Zion - A Blood Donation Management System

A PROJECT REPORT

Submitted

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BONAFIDE CERTIFICATE

Certified that this project report titled **"Zion - A Blood Donation Management System"** is the bonafide work of "**Mohit Soni(19BCE10133), Saarth Srivastava(19BCE10074) and Adarsh Bhasker(19BCE10060)"** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported at this time does not form part of any other project/research work based on which a degree or award was conferred on an earlier occasion on this or any other candidate.

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Abstract

Blood bank is a place where a blood bag that is collected from blood donation events is stored in one place. The term “blood bank” refers to a division of a hospital laboratory where the storage of blood products occurs and where proper testing is performed to reduce the risk of transfusion related events . The process of managing the blood bag that is received from the blood donation events needs proper and systematic management (7). The blood bag must be handled with care and treated thoroughly as it is related to someone’s life. The development of Web-based Blood Bank And Donation Management System (BBDMS) is proposed to provide a management functional to the blood bank in order to handle the blood bag and to make entries of the individuals who want to donate blood and who are in need.

There is no storage of blood so no complications in the database. The software is fully integrated with customer relationship management as well as content management system solutions. It is developed in a manner that is easily manageable, time saving and relieving one from manual work.

TABLE OF CONTENTS

1. Introduction

Blood is the most precious gift that anyone can give to another person — the gift of life. A decision to donate your blood can save a life, or even several if your blood is separated into its components — red cells, platelets and plasma — which can be used individually for patients with specific conditions. Safe blood saves lives and improves health .

Blood is also needed for regular transfusions for people with conditions such as thalassaemia and sickle cell disease and is used to make products such as clotting factors for people with hemophilia. There is a constant need for regular blood supply because blood can be stored for only a limited time before use. Regular blood donations by a sufficient number of healthy people are needed to ensure that safe blood will be available whenever and wherever it is needed (5). Therefore it is a necessity to develop a system that can manage all the things like patient requirements, donors information, types of blood available .

2. Objectives

- Successfully manage the donor information and data about blood.
- Campaigns and notices should be prominently displayed.
- Should be working 24x7.
- the admin should be able to change the data for their websites according to their company's services and needs.
- At home facility of blood donation.

3. Motivation for the work

India is a very diverse nation with many metropolitan areas and rural areas as well. There are many big blood bank systems in the big cities which don't need any management systems as they are directly connected with the government and they have their own systems. Our motivation comes from the fact that there are many small villages who have their blood banks but don't have a proper system to manage their blood details and often they rely on big city blood banks to supply them blood which in needy conditions, can have horrible outcomes. We wanted to develop a user-friendly solution to these blood banks of the rural areas so that people from the villages can help each other and become donors themselves and they become self-sufficient so that no person in the world should suffer for the reason that proper blood supply was not available at the appropriate time.

4. Existing Solutions

The Indian Blood Bank Website(e-RaktKosh)-e-Rakt Kosh enforces Drug & Cosmetic Act, National blood policy standards and guidelines ensuring proper collection & donation, effective management and monitoring the quality and quantity of the donated blood. Considering the national roll out, e-Rakt Kosh has been developed with a modular and scalable approach with configurable rule based architecture allowing customization to easily incorporate specific requirements from nationwide stakeholders.

Limitation:

1. Since this is a nationally hosted website by the central government and in certain states the same party doesn't hold power so there is discrepancy in supplying the facilities provided through this domain.
2. People don't come easily as (2) as that is the governing body in India.

National blood transfusion council-The National Blood Transfusion Council (NBTC) is a society registered under the societies registration act. It is a representative body having representation from the Directorate General of Health Services, Drug Controller General of India Govt. of India, representatives from Ministry of Finance, Govt. of India.

Limitation:

This works on only blood banks that come under the government and so the reach is less compared to (1) and there is no facility for someone who is scared to donate blood and wants a home facility.

5. Proposed Solution with Novelty

In Zion, we are aiming to have a system that can be used by small blood banks in the rural areas so that they are not dependent on the city blood banks and whenever there is an urgent need for blood, the delay and risks are minimal. We are aiming to add functionality that will help the organization using our facility to edit the pages from their admin end without even getting into the code (6).

We also aim to provide a unique service through which one can attain blood donation facility at the place as per their convenience by accessing the campaign section which will inform them about where we'll be carrying out campaigns and when. This empowers us and the users to overcome any stereotypes or fears they have about blood donation and it'll be an overall positive addition to society's welfare.

