

**DESIGN AND DEVELOPMENT OF AN ANDROID BASED APPLICATION  
“EMERGENCY MEDICAL EXPRESS”**

**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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DHAKA, BANGLADESH  
DECEMBER 2019**

## APPROVAL

This Project/internship titled “**Emergency Medical Express**”, submitted by Sium Jahan, ID No: 161-15-7046 and Waheduzzamanan, ID No: 161-15-6832 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 and approved as to its style and contents. The presentation has been held on 05 December, 2019.

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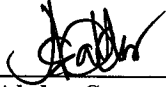


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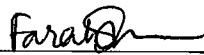
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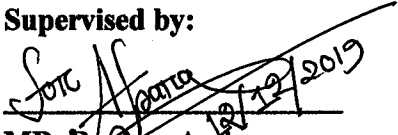
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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **MD. Rayhan Amin, 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.

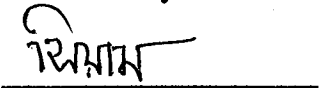
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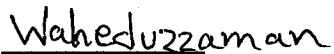
  
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## **ACKNOWLEDGEMENT**

First we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project/internship successfully.

We really grateful and wish our profound our indebtedness to **Md. Rayhan Amin, Lecturer**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of “Emergency Medical Express” to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Dr. Syed Akhter Hossain**, Professor and Head, Department of CSE, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

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

## **ABSTRACT**

The main objective of our project is to make life easier in a critical time or medical emergency time situation. We proposed and developed a solution of getting some emergency medical helping information through an android application. In which we tried to develop an android application with easy and simple UI, ability to show the location of nearest Hospital, Doctors, Pharmacy and ATM booths by using GPS. All emergency ambulance numbers are included and it's possible to call Ambulance easily. Doctors and hospital's Emergency numbers are also included in this application. Find out an interested blood donor will be very easy in a short time through this application. So, the compact solution is the application "**Emergency Medical Express**".

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Bangladesh is a developing advanced nation. So for being an advanced nation, we have to do everything in digitalized system. Our main objective is to provide the most needed emergency help for any medical situation information straightforwardly through an android operating system supported mobile. Any emergency medical situation sufferer can get the information easily by using this application. Not only in emergency situation but also this system will be helpful for our daily regular life. We convert the manual framework with carefully and appropriately.

### 1.2 Motivation

The motivation of our developed project is to provide any primary help with information easily in any medical emergency situation. Nowadays people are getting more and more digitalized. They prefer easy solutions for their every event of their life to make it easier. It is a common phenomenon that people get them into troubles and they need the information like hospital address and name, specialized doctor of that hospital and the specialty, emergency blood donation system, location of nearest ATM booth, pharmacy and ambulance providers contact number for critical situations. Specially when we get ourselves in an unknown place, we face the need of this kind of information. If any sufferer of such situation gets those kinds of help in one platform, sometimes it can be a lifesaving system.

### 1.3 Objectives

- Getting emergency medical information in a single touch.
- Select the hospital by analyzing the doctors list.
- Information of nearest pharmacy.
- Easier time management information for busy city life.
- Can call an ambulance easily.
- Building networks with blood donors.

## 1.4 Expected Outcome

- It is an Android platform based application by which people will be able to get the helpful information in medical emergency situation by opening the application just in one click.
- Through this application, any people or patient can choose the proper hospital for his/her treatment by analyzing any hospitals specialized doctors' information.
- In any critical situations, the sufferer will not need to inquire anyone for ambulance providers' contact number.
- In this application, user will find nearest pharmacy's location.
- The main goal is that smart compact solutions for any emergency and medical information.

The mentioned project is a smart solution for finding out the easiest way to get help with information in any medical emergency situation. In this Android application, user will not need to go through any login or registration process because it is designed as an emergency medical service. It also helps to save time in getting medical information.

## 1.5 Report Layout

To finish this report, we maintain the design. Design is the procedure of include anything in a short structure or a table to explain the whole procedure in a brief time. We use design since we need to demonstrate the majority of our work in a short structure with the objective that viewer can embrace the report properly.

**Chapter 1:** The description of the introduction, motivation, objective, expected outcome of this project is shown in this chapter.

**Chapter 2:** The description of this project background and the project overview. This chapter gives the information about related work, possibility of the problem and the challenges of the proposed project are talked in this chapter.

**Chapter 3:** This chapter is to show the requirement and specification of this project.

**Chapter 4:** The description of the design specification is shown in this chapter. It also shows the description of the front-end design and back-end design, UI design and functionality.

**Chapter 5:** The system about Implementation and Testing of this project is shown in this chapter.

**Chapter 6:** This chapter contains the description of conclusion and future scope for further development of this project.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

Nowadays people are getting more and more attracted to smart devices. Smart devices and daily innovative smart system are making life easier than before. Nowadays people are doing many different types of work on their android supported phone by using many different applications. There are many individual applications for many different emergency services. But in our country there is no application to provide all the medical emergency services in one application. In this chapter we are trying to give the overall concept of our android application “Emergency Medical Express”.

#### **2.2 Related Works**

In Google Play Store[1], there are some quite similar kind applications. Portions of this are Smart Medical Service, URAL EMS, ICE, Pharmacy BD, Simply Blood, Daktarbhai, IMS Medical[1] and so many. These android applications perform individual services each from their own field. But the “Emergency Medical Express” provides many services from above in one platform. The use of smartphone is increasing day by day to make our daily life easier.

#### **2.3 Comparative Studies**

The extent of our venture is predominantly for the people who are new in city or in an unknown place and facing any troubles of medical emergency. The person may need to know the nearest hospital location or ATM booth or nearest pharmacy location immediately. A patient with emergency situation passively cannot select the perfect optimal hospital for his/her unexpected emergency in an unfamiliar area. The motive of this project is to study what uncertainties can be applied as imputation by Medical Express to adjudicate a probable solution and to create a reckon model to help to lead the emergency patients to the most appropriate hospital.

## **2.4 Challenges**

There will be challenges in all kind of work always. Without facing any challenge, no work can be successfully complete. The proposed application should have to maintain the following challenges to perform a better service:

- Maintain a simplicity and user friendly UI.
- Maintain accessibility.
- Maintain compatible platform.
- Maintain GPRS connection every time to use.
- Proper GPS signal.
- Provide original trustworthy information.

## **CHAPTER 3**

### **REQUIREMENT SPECIFICATION**

#### **3.1 Requirement Collection and Analysis**

This android application system is basically designed for android OS phone user. “Emergency Medical Express” is a well-planned Android OS based application that gives the information and location of hospital, doctor, pharmacy, ATM booth and ambulance. As an Android application, our proposed undertaking system needs some product resource, asset and backing to develop and run it properly. In this part, we will talk about the necessity particulars for our development.

#### **3.2 General System Requirement of “Emergency Medical Express”**

A general list of software component is given below to get an idea of which component we used to developed our proposed project-

Software:

- Windows Operating System(windows 10):

The operating system Windows 10[2] is an evolvement of Personal Computer working frameworks developed by Microsoft as a component of its Windows NT group of working frameworks. It is the advancement of Windows 8.1 version and was vented to assembling on July 15, 2015 and comprehensively launched for retail deal on July 29, 2015. Windows 10 gets new expands on a continuous proposition which are created as accessible at no extra expense to clients, notwithstanding extra test works of Windows 10 which are accessible to Windows Insiders. Gadgets in big business field situations can get these updates at a slow motion or utilize long haul bolster achievements that just get the basic featured updates for example we can say security patches over their ten-year long life expectancy of expanded support system.

- Android Studio:

Android Studio[3] is the official incorporated advancement condition (IDE) for Google's Android working framework which is based on JetBrains'[4] IntelliJ IDEA programming and planned explicitly for Android development. It is accessible for downloading on Windows, macOS and Linux based working systems. It is an alternative for the Eclipse Android

Development Tools (ADT) as the essential IDE for local Android application development and improvement. For android application generally we use the firebase[5] database.

- XAMPP Control Panel:

XAMPP is familiar as a free and open-source cross-stage web server arrangement stack bundle which is created by Apache Friends, comprising for the most part of the Apache HTTP Server, MariaDB database, and translators for contents written in the programming languages like PHP and Perl. Since most genuine web server organizations utilize indistinguishable segments from XAMPP[6], it usually makes the updating and changing from a nearby test server to a live server conceivable.

