LifeSaver: The E-Blood Donation App

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Abstract**:** *With each passing year the need of blood is increasing. Though "Blood Donation Camps" are playing significant role in creating awareness about blood donation, still we face shortage of blood during emergency situations like natural disasters. Many times people are willing to donate blood but are not satisfied with the current system like many people think even if they donate blood free of cost to blood bank's or hospital and further these organizations will sell their blood at a high cost to the needy ones. Many people are not aware about when and where "Blood Donation Camps" are conducted. The aim is to design a system that provides solution to all such type of problems. Accessibility and availability are the criteria on which an application is designed for its success in the IT market. In this system we will make sure that also in the worst case the blood will be made available to the patient. There will be three levels as user, Blood Banks and Donors. The Donor or blood bank will supply blood as per requirement. In this proposed system, receiver with an android application requests blood on the cloud and this request will be sent to near blood bank and donors who are registered on cloud. Nearby donors and blood banks will be traced with the help of global positioning system. Hence, Requested receiver will get blood. Also we are using Rest API services in our proposed system.*

Keywords: Blood Donor, Patient, Geo-tagging, Blood Bank, User's Privacy, SMS gateway

1. INTRODUCTION

With each passing year the need of blood is increasing. Though "Blood Donation Camps" are playing significant role in creating awareness about blood donation, still we face shortage of blood during emergency situations like natural disasters.

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The E-Blood Donation App is the one of the best possible concept for the provision of healthcare services. We investigate the requirements in term of communication, storage, processing and development platform to make it acceptable solution. We may provide timely access to blood donors and requester to handle emergency.

The four features will empower the application and make it more efficient for users are as follows:

• Geo-Tagging : It will enable the application to track the nearby donor's within certain proximity using device location service.
• SMS Gateway : It will remove internet connection dependecy by helping the application to implement a notification system for providing alerts to registered users.
• Payment Gateway : It will allow users of application to carry out financial transactions with blood banks and donors. • System Security : Implementing two way handshake between donor and receiver will help in maintaining privacy and will thus improve the security.

2. LITERATURE REVIEW

In the proposed system, direct call routing will be done by using an android application. Using "Eligible Donor Finding Algorithm", the most eligible donors list will be found and the contact numbers will be given as an input to the system, for routing the call to the eligible donors. A blood bank database will be created by collection of details through Web Application designed. When the results are found, they are displayed for hospital to see. The results contains the basic information of the blood banks that have the specific blood group, ordered by the geographical proximity. This application will help to society in emergency situations and will provide users requirement with the help of android application and blood will be easily made available to needy person

The online blood bank databases available today does not provide direct contact between donor and recipient. This is a major drawback particularly in cases where there is an urgent need of blood. This project aims to overcome this communication barrier by providing a direct call routing technique using Asterisk hardware. Blood bank databases are generated by collecting information from various sources such as NSS; NGO's, hospitals, blood banks and internet. The data collected will be maintained in a central server. This central server will be associated with a Tollfree number that can be used to connect to it. Based on the algorithm the most eligible donor is found out. From the server the call from the required person is routed to the eligible donor's number.

Human health is new horizons for health that offers healthcare services by utilizing the mobile devices and communication technologies. In health care services, blood donation is a complex process and consumes time to find some donor who has the compatibility of blood group with the patient. They have created an android based application for blood donation such as mHealth. This is a solution to establish a connection between the requester and donor at anytime and anywhere. The objective of this application is to provide the information about the requested blood and number of available donors around those localities. It helps to the requester to broadcast the signal across the register.

3. SYSTEM WORKING

This Systems design is simply the design of systems. It implies a systematic and rigorous approach to design – an approach demanded by the scale and complexity of many systems problems. The purpose of system design is to create a technical solution that satisfies the functional requirements for the system design is to create a technical solution that satisfies the functional requirements for the system At this point in the project lifecycle there should be a functional specification, containing a complete description of the operational needs of the various organizational entities that will use the new system. The challenge is to translate all of this information into Technical Specification that accurately describe the design of the system, and that can be used as input to system construction. The functional Specification produced during system requirements analysis is transformed into a physical architecture. System components and distributed across the physical architecture, usable interface are designed and prototyped, and technical specification are created for the application developers, enabling them to build and test the system.

Understanding the factors that motivate donors to donate blood will facilitate improvements in the process of "Blood Donation". Donation incentives are often used attract donors for donating blood. A cross-sectional study was designed to understand donors' attitudes towards blood donation. Many times people are interested in donating blood but are not satisfied with current system like they donate blood free of cost to the blood banks or hospitals, but still when one needs blood in emergency situations they have to pay a lot of money for it.

To motivate people for blood donation and to help patients receive blood in emergency situations, we have designed an application to overcome all the problems which the current offline as well as online systems face. If in emergency a patient requires blood, using this application we'll not just be able to contact Blood Bank and Hospitals but can also seek help from

individual registered Donors.

