

Life Share-A Localized Blood Donor Connector Using Chatbots

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Abstract

Blood is paramount substance present in human body. Absence of this fluid results in loss of life. To overcome this situation, blood transfusion is carried out and to accomplish this, it is essential for the eligible blood donor to meet the recipient, who is in need of blood transfusion. “Life Share” is one major technological intervention in the medical field whose main objective is to carry out a location-based search of blood donors in the times of emergency, and thus save time and ‘Life’. This Location based web application connects genuine willing donors with recipient, known or unknown, within the vicinity of any hospital where the need has arisen. This web application help in saving precious time during emergency by connecting both parties in short span of time. Here the good Samaritans can register with their details and will be informed of the need of blood, via ‘Push Message’, if any need arises only within their specified Location. The Application acts as a Life Saver in times of emergency. Also, offering chat-bot assistance on social media wherein users can get instant response for their queries and will assist them for further queries.

The proposed web application will periodically update the details pertaining to donors and recipients promptly. And the administrators access all web application information, with an interactive chat bot in order to process queries and provides quick response that will speed up the process. Also, the proposed work includes Push technology that will alert users for blood requirement via message, which is bound to a specific location during emergencies. This web-based framework is easy to scale, effective and adaptable to the growing need for blood non-availability. This technique of optimization can save life’s at risk.

1.Introduction

In medical field, one of the most essential applications are included blood donation and medical monitoring which require on daily basis. The collection of blood from a donor is involved in the blood donation that can be helpful for someone else to treat the medical problem. Blood donations is playing an important role in healthcare system.

Due to the higher costs, healthcare systems are effected specifically for the people who are residing far away from medical centers and require to make long-travel for following up with the doctors mostly in developing countries [1]. As there is no availability of concrete information system that has been allowed both blood donation centers and donors to coordinate and communicate with each other efficiently for reducing the effort and time taken for the process of blood donation [2] which usually involves more time and effort from both medical staff or recipient and donors. Many granted medical procedures couldn’t be taken forwarded [3] if in case volunteers weren’t available for donating blood. In order to achieve the more convenient blood donation process that offers additional services and creates communities around the centers of blood donation, worldwide efforts have been focused on utilization of social media and smartphone applications in recent times.

According to the hospital requirements [4], the development of Hospital Information Systems should have to be made. The manual procedures have been involved in most of the existing blood donation system applications which couldn’t be able to update and download the donor details with latest update information. A lot of time is consumed and less accuracy is resulted in information retrieval. More manpower is needed [5] and less coordination between the users and different application is included. For generating reports, more time is consumed. In data handling, mismanagement provides lower security for the system. A proper method is needed for debugging the existing system. More data about the donors is provided by the presented system. The improved system

has become user friendly and the blood donation management is made like a flexible and easier platform. High level security with the inclusion of authentication is provided by this system [6]. To provide the services for society, the blood donation management system is established that provides the information of blood donor including storing, managing, retrieving, and searching. The overall information regarding blood donation management system is allowed to access by this web application which can be adaptable for fulfilling the requirements of blood donation management system. This paper main objective is to offer direct link between the recipient and the donor through a web interface and mobile application via short message service.

2. Literature survey

Bing Nan et al., (2009) [7] was demonstrated the web enabled and mobile-based application of Blood Donation Management System for maintaining effective day to day transactions. An e-Information about the organization and donor is created by this application that is relevant to the blood donation. For registration of blood issued details, blood collection details, and all donors, etc., this software has been used. A user has become a donor if registration is completed. Here, a donor will be allowed to open an account with the providing of basic details like email ID and Password. Based on the updating of mobile number, username, and profile picture, their account information can be modified by them. Roh et al., (2005) [8] was discussed the donors who are showing interest to donate the blood and they can confirm the system. If they are desired for, they can delete their account from the system. Admin is the central authority who can be added, deleted, and modified if needed in this application. From the home page, a donor is able to be searched by a user. Search facilities are provided by this application such as blood bag, doctor, patient, donor, and other identifiable factors. Based on the nearest place and expire date of blood donation, the information about donor will be displayed through a dynamic search.

