

Life Stream: An Android Application for Blood Donors and Recipients that Comprises of Search, Calling and Live Tracking

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Abstract- Our Android-based blood donation app keeps track of all volunteer blood donors and requesters. In an emergency, the application can send a post with blood type to all registered donors in exchange for a donation. We used the cloud computing to keep the application and user data accessible at all times and from any location. The main feature of our application is the ability for users to represent themselves as both a volunteer blood donor and a requester. Our application may aid in providing location and timely access to blood donors and requesters in order to deal with an emergency situation.

Index Terms - Blood transfusion, User authentication, Blood donation application.

1. INTRODUCTION

Blood transfusion is an important part of medical treatment. Each year, it helps save millions of lives in both everyday situations and emergencies. Despite advances in science, there is still no medical product equivalent to blood, blood components, or blood-derived products. Only living donors can donate blood. Every year, blood transfusions save millions of lives around the world. However, the quantity and quality of blood available for transfusion remains a serious problem worldwide, especially in developing countries. In addition, it improves life expectancy and quality of life for patients suffering from a variety of acute and chronic illnesses. Voluntary blood donation is the basis of blood donation services. Volunteer blood donors are a major source of well-managed blood supply chains. When supplies are exhausted, only those who come to the health centre and donate blood voluntarily are the only source of blood

donations in an emergency. Attempts can be made by providing a platform for people in need of blood to contact them. In urgent scenarios where blood cannot be delivered from blood bank inventory, smartphone applications will be developed to help find and interact with the closest available volunteer blood donors. Applications can utilize cloud computing services to send posts to all registered donors for donations, along with blood type and user details, while providing access to application data anytime, anywhere. The app has two domains, donors and recipients, both of which can post to both requests and donations.

2. PROBLEM DEFINITION

Due to the recent global crisis, there was a shortage of blood for several people all around the world. Several people lost their lives due to the pandemic being the reason, people became unwilling to make contact with other people. Most of our activities were thrown out of cycle and wide donation of blood seized to happen causing the blood banks to run low on blood supply. When there is low supply of blood, there is nothing that can be done to prevent and emergency situation. So, there is a need for proper blood supply and also in an emergency situation. In a well-managed blood supply chain, volunteer blood donors are the primary source of supply. People who come to the health centre and donate blood voluntarily will be the only source of blood supply in an emergency if the stockpiles are depleted. An attempt can be made by providing a platform to people in contact who are in need of blood.

3. PROBLEM OBJECTIVE

The objective of this proposed system is to provide a proper platform for contacting donors in any emergency situation. It not only provides user details but also the real time user location. This makes access to blood supply easier. Our system also provides details of nearby blood banks and blood donation camps. The application architecture allows you to store real-time data, blood requests, and contributions from users. The purpose is to make blood donors available to the general public in real time. This is an online blood financial institution system running on the Android platform. The Android app helps user's view and access records, including the birth of blood donors. The app contains the donor's name, address, contact information, and blood type that are available near the donor.

4. METHODOLOGY AND ARCHITECTURE

The proposed architecture of the blood donation application is shown in Figure 5.1. It can be divided into three sub-components: voluntary blood donors, cloud computing, and blood requesters. Every time a user requests blood, it is stored in the cloud and shown in the post feed. Donor can visit the post feed and contact the receiver by calling and tracking them. Donors can also broadcast a donor post so that receiver can easily access blood group related profiles. Our application can also filter out post feed using the search filter. This makes it easier for the receiver and donor to search for respective blood group when in need. With the advent of Android, it's amazing that smartphone devices have more applications than their predecessors and are published on the web via the handheld devices of many people around the world. At the same time, the main goal of "Hospitals and Blood Donor Locators" is to expand the utility that allows consumers to see nearby hospitals.

