

**ROKTIM: DONATE BLOOD, SAVE LIFE  
(A BLOOD DONATION WEB APPLICATION)**

**BY**

**Muhammad Mostafizur Rahman  
ID: 191-15-12543  
AND**

**SK Zaklin  
ID: 191-15-12675**

This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

**Dr. Sheak Rashed Haider Noori**  
Professor & Associate Head  
Department of CSE  
Daffodil International University

Co-Supervised By

**Mr. Md. Sadekur Rahman**  
Assistant Professor  
Department of CSE  
Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

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## **APPROVAL**

This Project titled “**ROKTIM: DONATE BLOOD, SAVE LIFE(A BLOOD DONATION WEB APPLICATION)**”, submitted by Muhammad Mostafizr Rahman and SK Zaklin to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation was held on 26-01-2023.

## **BOARD OF EXAMINERS**



**Dr. Touhid Bhuiya**  
**Professor and Head**  
Department of CSE  
Faculty of Science & Information Technology  
Daffodil International University

**Chairman**



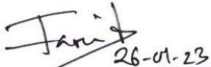
**Subhenur Latif**  
**Assistant Professor**  
Department of CSE  
Faculty of Science & Information Technology  
Daffodil International University

**Internal Examiner**



**Mohammad Monirul Islam**  
**Senior Lecturer**  
Department of CSE  
Faculty of Science & Information Technology  
Daffodil International University

**Internal Examiner**

  
26-01-23

**Dr. Dewan Md Farid**  
**Professor**  
Department of CSE  
United International University

**External Examiner**

## DECLARATION

We hereby declare that this project has been done by us under the supervision of **Dr. Sheak Rashed Haider Noori, Professor & Associate Head, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

### Supervised by:



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**Dr. Sheak Rashed Haider Noori**  
Professor & Associate Head  
Department of CSE  
Daffodil International University

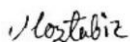
### Co-Supervised by:



---

**Mr. Md. Sadekur Rahman**  
Assistant Professor  
Department of CSE  
Daffodil International University

### Submitted by:



---

**Muhammad Mostafizur Rahman**  
ID: -191-15-12543  
Department of CSE  
Daffodil International University



---

**SK Zaklin**  
ID: -191-15-12675  
Department of CSE  
Daffodil International University

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## **ABSTRACT**

The blood bank management system project outline should meet or address the following requirements. All problems arise in blood banks. Problems may include difficulty in tracking donors. Managing blood bank accounts and streamlining hospital transactions. Blood Bank Management System Acquire and analyze data on blood bank management. Also monitors blood inventory Management and other operations related to blood banks. The main purpose of the blood bank management system is to keep track of blood, donors and blood Groups, blood banks, and inventory information. Track all information related to blood, blood cells, stock, and blood. Since the project will be implemented at the administrative level, Administrators can see it. The main purpose of developing this system is to provide blood to people in need. The number of people in need of blood is increasing significantly by the day. The system allows users to search for available blood types in the city and also obtain contact numbers for donors who have the same blood type as the blood type required. To help people in need of blood, effectively use this online blood bank management system to get the details of available blood types, and users can find blood donors with the same blood type and within the same city. A contact number can also be obtained. So if the blood type is not available in the blood bank, the user can request a donor to donate blood to save someone's life. This bank management system allows people who want to donate blood to register. To register in the system, you have to enter your contact details such as an address, and mobile phone number. [3]

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# CHAPTER 1

## Introduction

### 1.1 Introduction (project description)

Despite having a population of over 160 million, Bangladesh has a very small number of safe blood banks[2]. There wouldn't be much of a blood bank without divisional towns. But in order to treat patients, a significant amount of blood is required. Every day, a sizable number of incidents occur that mostly require blood. As a result, managing blood becomes extremely difficult for people. However, a lot of potential blood donors are enthusiastic in doing so but are unsure of who is in need of blood. Numerous lives are being lost as a result of the communication gap. Blood donation can save lives, and there is a high need for both blood and blood products. In the United States, a person needs blood every two seconds, and Cedars-Sinai alone requires more than 50,000 units annually[2]. To make an informed choice regarding donation, learn more about blood types, compatibility, different donation methods, and the need for life-saving blood.

Blood donations are selfless deeds, and blood transfusions save hundreds of lives annually. Through postings and SMS, our website's automated blood service instantly connects those looking for blood with willing blood donors. This program to promote voluntary blood donation in Bangladesh is non-profit. On our website, anyone can look up a donor and get in touch with them. According to one of the donors, "I've given blood seven times so far. I fasted and then went to the hospital to give blood. It was my birthday present to the hurting folks ".

Through the extraordinary power of SMS and email, our website bridges the communication gap and instantly connects persons in the situation. People from all social classes can readily use our services because they can also be accessed by SMS.

### 1.2 Motivation

Blood donation is the process of voluntarily taking blood for use in future transfusions when it becomes necessary in the hospital for a therapeutic procedure that requires blood. Donations can be either whole blood (blood taken directly from the body) or specific blood

components. Red blood cells, white blood cells, plasma, platelets, etc. Blood banks often participate in blood collection and other procedures such as inventory management, approval of blood requests, and updating of donation information. The inspiration for this project is the development of a blood bank information system focused on improving blood banks in Bangladesh and creating an online system that can be accessed by both donors and administrators. Blood donors can instantly get information about previous blood donations, including blood draw results and donation history, to easily plan their next blood donation. You can also update your personal information through our system without contacting the Blood Bank Registry information if necessary. The custodian is also responsible for fulfilling blood requests from the hospital and verifying the stock in the blood stock.

### **1.3 Objectives**

The project's objective is to provide a web application that blood banks may use to manage data about their donors and blood supply. The following are the primary aims of this website's development:

1. encouraging voluntarily donated blood
2. promoting the use of safe blood transfusions
3. allowing users to request blood via SMS, Internet, or Facebook
4. establishing contact with willing blood donors via SMS or email

Ensuring no more death just for the need of blood

5. tracking the changes and progresses
6. Connecting blood searchers with voluntary blood donors in a moment with the use of technology.
7. Encouraging blood donors to donate blood more than before.
8. Make it easy for patients to get blood quicker than before.
9. Fasten the blood donation process online.

### **1.4 Expected Outcomes**

Our main goal is to create a Blood donation information System where people both who are willing to donate blood and who need blood can communicate. For Bangladesh, the

blood bank management system is not well developed, and for this reason, many people die. If people use our system this problem will be reduced.

1. Those Who need blood will be able to get all the information about the blood donor and can get the information of the blood donor to get in touch with him.
2. Users will get a better and more satisfactory blood management experience with the listed blood donor.
3. There is an available helpline for the user.
4. Feedback on blood donation.
5. Authentication when login into the Roktim application.

### **1.5 Report Layout**

We are working on a development-related project. Our project report consists of seven chapters. An introduction, background information, requirement specifications, design specifications, implementation testing, impact on society and the environment, and a conclusion and future scope are all included in each chapter.

We discussed project introduction, project motivation, project objectives, projected outcome, project management, project finance, and report structure in the first chapter.

The backdrop of our study, including terminology, related works, comparative analysis, project scope, and challenges, is covered in the second chapter.

A few project needs and functions are discussed in the third chapter. The use case model's description and the business process model's diagram help us to comprehend how the routine actually operates. and to make it clear what kind of data is required for this project, we outlined the requirements collection, analysis, and logical data modeling..

The fourth chapter then moves on to the Design Specification section, which comprises the Front-End Design, Back-End Design, Interaction Design, and User Experience sections, and finally the Implementation Requirements section. This chapter goes into detail on the language types we utilized in the Front-End and Back-End.

In the Fifth Chapter, it is necessary to test a program to determine whether it is operating correctly or not. Therefore, we incorporated the database implementation and interface that this system provides. We also included front-end design implementation. Then we

displayed the results of our testing and demonstrated the procedures in the section. In addition to that, this section now includes the findings of a few experiments.

We discussed how our initiative will influence the impact on society and the environment in the sixth chapter. In our project report, we provided sustainability strategies after describing the ethical issues.

The seventh chapter, which has two sections, is the last one in our project report. These are the Discussion, Conclusions, and Future Development Aims. The specific features that we can introduce in the near future are described in detail in this section.

### **1.6 Project Management and Finance**

In this phrase, we made sure our project tasks toward the completion are done seamlessly. Below, We have given the key roles and responsibilities we have followed to complete these tasks:

#### **Requirement Gathering and Planning:**

There is a saying, “If you fail to plan, you plan to fail”. So we made plans and defied the process and also made schedules and deadlines to complete our tasks. Complete the job on time and in accordance with the project's requirements. The project timetable aids in project completion. To successfully accomplish my project, we also made a project schedule in this manner and gathered our resources which we needed to complete this project.

#### **Time Management:**

To get the best output on time and to make everything disciplined, we converted each task into a single segment and set a deadline for the completion.

Task Name	Duration
Requirements gathering and analysis	2 weeks
Project Proposal	1 week
Database Design	5 weeks
User Interface Design	4 weeks
Implementation	5 weeks
Testing	2 weeks
Evaluation	1 week

**Risk Management and Maintenance:**

Software issues are normal. So we have kept in mind what kind of risks we might face in the future and we made sure our web application is strong enough to handle the risk. Additionally, we have identified some risks that we might face in the future and we made sure that we have enough resources to deal with them.

**Software Deliverable:**

The complete system and the system document, which will include the following.

1. Software requirements and specification, are this project's primary deliverables.
2. Design documentation for software

## **CHAPTER 2**

### **Background**

#### **2.1 Preliminaries/Terminologies**

##### **Project Selection and Identification**

With this project, we planned to create an online blood bank system that would be primarily concerned with blood donors and who needs blood to save lives. Anyone interested in donating blood[2] can do so at a hospital or blood donation facilities.

