# Blood Bank Management System

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*Abstract*:With the increasing of the population of and revolution of the new technologies, Blood Bank Management System plays an important role in the blood bank as blood is the necessity to everyone. This proposed system of the Blood Bank Management System is a web-based system intends to simplify and automate the process of searching for blood in case of emergency and maintain the records of blood donors, recipients, blood donation programs and blood stocks in the bank. Through the manual system of keeping the blood donation records, it is quite difficult to maintain the details of the donors and their donations as reference because the data can be lost or redundant. In case of critical blood demand in one time, broadcasting the message should be done to all donors with the respected blood group.

The Purpose of this study is to develop a Blood Bank Management System to assist in the management of blood donor records and ease/or control the distribution of blood in various parts of the country basing on the hospital demands. Without quick and timely access to donor records creating market strategies for blood donation, lobbying and sensitization of blood donors becomes very difficult. The blood bank management system offers functionalities to quick access to donor records collected from various parts of the country. The proposed of Blood Bank Management System helps the people who are in need of a blood by giving them all details of blood group availability or regarding the donors with the same blood group. They don't need to go anywhere to search the blood when they need. They just need to use this system then all the result will appear in just a second. Our life is so busy so we don't have time to spend going here and there, we can use technical way to search the blood by using the Blood Bank.

*Keywords: Blood Bank Management System, Blood Donation, Blood Group*

## Chapter-1 Introduction

### 1.1 General

The software system is an online blood bank management system that helps in managing various blood bank operations effectively. The project consists of a central repository containing various blood deposits available along with associated details. These details include blood type, storage area and date of storage. These details help in maintaining and monitoring the blood deposits. The project is an online system that allows to check weather required blood deposits of a particular group are available in the blood bank. Moreover the system also has added features such as patient name and contacts, blood booking and even need for certain blood group is posted on the website to find available donors for a blood emergency. This online system is developed on react.js platform and supported by an Google Firebase database to store blood and user specific details.

### 1.2 AIM

The main aim of developing this software is to provide blood to the people who are in need of blood. The numbers of persons who are in need of blood are increasing in large number day by day. Using this system user can search the blood group available in the city and he can also get contact number of the donor who has the same blood group. In order to help people who are in need of blood, this Online Blood Bank software can be used effectively for getting the details of available blood groups and user can also get contact number of the blood donors having the same blood group and within the same city.

### 1.3 Existing System

At the present there is no software to keep any records in blood bank. It becomes difficult to provide any record immediately at times of emergency. Required more human efforts in maintaining the branch related information. Manually to keep the accounts is also tedious & risky job & to maintain those accounts in ledgers for a long period is also very difficult. Difficult to manage and maintain the files. Chance of damage of files, if the data is stored in the files for duration of time. Privacy is difficult, Time consuming is retrieving, storing and updating the data. It is difficult to keep track the record about the donor & receiver he has donated or received the blood at the last time.

### 1.4 Proposed System

The proposed system (Blood Bank Management System) is designed to help the Blood Bank administrator to meet the demand of Blood by sending and/or serving the request for Blood as and when required. The proposed system gives the procedural approach of how to bridge the gap between Recipient, Donor, and Blood Banks. This Application will provide a common ground for all the three parties (i.e. Recipient, Donor, and Blood Banks) and will ensure the fulfillment of demand for Blood requested by Recipient and/or Blood Bank. The features of proposed system are ease of data entry, system should provide user friendly interfaces, no need to maintain any manual register and form , immediate data retrieval and so on.

### 1.5 Applications

- Medical Field(Hospital Staff/Receptionist, Blood Bank)
- Blood Donation
- Can be used at Blood Donation Camps

### 51.6 Advantages

- Helps Blood Banks to automate blood donor and depository online.
- Encourages blood donors to donate.
- Helps people find blood donors in times of need.

### Chapter-2 Literature Review

#### 2.1     General

Every year the nation requires about 4 Crore units of blood, out of which only a meagre 40 Lakh units of blood are available. There are multiple blood banks around the world, however none of them offer the capability for a direct contact between the donor and recipient. A blood donation occurs when a person voluntarily has blood drawn donating blood may be of whole blood (WB), or of specific components directly. Today in the developed world most blood donors are unpaid volunteers who donate blood for a group supply. Donor can also have blood drawn for their future use. Today web based application has become a part of our daily life. With the revolution in technology many features were added to the field. This web application is developed to easily search the blood donor nearby at any emergency. Those who have registered in this app, their location, contact number and blood group along with other details with be displayed. The proposed work aims at servicing the persons who seek donors who are willing to donate blood and also provide it in the time frame required. This application allows donor to register their details such as their locality, weight, contact info etc. The application is monitored at all times so that the misuse of the user's privacy is maintained by the admins. The registration of the users must be confirmed by the admins for it to get updated in the database which prevents users from registering multiple times. Direct involvement of the donor and the seeker saves time and life as sometimes the required blood may not be available in the blood bank and also the seeker has to purchase the blood required in the time of emergency.