6. Project Procedure

The list below is the blood bank management system project modules (8):

Manage Recipients – The admin has access to the donor management. He can update the blood, can update camp details users, and can view the details of the customer who requested blood.

Manage Donator – The admin has access to the donator of the blood. He can update the details of the donor.

Login and Logout – By default one of the security features of this system is the secure login and logout system. The login and logout system of this **Blood Bank Management System** uses a session. It means that the user can only log in at once on the same browser.

Donor Registration – For the donor registration, you will fill the forms. Such as your complete name, gender, date of birth, blood type, phone number, email address, home address, etc.

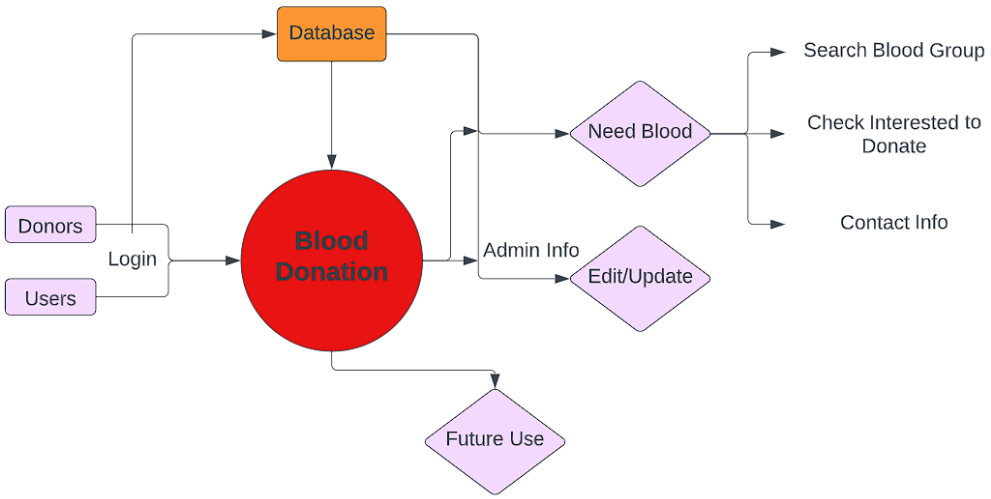
Contact Information – For the contact us, you will be able to see their address, phone number and email address.

Blood Letting Information – For the about us, you will be able see the goals and objectives of the blood bank management system.

Place of Requirement of Service - On our website we will also have a ticker (Moving Notice Bar), that will display all the upcoming events and drives. Users will

be able to access a google form in which they can choose the place of service requirement at the Centre/Mobile Units/Home. We will extract this information as a csv file and provide it to our database which will then send out mails regarding the donation service according to the choices made by the user.

UML



The purpose of this UML diagram is to visually represent the system along with its main actors, roles, actions, artifacts or classes, in order to better understand, alter, maintain, or document information about the system.

Tech - Stack Used

Base Server

XAMPP (9) is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the **Apache HTTP** Server, **MariaDB** database, and interpreters for scripts written in the PHP and Perl programming languages.

Security

PHP has many pre-defined functions for data encryption. Users can also use third-party applications for security. Security and flexibility are often contrasting features, but PHP somehow manages to offer them both, and that's great. PHP is designed specifically to be a more secure language for writing CGI (Computer-generated Imagery) programs. Security algorithms such as Sha1 (secure Hash algorithm 1) and MD5(Message digest 5) are used to encrypt the strings in PHP. Filter_var and strip_tags functions help to keep the environment more secure and safe for users.

6.1. Why do we use PHP?

PHP (8) can actually do anything related to server-side scripting or more popularly known as the backend of a website. PHP can receive data from forms, generate dynamic page content, can work with databases, create sessions, send and receive cookies, send emails etc. There are also many hash functions available in PHP to encrypt user's data that makes PHP secure and reliable to be used as a server-side scripting language. So these are some of the abilities of PHP that makes it suitable to be used as a server-side scripting language.

Reasons for using PHP (3):

- A large base of reference and educational materials
- Better loading speed of websites
- More options for database connectivity
- A large collection of open-source addons
- Inexpensive website hosting
- Great synergy with html
- Excellent flexibility and combinability
- Various benefits provided by cloud solutions

6.2. Real-time access monitoring

PHP provides real-time information about users' access. It provides a summary of recent accesses of the user. PHP offers a secure user management system and prevents unrestricted access.