##### **Project Initiation and Planning**

We have compiled the system's user requirements and prepared the project's scope and purpose before starting. Results from this phase include the proposed system's features, scope and limitations, objectives, costs and advantages, and user interface design.

##### **The Proposed System's Design**

We constructed a data dictionary and a user interface based on the analysis phase, and we transformed the diagram into a relational database model.

##### **Development of the Proposed System**

In this phase, we turned the suggested system's design into computer software, which entails computer programming using the PHP tool phpMyAdmin, which is intended to manage MySQL[8] administration, and turning the design specifications into computer code.

##### **Testing the Proposed System**

In this step, the programming code is tested to see if it functions properly under the circumstances of our system or not. In this phase, we corrected bugs to create a system with the highest performance possible.

##### **Implementing the Proposed System**

We put this system online so that administrators can easily add, amend, delete, and query entries, and donors may access their blood donation records there.

## **2.2 Related Works**

There are many websites but none of them actually meet the requirements. One of the closest works is Safe Life Connect[1], which provides users the solution to their blood seeking problem. This website offers detailed information about many areas and blood donors of Bangladesh[1]. Our website serves almost the same purpose but in an extended way. We are planning to add more features in future. Our website is more sustainable because we used Laravel[5] and its bled application.

And another website is “Online Blood Bank(Donor BD)”[9]. They are connected with many hospitals and they provide donors based on area as well. And they have a section for the user to know how to apply to become a blood donor and how to use this web application as well as how to look for a donor and contact him. But there is no section if any blood donor or blood seeker needs any advice, they can’t get any information from this website. This web application is rated by 20+ users.

## **2.3 Comparative Analysis**

After using this web application, we’ve found many interesting and helpful features which are very useful for the blood seeks and blood donors. Those features are :-

1. Every blood group donor lists.
2. Important information about how to find a donor and where to find it.
3. Donor profile such as donor age, donation status, contact information, donating time.

That information is helpful if a blood seeker wants to get a blood donor. However, there are still some features that are missing. Such as:-

1. Easy account creating feature
2. Authentication
3. No location tracking
4. Poor user experience



5. No record history for the blood donor or blood seekers
6. No available option to apply as a donor.
- 7.

## 2.4 Scope of the Problem

An online blood bank management system aims to serve people in need of blood by getting help from donors who are interested in donating blood for people. This system has seven main modules. In our web application, we tried to overcome the lack of previously developed applications and we have enhanced our user experience. And a user can create an account and login into the system and can see the main User Interface which is created for the users. We wanted to save all the records we have got and for that we have used a database. We wanted to help a blood seeker to get all the necessary information for one certain place. So, we used everything to make our website the best place for a blood seeker.

**Admin:** Both donors and acceptors can be managed by the admin. Any user can be added or removed from the system by him. Each participant in a donor & acceptor is given a user id and password that uniquely identifies him. Admin can edit donor information, remove donors from the admin section.

- Update Password
- Update donor information
- Remove donor information
- Log out

The option to "change password" is available whenever a user wants to do so. The form, which requests his old password and new password, is displayed by the system. After that, the system compares the previous password to the one already stored in the database, and if they match, the new password is established as the password.

**Donors:** A user can create an account through this module. When a user creates an account, he receives a user ID and password that uniquely identify him. The user may find blood

donors using this module and can also suggest a friend to become a donor. Additionally, the donor can find out when he last donated blood or when he will be able to do so again.

**Registration of Donors:** For donor registration, you have to complete the form. like you Name, gender, date of birth, blood type, phone number, email address, place of residence address etc.

**Modification of Donor Information:** Only registered donors can change details. I have a registration form that prevents other people from entering my username and password, so they cannot change my data. This provides a high degree of security for the data provided by donors. Donors had to enter a username and password if they wanted to change their details. After entering the username and password, the donor will be checked if they are existing donors, if the username and password match, after which they can change their overall data. If the username and password do not exist, the message "You have entered an incorrect ID and password. Please try again" is displayed.

## 2.5 Challenges

There are many blood-related websites or applications on the internet which makes it challenging to develop something which is already existing. The competition for web applications also is getting more challenging day by day. In this new era of creative ideas, we have come up with new ideas and tried to develop existing applications into a better one and more reachable and user friendly. We had to implement some new features that don't exist on other applications. Our biggest challenger is Safe Life Connect [1]. So, we had to look through their weaknesses and come up with new ideas and features which they don't have.

1. Collection of authentic data before the development process
2. Ensuring a better authentication while an user tried to create or login into the web application.
3. Setting up every workable process to show real time available data on desired location.

4. We had to make sure this web application is responsive to every compatible device and fits in every screen like desktop, tablet and mobile.

## **CHAPTER 3**

### **Requirement Specification**

For visually representing our project "Roktim " here are the requirements specification by providing Business Process Model, Use Case diagram, UML class diagram, ER diagram etc.[3]

#### **3.1 Business Process Modeling**

For the business process model first user and donor has to visit our home page. If they don't have any account they register then login. Admin has to login to the admin panel where he can see all the donor lists he can approve donors request, ban request etc. Admin can also update the database. When a user login to the website then he or she can search for the required blood group and request a donor for donation. If a donor is eligible for donating blood then he can accept the request. And the notification goes to the user.[5]

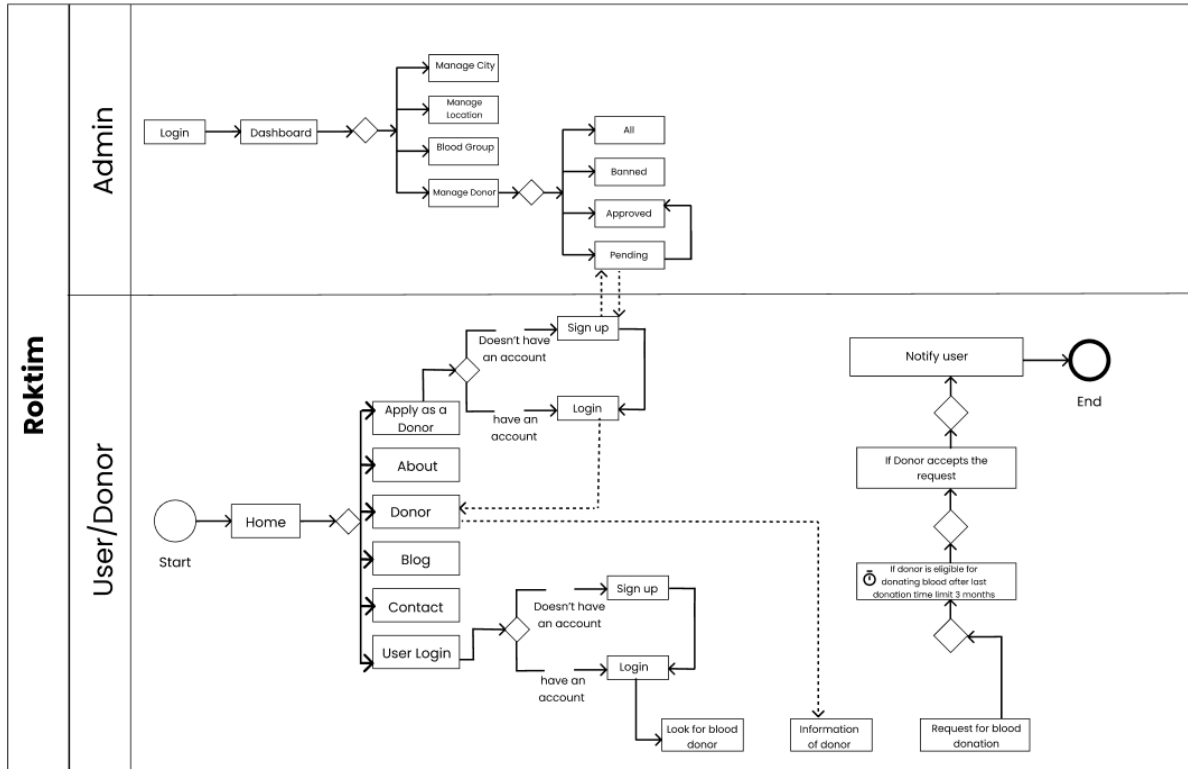


Figure 3.1.1: Business Process Model Diagram

### 3.2 Requirement Collection and Analysis

We have admin, donors, and users for this project. Everything in the database is under admin control. Our website allows users to sign up and log in. An admin may review the pending requests when a donor applies for a donor and then determine whether to approve or ban the donor. The donor can log in as a donor after the request has been granted. The necessary blood group can be searched for, and users can select any potential donor they wish. When a donor is qualified to donate blood—3 months must have passed since their last donation—they can accept a request for blood, at which point the user receives notification. The contact information for donors is listed on their profiles as phone numbers.