- Browser (Firefox, Chrome)

An internet browser is the application media for obtaining and analyzing any data or information from the WWW (World Wide Web). Every isolated website, webpage, pictures and video and other information is individualized by a particular URL (Uniform Resource Locator). Without the help of a browser no one can access the Wide World Web or any search engines to gain any information.

### **Programming Language and Framework:**

- Java

Java[7] is a high level and useful programming language which is class-based and object-oriented (despite the fact that not an unsophisticated elements of article arranged language, as it contains unpolished types) and contemplated to have a couple of execution conditions as could be expected under the circumstances. It is expected to give application engineers a chance to compose once, run anyplace (WORA), implying that assembled Java code can keep running on all stages that help Java without the requirement for recompilation. Java applications are normally aggregated to byte code that can keep running on any Java virtual machine (JVM) paying little heed to the fundamental PC design. The linguistic structure of Java is like C and C++, yet it has less low-level offices than both of them. Starting at 2018, Java was one of the most prevalent programming dialects being used by GitHub, especially for customer server web applications, with a revealed 9 million engineers.

- MySQL

MySQL is an open-source social database the executive's framework (RDBMS)[8]. The name of MySQL is a blend of "My", the name of prime supporter Michael Widenius' daughter and "SQL", the shortened form for Structured Query Language.



MySQL is free and open-source programming under the regulations of the GNU General Public License and is additionally accessible under an assortment of restrictive licenses. MySQL was claimed and supported by the Swedish organization MySQL AB, which was purchased by Sun Microsystems (presently Oracle Corporation). In 2010, when Oracle gained Sun, Widenius forked the open-source MySQL task to make MariaDB.

- Google API

Google APIs is actually a set of application programming interfaces (APIs) which is invented and developed by Google which allow us to communicate with Google Services and their integration to all other services. These include the examples like Searching, Gmail, Translate or Google Maps. Any third-party application developer can easily use these APIs service by following some protocols to take advantage of or extend the functionality and accessibility of the provided existing services. The APIs give the opportunity of functionality like analytics, machine learning as a service (the Prediction API) or access to user data (when users' permission to read the data is provided). Another most important example can be described as an embedded Google map on an application or a website, which can be achieved as using the Static maps API, Places API or Google Earth API[9].

It also ensures following requirements that is required:

- Data accuracy
- Efficiency of working
- Real time location data show
- User friendly
- Effectiveness

### **3.3 Design Requirements**

- Hospital list
- Hospital location
- Hospitals' basic information
- Enlisted doctors.
- Pharmacy and ATM booths' location.
- Request for blood donation.
- Ambulance providers list.

### 3.4 Use Case and DFD Modeling and Description

Use case model:

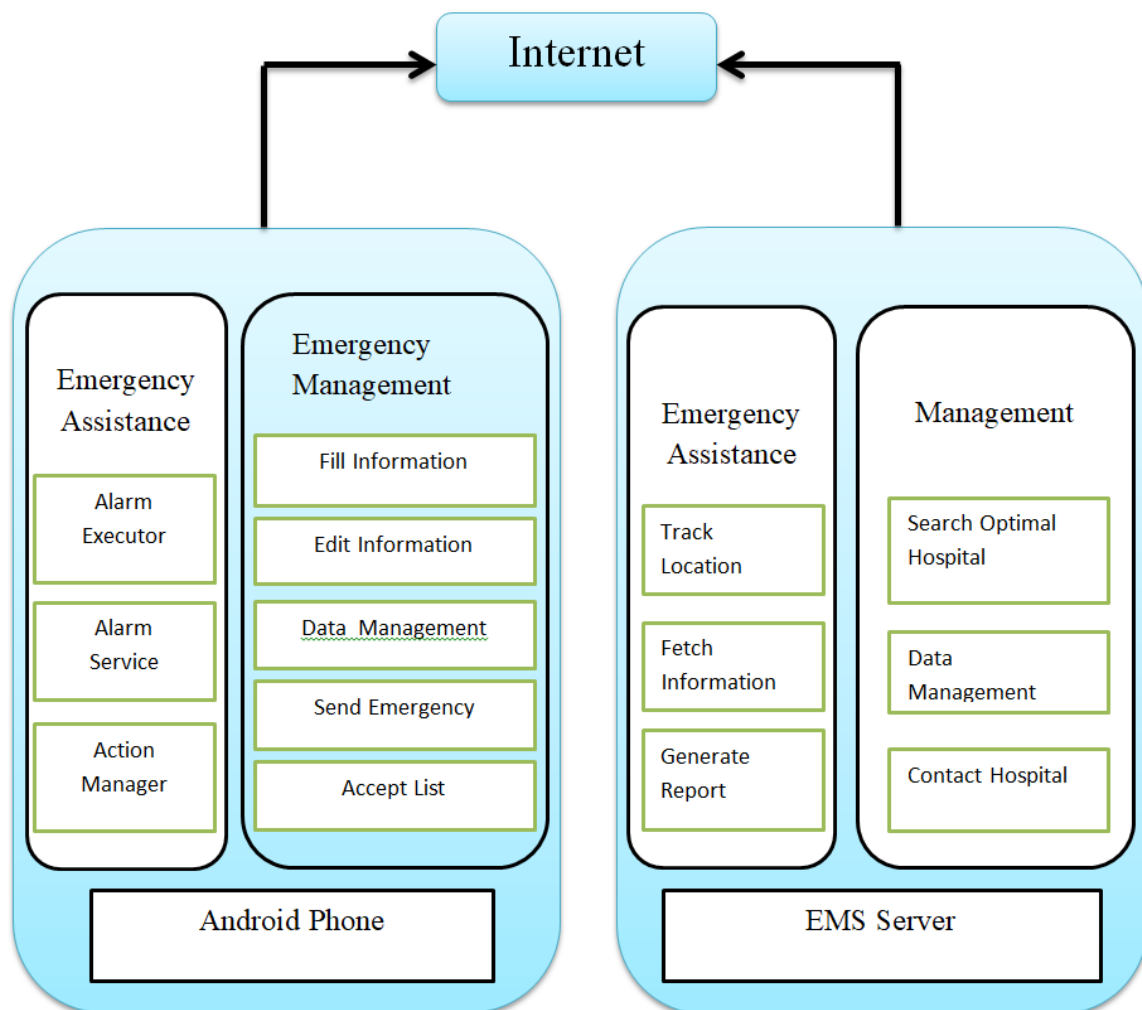


Figure 3.4.1: Use Case Model

In this figure there is no need to login or registration process. Every features of the application is performed with GPRS connection and accessing GPS of the users smart device. Connecting with EMS Server location is tracked and fetches information according to the command and show optimal result.

DFD diagram:

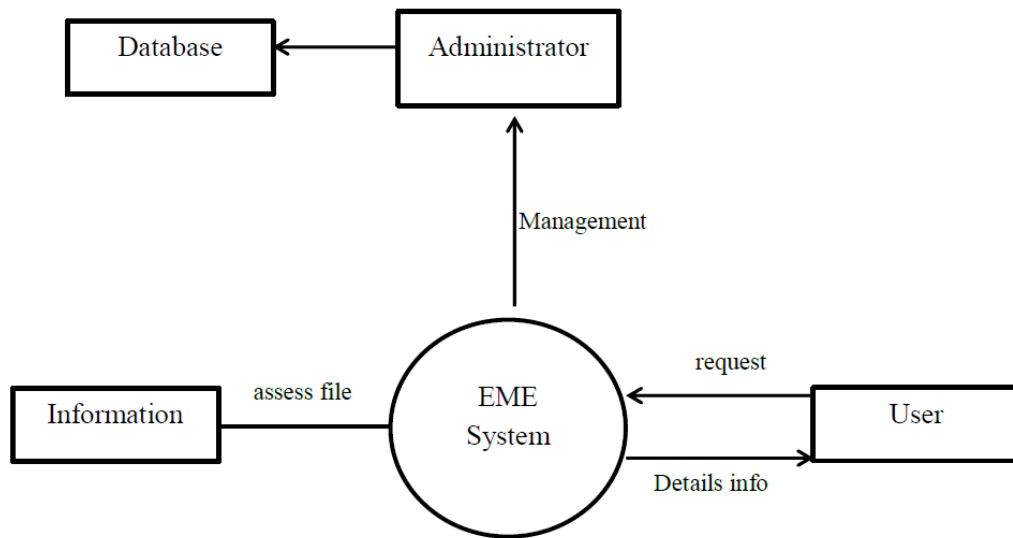


Figure 3.4.2: Data Flow Diagram

Administrator can only manage the database of Emergency Medical Express and can make all the change or update. User can request for any information in the system. Then the system assesses the file to the requested information and fetches the details information to the user.

