Blood Donation

Submitted 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,

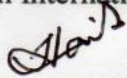**BANGLADESH**

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APPROVAL

This Project titled **"Blood Donation"**, submitted by Md. Milon Hossain, ID: 182-15-11603 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 02/02/2023.

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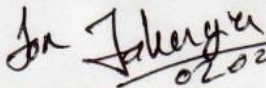Jahangirnagar University

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Abu Khalid Mubashshir Mahmud, 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

E-Health, sometimes known as "new horizons for health," is a branch of medicine that provides medical services through the utilization of mobile devices and other forms of electronic communication technology. Donating blood is a difficult and time-consuming process in the medical field since it requires finding a donor whose patient has a blood type that is compatible with the donor's own. Donating blood is a selfless act of citizenship, and the use of gamification features in blood donation applications can make the process more enjoyable for donors, especially young people. Donating blood has helped save the lives of millions of people. However, the real number of donations in our nation is not proportional to the amount that is required. Donations of blood continue to be the primary source of both whole blood and blood components in every region of the world. The blood in our veins is the most crucial component of our bodies. The global population is essentially permanently caught in a blood shortage. At some point, they will not be able to get enough blood to overcome their shortage no matter how much planning is done. There are a number of typical issues that blood searchers confront, including how to locate a donor and where most people donate blood. Blood Donation, an android app, is the most effective means by which a blood donor's issues may be resolved. Using the most up-to-date donor information, as well as other data collected in this submission. When an immediate transfusion of blood is required, we can use GPS to locate the nearest available blood donor. Once the user specifies the blood group that is needed, the app will locate a donor in the area and send them a notification. Better access to donor profiles allows for more efficient blood searches. By doing so, a person in need of blood can learn important details about a donor, such as their blood type, the last time they donated, and when they will be able to give again.

TABLE OF CONTENTS

CONTENTS	PAGE

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1
INTRODUCTION

1.1 Introduction:

We are living in an advanced world now where technology is everything. And it's getting advanced day to day. We humans are also welcoming the advancement of technology in our daily life to make it easier. As the technology is improving, we are also trying to improve ourselves. In a way so that we can use this technological advancement for the betterment of our society and country. The smartphone industry is one of the sector of advancement. A report shows that there are currently 6.37 billion smartphone users in the world and that's almost 50.9% people around the world. Another report that shows, in 2020 the smartphone users of Bangladesh are 53.3 million out of the total population of 64.69 million. According to statistics,

Android holds a market share of 75% globally with 2.8 billion plus active users, and in 2020 there were 2.95 million applications available in Google Play Store, and now in 2021 the amount reached to 3.48 million. From the reports we can say that, the usage and development of android application is increasing. In Asia region, the number of app developers are 760,000. If we talk about what encouraged us to develop blood related application then we would say, lack of blood some people lost their life and some lost their beloved family member and friend. From this, we came up with the idea to develop this application.

"Blood Donation" is a blood donation and emergency help related application. The users of this application are the admin and the blood seekers. The admin will have the control of all the functions in the application like — adding or deleting any kind of data, seeing the information of all the users etc. The blood seekers will be able to get information's about the blood donors. By using this application, blood seeker can easily find the desire blood group blood donor, and also they can find most needed information to reach the blood donor as soon as possible.[1]

1

1.2 Objective

The goals before the development of this application. Before the implementation we must set some objective. Without any goals, we cannot came up with proper outcomes. The objective of our application are-

- Help to find blood donor all over the country easily.

- Each donor will have an account and can update their status and availability.

- Anyone interested in blood donation can be a part of this application.

- There will be a newsfeed where someone can post for blood or a donor can post his/her availability.

1.3 Motivation

Blood donating is very big hearted work. This day's people's interest and engaging increasing. People who needs a donor post in different social media platform or call on number to many, it's quite hard to find a donor in time. Many organization working in this but there is not a good platform for sharing blood or communicate donors. For this we want to make a platform to make easy blood donating to save life.

1.4 Expected Outcome

Goals that we want to implement in the application. There are some expected outcomes of our application-

- Blood seeker will get the all-important information before him/her get touch with the blood donor.

- Get the convenient and satisfactory blood manage experience with listed blood donor.

- Also available medical emergency contact/helpline info.

- The most impotent blood donating organization info.

- Blood donation feedback.

- Authentication while login into the application.

1.5 Report Layout

This report contains six chapters, this segment will gives knowledge for all six chapters.

1. The initial chapter gives the Inspiration, Destination, Main results of the think about of this android application project.

2. In second chapter, we discuss about the related work. It gives us the issue and also it helps to investigate the issues.

3. Within the moment chapter, way of the systems prerequisite, thread handling model, diagrams, data flow models and framework engineering are discussed.

4. Within the chapter four, we shown are framework purpose plan, Graphical User Interface, back-end design plan, database plan.

5. Fifth chapter there is the database execution, investing, and testing

6. End of the chapter six has the conclusion, limitations of this application, and most important future study of this android application those topics are discussed.

CHAPTER 2
BACKGROUND STUDIES

2.1 Related works

There are some blood donation type's apps on Google Play Store those are developed by Bangladeshi developer for Bangladeshi people. We have installed them and take tour of this application to see the features and functionalities. Let's talk about some important features and functionalities of those application

The application known as "Blood Donation" is designed for use on android-based mobile devices that can be downloaded from the Google Play Store. The 'PlanetApps Team' is responsible for the development of the application. This application provides specific details on a wide variety of locations and sources of blood donations inside Bangladesh. When we use the application, we found that they also include important information about how to find a blood donor. The application does not show anything without internet.

The 'Blood Line' app for Android devices that can be downloaded from the Google Play Store. Crenipter Lab is responsible for creating the app. This software provides comprehensive data on several locations and potential blood donors inside Bangladesh. In order for this app to work, the user must first allow the app to access their location data through GPS after launching it.. After that when we use the application, we found that they also include important information about how to find a blood donor. But there is no advice section if any blood donor and blood seeker need advice they cannot get any advice from this application. This application is rated by 50+ users. But the application does not show anything without internet as like previous.

