DESIGN AND DEVELOPMENT OF AN ANDROID APPLICATION FOR MEDICAL SERVICE

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APPROVAL

This Project titled "**DESIGN AND DEVELOPMENT OF AN ANDROID APPLICATION FOR MEDICAL SERVICE**", submitted by **Md. Showkat Osman Gony Easin**, **Shartaj Islam Niloy,** and **Saiful Islam** 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 04-01-2022.

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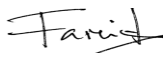

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Mrs. Afsara Tasneem Misha, 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 the award of any degree or diploma.

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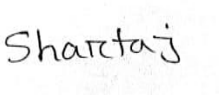

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ABSTRACT

We had an intention to make an online-based health care application and our final year project gave us the opportunity to do it. By using this application users will get the information of various medicines, ambulances, and diagnostics. Besides this, a number of doctors' information will also be added here. Introducing people to online-based health care is the main purpose behind making this App. It will make users' life more spontaneous as it will be facile for them to find the information. People don't need to be anxious as they are getting four kinds of information from a single app. Our application will be very users friendly so users can easily operate the apps. Ambulance information is a feature of our apps where users can collect the information of ambulances in time of emergency.

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CHAPTER 1

INTRODUCTION

1.1 Project Overview

Health is the greatest wealth of our life. People follow various kinds of roles and regulations to keep their health fit. Nowadays our country is developing in ICT Day by day. It is a matter of anxiety that there are few online-based resources from where a person can get those services. We have taken initiatives to make an online platform where people can get various information in any time and emergency moment. Every user will have their own profile from where they can know the information of doctors, ambulance, medicines, and diagnostics. It is the first-ever platform in Bangladesh where users can get all those information together.

1.2 Motivation

Every year many people of our country especially the people of rural areas are dying as a result of not getting any services in time of emergency. In order to reduce those rates of death, we are building health care apps that will include four kinds of information specially the ambulance information is most important for this situation.

1.3 Objective

- Introducing people with a digital healthcare application.
- Sorting four types of medical information in a single platform.
- Making people's lives easier.
- integrate strongly with new technology

1.4 Expected Outcome

- The expected outcome of our project are given below:
- Authentic information will be placed

- User-friendly application
- Can find the required information easily

1.5 Report Layout

Our project report is organized as follows

- Chapter one is included introduction, motivation, objectives, expected outcome, report layout
- Chapter two is included an introduction, related works, comparative studies, scope of the problems and challenges
- Chapter three is included business process modeling, requirement collection and analyses, use case modeling and description, logical data model, and design requirements
- Chapter four is included front end design, back-end design, interaction design, and UX, implementation requirements
- Chapter five is included Implementation of Database, Testing implementation, and Test result and report
- Chapter six is included impact on society, impact on the environment, and Ethical satiability
- Chapter seven is included discussion and conclusion and Further development

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CHAPTER 2
BACKGROUND

2.1 Introduction

Our apps are useful for connecting with people in order to ensure the betterment of their health. By using this system users can know various kinds of information about drugs like price, uses, after effects, and company. Moreover, the information of various kinds of diagnostics will also be included as many people became confused about their medical experiment given by the doctor. It will make our country more digital and will have a positive effect on our economy.

2.2 RELATED WORKS

There will be a personal profile for every user where their various information will be added. Besides our project already there are some apps in our country. We are trying to include some innovative ideas in our works. Four kinds of sections will be designed and each section will be sorted with related data. Every user has the authority to access all kinds of information for free. There is already some application for SebaGhar, Maya MD, Doctor serial bd, Doc Time, Patient aid, etc. Those apps have their own features and are very popular all over Bangladesh. We are trying to build up an information-based application from where users can able to find various information.

2.3 COMPARATIVE STUDIES

Our Medicare apps are different from other works. The information of four departments will be found here. Every section is full of desired information and specifications. In other words, users will not find that information together though we are providing those data. There is a section named department where various medical departments are added. If a user clicks the desired department, then he will be able to find the doctors of this department. This is the new feature of our system.

2.4 SCOPE OF THE PROBLEM

This is a system where user can collect their required information of four sectors that are important for their treatment. Users will not face any difficulties to find that information as the data are sorted in order.

- Our system requires a user to register in the system
- Registration provides the system to identify the user and other relevant information
- All-time internet is required
- Government permission need to add some data

2.5 CHALLENGES

As there is no work without any challenges, we have also faced many challenges during the project work. At first, we were initiated to build up a medical service application. When we were started with our motive, we became very confused that from where we should start. Among them collecting data is the most difficult challenge.

Collecting data was one of the biggest challenges we have ever faced as we had to work hard to collect those data. Our system needed a lot of data as it is mainly an information-based application. We went to various hospitals of various divisions. We faced many doctors who were not ready to provide us with their information for free. Moreover, we had to collect the information of Ambulance and Diagnostics. It took a long time and the cost became high.

We need to make Shure that we are updating the relevant information. We also need to get regular update on a regular basis so that any user gets started once.

CHAPTER 3

Requirement Specification

3.1 Business Process Modeling

Business process modeling is the activity of representing the process of an enterprise so that the current business processes may be analyzed, improved, and automated [1].

First of all, users have to register in the apps. After registering in the apps, the user has to log in to the system. When they are done with their login, they need to select their division from they are trying to collect information. After selecting the division, they will have the interface for selecting Medical, Diagnostic, Doctor, Ambulance. In this option, they will be able to get various information according to their requirement.

