Design and Implementation of E-Blood Donation System Using Location Tracking

Deeptha Hegde[1], Agnus Kuriakose[2], Amitha Mariya Mani[3], Anju Philip[4], Annamma P Abraham[5]

Assistant Professor, Information Science & Engineering, Yenepoya Institute of Technology, Mangalore, India[1]

Student, Computer Science & Engineering, Yenepoya Institute of Technology, Mangalore, India[2,3,4,5]

ABSTRACT: This paper presents a high-end system to bridge the gap between the blood donors and the people in need for blood. Application for Online Blood Donation System is a way to synchronize donors and users with the help of Internet. It is an Application through which registered users can view the availability of donors and can send Request for blood to the donor matching with blood requirement and can be ordered online as and when required. The Android application can be accessed only by the donors to receive the blood donation notifications and the requesting users and hospitals to search the nearest donors and notify them.

KEYWORDS: Blood Bank Management, Blood Bank, Hospital, Donor, Recipient.

I. INTRODUCTION

Blood is a saver of all existing lives in case of emergency needs. The task of blood bank is to receive blood from various donors, to monitor the blood groups database and to send the required blood during the need to the hospital in case of emergencies. The problem is not insufficient number of donors, but finding a willing donor at the right time. We want to build a network of people who can help each other during an emergency. This application timely updates the information regarding the donors where the administrator accesses the whole information about blood bank management system. Donor will be prompted to enter an individual's details, like name, phone number, and blood group. In the urgent time of a blood requirement, one can quickly check for blood banks or hospitals matching a particular or related blood group and reach out to them through the App. Blood bank App provides list of blood banks in your area. A large number of blood donors are attracted using an Android application. Since almost everyone carries a mobile phone with him, it ensures instant location tracking and communication. Only a registered person, with willingness to donate blood, will be able to access the service. In this application we use the GPS technology that will be used to locate a donor. The user will get the route to reach the desired location and he won't have to ask manually, therefore time can be saved. Hospitals are provided with windows to specify the blood requirement. The blood bank database of various hospitals are networked. The Databases are searched to find compatible group donors. This is the first level of filtration. The system tracks the location of the compatible donors by using GPS services at the donor mobile. Only those donors are within a boundary of specified area from the requirement are notified.

II. RELATED WORK

In "The Optimization of Blood Donor Information and Management System by Technopedia" by P. Priya and V. Saranya have proposed an efficient and reliable blood donor information and management system based on GIS integrated in android mobile application. The service provided by the proposed system is needed and valuable to health sector where a quality of the blood is considered for the safety of the patient through a systematic process by the blood management system. This system will be the solution for the problems such as wrong information of donors, misuse by third parties and updation .

In "MBB: A Life Saving Application" by Narendra Gupta, Ramakant Gawande and Nikhil thengadi have proposed the system that will link all donors. The system will help control a blood transfusion service and create a database to hold data on stocks of blood in each area as data on donors in each city. Furthermore, people will be able to see which patients need blood supplies via the application. They will be able to register as donors and thus receive request from

their local clients who needs blood to donate blood in cases of need. In "an android application for volunteer blood donors" by Sultan Turhan a smart phone's application for the volunteer blood donor to increase the willingness and accessibility with the purpose of providing a continuous blood supply is presented. This application helps health database. Private and confidential data of the users can only be viewed by administrator. This system promises very less paperwork and also provides help to blood recipient, blood banks and donors also. With help of our application the user will not have to go to the blood bank and ask for the required blood he/she can directly check from our application.

III.   EXISTING SYSTEM

The population of the world is multiplying with each coming year and so are the diseases and health issues. With an increase in the population there is an increase in the need of blood. The growing population of the world results in a lot of potential blood donors. But in spite of this not more than 10% of the total world population participates in blood donation. With the growing population and the advancement in medical science the demand for blood has also increased. Due to the lack of communication between the blood donors and the blood recipients, most of the them in need of blood do not get blood on time and hence lose their lives. Here the problem that we face today in blood donation is not the lack of donors but to find a willing donor at the right time. He/she must be having the matching blood group as that of the requirement. Also he/she must be easily accessible to the center of request. In earlier related works all the registered donors are notified about a requirement ,no matter if it matches his/her blood group. This involves overhead which must be reduced. Similarly with the present systems there is no jurisdictions employed about choosing a donor based on his/her proximity to the requirement center. For a blood request in a specific area only those who are within a certain locality will be able to respond to the request. But the present systems involves overhead in this aspect. The actual problem that is addressed in this project is to make blood donation most efficient and secure.
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IV.   DRAWBACKS OF EXISTING SYSTEM

