

# **St. Lawrence College**

*(Affiliated to Tribhuvan University)*

**Chabahil, Kathmandu**

**Nepal**



**A Final Year Project Report**

**On “Blood Databank” (CSC-404)**

A Final Year Project Report submitted to the partial fulfilment of the requirements for the degree of Bachelor of Science and Information Technology awarded by Tribhuvan University.

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# St. Lawrence College

## Tribhuvan University

### Letter Of approval

This is to certify that this project prepared by **Akash Acharya, Bijay Karki, Dipesh Bhandari** and **Samrat Acharya** entitled "**Blood Databank**" in partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Information Technology has been well studied. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

Signature of Supervisor  .....	Signature of HOD/ Coordinator  .....
Signature of Internal Examiner  .....	Signature of External Examiner  .....

**St. Lawrence College**

**Tribhuvan University**

**Supervisor's Recommendation**

I hereby recommend that the project prepared under our supervision by **Akash Acharya, Bijay Karki, Dipesh Bhandari** and **Samrat Acharya** entitled "**Blood Databank**" in partial fulfilment of the requirements for the degree of Bachelor of Science in Computer Science and Information Technology to be processed for the evaluation.

.....

Tika Dahal

**Supervisor / Lecturer**

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## **Abstract**

This report introduces the web application system for blood databank. The web app keeps the records of donor, blood, blood bank and hospital. Blood Databank helps to reduce one of the major issues i.e. finding and contacting the blood donor. Its major task is to keep tracks and records of blood donors for easier contact with them.

Basically, the proposed system of Blood Data Bank is all about process of abstracting information about the blood, blood bank, donor and blood in one common platform as web application. The main focus of the blood databank is for the hospital.

Whenever there is blood request, the website checks which group of blood is required and which donors are available in that particular area. When it determines the donors list, it sends message to all the available donors. The major focus of this app is thus to function as a bridge between one who requests and one who donates.

Our project is web-based project which is fully based on internet and SMS system.

## Table of Contents

Acknowledgement .....	i
Abstract .....	ii
List of Figures .....	v
List of abbreviations .....	vi
Chapter 1: Introduction .....	1
1.1 Introduction .....	1
1.2 Problem Definition .....	2
1.3 Objectives .....	3
1.4 Scope and Limitation .....	4
1.4.1 Scope .....	4
1.4.2 Limitation .....	4
1.5 Features of Project .....	5
1.6 Report Organization .....	6
Chapter 2: Requirement Analysis and Feasibility Study .....	7
2.1 Literature Review .....	7
2.2 Requirement Analysis .....	8
2.2.1 Functional Requirements .....	8
2.2.2 Non-Functional Requirements .....	9
2.3 Feasibility Analysis .....	11
2.3.1 Economic Feasibility .....	11
2.3.2 Operational Feasibility .....	11
2.3.3 Technical Feasibility .....	12
2.3.4 Schedule Feasibility .....	12
2.4 Structing System Requirements .....	14
2.4.1 Data Modeling: .....	14
2.4.2 Process Modeling .....	15
Chapter 3: System Design .....	18
3.1 Database Schema Design .....	18
3.2 Interface Design .....	19
3.2.1 User Interface Design .....	19
3.2.2 Admin Panel Design .....	20
Chapter 4: Implementation and Testing .....	21
4.1 Implementation .....	21
4.1.1 Overview of Development Methodology .....	21

4.1.2 Tools Used .....	22
4.1.3 Listing of major classes and files .....	23
4.2 Testing .....	25
4.2.1 Unit Testing .....	25
4.2.2 Integration Testing .....	32
4.2.3 System Testing .....	34
Chapter 5: Maintenance and Support .....	35
5.1 Maintenance .....	35
5.2 Support .....	35
Chapter 6: Conclusion & Future enhancements .....	36
6.1 Conclusion .....	36
6.1 Future enhancements .....	37
Reference and Bibliography .....	38
Appendix .....	39