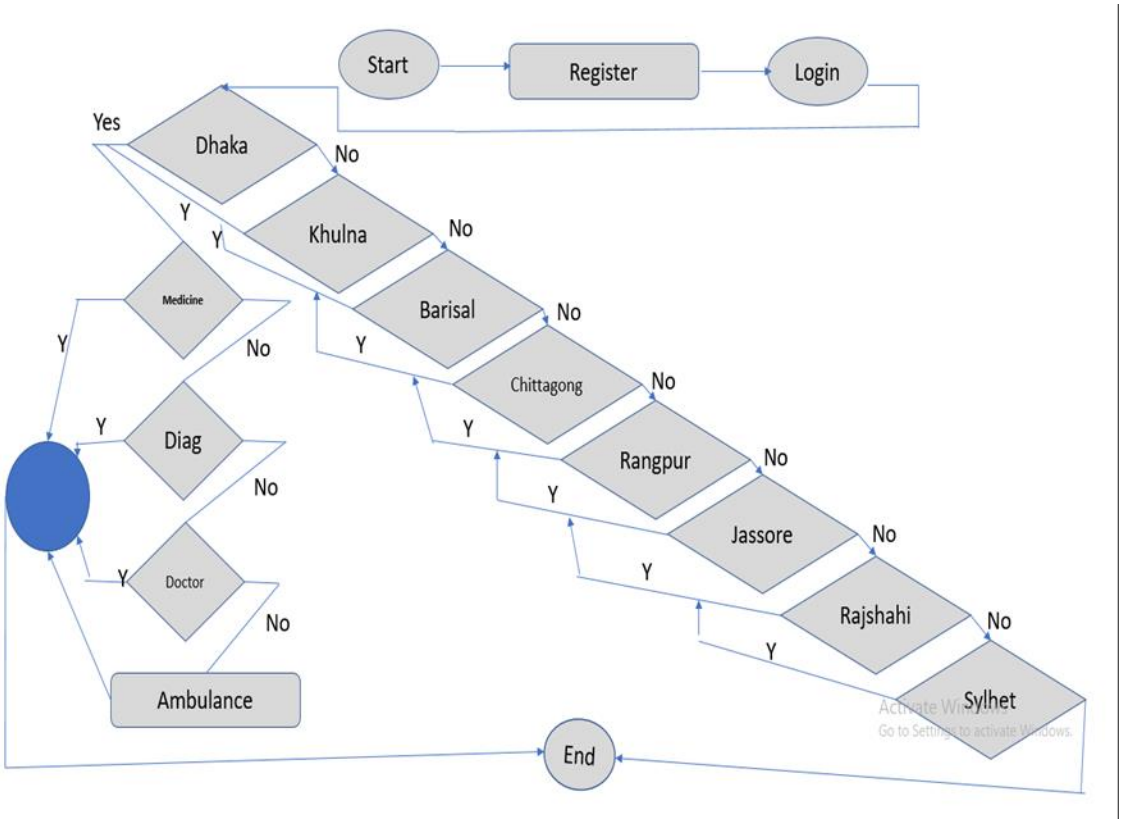

Figure 3.1: A business process model

3.2 Requirement Collection and Analysis

3.2.1 Software requirement

- Android studio IDE: Android Studio is the official IDE of Android. It provides equipment customized for android developers with rich editing, drugging, testing, and profiling tools
- Android Virtual Device: An Android Virtual device is a device configuration that runs on the Android emulator. It provides a virtual device-specific Android environment where we can install and test our Android application.
- Database (My SQL): My SQL is an open-source relational database management system. It is a fully managed database system to deploy cloud-native applications. We have used the My SQL database in our application.

3.2.2 Hardware requirement

- Operating system: Windows
- Android supported device
- Android supported devices: 1. RAM – 8 GB (min)
  2. Hard disk – 150GB (min)
  3. Processor -1.5 Hz (min)

3.3 Use case modeling and description

The use case diagram is the graph of the actor, a set of usage bounded by system boundaries generalization between communication associations and uses between actor and users [2]. Case use defines the outside and inside of the case model system behavior.

Here the figure 3.2 shows that registering is the first step which is controlled by the user to operate the application. After registering user can log in to the system and can control the whole system. Each part of the system can be controlled by the user so that each section has a direct relation with the user.

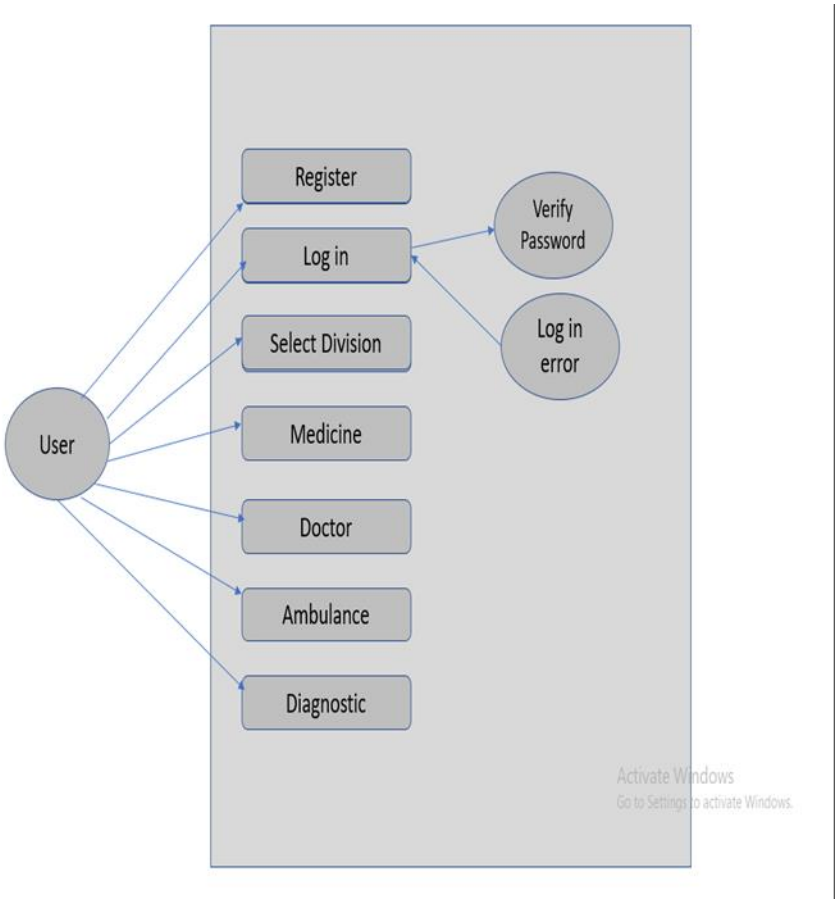

Figure 3.2: UML diagram

3.4 Design Requirements

We know that design requirements are a function feature that transforms ideas into design features.

From the statement of design requirements, it is necessary to develop a product demographic, physiological, ethnographic, and physiological data needed to get started. Actions must be performed to develop the device [3]. In this project, we have done some paperwork and case diagrams shown in figure 3.2. We draw a business process model that shows the whole process running system.

