Automated Blood Bank Management System Using Direct Call Routing Technique

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Abstract: "Automated Blood Bank system" brings voluntary blood donors and those in need of blood on to a common platform. This project servicing the persons who seek donors who are willing to donate blood. "Direct contact between the donor and recipient" is the main concept of this project. Direct call routing is the technique used for providing the communication between the donor and the recipient. A blood bank database is created by collection of detail through web interface. The data collected will be maintained in a central server. By using eligible donor finding algorithm the most eligible donor is found out and the call will be routed. From the server the call from the required person is routed to the eligible donor's number. Willingness of the donor, Location, Last donation date and blood group are the major four components considered in this project.

Keywords: Blood Donor, Call Routing, Interactive Voice Response System (IVRS), Recipient, Web Interface and Web Server.

I.   INTRODUCTION

Blood is one of the most critical elements and it's truly referred to as 'river' of life. There are number of scenarios where urgent need of blood comes. At these critical time, the online blood bank with has an automatic call routing facility will be of great aid. We here intend to achieve this through the direct call routing function. An algorithm is defined to find the suitable donor at every point of time. This kind of a system is more advantageous compared to present systems available as immediate contact with the donor is provided every time. This helps in getting an immediate response than a messaging based system or simply internet based database system. An immediate fulfilment of the blood requirement is possible in this system.

Every year the nation requires 4 Crore units of blood, but only a meager 40 Lakh units of blood available. There are multiple online blood banks around the world, however none of them offer the capability for a direct contact between the donor and recipient. This is often a serious disadvantage in cases wherever there is associate degree pressing would like of blood. This project aims to beat this type of communication barrier by providing an immediate link between the donor and the recipient. "Automated Blood Bank" proposes to bring voluntary blood donors and those in need of blood on to a common platform.

The main objective of proposed work is servicing the persons who seek donors who are willing to donate blood and also provide it within the time frame. Every year the state needs regarding four Crore units of blood, out of that solely a meagre forty Lakh units of blood square measure out there. Every two seconds somebody desires blood. More than thirty eight thousand blood donations area unit is required per day. A complete of thirty million blood parts area units transfused annually.

II. LITERATURE SURVEY

Automated online blood bank database:

A number of online blood bank databases are available, however none of them offer the capability for a direct contact between the donor and recipient. This is a major drawback particularly in cases where there is an urgent need of blood. Our project aims to overcome this communication barrier by providing a direct call routing technique using Asterisk hardware. A blood bank database is created by collection of details from various sources like Blood banks, NSS, NGO's, hospitals and through web interface. The data collected will be maintained in a central server. This central server will be associated with a Toll free number that can be used to connect to it.

The willingness of donor and the closeness of the donor to the place from where the call is coming are also accounted for in defining this algorithm. 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. Such a system considerably cuts down on the overheads involved in referring to an online database and then calling the donors and verifying their willingness at a time when there is a critical need for the blood.

Design and implementation of automated blood bank using embedded systems:

Automated Blood Bank is an associate work that brings voluntary blood donors and those in need of blood on to a common platform. The mission is to fulfill every blood request in the country with a promising android application and motivated individuals who are willing to donate blood. The proposed work aims to overcome this communication barrier by providing a direct link between the donor and the recipient by using low cost and low power Raspberry Pi B+ kit. It requires Micro USB of 5V and 2A power supply only. Entire communication takes place via SMS (Short Messaging Service) which is compatible among all mobile types.

"Automated Blood Bank" is a project that brings voluntary blood donors and those in need of blood on to a common platform. This project aims at servicing the persons who seek donors who are willing to donate blood and also provide it in the time frame required. Automated Blood Bank tries to assist victims/patients/those in want of blood. It is an endeavor to achieve dead set these people in want of blood and connect them to those willing to donate. The proposed work explores to find blood donors by using GSM based Smart Card CPU – Raspberry Pi B+ Kit. The vision is to be "The hope of every Indian in search of a voluntary blood donor".

Blood bank management system:

At present, the public can only know about the blood donation events through conventional media means such as radio, newspaper or television advertisements. There is no information regarding the blood donation programs available on any of the portal. The current system that is using by the blood bank is manual system. With the manual system, there are problems in managing the donors' records. The records of the donor might not be kept safely and there might be missing of donor's records due to human error or disasters. Besides that, errors might occur when the staff keeps more than one record for the same donor. There is no centralized database of volunteer donors.

So, it becomes really tedious for a person to search blood in case of emergency. The only option is to manually search and match donors and then make phone calls to every donor. There is also no centralized database used to keep the donors' records. Each bank is having their own records of donors. If a donor makes donation in different hospital, no previous records can be traced except if the donor brings along the donation certificate. Hence, the donor is considered to be a first-timer if they make blood donation in a new place. Without an automated management system, there are also problems in keeping track of the actual amount of each and every blood type in the blood bank. In addition, there is also no alert available when the blood quantity is below its par level or when the blood in the bank has expired.