## List of Figures

Fig.1: Use Case Diagram .....	9
Fig.2: Gantt Chart .....	13
Fig.3: ER-Diagram.....	14
Fig.4 Context Diagram/0-Level DFD .....	15
Fig.5: Level-0 DFD.....	16
Fig.6: Level-1 DFD.....	17
Fig.7: Database Schema.....	18
Fig.8: Structure of User Interface .....	19
Fig.9: Structure of Admin Panel .....	20
Fig 10. V-Model of development.....	22
Fig 11. Test Case for User Login.....	26
Fig 12. Test Case for New User Registration .....	27
Fig 13. Test Case for Request for blood .....	29
Fig 14. Test Case for Feedback.....	31
Fig 15. Test Case for Request for Blood and blood donor list is available for SMS...	34
Fig.16: Numbers of blood bank in Nepal.....	39
Fig.17: Blood Request in Social Media .....	40
Fig.18: Graph of blood request .....	40
Fig.19: User Interface .....	41
Fig.20: Admin Panel .....	41



## **List of abbreviations**

API	Application Program Interface
CSS	Cascading Style Sheet
DFD	Data Flow Diagram
ER	Entity Relationship
HTML	Hyper Text Markup Language
HIPO	Hierarchy Input-Process-Output
ICT	Information and Communication Technology
IPO	Input-Process-Output
JS	JavaScript
PHP	PHP Hypertext Preprocessor
SMS	Short Messaging Service

SQL      Structured Query Language

# Chapter 1: Introduction

## 1.1 Introduction

Blood is one of the major aspects of life. The need of blood and its importance is indescribable. From the start of medical enhancement blood transfusion has been a major issue. The type of blood required, the process of storage and finding and contacting the donor has always been a problem in the history of blood transfusion.

Blood Databank is a web application (application or system used henceforth) that helps to reduce one of the major issues i.e. finding and contacting the blood donor. Its major task is to keep tracks and records of blood donors for easier contact with them.

We see many blood requests frequently added in various social medias. Many of the blood requests are not handled properly. The hospital does not keep the digital record of the requests. Also, the record keeping in hospital is kept manual. In case of emergency camps that include various disaster relief camps, mountain base camps and war refugee camps we have no proper access and availability of blood during the time of need.

Whenever there is blood request, the system checks which group of blood is required and which donors are available in that particular area. When it determines the donors list, it sends message to all the available donors. Thus, this system tries to resolve one of the major by acting as a bridge.

Blood Databank is developed using the HTML, CSS, PHP and MySQL. SMS API will be implemented on the system so as to provide the functionality of message sending to the donors. The database will be maintained using SQL feature.

Google API is used to use the map features.

The system is implemented using the “V” model of development. The main reason for using this particular model is because of its flexibility in adding or editing any components based on the previous steps. The testing goes with hand on validation with the requirements and design process. Suppose if there is any alteration found after testing i.e. if something is missing or some requirements gets excess then we can go back and change the corresponding stage without altering other stage/steps.

## 1.2 Problem Definition

The old manual and digital systems were suffering from a series of drawbacks. Since whole of the system was to be maintained with hands of keeping, maintaining and retrieving the information was very tedious and lengthy in hospital and blood bank. If any information was to be found it was required to go through the different registers, documents there would never exist anything like report generation. There would always be unnecessary consumption of time while entering records and retrieving records. So, this application helps to digitized the blood information and donor details. This system keeps the records of the donor and blood available in the hospital and blood bank. The implementation of this web application has a wide scope of use that ranges from the use in hospital for fresh blood to the emergency cases that may arise in various outer camps. We can view the scope of this system based on the following points:

1. We find many blood request cases on various social medias and groups on daily basis.
2. The records for blood requirement are stored in paper manually and no digital information is stored.
3. There are many cases of blood mafia that results in unavailability of blood or increased cost of blood which can be minimized.
4. The application can be used in versatile environment.