### 3.3 Use Case Modeling and Description

Here is the use case diagram of our project Roktim. In this use case diagram, there are three actors: donor patient, and admin. A patient who needs blood can visit our website and complete registration. After that, he or she can see the available donors and request for blood donations. Donors can apply as donors providing their information. Admin, on the other hand, will log in to the admin panel and the admin can see the requests and donors he or she can approve or ban the donor also approve requests, cancel requests, manage location then can update the database.[10]

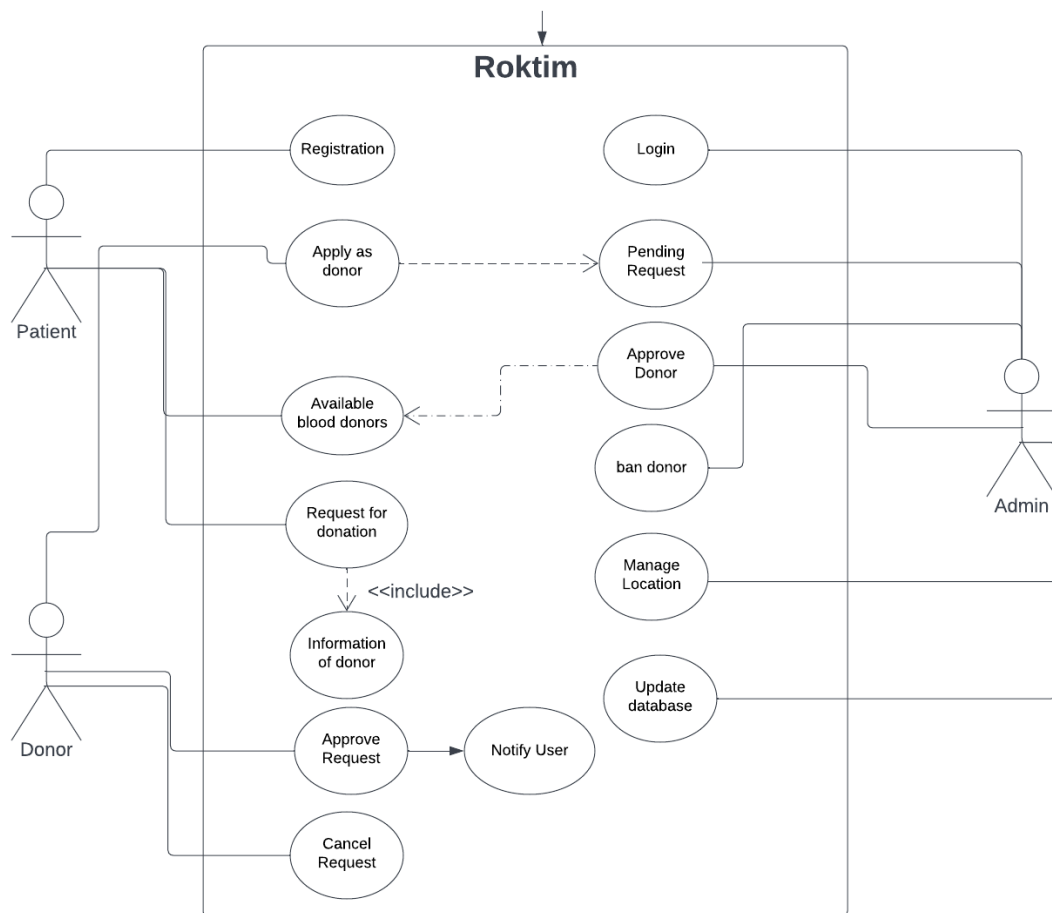


Figure 3.3.1: Use Case Modeling Diagram

### 3.4 UML Class Diagram

This is a UML class diagram[10] of “Roktim”. What type of data are flowing is given here .

Here minus sign (-) indicates the data and methods are private such as username,password,user id etc. Plus sign (+) indicates the data are public such as functions.

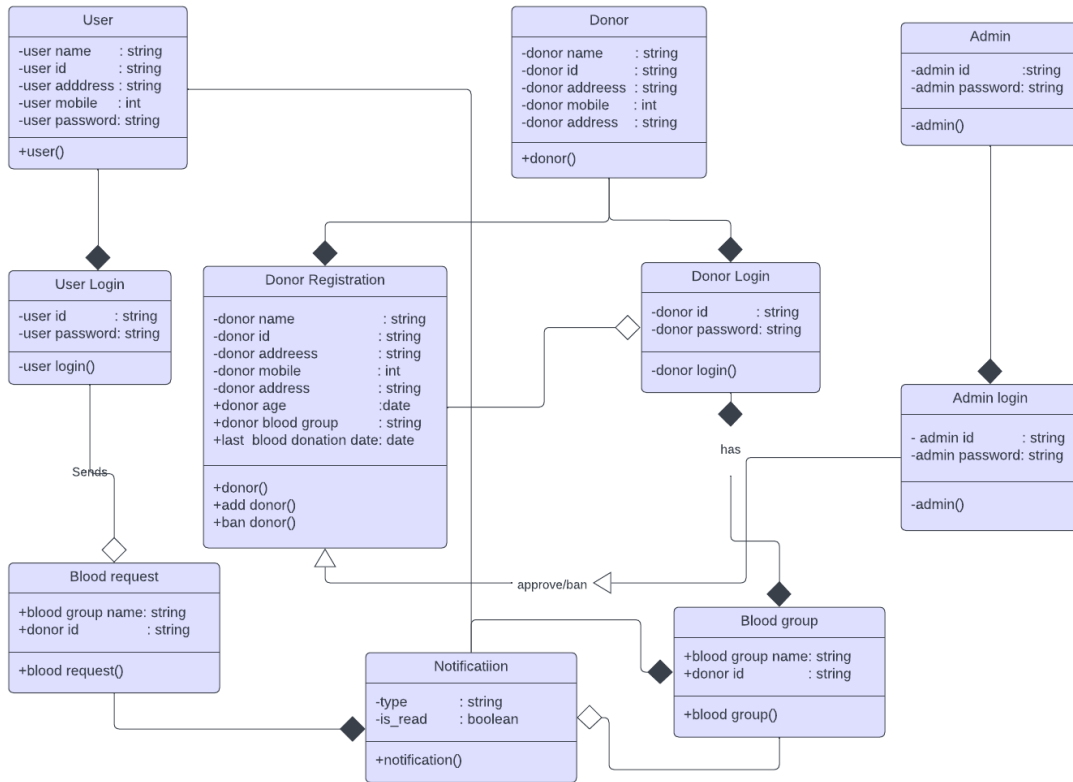


Figure 3.4.1: UML Class Diagram

### 3.5 Logical Data Model

Our system has many users,donors and also admin. There are many entities in the system . Our database depends on the user entities approved by the admin[4] .

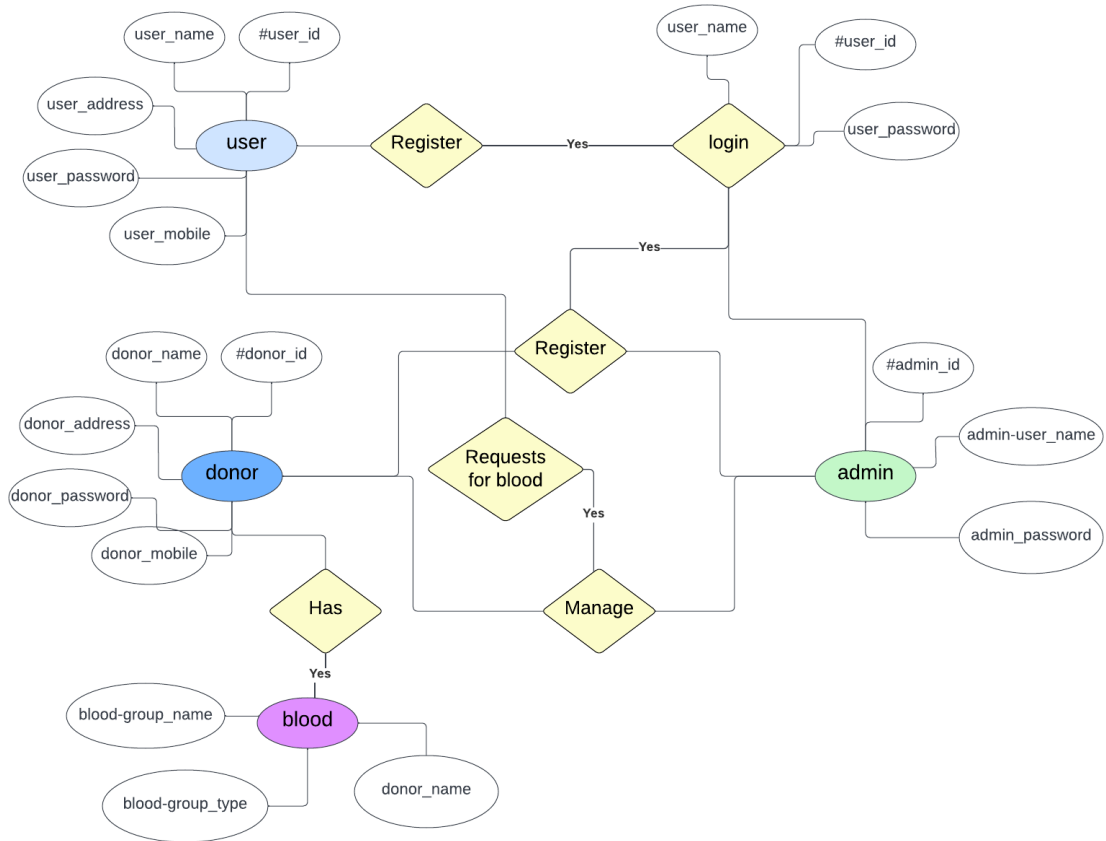


Figure 3.5.1: Logical Data Model Diagram

### 3.6 Design Requirement

We used CSS to create the UI. We used laravel for the framework. It also had blade templates. For the diagrams we used several tools. Such as figma for business process modeling, we also used Lucidchart for our use case diagram and UML class diagram. We also used Creately for our ER logical data diagram.



## **CHAPTER 4**

### **Design Specification**

#### **4.1 Front-end Design**

Front end design is the client-side of the application. After entering the web application, the information a client sees in the front page is the Front-End design. Front-end is the key to attract users with user friendly and user useful information and data like colors, styled texts, animated buttons, pictures, navigation menu and many more. Front end designers and developers have to work on the appealing appearance, behavior, structure, content of the web application keeping in mind the client's interest. The front end part is one of the toughest parts as we need to do it depending on the user's interest. Also, we had to keep in mind that the web application is responsive with all the screen sizes like computer desktop, tablet, mobile. Beside responsive design, performance is another thing to work on to stabilize the web application.

