

## "Blood Bank Management System"

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**Abstract** -This paper proposes a Blood Bank Management System (BMMS) which can be used by laboratories, clinics, hospitals, or anyone who is in need of blood. The proposed system would be able to connect the requester and donor through a safe web-based platform with a simple registration process. This improper management of blood leads to wastage of the available blood inventory. The methodology that has been chosen to develop BMMS is the Rational Unified Process (RUP). The methodology consists of four phases namely Inception, Elaboration, Construction, and Transition. Some important modifications to this methodology include admin access to registered user's data and a personal notification alert system. This study found out that this system puts an end to the fear caused during an emergency period and reduces the hassle of manual paper-based data entries. GPS tracking via registration and Cloud Storage for scalability can further improve the feasibility and Data processing of the presented system.

**Key Words:** Rational Unified Process (RUP), XAMPP, PHPMYADMIN, Donor, Recipient

### 1. INTRODUCTION

India suffers from an annual deficit of two million units, as only 1% of the Indian population donates blood as stated by the World Health Organization (WHO). Due to substandard medical facilities and practices in many parts of the country, there have been cases of transmission of infectious diseases like AIDS. The need for blood is increasing along with its importance for treating various medical conditions. There are three main components of blood; plasma, platelet, and RBC/WBC. Especially during this covid pandemic, we're seeing a huge spike in the requirement of blood plasma from the patients who were recovered from covid-19 as their Convalescent Plasma now contains covid-19 antibodies.

There is a dire need for a software management tool for synchronization between the blood donors, hospital admins, and the blood banks. Improper communication, lack of synchronization in the blood banks leads to wastage of the available blood and loss of life. From registration to donation, a high-end, efficient, highly available, and scalable system has to be developed for easy registration of donors, recipients as well as an

automated management system for blood bank desk admins. Thus, reducing the efforts required to search for blood donors as well as their data management.

### 1.1 Proposed System

The proposed Blood Bank Management System helps the Blood Bank Admin to easily monitor the blood requests and users database. The proposed system takes a systematic approach of how to bridge the gap between Recipients, Donors, and Blood Banks. It improves the existing system by providing a common ground to ease the process of blood donation and reception.

The Blood Bank admin uses Donors Registered Phone Number and Email-Id to verify the request so as to confirm the booking. While requesting the blood, the registered recipient can also check the availability of the required blood type as displayed by the admin. A direct messaging feature for inquiries is also available to the registered user.

The database mainly consists of the registered donor's information and inquiries managed by an Admin. It also comprises the records of available blood group samples. The database is currently hosted on a local host server using 'xampp' and managed using 'phpmyadmin'.

### 2. LITERATURE REVIEW

In "Blood Bank Management Information System in India" Vikas Kulshrestha and Dr. SharadMaheshwari [1] investigates the conditions laid by the Blood Bank for the donor in order to donate blood. The study describes the comparison of five existing web-based blood banks. The first, Blood Bank India provides the basis of city-wise and blood group-wise search for blood. The second, Bharat Blood Bank provides state-wise, area-wise and blood-group-wise searches of blood. It fails to provide a tool where a patient can ask for blood online. The third, e-Blood Donors provides gender-wise, city-wise, and blood-group-wise searches for blood but fails to provide blood on online request. The fourth, Lions Blood Bank & Research Foundation provides the current status of availability of blood, frozen plasma, platelets, and packed cells. The fifth, Web Blood Bank provides Rh factor-wise

search of blood. The study also lists few improvements which can be made to these existing systems.

In “A Study on Blood Bank Management” by A. Clemena, K. Sankar and S. Kannan [2] explores a plan to collect blood from various places and give it to the ones who are in need. It is a software application that keeps track of everyday transactions and suits all blood types. The proposed system automatically stores the information on the system which makes it more efficient and faster rather than storing information in bulky files. The access to the system is secured by login to avoid intentional threats. The system has the following modules User Login Screen, Menu Form, Donor Management, Donor Registration, Donor Blood Test, Recipient Management, Blood Management, Blood Stock, Blood Reservation but it fails to provide the pictorial representation of the mentioned module.