### 1.3 Objectives

- To provide a means for various social organizations to organize and publicize blood related events.
- To provide the details of the nearby events to general public so that they can participate the blood donations programs and camps.
- To allow the probable recipients to make search and match the volunteer donors and make request for the blood.
- To provide an efficient donor and blood stock management function to the blood bank by recording the donor and blood details.
- To provide synchronize and centralized donor, hospital and blood stock database.
- To provide immediate storage and retrieval of blood data and information.
- In some major accident surgery, heart surgery and organ transplant fresh blood are needed (we can say “in emergency cases”) so in such cases, we can send SMS to available donor with same blood group. This feature of our system can help to save the life of people whose life is in danger due to lack of fresh blood.
- Hospital cannot store the blood for long time. If there is excessive amount of blood in hospital that can shift to blood bank for store.

## **1.4 Scope and Limitation**

### **1.4.1 Scope**

The system is used for maintaining all the process and activities of blood data bank management system. The system can be extended to be used for maintaining records of hospital, organ donation / transplant and other similar sectors. While developing the system, there shall be space for further modification. There shall be a proper documentation so that further enhancement becomes easy. System is web based so everyone can access it and people can request the blood for various cause like operation, accident etc. Also, system shows the blood requests from public and their details so donor can easily contact them from the details provided by requester.

### **1.4.2 Limitation**

Some of the limitations of the systems are:

- Our system is completely based on internet.
- Our system lacks technical information.
- Our system lacks proper information about donors as per the requirement of blood bank.
- Our system will be used for social cause so we may suffer from financial loss as we don't have any incoming financial source.
- Our system is limited to web application only.

## **1.5 Features of Project**

This project is targeted to the users who use the web application. If any user first enters in the site they are able to see various events and blood requests. If the user signup in the site then they have to provide their details which is stored in the blood data bank and in the emergency case hospital can send SMS to specific donor to donate the blood.

The main features of the project are described below:

- Well-designed interface viewable in any resolution.
- Details information regarding the various donor near hospitals.
- One can search for the available blood in the hospital and blood bank from web page.
- Register and signup for new user to up to date blood database and others camp details.
- Users can view the available blood in the hospital and blood bank and request for required blood.
- Visitors can know the details about the blood donation camps and location.

## 1.6 Report Organization

- In chapter 1, we introduce why our system is built and condition of old and manual systems which are not reliable. And also, objectives and features of the project are explained in detail with scope and limitation of the system.
- In chapter 2, we discuss about the existing system along with requirement as well as feasibility analysis of the system. The data modeling and process modeling technique are used to give the information about the system requirement.
- In chapter 3, we discuss about the system design. The system design can be database schema design, interface design and process design.
- In chapter 4, we discuss which tools are used on our project to make it possible. The testing is also explained in this part with detailed tabular input and output.
- In chapter 5, we discuss about the maintenance and support implemented on the project.
- In chapter 6, we discuss about the conclusion and future enhancements of the project.



## Chapter 2: Requirement Analysis and Feasibility Study

### 2.1 Literature Review

The system is web-based application which keeps the records of donor, blood, blood bank and hospitals. Blood databank is a software that helps to reduce one of the major issues (finding the fresh blood). Major task is to keep the tracks and records of the blood, donor, and blood bank.

During the literature survey, we found the maximum blood request on social medias like Facebook, Twitter etc. Let's be accurate, we found many request on Facebook group named Men's Room Reloaded and Blood on request and we collect the data of blood request. In 2-month survey, the collected data is presented using line chart. During the survey we observe the problems of general public who could not found the donor on the need and many people misuse the information. Many fake donor and requester seen over the social medias and make the available of blood quite difficult.

While working on literature survey, we studied many existing systems. Mostly there are many existing mobile applications on which provide the services related to blood on which blood request, donor tracker etc. **E-Blood Donor** is the mobile based application which only provide the information about the donor and there is receiver service where we can request for blood in any state and city of India. **Blood Member Nepal** is also the mobile based application which asks for blood group and district in Nepal and search for available donors in the following district from blood donor association Nepal (BLODAN)'s database. **Eblood** is also mobile based application which stores the donor information, information can be location, blood group, email and last donated date. **Blood Nearby** is mobile based android application which track donors and search for nearby blood banks in certain radius.