For the front-end design, we used HTML and CSS in our web application. It is not a programming language. HTML is used to create the structure of the web application and present all the necessary information which takes time. With the help of HTML, we put all the data, texts, buttons, pictures, all the forms in place. We created a layout and implemented the buttons and texts. HTML only helps to put raw data, not the visually driven one. If we think of HTML as a skeleton then CSS is the body of HTML. With the help of CSS, we made a layout of the given data. CSS helps to make the data visually appealing. We aligned , gave color, put animation and put a scrolling effect using CSS. After completing the design using HTML and CSS, users can see and use a beautiful interface.

#### **Landing page:**

Below Figure 4.1.1 represents the landing page of our web application. This first page comes with a short introduction and overview of the motive of our website. This page has a login button from where users can login and request for blood. In the navigation bar, a

user can go through multiple pages to fulfill their motives. Landing page is accessible for anyone even if the user doesn't have any account of Roktim.

## Available Blood Donors

<span style="color: red;">🩸</span> <b>O+</b> (4)	<span style="color: red;">🩸</span> <b>A+</b> (1)	<span style="color: red;">🩸</span> <b>AB+</b> (2)	<span style="color: red;">🩸</span> <b>A-</b> (0)
<span style="color: red;">🩸</span> <b>O-</b> (0)	<span style="color: red;">🩸</span> <b>AB-</b> (2)		







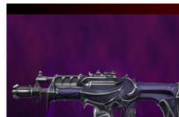

### Why bloodlab

Omnis harum qui vel repudiandae officii nemo perferendis libero soluta consequuntur culpa, laborum facere, fugiat totam ratione.

- 🛡️ **All Data is Secured**  
 Aamet consectetur adipiscing elit. Est voluptatibus accusamus nam labore, quam a quo. Quibusdam est voluptatibus animi quia.
- 🆓 **Always Free**  
 Aamet consectetur adipiscing elit. Est voluptatibus accusamus nam labore, quam a quo. Quibusdam est voluptatibus animi quia.
- 🤖 **100% Automated**  
 Aamet consectetur adipiscing elit. Est voluptatibus accusamus nam labore, quam a quo. Quibusdam est voluptatibus animi quia.

## Top Donors

Dolor sit amet, consectetur adipiscing elit. Dignissimos soluta est qui totam expedita eaque, deleniti quidem sequi magni iure nulla corporis.

 <b>Hayes Robles</b> Blood Group : (AB-)	<span style="font-size: 2em;">356x412</span> <b>Joan Luna</b> Blood Group : (AB+)	<span style="font-size: 2em;">356x412</span> <b>Quynn Espinoza</b> Blood Group : (O+)	 <b>Felix Rosario</b> Blood Group : (AB+)
 <b>gdfjhd bk</b> Blood Group : (O+)	 <b>Paula Ellis</b> Blood Group : (O+)	 <b>Mrahmna</b> Blood Group : (A+)	 <b>zakin</b> Blood Group : (O+)

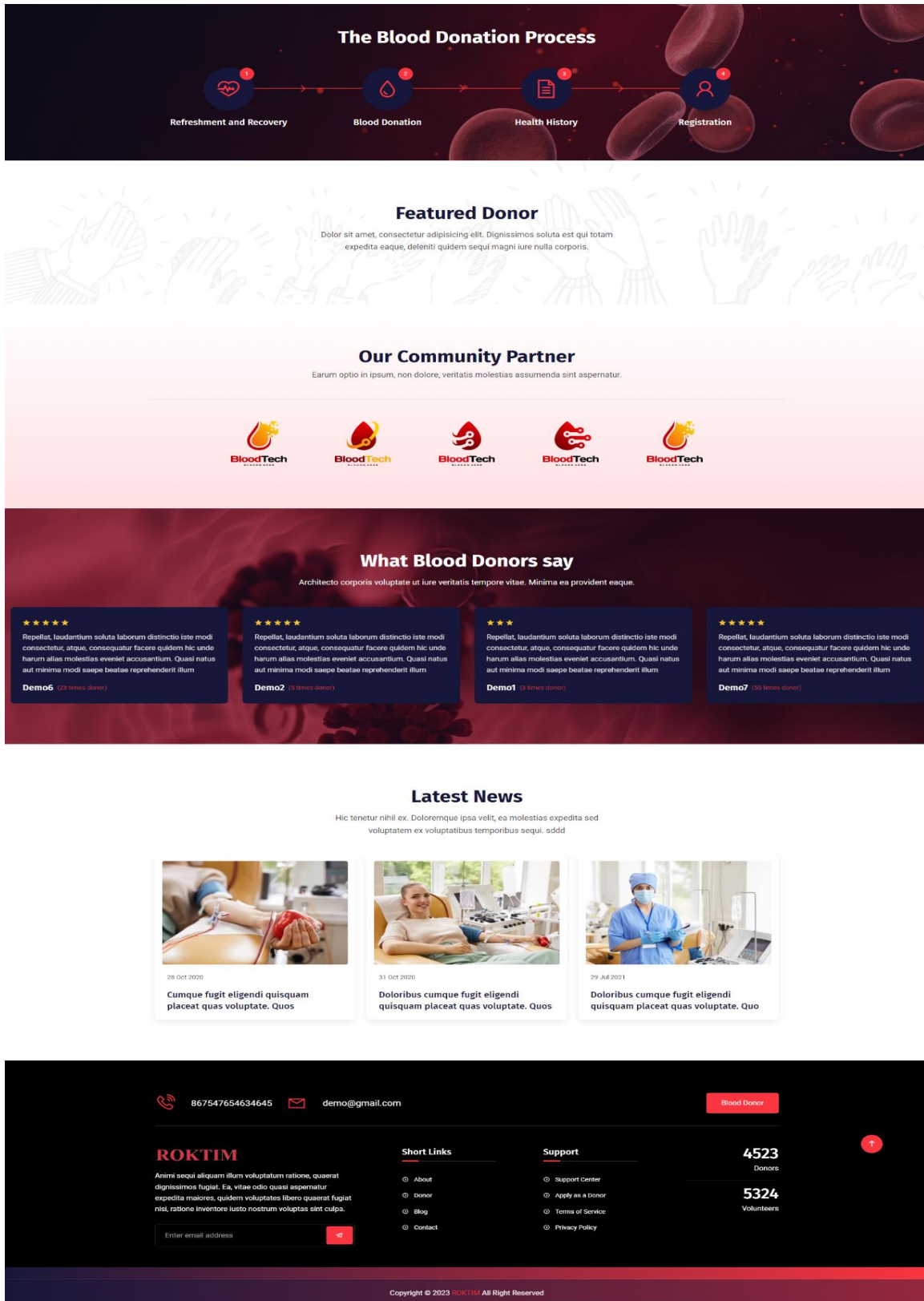


Figure 4.1.1: Screenshot of Landing Page

**Login Interface:**

The screenshot below is our sign in or login interface. From here, an user can login to the web application using the login credentials. If a user doesn't have an account then they can go to the registration form by clicking the Registration button and create a new account. If the user provides the wrong username or password and tries to login, then an alert message will be displayed “username or password is incorrect”[1]. Below the Login button, there is a link to the Registration page and you can open a new account on the registration page. Login page can be accessed by anyone except logged in users in Roktim.

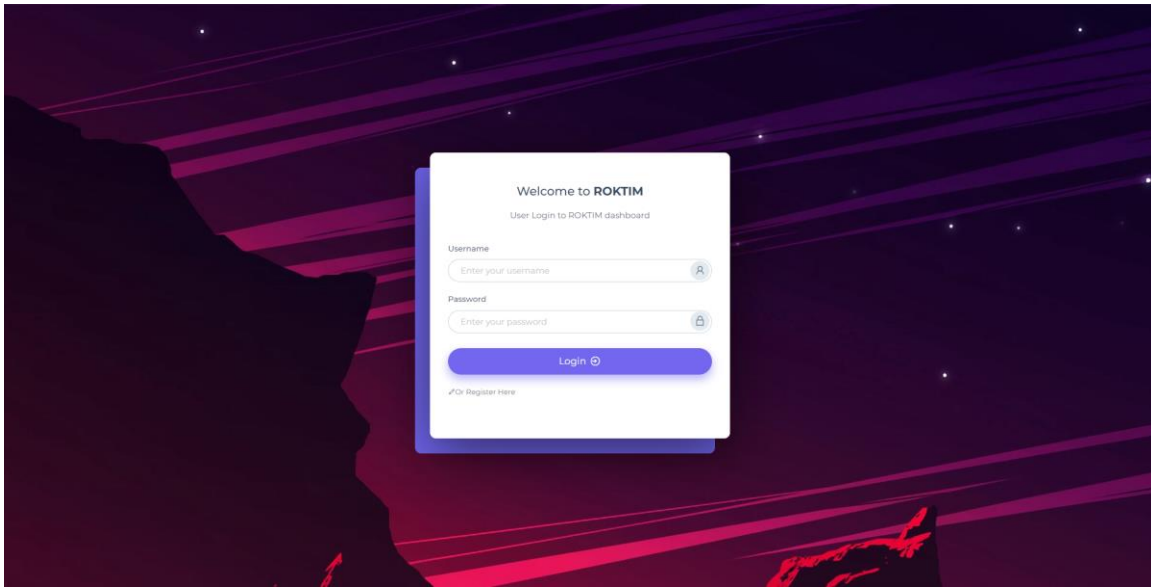


Figure 4.1.2: Screenshot of Login Interface

### **Sign Up interface:**

From here, a new user can register and create an account giving their proper credentials and information in the form. To create an account, users must provide names, email address, date of birth and mobile number. An alert message will be displayed after clicking the registration button[1]. In the registration page, there is a button below that says”or Login here”. With this an existing user can login to our web application.