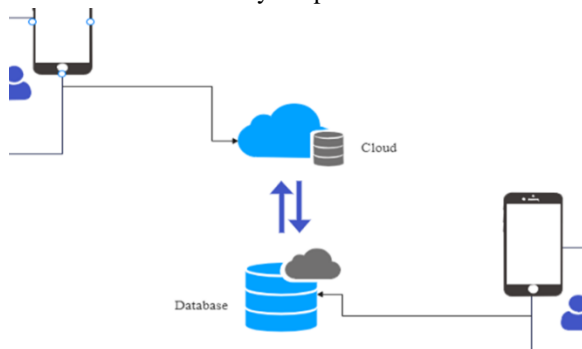


Fig 1: System Architecture

Our Requirements lie in terms of:

Communication (request, donate, post):

A well designed and maintained system is needed to allow users to create account and store information so that it can be shared later on with other users. Users also need functionality to make request or respond to request and a notifier to update any information.

Data Storage (account, form data, real-time location, chat data):

A secure database to store different attributes that are required for the application. For example, like User Account information, User request data and the relational data with other user when request or response happen. A complete history of any transaction happening.

Computation / Processing (real-time location, API data handling):

All the part of processing the data will happen on the cloud. Creation of user account request is handled by cloud platform and data relating to request and responding to the request data is the processing job of the cloud. The cloud is responsible for any computation happening within the server.

Tools and Technologies:

1. Designing & Blueprint:

Figma: Figma is an interface layout software that runs within the browser—however it's certainly plenty more than that. I might cross to this point as to mention its probable the nice software for team-primarily based totally collaborative layout projects. Figma offers you all of the equipment you want for the layout segment of the project. Including vector equipment which might be able to fully-fledged illustration, in addition to prototyping capabilities, and code era for the hand-off. In Figma, the layout tab permits you to view, add, take away or extrude the homes of items inside your layout. Firebase real-time databases are cloud-hosted databases. Runs in the cloud and gets permission to deliver to consumers as a service. Saves data in JSON (JavaScript Object Notation) format, which is the standard for saving and sending data. All connected users can access the data in real time.

2. Development IDE:

Android Studio with Java: Based on JetBrains IntelliJ IDEA software and customized specifically for Android development, Android Studio is the official integrated development environment for Google's

Android operating system. In particular, there are some gears that make application development much easier. This includes the ability to preview the application on special smartphones and tablets, understand what the code you are modifying will look like, and how it will look in different forms. Of the expression that exists. The Android application is written in the Java / Kotlin language, but you will need to compile it later to leave a single .apk report. This last step is easy in Android Studio. Let's say the brand new IDE is much more familiar and easier to use than Google's previous SDK.

3. Cloud Provider:

Firestore and its console: Firestore is an app development platform that helps you create and scale popular apps and games. It uses Google and is used by millions of companies around the world. Firestore Authentication provides a back-end service for authenticating users in your project, an easy-to-use SDK, and a ready-to-use UI framework. Accept passwords, phone numbers, and well-known federation identity providers such as Google, Facebook, and Twitter. Firestore Authentication is tightly integrated with other Firestore services and uses industry standards such as OAuth 2.0 and OpenID Connect to simplify integration with custom back ends. Firestore Real-time Database is a Cloud-hosted database, i.e. it runs on a cloud and access to the user is provided as a service. It saves data in the JSON (JavaScript Object Notation) format, which is a data storage and transmission standard. All users linked to it have real-time access to the data.

4. Additional:

Google Map API: A map is a symbolic representation of a space that emphasizes the connections between objects, areas, or themes. Many maps are static. H. Paper and other permanent media, but others are dynamic and interactive. The Google Maps API key is a unique code that enables you to use Google Maps on this website. With API access, you can take advantage of the free tier of Google Maps Search. Usage in excess of your quota will be charged to your Google Account immediately. Add maps to Android apps, including WearOS apps, using Google Maps data, map display, and map gesture responses using the Maps SDK for Android. You can add markers, polygons, and overlays to your map to provide more information

about the location of your map and make it easier for you. The SDK includes support for Kotlin and Java programming languages, as well as libraries and extensions for advanced features and programming approaches.

