Implementation of Android based Blood Donation Application

[1]D. Mahendra Reddy, [2]D.Architha Chaturvedika, [3]K.Naga Vamsi Krishna
[4]H.Rama Krishna

[1]Assistant Professor (Adhoc), Department of CSE, JNTUACEP, Pulivendula-AP
[234]Under Graduate, Department of CSE, JNTUACEP, Pulivendula-AP

ABSTRACT: *Blood Donation" is a mobile based project developed in Android Platform. This android project provides an easy and fast way to search for blood. This app enables users to find blood in emergency situations. Due to lack of communication, the blood is not available for the donors in emergency situations. Here Users can easily find the details of the donors through their mobiles. Users need to register with the application to get the details of the donors which are available in the app. Users can get brief details about the donor's contact details including locations. There are many donors who are interested in donating blood but there is no proper communication between the donors and receivers. The existing blood banking system needs a lot of manual work which takes a lot of time and physical effort. It takes a lot of time to get the information about the blood donors. In this application, the blood receivers get the details of the donors in a simple and easy way which does not take time and effort. Users can get the details of the donors including their mobile number, location etc. This application enables users to communicate with donors directly which avoids miscommunication. By using this application, we create a better platform for communication between donors and receivers which helps several patients to save their lives.*

INTRODUCTION:

Blood is one of the most important elements of the human body, and it's presence is crucial for the survival of humans, especially during medical procedures and treatments the availability of the required type of blood in the essential quantity is of utmost importance. The importance of blood and its components cannot be specified enough.

Every day we see a huge number of accidents, each day sees over 1200 accidents in India. And along with accidents, there are also procedures that have to be performed for unwell patients, which also require blood.

With so much importance lying on it, the methods for procuring and distributing blood are still crude. People all over the country are in need of blood, but there aren't systems that make it easy for people to acquire blood, and even though there are people willing to donate blood they don't have proper guidance as to where to donate blood. Another major problem is that in the case of an emergency if there is stock of blood in the blood banks, there is no common way for patients to acquire it or ask for it in the surrounding areas. There is no common method or platform that is generally acclaimed where people can go and look for the availability of the required blood and where people can list themselves as a donor in case of need.

Considering all these problems there is dire need of a method or a solution to ensure that

the people in need of blood have a way of getting it, and hence saving lives.

LITERATURE REVIEW:

From the time we came up with the problem statement to the time we started the development process we did a lot of literature surveys and research on how blood donation and blood distribution was being carried out around us. There was only the use of conventional methods such as calling people and asking for blood, which was a very time taking process and spreading of word through mouth which was also a time taking process.

Only hospitals maintained any form of blood databases and even that did not have any proper maintenance, they lacked the interoperability and were restricted only to the patients who only visited their hospital. And this was nowhere sufficient. And with the boom of mobile applications there are not many applications that help in addressing these needs in a proper way.

From all the existing applications we can find out that the user has not been given any kind of importance there. It's only the administration or blood donation organizations that actually have a control of the donor list, and in case a patient requires blood he has to contact them and wait for their response. And this is a problem that can be solved. Especially with each and every person owning a mobile device it's easy to let them have a platform where they can be in control and get the details of a donor who can provide them blood or in turn list themselves as a donor.

SYSTEM ANALYSIS:

To create a mobile application that can help people in finding blood donors around them and also allows to list themselves as donors if they are willing to donate blood.

The major objective of this application is to provide a platform that will act as a blood donors database where people could search for the blood group they require and find the results as details of people who have the same blood group and are willing to donate blood. This application shows results based on the locality from where the search is being performed showing the nearest results first. And it also allows people who are interested to donate blood to become donors so that people can contact them in case of a requirement.

Proposed Work: The application we're trying to create allows users to sign up and create an account. Then they can search for the blood group they require and the results would be

shown according to the location they are in. And it also allows users to sign up for an account and list themselves as a donor, so that people in need can approach them when there is a requirement that they can satisfy. The advantage of this application is that anyone can list themselves as a donor as long as they are willing to donate blood and people in need of blood can find they donors immediately with a single search, as it offers them every donor in their surrounding locations.