1. The existing system less user friendly because the retrieval of data is very slow and data is not maintained efficiently. The use of the some technology can be time consuming. 2. It have a lots of manual work (Manual system does not mean that we are working with pen and paper, it also include working on spread sheets and other simple software's). All calculations to generate report is done manually so there is greater chance of errors. 3. Here the faculty has to suffer a lot through the calculation and if there is a loss of some report then it may cause a lot of problem. 4. This is time consuming also due to exaggerating calculation. Even after that there is some miscalculation which is very frustrating for the faculty. These calculations also effects the marks of the students which will finally led to their percentage. 5. It was limited to a single system. 6. The present system was very less secure.

V.   PROPOSED SYSTEM ARCHITECTURE

The user has to first download the application. He/ She will be provided with two options: Login and sign in. If the person has already registered, then he/she has to login. If not, he/she has to create an account providing basic details like name, address, contact, date of birth, blood group, email id etc. Once the user registers, he/she can check various blood banks that are located.
The user will get various options on screen:
- Search donors
- Request for blood
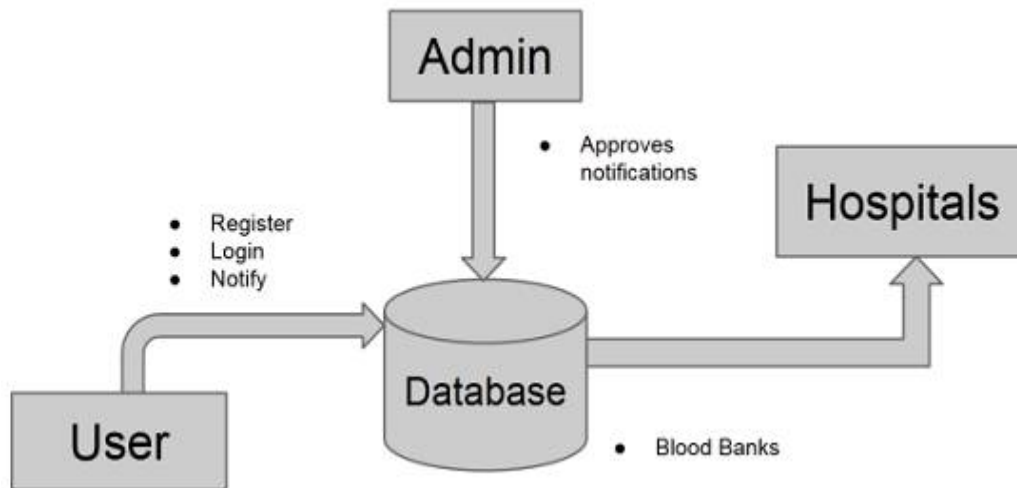- View contact details of donors

Advantages:
- This system promises very less paperwork and also provides help to blood recipient blood banks and donors also.
- With help of our application the user will not have to go to the blood bank and ask for the required blood he/she can directly check from our application.

Fig: Proposed Block diagram of networked android based online blood donation system.

The user can select any of the option and according to the selected option he/she will get the information. The user can also get the exact path from his/her location to blood bank or hospital by using Global Positioning System (GPS). The details of the blood banks, hospitals etc will be saved in database and only the admin will have access to database. This system promises very less paperwork and also provides help to blood recipient, blood banks and donors also. With help of our application the user will not have to go to the blood bank and ask for the required blood he/she can directly check from our application.

VI. MODULES

1. Administrator Module:
- This module provides administrator related functionality.
- Administrator can add and view details of donor.
- Add new blood bank.
- Update blood bank details.
- Admin has the role to approve each donor and hospital.