Flowchart design:

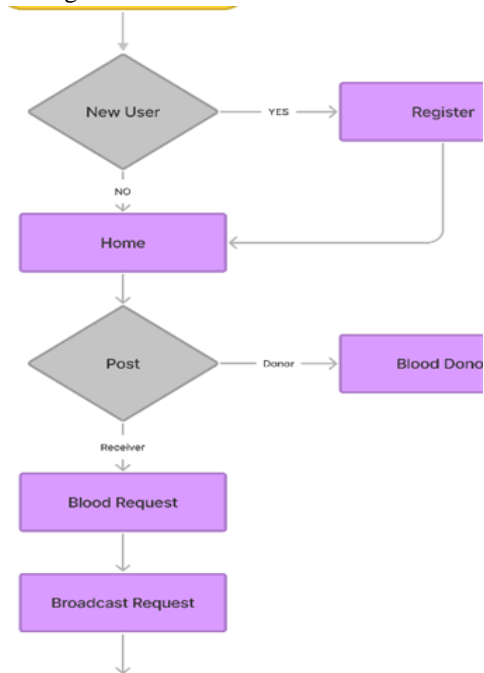


Fig 2: Flowchart for Application

5. Result and Output:

This is the initial page the user sees when he first opens the app, following which he must register. When a new user installs the application, he/she has to register as a new user by providing details and phone number. To authenticate your users, you only need to obtain the user's login credentials and send them to the Firestore Authentication SDK. These credentials are email addresses and passwords, mobile numbers, or tokens from identity providers such as Facebook, Google, Twitter, and GitHub. When you submit your credentials, Firestore validates your credentials and receives a response indicating whether authentication was successful. When the user (donor or blood donor) enters the required data such as phone number, address, and blood type and presses the register button, all the data will be transferred to the database.

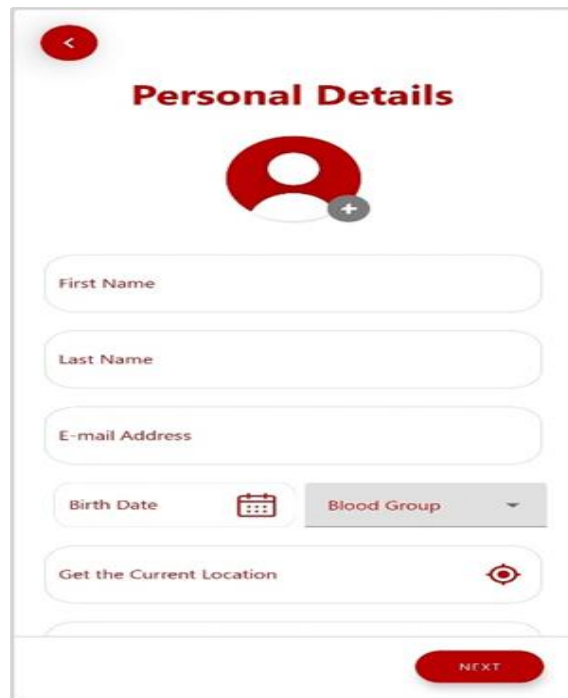
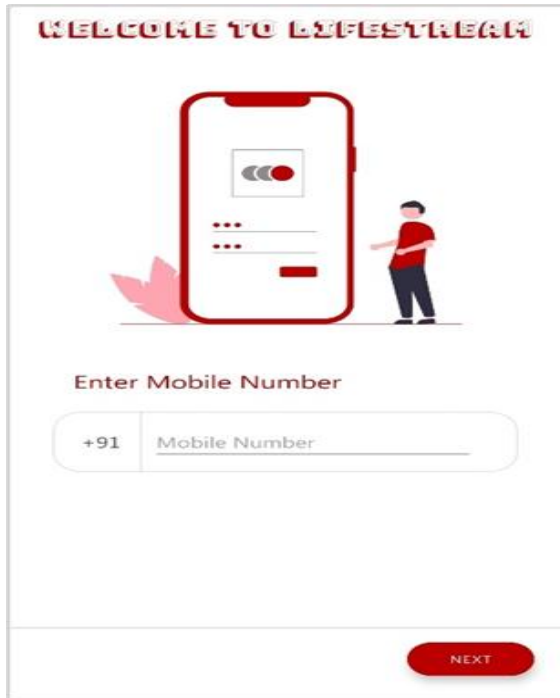