6.3. Platform Independent

We can run PHP on any device and operating system (Microsoft Windows, macOS, Linux, RISC OS, or Unix). We can easily connect it with various databases and are also compatible with almost all web servers used today (Apache, IIS, and others). It supports a wide range of databases as well. Its cross-platform compatibility makes really popular among its users as it saves a lot of time and energy

7. System requirements

As we are using XAMPP for the local hosting, the hardware requirements of XAMPP are as follow (4):

7.1. Windows

- Free Space on Hard disk- 1 GB to 2 GB (according to the version)
- RAM- 512 MB (minimum)
- Platform- Windows 2008, 2012, Vista, 7, 8, 10 (above XAMPP versions are not supported in windows XP and 2003)
- System Type- 32-bit operating system

7.2. Linux

- Free Space on Hard disk- 2 GB to 10 GB (according to the version)
- RAM- 1 GB (recommended)
- Platform- Debian, CentOS, RedHat, Fedora, Ubuntu, Gentoo, Arch, SUSE
- System Type- 64-Bit operating system

7.3. macOS

- Free Space on Hard disk- 2 GB to 5 GB
- RAM- 1 GB (recommended)
- Platform- macOS 10.6 Snow Leopard, 10.7 Lion, 10.8 Mountain Lion, 10.9 Mavericks, 10.10 Yosemite, 10.11 El Capitan, 10.12 Sierra
- System Type- 64-bit operating system

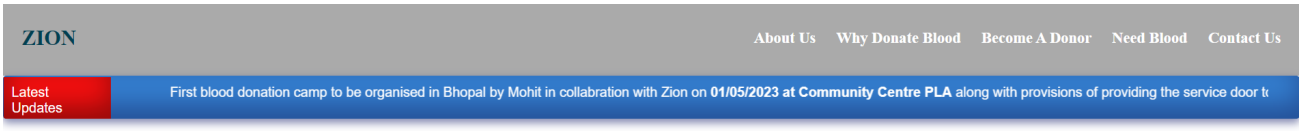
8. Work Done

8.1. User - End

1	Home Page
2	About Us
3	Why to Donate Blood
4	Donor Initiation
5	Blood Requirement
6	Contact Us
7	Campaign

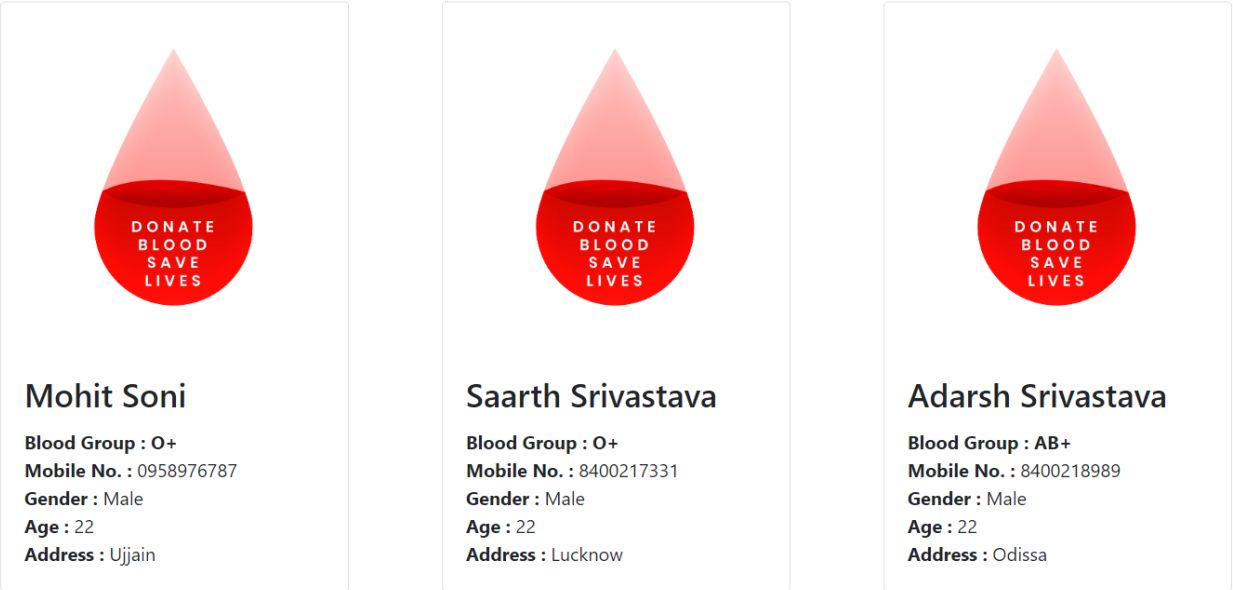
These are the context pages that the users will be able to see on their end and interact with. Moreover, all these pages will be changeable from the admin end for those users who have limited technical knowledge and of course from the back end for those with experience in handling databases.