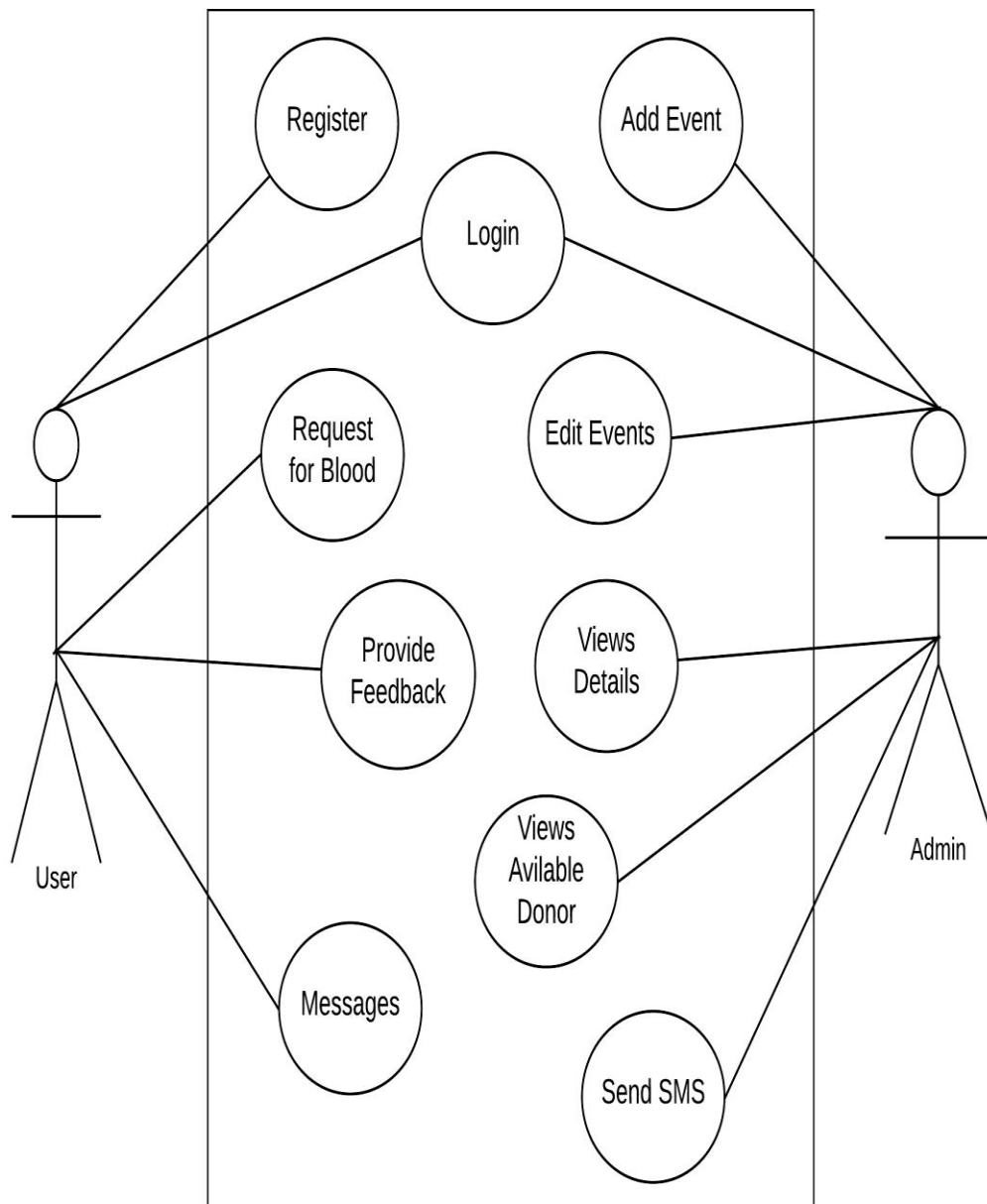
## 2.2 Requirement Analysis

The requirement includes both functional and non- functional requirements:

### 2.2.1 Functional Requirements

A typical functional requirement will contain unique name and number, a brief summary, and a rationale. The functional requirement of the system Blood Databank are:

- **User registration (Donor or general user):** System register the new user with valid and genuine data so that they can donate and request the blood.
- **User login (admin):** Admin can be Blood bank or system admin. Admin can add, modify and delete the nearby events. Admin plays important role to manage the entire functions of the system. Admin sends the messages to donor if required. SMS API is integrated with our system and SMS is send according to the availability of the donor.
- **User login (General user):** General user can login with user id and password. Password is case sensitive i.e. must contain uppercase, lowercase, number and special symbol. General user can request the blood and can see nearby events.
- **Request for blood:** The general user request for blood. Whole requesting the blood user must fill the form as form contains the blood group, pint amount, reason, address and phone number.
- **Send SMS to Donor if needed:** SMS can only send by admin, SMS API is integrated and bulk SMS is purchased from Sparrow SMS.
- **Nearby events:** Nearby events can be added, modified and deleted by admin. General user can see the nearby events. Events can be blood donation camp. User can see the nearby events according to the map as Map API is integrated.
- **Feedback to Admin:** General user and visitors to site can send feedback to admin. Feedback can be anything that can sometimes be important and sometimes useless.



**Fig.1: Use Case Diagram**

### 2.2.2 Non-Functional Requirements

Non-functional Requirements are often called “quality attributes “of a system. Other terms for non-functional requirements are “qualities”, “quality goals “, “quality of service requirements”, “constraints” and “non-behavioral requirements”. Non-functional requirements are:

- **Security:** Data like personal details of general user and admin must remain confidential. To keep all these data, system don't reveal the personal data to any other user.
- **Correct information:** The information provided by our system is genuine and correct.
- **Availability:** System works 24 hours a day so that general public can access the system and use of the system.
- **Performance:** The performance of the system is good and webpage is user friendly. Anyone who can understand English and have knowledge of computer can easily use the system.
- **User satisfaction:** Whatever the system provides the facility, user can be satisfied with all their heart.
- **Backup:** As our system mainly deals with data, backup of data and information is must for our system.

## **2.3 Feasibility Analysis**

Feasibility is the practical extent to which a project can be performed successfully. To evaluate feasibility of our system, we performed feasibility study, which helps us determine whether the solution considered to accomplish the requirements is practical and workable in our system.

### **2.3.1 Economic Feasibility**

Economic feasibility analysis is the most commonly used method for determining the efficiency of a new project. It is also known as cost analysis. It helps in identifying profit against investment expected from a project.

Economic feasibility was the first thing we considered during the project selection and planning. As we know every project needs certain cost and resources to be completed. We studied the different aspects of the project and calculated whether our project is economically feasible or not. First, we analyzed the cost required for developing the system, the resource like hardware, software, cost required to launch the system (Hosting) and operational cost. Our research was not only about financial value but also efficiency of time.

The user doesn't need to buy the additional software to access the service using the mobile phone and computers. Hence, the project is feasible economically for the user but there is no profit for the admin or developers.

### **2.3.2 Operational Feasibility**

Operational feasibility refers to the measure of solving problems with the help of a new proposed system. It helps in taking advantage of the opportunities and fulfills the requirements as identified during the development of the project.

During the period of feasibility study and research we studied the operational environment of our project and calculated the operational feasibility. In this case we studied about the operational environment and necessary resource available. Further there is no any restrictions from government regulations for implementing the system. There can be the problem when blood bank refuse to provide the enough information to operate the system. Our system is not economically feasible to the developers and admin, so the operational

cost could be higher due to which we may not be able to manage the basic operation of the system.

