



A research paper on lifeline donor blood donation application

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Abstract

The Blood Bank Donor Management website is a sincere effort of easing all processes revolving around receiving and donating blood. The website enables the user to easily access data regarding the availability of blood type in different blood banks across the state, along with the date of donation of blood and option to schedule a voluntary blood donation. A blood bank is a repository where the blood is stored and also managed because of blood gathered by collection and donation also they are preserved for future use. There are number of online blood bank donor management system tool which helps in storage of data for blood centers and the hospitals to maintain information of donors, blood availability. The website will include everything like registering an individual online to donate blood to searching nearby blood banks for checking the availability of blood.

Keywords: Database, Modules, Donor Registration Form, Basic Framework, Global Population Introduction (Heading 1)

1. Introduction

Blood bank donor storage and management involves in keeping a record of blood available and also information of the donors. Managing donation process has very little margin for errors. Blood is classified into four main types, with its negative and positive differences in variation. Other data like blood sugar content, antibody in it are necessary while matching a donor to a recipient. Hence, it is needed that these data must be stored securely. Other information includes the donors primary test results. The requirement of blood in hospitals may arise at any time and so it is required to ensure the availability of blood in banks all the time. The requirement of blood in India is almost Thirteen (13) crore units per year. But there is some mismatch in the blood collection and blood required. Haphazard management of blood bank leads to various issues like non-availability of bloods in bank, shortage of blood, and last-minute panic situations among the people who require blood in small time. The online blood bank management system can help to regulate process of blood flow and abolish the ambiguity of the system. Blood Transfusion Service (BTS) is an essential component of any health care delivery system. The timely availability of safe blood and blood products is needed in health facilities where transfusion is performed (WHO 2010a). Policy makers at different stages, programmer of bank managers and providers of blood for transfusion need to know how much blood is needed for their population, where and when it is needed so that blood is neither under - nor over- supplied (WHO 2009c). Today, many countries including India face difficulty in maintaining regular supply of blood and its product. According to WHO, blood donation by 1% of the population is normally taken as the minimum need to meet a nation's basic demands for blood; while the demands are higher in countries with more advanced health care systems (WHO 2009b). However, there is no prognostic support or attainable statistical model to substantiate this hypothesis. As per the above norm, India's requirement for blood is around 13.1 million blood units (1% of 1.3 billion population). Many studies and reports show varying amount of annual blood collection in India. In 2007, the total collection in India was appeared as 4 million against the need of 10 million (WHO 2008). In 2011, it was reported that Indian blood banks were proficient to collect 5.5 million blood units against the requirement of 9 to 9.5 million per year which is a serious mismatch in the demand and availability (Sa and Kulkarni 2011). Another study shows that India has 2,433 blood banks that can collect 9 million units of blood yearly, but accumulate only 7 million (Agarwal 2012).

The requirement of blood for the country is approximate to be 8.5 million to 10 million units/year, whereas the available supply is only 7.4 million units/year (Siromani et al. 2013). As per these studies and reports, it is apparent that there is a large mismatch between demand and supply (Sa and Kulkarni 2011, WHO 2008, Aggarwal and Sharma 2012, Sir Omani et al. 2013). There are huge differences in the estimated demand, supply and consumption of blood and blood products as well. As you go into this paper, you will be proposed a new solution for this problem after applicable researches and documents.

2. Aim and Objective

The aim of this research is to find a feasible solution to the problem that are faced by blood management centers.

The objectives of this research are to:

- Develop a possible solution to handle management activities in blood banks
- Make an effective means of communication between donors, hospitals, donors and recipients.
- Device means for the coordination of the activities of blood banks and blood donation.

A. Literature review

The main purpose of this research is to find a way and provide the solution to blood donation centres, the patients and also the donors. For providing this solution we have done much research and studied number of research papers to gather good quantity of information that will help achieve our goal. In order to recognize the facts in this research, it is necessary to analyse the overall structure of the blood donation (blood bank system) also the attempt being put in order to acknowledge the central blood repository.