2.2 Comparative Studies

From our experience with the app, we can say that it provides its users with a number of unique and helpful tools in their quest for blood–

- There are things like a list of donors for almost every blood group.
- Determine where people can get blood.

- Donor information including but not limited to age, donation status, preferred method of contact, and length of service.

These are all that are necessary for the individual in need of blood to locate a blood donor. Although these applications are convenient, we found that they lacked key functionality, such as an easy account-creation process, throughout our testing–

- easy account-creation process
- Help desk
- There is no live tracking available
- the location at where the app is now being used will also change.
- Neither the blood donor nor the recipients are identified in any way
- There is no sign or button indicating that a blood donor is available.

2.3 Scope of the problem

In our application we have want to overcome the lacks of previous developed applications. We have create a system where a blood donor and blood seeker create an account easily. After these procedure a user can login into the application and they can see the main UI (User Interface) which is created for the user. As we wanted to save all the records for that we have used database. We wanted to make sure that a blood seeker can get all the major helps in a one place. To get a best blood donor we wanted to make sure they get everything within the application.

2.4 Challenges

As there are lots of travel related applications available, so that it's kind of challenge to develop something which is already there. The competition of android application development is also getting higher day by day. As enormous competition going on, the struggles are also infinite in developing android application. In this struggling situation we had to come up with new ideas or try to develop the existing ones in a better way. Otherwise it will be waste to develop one. We thought to develop our application like the existing ones, so we had to generate some new features.

It is common to every developer that, whenever developers want to develop or implement a system then they have to face some challenges. The challenges that we faced to develop the application are –

- Implementing the idea into a visual representing by using diagrams
- Collecting authentic data before development
- Making proper authentication when user tries to create an account and login into the application
- Getting the proper workable API to show the real time available data around the location on the map
- For the convenient use of the application we had to make sure the app is device compatible and fits on every screen

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Case Diagram

Static behavior alone is not enough to represent a system; rather, dynamic behavior is more crucial than static behavior when it comes to modeling a system. One of the five diagrams that may be used to depict the dynamic nature of an application written in UML is called a use case diagram. Since we are required to explain the fact that the use case diagram is dynamic in nature, there need to be certain variables, either internal or external, that are responsible for producing the interaction.

Actors are generally understood to include both internal and external agents. Actors, use cases, and the interactions between the two are what make up use case diagrams. For the purpose of modeling an application's system or subsystem, the diagram is employed. A specific aspect of a system's functioning may be represented by a single use case diagram.. [2]

Use case diagrams can be used for −

- An study of the requirements, as well as a high-level design.

- Create a representation of the system's environment.

- Reverse engineering.