In “Blood Bank Management System” by Ravi Kumar, Shubham Singh, V Anu Ragavi [3] discusses an application that is scalable and adaptable for the complex needs of blood banks. It discusses the limitations of the existing system such as the details of donors being entered manually which led to a waste of time and even caused incorrect information. The tracking was also very complicated in the manual system. The proposed system has three main modules namely admin, donor, and acceptor. The application was developed using ASP.NET, C#.NET, and SqlServer.

### 3. METHODOLOGY

The methodology chosen to develop the Blood bank system is the Rational Unified Process (RUP) from IBM developerworks. RUP is a multi-layered adaptive process designed for software project teams that use their process elements as they scale up. There are four phases involved in this methodology. They are Inception, Elaboration, Construction, and Transition.

Overall, these phases primarily include important use cases, the scope of the project, initial costing, development process including depth and breadth of prototype success factors, risks involved, coding, testing, and debugging. Thus the primary objective is to build the software system and later on ‘transit’ the system from development to production or application systematically. Maintenance and beta testing are also key aspects of this system. The development time required is also greatly reduced due to the re-use of software components. It also saves time in backend integration. This methodology ensures the stability and adaptability of core system applications.

### 4. RESULT

Shown below are the screenshots of various activities from the web application along with their description.

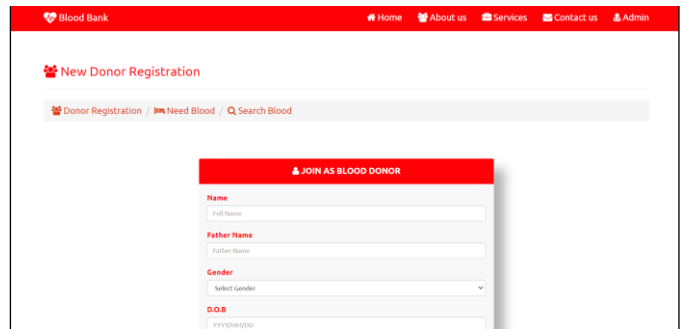


Figure 1: New Donor Registration

For Blood Donation, the user has to login or register as a donor to get started with the web application. After clicking the LOGIN button, the entered password and the entered username will be sent to the back end database and the user will be granted access if he is registered within the system.

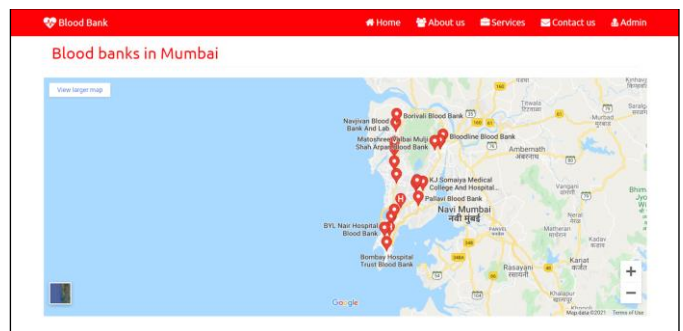


Figure 2: Nearby Blood banks using Google Maps

The ‘Nearby Blood Banks’ option opens Google Maps. From this the user can locate the blood banks through red markers for a quick search.

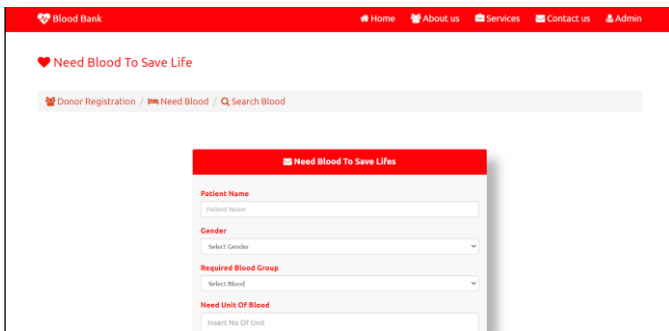


Figure 3: Recipient Registration

The user has to log in or register as a recipient to get started with the web application. The Blood Bank admin will then verify the details.