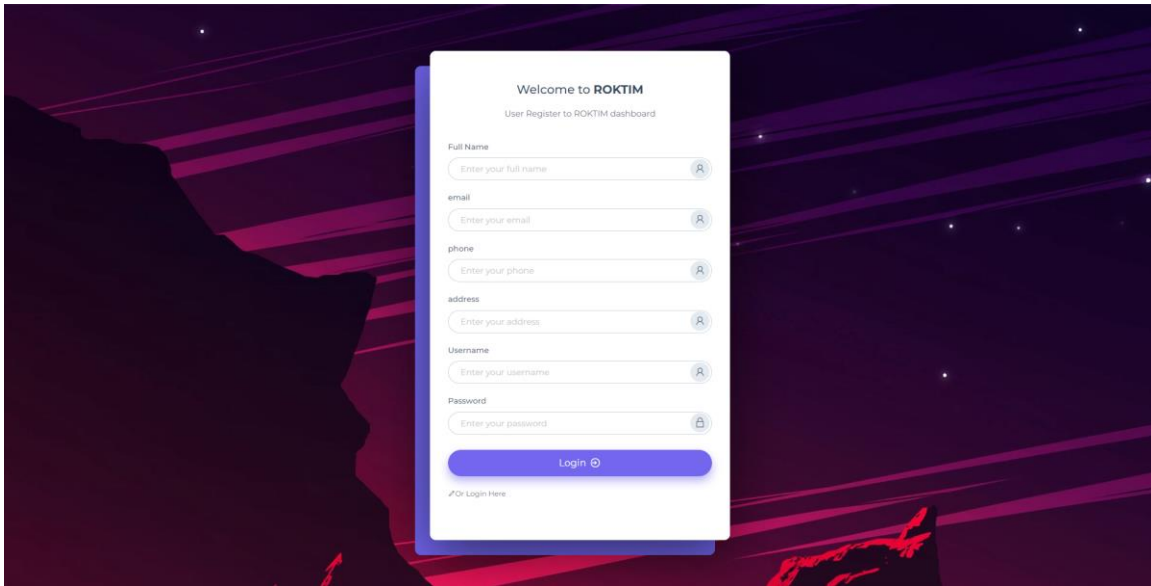


Figure 4.1.3: Screenshot of Sign Up Interface

### **Donor Page:**

In this page, a blood seeker can find donors who are available to donate their blood. A user can find a donor and contact him and request for a blood donation with time and date and place. There, the user can search for his desired blood donor by filtering with blood type, city, area location also with gender specification.

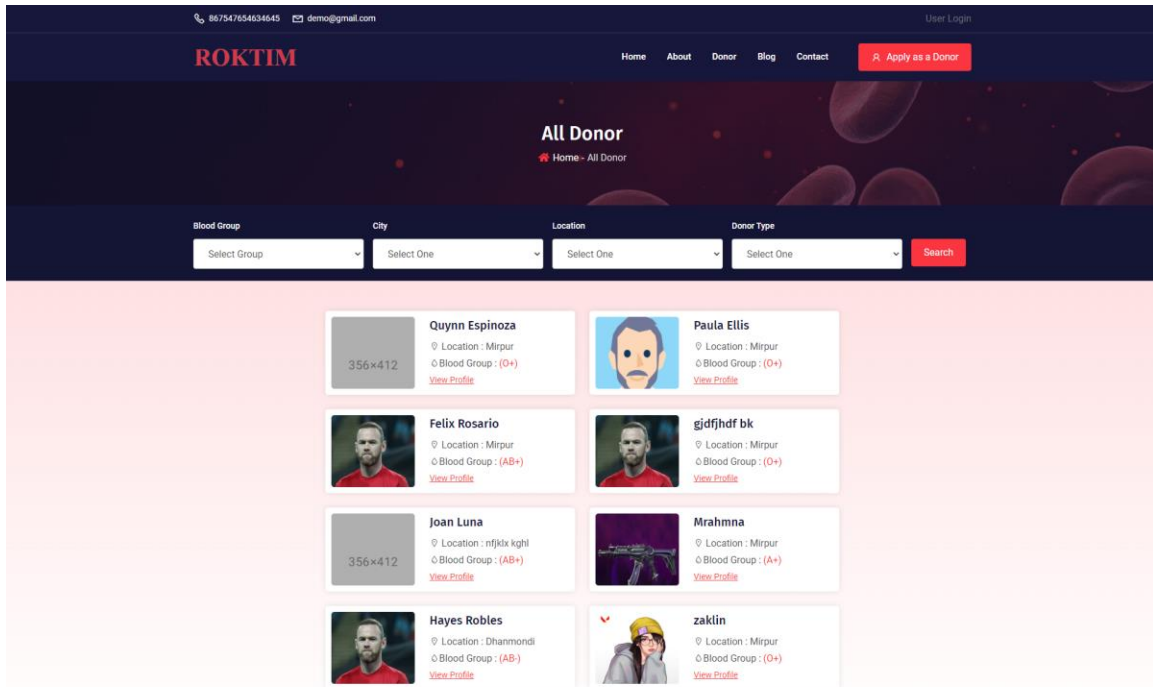


Figure 4.1.4: Screenshot of Donor Page

### Donor Profile:

Blow screenshot, this is a donor profile page. After finding the desired donor, the user or the blood seeker can go to his profile and request for blood donation. In the donor profile, there is information about the donor such as his blood group, when the donor last donated his blood and how many times he has donated blood till now. Also there is given his personal information like his name, gender, date of birth, age, religion, phone number, email, profession and as well as address. If a user wants to contact this donor then he can call him or email him. And there is also a donor's facebook, instagram is provided. So a blood seeker can contact him through social media. And the best suggested approach to contact with him using the form. The blood seeker can set a date and location and write a message then send the request to the donor.

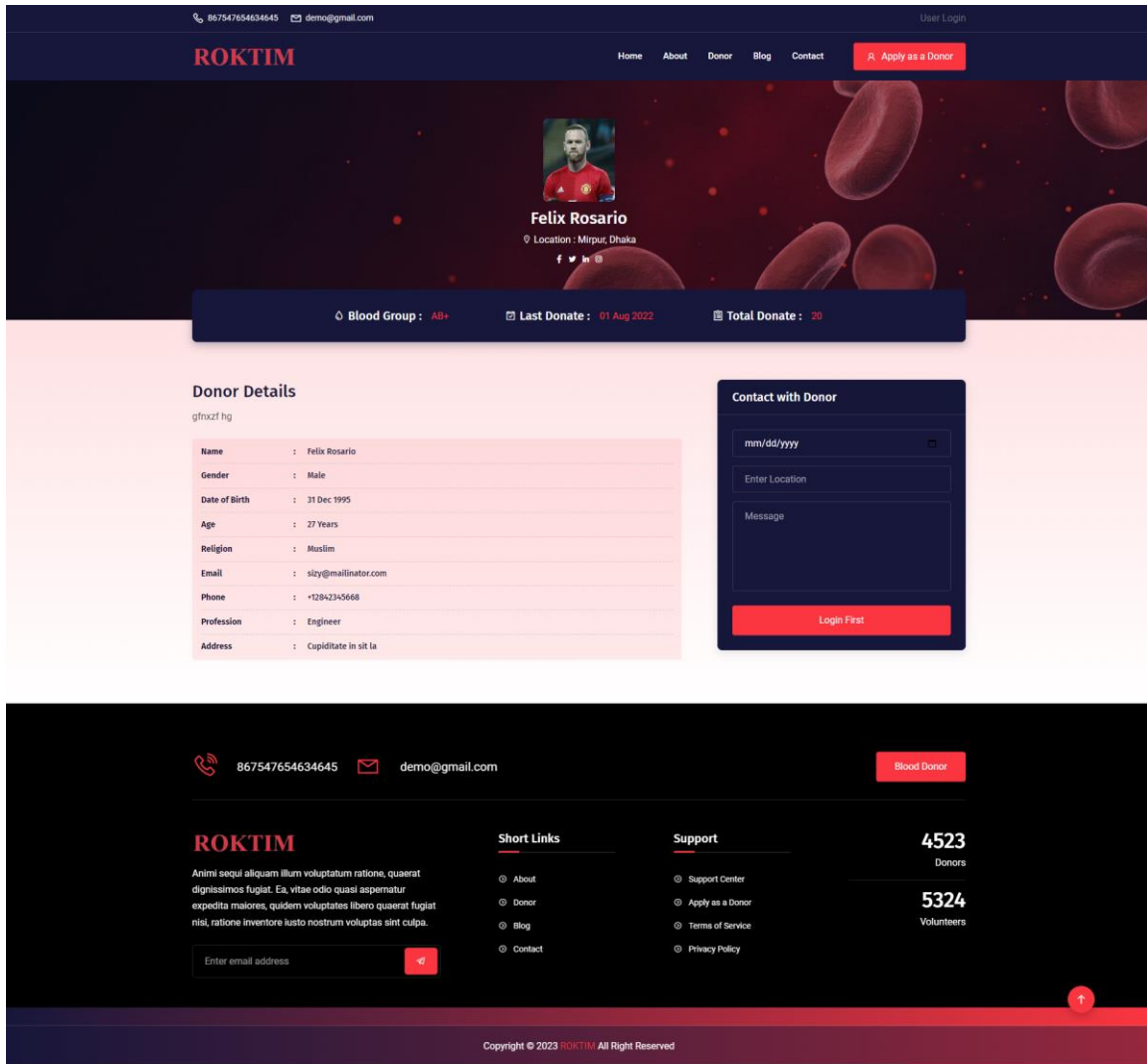


Figure 4.1.5: Screenshot of Donor Profile Page

## Blog Page:

In the blog page, we have displayed useful information for a blood donor and blood seekers. Such as how to look for a blood donor, how to send a request for a blood donor as well as about some useful information like blood disease and cancer.