2. User Module:
- User can search for blood available in district and city wise .
- User can search single or two level enquiry and request donors for blood by automated sending of messages.

3. Donor Module:
- The administrator consist the route module.
- Donor can register and login with the system.
- Can get messages about a blood requirement in case any search matches Hospital profile.

4. Hospital module:
- Hospital can register themselves with this application.
- The blood banks are located in hospital.
- Admin must approve it to be added to the database.
- Hospital module also has search donor option.

VII.   BENEFITS OF PROPOSED SYSTEM

The system provides very less paper work and turns the present manual system in to computerised system. This provides a means to connect people who are in need of blood and willing donors. With the proposed application blood donation becomes more effective.
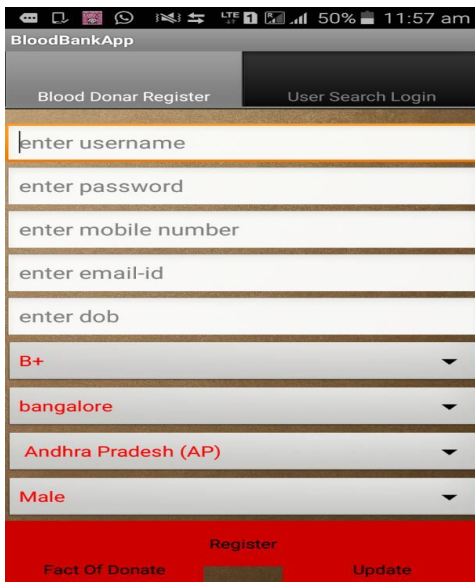
VIII.   RESULTS

Donor and User module Results:

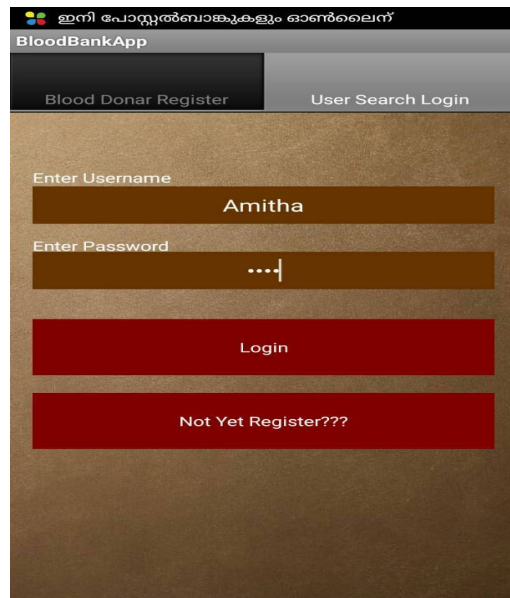**Fig 1: Registration page for donor**
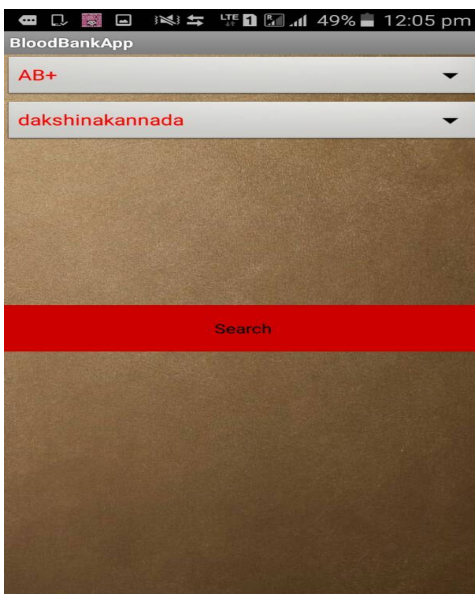