Fig 3: Register and Login

After a logging a user lands on a home page which consists of a profile card and three-tab section which includes featured news, nearby donation camp, nearby blood banks. This page also consists of bottom navigation bar which helps in switching fragments. User can access their profile details and settings in the

profile section. User can logout under the profile section.

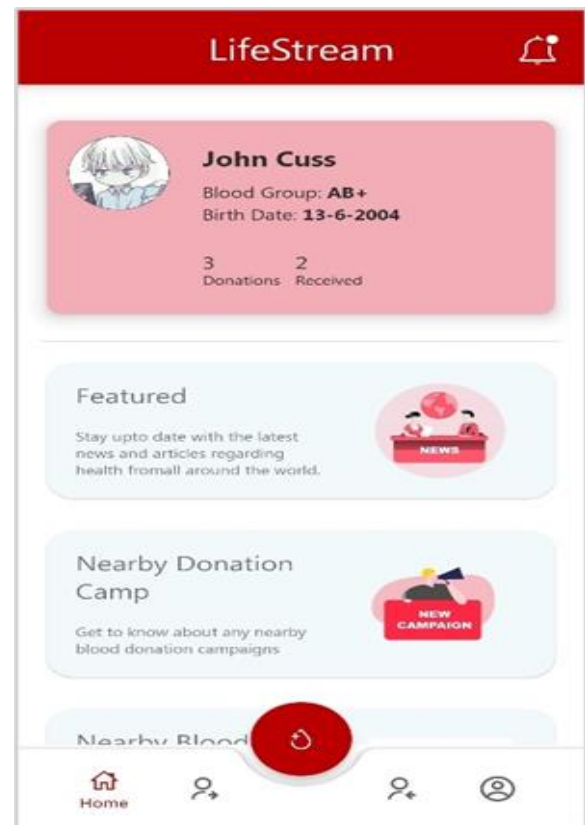
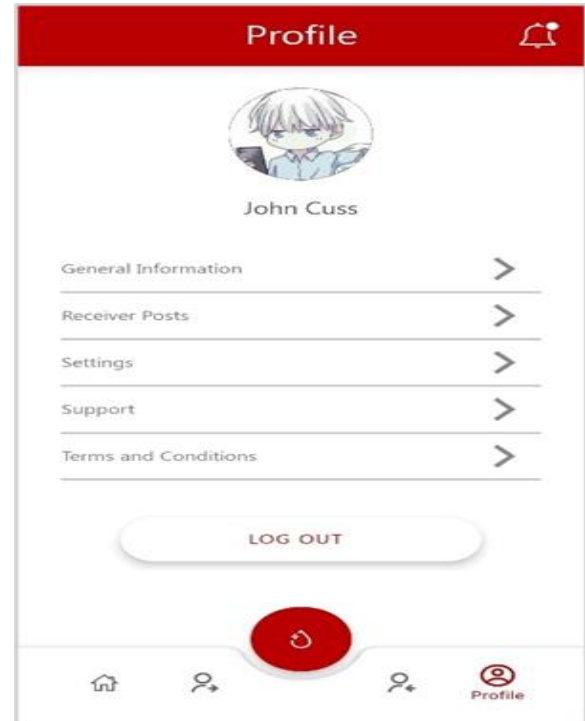


Fig 4: Home and Profile

Whenever a user is need of blood he/she can create a post by filling the necessary details such as blood type required date time with a small necessary details. The created post will appear on the donor or receiver feed.



