# BloodCare: A Web-based Blood Donation Management System

## Declaration

It is hereby declared that the project titled "BloodCare: A Web-based Blood Donation Management System" submitted is our original work carried out during the course of our degree at City University. The report does not include any material previously published or written by a third party except where cited and acknowledged. It also has not been submitted elsewhere for any other degree or diploma.

## Approval

This project report titled "BloodCare: A Web-based Blood Donation Management System" submitted by:

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has been approved as fulfilling the requirements for the degree of B.Sc. in Computer Science and Engineering in Summer 2025.

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## Abstract

BloodCare is a dynamic web-based blood donation platform developed to efficiently connect blood donors and recipients, streamline donor management, and provide role-based access to system administrators. The system is designed with donor and user interaction in mind and features search tools to locate eligible donors based on location and blood group. Administrators, including Super Admins and Normal Admins, manage user accounts, donor registrations, and system data. Super Admins have extended privileges over admin management.

The application aims to reduce delays in accessing blood in emergencies and offer a transparent, accessible donation process.

Keywords: Blood Donation, Donor Management, Role-based Access, PHP, MySQL, BloodCare

## Acknowledgment

All praises to the Almighty for granting us the strength and opportunity to complete this project. We express our deepest gratitude to our supervisor Labiba Tasfiya Jeba for continuous support, feedback, and valuable guidance throughout the development process. Special thanks to our families and friends for their support and encouragement.

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## 1. Introduction

Blood donation is a critical component of healthcare. In emergency situations, access to the right blood group is crucial. BloodCare aims to digitize and simplify this process by creating an online platform that connects blood donors and seekers in real-time.

## 2. Objectives

- Build a donor-user registration and management system.
- Allow users to search donors by city and blood group.
- Enable donors to manage their availability.
- Equip admins with tools to oversee and manage users and donors.
- Implement a secure and user-friendly platform.

## 3. System Overview

- Platform: Web-based application
- Users: Donors, Normal Users (Recipients), Admins (Normal and Super Admins)
- Modules: Registration, Login, Profile Management, Donor Search, Admin Dashboard, Blood Group and City Management

## 4. User Roles and Features

### A. Donors

- Can sign up and log in to the system securely.
- Maintain their profiles (name, gender, contact info, blood group, city, etc.).

- Set status: Active / Inactive

- Update profile and contact info

- Can be searched by users based on city and blood group.

### B. Normal Users (Recipients)

- Register and log in securely

- Maintain their profile.

- Search donors by blood group and city

- View donor details including name, availability status, and phone number.

## 5. Admin Roles and Access

### A. Normal Admin

- Can log in and access the admin dashboard.

- Can view and manage all records:

- Donors

- Users

- Cities

- Blood Groups

- Admins (Read-only access)

- Cannot add/edit/delete admin accounts.

### B. Super Admin

- Full access to all admin functionalities.

- Can add, edit, delete, and update other admin accounts.

- Can change admin types (promote/demote to/from Super Admin).

- Has access to all sections like:
  - Cities Management
  - Blood Groups Management
  - User and Donor Management

## 6. Key Features

### 1. Authentication & Authorization

- Separate login systems for users and admins.
- Session management and role-based access control.

### 2. Donor Search System

- Search filters by blood group and city.
- Show donor availability with status badges (Active/Inactive).
- Display donor phone numbers for contact.

### 3. Admin Dashboard

- Data visualizations and key statistics (e.g., total donors, active donors).
- Sidebar menu for easy navigation.
- Super admin-exclusive access features.

### 4. Landing Page

- Informative layout with the following sections:
  - How It Works
  - About Us
  - Contact Information
  - Quick Links

## 7. System Architecture

- Frontend: HTML, CSS, Bootstrap, jQuery, Ajax
- Backend: PHP (modular pattern)
- Database: MySQL
- Routing & Session: PHP sessions, .htaccess for URL rewriting and error handling

## 8. Technologies Used

- HTML5 / CSS3
- JavaScript / jQuery
-Ajax
- PHP
- MySQL
- Bootstrap Icons / Font Awesome

## 9. Database Schema Overview

### 1. Key Tables:

- **donors** (id, name, blood_group_id, city_id, status, ...)
- **users** (id, name, email, city_id, ...)
- **admins** (id, name, is_super_admin, ...)
- **cities** (id, name)
- **blood_groups** (id, name)

### 2. Relationships:

- Donors and users are linked to cities and blood groups via foreign keys.
- Admins have a boolean flag "**is_super_admin**" to control access.

## 10. Security Practices

- Passwords hashed using SHA-256.
- Input validation and sanitization on both client and server.
- Session-based access control.
- Restricted admin panel based on user role.
- Panel access is strictly role-based:
  - Admins cannot access Donor or User panels.

- Donors and Normal Users cannot access the Admin Panel or each other's dashboards.

- Super Admins have elevated access but are still confined within the Admin Panel.

- Unauthorized route access is redirected based on role.

- Admin sections are further restricted using flags like "is_super_admin" and "is_protected".

## 11. File Structure Highlights

- index.php: Landing page

- /user/: Contains donor and receiver dashboard, profile

- /admin/: Admin dashboards and management sections

- /assets/: Static files (CSS, JS, images)

- 404.php: Custom error page for invalid routes

- .htaccess: Rewrites and error handling

## 12. Future Enhancements

- Enable donor-user messaging system

- Donation history and frequency tracker

- Email notifications for urgent requests

- Responsive mobile app version

- Analytics on blood demand by region

## 13. Conclusion

BloodCare successfully delivers a comprehensive and well-structured platform that addresses the real-world need for efficient blood donation management. By combining user-friendly interfaces with robust backend logic, the system ensures a seamless experience for all types of users — including donors, recipients (normal users), and administrators.

The platform empowers donors to manage their profiles and availability status, while normal users can easily find and contact suitable donors in times of emergency. Admins, especially super admins, can efficiently monitor, update, and maintain critical data such as blood groups, cities, and user information — all through a role-restricted, secure admin panel.

The project prioritizes data protection and role-based access control, ensuring that unauthorized users cannot access areas outside their permission level. This layered security model helps build trust and credibility in the system.

Overall, BloodCare demonstrates a scalable, maintainable, and efficient solution tailored to solving urgent challenges in healthcare and emergency response. It lays the groundwork for future improvements, such as real-time notifications, donation tracking, and integration with mobile technologies.