- Forward engineering

Figure 3.1.1: Use Case Diagram

Blood Donation System

Login / Register or Edit Profile

2.0

Manage User Information

Login / Register or Edit Profile

userProfile

User 1

2.1

Manage Blood Request

User 2

Request for blood or find Blood Request

Blood_Req

Request for blood or find Blood Request

2.2

Manage Communication

Send or Received message

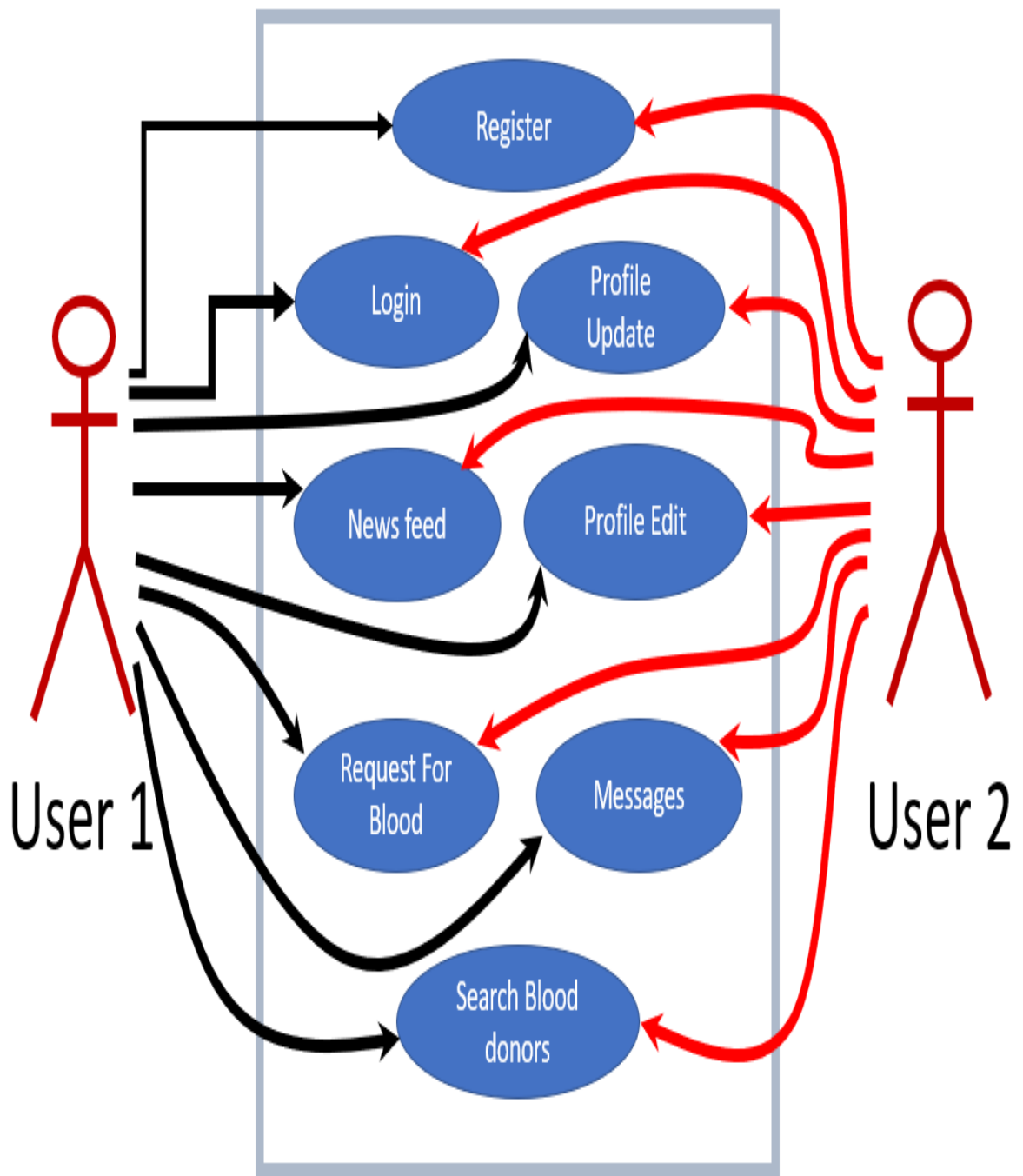Send or Received message

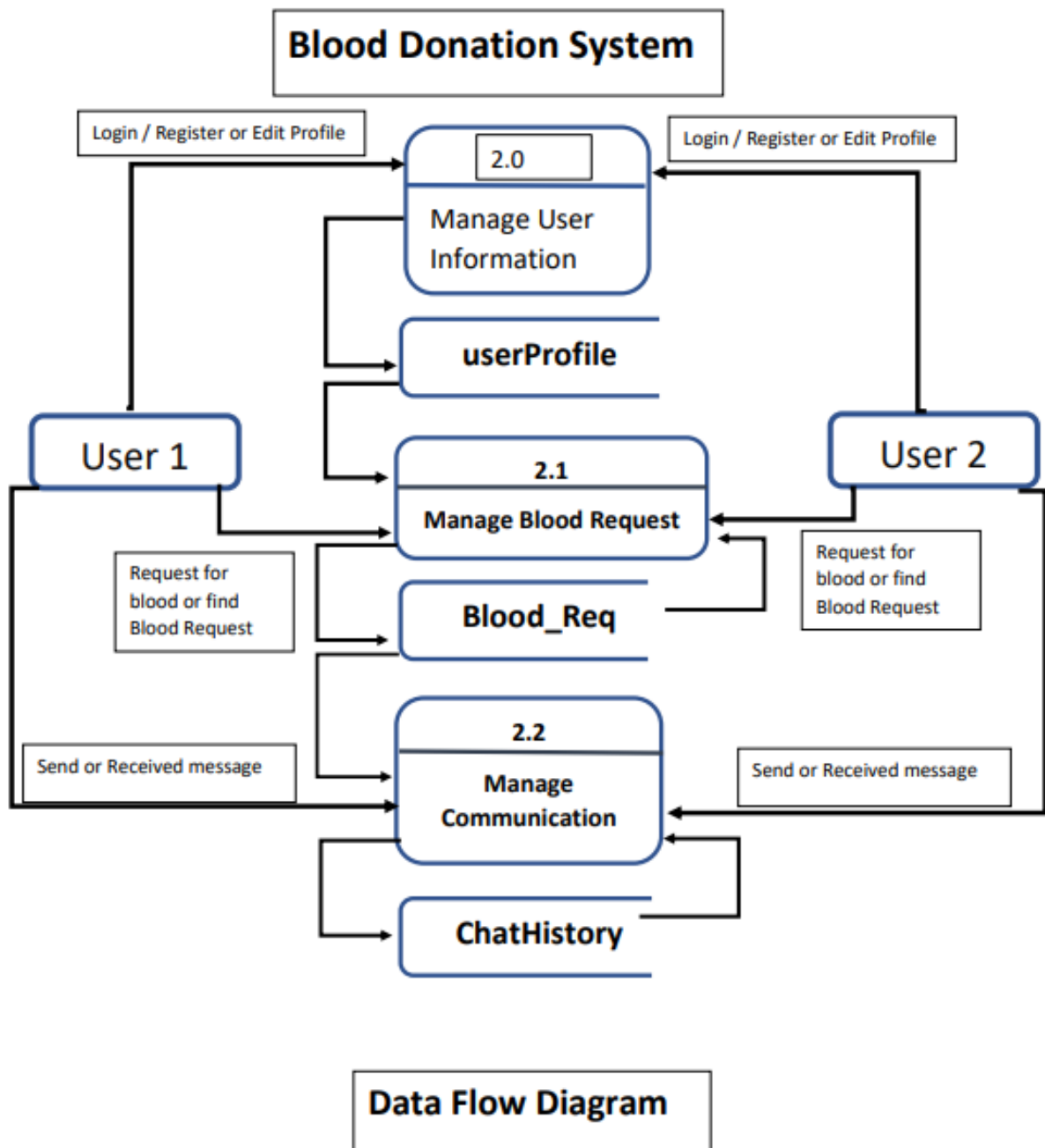**ChatHistory**

Data Flow Diagram

Figure 3.1.2: Data Flow Diagram

Table 3.1.1: Use case for Login Function

Utilize case title	Login
Pre-Condition	Have to register
Actors	Users
Purpose	For user security
Main Flow	1 – Homepage will show login page first
	2 – The system will required an email address and password
	3 – User have to enter required info
	4 – Click to login

User have an account to use this application. Without account none can use the application. Because there is no guest mode or demo mode. For this reason account is mandatory.