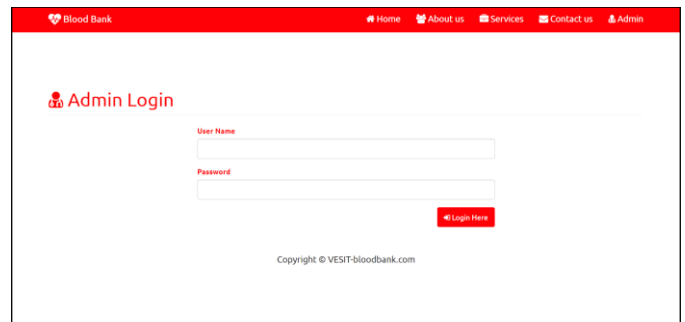


Figure 6: Admin Login

The Blood Bank Admin has to log in with his registered credentials. The Blood Bank Admin has access to the entire database and dashboard men

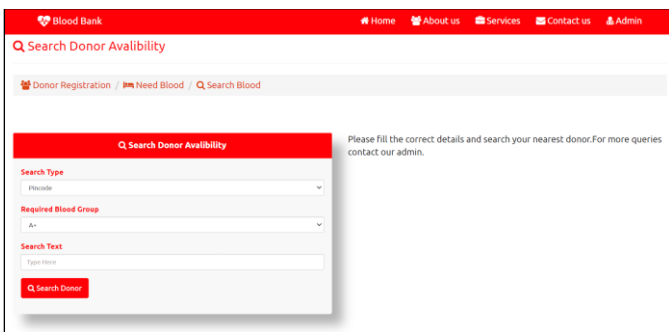


Figure 4: Search Donor Availability

The registered user can search for an active donor directly by entering the proper blood type and location. The Active Donors Database is frequently updated by the Blood Bank Admin.

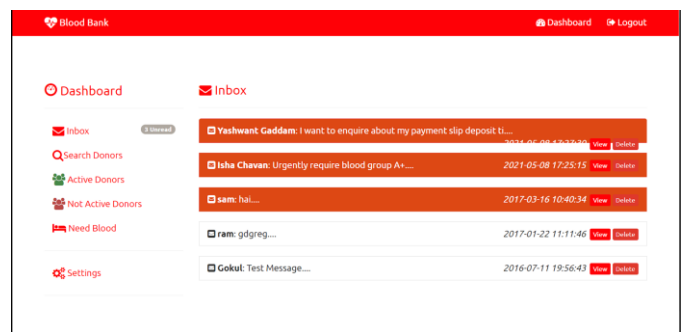


Figure 7: Dashboard - Inbox

The Admin can perform various actions in the dashboard menu. He can reply to queries, Add or Remove Active Donors, Verify User details, etc.

### 5. CONCLUSION

This proposed Blood Bank Management System gives a reliable platform for both donors and acceptors. The BBMS is a web-based application that helps to minimize human errors and problems pertaining to data redundancy. It is a fast-paced and efficient way to communicate without any security threats as the data entered will be verified and frequently updated thereby increasing the probability of saving one's life. Moreover, the availability of a location-based system where the nearest blood bank can be located through Google maps makes it more accessible.

### 6. FUTURE SCOPE

This paper proposes a Blood Bank Management System which we believe will bring remarkable change. Support of various regional languages for better reach. The size of the database may increase exponentially, so our BBMS is made such that it is scalable and can be deployed on cloud storage systems like

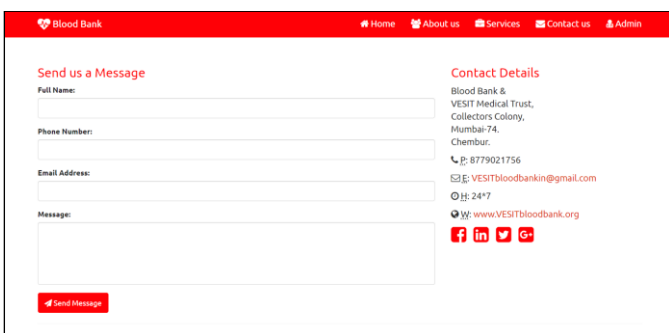


Figure 5: Enquiry/Contact

The registered user can directly message the Admin for any queries. The user can also contact via details from the main contact section.

Amazon Elastic Compute Cloud (EC2) or Google's Kubernetes Engine (GKE) after containerizing the application.

## REFERENCES

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