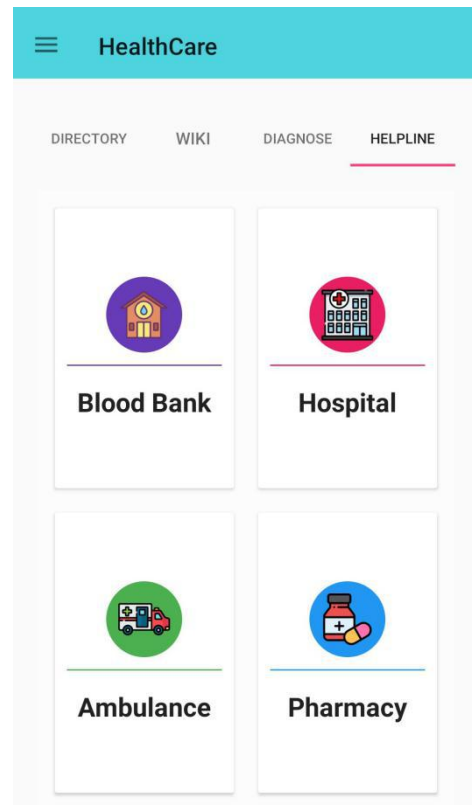


Figure 5.10: Helpline

After clicking Doctors, we get doctor's list. We can search the doctors using the search option like Figure 5.11.

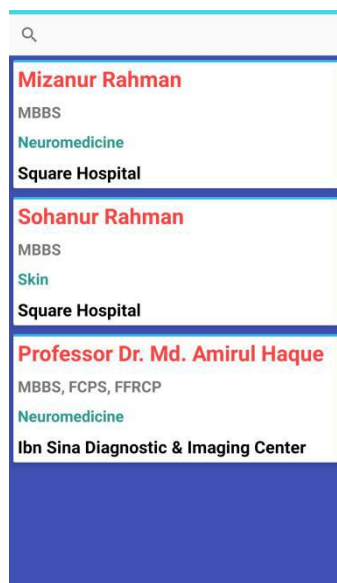
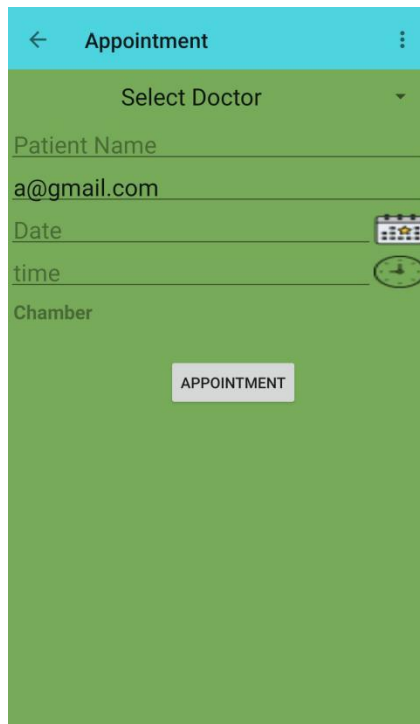


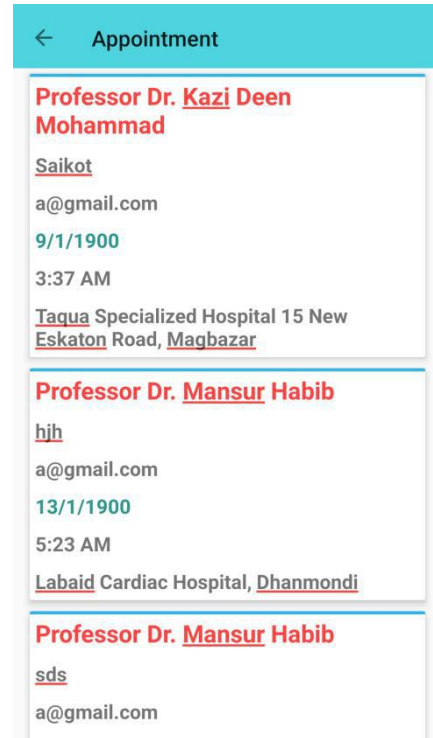
Figure 5.11: Doctor's list

We can also take doctors' appointments. This appointments will appear in Appointment list like figure 5.13



The screenshot shows a mobile application interface for making an appointment. At the top, there is a blue header bar with a back arrow and the text "Appointment". Below the header is a green form area. The form contains the following fields: "Select Doctor" (a dropdown menu), "Patient Name" (a text input field), "a@gmail.com" (an email input field), "Date" (a date picker icon), "time" (a clock icon), and "Chamber" (a text input field). At the bottom of the form, there is a white button with the text "APPOINTMENT".