Table 3.1.2: Use case for User Sign Up

Utilize case title	Sign Up
Pre-Condition	Null
Actors	First users for secure login to the app
Actors	Access to the application
Main Flow	1 – Homepage will show Sign Up button
	2 – Click on the Sign Up button
	3 – System will require:
	• Name
	• Email address
	• Password
	4 – User enters the required info
	5 – Click to Sign Up button
	6 – Next page system will require:
	• Phone Number

	• Blood Group
	• City
	• Full Address
	7 – Then press Done button

Table 3.1.3: Use case for Make a Request for Blood

Utilize case title	Login
Pre-Condition	Must have login
Actors	Users
Purpose	Make Request for blood
Main Flow	1 – Go to home page
	2 – Press on Request icon
	3 – Then a user interface will appear
	4 – This will require:
	• Name
	• Phone Number
	• Blood Group
	• Hospital Name
	• Location
	5 – User need to click the Submit button.

Table 3.1.4: Use case for finding a blood donor using Live Donor Map

Utilize case title	Login
Pre-Condition	Must have login
Actors	Users
Purpose	Find nearby donor by Live Donor Map
Main Flow	1 – Go to home page

	2 – Then click on the hamburger menu, left side of dashboard
	3 – Then a navigation bar will come up
	4 – Click on the Live Donor Map at the navigation bar then the map will show that which donors are available

Table 3.1.5: Use case for Finding Blood Donor in Donor List

Utilize case title	Login
Pre-Condition	Must have login
Actors	Users
Purpose	Find blood donor in donor list
Main Flow	1 – Go to home page
	2 – Press on Donor icon
	3 – Then a user interface will appear
	4 – User can see the list of blood donor with Name, Phone number and Blood group
	5 – User also can use filtering option for finding blood donor according to blood group filtering, city filtering and doing both filtering at a time.

Table 3.1.6: Use case for Logout

Utilize case title	Login
Pre-Condition	Must have login
Actors	Users
Purpose	Logout or Exit from the app

| Main Flow | 1 – Press the hamburger menu, top-left portion of the application |
| | 2 – Click on the Logout. |

3.2 Logical Data Model

- Security: For utilizing this application client should have a checked record. Without a record, the client cannot ready to login to the framework. Due to this, the client likewise cannot access the highlights of the application gave by engineers. We guarantee confirmed clients for this reason we have decent security.

- Availability: Framework will be accessible on Google Play Store with standard updates. As it is practically an online-based android application thus a few highlights may not be accessible during disconnected

- Usability: The interface of our framework is extremely helpful, simple thus much basic. 15+ age, everyone can utilize it. The application is 100% easy to understand and less case delicate for eliminating unpredictability.

3.3 Requirement Collection and Analysis

We have utilized the Waterfall model as our framework improvement procedure. It is a straight consecutive life cycle strategy. The effortlessness of this technique is exceptionally high and comprehend to use for engineers effectively. [3]
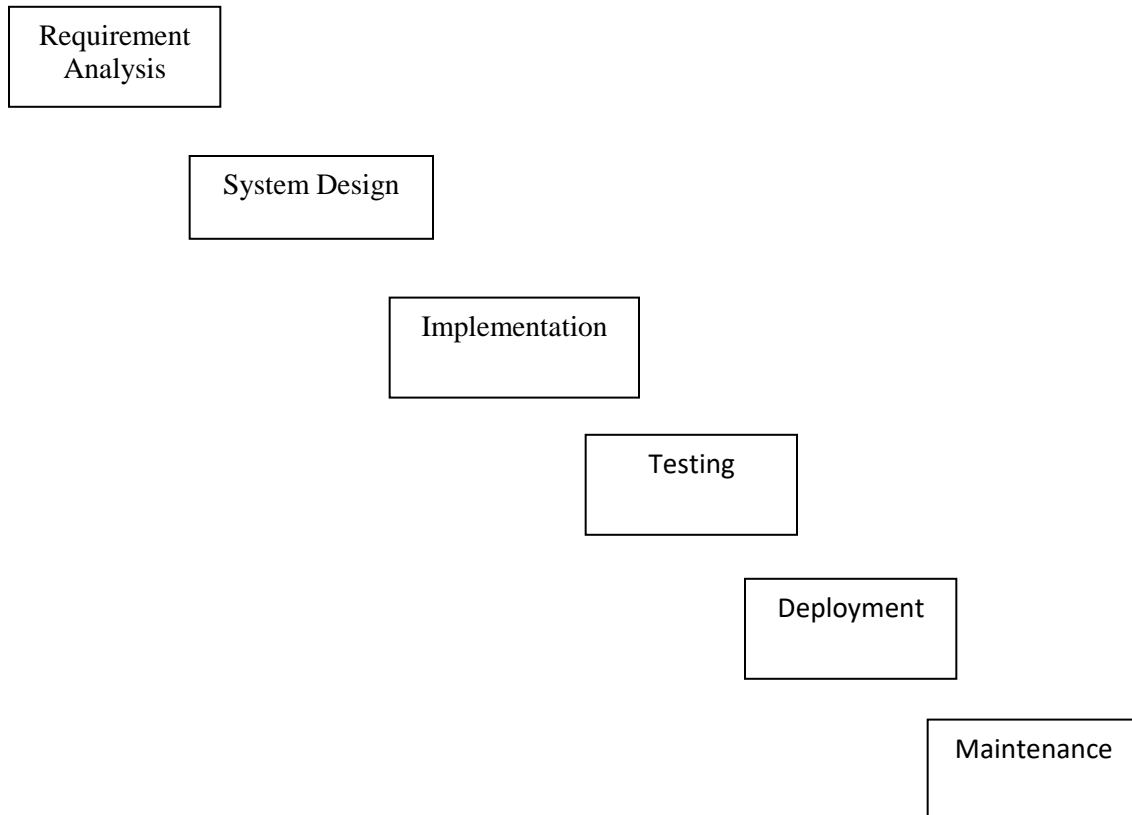
```
┌─────────────┐
│ Requirement │
│  Analysis   │
└─────────────┘
       ┌──────────────┐
       │ System Design│
       └──────────────┘
              ┌────────────────┐
              │ Implementation │
              └────────────────┘
                      ┌──────────┐
                      │ Testing  │
                      └──────────┘
                            ┌────────────┐
                            │ Deployment │
                            └────────────┘
                                   ┌─────────────┐
                                   │ Maintenance │
                                   └─────────────┘
```

Figure 3.3.1: Waterfall Model

3.4 Design Requirement

Design Requirement In order to access our program, which is an android app, our project is built on an online platform. We have designed based on user demand, where requirements are available and in a range.

