DESIGN AND DEVELOPMENT OF AN ANDROID BASED APPLICATION FOR EMERGENCY ASSISTANT

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

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APPROVAL

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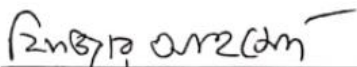
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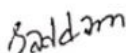Daffodil International University

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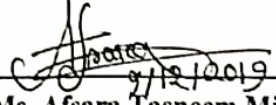
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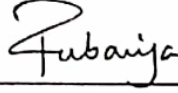United International University

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of Ms. **Afsara Tasneem Misha, Lecturer of CSE Department,** and 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.
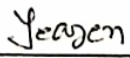
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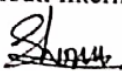
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ABSTRACT

Basically this "Emergency Assistant" android based application is built to provide help in emergency situation. Here we have mainly focused to help people who need blood in short time and with information of nearby hospital service, ambulance service and fire service. This apps main goal is to make a simple and easy way of connection between blood donor and receiver, also in emergency situation provide user with hospital, ambulance and fire service information. This app will reduce time to get specific blood group donor. User can search for desired blood group in his suitable location, user can contact with any nearby hospital, fire service station and ambulance service. Also there is an emergency button which will directly connect user with the 999 help center where they can get police, ambulance fire service help in a short time. This button is for the most crisis situation. In this "Emergency Assistant" app user search blood donor with his or her desired blood group and location, user will be provided with nearby blood donor, user can also get the mobile number of the blood donor. If any blood donate organization wants to provide donor information they can add in the database. In this app user has to register his or her details in the app so a user can provide blood and also can receive blood. This emergency assistant apps main goal is to make user life less complicated in any crisis situation which will help them take proper decision when mind gets jammed. This application main goal is to assist user in any emergency situation.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

"Emergency Assistant" application not only based on blood donation pre-process it also provides user with nearby hospital information, ambulance information, fire service information and an emergency service center number. In this project user not just get donor location they are provided with donor contact details. This app will reduce time and work to get the desired outcome. Any data this app has stores in the database can't be accessed by any third party without permission of admin.

1.2 Motivation

Blood is one of the priceless element of a human body. Blood is monumental for human to survive yet we don't take this sober before any tragic accident or illness is occurred. Although in Bangladesh we are seeing a rise in number of voluntary and direct donation of blood in recent year but yet it lags behind the actual demand. The reason it is lagging behind is the complicated way of connection between blood donor and blood receiver .Our main motivation was to create an easy connection between them. People who are in a critical medical situation most of the time they don't get the proper information where to get hospitalized, nearby ambulance number our concern for them is to provide them with nearby hospital, ambulance and fire service information with details. Because we have seen nowadays major number of ill people to die on the way to get hospitalized. To get any kind of help like police, fire service and ambulance we have a path to connect the user with a 24 hour help station. Our main motivation is to help the user with an information provider within a short period of time.

1.3 Objectives

- To build a easy to use and understand the process.
- To create a platform for both blood donor and blood receiver.
- To provide the user with information of a blood donor with details.
- To provide user with nearby hospital, ambulance and fire service information.
- To create a connection for the user with a 24 hour help center.
- A strong database with maximum security.

- To help user to take the best decision in a crisis situation with proper information.
- To hope to build an application where user can be benefited.

1.4 **Expected Outcome**
- Best outcome is to reduce death in emergency situation.
- In critical situation user can get the best information.
- Blood receiver can easily connect with the blood donor.
- User can get all the information in a structured way.
- Make user less stress in a panicking situation.
- Ensure 24hour service.
- Providing user with government official help center.
- Help the user in kind of emergency situation.

Basically we are wanting to build an app which will help every people whatever emergency situation they are in. This app will work as a helping hand in any kind of situation.

1.5 Report Layout

Chapter 1: Introduction

Here we have studied about the information and requirement about the "Emergency Assistant application. Basically here we have talked about why we had thought to develop the application.

Chapter 2: Background

Hitter we have worked on grounding of the application. Mainly this section prescribe our thought process to make an application which will justify user need and security.

Chapter 3: Requirement Specification

This section indicates what we need build the application. Here we have specified our primary need to build the application. We have worked on various models to develop the application in this section.

Chapter 4: Design Specification

Here at first we made a blue print of the whole application how it will appear to the user.

Way of appearance to the application to the user need to be specified in this section.

Chapter 5: Implementation and Testing

In this section shows outcome of our hard work and also how the application is working. Here we will justify our apps eligibility.

Chapter6: Conclusion and Future Scope

We have focused on future planning. How we want to work and update our application. Basically in this section we will discuss how far we want to go with the application.

CHAPTER 2
BACKGROUND

2.1 Introduction

Emergency assistant app is an effective and useful application on any emergency situation. It is really helpful to finding blood donor within short space of time and they can get information of ambulance, hospital and fire service. Here user can get all the information of blood donor, user also can get hospital, ambulance and fire service information. People will no longer have a difficult time to get blood donor. Collecting blood donor information from multiple blood bank is time consuming and difficult. Through this app user can get all the information just in one click. In this app user first register his or her all details so in a way they are also becoming a donor. If user already an account he or she can get all the information by just searching with selected blood group and location. When user is in an unknown place it is hard for him to get the nearby hospital location but in this app user can get all the nearby hospital location by just clicking one button. In a most crisis situation user can be connected with the government official help line by just clicking the emergency button. Various blood bank can update blood donor information with the permission of admin.

2.2 Related Works

In this application user can send messages and call the donor. This is online base application. We have made sure the application is user friendly and easy to use. We have made a premium performance and high-quality database. We have use a real-time database. We have collected data in various way to full fill the data base. Through various survey we tried to find what general people needs the most in a crisis situation.