### 2.3.3 Technical Feasibility

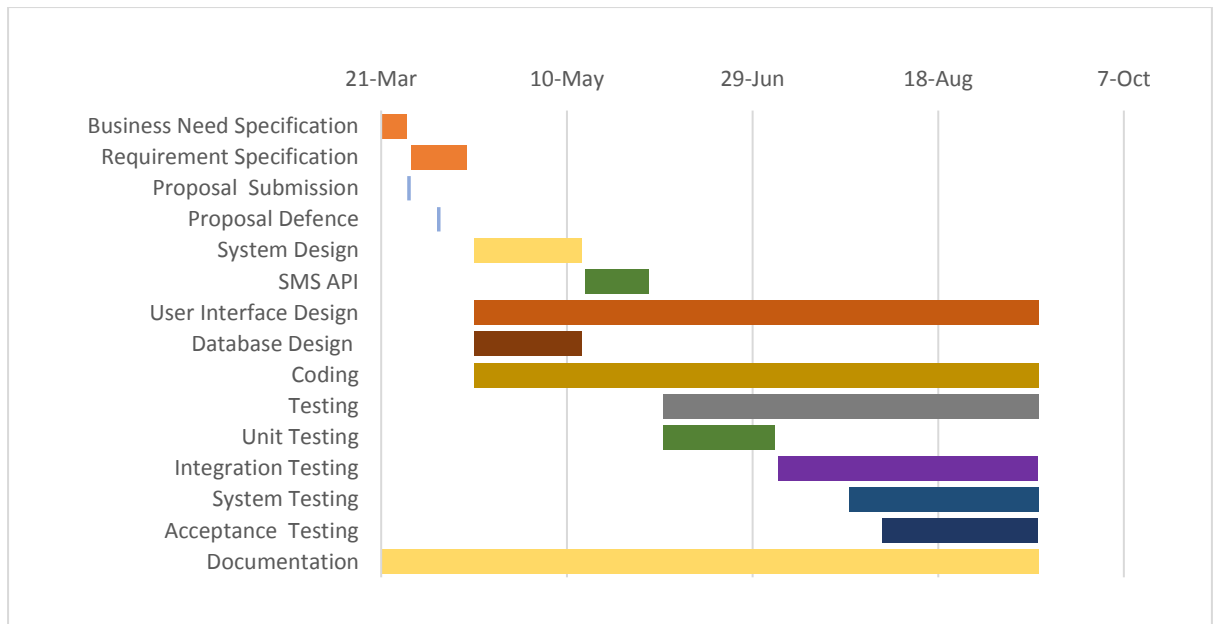
Technical feasibility study is the complete study of the project in terms of input, processes, output, fields, programs and procedures. It is a very effective tool for long term planning and trouble shooting.

To develop the web application, we have used HTML, CSS, JavaScript, jQuery, etc. as the interface for the front end as well as backend and for programming we used core PHP and for database we have used SQL. We have used SMS gateway from Sparrow SMS API and google map API.

Hence, the project seems feasible in terms of every technical aspect but since SMS API is not free, in this case it doesn't seem feasible.

### 2.3.4 Schedule Feasibility

TASK ID	TASK	START DATE	END DATE
1	Business Need Specification	21-Mar	28-Mar
2	Requirement Specification	29-Mar	13-Apr
3	Proposal Submission	29-Mar	29-Mar
4	Proposal Defence	6-Apr	6-Apr
5	System Design	15-Apr	14-May
6	SMS API	15-May	1-Jun
7	User Interface Design	15-Apr	14-Sep
8	Database Design	15-Apr	14-May
9	Coding	15-Apr	14-Sep
10	Testing	5-Jun	14-Sep
10.1	Unit Testing	5-Jun	5-Jul
10.2	Integration Testing	6-Jul	14-Sep
10.3	System Testing	25-Jul	14-Sep
10.4	Acceptance Testing	3-Aug	14-Sep
11	Documentation	21-Mar	14-Sep



**Fig.2: Gantt Chart**

The figure above shows the schedule of the project with the major phases. Initially, the requirements for the systems were gathered and analysed properly. Later the system designing, user interface designing and database designing was done. The coding phase was the longest phase of the project life cycle. The testing was done corresponding with the implementation so that changes can be done on the same time. The documentation of the system was carried out from the starting of the project.