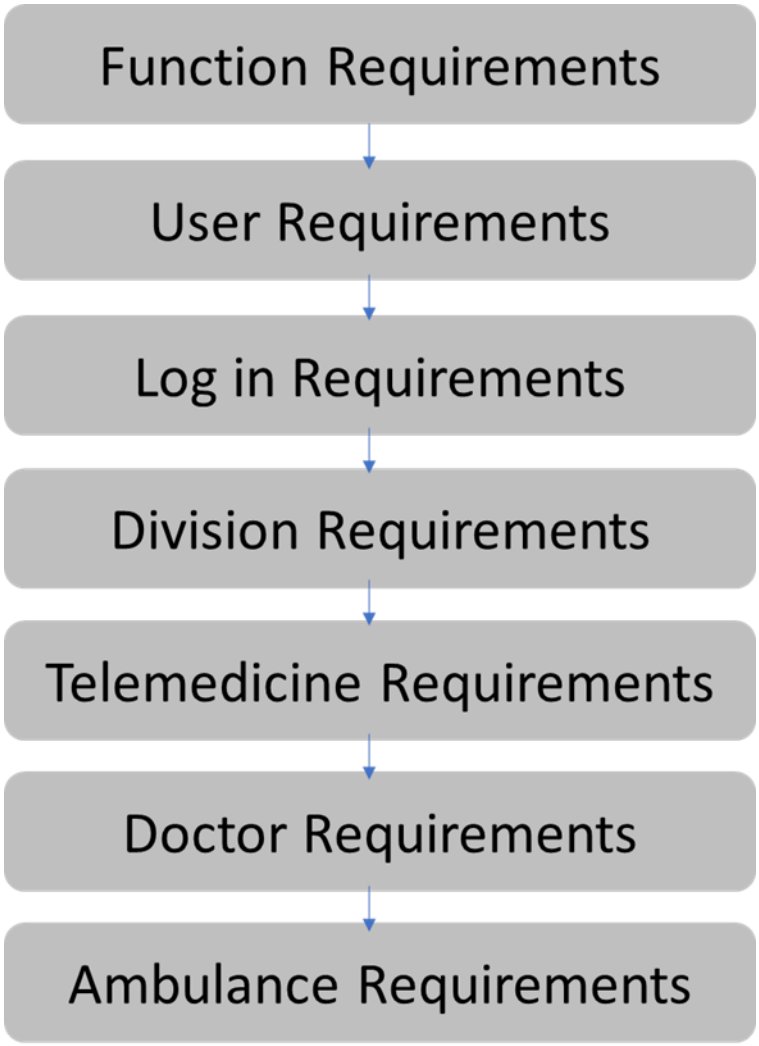

Figure 3.3: Design Requirement

CHAPTER 4

Design Specification

4.1 Front-end Design

4.1.1 Logo

The following picture is the logo of our application which will be shown when the user will enter in our application

Figure 4.1: Logo

4.1.2 Register

In this step, the user needs to register in our apps. In order to register in our application users, need to provide a user name, Gmail, and password.

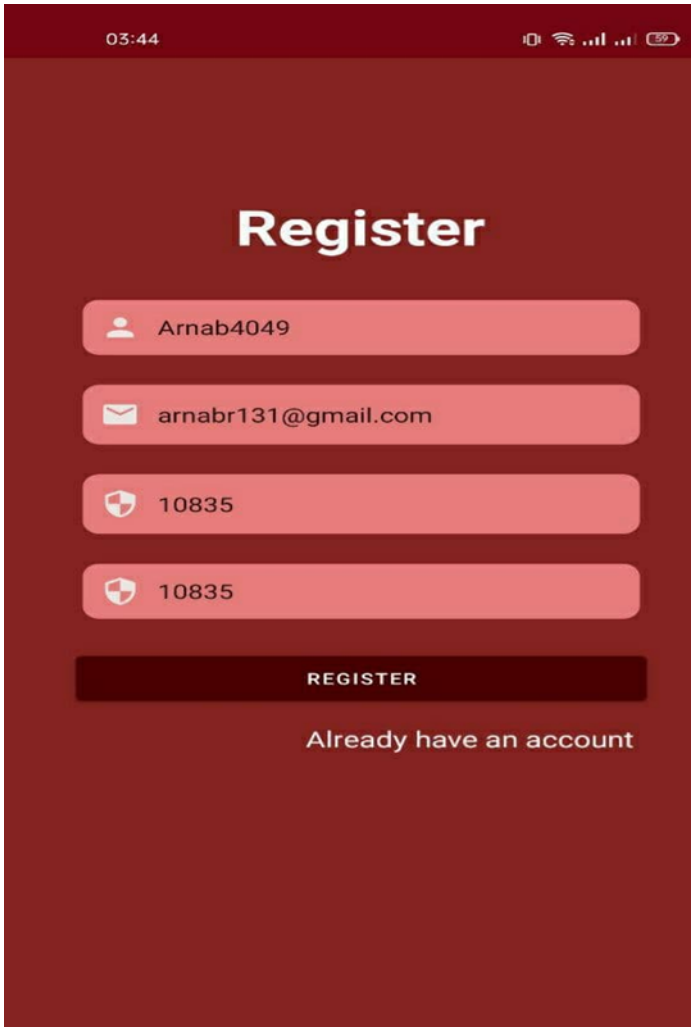

Figure 4.2: Screenshot of the Register part.

4.1.3 Log in

After providing the required information user will be eligible to log in to our apps.

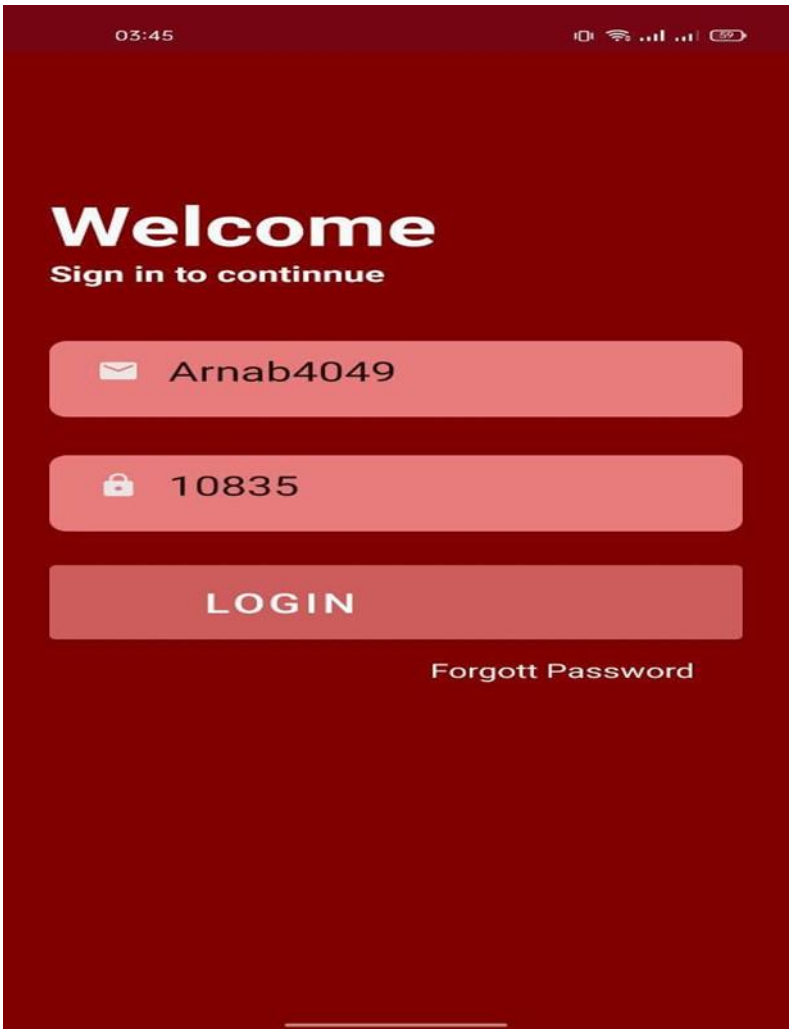

Figure 4.3: Screenshot of login part.