2.3 Comparative Studies

The "Emergency Assistant" application is different from any other blood bank based application because we just didn't focused on a single situation. There are many blood donation app is available but there user can only find blood donor information but here we are providing the donor with all contact information because we have created an individual profile for every blood donor. In this app user can find his or her nearby hospital, ambulance fire service inforamtion. If the situation is really critical then user can get help 999 help center. In government help center they can get various help like Ambulance contact number near their location, get help from the police station. 999 help center is a 24 hour help center and they help people in every situation.

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2.4 Scope of the Problem

- Any user can view donor profile.
- User can add his or details in the database and can also search for donor.
- User can find information of desired location ambulance, hospital and fire service information.
- Admin can give access to specific blood bank group to register donor information in database to create a vast community.
- User can directly connect with the 999 government help center.

2.5 Challenges

It is not possible to reach the goal without any challenges. Reaching the goal without any obstacle isn't satisfying. Challenges makes the goal mammoth. Like wise to complete our application we have faced a lot of obstacle but somehow we have manage to overcome most of them. In this application user can access all the details of blood donor it is one most difficult challenge to overcome.

In this application user will be provided with nearby hospital, ambulance and fire service information. It is no right to provide every hospital, ambulance and fire service details near user because our main goal is provide user with the best possible information. For this we have to verify the hospitals which suitable for the users.

Basically we want to know what our user might need in emergency situation. Based on that we have to take action. We have to look on our users security because we are collecting there information in our database. For that we have to look into our database security system.

People will use this application mainly in critical situation, so we have to look on this fact and we have to build a user friendly application. Complicated method will make the whole system unusable.

Here some major challenges are given below-

- Create a strong database with maximum security.
- Being able to provide user with all the information of blood donor.
- Ensuring providing with the best information.

- Publicity.
- Maintenances of the whole application.
- User can add details in the database.
- Admin decides to give any one access to the database.
- Mobile phone number verification.

CHAPTER 3

REQUIREMENT SPECIFICATION

3. Business Process Modeling

If we want create any project first we have to build a business processing model. Through business process modeling we can understand how the application will run by step by step. Business process modeling is given below Figure 3.1
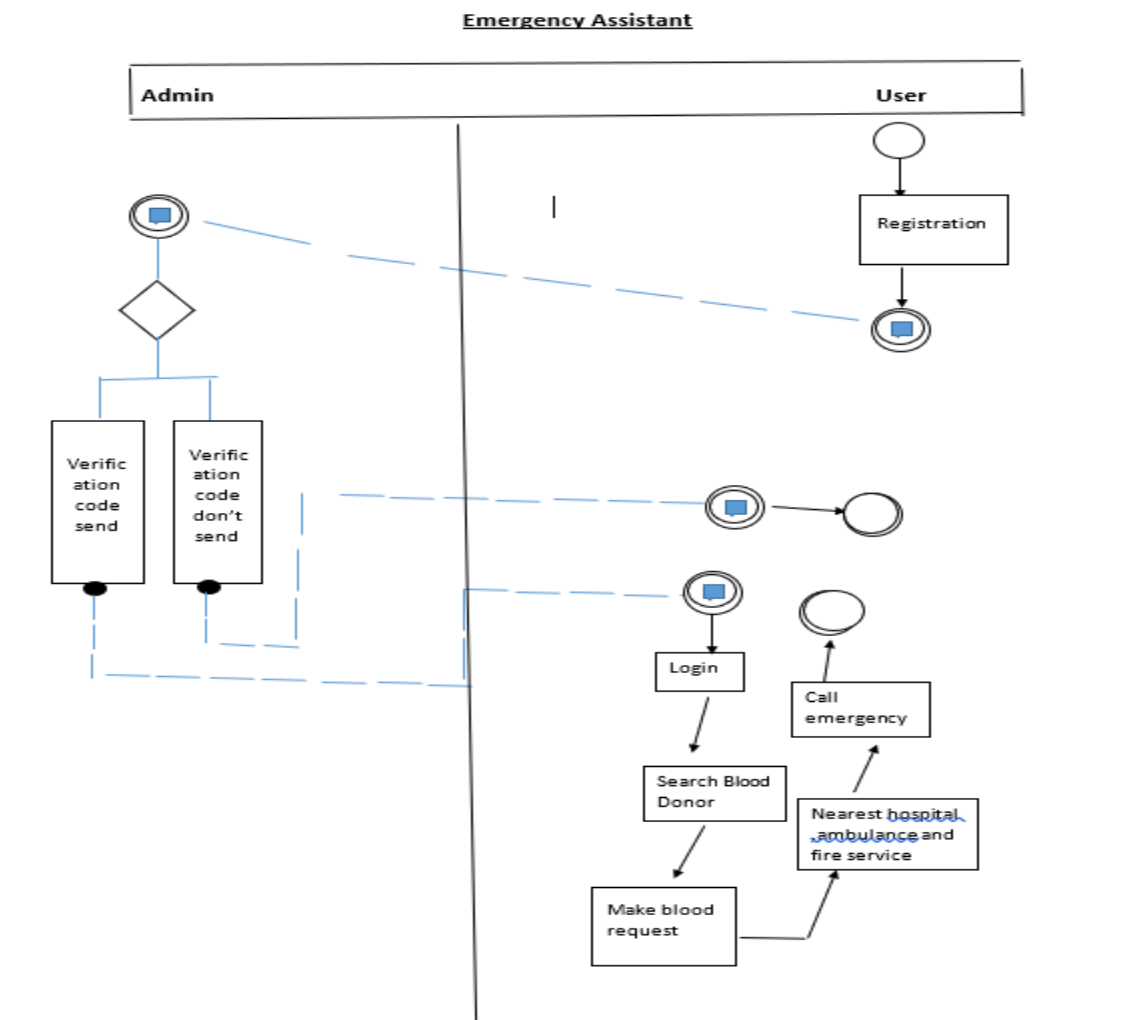

Figure 3. 1: Business Process Model of Emergency Assistant.