B. Existing System

Much research have written on the concept of blood donation management systems with the most of them commend computerization as a mechanism for achieving capability and efficacy in this area and thus not looking at the problems the system may because of the misuse of functionalities.

Pah Essah and S.A.Rahman (2011) put forward the development of information system to lead the blood donation centres and blood banks which are based on the information of donors and its recipients. Their system has 3 modules which are – The blood module, the donor module, and the recipient module. But some issues are still left aside in this perspective.

According to M.D.Gaijjart (2002) proposes an evolution of blood bank information management system as an outcome to stop near miss events (errors) and also the retrieval of records. Their dispute is that with the help of computerization the information and records a=can be retrieved faster which increase the efficacy of the blood bank donation management system operations.

Akshay V Jain Khanter (2009) proposed blood bank and donation management information system that resolves some issues related to blood bank management system in a region. An engaging fact by Jeroen Benien and Hein Force (2012) is for the supply chain of blood bank centres and there products stating the procedure as irregular and the demand for blood is stochastic. This is a great suggestion if the blood bank management were to become effective.

Finally, E. M. S. S. Ekanayaka and C. Wimaladharm (2015) proposed a Blood Bank Management system to gather all the

donors of blood under single roof and also inform them regularly about their chances for donating blood using SMS and emails.

C. Proposed System

So, from the above stated literature, we make it our base for the research, and we pay very close attention to blood transfusion centres, blood donation centres and banks, also various other methods and stakeholders which are involved in those studies to develop a blood bank management system that will organize and improve its quality for various activities and operations which are conducted. The system which we are stating here is centralized and monitored which means it will have a single system which will provide various facilities to its users and the management.

Our proposed system is a web based system. It will be developed in Hyper Text markup Language (HTML-5) and CSS. It also uses JavaScript and Django framework and will be accessible through HTTP protocol. HTML with CSS is used to develop the interface of the user. JavaScript will be used to provide the backend functionalities.

The proposed system stores a large amount of data and therefore it will be connected to database. In this project, we will use SQLite database. SQLite database is an open source database implementation software. It can be embedded in the system as a library thereby leaving very small footprints. As a result, it is really fast, secured and most importantly very easy to use.

The website gives a very easy user interface with various features that are need of the hour. Some of which include pinpointing blood banks near your location, sharing the obtained location with a dedicated share button, providing you with directions to the desired blood donation centre or blood bank with an integrated google map, a direct hyperlink for the contact details of that particular blood bank, availability along with the number of units of every blood group. Real-time updating of units of blood available in the selected blood bank is one of the most prime feature

3. Methodology

A. Blood bank Web Application

This Module involve a detail information of how application works. The blood bank management system is the web-based online application with SMS as well as Email alert function various sharing method via social media applications and Blood bank locator that implemented using HTML CSS PHP JavaScript and SQLite for database.

In this Module the requests from receptors for the required blood group are provided.

The Blood donor can register himself on the system and it will provide a donor id on the completion of registration via Email service. If the false request sent to the blood bank the admin as well as blood bank have full rights to delete the request. In case If the request is sent to blood bank for specific blood group by user and his registration id also generated but unfortunately user won't come, the system automatically discard his registration id and update new blood bank data by using real time updating The system will notify to all the relevant donors with the request. Blood bank can add or remove a donor from the system. He can add blood stock to that blood bank. Blood Bank Management system has a separate Admin panel.

Admin has entire authority to add various blood banks and terminate. Admin can also check whether the blood bank is

active or not. The system is having different blood bank panel in which blood banks can have their user friendly dashboard in which they can manage blood, manage request, and manage blood issued.

B. Database

In this system, database is used to manage the transactions of blood donations and blood issued. The main goal of this system is to keep an organized records management of blood. Information such as Donor Details, Blood Collection, Screening, Component preparation, Blood storage, Blood request, Compatibility, Blood issue, Monthly statistics records are contained using database. It provides great help in the proper monitoring of blood available in the blood bank and for easy clarifying of blood request.

