Lifeline: A Portable Blood Bank Application

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Abstract

Blood donation is one of the most significant contribution that a person can make towards the society. There is a point of time in everyone's life where they might require blood and not everyone's blood group is the same. Blood can be stored for a limited period of time that is why the blood banks need a steady and constant collection. Nowadays a public awareness camps have become a trend. Many clubs, colleges, societies, offices, etc. organize blood donation camps on different occasions. But outside the walls of these offices, colleges not many people are ware about the importance of donating blood and blood donation camps details. "LIFLINE" android application provides an interactive platform between a doctor, a donor and the blood bank. It is developed to easily search for blood donors in nearby areas for emergency and also provides clear access to blood in real-time. It also provides information to the donors about the upcoming blood donation camps. The goal of our project is to create an android application for managing the blood donations. Blood donors register themselves in the application. The name, date of birth, location, blood group, last donated date etc. of the donors are captures in the application. Verified doctors also are registered in the application. The application has a separate login for donors and doctors.

Keywords: Blood, Android, FCM

1. INTRODUCTION

India being one of the most crowded country in the world has an average requirement of about 4 Cr. Units of blood but unfortunately the amount stored yearly is around 5 Lakh units only. A lot of people wish to donate blood but are unaware of blood donation camps, events etc. because there is no efficient means of communication between one another. As a result, the people in need of blood run around asking people, send broadcast messages all over the social media and undergo any means to arrange for blood. India has many medical organizations, all-functioning in a distributed fashion. The existing system involves individual hospitals having their own respective blood reserves thus keeping very less or no interaction with blood banks. Also, the existing system faces troublesome people which request for blood which they do not require.

Blood is nothing but a fluid that runs across the body delivering necessary substances through tubes called arteries and veins. Blood banking is a reserve of blood and its components, assembled as an outcome of blood donation, stored and conserved for future use in blood transfusions. In addition to this, the blood group and other essentials must be determined for compatibility sake for a blood transfusion. It is conceivable that in some situations that the patient is unable to get the obligatory amount of blood at right time due to lack of interrelationship in form of a networked database among the blood banks which leads to the lack of knowledge of updated record of all blood donors.

In a world where technology is booming everyday mobile and mobile based applications have become a vital part of our lives. Many great features were added to the mobile technology field resulting in mobiles getting smaller, quicker and improved as the decade passed. A large number of people are attracted towards Android applications. Since almost everyone carries a mobile phone with them, operational on android platform, it will help users easily find donors in their location and can contact them for instant help.

Here we introduce the Lifeline App. This Android application provides an interactive platform between a doctor, a donor and the blood bank. It is developed to easily search for blood donors in nearby areas for emergency and also provides clear access to blood in real-time. At Lifeline we understand the troubles faced by everyone when they are in desperate need of blood and have to run around to find a donor with the exact same blood group or the long tedious process of form filling in a blood bank. It is this App that allows anyone to request for blood at an online platform which only notifies the people who possess the requirements mentioned by that person and before donors being notified, the following is verified by the doctor to prevent any pranks or malicious acts.

2. INFORMATION ABOUT BLOOD

➢ Blood contains the following
- Plasma: A fluid that transports all the blood   components around the body
- Red blood cells (RBC's): Provides oxygen to all the   parts of the body
- White blood cells (WBC's): Protects the body from bacteria, infections etc.
- Platelets: To facilitate blood clotting

➢ The following characteristics must be met before donating blood:

- Donor must age between 18-60
- Donor must have a healthy hemoglobin count that is above   12.5 g/dl
- Donor must weigh at least 45 kg's
- Donor must not have fever while donating blood
- Donor should not have bradycardia or tachycardia when donating
- Donor must have no diseases when donating
- Donor should not ingest any form of medication 48 hours prior
- Donor must not be addicted to drugs.

3. LITERATURE SURVEY

There are many applications which are available on the Google play store, such as the Blood App and blood donor app, introduced by the American Red cross where users can schedule their appointments, track total donations, earn rewards and invite others to join them on a lifesaving team, Friends2Support.org by F2S team, Simply blood app, Indian Blood donors app, Raktha Bandhab application , Maru Blood app, CBB donor application and many more. Google's cloud technology is used to provide different types of services.

We have done a research on the different technologies used for the blood management system, which are described in detail below:

- **Share and Care Application :** There is a share and care application which is an android based application. It also contains web portal. It deals with the donors and receivers blood information. Here the user needs to register in the application if the user is a donor he needs to enter his detail such as Blood group, contact details. If suppose user is a receiver he can search for the donor of blood type he is in need of, through this application he will get the contact details of donor. If the donor has donated blood withing 3 months period then his/her name will not be displayed in the receivers search.

- **Blood donating Agent:** This is another application which uses the GPS system for the blood management.The Blood Donation Agent creates an e-Information about the donor and organization that are related to donating the blood. Through this application any person who is interested in donating the blood can register himself in the same way if any organization wants to register itself with this site that can also register. This project aims to develop an online Blood Donation Information. The entire project is designed based on the distributed client server computing technology.