3.2 Requirement Collection & Analysis

To build an all-round application we had to collect data and had to understand what kind of support actually people actually want in an emergency situation. We are building the application with a thought process every user can be benefited, if the people don't get their basic requirement in our application they won't use it.

- User can register all his information in the database with have the direct access in the system data base.
- Needed to login to use the application.
- For new user sign up option.
- User will view the blood donor profile.
- User will search blood donor with blood group and blood location.
- Only admin will have the access to main database and will be needed admin authorization to access database by any third-party.

3.3 Use Case Modeling and Description

Use case modelling is a useful tool for requirements elicitation. It provides a graphical representation of the software system's requirements.

The key elements in a use case model are actors (external entities), and the use cases themselves. In outline, a use case is a unit of functionality (a requirement), or a service, in the system. A use case is not a process, or program, or function.

Because use case models are simple both in concept and appearance, it is relatively easy to discuss the correctness of a use case model with a non-technical person (such as a customer).

Use case model is an analyzing technique how user will interact with the system. Use case mainly shows the relationship between user and different use case user will interact with [1]. Figure 3.2
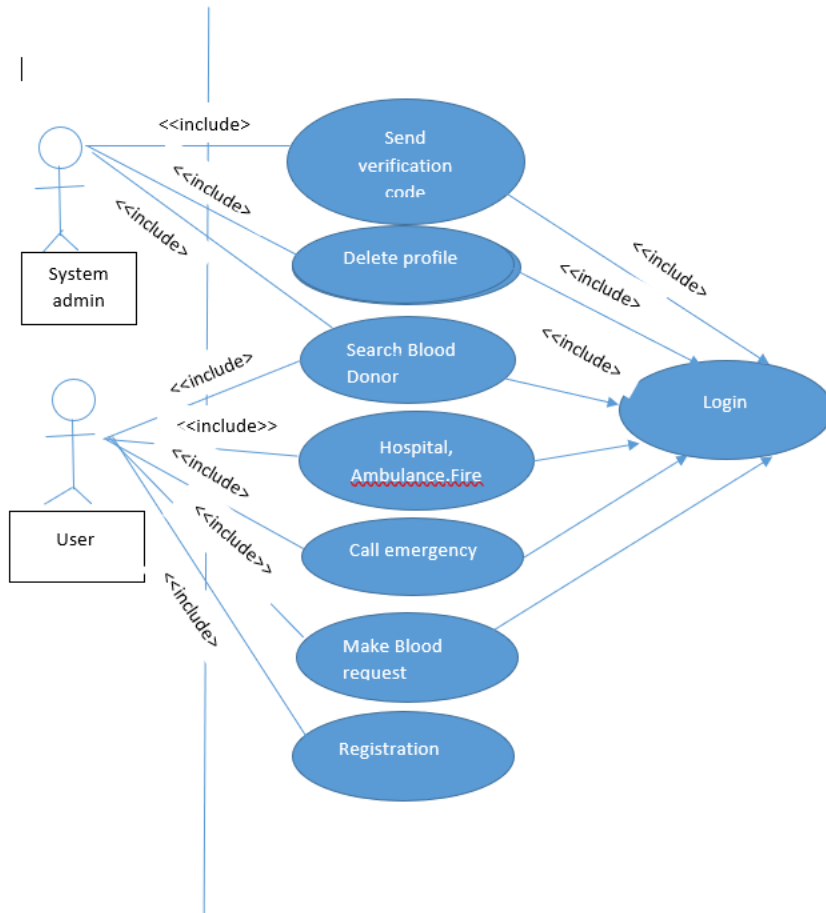
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Figure 3. 2 Use Case Model of Emergency Assistant.

3.4 Logical Data Model

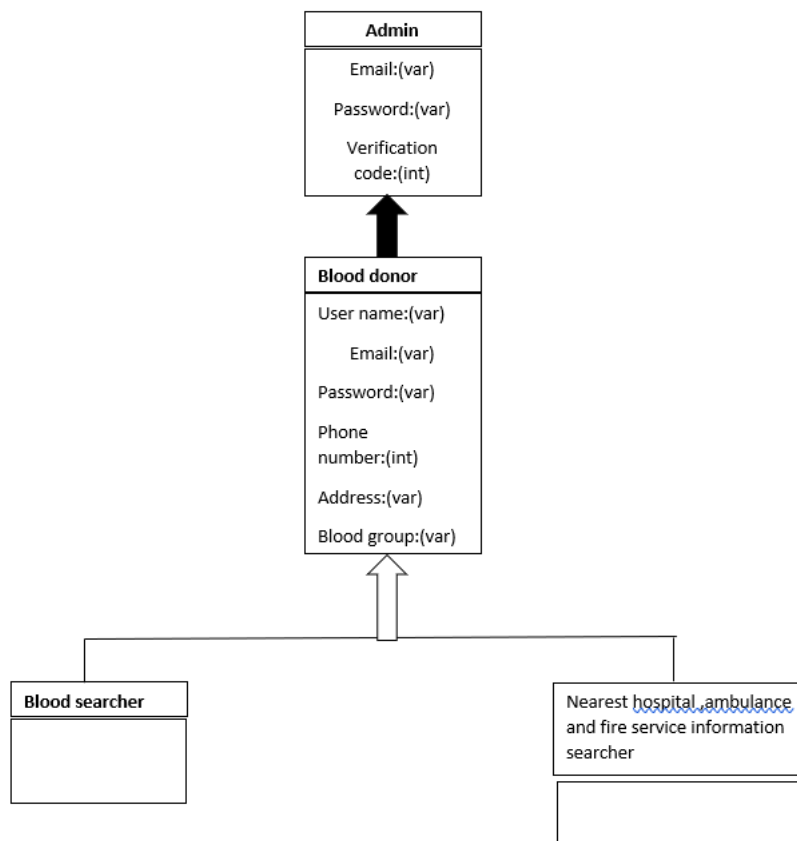Logic model refers how the applications logic will work. Figure 3.3