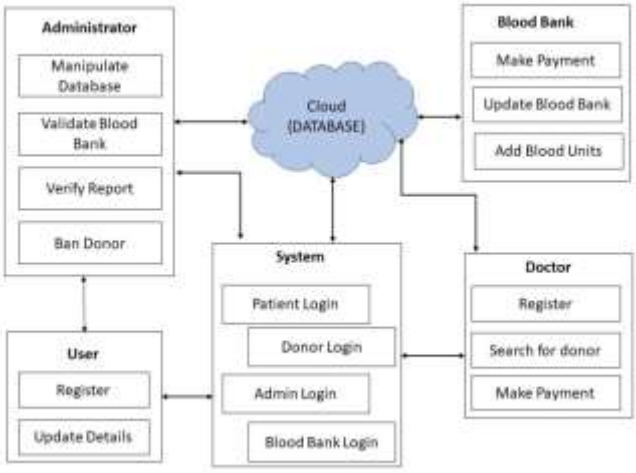

Fig 1: System Architecture

4. METHODOLOGY

The Project is divided into 3 main modules as follows-

A. USER INTERFACE MODULE:

User will communicate with the system using user
interface module. It will include following sub-modules as follows-

Admin:

Admin can manage both donors & receivers. He can add or remove any user from the system. Each member is given a user id and password, which identifies him uniquely.

Login:

To login in the system user has first register himself/herself. After successful Registration user can login into the system.

Donors:

From this module user can search donor for blood and can also refer people to become a donor. Donor can also get access to information like when he last donated blood or when he will be eligible to donate blood.

Donor Registration:

In this module, people who are interested in donating blood get registered in my app and give his overall details related to him, i.e. he fills in a registration form by giving the total details such as name, address, city, sex, weight, DOB, blood group, telephone numbers, e-mail address, etc. He was also given two fields' username and password to fill such that he was a registered donor and he can enter the login form with his username and password and can modify his details if needed.

Update Profile:

The registered donor only is able to modify his details; no other person can modify his details as the login form restricts others from entering the username and password providing high security for the details given by the donor. After giving the username and password it checks for the donor whether he is an existing donor or not and if the username and password matches, he can then able to modify his total details.

Donor Search:

The people who are in need of blood can search for getting the details of donors having the same blood group and within certain proximity. Not only this, donor's present in different city can also be searched by searching with respect to that particular city. If no match is found for a city or a particular area with the respective blood group selected then an alert with 'SORRY DONORS ARE NOT AVAILABLE FOR THE FOLLOWING BLOOD GROUP AND AREA' gets displayed.

Acceptors:

This module helps user to find blood group. When user click on find a blood; system ask him to enter blood group user wants to search. After entering the blood group, system will search for the availability of the blood group and give them the list of the donors who has the same blood group within certain area.. Clicking on logout button user can log out from the system. Acceptor can some the following

· Find A Donor.
· Refer A Friend.
· Change password.
· Find a Blood group.
· Logout

Search Results:

This module displays the search results of the blood group. It displays the Address and the contact number based on user preferences he can direct call to selected contact by using Direct Calling with Call API which is provided by android.

Life Saving Contacts:

If at all the people in search of a donor doesn't get any match for their area and group then they will be provided a service i.e. he will be given a Contact Person details for their nearby cities who have the details of many other donors with him. The people in search can call him and can get the details of the donors and can be provided services in this manner. But this life saving contact persons can be available only for a limited number of cities but not for all. These contact persons are the authorized persons of my blood bank.

B. SOFTWARE INTERFACE MODULE:

Android Studio:

Android Studio is the official integrated development environment (IDE) for Android platform development. It was announced on May 16, 2013 at the Google I/O conference. Android Studio is freely available under the Apache License 2.0.

PHP:

PHP is a general-purpose scripting language that is especially suited to server-side web development, in which case PHP generally runs on a web server. Any PHP code in a requested file is executed by the PHP runtime, usually to create dynamic web page content or dynamic images used on websites or elsewhere. It can also be used for command-line scripting and client-side graphical user interface (GUI) applications.

JAVA JDK and JRE:

We are using Java Development Kit in order to execute the Java code. The Java Development Kit (JDK) is an implementation of either one of the Java SE, Java EE or Java ME platforms. The JDK includes a private JVM and a few other resources to finish the recipe to a Java Application. The Java Runtime Environment (JRE), also known as Java Runtime, is part of the Java Development Kit (JDK), a set of programming tools for developing Java applications. The Java Runtime Environment provides the minimum requirements for executing a Java application; it consists of the Java Virtual Machine (JVM), core classes, and supporting files.

MYSQL:

MySQL is a relational database management system based on SQL – Structured Query Language. The application is used for a wide range of purposes, including data warehousing, e-commerce, and logging applications. The most common use for MySQL however, is for the purpose of a web database. It can be used to store anything from a single record of information to an entire inventory of available products for an online store.

C. COMMUNICATION INTERFACE MODULE:

REST API:

In many applications, REST API is a need because this is the lightest way to create, read, update or delete information between different applications over the internet or HTTP protocol. This information is presented to the user in an instant especially if you use JavaScript to render the data on a webpage.

REST API can be used by any application that can connect to the internet. If data from an application can be created, read, updated or deleted using another application, it usually means a REST API is used.

Transactional SMS:

These are messages which are sent to your customer to pass on information necessary for using your product or service.

For example:

1) A message sent by a bank to an account holder regarding his/her available account balance.
2) A message sent to the client by a company regarding his Invoice amount.

5. CONCLUSION

In this semester the hardware part of the project will be programmed and implemented. Life Saver: The E-Blood Donation App is one of the best possible concept for the provision of healthcare services. We investigate the requirements in terms of communication, storage, processing and development platform to make it an acceptable solution. We believe that our application is ubiquitous solution and may provide timely access to the blood donors and requester to handle emergency by using SMS Gateway

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