III. PROPOSED METHOD

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. The data collected will be maintained in a central server. This central server will be associated with a Toll free number that can be used to connect to it. Web interface helps recipients to view a list of prospective donors and also allows new donors to register to the database. This proposed system will be the real time implementation of the existing system. A key component of the system is the algorithm used for determining a prospective donor in real time. The parameters which are taken into consideration are:

- Blood Group

- Location

- Last donation date
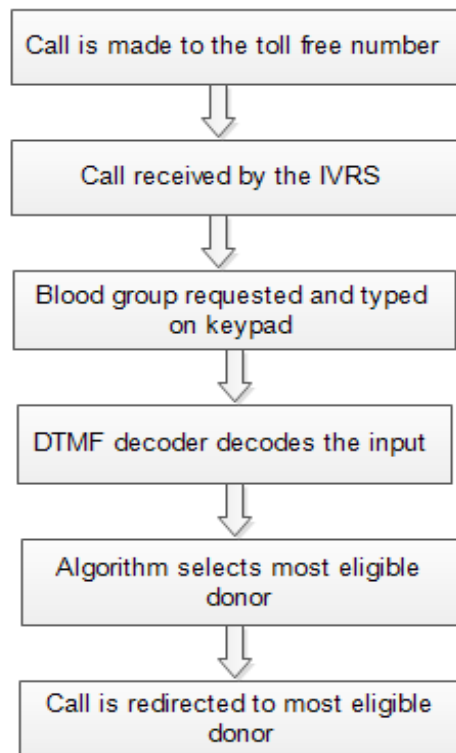
- Last contact date

A. System Architecture:
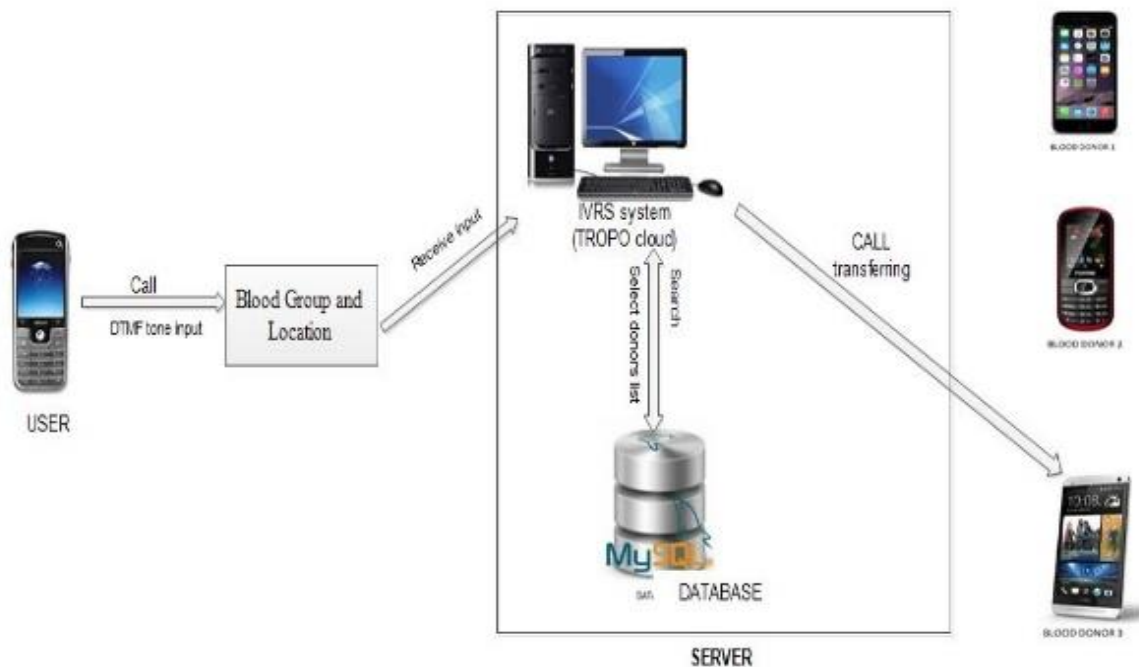
The fig.1 shows the architecture of the proposed system.

B. *Implementation:*

The entire process of this system is shown in below steps:

- Call is made to the server.

- Required blood group is typed on the keypad.

- DTMF decoder decodes this key.

- Algorithm comes into play getting the list of eligible donors.

- Call gets routed to the most eligible donor.

- In case the most eligible donor is not responding, automatically the call gets routed to the second most eligible donor.

- IVRS system constantly updates the person who is making the call so that he knows what process is going on.

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The fig.2 The diagram represents the overall functional block diagram of the proposed system.

IV. ANALYSIS AND RESULTS

MODULE DESCRIPTION:

Module 1: Web Application:

In the first module, web application was designed with registration form. The registration form was used to collect donors information and save it in database which was connected to centralized server.

Module 2: Finding eligible donors list:

In the second module, an algorithm was designed to find the eligible donor from the database.

Module 3: Receiving input from blood recipient:

In the third module, IVRS will be designed to receive recipient blood group and location. DTMF decoder will be used to detect the input based on the key pressed. The blood group and location will be given as a input to the eligible donor finding algorithm which was designed in Module 2.

Module 4: Call Routing:

In the fourth module, an android application will be designed to route the call from the recipient to the most eligible donor who will be identified by the eligible donor finding algorithm.

ELIGIBLE DONOR FINDING ALGORITHM:

*Input***:** Blood Group and location

*Output***:** Most eligible donor

*Algorithm***:**

*Step 1***:** Receive blood group from blood recipient and track location.

*Step 2***:** Select donors list and store it in list L1.

*Step 3***:** Calculate duration d1 between oldest donation date and current date.

*Step 4***:** Select donors list from L1 (duration>56 days) and store it in L2.

*Step 5***:** Sort the list L2 based on d1 (highest duration is on top).

*Step 6***:** The sorted list L2 is the eligible donors list.

V.   CONCLUSION

Blood is the primary necessity of life. There are different scenarios available for searching blood donors. This proposed system will be one step ahead from the other blood donation systems. Blood recipient can contact the blood donor directly by using this system. An algorithm was designed to find the eligible donor based on the blood group and location. When there is urgent need for blood, it may not be possible for people to connect to the internet to look into the online blood database systems that are already in existence. Online database with automated call routing functionality is the apt choice for immediate fulfillment of blood requirements.

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