Figure 3. 3: Logical Data Model of Emergency Assistant.

3.5 Design Requirements

- This application will consist of two types of user the admin and another user (blood donor, blood receiver) .

- Admin can add donor, update profile and delete profile.

- User can create account.

- Blood receiver can search blood donor.

- User can search nearby hospital ambulance and fire service information.

- User can call emergency help center.

- Admin maintain the database and all the access.

- User can view profile.

CHAPTER 4
DESIGN SPECIFICATION

Here we will discuss about what our work will be to design a user friendly layout. Here we will talk about designing our thought visually.

4.1 Front-End Design

Front-end is the presentation layer of a system. Front – end design of any application really important because it's a crucial path to interact with the user. Front-end is basically a client side area. The way of designing a front-end of any application is to build in way where client can easily understand. Front-end design must be user friendly. Because if a user using an application for the first time his or her first impression will come from the layout of the design. It is a path of interaction between the user and application. Front-end consist of images, button, input field and search query field. Front-end collects data from user through user interaction then front-end pass the data to back-end, back-end calculate the data return a processed data to the user. Front-end is a user interface, so designing the front-end is really important because if we can build a design which easy to usable and understand then we can say it's a well formed design. Here are some basic front-end design

- Log in page.
- Mobile verification page.
- Register page.
- Home page.
- Search option.
- Button.
- Donor profile page
- Hospital, ambulance and fire service information page.

4.2 Back-End Design

It is the data access layer of any system. Core part of any application is the back-end. It is the logical part of an application. How application will act through various situation is controlled by the back-end. In a word back-end is the application logic which collects data from front-end through internet. Back-end designing can be complicated because to perform multiple functionality it can't be in an easy form. Back-end design isn't visual to the user, user only see the front-end design. Back-end manages the logic and the data storage system. Back-end works according to users need. Back-end takes decision whether to give access of the data to user. Back-end is occult from user so it can be code or program. Here are the main back-end design

- Database create.
- Application logic.

4.3 Interaction Design and UX

It is design for user how they will interact with the application. The main goal for interaction design is to make available of sources or products to the user in the best possible way. There can more than single path for the user to interact with the application but all of them aren't simple and efficient. For that interaction design takes the best available way to communicate which easy to understand and simple to execute.

- Create user friendly interaction.
- Less confusing by providing minimum option.

UX design is known as user experience design. UX design is basically a cognition method that you have to understand what user might need in your application. Through UX design we can predetermine user need.

- Try to understand user's basic need.
- Provide information considering user in a critical situation.

4.4 Implementation Requirements

- The design need to be implemented in android mobile based application java language.
- Preferred database is fire base real-time database.
- Json structured data storage.
- User phone number authenticate with fire base.
- Create user interface using xml.
- Search with firebase database query.
- Registration form using java.
- Emergency help center connection using java.
- With admin permission blood bank's capability to add donor information.

4.4.1 Java Language

When it comes time to develop Android apps, the first and most popular option is Java. Java is the official language of Android development, meaning it is the one that has the most support from Google and the one that most apps on the Play Store are built with. The number one way to develop Android apps, is to go ahead and download android studio. This is a piece of software called an IDE, or Integrated Development Environment. It will come packaged with the Android SDK (a set of tools to facilitate Android development specifically) and basically this will give us everything we need in one place to get up and running [2].

4.4.2 Android Studio

Android studio is the official IDE (Integrated Development Environment) or tool (layman terms) for developing application exclusively for Android platform. It has a strong editor tool for developing creative UI and emulators for different versions to test and simulate sensors without having actual Android devices. It also has a very useful Gradle plugin using which you can create application files (apks) with different configurations. Moreover it makes exporting and uploading apk on play store easy with a single click. It also has ANT build if you prefer that. In the recent updates Android studio has brought instant run which makes testing even faster and easier [3].

4.4.3 XML

XML is a markup language. Using xml we can easily design a user interface and a screen which consist of elements. In xml every layout contains single root element, we can add additional layout objects as child elements to build a viewing hierarchy which will create our layout.

- **UI Elements in XML**. Androids consist of a broad XML vocabulary. This vocabulary will help us to view classes and sub classes for designing the layouts Using a drag and drop interface we can create a XML layouts in Android Studio's layout editors.

- **Instantiate layout elements at runtime**. We can create View and View Group objects (and manipulate their properties) in our application programmatically. Declaring a UI in XML allows us to separate the presentation of our app from the code that controls its behavior. Using XML files also makes it easy to provide different layouts for different screen sizes and orientations (discussed further in Supporting Different Screen Sizes).

The Android framework gives us the flexibility to use either or both of these methods to build your app's UI [4].