There are times where there is a tima factor for the acquisition of blood, and the conventional methods of calling and asking for blood among different hospitals, friends and relatives is a tiresome and time taking process, by which there could also be the loss of life. But this mobile application helps even in such situations, to put it perfectly it is exactly in these situations that it's efficiency would come out to test. And in these situations this application can help in the saving of lives.

We have decided to develop this project in the form of a mobile application considering that almost every person has a smart phone and it's only sensible to make a mobile application. And with the help of AngularJs and Android studio we have developed the build and the architecture of the application , and Google Firebase has helped

us in the authentication and the database storage processes.

Collectively with all the mentioned technologies we have made an application that is fast, efficient and serves a purpose.

SYSTEM DESIGN:

Data Flow Diagram: Data flow diagrams are used to graphically represent the flow of data in a business information system. DFD describes the processes that are involved in a system to transfer data from the input to the file storage and reports generation.

Data flow diagrams can be divided into logical and physical. The logical data flow diagram describes flow of data through a system to perform certain functionality of a business. The physical data flow diagram describes the implementation of the logical data flow.

In our application data flows from both the user sections into the same central database, for ease of understanding we have named that database "Blood Bank". The donors enter their data to the blood bank and the receivers search the "Blood Bank" for data about the donors.
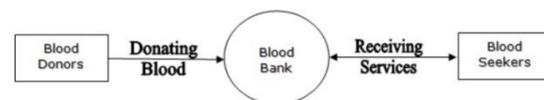

Fig-1: Data Flow

IMPLEMENTATION

Implementation refers to the process of describing how this application was implemented using the above mentioned technologies. That is how each part of the application was developed individually and how each technology helped in achieving the complete application seamlessly.

We will look over the implementation of the application by dissecting it into each individual major component.

Authentication

Authentication is the process of allowing a user into the system by providing them an unique identification that would help keep all of their activity and preferences in one place and help them in going through their tasks on the application with ease.

It is the act of providing an assertion , such as the identity of the computer user, by receiving a key value pair from them that helps them identify themselves uniquely. Username and password or Email and password are some of the most famous authentication methods.

We have the need of authentication to ensure that the users are allotted their respective use cases, that is the users have to be identified uniquely so that the details they enter, such as their blood groups and age and medical history, is attributed only to them, and there is no miscarriage of information.

For authentication in our application we have used Firebase Authentication, a free service provided by Google. We have chosen the Email and password authentication provided for Android.

●   Firstly we added firebase to the android project we were working on.

●   Then in the fire base console we approved the Email authentication.

●   Using the Firebase Android BoM, we declared the dependency for the Firebase Authentication Android library in your module (app-level) Gradle file (usually app/build.gradle).

```
dependencies {
    // Import the BoM for the Firebase platform
    implementation platform('com.google.firebase:firebase-bom:28.2.0')

    // Declare the dependency for the Firebase Authentication library
    // When using the BoM, you don't specify versions in Firebase library dependencies
    implementation 'com.google.firebase:firebase-auth'
}
```

Fig-2: Firebase Sdk Import

Becoming a Donor.

Becoming a donor is one of the important tasks in the application, and this is provided to the user with the help of a form, which he can fill. But the information that he provides is stored in the firebase realtime database.

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in realtime to every connected client. When you build cross-platform apps with our iOS, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates with the newest data.

The Firebase realtime database lets us store instances of data related to all the users, in nosql format and helps us retrieve it whenever we need it at an efficient pace. Similar to the previous authentication component, it works with the Firebase SDK.

● We need to configure the application with the Firebase SDK.

● Then in the Firebase realtime database console we need to choose the project we are working on and then choose a plan.

● Choose a region for the database. Depending on your choice of region, the database namespace will be of the form <databaseName>.firebaseio.com or <databaseName>.<region>.firebasedatabase.app

● Then we need to configure the Realtime database rules to suit them to our need.

```
// Set the configuration for your app
// TODO: Replace with your project's config object
var config = {
  apiKey: "apiKey ✎",
  authDomain: "projectId ✎.firebaseapp.com",
  // For databases not in the us-central1 location, databaseURL will be of the
  // form https://[databaseName].[region].firebasedatabase.app.
  // For example, https://your-database-123.europe-west1.firebasedatabase.app
  databaseURL: "https://databaseName.firebaseio.com",
  storageBucket: "bucket ✎.appspot.com"
};
firebase.initializeApp(config);

// Get a reference to the database service
var database = firebase.database();
```

Fig-3: Realtime database configuration.