CHAPTER 4
DESIGN SPECIFICATION

4.1 Front-end Design

It is the part of the app that users see. When a client opens an app, the first thing they see is the front-end design. The most interesting part of any website or app is the front end, which has things like colorful and elegant text, attractive buttons, images that scroll and slide, a navigation menu, and much more. Frontend developers must make sure that the look, behavior, structure, and content of an app match what the client wants. Getting people interested in a project can make it hard to design it. From our point of view, the designing phase takes more time than the building phase. The frontend of an application is where users interact with it the most, so it needs to look nice and respond quickly to keep users happy. Responsive application design means that the program can be installed and used on any kind of device and adjusts to the size of each screen. Along with responsiveness, application speed is also very important. For the app to work well on all devices, its responsiveness and speed must be the same on all of them.

We used XML to build the front end of our application. The word "Extensible Markup Language" is what "XML" stands for. Since this isn't a programming language, it is used to control how data is shown. Android XML does not make it difficult to design, but it does require time. In XML, designs are made with layout, view, and view groups. First, we need to set up a root layout. Then, we can put all implementations inside the root layout. Buttons, Text View for showing text, Edit Text for writing text, Image View for showing pictures, Web View for showing web pages, Fragments, and more are all put into place. 3. The view and view groups in XML are made up of tags. By dragging and dropping the view and view groups, we can also write tags in XML. When every design is done in XML, users may see a beautiful interface. [4][5]

A list of GUI of our android application-

Table 4.1.1: List of application pages

1	Login page
2	Registration page
3	Dashboard
4	Profile
5	Message
6	Feed of blood request
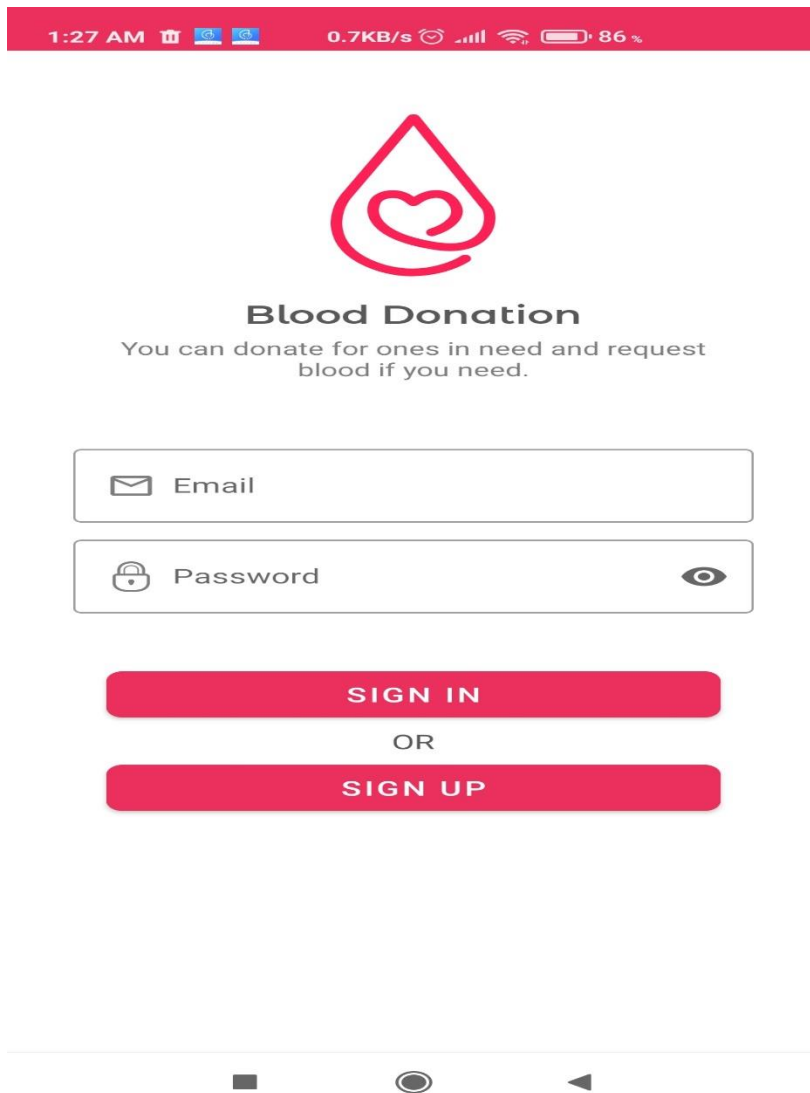
Figure 4.1.1: Login page