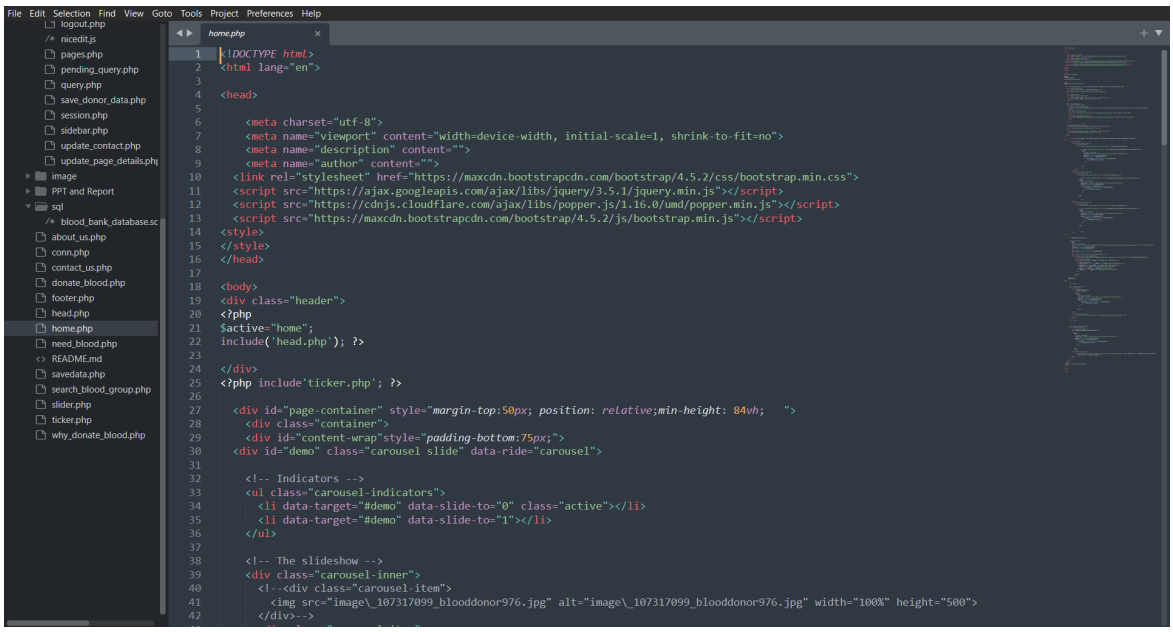
8.1.1. Screenshots



Welcome to Zion Blood Bank Manager

Blood Donor Names





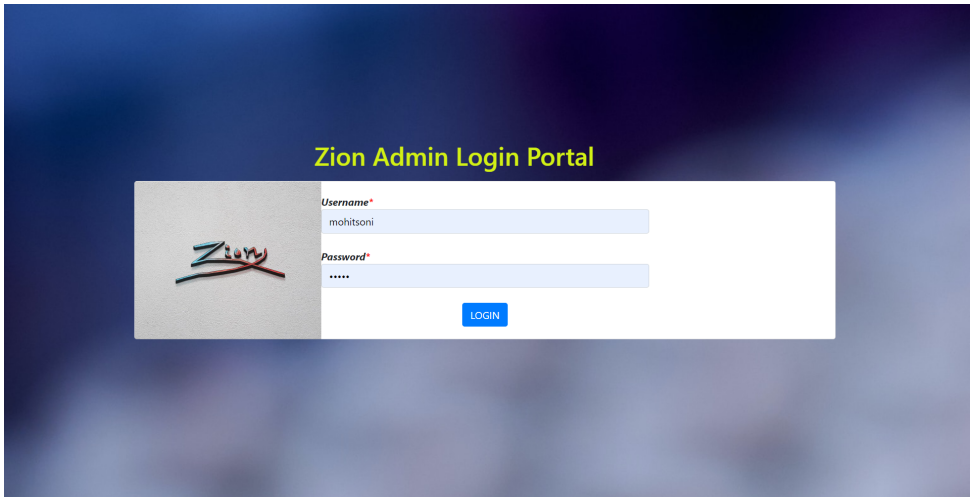
8.2. Admin - End

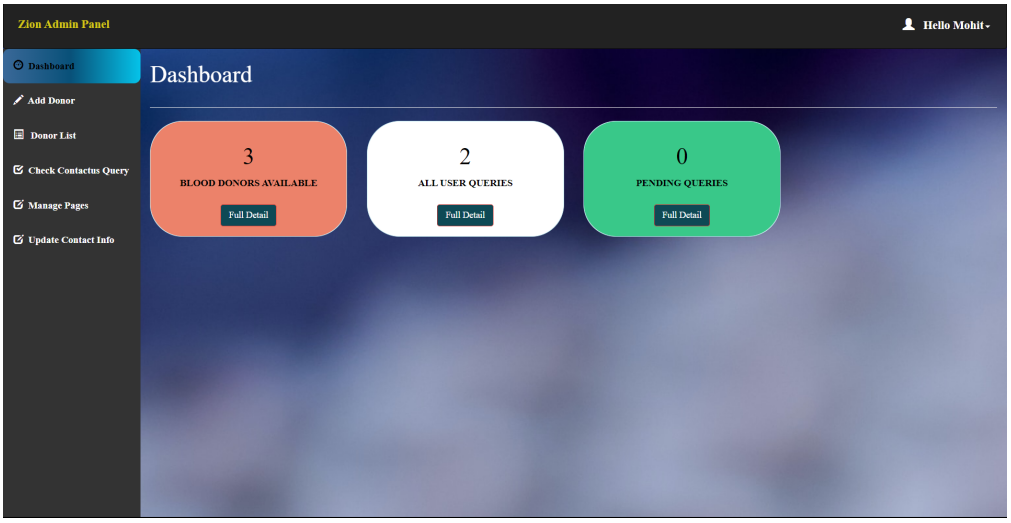
1	Dashboard
2	Login Portal
3	Adding Donor

4	Donor List
5	Password Reset
6	Contact Us Queries List
7	Manage Pages
8	Update Contacts

These context pages could be accessed only by the admin who is hosting the website or whomsoever they authorize with admin powers to access the data. In case of discrepancy in security even if an unauthorized person gains access to the admin info, they can be locked out manually from the back-end or if that's not possible, they will only be able to access the generic data provided by the php HTTP server since all the stored data is encrypted thanks to the facilities of utilizing php.

8.2.1. Screenshots




Zion Admin Panel
Hello Mohit
Dashboard
Add Donor
Donor List
Check Contactus Query
Manage Pages
Update Contact Info
Dashboard
3
BLOOD DONORS AVAILABLE
Full Detail
2
ALL USER QUERIES
Full Detail
0
PENDING QUERIES
Full Detail