# CHAPTER 4

## DESIGN SPECIFICATION

### 4.1 Front-end or UI Design

User Interface is the front-end design of an application where the user can interact and take service from the server of the application. The front-end design makes an application more attractive to the users. The design should be much attractive so that the users should not find difficult or annoyed while using the application.

#### 4.1.1 Starting Page

Here is the starting page of the application. This design is very simple and user friendly.

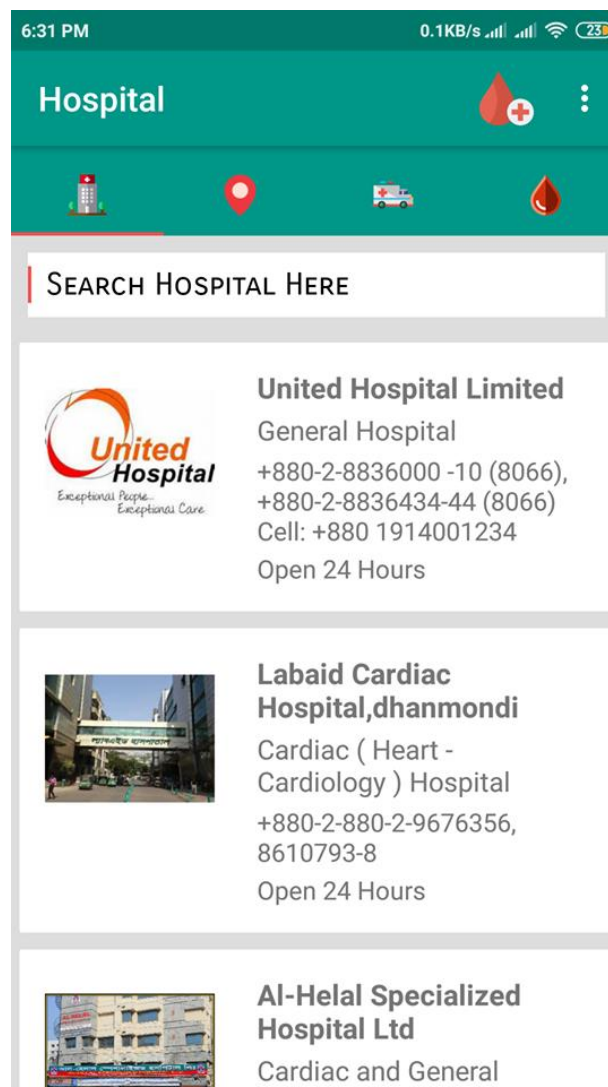


Figure 4.1.1: Opening Page of Application.

#### 4.1.2 Location of hospital and Doctors info

From the list of the hospital, clicking any hospital, user can find the information embedded in that hospital.

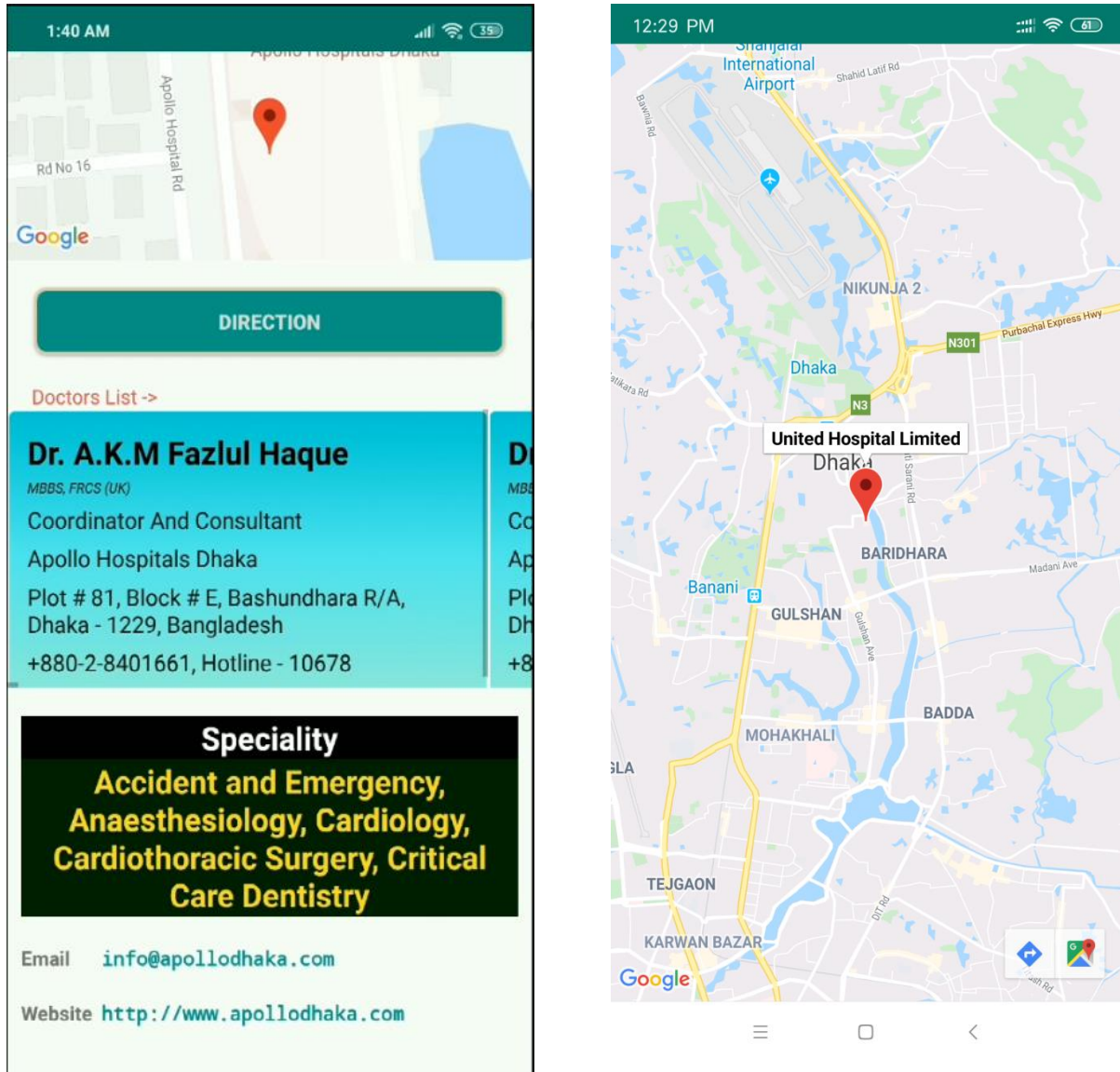


Figure 4.1.2: hospital location and doctor info

### 4.1.3 Searching any hospital

After opening the application, user can search any specific hospital according to his/her choice.