Figure 4.1.2: Registration page

Create Your Account

null
kobir0058bd@gmail.com

Phone
📞 01234567890

Blood Group | Select a Blood group

Address
📍 Kandirpaar, Cumilla

☐ Do you want to Donate your blood

OK, Done

Figure 4.1.3: Registration Details
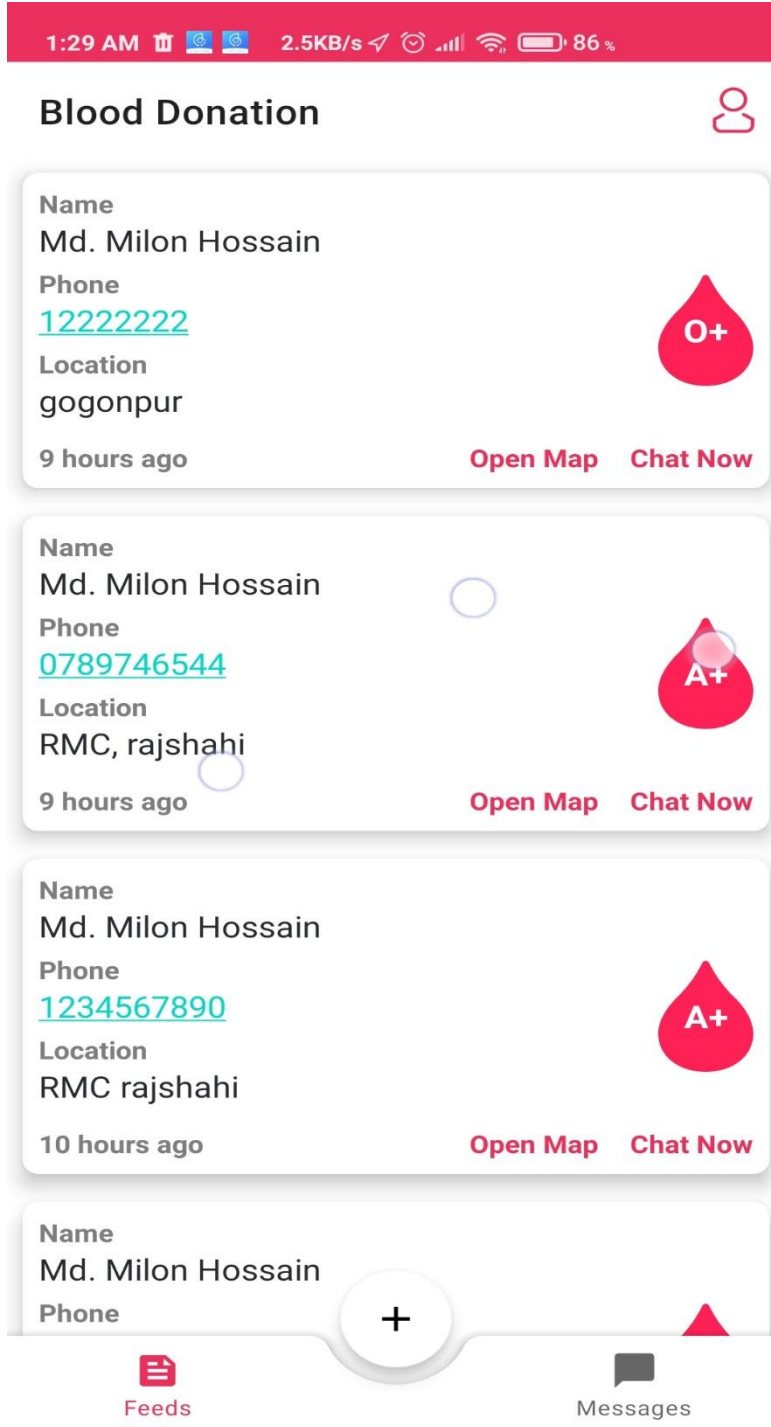
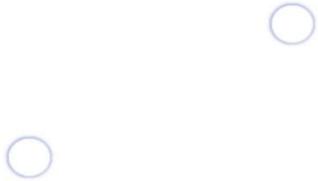Figure 4.1.4: Blood Request Feed
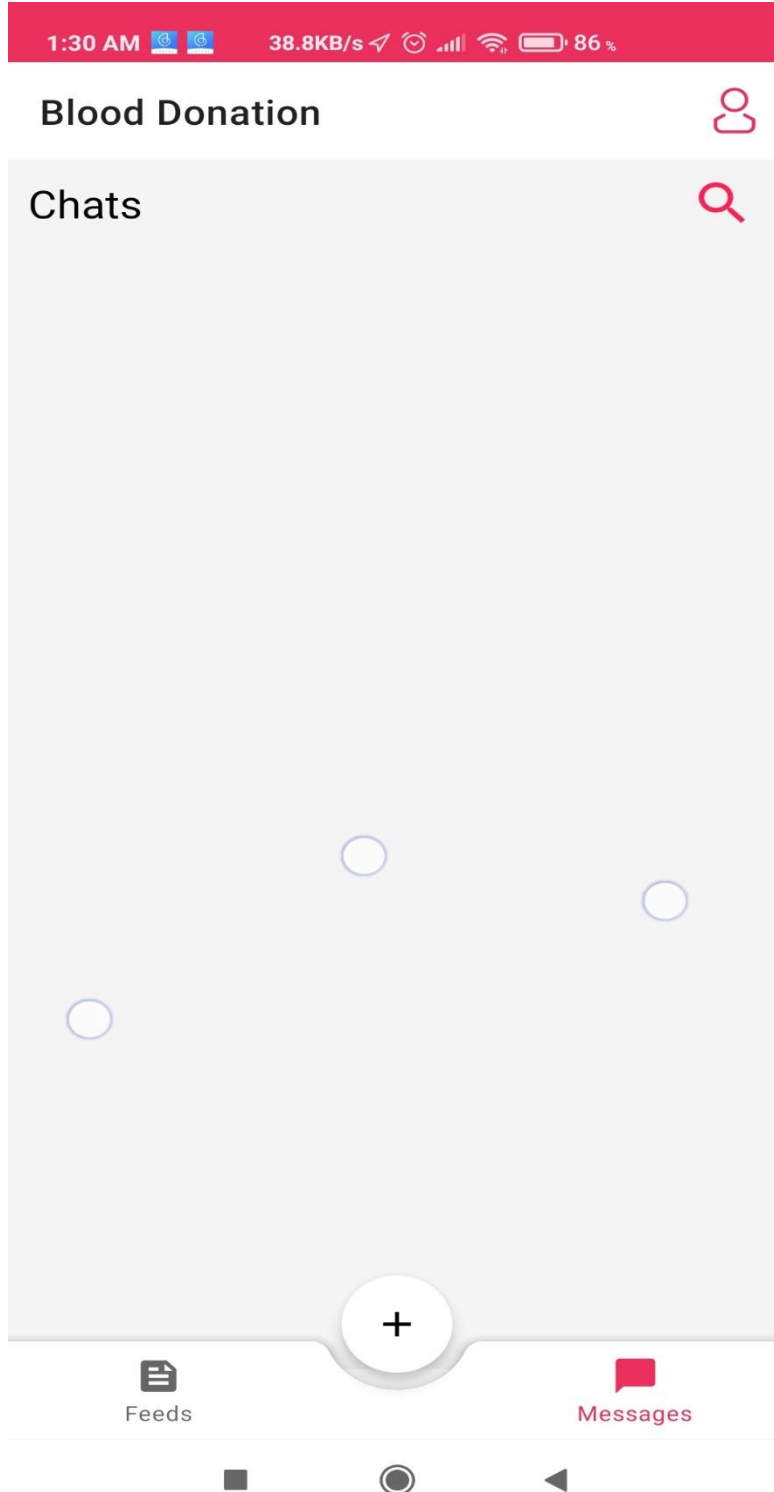
Figure 4.1.5: Blood Request