4.4.4 Firebase Real-time Database

Fire base real-time database is a cloud hosting database, this database supports android, ios and web. Storing data or any changes made in database all performed in json structured method. It manages to sync across all platforms.

 JSON Structured Data Storage Firebase real-time database is a schema less database in which the data is stored in JSON format. The entire database runs through json structured method. So whenever we need to update, add or delete any data we have structure a json tree which is accessible in easier way by avoiding nesting of child nodes [5].

4.4.5 Firebase Database Query

A Query sorts and filters the data at a Database location so only a subset of the child data is included. This can be used to order a collection of data by some attribute (for example, height of dinosaurs) as well as to restrict a large list of items (for example, chat messages) down to a number suitable for synchronizing to the client. Queries are created by chaining together one or more of the filter methods defined here

Just as with a Reference, you can receive data from a Query by using the on() method. You will only receive events and data snapshots for the subset of the data that matches your query [6].

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

Here in this application we are using firebase real time database. It is easy to create and easy to connect with the application. Firebase database maintain json structured method in both the time while storing data and also providing. Firebase database efficient and high security system. Admin sets who can access data and who can't.

Users Registration Table: Information's such as full name, email, password, mobile, and email stored in this table.
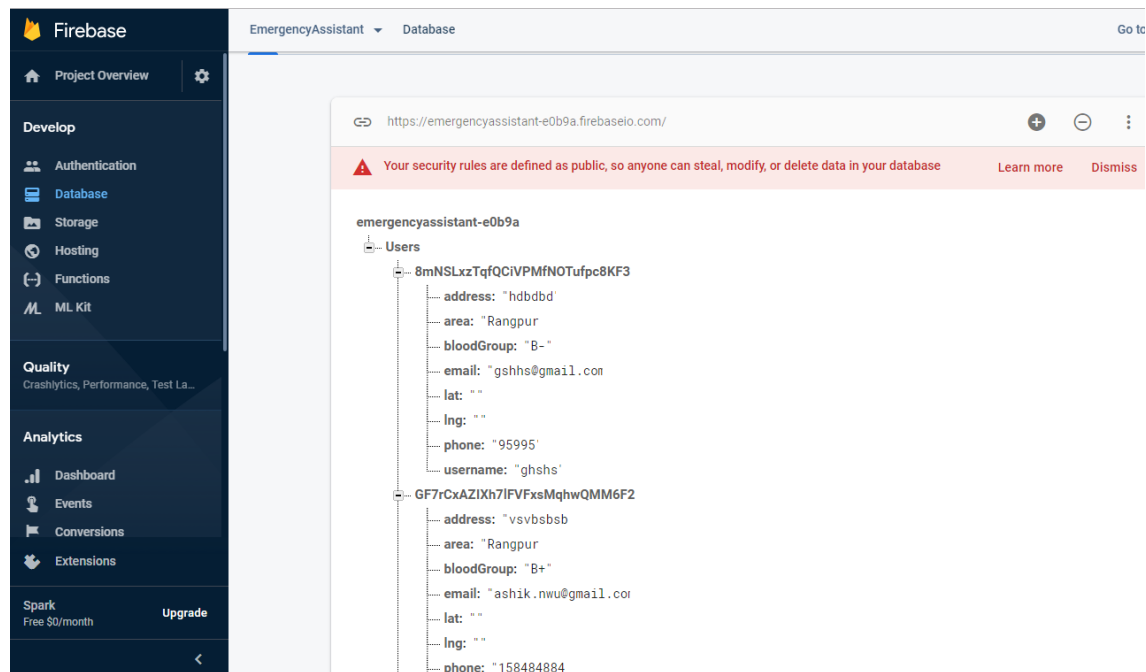
Figure 5. 1: Registration Database.

Third Party Access Instruction: Blood bank add table.

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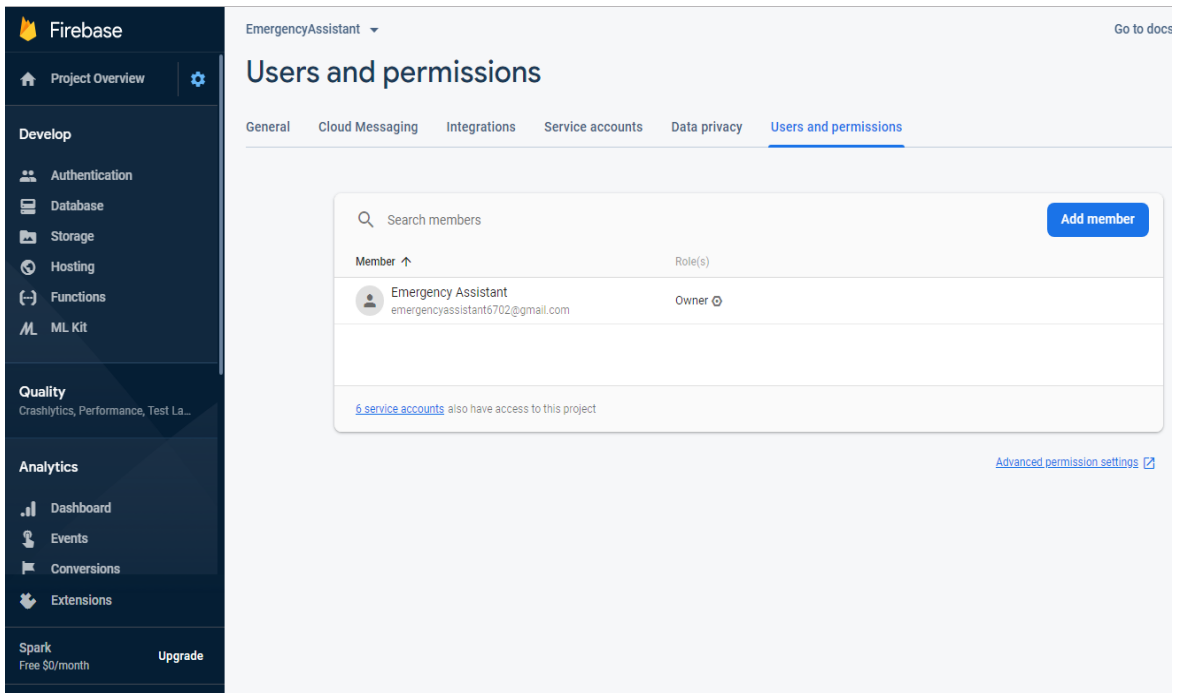
Figure 5. 2 : User Adding Database Table