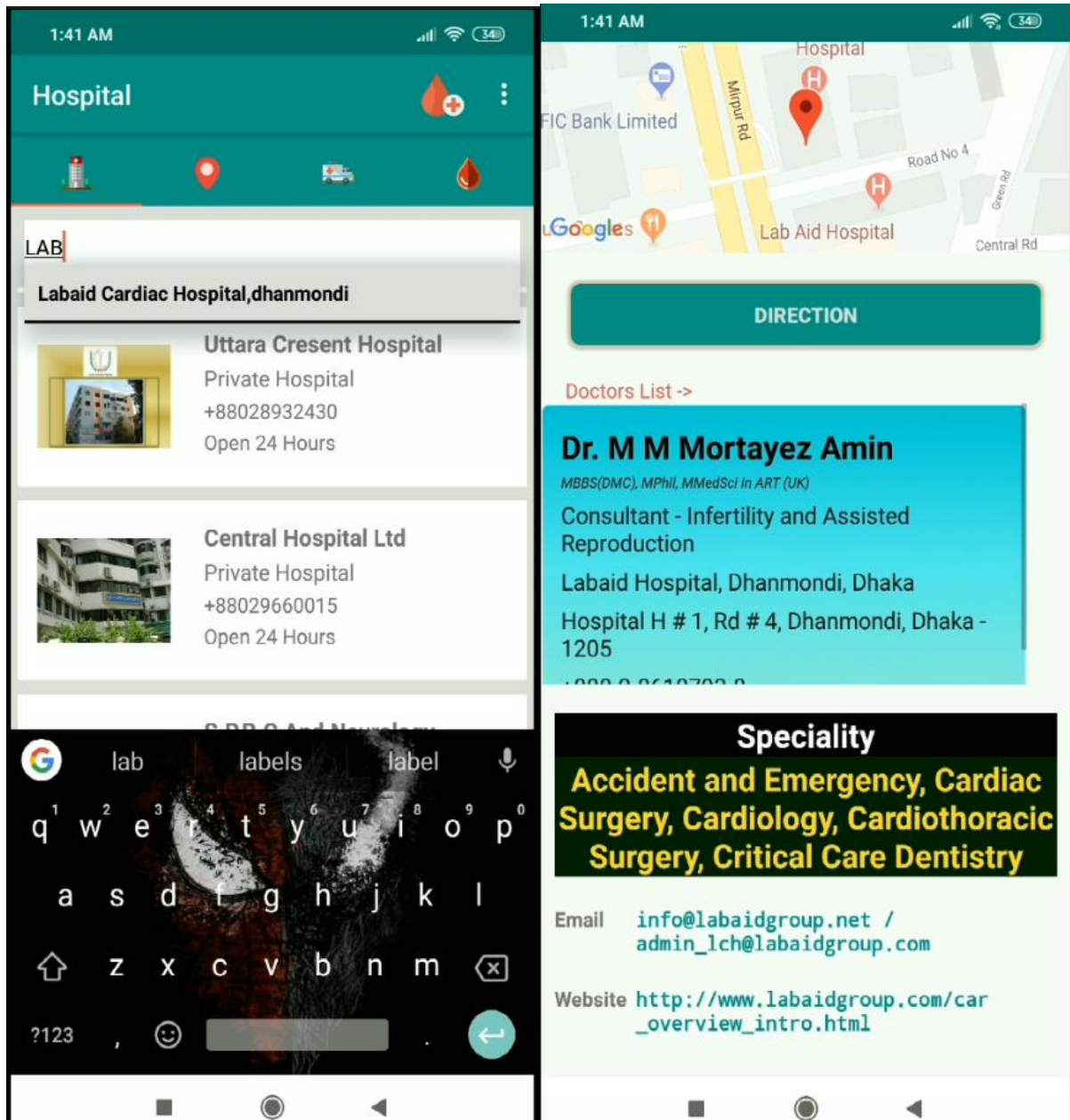


Figure 4.1.3: Search option and search result of hospital.

#### 4.1.4 Nearby hospital location and list

The application will show the nearby hospitals' location by using the smartphones' GPS. By clicking the hospital button user can find the location of nearby hospital.

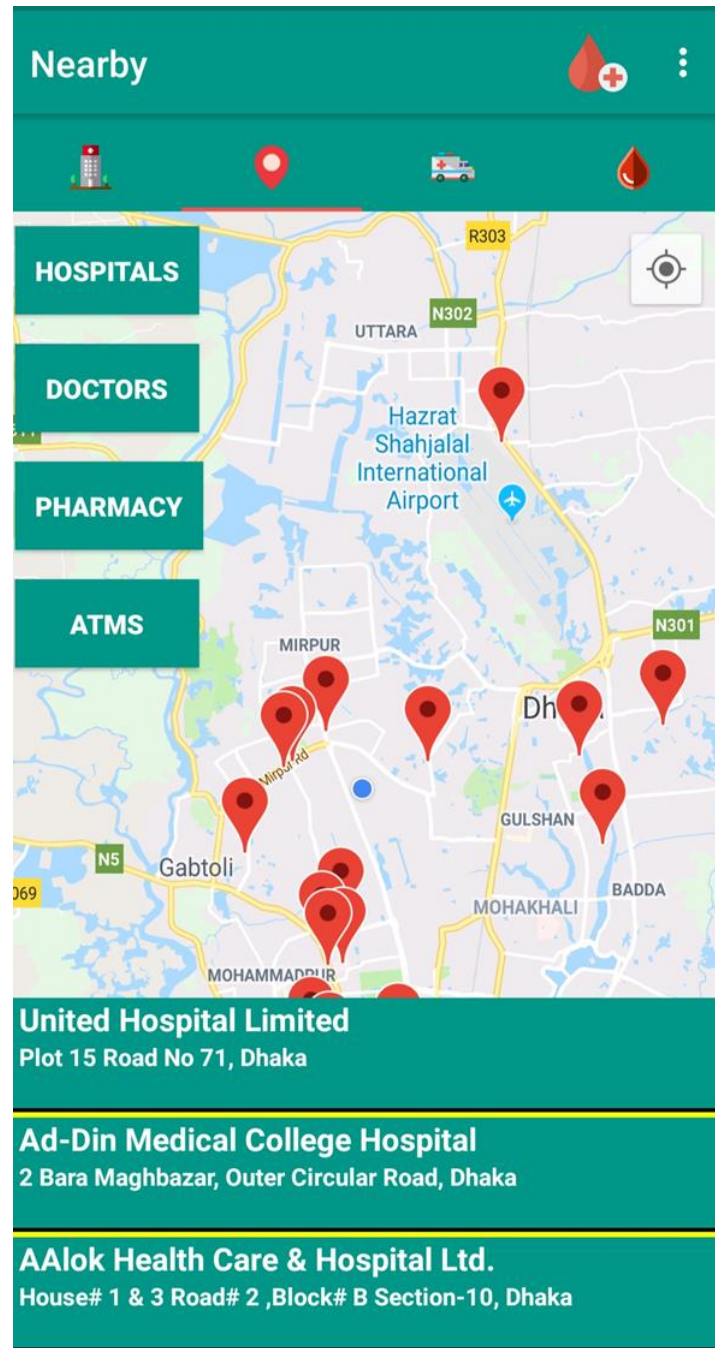


Figure 4.1.4: Nearby hospital location.

#### 4.1.5 Nearby Pharmacy

In any unfamiliar place, pharmacy and ATM booths location is a major fact. By clicking the pharmacy button user can find the location of nearby pharmacy.