4.1.4 Selecting Division

When the user will able to enter our apps then he will get an interface of selecting division. Here he/she should select his/her required division from where he/she belongs.

Figure 4.4: Screenshot of selecting division part.

4.1.5 Home page

After selecting division, it will take the user to the home page of our application. It is designed with four kinds of information and is Telemedicine, Diagnostic, Find Doctor and Ambulance.

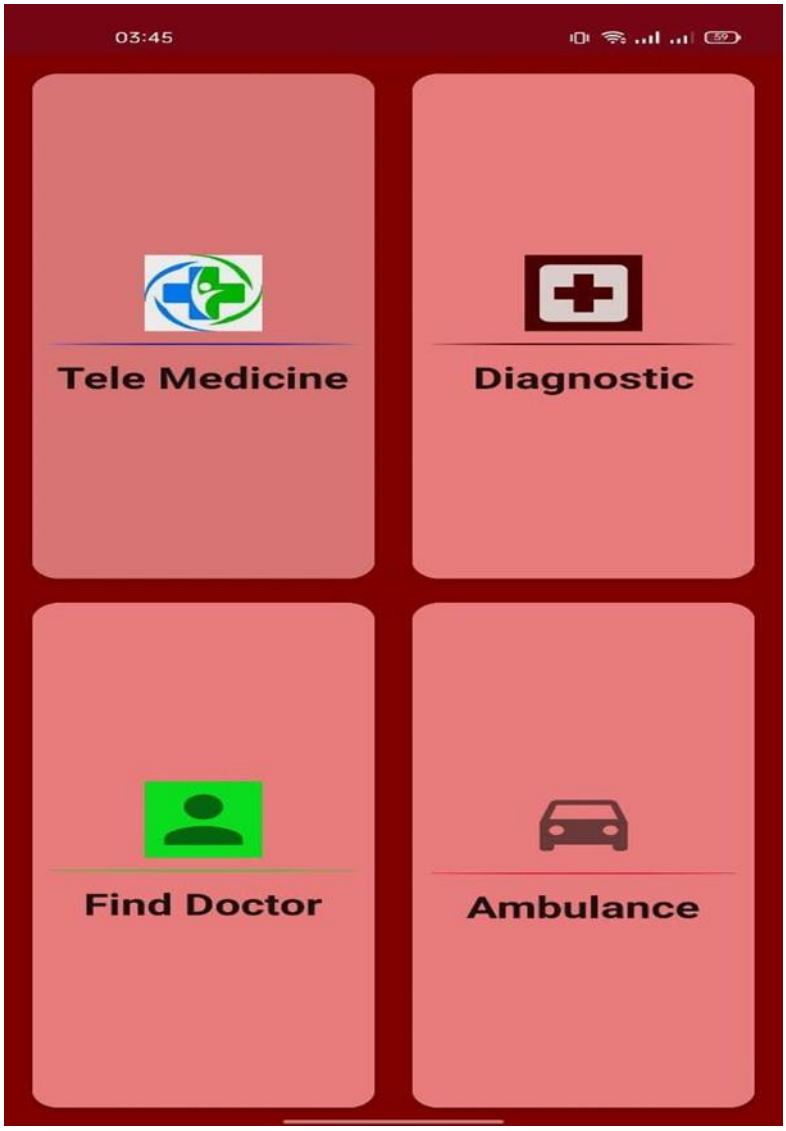

Figure 4.5: Screenshots of the home page.

4.1.6 Telemedicine

Here we have added the data of various data of our medicine of our country.

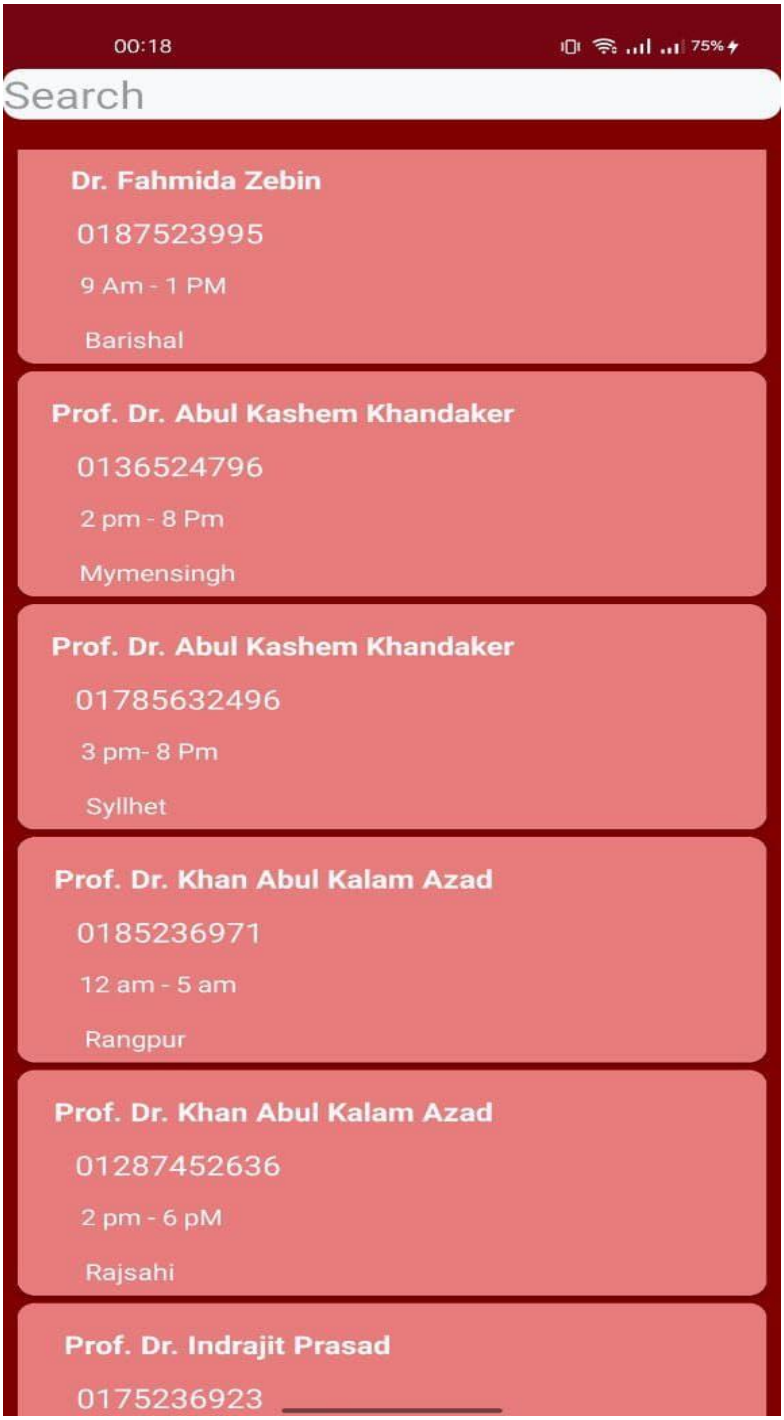

Figure 4.6: Telemedicine

4.1.7 Diagnostic

Here we have added the data of various information of reports which is provided by the doctors.