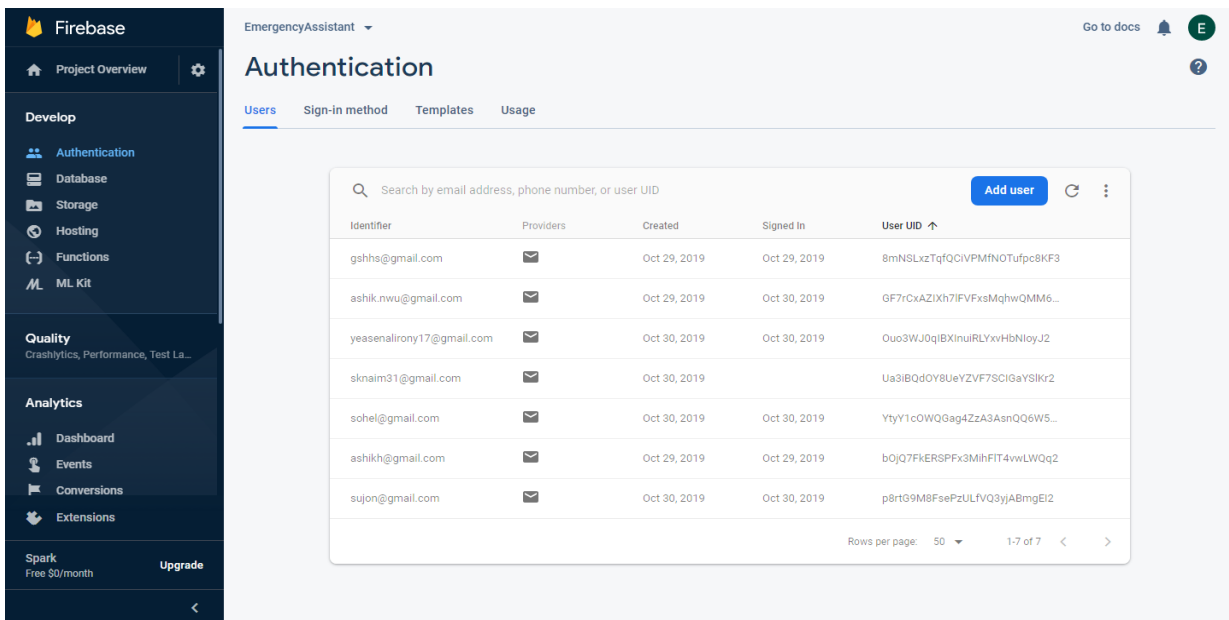**Accessible:** If any blood bank want to provide information they can access the main database with admin permission.

Figure 5. 3: Stored Data Table.