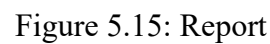
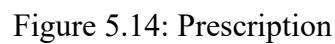
Figure 5.12: Appointment



The screenshot shows a mobile application interface displaying a list of appointments. At the top, there is a blue header bar with a back arrow and the text "Appointment". Below the header, there is a list of three appointment cards. Each card contains the following information: Doctor's name (in red), Patient's name (in blue), Email address (in black), Date (in green), Time (in black), and Hospital name (in blue). The first card is for Professor Dr. Kazi Deen Mohammad, Saikot, a@gmail.com, 9/1/1900, 3:37 AM, and Taqua Specialized Hospital 15 New Eskaton Road, Magbazar. The second card is for Professor Dr. Mansur Habib, hjh, a@gmail.com, 13/1/1900, 5:23 AM, and Labaid Cardiac Hospital, Dhanmondi. The third card is for Professor Dr. Mansur Habib, sds, a@gmail.com.

Doctor's Name	Patient's Name	Email	Date	Time	Hospital
Professor Dr. Kazi Deen Mohammad	Saikot	a@gmail.com	9/1/1900	3:37 AM	Taqua Specialized Hospital 15 New Eskaton Road, Magbazar
Professor Dr. Mansur Habib	hjh	a@gmail.com	13/1/1900	5:23 AM	Labaid Cardiac Hospital, Dhanmondi
Professor Dr. Mansur Habib	sds	a@gmail.com			

Figure 5.13: Appointment List

[illegible]

After clicking any section of Wiki, Diagnose, a list of diseases appears like figure 5.16. By clicking on any disease user will get their desired information like figure 5.17.



Figure 5.16: Diseases' List

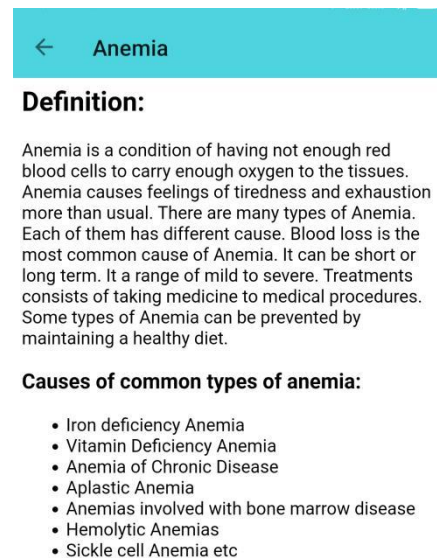


Figure 5.17: Description

On the other hand in Blood Bank, Ambulance, Hospital sections you can call your desired service respectively like Figure 5.18, 5.19, 5.20, 5.21.

