

## Blood Donor App: A Small Step to Save the Life

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**Abstract-***Blood donation is life saving act which can save life and as well as provide a relief to those people who are under long term treatment. This treatment may depend on the regular blood transfusion. A healthy person can donate blood once in every three to four months for treatment of any patient. Blood banks are well-known for supplying bloods to save people. But this system cannot be able to procure blood for longer period of time. Blood banks will have to dispose of the blood that is not used within 42 days, which is a colossal waste. Even sometime it fails to provide rare blood group on the spot. Blood Donation mobile application is developed to help people who are in need of blood. It provides the information about the people who stays in close proximity of the requester and willing to donate blood.*

**Index Terms :** *Blood donation, Blood donor, Haversine Formula, asort function*

### 1. Introduction:

In case of an accident, medical emergency or excessive blood loss of any person can create put their life in danger. In such cases, the care taker /relatives will be panic and distressed. They will be in search of blood or donor for saving the life of the patient. Blood transfusion from one person to another can save the life. During such critical situation, there is a possibility that donors and receiver's blood group may not match or else blood donor is not available. In some cases, shortage of the required blood type also found in

the blood bank. Blood cannot be stored for a long duration of time, typically it can be stored for 42 days [1], and this leads to force blood bank to maintain limited stock of blood. Most of the time blood will be available in blood bank, but they insist for an alternative donor to be arranged for replacing the required quantity of blood, which is a tedious process. These all situation may make create a chaos for the patient and their relatives. They may become worried and may go under depression. The proposed blood bank app aims to make this process easier by allowing the people who are in need of blood to locate and contact the donors who are able to donate the blood. It allows Donors and the needy person to register and maintain their details. Whenever a request for blood will be arise, based on the location, it will find the details of the donor and update the person who is in need of the blood. It is an attempt to create a bridge between a donor and requestor in their vicinity.

### 2. Literature Survey

In medical emergencies, blood transfusions are often considered the only way to save an individual's life .A sufficient supply of donated blood is thus literally a matter of life and death. The amount of blood donated by a single person is very small. It is well known that blood cannot be produced artificially, and it can be stored for a

short period of time. Therefore, to meet the need for blood, a wide and healthy base of donors can be able to give blood whenever required [2]. Thalassemia, Sickle Cell Anemia, Liver Disease, Bleeding disorder, Thrombocytopenia, Von Willebrand Disease kind of disease demand huge amount of blood. Due to scarcity of blood or unavailability of the rare blood type sometime even blood bank may become helpless to avail blood [3].

There are many web based system are existing where user who is in need of blood, have to login to the respective website and search for the specific blood for different blood banks. It found that these blood banks may be not available in their locality or he may have to pay them [4].

An application “Blood Bank” created by “B corp” allows user to register them to donate blood, they will store their name, city and the pin code of the area where they live. Due to static data storage behavior of application, it will be not be able to updated the database based on the movement of the donor [5].

Indian Red Cross Society (IRCS)’s blood bank app allows user to store blood in an actual blood bank and transfer it to other people at the click of a button or to withdraw blood themselves. User can only withdraw the exact amount of blood that he has donated. Even though this application is similar to the one being already developed, it involves exchange of blood and does not provide provision for blood donation. It does not extend its services based on location specific search [6]. All these problems and limitation of existing system create an opportunity for an application that would create a dynamic supply of blood whenever its needed. It will fulfill the need for supply and avoid the need for storage and wastage of blood. This can be resolved by creating a mobile application that can allow a user to create an alert requesting for blood, and allow the surrounding available donors to respond.

### 3. Proposed System

The Blood donation app provides simple mechanism for users to share and acquire knowledge about blood donors as and when required. This app is built on android Operating System. Android application uses xml files to

create the layout of the application. Android studio makes use of the java programming language to function and to perform computations.

Although there exists an implementation of SQL called SQLite in android, it does not allow to employ persistent and centrally store data, i.e. the data is stored temporarily in the device and each device will have access only to its own data. This will not allow the data to be stored on a centralized server. To overcome this limitation client-server module architecture has been adopted where the mobile app plays the role of the client and the server has the database and a few computational scripts written in PHP. The only need is to store the details of the donors and the details of the requesters are required which help in computation of distance.

Blood donation app built on client-server model [ Fig 1]. Here, the applications act as the clients and the server handles the interaction between the clients and the database server. Each client app can act as both a donor and a receiver. Once a user registers as a donor, this application runs a background service to monitor his location continuously. Server side script also calculates the distances between the users and sends response to the requester.

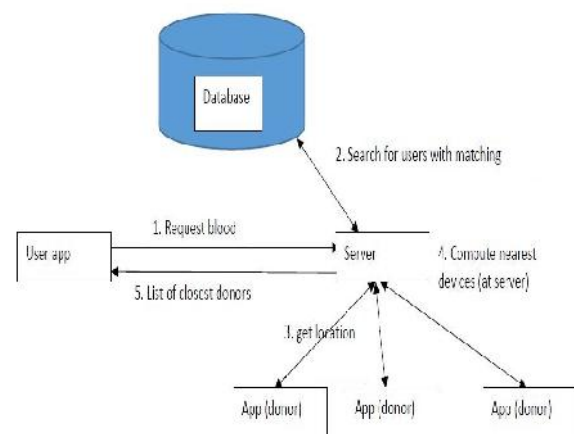


Fig 1: Architecture diagram of the application Major modules of Blood donations application are

- **Donor module**

The donor module handles the registration of the donor. Here, through the app interface user provides information, and it transfer these data to the server through a HTTP POST request using

volley [8]. On the receiving end, server contains a script written in PHP to store this data in the database. A background process runs even the application is not in the foreground. This process implements the location listener API [7] and listens for changes in the location of the mobile device, whenever mobile device moves more than five kilometers and it updates the location of the donor in the server.