Fig 5: Post and Create Post

After posting, the post appears on the respective feed where user can access the details of the respective user. User can also use search filter to filter out the required need.



Fig 6: Donor and Receiver Feed

User can contact using given phone number. User can also access real time location of another user using google map provide by Google Map API.

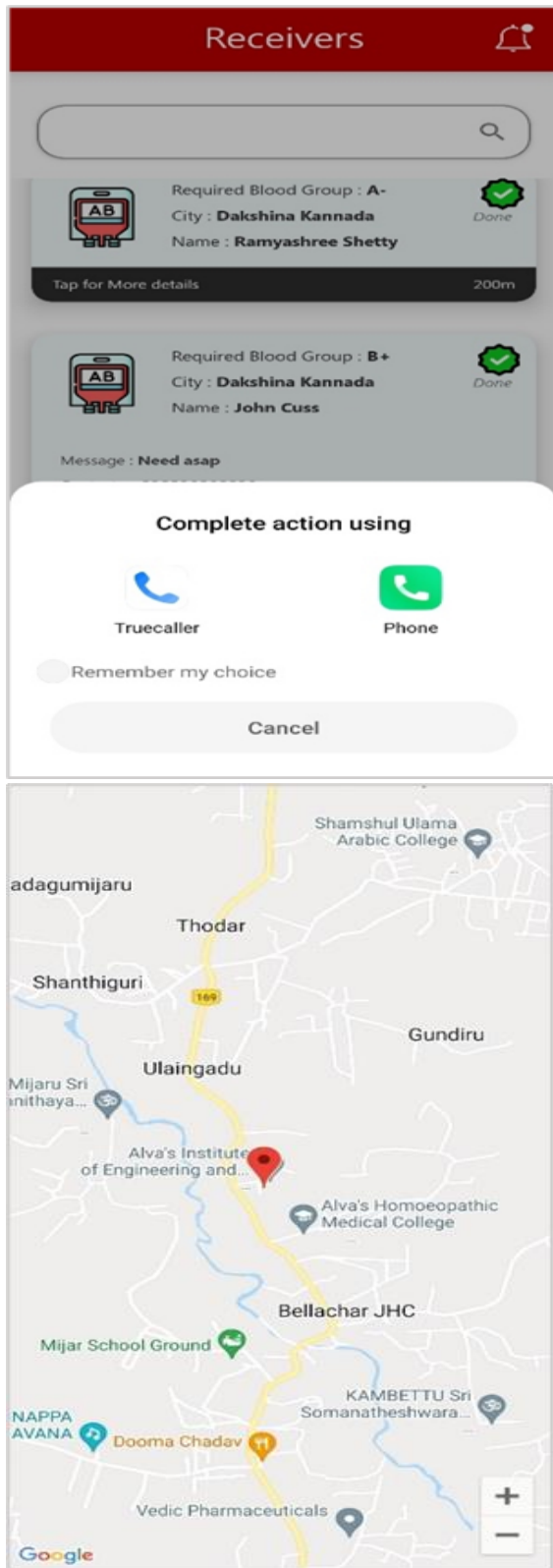


Fig 7: Call and Track option

6. CONCLUSION

To provide user-friendly interfaces, the suggested architecture uses the design concept of human-computer interaction. We should not be shocked by many researchers working in the field of technology that care about health, which is the basis of human life. Our proposed system provides an easy to use interface which makes it easier for a common man to use our service which provides all the necessary services for blood donation service. The outcome of this Project will provide a platform that connects people who are in need of blood with people who are willing to donate blood. Amidst the pandemic that is happening, this will provide a way of avoiding much physical contact and provides the necessary information through the platform it is going to provide.

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