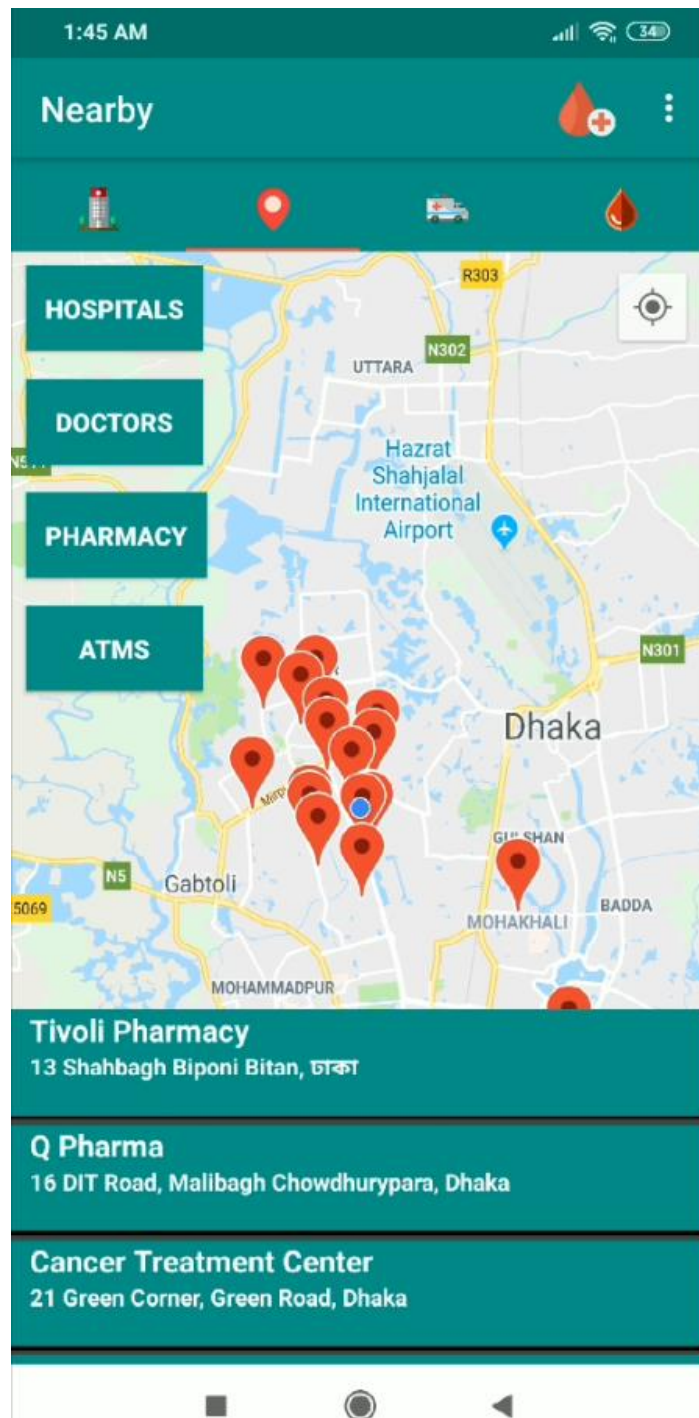


Figure 4.1.5: Nearby Pharmacy.



#### 4.1.6 Nearby Doctors

User can search the nearby doctors' chamber by clicking on DOCTORS button. Then the app will provide the location.

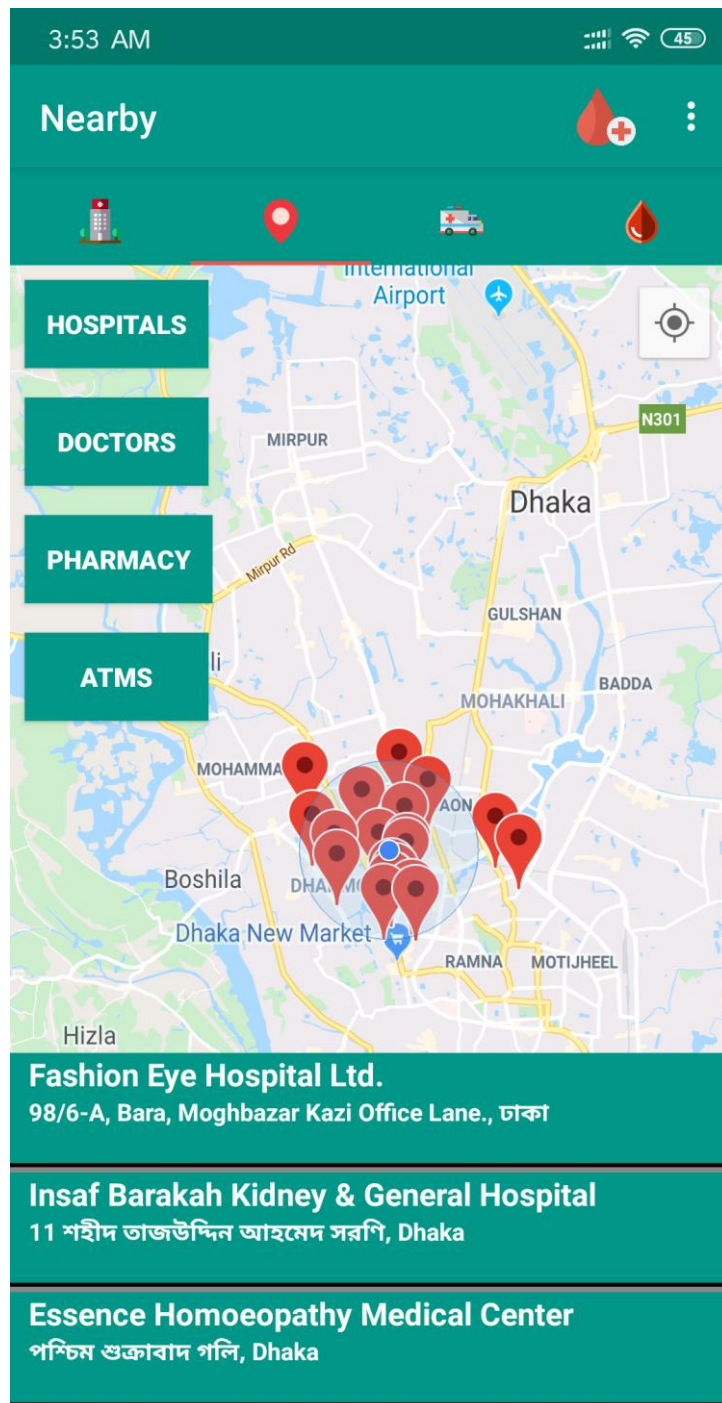


Figure 4.1.6: Nearby Doctors.

#### 4.1.7 Nearest ATM booth

In sometimes it becomes difficult to know the exact location of a certain ATM booth. But one can easily find out the location of the nearest booth by using this application.

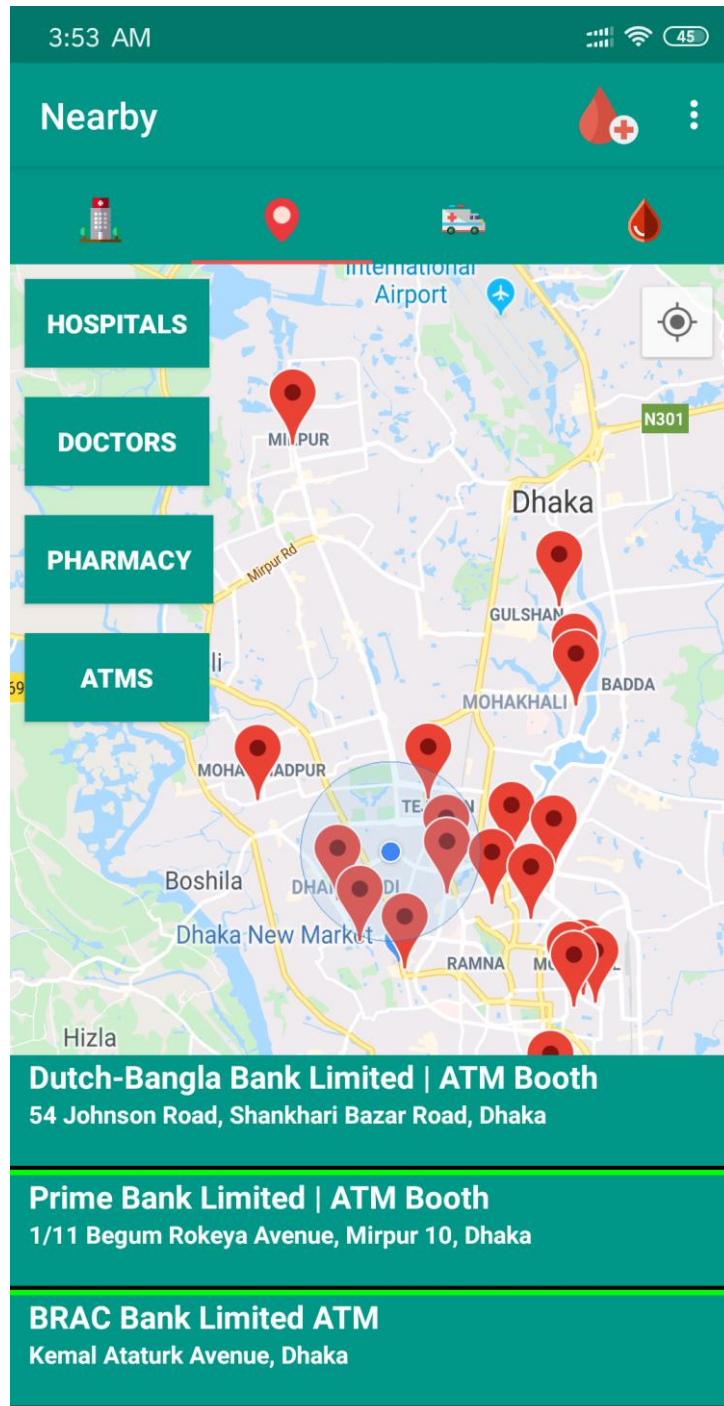


Figure 4.1.7: Nearby ATM booth.