Fig 2: Login page for user

Fig 3: User search based on criteria
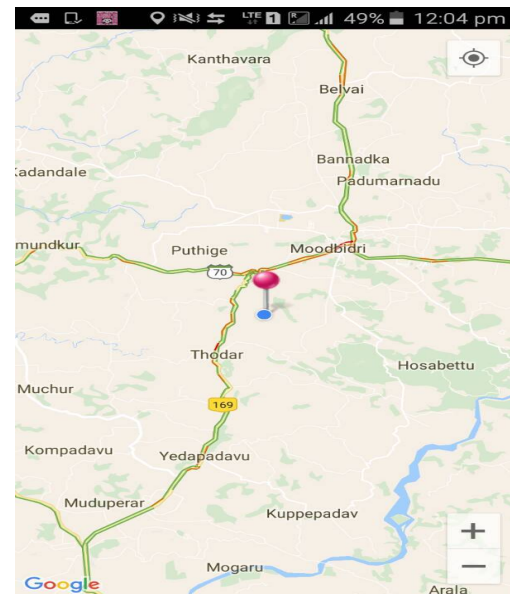
Fig 4: Result of search

Fig 1 shows the registration page for donors. The people who are willing to donate the blood have to be registered into the application by filling their details in the registration page. Also the users who are already registered can login into the application directly as shown in Fig 2. Suppose if the user is not yet registered, he/she has to be registered into the application. Then the user who are in need of blood can search the registered donors based on the blood requirement and particular area of location as shown in Fig 3.And finally the Fig 4 shows a GPS moving map which trace the exact location of that particular donor. When we double tap on that location it will display the details of the filtered donors and simultaneously message will be sent.

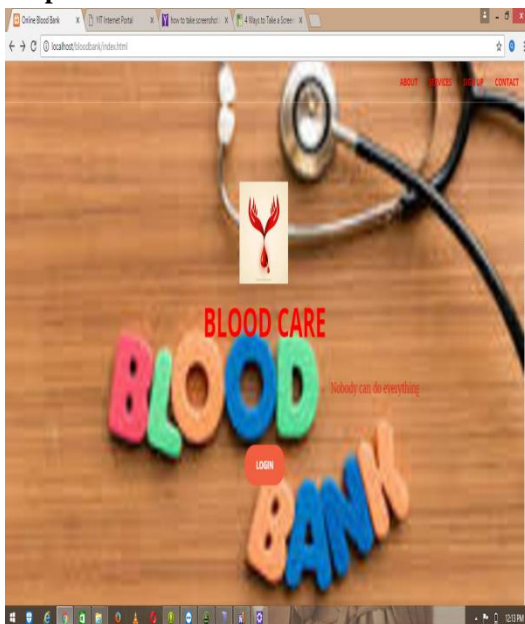### Hospital and Admin module Results:
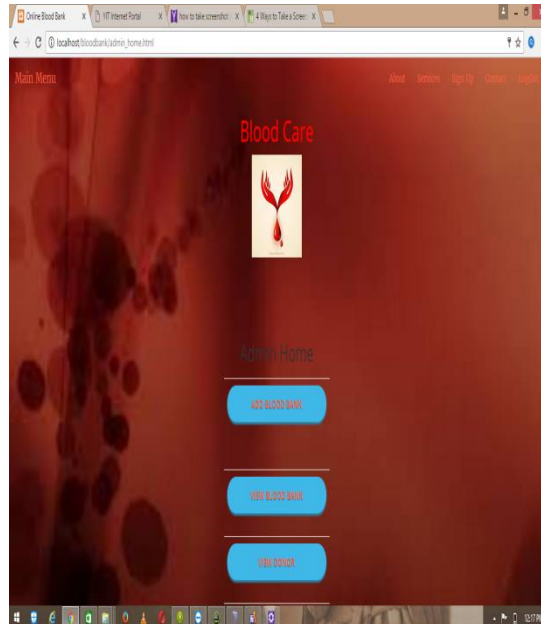