B.M. Shashikala et al., (2018) [9] was proposed a web based application of blood donation management system (BDMS) which manages the record of donors. A blood database is created based on a web interface. The storing of gathered information is made in a central server. Based on the technique of bulk message dispatch, mobile application is utilized to send notification through text message in order to create a communication link between the recipient and the donor. By using the available contact information, the donor can be contacted by the recipient. On the mobile application, the registered members can only be searched the information about blood donors. The main intention of this system is provide an easier platform to search for blood donors in an emergency case and to facilitate direct link between the recipient and the donor as well.

I. PROPOSED SYSTEMS

Initially donors will create their profiles with their respective credentials (Name, blood group, address etc.).

- These details would be stored in a secure database.
- Person in need of blood can search for the apt donor via this application for the required blood group within their vicinity.
- The donors would be notified either by text messages in and out of the application.
- The registered donors should satisfy certain criteria's that would enlist them eligible.
- The receivers would then be notified after the eligible donor accepts the request.
- This will help reduce time and efforts for finding right choice of donor for the person in dire need saving his life.
- With a tap of a button, getting detailed information of donors around you. This interface can be related to cab hailing facility. Finding blood is as easy as hailing a cab.
- This also reduces the dependency on blood banks as and when they run low on stocks or unavailability of rare blood groups, using this the application user can be notified of available donors.

- Feasibility is a major factor to consider, rather than procuring blood from blood banks for exorbitant prices the user can obtain blood for cheaper rates from volunteer nearby.
- Also, by marketing I have make public aware of the presence and importance of blood donation.



Fig. 1. Scenario of the proposed method

Working of Application:

Initially the users could signup via registered Mobile number/Social accounts (ex: Facebook account kit).

Following which users will create their profiles with their respective credentials (Name, blood group, location etc.). These details would be stored in a secure database. Person in need of blood can search for the apt donor via website for the required blood group within their vicinity mandatorily providing their blood group and location. The donors would then be notified by text messages if any request is posted on web application. The receivers" would then be notified after the eligible donor accepts the request. This will help reduce time and efforts for finding right choice of donor for the person in dire need saving his life.

Also, Chatbot assistance will be provided on social networks to better interact the registered users. Here, it presents a location-based web application through which the needy could get in touch with the willing and volunteer blood donors which could save a life as well as time in case of emergency. The person in need of blood or the recipient could contact the donor within his vicinity by a few clicks. Also, with the chatbot assistance which would act as a beneficial assistant to the users.

Hence Life Share would be a beneficial web application in the medical field which would contribute to a global village.

A. Functional Requirements

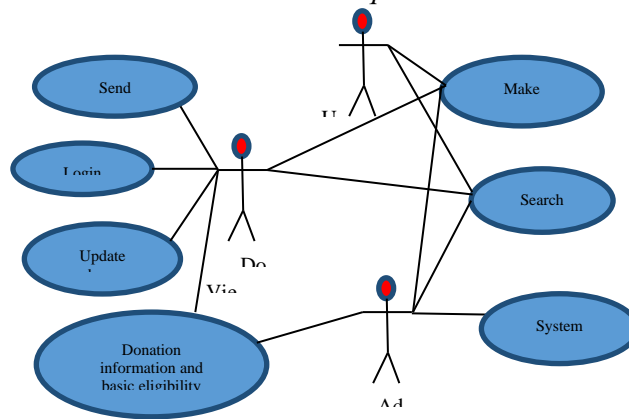


Fig. 2. Use case diagram

This section covers the Life Share criteria. This is then structured into detailed case diagrams and sequence diagrams, in order to better understand the system's functional requirements.

Users may look for blood from donors in this framework. Donors will login and add details to their own profiles. You should look for donors, ask for blood, and send messages to other donors. Admin can perform tasks for system management.