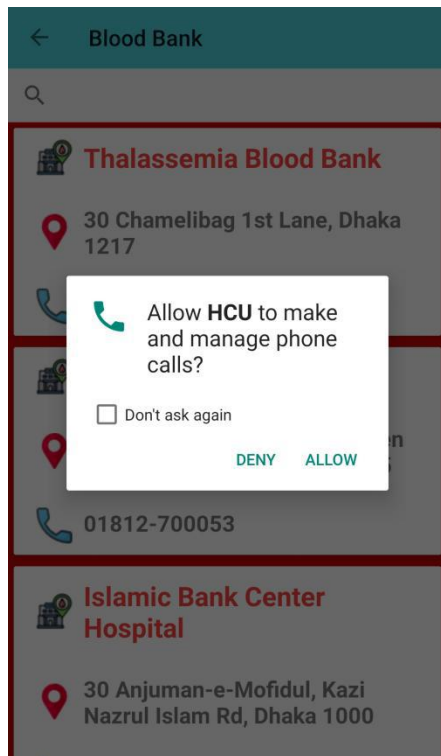


Figure 5.18: Blood Bank

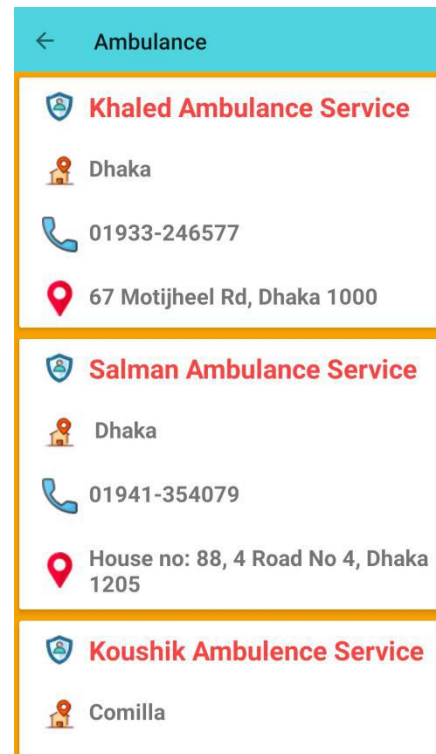


Figure 5.19: Ambulance

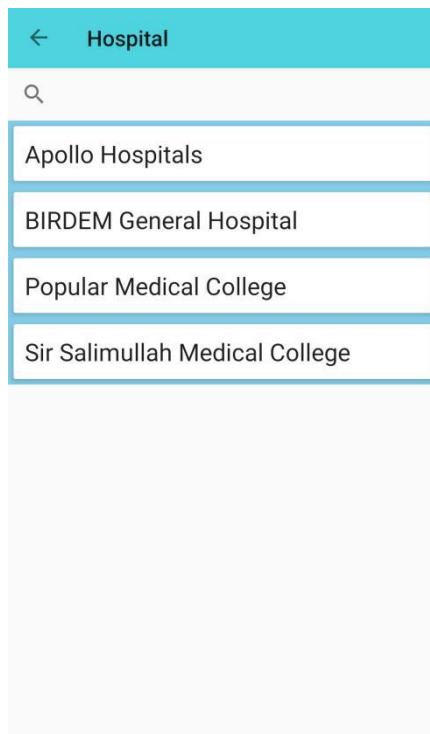


Figure 5.20: Hospital

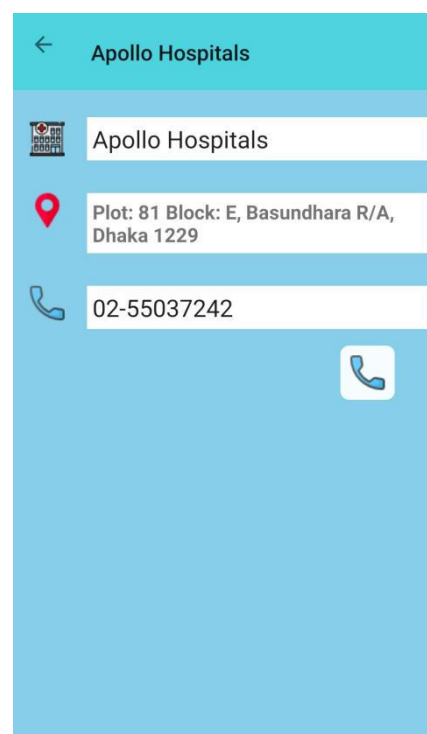


Figure 5.21: Hospital Activity

You can also order medicines in the Pharmacy section of our app. There is cart facility too. These functionalities are shown in figure 5.22, 5.23, 5.24.