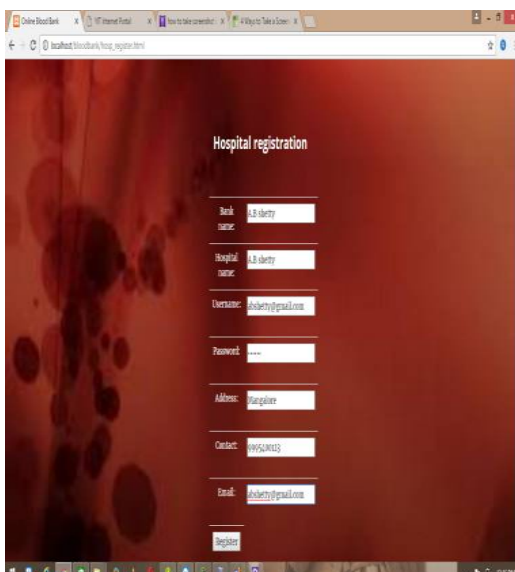**Fig.5. Login page at server side**

Fig 6. Admin home

Fig.7 Hospital registration form
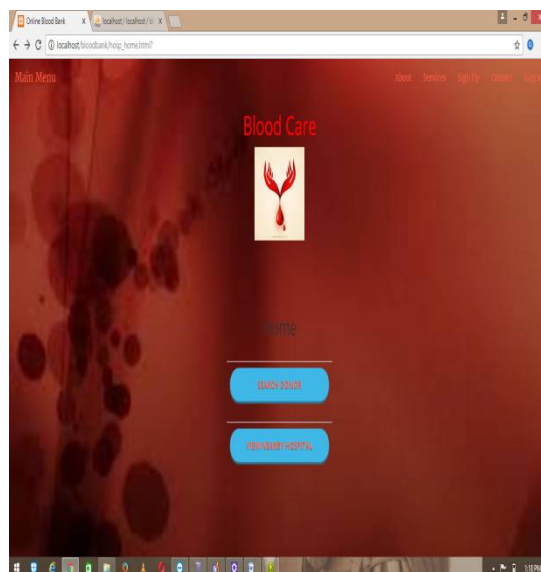
Fig.8 Hospital login home page

Fig.5 shows the login page at sever side. Click on the login button leads to a login page for admin. After this login, the admin can enter into the admin's home page as shown in Fig.6. Mainly the admin have three options like add blood bank, view blood bank and view donors. In add blood bank we can add new blood banks by using an add action. And we can view those blood banks. Also we can delete a particular blood bank when it is not needed. In the view donor option, the admin can view the registered donors. The Fig.7 shows the hospital registration form. Here the hospital can register into the application by giving its name, blood bank name, address etc. Then this registered hospitals can login to the home page as shown in Fig.8. This home page provides mainly two options for hospitals: search donor and view near by hospitals. In search donor, the hospitals can search the donors based on the blood requirement and location. Also the hospitals can view the nearby hospitals by using the second option.

IX. CONCLUSION

Technology is introducing new innovations day by day, thus reducing the time required to do things. The proposed system can be used to reduce the time required to deliver required blood to the needy in cases of emergency. The Android application can be used by the people interested in donating their blood by locating their nearest blood bank. The web application provides a way of communication and synchronization between the hospitals and the blood banks. It also provides them with the facility of communicating with the nearby donors in emergency. The database is a vital aspect of the system. The database of the hospitals and the blood banks must be checked for consistency on regular basis for smooth working of the system. The proposed system uses Google Maps which provides the user with an efficient way of locating the nearby donors/blood banks. The Android application is developed using Android Studio which is an open source software, while the web application for the hospitals and the blood banks is also developed using open source tools, hence the system developed is quite feasible.

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BIOGRAPHY

Mrs.Deeptha Hegde is an Assistant Professor, Dept. of Information Science & Engineering, Yenepoya Institute of Technology, Mangalore, Karnataka.

Agnus Kuriakose is pursuing her B.E degree in Computer Science and Engineering from Yenepoya Institute Of Technology, Mangalore, Karnataka affiliated to Visvesvaraya Technological University, Belgaum, Karnataka.

Amitha Mariya Mani is pursuing her B.E degree in Computer Science and Engineering from Yenepoya Institute Of Technology, Mangalore, Karnataka affiliated to Visvesvaraya Technological University, Belgaum, Karnataka.

Anju Philip is pursuing her B.E degree in Computer Science and Engineering from Yenepoya Institute Of Technology, Mangalore, Karnataka affiliated to Visvesvaraya Technological University, Belgaum, Karnataka.

Annamma P Abraham is pursuing her B.E degree in Computer Science and Engineering from Yenepoya Institute Of Technology, Mangalore, Karnataka affiliated to Visvesvaraya Technological University, Belgaum, Karnataka.