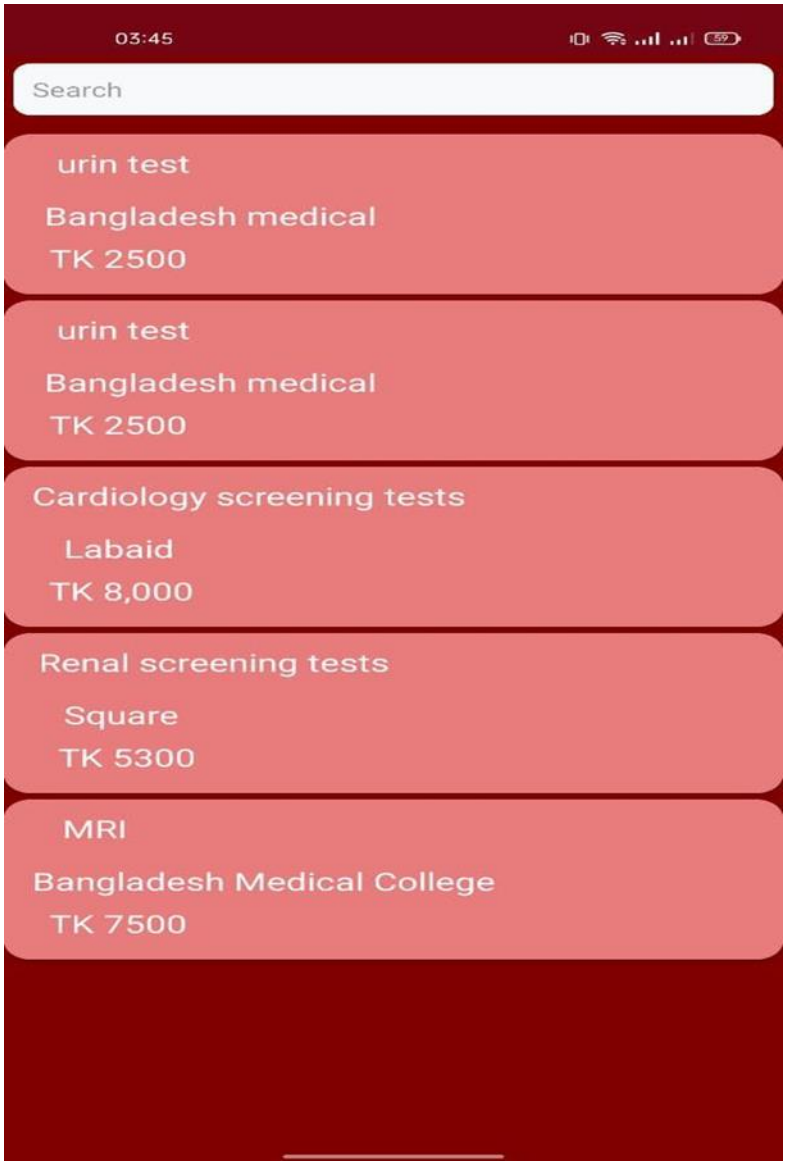

Figure 4.7: Screenshot of diagnostic.

4.1.8 Find Doctor

In this option, the user will be able to find the doctor's list as his requirement. For this user will have the advantage of selecting departments as we separated the doctors according to their department.

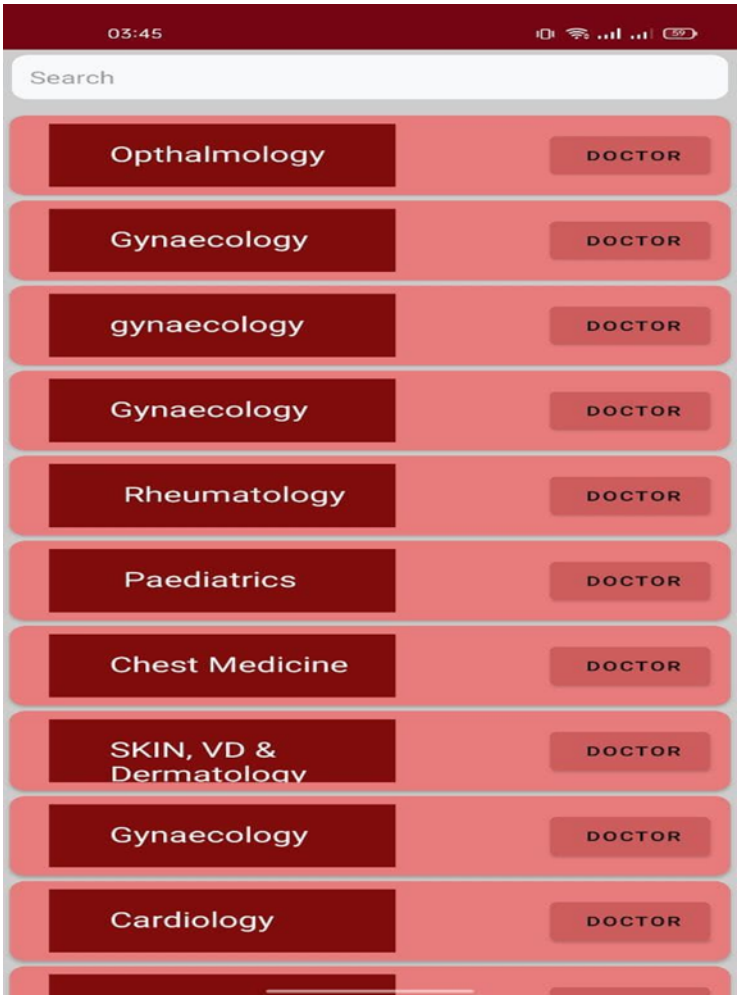

Figure 4.8: Screenshot of department list.

Here it is the screenshots of doctors list in a selected hospital

Figure 4.9: Doctor List.

4.1.9 Ambulance

Here users will get the information about the Ambulance. User will find their phone number from our application.

Figure 4.10: Ambulance list.