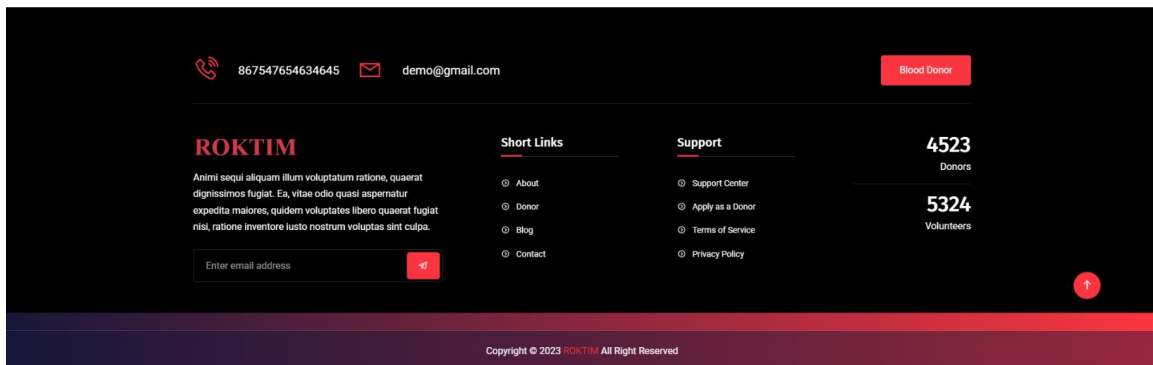
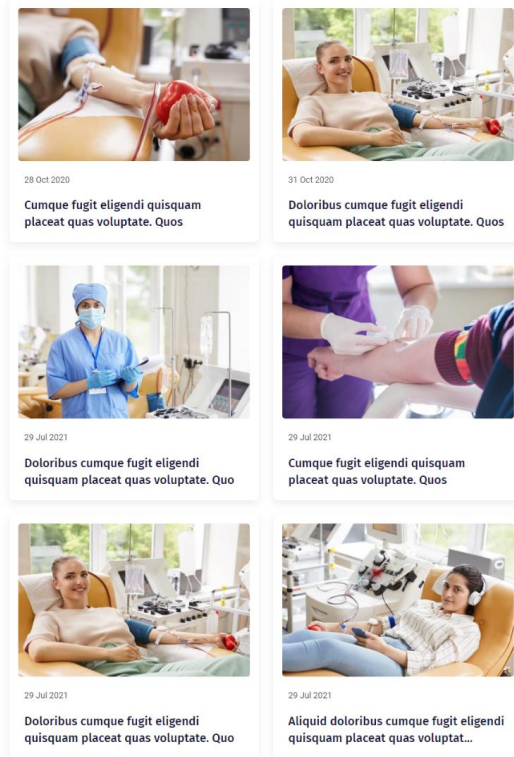
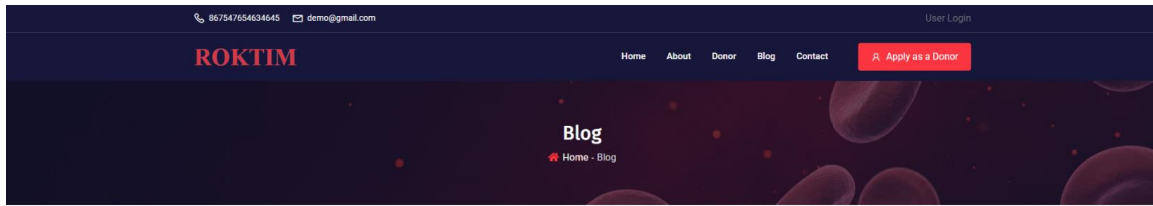


Figure 4.1.6: Screenshot of BlogPage

### Contact page:

Below, there is a screenshot of the contact page. If a user faces any difficulties which is unlikely, the user can contact us through the contact form. They have to provide their name,

email address and subject. And then lastly they need to type the text or problem they are facing and click on the submit button. Also information about us has been provided such as our location, Roktim’s email address as well as phone number. There is a live location provided by which users can get our live and current location through google map.

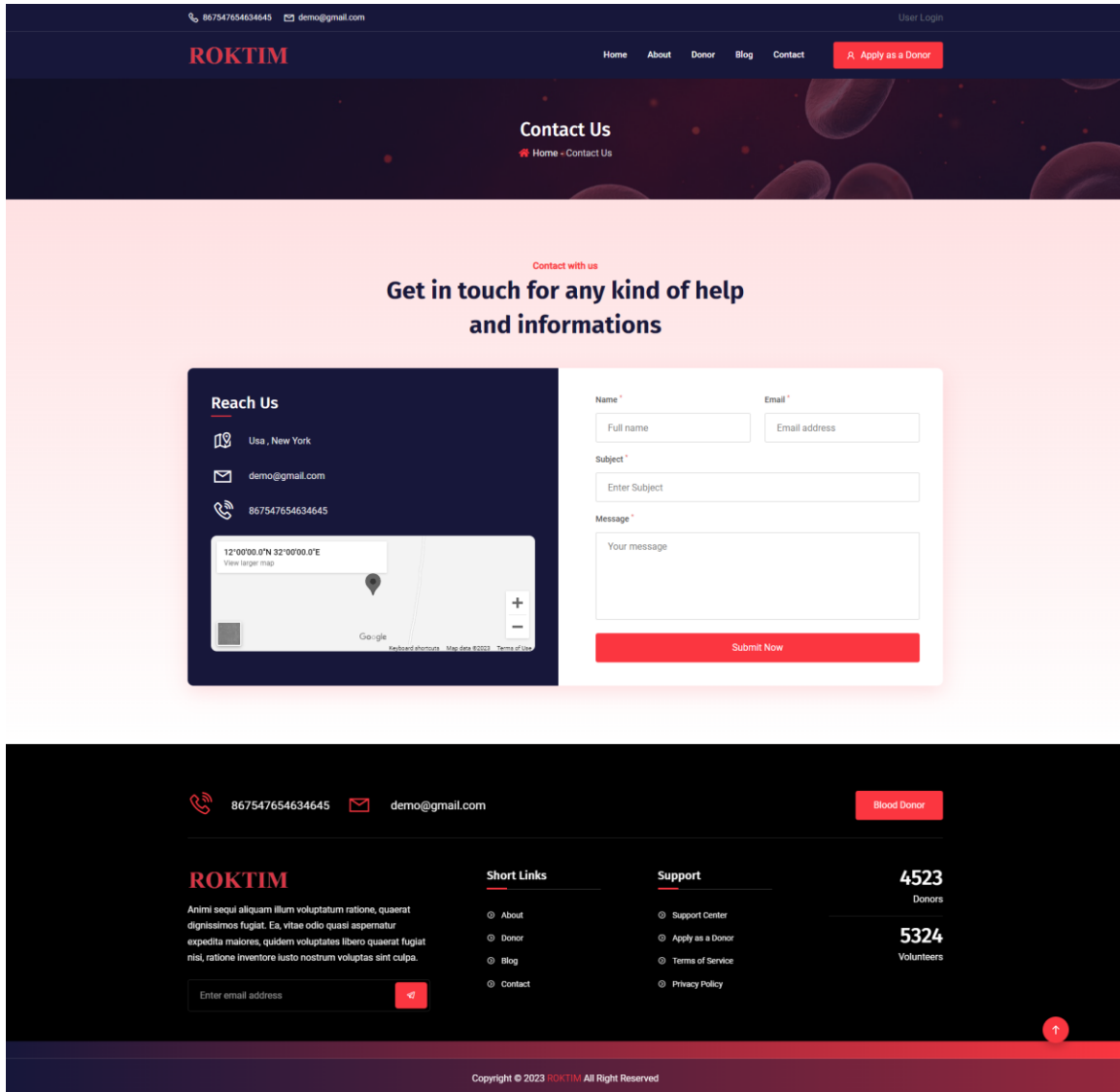


Figure 4.1.7: Screenshot of Contact Page

### Apply As Donor:

Below, this is the screenshot of apply as donor page. When a user comes into the website and if they wish to donate their blood then he can apply as a donor by clicking on the “Apply as Donor” button. Then he needs to fill up the form with necessary information like

name, email address, phone number, city, location, address, and also he has to put his login credentials in this form too. Then he has to provide his social media links and most necessary information such as blood group, gender, his total donation, date of birth and when he donated his blood last time. He also can set his image and he also can write about himself. A request for a donor can only be accepted by the admin panel. Admin can accept or reject his application.

The screenshot shows the 'Apply as a Donor' page on the ROKTIM website. The page has a dark blue header with the ROKTIM logo, navigation links (Home, About, Donor, Blog, Contact), and a red 'Apply as a Donor' button. The main content area is titled 'Apply as a Donor' and contains a form with the following sections:

- Personal Information:** Name (Full name), Email (Enter Email), Phone (Enter Phone), City (Select One), Location (Select One), Address (Enter Address).
- Login Credentials:** Username (Enter Username), Password (Enter Password).
- Social Links:** Facebook Url (Enter Facebook Url), Twitter Url (Enter Twitter Url), LinkedIn Url (Enter LinkedIn Url), Instagram Url (Enter Instagram Url).
- Others information:** Blood Group (Select One), Gender (Select One), Religion (Enter Religion), Profession (Enter Profession), Total Donate (Enter total blood donate), Image (Choose File, No file chosen), Date Of Birth (Enter Date Of Birth), Last Donate (Last Blood Donate Date), About You (Enter Details).

A red 'Apply Now' button is located at the bottom of the form.

Figure 4.1.8: Screenshot of APply as a Donor Page

## User Profile:

Below, there is a screenshot of the user profile page. A user can find information about him on this page. Such as his name, how many blood donor's requests have been accepted for him. And his details like name, email and phone number. And underneath that, the table shows about the blood request he has sent, what is the donor's name, blood group, date, location and whether the request has been accepted by the donor or not. And there is an action bar where he can decide whether the donor donated the blood or not and he can close the status from there.