Once we configure the realtime database to suit our needs, we can then store the information as we require it.

Receivers Search.

The receiver searches the database for the availability of the blood using the application and that we have achieved using Firebase Query. As we use the Firebase database to store the data, it also provides a feature called "Query" to search the database.

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 Queries are created by chaining together one or more of the filter methods defined here.

Using this feature we can enable the user to search the database for the required blood.

Other Features

Along with the features specified above, we also have additional features such as.

● Home : This is the home screen that the user is taken to when he logs into the application, it contains details of the user along with any history of blood donations and searches, along with some other information.

● Contact Us: This page contains the contact form, as we the developers are also acting as the admins here, we have provided a form to enable the users to contact us , so that we can receive complaints and any suggestions.

With the seamless combination of all the above mentioned technologies we came up with an application that is fully functional and exceptionally working to serve the users and solve the problem of a general user sustained database.

RESULTS: Sample Screens:
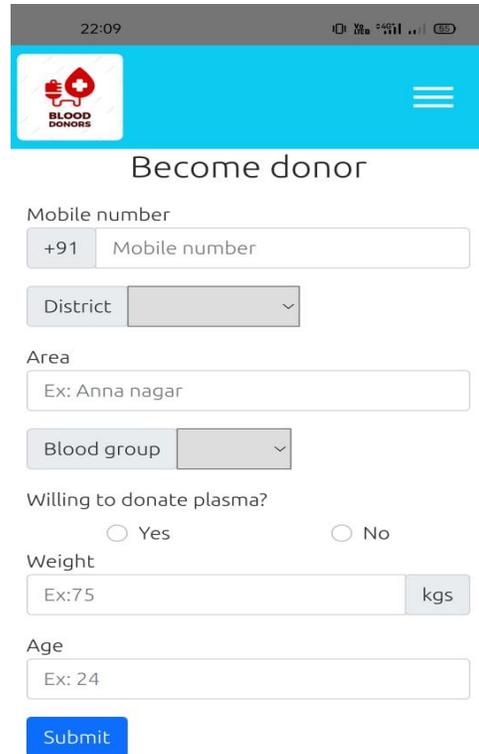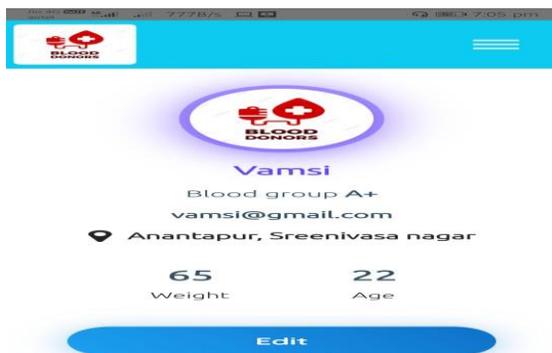
CONCLUSION

This blood donors mobile application aims at getting together people who are in need of blood with people who are willing to provide blood based on their locality. It enables any interested person to become a donor so that he could donate blood and it also enables people in search of blood to find out possible donors in their locality.

This application has its core functionality based on firebase so there is no problem of crashing , availability and security. It was developed using android studio and Angular

Js, so as to enable it to be hybrid. One major thing to remember here is that this application is crafted to ensure that it is self sufficient, that is one person is not responsible for feeding the donor data into the system while others search. This follows a crowd sourcing model where everyone can donate and receive at the same time, and in such applications it is evident that some misinformation, redundancy and frauds may tend to happen. But over all this application serves its basic purpose wonderfully.

REFERENCES:

[1] Firebase Authentication Documentation by google [online[

https://firebase.google.com/docs/auth

[2] Firebase realtime Database Documentation by google [online]

https://firebase.google.com/docs/database

[3] Android Studio Documentation by google [online]

https://developer.android.com/studio

[4] Angular JsDocumentation [online]

https://angular.io/docs

[5] Node JS Documentation [online]

https://nodejs.org/en/docs/