- Manual Blood Bank Management System which was implemented by Muhammad Sajidur Rahman and Team, Bangladesh in the year 2010 , was a manual way of managing the blood. Here in this manual blood bank system the donors are required to go to a particular blood bank bank, register for the blood donation and then the officials will store the donor details who have donated blood in form of the excel sheet and whenever a blood request is there the blood bank will search the donors manually.

- Blood Bank Management System proposed by PRATHAMESH RAUT, PRACHI PARAB, YOGESH SUTHAR, SUMEET NARWANI, SANJAY PANDEY was designed to help the blood bank administrator to meet the demands of blood by sending and serving the request for blood and when required. This system gives the procedural approach of how to bridge the gap between recipient, Donor and Blood banks. This Application will provide a common ground for Recipient, Donor, and Blood Banks, and will ensure the fulfillment of demand for Blood requested by Recipient and/or Blood Bank. The location of the blood bank can also be traced using maps. The Android application can be accessed only by the donors to search the blood donation centers and the requesting blood banks and hospitals to search the nearest blood banks and donors.

4. LIMITATIONS TO EXISTING SYSTEM

The current system inhabits many flaws like:
- Not many people are aware about the existing blood banks and the location of blood donation camps that are held by them.
- There is no genuine proof about the intentions of the person who requests for blood.
- Not all the information regarding blood and donors is digitized.
- Blood details of a person is a sensitive data that a hospital should protect. These kinds of data cannot be disclosed to strangers. Therefore data is not secured.
- The blood donation process usually consumes a lot of time and effort from both donors and medical staff since there is no concrete information system that allows donors and blood donation centers communicate efficiently
- In the event of a server malfunction all the data is lost.

5. PROPOSED SYSTEM

System architecture is a conceptual model that defines the construction, performance, and various interpretations of a system. An architecture portrayal is a formal account and representation of a system, ordered in a way that supports reasoning about the structure of the system which comprises system components, the externally visible properties of those components, the relationships between them, and provides a plan from which products can be procured, that will work together to implement the overall system.
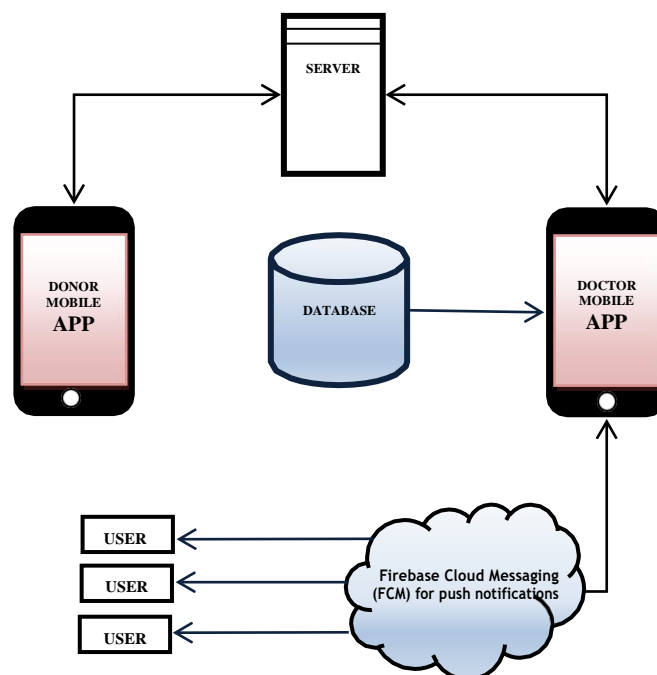

Fig 5.1 System Architecture

STEP 1: Username and a password are given to the actors to log into the system.

STEP 2: After logging in to the system the actors profile is displayed. There are two actors Doctor and Donor.

❖ **Doctor login:**

➢ A doctor can accept or deny blood requests.

➢ A doctor can update the donors about upcoming blood donation camps.

➢ A doctor can change the password for their respective profiles.

❖ **Donor login:**

➢ A Donor needs to update his last donated on since his data would not display if he were to donate less than three months ago.

➢ A donor can make blood requests if he/she were in need of it.

➢ A donor can select the hospital and doctor representing that hospital for verification purposes.

➢ A donor is also provided with the routes to the selected hospital.

➢ A donor can change the password for their respective profiles.

STEP 3: Upon request for blood by a person in need, a map is displayed from which the nearest hospital is to be chosen and then a doctor working in that hospital.

STEP 4: The doctor is then notified and meets the requester in person at the hospital. After verification the doctor accepts or denies the request.

STEP 5: The system then sends a push notification to all the donors with that particular blood group who haven't donated in the past three months.

CONCLUSION

We are well aware about the significance blood has in our lives but not everyone knows the importance of donating blood. There are many cases where in immediate blood is needed to save human lives but we always fall short. Our project will help reduce the problems we face with respect to blood. Lifeline is a dual android application separated by the function it provides to two different actors, one being the donor and the other, doctor. It creates a bridge of efficient communication between both the actors. Our application is user-friendly and simple. The donor application features a Request function after which the doctor can accept/reject this request upon having an offline verification which could include a phone call or face-to-face meeting. Thus this project could help the existing blood banks function better and upgrade to a much more convenient framework.

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