▪ **Requester module**

The requester module accepts user information such as name and blood type. It has its own implementation of the location listener class that enables it to pinpoint the location of the device up to 50 meters. This data will transfer to the server. The requester module also displays the response received from the server in the form of a list.

▪ **Server module**

The major responsibility of server is to accept requests from the requester module and identify the nearest donors for the requester. Initially database querying statements are used to extract compatible donor set from the database. The Haversine formula [11] helps to compute the distance between each donor and the requester in the later stage. Resultant data will stored in an associate array along with the id of the donor as a key, this array is sorted using asort function and response will be sent back to the requester in the form of a list of twenty donors who are present in close proximity of requestor [9].

**4. Features of proposed system**

The following are the main features that are included in the blood donation app:

- **Wide platform support:** This application is designed for android nougat devices and it is also compatible with earlier version till android ice cream sandwich. This covers 97% of the devices in the market.
- **User account:** The user can register this app through Google account. This helps to provide authenticate data of user.
- **User support:** A large number of users can register and make use of the application and it is highly scalable.

- **Donor search:** A modified version of the common Euclidian formula is used to search for the nearest donors.

- **Donor sort:** The sorting of the donors list is done using a highly efficient algorithm to provide optimum throughput by making use of minimum resources.

**Location update based on distance:** System will consistently monitor the location of the Donor, if it finds the distance between registered location and present location is more then 5 km , It will update automatically to the server.

**Active/In-active Donor:** In case Donor has already donated blood or undergoing any medical treatment, then he can de-activate his status temporarily. His details will be maintained in the database. During this time donor details will be not visible for requester mobile. Later whenever he wants to donate, can activate his account

**5. Result**

Donor will register himself using his gmail account ( in Fig 2 ) and update his details (in Fig 3).

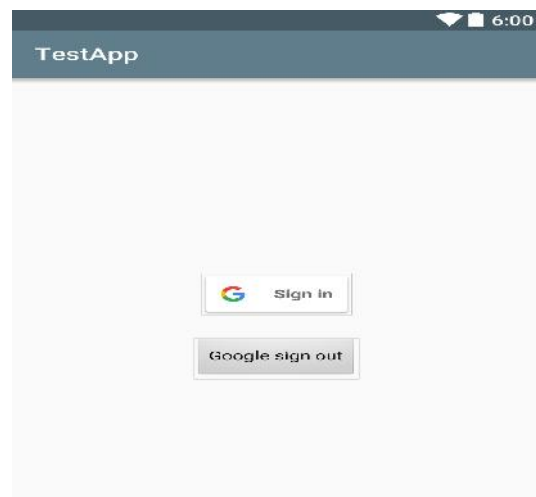


Fig 2 : Login Page

In Requester form ( in Fig 4 ) , user will provide name, blood type and his current location for requesting of blood. Once he submits his request,

this mobile app will show the donor list who are located in nearby his neighborhood (in Fig 5). It provides donor name, contact number and the distance.

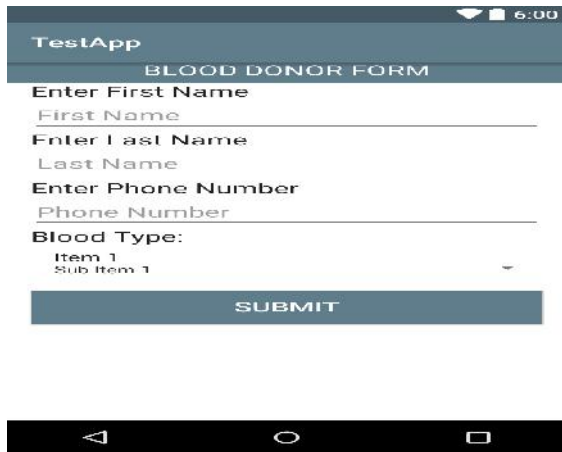


Fig. 3

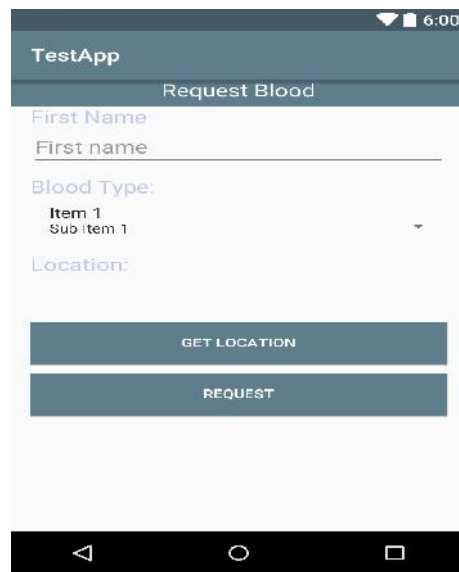


Fig 5: Blood Donor List



Fig 4: Requester form

## 6. Conclusion

Blood Donation mobile application is an attempt to provide information of the blood donor to save the life of person and serve the society. At the later stage of this project another module will be added that will allow user to contact donors by calling him directly through whatsapp or any social messenger.

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