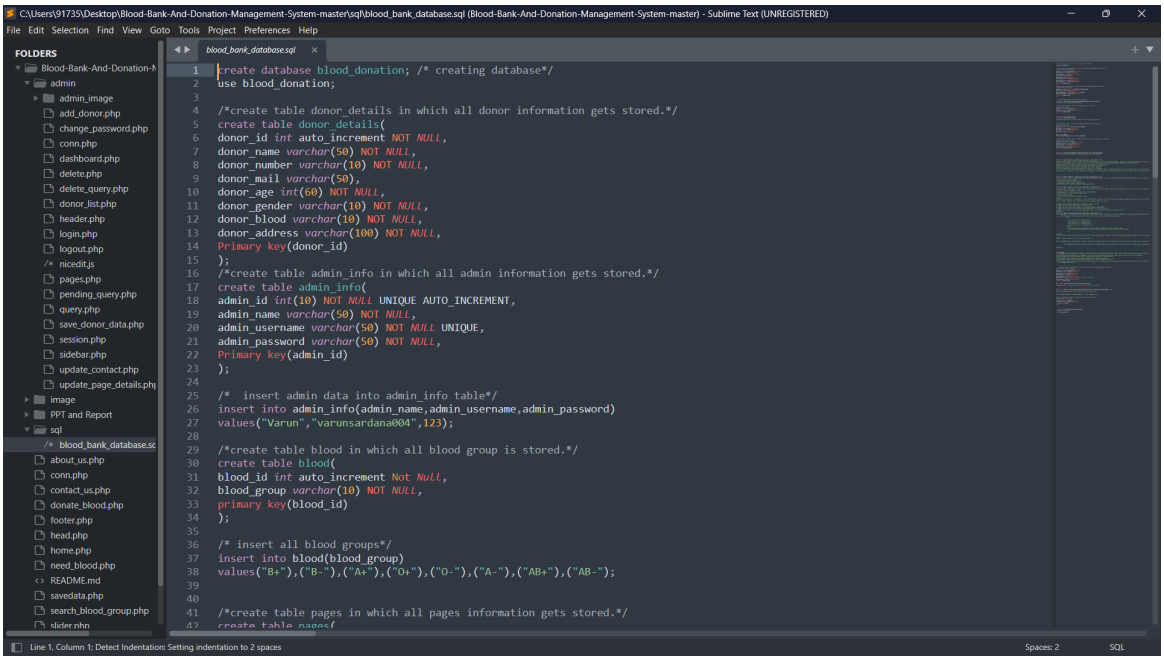

admin_image
add_donor.php
change_password.php
conn.php
dashboard.php
delete.php
delete_query.php
donor_list.php
header.php
login.php
logout.php
nicedit.js
pages.php
pending_query.php
query.php
save_donor_data.php
session.php
sidebar.php
update_contact.php
update_page_details.php
image
PPT and Report
sql
blood_bank_database.sc
about_us.php
conn.php
contact_us.php
donate_blood.php
footer.php
head.php
home.php
need_blood.php
<head> <meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
<meta name="description" content="">
<meta name="author" content="">
<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script></head>
<body background="admin_image\blood-cells.jpg">
<form class="" action="<?php $_SERVER['PHP_SELF']; ?>" method="post">

<h1 class="mt-4 mb-3" style="color:#D2F015 ;">
Zion Admin Login Portal
</h1>

<div class="card" style="height:250px; background-image:url('admin_image/zion.jpg'); background-repeat: no-repeat;
background-size: 295px 250px;">

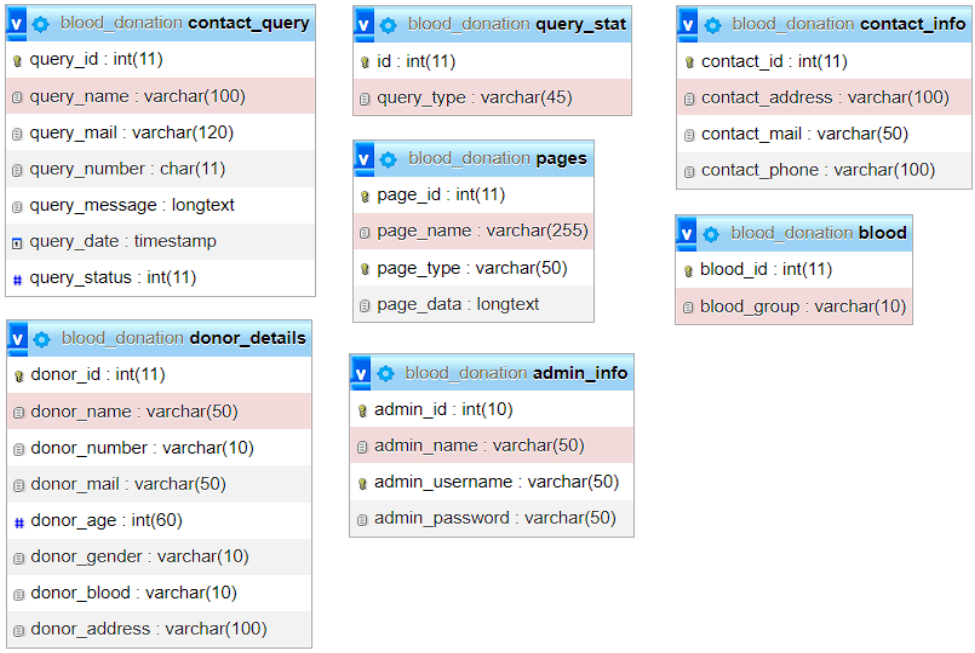
Username*
<input type="text" name="username" placeholder="Enter your username" class="form-control" value="" required>