The method proposed is used to preserve full blood records. There are mainly modules -Admin, Donors, Acceptors, Device database-in this proposed framework.

A. Admin: This section focuses on donors and recipients. A user ID and password is given to each member in a donor & acceptor, identifying them only once. The user has a form for login. It enters the user ID and password for login info. The options given to the gui administrator are -Change password, Keep donor information, Keep acceptor details, update donor information , update acceptor details, Logout.

B. Donor: A user Id and password will be given to each donor member, which uniquely identifies them. Members are issued with a registration form. The user I d and password information are entered. Change your password, Find a Blood Group, donation appointment, logout are the choices given to each member of a group.

C. Acceptor: Acceptors definition. Acceptors can select from the gui to-Password update, Blood community locate, who needs blood, Logout. The one who needs blood is the one who needs someone connected with him.

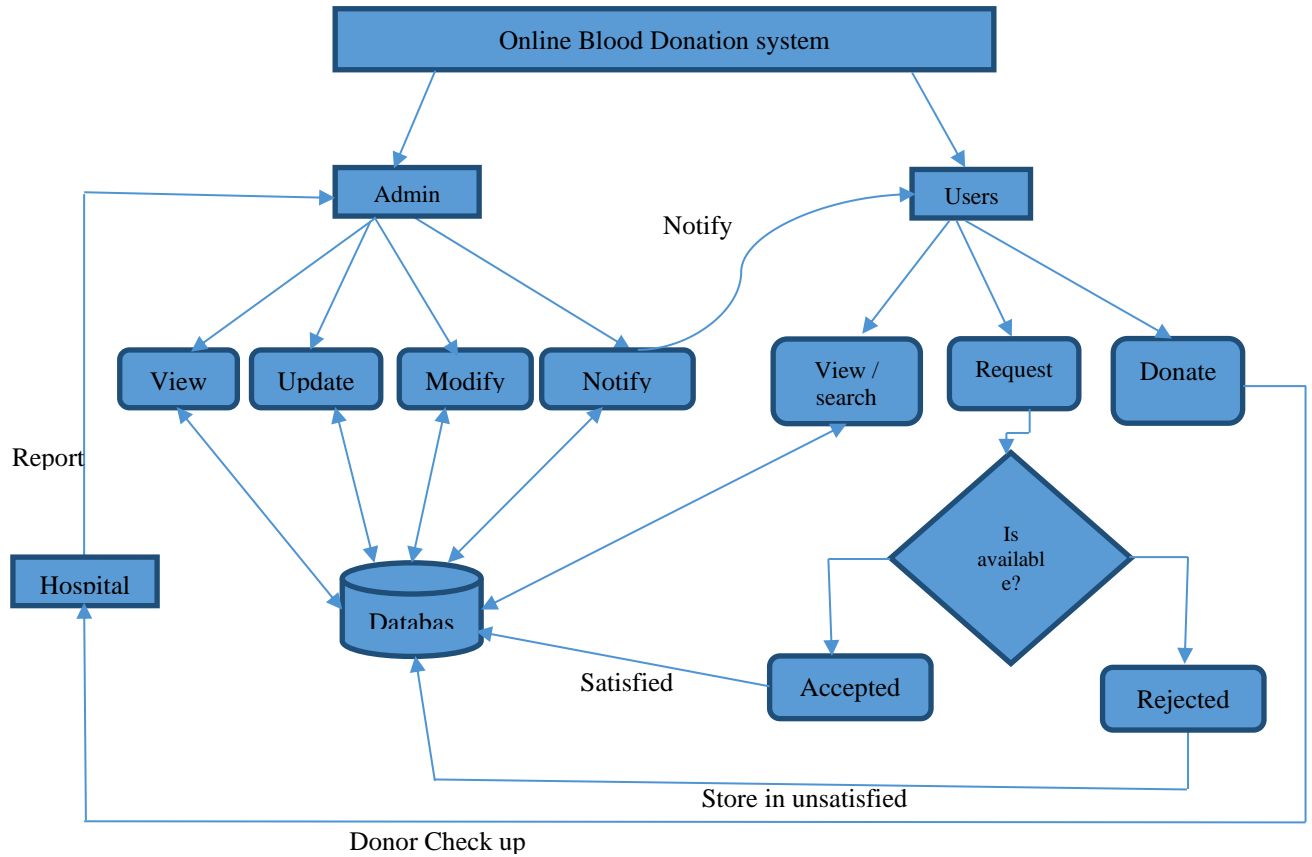


Fig. 3. System architecture of Life Share

D. System Database: Stores all the details about the sender, recipient and patient. There will be an opportunity to upgrade users ' personal details. This is for information analysis and management.

B. Method

The purpose of this paper is to develop online blood donation information. The whole work has been developed with regard to the distributed client server computing technology. The system consists of creating an e-data about the donor and the organization involved with blood donation. Anyone interested in blood donation may register itself as a donor via this application. In addition, if any general consumers choose to send blood requests online, they can also use this web site. The study is organized to view the distributed architecture with centralized database storage. The request has been planned to store the data. Both user interfaces have been developed with Ruby on Rails technologies using the architectures of the SQL Server. The synchronization of the database is planned with the technique "SQL Link." Data protection and security standards are a crucial option for correct use. The system covers the various modules and their associated reports generated in compliance with the required strategies and standards by administrative staff. The framework has been developed to take account of the distributed client server computing technology. To eradicate all inconsistencies caused by a database operation carried out by general users and organizational