4.2 Back-end Design

The back end is an implementation part of a mobile application that stores data, security, and business logic. For mobile applications, the back end is like a server as it sorts and stores important information that the end-user does not see [4]. The back edge is written in java, which is great. In addition to the java standard library during application coding. It gives access to a ton of pre-made objects and the APLs are documented online by Oracle and Google [5]. In this application, we use the My SQL database, based on the cloud-hosted database.

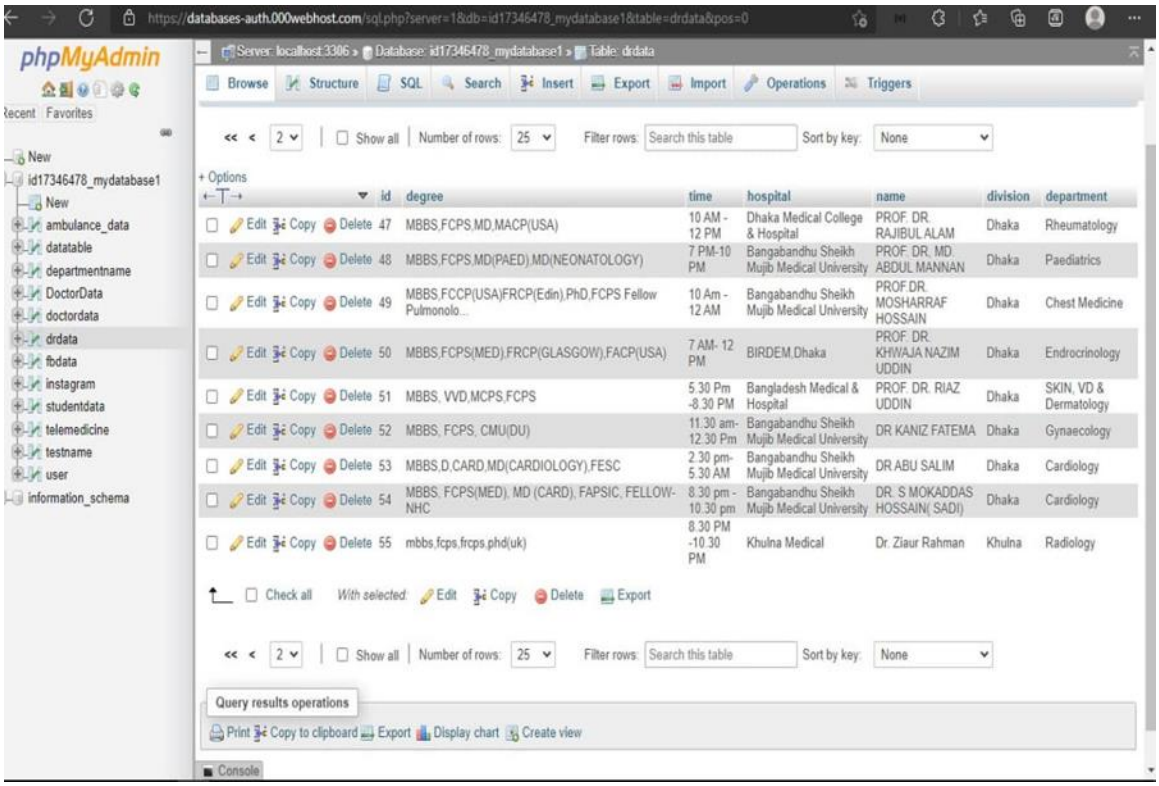

Figure 4.11: Doctor Data

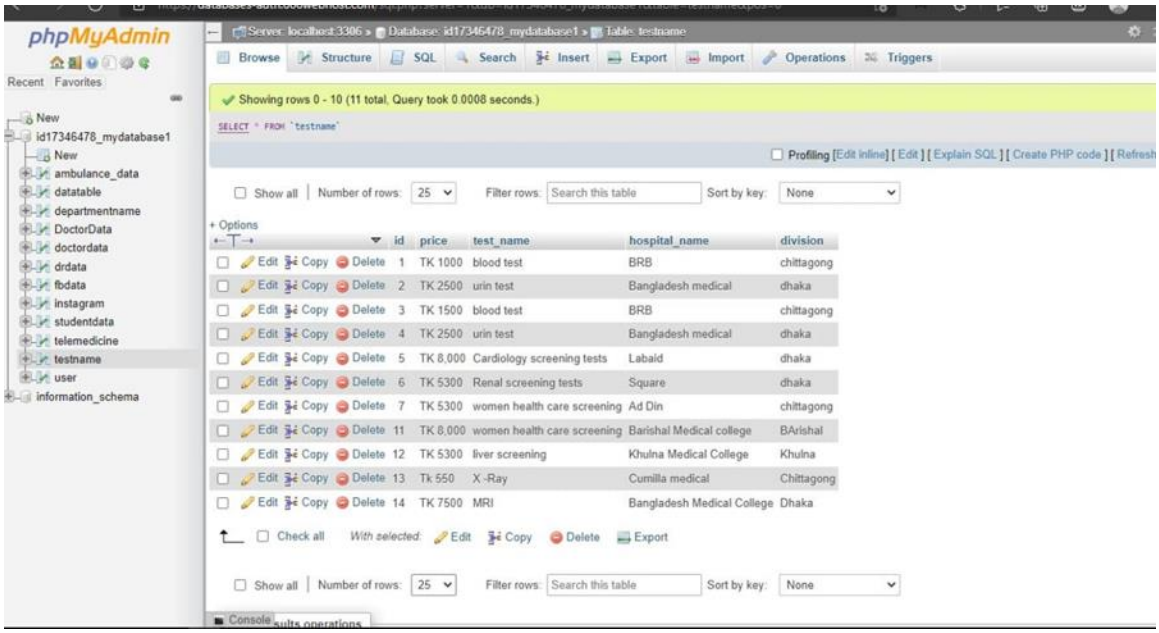

Figure 4.12: Diagnostic data with the hospital name

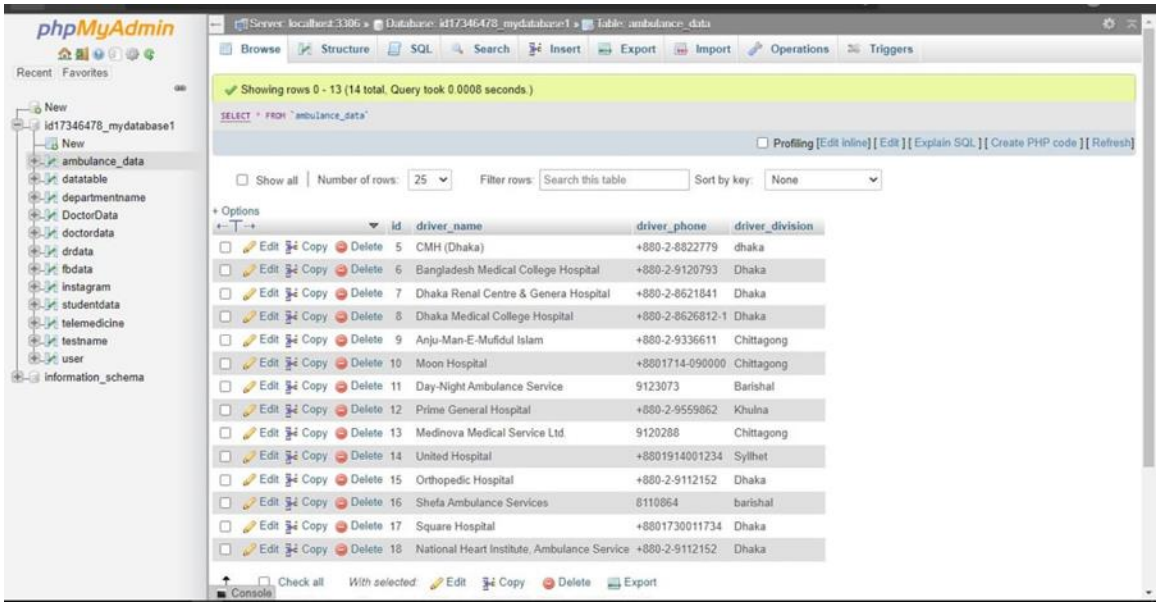

Figure 4.13: Ambulance data

4.3 Interaction Design and UX

Interaction design is the creation of a conversation between a person and product, system, or within service. This conversation is both physical and sensitive in nature and it is revealed interplay in technology as experienced in form, function, and time [6].

The user experience is not the product they use as an overall travel user. This includes their direct interaction with the product and how it fits them. The process of completing the overall task [7].

We have separated all the information into four parts so that users will feel comfortable while they will use the apps. Our data have been sorted in order which will be easy for the user to find any kind of information. There is also a search system for the user to search for any kind of item.