### 4.1.8 Blood Donation

In any critical situation, one may need blood for treatment. Sometimes it becomes difficult to manage blood. So, this application user can request for blood which will save his time.

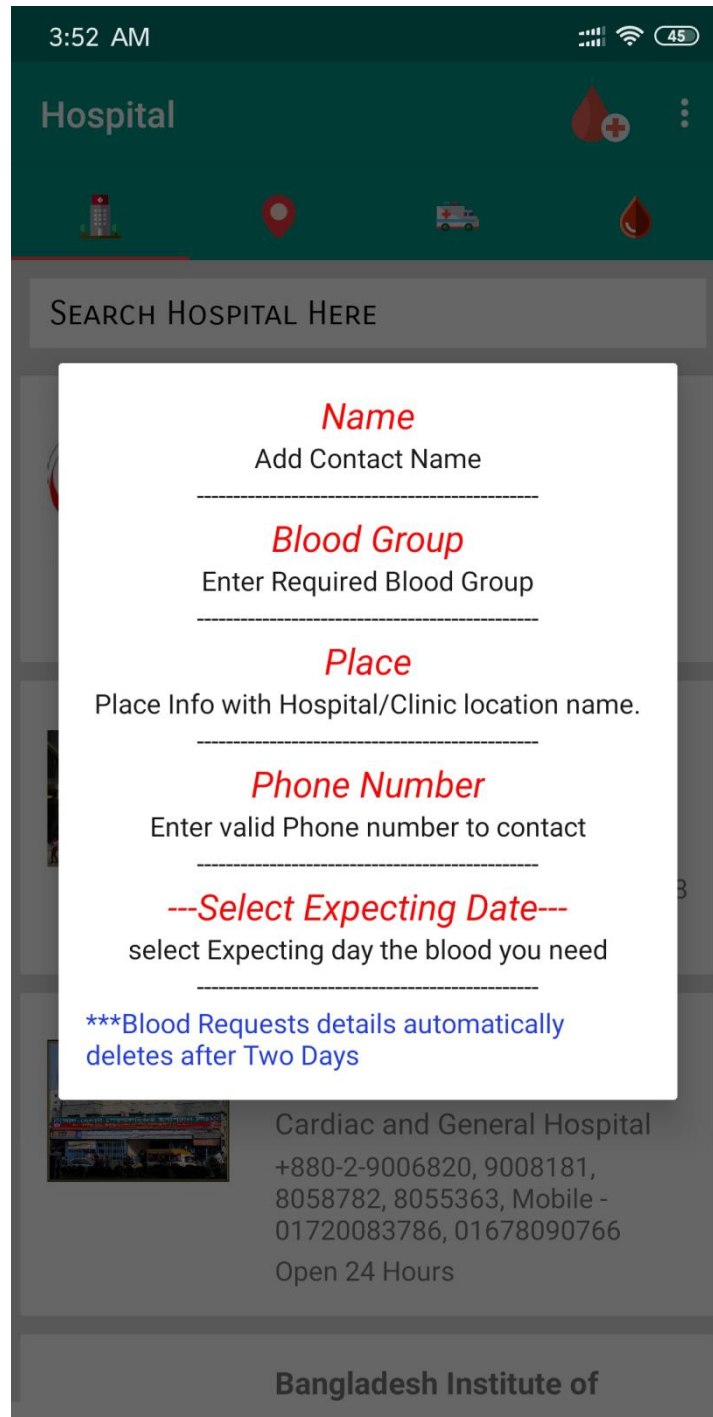


Figure 4.1.8: Blood Donation instruction process.

### 4.1.9 Blood Donation Request

According to the process user can request for blood by filling the request form and the request will be shown in every app on blood section.

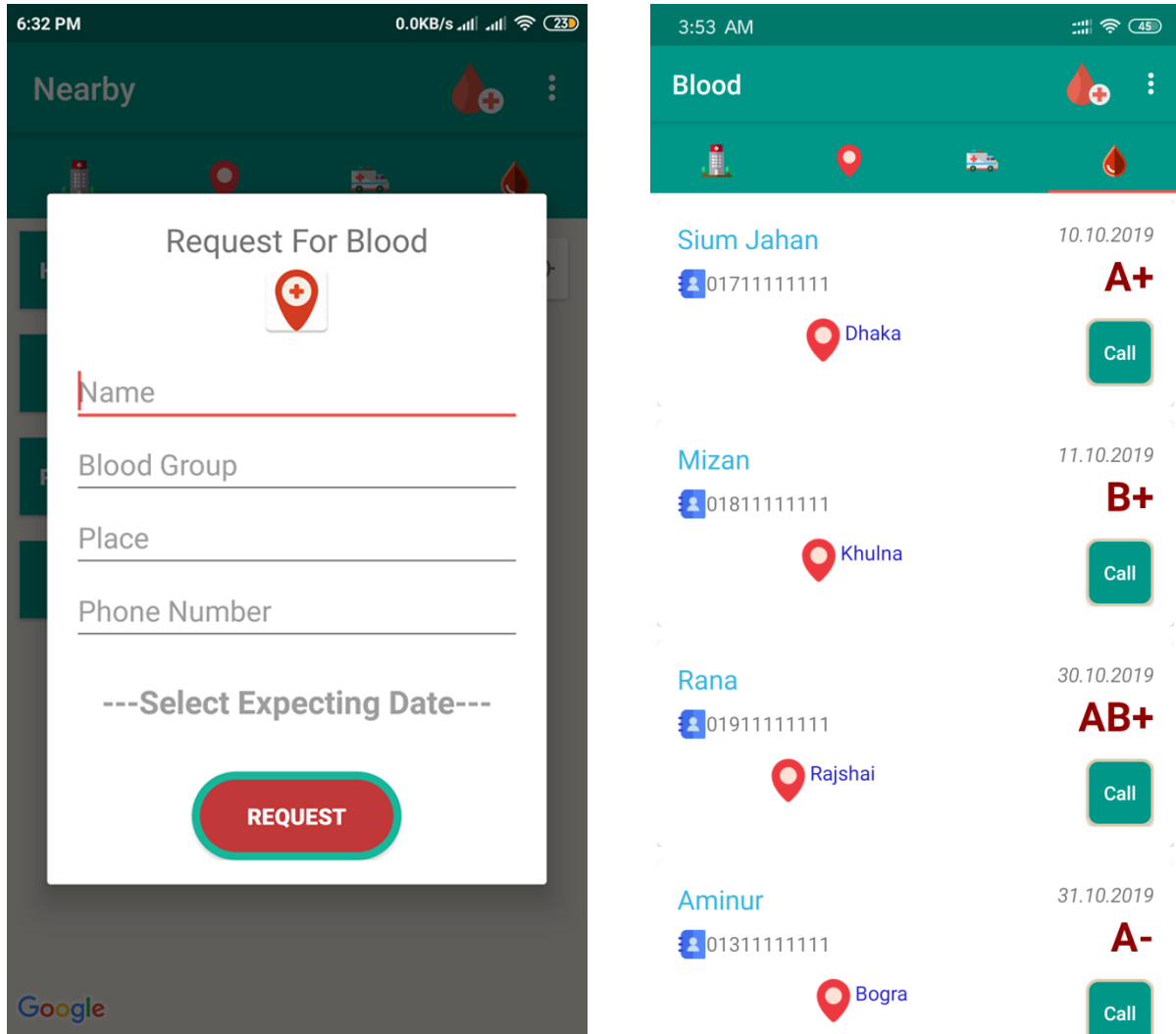


Figure 4.1.9: Blood Donation request.