administration, the specification was normalized to 3NF. The user interfaces are unique to the browser to offer distributed system usability. The internal database is the SQL server. The fundamental components of the table spaces, clusters and indexes have been used to ensure greater accuracy and reliability for storing data. The SQL server has been chosen for its highly stable and safe framework. It occupied the complete front end. The framework maintains data compliance with relevant company guidelines or validations at all necessary levels. The link in the database was designed with the new Microsoft Corporation "SQL Connection" technology. Cross-check of the authentication and authorization at all stages. Accessibility to user levels has been limited to two regions.

II. SYSTEM DESIGN

An architectural explanation is a formal description and illustration of a system, organized in a manner that supports reason in relation to the structure of the system which comprises system components, the externally detectable properties of individual components, and the interaction among them.

There can be two users for the system: donor and recipient. The donor has to register with his details to the application; donor can also request and donate blood. The recipient has to register with his details and send a request. Based on the availability of the blood the request will be accepted and may be rejected or notified to wait.

Table 1 to Table 3 displays the device database design

TABLE I. DONAR_ENTRY

Attribute name	Attribute name	Constraints
Name	Varchar(50)	Allow Null
Sex	Varchar(50)	Allow Null
Phone_number	Varchar(15)	Allow Null
Email_id	Varchar(50)	Primary key
Fb_id	Varchar(50)	Allow Null
Blood_group	Varchar(50)	Allow Null
Weight	Varchar(15)	Allow Null
Height	Varchar(15)	Allow Null
Location	Varchar(15)	Allow Null
Latitude	Varchar(15)	Allow Null
Longitude	Varchar(15)	Allow Null
Religion	Varchar(50)	Allow Null
Picture	Image	Allow Null
Username	Varchar(50)	Allow Null
Password	Varchar(50)	Allow Null
Memorable Word	Varchar(50)	Allow Null
Total_donation	Varchar(15)	Allow Null
Last donation Date	Varchar(15)	Allow Null

The specific information given to users by donors is presented in Table 1.

TABLE II. RECIEVER_ENTRY

Attribute name	Attribute name	Constraints
Name	Varchar(50)	Allow Null
Phone number	Varchar(50)	Allow Null
Blood group	Varchar(50)	Primary key
Location	Varchar(50)	Allow Null
Need _amount	Varchar(50)	Allow Null
Need date	Varchar(50)	Allow Null

Attribute name	Attribute name	Constraints
Donation date	Varchar(50)	Allow Null

Table 2 provides information on recipients who need eligible donors to donate blood.