4. Actor's and modeling system

A. Donor

The website is useful not only for the receiver end but also for the donor end. Unlike the standard way where one has to physically go to the blood bank register himself and carry out the protocols there, the donor can register himself with the online portal to the nearest blood bank present and schedule a date for donating blood voluntarily, this not only will save his/her time in case of crisis but will also provide the user with peace of mind. Since the donor is registered to the blood bank portal the donor could be directly reached by the blood bank in case of total emergency. The private data of the donor will not be made public and cannot be accessed by the receiver directly but will be stored in that certain blood bank database thereby not violating his/her privacy. The personal data of the donor will not be made public and cannot be accessed by the receiver directly but will be stored in that particular blood bank database thereby not violating his/her privacy.

B. Admin

The admin section concludes all edits like manage blood bank, manage donor, manage request. He can also make changes in donor details, delete donor or change password. There is also one important feature of admin panel and that is status button. The Status button is used to hide/delete the status of blood bank. If blood bank is fronting some technical issue so admin can hide the blood bank from database. So that user doesn't get confused. After the problem solved then admin can easily enable the status button.

- Manage blood request
- Manage blood donor
- Manage blood bank
- Delete donor details
- Admin maintains security of the organization
- Logout

C. Receiver

The receiver unit helps user to find blood group. When user (receiver) clicks on find a blood group organization ask him to enter blood group he wants to find. After entering the blood group, system search for the readiness of the blood group and give him the list of the blood banks where the blood is accessible. The user will select an appropriate blood bank and will issue blood.

- Find a donor
- Refer a friend via social media app
- Find a blood group
- Logout

5. Modules

A. Factors and constraints to be considered to register

The respected donor should be aged between 18 and 60 years only. Hemoglobin should not be more than 12.5g/dL.

A Donor should weigh more than 45 kg. Before donating blood, the donor's body temperature and blood pressure should be normal. The donor should be free from diseases from the past 3 years. Most prominently the donor should not be addicted to drugs.

B. Blood Type

Our website has this service to let the users and deprived search for the specific type of blood they are looking for. Here we are passing the POST request where firstly the search form along with the donor list gets executed by fetching details from the search and the Dreg types from the database. Then authentication takes place by purifying the post request with the Dreg data, if the request is valid then the filtered data from Dreg gets positioned in a dictionary and return to the page through executions.

C. Donor Registration Form

Donors can be divided into returning donors, who donate on a nearly regular basis, and walk-in donors, who are entering the system infrequently or for the first time.

We have combined a form for donor parties to register themselves as donors. The form will ask the name, gender, date of birth, number, email, address, last donate month, health information etc. We have applied all types of restrictions in the form so that false or incorrect information is cast aside.

Same post request is used initially data gets filled into the limits through validation and must and should fields, later as usual data gets connected and stored in Dreg category of the database if all the effective and verify conditions of the library models has been satisfied. After the successful render concise data gets visible on the screen.

Here POST requests have been used mostly as the POST carrier request in the message body delivers the most secured way of transferring data from client to HTTP protocol by.

- Never caching process
- Requests do not remain in the browser
- These requests cannot be bookmarked
- It has no boundaries on data length

6. Basic Framework

Our system will manage blood collection, inventory, distribution of blood, donors along with a preceding investigation report about the success probability of any blood donation camp which are proposed. The whole system is a combination of some web based tools for user interfaces and using databases.

Different components are discussed next

A. Web Interface

It will be basically a website and an Android application which can be accessible by anyone having browser or mobile with an active internet connection. This system will be used by all the blood donors, recipients, patients, blood banks executives, blood donation camp organizers, the hospitals, by various NGOs, and the district administrators along with the common users for many different purposes.

Many of the use cases are already identified and proposed. Some of them are also implemented. In our web interface we

have three essential modules that form the framework namely Blood record Management, Donor Management, and Admin Portal.

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