#### 2.2     Literature Review

Applying optimization methods to healthcare management and logistics is a developing research area with numerous studies. Specifically, facility location, staff rostering, patient allocation, and medical supply transportation are the main themes analyzed. Optimization approaches have been developed for several healthcare related problems, ranging from the resource management in hospitals to the delivery of care services in a territory. However, optimization approaches can also improve other services in the health system that have been only marginally addressed, yet. One of them is the Blood Donation (BD) system, aiming at providing an adequate supply of blood to Transfusion Centers (TCs) and hospitals.

Blood is necessary for several treatments and surgeries, and still a limited resource. The need for blood is about ten million units per year in the USA, 2.1 in Italy and 2 in Turkey; moreover, people still die in some

countries because of inadequate supply of blood products (World Health Organization 2014). Hence, BD plays a fundamental role in healthcare systems, aiming at guaranteeing an adequate blood availability to meet the demand and save lives. In Western countries, blood is usually collected from donors, i.e., unpaid individuals who give blood voluntarily. Blood is classified into groups (A and subgroups, B, 0 or AB) and based on the Rhesus factor (Rh+ or Rh-), and each donor should be correctly matched with the patient who receives his/her blood. Moreover, as it may transmit diseases, blood must be screened before utilization.

Generally, there are two types of donation: whole-blood donation, in which the whole blood is directly collected in a plastic bag, and apheresis, i.e., the donation of specific components in which a mechanical gathering unit decays the required blood parts. Blood requires particular precautions for collection and storage, and its shelf life from donation to utilization is limited, thus requiring a continuous feeding of the system (Greening et al. 2010). Hence, a successful BD supply chain should meet the daily demand of blood and follow its temporal pattern. According to Sundaram and Santhanam (2011), BD supply chain and the related management problems can be classified based on the main phases of a blood bag life: donor registration, blood collection, blood screening/evaluation, inventory storage and delivery. A slightly different classification is proposed in Pierskalla (2004), according to which the management of BD supply chain concerns both strategic decisions (e.g., location of blood centers) and tactical operational decisions (e.g., production of multiple products, control of inventory levels, blood allocation to hospitals, and delivery to multiple sites). In our review, we refer to the first classification scheme.

Many papers address the management of the BD supply chain (see Belien and Forcé (2012) for a recent survey); however, there are still some open issues. The aim of this paper is reviewing the literature related to the BD system management and classifying the existing research based on the process phase, in order to highlight unexplored issues and to point out alternative perspectives and possible future research opportunities. In section "Phases of Blood Donation System" we give details about the BD system and survey the existing literature (review updated at December 2014); then in section "Discussion and Open Issues" we discuss the open issues and propose future research directions.

## Chapter-3 Software Requirements Specification
### 3.1 Hardware Requirements (Minimum)

| Processor | Intel core i3 or greater |
|-----------|--------------------------|
| Memory    | 4 GB                     |
| HDD       | 60 GB                    |

### 3.2 Hardware Requirements (Minimum)

| Operating System  | Windows XP or Greater              |
|-------------------|------------------------------------|
| Development Tools | ReactJs, CSS 3, HTML5, Javascript  |
| Database          | Firebase                           |
| Browser           | Chrome, Firefox                    |
| IDE               | Visual Studio                      |

## Chapter- 4 Conclusion and Future Scope
### 6.1 Conclusion

Based on results, this study concluded that online blood bank management system is much better than the manual system. The findings showed that respondents prefer to use online blood bank management system rather than the manual system because it offers many advantages and benefits that lead to its effectiveness, and efficiency. Because of the increased confidence on the users on the system, it can be concluded that the online blood bank management system enhances blood transfusion safety because it provides better ways of handling the various processes in blood bank.

### 6.2 Future Scope

The proposed system is Blood Bank System. We can enhance this system by including more facilities like emergency SMS for donor which ready for donating blood as well as embedding with hospitals, for Hospital patients facility those who one need blood they can find easily.

### 6.2 Future Scope

In view of the findings, the researchers recommend that implementation of online blood bank management system. Further, the researchers recommend that further studies on how online blood bank management system enhances blood transfusion safety can be undertaken to strengthen this study's findings. This requires actual implementation of the online system and evaluates how the users respond after implementation. This study recommends that it should be roll out across the Sultanate of Oman. Likewise, to ensure that there will be better user engagement, user manuals and proper user training should be given. Lastly, this study recommends that the system can be expanded by allowing donors to register online and be a system user, and these donors will be informed about the planned blood donation activities through the online system.

### References and Bibliography

Alfonso, E., Xie, X., Augusto, V., Garraud, O.: Modeling and simulation of blood collection systems. Health Care Manag. Sci. 15(1), 63–78 (2012)

Axsäter, S.: Using the deterministic EOQ formula in stochastic inventory control. Manag. Sci. 42(6), 830–834 (1996)

Bani, M., Giussani, B.: Motivation in Italian whole blood donors and the role of commitment. Psychol. Health Med. 16(6), 641–649 (2011)

Belien, J., Forcé, H.: Supply chain management of blood products: a literature review. Eur. J. Oper. Res. 217(1), 1–16 (2012)

Blajchman, M.A., Shepherd, F.A., Perrault, R.A.: Clinical use of blood, blood components and blood products. Can. Med. Assoc. J. 121(1), 33–42 (1979)

130 S. Bags et al. Blake, J.T.: On the use of operational research for managing platelet inventory and ordering. Transfusion 49(3), 396–401 (2009)