Figure 4.1.6: Chatting option

md. shariear kobir

🩸 O+

✉️ kobir0058bd@gmail.com

📞 01647600058

📍 pirganj, thakurgaon

☐ Available For Blood Donation

↪ Log Out

Figure 4.1.7: User Profile View

Figure 4.1.8: Edit Profile

4.2 Back-end Design

The design of the server-side part of an application or website is called the backend. In fact, on the client side, it is hidden from the user. Even if users can't get to the program's backend, they can still talk to the server-side in a roundabout way by using the front-end interface. The backend is where all of the data is stored, organized, maintained, and updated. Because everything happens inside a system for managing databases.

There are many well-known programming languages available today. Some of them are C, C++, Python, Java, PHP, and JavaScript. We are using the programming language Java to make the Android app we are making. It is an object-oriented language, which is a type of programming language. Java is the most popular language for backend development, and most people agree on that. It works with a wide range of operating systems, such as Windows, Mac OS, and Linux, thanks to the Java Virtual Machine (JVM).This is one of the most valuable advantage of Java and because of this advantage it is called as "Write Once, Run Every Where". Java also allows multi-threading. Multi-threading means that, multiple users can perform different task at once in the application. The server becomes receptive and the response of the application is also quick because of multi-threading. The main reason of Java being one of the popular language is it is supported by Google. Java is not so easy to learn and also building complex applications with it can be a problem for the beginners. Yet the developer build most of the applications with java. We have used Java as backend in our application. [7]

4.3 Implementation Requirements

There are the requirements to implement our project, [8]

Hardware specification,

Table- 4.3.1: Hardware specification

Processor	AMD Ryzen 5 2500U with Radeon Vega Gfx 2.0 GHz

Disk Space	50 GB of SSD and 655 GB of Hard Disk Available
RAM	8GB
Display	1920*1080
Graphics	NVIDIA GeForce GTX 1050 series 4gb
Mobile Phone	Xiaomi Poco F2 pro

Table- 4.3.2: Software Specification

Operating System	Windows 10 64-Bit
IDE	Android Studio
Database	Firebase Real-time
Web Browser	Google Chrome

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of database

We used Firebase as our database in our project. It's a backend service that uses a Real-time Database. Because the data changes often and the workload is significant, real-time databases require real-time processing. The stock market, for example, fluctuates on a regular basis. Real-time databases are utilized in banking, medical records, reservation systems, scientific data processing, and other applications. Transactions are now faster thanks to the Real-time database system. Because Firebase is based on Google's infrastructure, it is a NoSQL database that stores document data in JSON format. In the firebase database, there are a few crucial features. This real-time database's primary features include authentication, test lab, hosting, and alerting.[8]
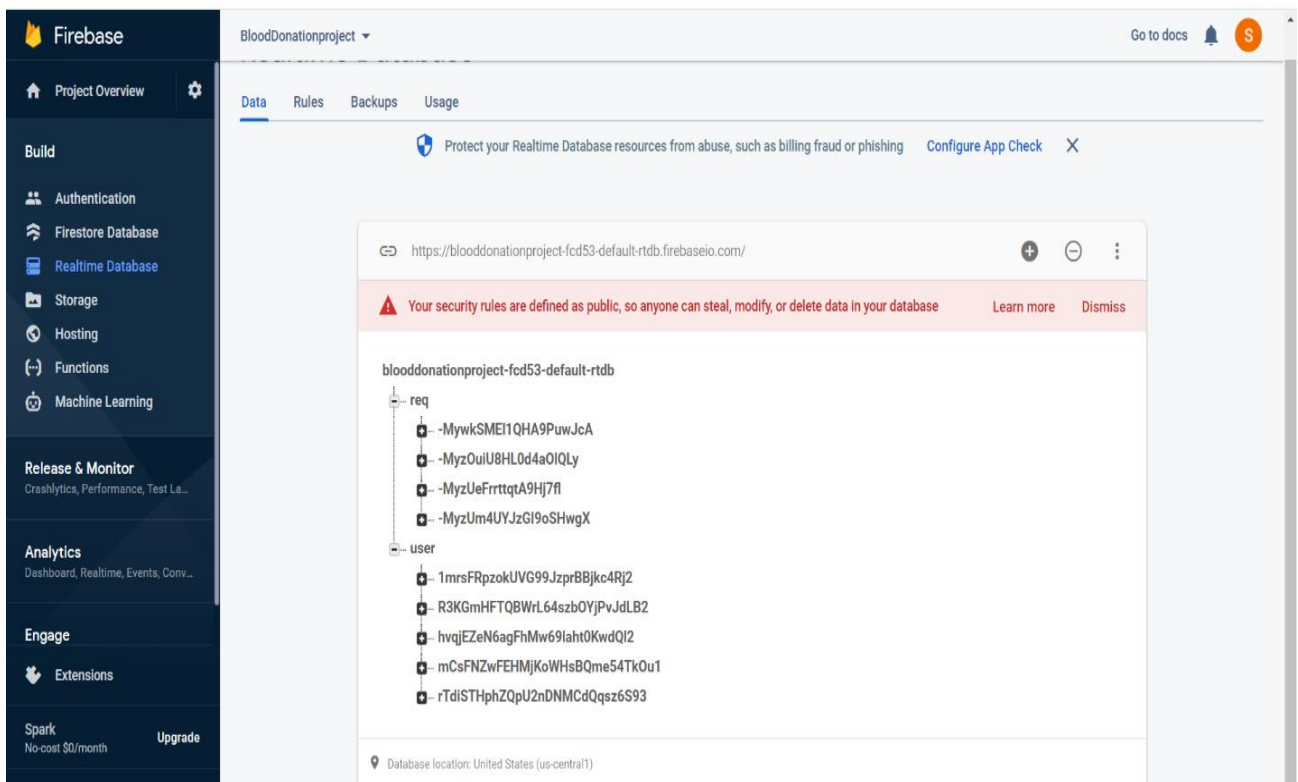