4.4 Implementation Requirements

The technology used as follows:

Programming language: Java, XML.

Database: My SQL.

CHAPTER 5

Implementation and testing

5.1 Implementation of Database

The implementation of the database is where we install the DBMS on the required hardware, optimize the database to run best on that hardware and software platform, and create the database and load the data [8]. Here we have used My SQL database.

My SQL is an open-source relational database management system. It is a fully managed database system to deploy cloud-native applications. It offers unmatched scalability to facilitate system administration to configure the MySQL database server for flawless performance. It is also known as the most secure and reliable database management system.

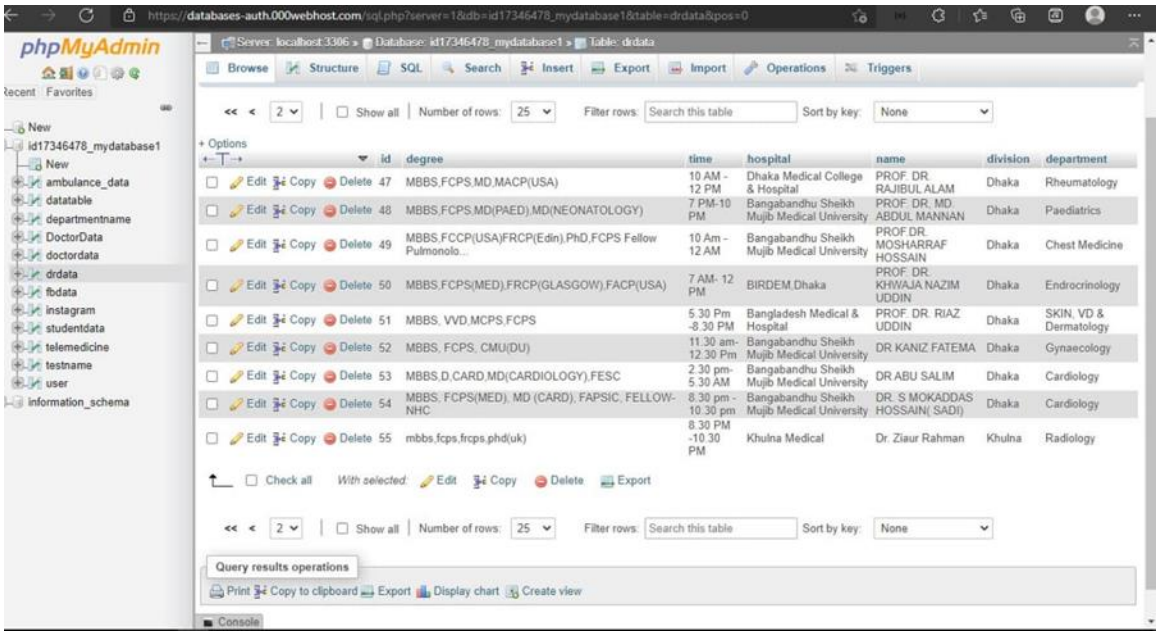

Figure 5.1: Database

These are the diagnostic data with the hospital name

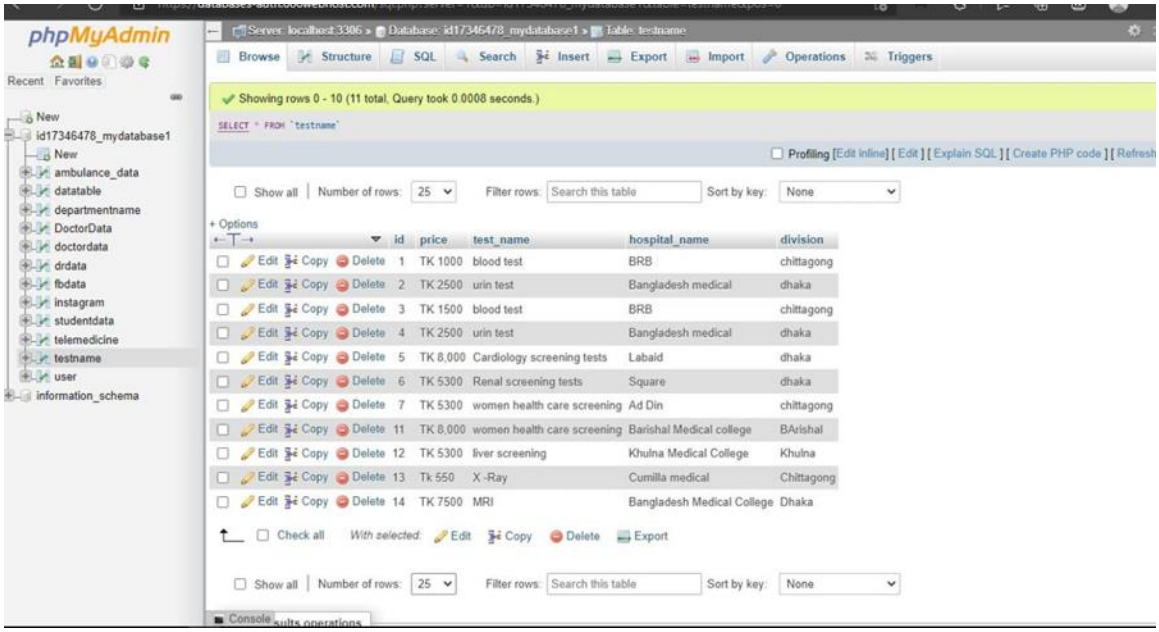

Figure 5.2: Database (2)

5.2 Testing Implementation

In android, there are some types of testing. There are local unit test, instrument test, integration test, and system test

The local unit is connected with a local computer where the android studio is installed and connected with a database. They use java on the computer so it works very fast because they didn't be a simulator is needed to do it.