<div class="font-italic"style="font-weight:bold">Password*


C:\Users\917357\Desktop\Blood-Bank-And-Donation-Management-System-master\sql\blood_bank_database.sql (Blood-Bank-And-Donation-Management-System-master) - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
FOLDERS
blood_bank_database.sql
create database blood_donation; /* creating database*/
use blood_donation;
/*create table donor_details in which all donor information gets stored.*/
create table donor_details(
donor_id int auto_increment NOT NULL,
donor_name varchar(50) NOT NULL,
donor_number varchar(10) NOT NULL,
donor_mail varchar(50),
donor_age int(60) NOT NULL,
donor_gender varchar(10) NOT NULL,
donor_blood varchar(10) NOT NULL,
donor_address varchar(100) NOT NULL,
Primary key(donor_id)
);
/*create table admin_info in which all admin information gets stored.*/
create table admin_info(
admin_id int(10) NOT NULL UNIQUE AUTO_INCREMENT,
admin_name varchar(50) NOT NULL,
admin_username varchar(50) NOT NULL UNIQUE,
admin_password varchar(50) NOT NULL,
Primary key(admin_id)
);
/* insert admin data into admin_info table*/
insert into admin_info(admin_name,admin_username,admin_password)
values("Varun","varunsardana004",123);
/*create table blood in which all blood group is stored.*/
create table blood(
blood_id int auto_increment Not Null,
blood_group varchar(10) NOT NULL,
primary key(blood_id)
);
/* insert all blood groups*/
insert into blood(blood_group)
values("B+"),("B-"),("A+"),("O+"),("O-"),("A-"),("AB+"),("AB-");
/*create table pages in which all pages information gets stored.*/
Line 1, Column 1; Detect Indentation: Setting indentation to 2 spaces
Spaces: 2
SQL

8.3. Database

	Table	Action	Rows	Type	Collation	Size	Overhead
☐	admin_info	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	48.0 KiB	-
☐	blood	Browse Structure Search Insert Empty Drop	8	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	contact_info	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	contact_query	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	donor_details	Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	pages	Browse Structure Search Insert Empty Drop	7	InnoDB	utf8mb4_general_ci	32.0 KiB	-
☐	query_stat	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_general_ci	32.0 KiB	-
	7 tables	Sum	24	InnoDB	utf8mb4_general_ci	176.0 KiB	0 B