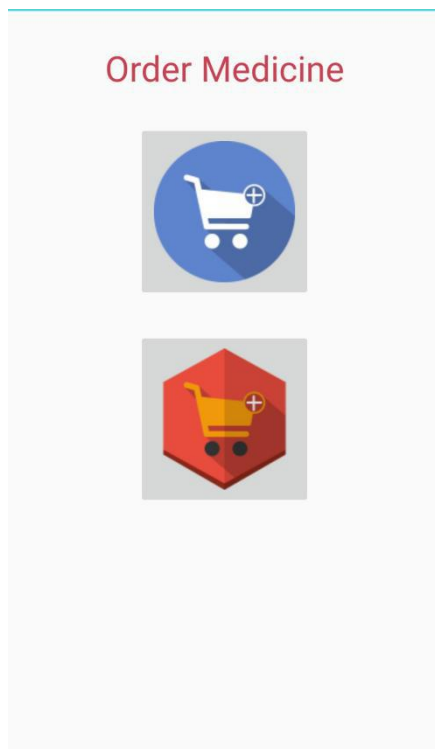


Figure 5.22: Order Medicine

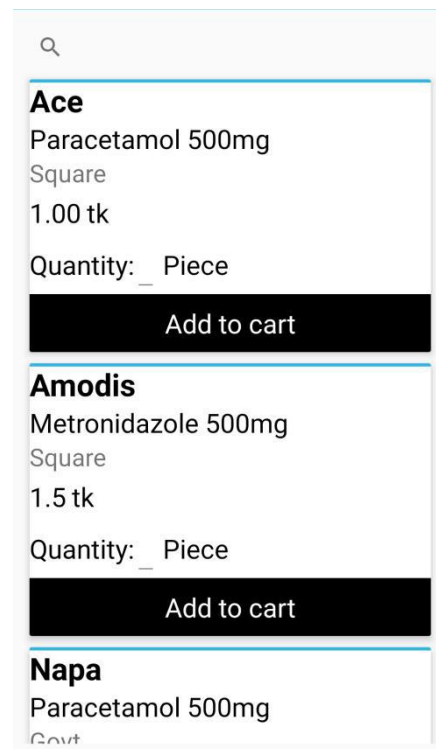


Figure 5.23: Add to cart

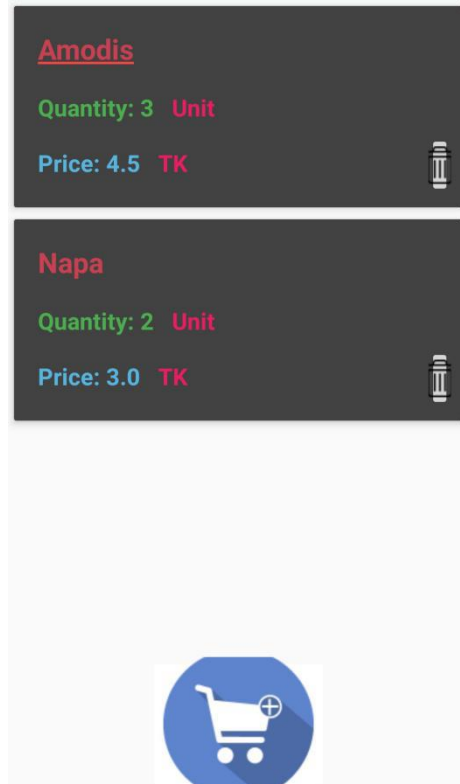


Figure 5.24: Confirm Order

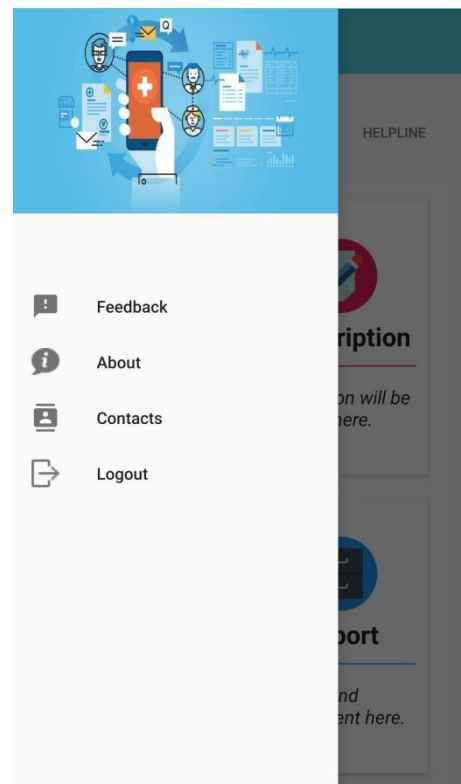


Figure 5.25: Navigation Bar

As shown in Figure 5.25, you can use various facilities like Feedback, Contact, About info right from the navigation bar.

### **5.3 Implementation of Interaction**

We implemented our app for user. Proper interaction makes a system appealing and desired to the user. That's why it's very important to interact with the user as it can fulfill their expectation. By making our app interactive to the user, we tried to make it simple and user-friendly. We implemented our app with responsive UI so that user can have better user-experience. To turn our expectations into reality, we used flat icons, texts and button options.

Our application is implemented successfully with required libraries that can easily interact with the user. The app has a spectacular interaction with the user.

### **5.4 Testing Implementation**

Our aim is to plan a series of test cases which has a high probability of finding errors. To repair the errors, various software techniques are applied. This technique provides systematic guidance for planning a test system.