We know that system tests test the whole system. These are the tests used to check the code test. Unit test is important because software developers sometimes try to save time for minimum unit test and cost id high as a result of this mythical reason inappropriate unit test error fixing during system testing, integration testing, and even beta testing the application is built. If initial unit testing is done at an early stage, it saves time and money in the end [9].

For more testing by integrating test framework test android is called Unit test.

5.3 Test result and report

In Figures 5.4 and 5.5 we can see that a user is registering in our apps. After registering the user can able to select the division and then move to the home page. On the home page, there are 4 options to select and each section contains various data. If users select the Telemedicine section, then it shows the data of various Medicine.

The test of this application runs successfully.

Test Case	Expected Result	Required Result	Test, Result Pass/Fail
User Login	Login	Login Successfully.	Pass
User View	Doctor list, Telemedicine, Ambulance number List, Diagnostic name list.	Doctor list, Telemedicine, Ambulance number List, Test name list Successfully.	Pass
.			
Admin Edit	SQL database, all data update or delete insert.	SQL database, all data update or delete inset successfully.	Pass

Chapter 6

Impact on Society, Environment, and Sustainability

6.1 Impact on Society

We have built an android based application whose main theme is medical service. From our application, people will be able to find various kinds of medical services which is consist of four different types of information. So, people don't need to go outside as they can get the information by using our application. Our government is initiated to make an ICT skilled and digital nation. We hope that our application will help our country to become more digital. It is also very useful in the emergency moment because ambulance service has been added to our application. It will revolutionize the way we work, play, communication, and shop. As our application is very easy to use, each person will be able to operate it if they have a smartphone. Sometimes people get confused about selecting Doctors. Our application will help that person by providing them with their required information. Our application will also be helpful for the Ambulance driver and Medicine seller. They will be able to increase their business as a user can get linked with them very easily. At last, we hope that it will make a positive effect on our society and user will able to get 100% benefit by using our application.

6.2 Impact on the environment

We have built an application that is free of any kind of environmental pollution. There is no function in our application that will be harmful to our environment.

6.3 Ethical Aspects

The ethical aspects are given below:

- Addictive design
- Corporate ownership of personal data
- Algorithmic bias
- Weak cyber security and personally identifiable information protection
- Overemphasis on features

Chapter 7

Conclusion and Future Scope

7.1 Discussion and Conclusion

It will be an efficient system in order to digitalize our country. We hope that our project will have a positive effect on our society and will help those people who are required to know about medical information. Our data is sorted so nicely that anyone can able to find those easily. It is also supportive to the doctors and medical staff. It will make a complex task easier for the general people. It will save the time of people as they are taking the service at home.

7.2 Scope for Further Developments

We have a big expectation for this project. We will add some more features which will be more useful for the users. In the future, we will arrange an online meeting with the doctors which will save both money and time. Online delivery of drugs will be ensured in the future. Users will also be able to book the hospital sits by using our system. We will try to build a system of online meetings with MBBS doctors. Overall, we hope to provide a better online medical service in the future.

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[9] Wikipedia <<https://en.wikipedia.org/wiki/Business_process_modeling>> last accessed on 23 December 2021 at 4:23am

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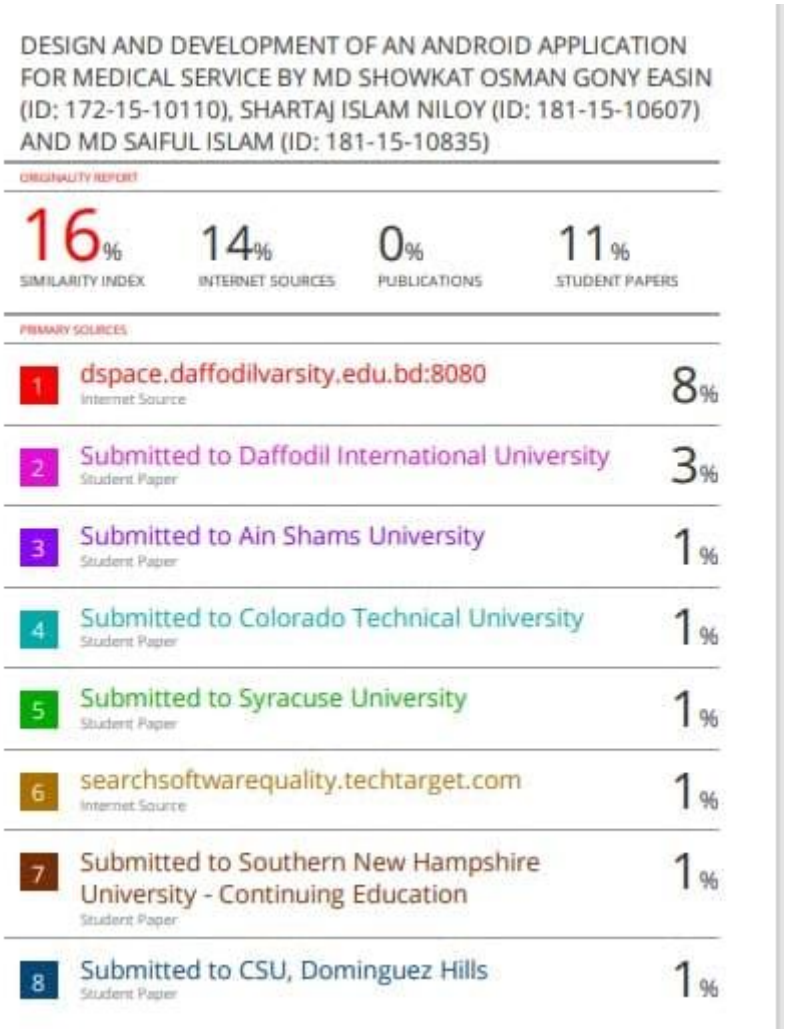

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