TABLE III. DONOR_UPDATE

Attribute name	Attribute name	Constraints
Name	Varchar(50)	Allow Null
Sex	Varchar(50)	Allow Null
Phone number	Varchar(15)	Allow Null
Email_id	Varchar(50)	Primary key
Blood_group	Varchar(50)	Allow Null
Weight	Varchar(15)	Allow Null
Height	Varchar(15)	Allow Null
Location	Varchar(15)	Allow Null

For potential updates and views, the profile of the donor is shown in Table 3.

Figure 3 shows the system where the process begins by opening up the website hosted by the cloud in Figure 3. The website offers an admin option for either logging in or logging in for updating or changing other users' information. The admin will choose the way the admin should already supply the system in which it is stored in the database with its details. The administrator can view all of the donor, acceptor and patient information. The procedure before and after the donor's blood donation to the acceptor should be periodically updated by the administrator where he or she is named the donor and the recipient intermediary. The framework can be used easily by the system admin to periodically update. The details provided by the donor are manually reviewed by the admin so that the right information on the list can be submitted so that the donor who has posted the information will supply blood when it is needed.

Thus, anyone who needs blood anytime and anywhere will benefit from the system. The donor information is accurate so that the donor can be available in an emergency situation.

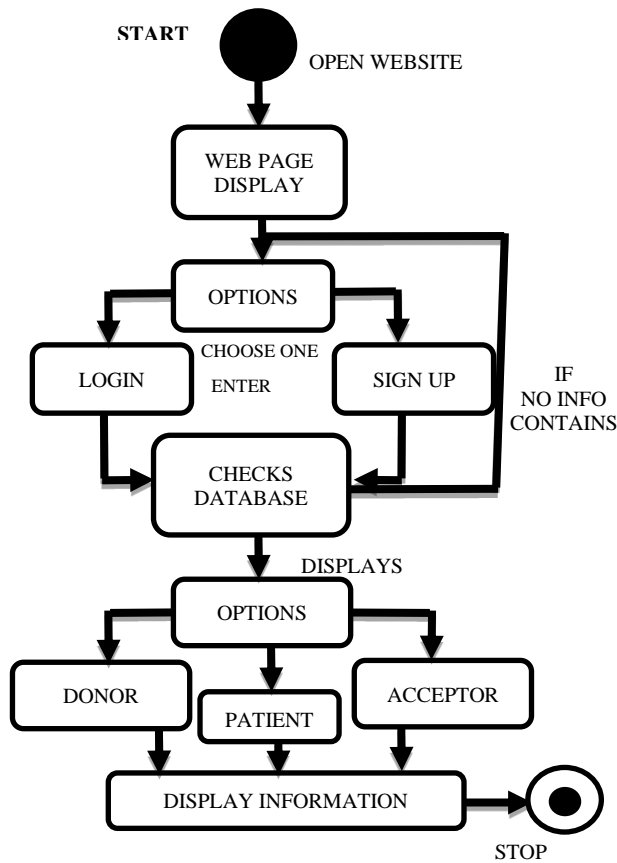


Fig. 4. State Transition Diagram for the propose system

3. Conculation

The Life Share Web application along with the bot provides a better and efficient method to users who require blood on a very brief notice and don't have the luxury of time. The users will not have to spend time inquiring the availability of blood at various blood banks and hospitals if a suitable donor lives within their city premise. Through the web application it provides registering of donor and access to recipients to view the donors near them. The chat-bot facilitates the web application by providing access to user to the web application database through social media sites (Facebook, Skype, etc.) to widen the community of donors and receivers.

Further modification and updating to the website such as:

- These details would be stored in a secure database.
- To maintain a log of all donation made by user and acknowledging the contribution made by the donor.
- To improve chat-bot features like updating user of upcoming blood drives and help set a reminder for monthly eligibility to donate blood.
- To provide organ donation facility to the users.
- By implementing organ donation, it can maintain a health portfolio for each user which can be used by health professionals for determining the history of user.

4. References

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