#### 4.1.10 Ambulance Information

The user can be able to get the information of ambulance providers' contact by clicking the ambulance logo button.

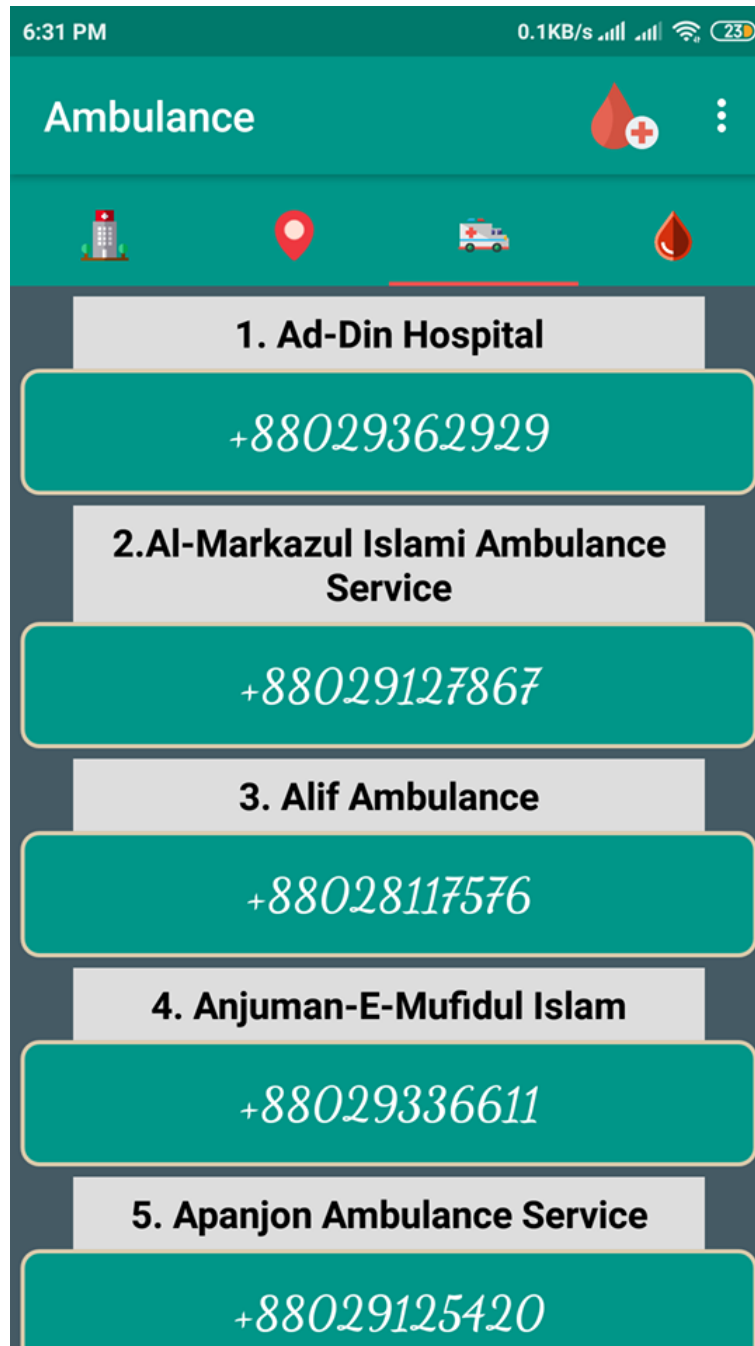


Figure 4.1.10: Ambulance Information.

#### 4.1.11 Calling an ambulance

In this application, after viewing the contact list, user can easily call any specific number using his phones' calling system by connecting with this application.

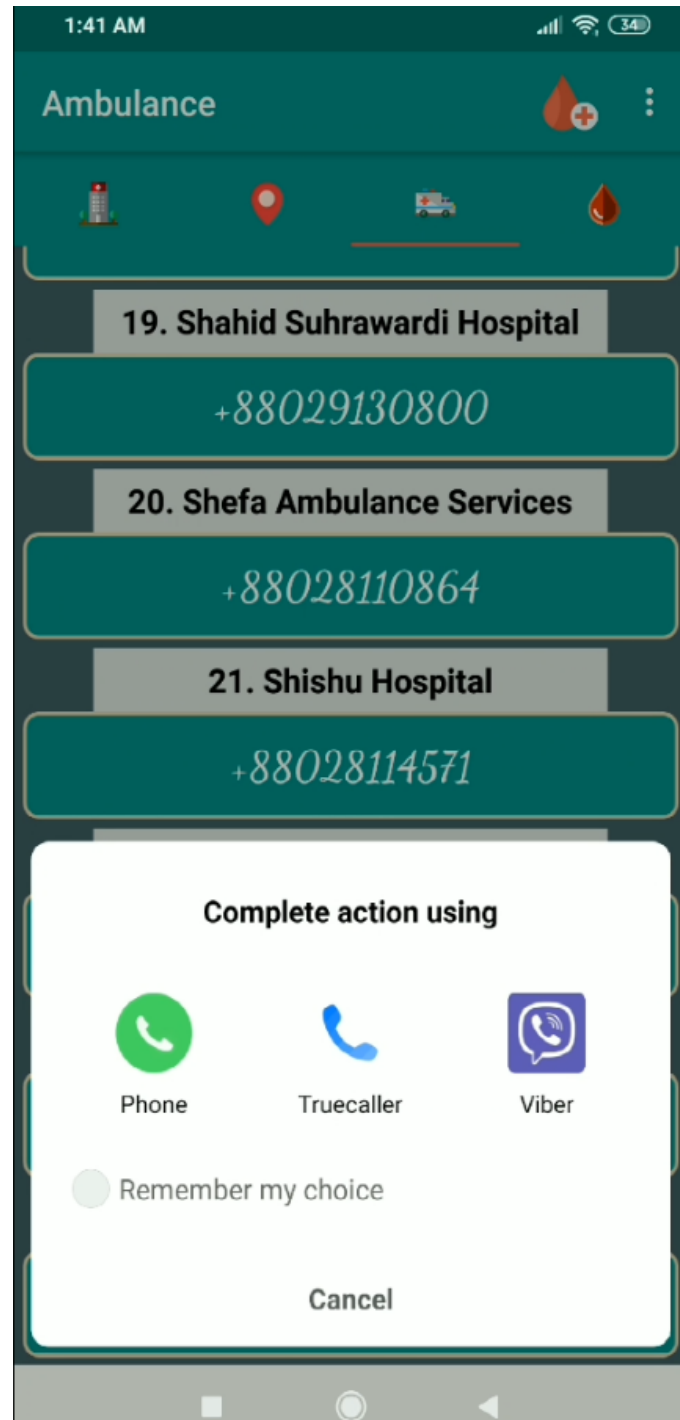
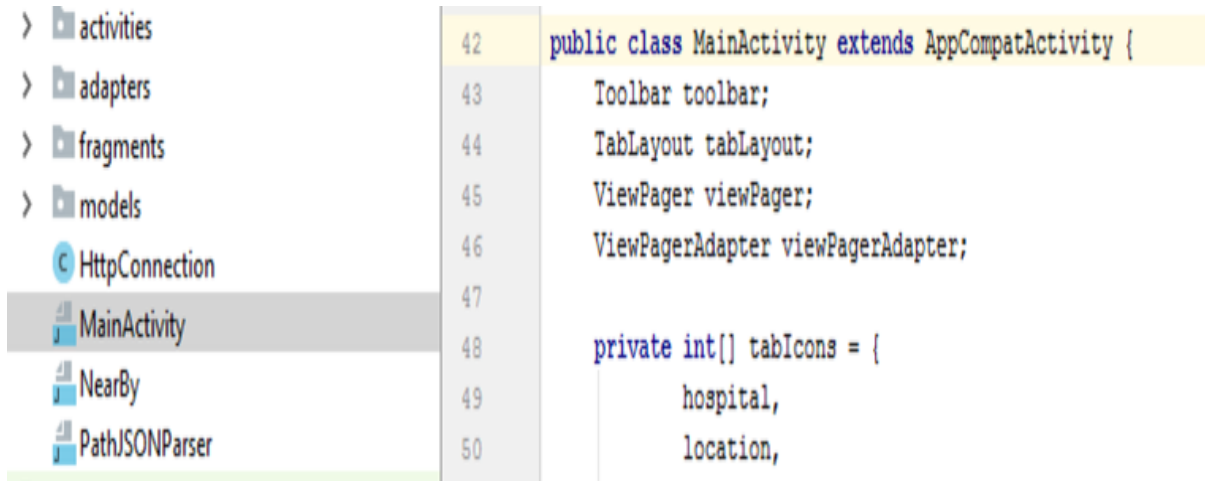


Figure 4.1.11: Calling system of an ambulance.