Figure 5.1.1: Database Implementation Model

Security Rules and Firebase Authentication: Firebase Security Rules provide access control and data confirmation in a structure that can accommodate a wide variety of complicated scenarios. Use Firebase Authentication in conjunction with Firebase Security Rules to create access systems that are both stoner- and part-grounded while still maintaining the security of your druggies' data. [10]

Identify users:

By authenticating users, you may learn which ones are trying to break your rules by looking at their IP addresses. There is the following data stored in the auth variable:

- **uid:** A unique user ID, assigned to the requesting user.
- **token:** A map of values collected by Authentication.

Leverage user information in rules

In practice, using authenticated information in your rules makes your rules more important and flexible. You can control access to data grounded on stoner identity.

In your rules, define how the information in the auth variable — the requestor's stoner information — matches the stoner information associated with the requested data.[10]

5.2 Implementation of Interaction

By implementing our application association, we make the application appealing to the user. The most crucial colleague is required for each user. By integrating the applications, we make our user affords easier and more secure. We finished our project with a basic symbol that may be used by a wide range of users.

Our project was well-designed, with all of the necessary elements for the user to engage with it with ease.

5.3 Testing Implementation

This is the most important part of an application. Without testing it none can say that their project or application is running without any error. For this reason we run our application in several devices. The testing parts are –

1. Internal Logic.
2. Input and output domain.

Table-5.3: Test Case Table

Test Case	Test Input	Expected Outcome	Actual Outcome	Result
1. Run the app	Uses some android OS phones	Run the application successfully	Run the application successfully	Passed
2. Try to sign in without info	Blank or incorrect address	Signing info must be needed	Invalid Email address	Passed
3. Username	Blank or incorrect address	Correct password must be needed	Incorrect password	Passed
4. Password	Blank or incorrect address	Correct password must be needed	Incorrect password	Passed

5.4 Test Result and Reports

Through the implementation of our application affiliation, we make the application more interesting and engaging for the customer. The most important and vital colleague is necessary for each individual customer. By integrating the apps, we make the job of our

customers easier and provide a higher level of safety. We brought our project to a successful close by creating an important picture that would be employed by a broad range of customers. Our enlargements were skillfully developed, and they included all of the necessary constituent parts so that the customer could easily lock in with it.

Chapter 6

Impact on Society, Environment and Sustainability

6.1 Impact on Society

It's can make our life more helpful and ease. The people of society can use this for any kind of blood needed.

6.2 Impact on Environment

It's don't effect our Environment.

6.3 Ethical Aspects

1. that donors receive some form of reimbursement.
2. that subsequent procedures, which inevitably incur costs, may involve considerable financial activity;
3. that legislation in some nations may allow trade in certain types of human biological material;

6.4 Sustainability Plan

- Update security system of this application according to global rules and regulation
- Solved if any kind of bug occurred

CHAPTER 7
CONCLUSION AND FUTURE SCOPE

7.1 Discussion and Conclusion

Both the Google Play Store and the Apple App Store now include a significant number of applications dealing with topics such as emergency assistance and blood donation. The rapid growth of technology has made it possible for us to save all of the information we require on our mobile devices in the form of applications.

Because everything now operates through the internet, we decided to base the implementation of our application on the internet as well. so that anyone looking for blood may access all of the information included inside the application with the assistance of the internet. When we put our plan into action, we kept the comfort of the people looking for blood in mind. We have included an area for comments in order to determine whether or not the people who are looking for blood and the people who donate blood are happy with the service. Considering the difficulty of contacting emergency services in an unfamiliar location in the event of a catastrophic event, we decided to build this functionality into our program. In the end, as a service provider to the people of Bangladesh, we intended to create the application so that blood donors and blood searchers in Bangladesh could be happy by using our android application. This goal was accomplished by implementing the application.

7.2 Scope for Further Developments

Our further development plan is to develop a website with the name of our application. Nowadays, every company or service provider has their own website, so we also want to develop one. Beside with this, we will continuously update our android application as there are some missing features yet needs to implement. And if our users find any bug in the application then we will solve the issue. Further we want to implement a section for the foreigners who need blood at his/her emergency situation. Our concern is also for the peoples those are lives in Bangladesh.

7.3 Limitations

As we know that there is nothing that is perfect. Every creation or development has its own limitation.

So that's way our project has some of limitations. Those limitations are-

- This application developed for only android platform.

- Features don't work without internet connection.

- One-Time Password (OTP) is not implemented.

7.4 Future Works

There are some features in below which will be implemented in future-

- Develop our application for iOS platform

- Update security system of this application according to global rules and regulation

- Optimize the UI and UX and make app faster.

- Make UI more attractive

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