1. To exercise the software components' internal logic and
2. To exercise the input and output domains of the program to reveal errors in program function, performance and behavior.

Table 5.1: Test case shows the following test case has been done for several time to detect errors.

Serial No.	Test Case ID	Test Case Name	Test Case Description	Step	Expected Result	Actual Result	Test Case Status Pass/Fail
1	Login User	Validate Sign-in	To verify the Login ID on Sign-in page	Enter the Login Email and Password and click Login button	Login successful or Enter correct login details must be shown	Login Successful	Pass
2	Password	Validate Password	To verify the password on login page	Enter password and Email and click Login button	An error message "Enter correct login details" must be displayed	Password is invalid	Fail
3	Add to cart	Validate quantity amount	Making sure the quantity field is not empty	Enter quantity	A message is shown which is the amount of money needed to buy	The message is shown	Pass
4	Add to	Validate	Making	Enter	A	Quantity	Fail



	cart	quantity amount	sure the quantity field is not empty	quantity	message is shown which is the amount of money needed to buy	field is empty	
5	Order medicin -e	Orderin- g total amount of medicin -e	To order the entire cart of medicine that was added before	Click order icon	Order Successfu -l	Order Successf- ul	Pass

## 5.5 Test Result and Reports

Test Reports projects the outcome of the test in an official manner. Report which consists of the evaluated data in an organized and professional way. Report describes the operating condition and presents the outcome with test purpose. By analyzing the test report, we can say if the application is ready to use or not. In table 5.1, we described the Test Case No., Test Case ID, Test Case Description, Test Case Step, Expected result, Actual result and Test Case Status. Using these criteria, we took several number of tests and got the accurate result. The accuracy is 100%. So to say, the app is free from errors and allowable to the users.

## **CHAPTER 6**

### **CONCLUSION AND FUTURE SCOPE**

#### **6.1 Discussion and Conclusion**

Now-a-days, Finding a proper health guide and nearest hospitals in a city has become a huge problem. To maintain this problem, every people should have the information about doctors, hospitals, blood banks etc of an area. Our app is developed to handle that information. So, it will be a great help to the people of that area. In the age of Computer Science, analog system for maintaining information is an ancient process. People can easily find the information and get their service by using their smart-phone. It will also save their precious time.

If the user feels free to use our app and accept our work in a wholehearted way, then the implementation of our app will be successful.

#### **6.2 Future Scope**

There are some features that couldn't be implemented due to various reasons. But we don't stop at right there. We will add these features alongside with new ones that will bring convenience to the people and the government. The main audience of our app are local people. We want to add some self-diagnosing questionnaire feature in our app. Using this feature, people can easily identify their disorders at primary stage and get help from experts and hospitals.

## REFERENCES

- [1] “DIMS”, Available at <<<https://play.google.com/store/apps/details?id=com.twgbd.dims>>>, last accessed: April 29, 2020.
- [2] “Disorder & Diseases Dictionary Offline”, Available at <<<https://play.google.com/store/apps/details?id=com.ufo.disease>>>, last accessed: April 29, 2020.
- [3] “Patient Aid”, Available at <<<https://play.google.com/store/apps/details?id=com.itmedicus.patientaid>>>, last accessed: April 29, 2020.

## **APPENDIX**

### **Appendix A: Project Reflection**

Our journey was started from Summer 2019 to develop this android app. We attempted to build a user-friendly UI for our project. The main point of our app is to make an easy health-care service in Dhaka city. It is very important to keep all health related information in one place altogether. In present, people uses the smartphone a lot in their daily life. Our app provides them with necessary health related services in real life. To implement our app, first we built a model of our app. Then we implemented them step by step. Following hard-work and a lengthy journey, finally we are capable of reaching our target. Our app reduces time and give users a better solution to find their desired health-care for their treatment.

We believe that our app will have influential and positive effects on users.

### **Appendix B: Related Diagrams**

To build our proposed app, at first we made a model of it. Some use-case model and diagrams were used to analyze how to implement it. We created the first diagram as the use-case diagram. We can know about users of our application and their activity in the app from the use-case diagram. In our Healthcare Utility Services app, the user is the person who is seeking proper health-care. We also used BPM (Business Process Model) which reacts as a flow-chart. We described the activity of the user and their interaction method with the system in this section. Our app was developed using Android Studio and Firebase. In this section, back-end and some diagrams from the UI are added. The use-case diagram are shown in Figure A1.

# Healthcare Utility Services

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