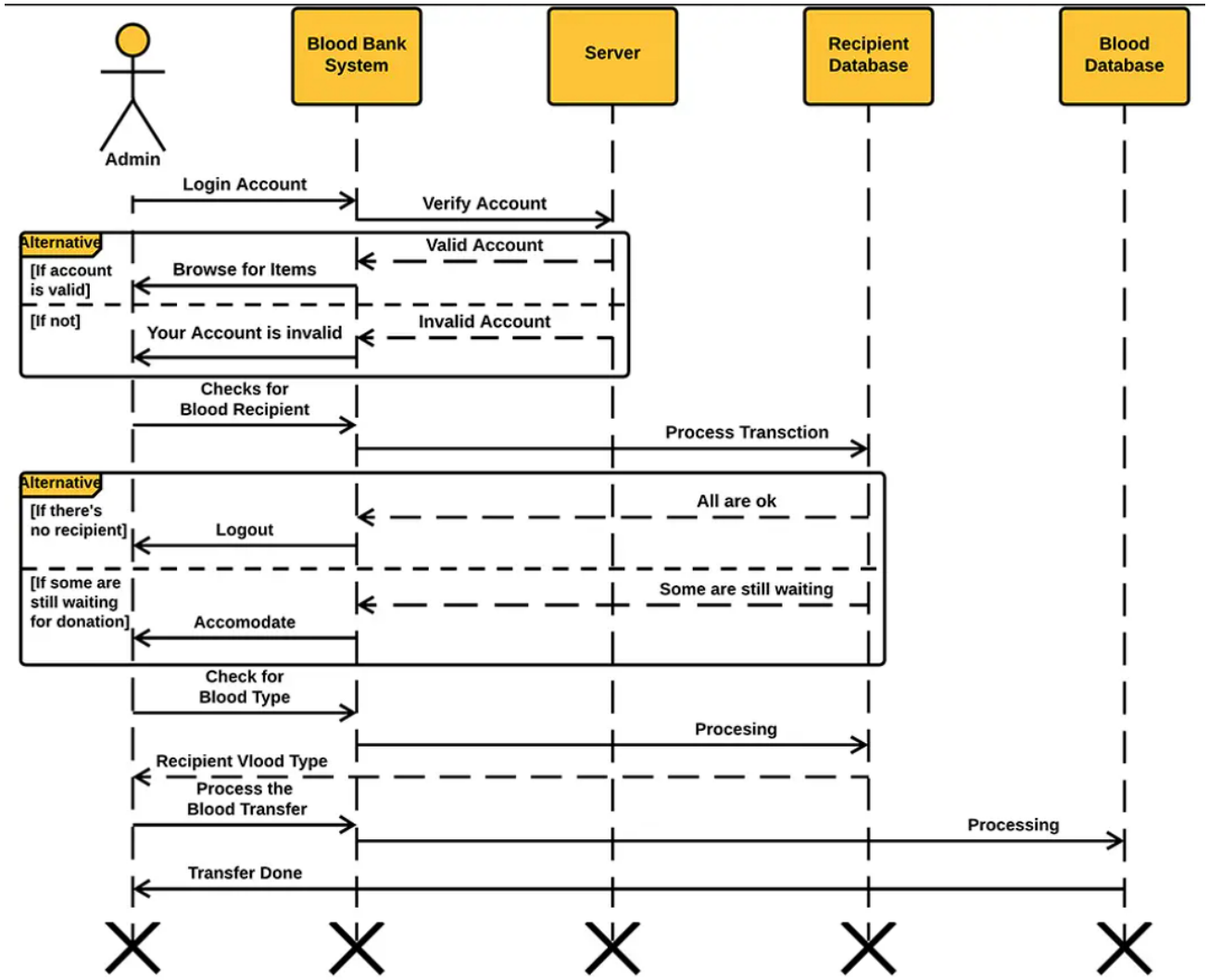


The database that we have utilized is a MySQL database which can only be accessed by the host of the website and the data remains secured since it obscures the container in which the data is held. In addition it retains durability by maintaining logs of previous database states during a transaction. In the event of a system failure, we can recover the database at the most recent state ensuring durability.

9. Testing

We gave our service to our family members and friends only to find out how easy our website is to use and what difficulties they come across. The approximate count of people that tested our service is 30. We found in our testing that our service is reliable and user friendly and people liked the facility for its simplicity and ease of usage , especially the facility that we added which helped the people to edit information in the pages according to their needs. We found out that it was more eye-catching if we added the campaigns section on the top, so the people are more careful on what all campaigns are going on in the nearby areas. There were only limited cases when the site went down but it was only due to the MySQL server being down for maintenance, otherwise, overall the website was benchmarked successfully.

10. Observation



The design is a detailed illustration of the sequence of events that happens in the Blood Bank Management System. This is able to show programmers and users the sequence of messages between the actor and the objects.

The key observations we found are:

1. Our website is able to work 24x7.
2. Our website is able to handle different bloods, donor information and queries.
3. the campaigns and notices are prominently displayed.
4. the admin can easily change the information displayed on different pages.

Thus, this represents all the possibilities that we had gone through while testing the different cases on the basis of inputs we provide, be it donor, requirement, queries details, the response and performance of the website (HTTP server) and also stress testing the MySQL database.

Since our website is currently locally hosted, we are limited by the constraints of minimum storage provided by the phpMyAdmin server, but there are almost no instances of the site or the DB server going down.