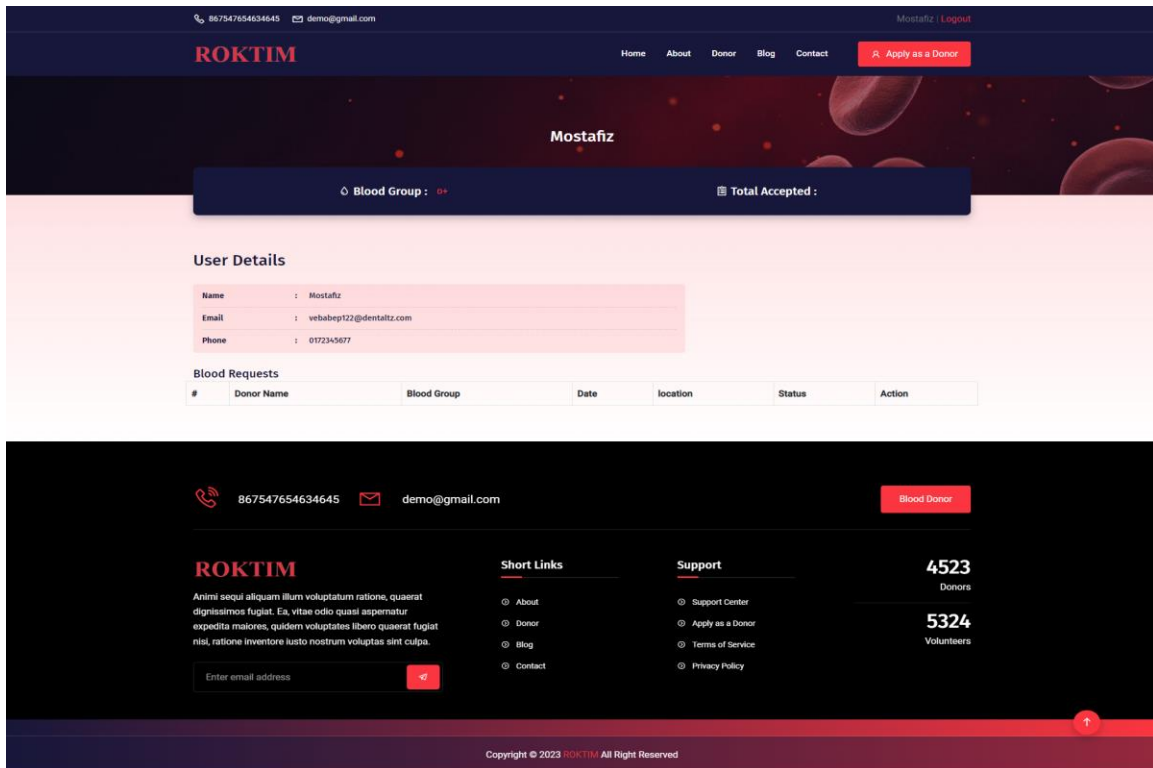


Figure 4.1.9: Screenshot of User Profile Page

## 4.2 Back-end Design

Back-end refers to the server-side of an application. It is always hidden from the client-side. Even though the user takes advantage of back-end design, they don't know how the back-end works. All the client's data is sorted, arranged, stored, managed and updated on the back-end in the database system.

In our blood donation web application, front end and back-end are somehow similar yet totally different in applications. They interact between themselves with the help of API. Roktim's back-end is developed using a PHP framework called Laravel[1]. It is a programming language. It can be run on all kinds of platforms such as Windows, Mac OS and Linux. We used Laravel because the MVC pattern support[5], object oriented libraries, command line-Interface makes it more than trustworthy. Also, it comes along with the high security advantage. Security is Laravel's highest priority or primary concern such as user authentication, password management, user login and sign up, data encryption and routing protection. And there is built-in encryption mechanism in laravel. So, it's nearly impossible for an outsider to take unauthorized access. By using middleware we can optimize the communication between PHP applications without the help of any third party app. And Laravel is fully open source. So, it has much more room for customization, modification, and extensions than the other frameworks.

### **4.3 Interaction Design and User Experience(UX)**

Interaction and User Experience Design refers to how a user interacts with our web application and how they feel and how easy it is to interact with our web application.

To make our web application modern and trendy keeping in mind a good user experience we made an user friendly interface following a modern website trend. And our user interface is friendly first, so that someone can easily navigate and enjoy the experience from the very fast beginning.

Our web application is very much auto-managed itself. And it will be up to date all the time by monitoring. And also, our web application is going to be more effective and efficient once we get more data from the user. The more accurate data it will get the more effective it will be. the resource will need and will be used only the data we get from the user.

#### 4.4 Implementation Requirement

There are the requirements to implement our project:

##### Hardware Specification:

Processor	AMD Ryzen 5 3600
Disk Space	1TB of Hard Disk and 128 GB of SSD
RAM	16 GB
Display	1920*1080
Graphics	NVIDIA GeForce GTX 1650 Super 4 GB
Mobile	Redmi Note 10 Pro

##### Software Specification:

Operating System	Windows 10 65-Bit
IDE	Visual Studio Code
Database	PHP (Apache)
Web Browser	Google Chrome

## **CHAPTER 5**

### **Implementation and Testing**

#### **5.1 Implementation of Database**

We have done the back end using the PHP framework Laravel for our web application project. It's a back end service that uses Real time data. We created tables and separate columns for each unique feature like name, blood type and gave those unique ids to prioritize them. And Each column contains users data such a phone number, name, email address, blood type, address or location. Same goes for the donors as well. We get that information from the registration form and the more data we get, the better our web application can perform.

#### **5.2 Implementation of Front-end Design**

As the back-end is done with Laravel, it is very convenient to use simple things for the front-end. We have used HTML, CSS along with Laravel API in front end development. To give the front end the real structure, we used HTML to put all the contents, photos, buttons, texts and buttons. And to design and create a beautiful User Interface, we used CSS and added colors alignment, and have done some effects. We have made the web application responsive, so that it is able to be used on various devices such as computers, tablets and smartphones.

#### **5.3 Testing Implementation**

A development environment is not completed unless it has been tested successfully to ensure that the web application works properly. So, we have performed several testing for each feature after creating it to make sure it runs without any error. As we are not known or familiar with any automated testing tools, we have tested the web application manually by ourselves.

Test Case	Test Input	Expected Outcome	Actual Outcome	Pass/Fail
User Registration	A user must fill the sign up form with name, email, password and other data	Account Activated	Account Activated	Passed
User Login	User must fill the login form using correct username and password	Account logged in	Account logged in	Passed
User Login	User filled wrong information	Username or password is incorrect	Username or password is incorrect	Passed
Apply as a donor	Fill the necessary information with blood group, date of birth, last donated date	Application sent for donor to admin	Application sent for donor to admin	Passed
Send a donation request	Sent a blood donation request to a donor	Donor received the request from the user	Donor received the request from the user	Passed
Accept blood donation request	Click the Accept button to the request	The notification of acceptance to the user	Connection between the donor and user has been created	Passed
Close Status after donation	Click on Done button after the blood donation	Successfully done the donation	Successfully done the donation	Passed
Search Donator	Search using city, area, blood type	Found donor with expected blood type	Found donor with expected blood type	Passed



## **5.4 Test Results and Reports**

The test results and reports are satisfactory as well as we can publish this web application for the desired people to use it. Although applications are not above bugs and failures yet we have to make sure that our web application works fine without any issue. As we tested our web application manually by ourselves, there might be issues remaining which were overlooked. But we made sure that our application is working properly for regular uses and is ready to be published.

## **CHAPTER 6**

### **Impact on Society, Environment and Sustainability**

#### **6.1 Impact on Society**

Our website will help the people in need of blood. Sometimes there are rare blood type patients who can't find the specific blood type. For these reasons, many people die every year. By using our website People can easily donate and get the required blood. For these, life will be safe . It spreads a positive impact on society that people can donate blood to help others. Once in three months, one person can donate blood. It's not harmful to the body and totally safe. Our websites can make accessible communication for both patients and donors. Connecting people to save lives is our goal.

#### **6.2 Impact on Environment**

Around 234 million major operations are performed annually, the majority of which necessitate blood transfusions. Hemorrhage is the primary factor in about 25% of the 530,000 maternal deaths that take place annually; 99% of these deaths take place in underdeveloped nations. Every year, 1.2 million people lose their lives in traffic accidents, while 30 million more suffer injuries or become incapacitated. Ninety percent of these patients die if blood is not given within the first 24 hours of treatment, which is when a sizable portion of them require blood. Every year, 4.5 million Americans would die without the life-saving blood that is available. An estimated 85.6 million people need blood transfusions every year to stay alive.

The data was submitted by 430 individuals in different urban and rural areas of Bangladesh. Interviews with the hospital administration, blood donation groups, public and private organizations, as well as volunteers who work for various blood donation groups, have all been conducted in-depth. According to this study, patients need blood for thalassemia (37%) and anemia (41%), surgery (55%), kidney illnesses (33%), and anemia (76%) in

addition to delivery (76%). In accordance with 48% of blood donors, handling each bag of blood takes between 19 and 24 hours.

Additionally, the seekers claim to obtain their blood supplies through blood donation centers (33%), blood banks (26%), and relatives (77%). A quarter of donors—26%—say they must travel more than 6 kilometers to donate blood. Additionally, they spend over 100 taka (12%) for this reason. Donors encounter a variety of challenges both before and after giving blood, including long cross-checking procedures (35%), transportation issues (38%), dealing with emergency situations (32%), untrained staff (29%), and health-related issues (15%).

Due to a significant lack of donated blood, India loses 12,000 people per day. India need 15 million blood units, but only receives 11 million, leaving a shortfall of 4 million units. There are around 40 districts in India without even a single blood bank. We want to convince 1 million people to give at least once or twice a year, not via advertising but rather by word-of-mouth, in order to bridge this gap and reach the most rural parts of India.