## 4.2 Back-end Design

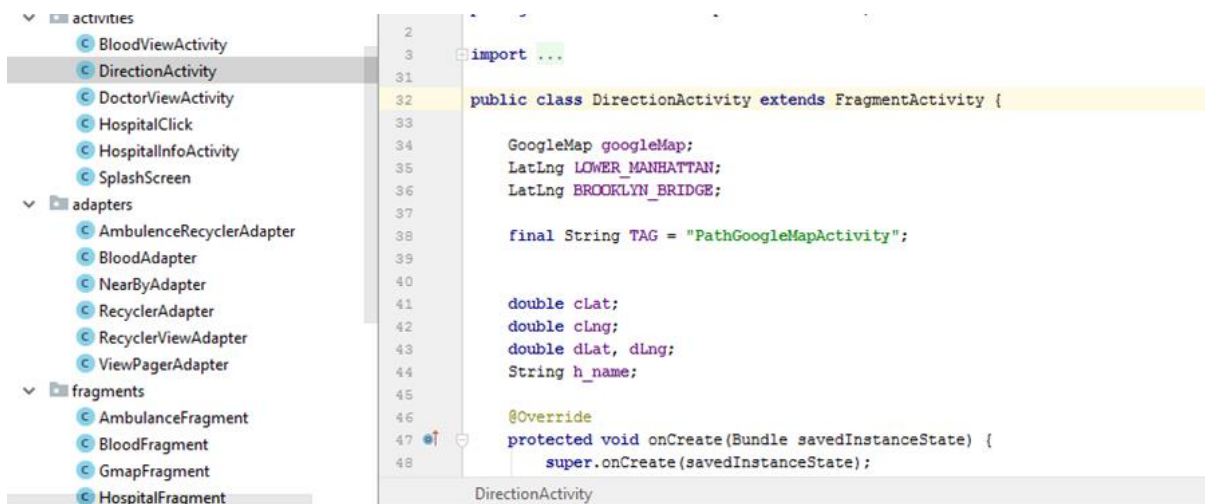
Emergency Medical Express is developed using Android Studio. The firebase database and cloud SQL API are also used to perform the activity of the application properly.



The screenshot shows the Android Studio interface. On the left, the 'Project' view displays a package structure with folders for 'activities', 'adapters', 'fragments', and 'models'. Below these are several Java files: 'HttpConnection', 'MainActivity' (highlighted), 'NearBy', and 'PathJSONParser'. On the right, the 'MainActivity.java' file is open, showing the following code:

```
42 public class MainActivity extends AppCompatActivity {
43     Toolbar toolbar;
44     TabLayout tabLayout;
45     ViewPager viewPager;
46     ViewPagerAdapter viewPagerAdapter;
47
48     private int[] tabIcons = {
49         hospital,
50         location,
```

Figure 4.2.1: Activity list of the app.



The screenshot shows the Android Studio interface. On the left, the 'Project' view displays a package structure with folders for 'activities', 'adapters', and 'fragments'. Under 'activities', several files are listed: 'BloodViewActivity', 'DirectionActivity' (highlighted), 'DoctorViewActivity', 'HospitalClick', 'HospitalInfoActivity', and 'SplashScreen'. Under 'adapters', there are 'AmbulanceRecyclerAdapter', 'BloodAdapter', 'NearByAdapter', 'RecyclerAdapter', 'RecyclerViewAdapter', and 'ViewPagerAdapter'. Under 'fragments', there are 'AmbulanceFragment', 'BloodFragment', 'GmapFragment', and 'HospitalFragment'. On the right, the 'DirectionActivity.java' file is open, showing the following code:

```
2
3
31 import ...
32 public class DirectionActivity extends FragmentActivity {
33
34     GoogleMap googleMap;
35     LatLng LOWER_MANHATTAN;
36     LatLng BROOKLYN_BRIDGE;
37
38     final String TAG = "PathGoogleMapActivity";
39
40
41     double cLat;
42     double cLng;
43     double dLat, dLng;
44     String h_name;
45
46     @Override
47     protected void onCreate(Bundle savedInstanceState) {
48         super.onCreate(savedInstanceState);
```

Figure 4.2.2: Direction activity.

## **CHAPTER 5**

### **IMPLEMENTATION AND TESTING**

#### **5.1 Interaction Design and UX**

For the development of our Android project “Emergency Medical Express”, we used Android Studio software and some resources from the internet. Without those elements we may not be able to develop or run our application like as we expect to run for completing our desired goal. In the implementation process, the applications we used, encourages us to create the application more responsive and better visual scenario to use easily in any condition. GPS[10] tracking and location showing in map has to be arranged perfectly in the display of the users smartphone or device.

#### **5.2 Implementation of Requirements**

- The User Interface design had to be integrated into the Android Studio software which is mainly a java framework.
- DB: The database should be in MySQL.
- Google API must be connected properly.
- Valid information is a must require thing.

#### **5.3 Implementation of Interaction**

So as to make our android application framework intelligent we made the UI responsive and use catches, symbols, content, location map features and some more. The framework structured UI of our application is very easy to use. Client will be able to use the application in any medical emergency situation without any trouble.



## 5.4 Testing Implementation

Testing implementation is the process by which the tester or developer can able to test or check the implementation of a system. By this process tester or developer of the system architect can able to see and analyze cases and specification whether there is any implemented complexity or have limitations.

Table1: Test case implementation.

Test case	Test input	Expected outcome	Obtained outcome	Passed/Failed	Testing Period
Search hospital	Input valid hospital name	Successfully searched	Successfully searched	Passed	23-10-2019
Location	Input valid hospital name	Exact location on map	Exact location on map	Passed	23-10-2019
GPS	Turn on phones GPS	Show the location of user	Show the location of user	Passed	24-10-2019
Blood Donation	Add valid information	Successfully added	Successfully added	Passed	24-10-2019
Call ambulance	Select valid information	Successfully called	Successfully called	Passed	23-10-2019

## **CHAPTER 6**

### **CONCLUSION AND FUTURE SCOPE**

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

Ultimately the process of our development has been ended. This project was developed based on the concept to help with information anyone in any medical emergency situation. The application “Emergency Medical Express” will assist the user with information in one click. This application will spare kill-time and reduce troubles. This is specially made for the people who are new in any place and may need emergency medical related information. According to our present scenario, Medical Express decide most suitable hospital based on distance parameter whereas it also consider the other issues like seriousness condition of patient or situation, emergency resources, hospital category etc. This developed application is capable to guide an emergency patient to nearest and appropriate hospital and also inform the hospital about the patient’s emergency by providing emergency information. This application is designed only to act like a lifesaving curtail information provider and capable of providing location information very correctly.

#### **6.2 Future work and Further Development:**

In the meantime of completing our project, we also have some thought to add more facilities in our Android application. Our developed system has a lot of sequel scope to develop and update it as more users friendly. Eventually, we will try to develop iOS based application for all iPhone users. Here this application is working for only in android smartphone.

- The features of this system will be upgraded eventually for a better experience.
- Doctors information will be added as more elaborately in this application.
- The upcoming features will be added based on user feedback.
- (AI) Artificial Intelligence[11] can be developed to make the system fast and more durable.

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## **APPENDIX**

### **Appendices - A**

**Projection Reflection:** From the Spring-2019 semester we started our journey for make the project “Emergency Medical Express”. We developed this project for providing some information easily in medical related emergency situations.

### **Appendices - B**

#### **Abbreviations**

XML : Extensible Markup Language

UI : User Interface.

API : Application Programming Interface.

SDK : Software Development Kit.

iOS : iPhone Operating System.

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