11. Result and Conclusion

The development of this web-based system is proposed to provide a management function to the blood bank in order to handle the blood bags and to make & manage entries of the individuals who want to donate blood to those in need. We were able to provide a suitable functionality to change the information displayed on every page. We accomplished the website to work 24x7 even if locally hosted. Our website's user-friendly interface helped people to easily find their needed information and the campaign's ticker seemed to have been a useful addition to the users who tested our website.

Hence, we accomplished all our objectives which we stated above and we further aim to add more functionality in our website which can help users as well as admins to handle the security of the data more efficiently.

Project zip: Zion

12. Limitations

1. Since Zion is a web based application so a constant internet connection is required when the website will be hosted online.
2. We had hosted our website on Heroku (a cloud application platform) on a free to host basis, but since then the hosting facilities are being charged so for now it's locally hosted and we aim to host it on a cloud based service soon which will enhance security further.
3. Continuing from the last point, currently we have limited storage since we have a local DB, but on cloud storage we will overcome this limitation quite easily.

13. Management After

13.1. Server Security

In future, we aim to host out database on a cloud, such that the users of the website can locally host admin and user interface on their end, but the database for all of the iterations will be centralized and maintained by Zion, such that there will not be any data loss or data theft and provision of efficient data backup.

13.2. Promotion

When it comes to promoting any website there are some limited platforms like Google Ads or social media browsers like telegram, whatsapp, etc. We can Promote our website across Google and these social media apps to make people get to know of the services being provided by our website.

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