Stored Data Table: Information of user stored in this table.
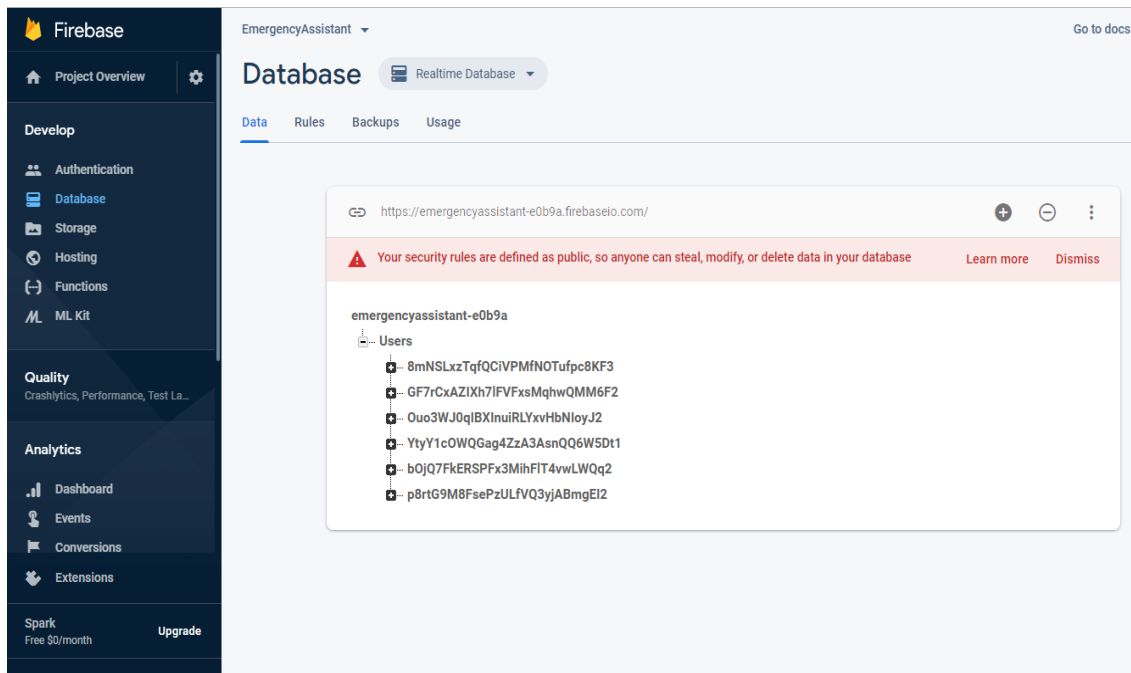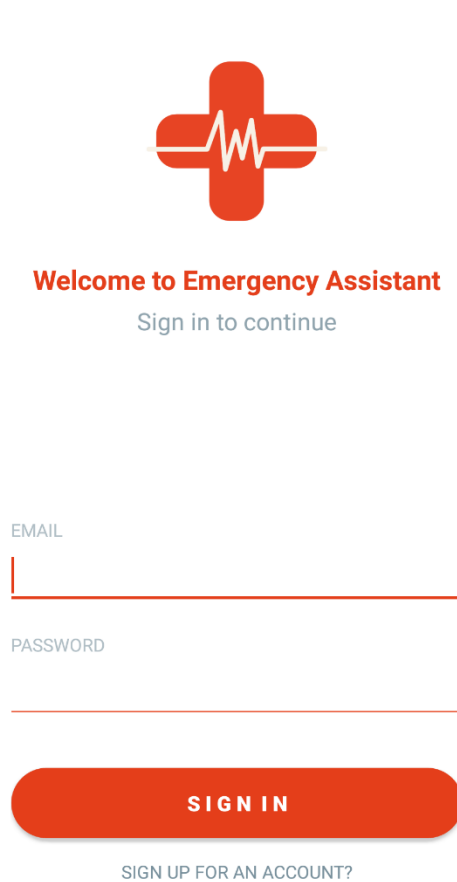
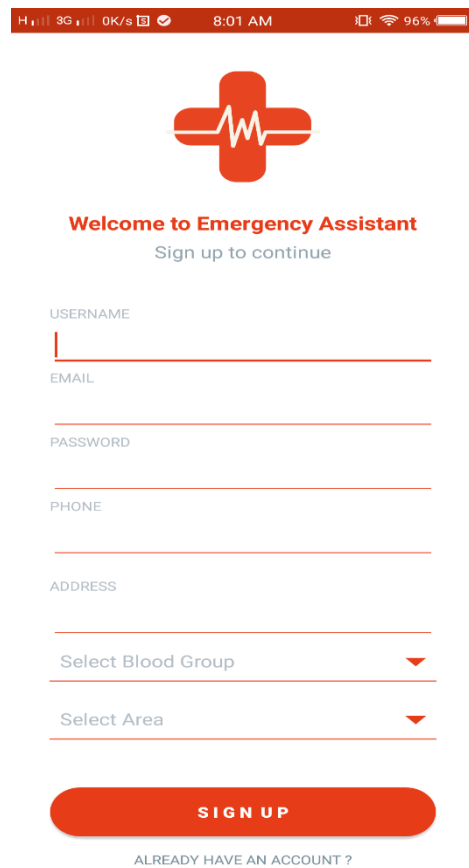©Daffodil International University

Figure 5. 4: Main Database Table.

5.2 Implementation of Front-end Design

We were more concern to build a user friendly front-end design. Here is the sign in and sign up page for the application. Here user will register his/her account or sign in.

Figure 5. 5: Log in Page.

Figure 5. 6 Registration Page.

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Here is the home page and blood donor search field for the application.
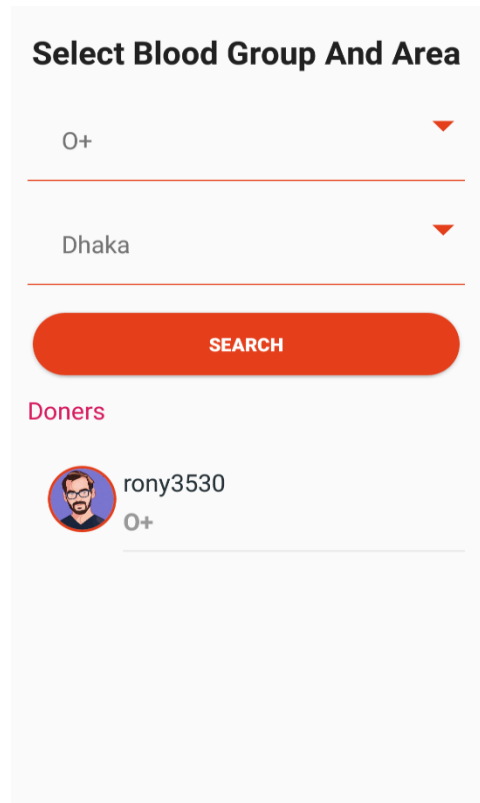