Blood donation is something that a lot of individuals voluntarily want to undertake.

Due to a communication breakdown with blood donors, they are unable to provide. Keeping track of donors, training staff, and using technology and equipment can all help to overcome problems with blood donation. So, in order to reduce communication gaps and create a secure environment, "Roktim" was what we set out to build.

### **6.3 Ethical Aspects**

The most valuable present somebody can give to someone else is their blood, or their life. Donating blood, especially if it is broken down into its component parts (red cells, platelets, and plasma), which can be utilized separately for patients with various conditions, can save a life, or possibly several lives. By giving blood four times a year, we can save 12 lives overall because every pint we give helps save three lives. Without the aid of a superhero, donating blood is an easy procedure that can save lives.

- One needs blood every two seconds.
- A hospital receives about one in seven patients who require blood.

- For the treatment of cancer patients, hemophiliacs, and surgery patients as well as accident victims, blood is always required.
- 
- Blood cannot be produced in a lab.
- Less than 10% of people who are eligible to donate blood actually do so each year, and only 37% of the population of our country is qualified to do so.

## 6.4 Sustainability Plan

Our project is built in Laravel. Which ensures the sustainability of our project ‘**Roktim**’. For future updates and long run we ensure the sustainability of our project. Our project is sustainable because of the features of Laravel by using blade templates we used to build our project. Now the question arises,

- **What is Laravel?**

Laravel is a free and open source cross-platforming PHP framework for building websites and web applications. Laravel is a server based platform where developers can manage data using MVC (Model View Controller) design pattern. Laravel divides the application into backend and frontend architecture and logical pieces. Laravel has a feature of reusing existing components of different frameworks. Laravel has this rich set of features of PHP frameworks which boosts the speed of web development and is easier to use.

- **History of Laravel**

Taylor Otwell developed Laravel. To provide developers with a different framework option from the CodeIgniter one, Laravel was developed. Many built-in functionalities, such as user authentication and authorization, could not be provided by CodeIgniter.

Laravel's initial beta version was released and made accessible on June 9, 2011.

After a month of beta testing, Laravel 1 was subsequently released.

Models, views, localization, routing, and mechanisms were all supported by Laravel 1 out of the box. However, the version 1 was not a genuine MVC framework because it lacked controller capabilities.

The following year, in September, Laravel 2 was made available. It resulted in a number of changes from both the author and community. Laravel 2 was a completely compliant MVC framework. A templating system, built-in support for the inversion of control principle, and support for controllers were among the enhanced features. The Laravel templating framework is known as "Blade." But Laravel 2 no longer supported third-party packages, which was a drawback of this version.

Laravel 3 was released in February 2012. The "Artisan" function of the cmd command-line interface (CLI) was included in this version. Additionally, database management systems, database migrations, and database storage were all integrated into it.

layouts, event handling assistance, and a packaging option called "Bundles." At the time, this rendition was very well-liked.

In May 2013, Laravel 4 was released. The "Illuminate" codename. The Laravel framework underwent a major revamp to become Laravel 4. It contained migration of its layout into distinct packages, distribution via composer, application-level manager, database seeding, message queues, built-in support for sending various types of emails, and support for "soft deletion," or the delayed destruction of database records.

February 2015 saw the release of Laravel 5. It offered capabilities like assistance for scheduling actions that were carried out on a recurring basis through a program called "Scheduler." The processing of package assets through "Elixir" was made easier thanks to an abstraction called "Flysystem," which allowed remote storage to be utilized in local file systems. Laravel 5 also had its own versions, including Lumen 5.0, Laravel 5.1, Laravel 5.2, Laravel 5.3, and Laravel 5.4, which was discontinued on January 24.

Laravel 6 was released on September 3, 2019. alterations to the way blueprint code is produced, the addition of semantic versioning, compatibility with Laravel Vapor, enhanced authorization responses, enhanced job middleware, and the transfer of frontend scaffolding from the main package to laravel/ui.

On March 3, 2020, Laravel 7 was made available. Along with Laravel Sanctum, Custom Eloquent Casts, Blade Component Tags, Fluent String Operations, and Route Model Binding Components, this version also included Blade Component Tags.

The next year, on September 8, Laravel 8 was released. It included features like Laravel Jetstream, model factory classes, migration squashing, Tailwind CSS for pagination views, and other usability upgrades.

On February 8,2022, Laravel 9—the most recent version—was finally launched.

- **Advantages of Laravel**

1. Laravel has an In-built Authentication and Authorization System:

- restricting access to protected resources
- Manage requests for access with ease
- Refuse unapproved requests

2. It has Simplified Mail Integration System:

- Notify users when each and every activity is completed
- Integrate mail notification systems seamlessly
- Utilize SMS and Slack to send emails and notifications.

3. Cached Memory Integration for better performance:

- Automated better memory management
- Accelerated execution

- Enhanced backend efficiency
4. Easier expectation handling:
    - Enhanced information distribution to consumers through instant alerts in the event of an exception
    - A higher client satisfaction rate as a result of the interface's usability and clarity
    - Improved usability without snags or friction for the user
  5. Better handling of security and technical vulnerabilities:
    - A promise for improved and more secure performance
    - the eradication of serious security and vulnerability issues
    - faster technical and security issue debugging and correction
  6. Seamless Automation Testing
    - Automation leads to quicker testing
    - Automation makes sure that the testing of essential functionality is flawless.
    - Calculating performance ratios accurately by taking into account various scenarios
  7. Bifurcation of business logic from presentation logic:
    - A promise for improved and more secure performance
    - No conflict between UI/UX designers and developers
    - Faster technical and security issue debugging and correction
  8. Simplified URL Routing Configuration:
    - Automation leads to quicker testing
    - Automation makes sure that the testing of essential functionality is flawless.
    - Calculating performance ratios accurately by taking into account various scenarios
  9. Efficient Task Scheduling and Management Configuration:
    - Simple task and process management through automated schedule formulation, upkeep, and communication

- performing redundant activities automatically, such as cleaning up data or sending subscribers periodic emails,
- Utilizing a single CRON input, time management for schedules is made easier.

#### 10. Highly Secure Framework:

- Scale applications quickly without being concerned about security
- Manage difficult security flaws without making additional effort
- Basic security features built-in for increased security

#### 11. Object-Oriented Library Accessibility:

- There is no requirement to spend time and effort creating object-oriented structures.
- An app's built-in library for incorporating new capabilities
- programming in objects in its entirety

#### 12. Seamless Database migration:

- Quicker database synchronization between development tools
- Simpler, faster, and more painless database migration
- Built-in database migration tool

- **Why did we use Laravel?**

We use Laravel for our project because Even novice coders can easily use Laravel's expressive and elegant syntax. The framework is built on the model-view-controller (MVC) architectural pattern, which makes managing intricate and extensive projects easier. Additionally, a vast array of libraries, tools, and templates are provided.

#### 1. Faster Time-to-Market Thanks to Laravel Development:

Laravel is an open source and free framework which allows developers to work freely. It has these features which are easy to use and for this development gets faster and smoother.



making the projects finish sooner than the deadline and it makes economic progress for developers and designers .

## 2. Better Authentication and Authorization Option:

The Authentication and Authorization system comes configured with Laravel out of the box. In other words, your application will be outfitted with secure Authentication and Authorization in only a few artisan instructions.

## 3. Less Technical Vulnerabilities

Every time there is a codebase, the security risk also increases. A web application is protected by Laravel even from serious security issues like cross-site request forgery, cross-site scripting, SQL injections, and others. As a result of its very sophisticated codebase, the Laravel framework is far superior than other PHP frameworks.

## 4. MVC Architecture of Laravel Framework

The Laravel framework's MVC design pattern primarily makes sure that the logic and presentation are both very effective and clear. Improved documentation is made possible by MVC architecture, which also helps with efficiency.

## 5. Blade Template in Laravel

Blade is the straightforward yet effective templating engine included with Laravel. The use of plain PHP code in your views is not prohibited by Blade, in contrast to other well-liked PHP templating engines. Since every Blade view is converted into plain PHP code and cached until it is updated, Blade almost has no overhead for your application.

## **CHAPTER7**

### **Conclusion and Future Scope**

#### **7.1 Discussion and Conclusion**

Finally our project “Roktim” is made for people’s needs. A life, a soul is priceless. Not every superhero wears a cape to become a hero. By saving a life any person can become a superhero by saving a life. In this modern era road accidents, diseases and many more. Life is becoming fragile as each day passes. Blood is not only some red fluid flowing through our veins but it is the most necessary component for every living being ever to come to earth. By donating blood a person can save a life if we donate blood on a regular basis. Death for losing too much blood or not finding blood on time would be a thing in the past . Sometimes there is a shortage of blood in blood banks or the blood group needed is rare, so for this our project will help people who face these problems.

Our project will help people to connect and donating blood will be easy. Our project “Roktim” doesn’t require any type of blood bank. For this the problem of storing blood is out of the question. A life can be saved, a family will be saved. Our project “Roktim” is also user friendly which makes users use the website easily.

#### **7.2 Scope of Further Developments**

We are determined to overcome our limitations and convert the web application better and more sustainable. So we would like to develop our web application in future:

- We would like to develop a mobile application for “Roktim ” because nowadays, everyone has a phone and users use everything most with their phone. We will build it so that our users don’t have to rely on the web browser. Yet the web version will be available.

- We will add a messaging system so that the blood seeker can directly communicate with the blood donor through our web application.
- We will add a feedback system for the user so that after getting blood, the user can rate and write something about the donor.
- We will update the security system of our web and mobile application according to the global rules.
- We will Optimize our User Interface and make our web application even faster and will keep the UI up to date with trendy design to attract our users.

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