Figure 5. 7: Home Page.
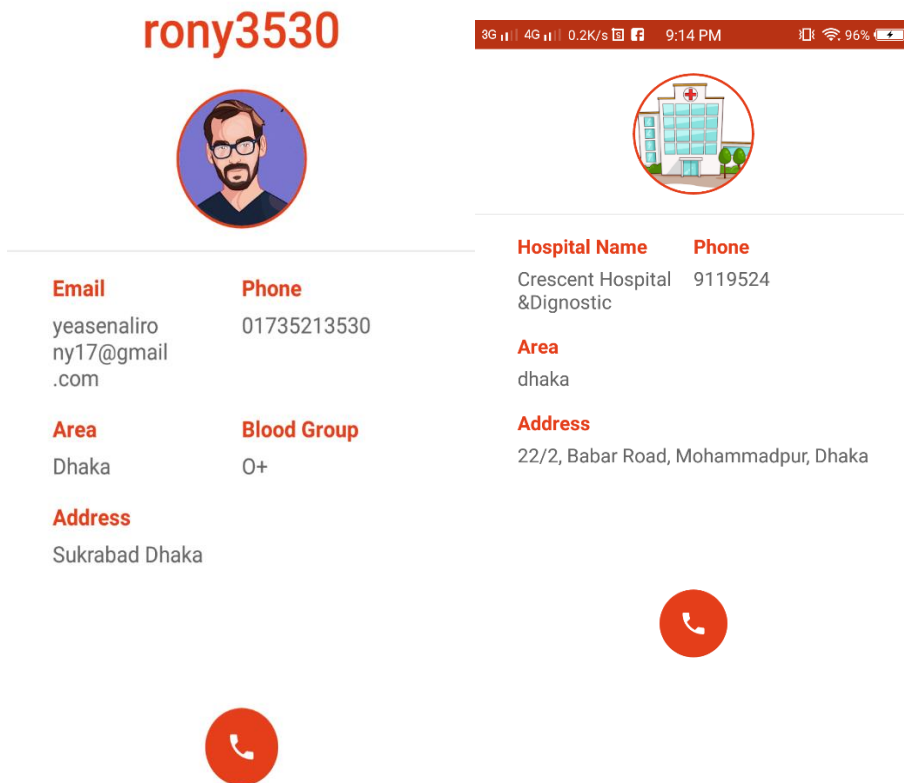

Figure 5. 8 : Search Field.

Figure 5. 9 : Profile Page

5.3 Implementation of Interactions

Here we have made a simple and easy way to interact with the application. User can log in if he or she has previously registered if a new user they can register. To find blood donor a simple interface has been created with search field. If user needs to find nearby hospital ambulance and fire service information they have to just click the nearby hospital ambulance and fire service button and to connect with the 24 hour help center user just need to press the emergency call button.

5.4 Testing Implementation

Testing is executing a system in order to identify any gaps, errors, or missing requirements in contrary to the actual requirements

Testing implantation is the process where a tester test the application. Through this testing we can come to a conclusion how our application is working. If we detect any problem we can solve the problem.

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5.4.1 Table

5.4.1 Table: Testing Implementation

Test Case	User Input	Expected Result	Acquired Result	Test Result (Pass/Fail)	Test Date
Login	Login email, password via	Successfully Log in	Successfully Log in	Pass	30-10-2018
Password	Wrong password	Warning With Wrong Password	Show Wrong Password	Pass	30-10-2018
Password	Right password	Successfully Log in	Successfully Log in	Pass	30-10-2018
Search	B+ ,Dhaka	Show profile information	Showing profile information successfully	Pass	30-10-2018
Call Donor	Search Profile	Call donor	Call donor	Pass	30-10-2019
Search Hospital, Ambulance and Fire Service	Mhommadpur	Show information	Showing information successfully	Pass	30-11-2018

5.5 Test Results and Reports

We need to create a test result in a formal way so that we can find out the test result in a very simple way. From the above test table we can come to a conclusion that our application is working properly.

Principles of Testing

All the test should meet the customer requirements

- To make our software testing should be performed by third party

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- Exhaustive testing is not possible. As we need the optimal amount of testing based on the risk assessment of the application.
- All the test to be conducted should be planned before implementing it
- Start testing with small parts and extend it to large parts.

Basically through test result we can decide how well the application is working.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

This is the last chapter of our project work, here we will discuss finally what we have manage to achieve and how it could have been more.

6.1 Discussion and Conclusion

Finally, we managed build our own application. It feels like a dream come true. When we first thought of this project we weren't fully sure of our self. Rick Conlow once said "Dreams Don't Work Unless You Do". If this application helps to save a human life we can think our hard work has been justified. Our first goal was to build an application which can be helpful for user in critical situation.

The application will come with more updates and new feature in future to help user in more way. We are happy and satisfied to be in where we have manage to reach ,without the grace of all mighty Allah nothing is was and will be possible.

6.2 Scope for Further Developments

This application has a huge scope to carry on with the digitalized world. We can provide user with many more assistance.

- Create IOS version for the same application.
- Provide user with live blood donor location.
- Send notification to same blood group blood donor.
- Create an online chatting platform.
- User can update his or last blood donation date.
- Collect data from blood bank all over the country.
- Proper maintenance and publicity.
- Create more user friendly UI in future.
- Keep upgrading the application with the time.

APPENDIX

Appendices A

Project Reflection: From Fall-2018 semester we started to work on our dream project to build an emergency situation based android application. We faced many obstacle throughout the whole journey. We followed the guidance of our respected supervisor and our determination made us to reach our goal. We followed the model to implement the project. It wasn't an easy journey to overcome but in the end it was an eventful journey.

Our main inspiration to build this application came through our own bitter experiences. We wanted to help user in an emergency situation, most of the time people can't take the best decision in an emergency situation so we just wanted to provide them with some better option. Our app will be like an assistant for the people. We have tried to reduce time for people to find blood donor. People can also find hospital, ambulance and fire service location and information through this application with short span of time and in the most critical situation user can connect with the government official help center where they can get any kind of help like ambulance, fire service and police.

We hope that our application would help people in the most needed time. We are going to continuously monitor the application and create new feature in future.

Appendices B
Combination and Acronyms
PC: Personal Computer.
UX: User Experience.
UI: User Interface.
JSON: JavaScript Object Notation.

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