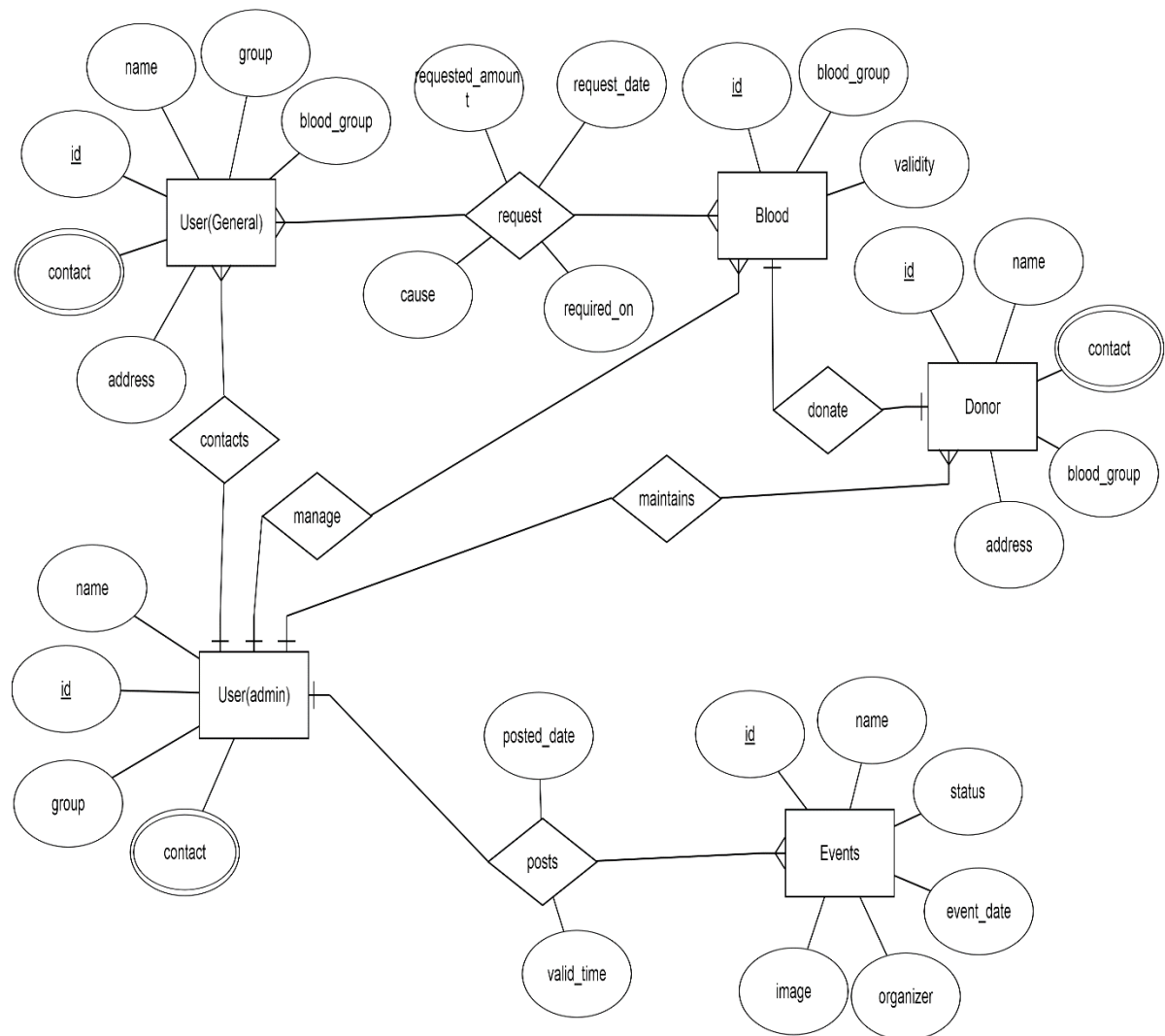
## 2.4 Structing System Requirements

### 2.4.1 Data Modeling:

Data model is a detailed model that captures the overall structure of data in an organization. Entity-Relationship(E-R) diagram are commonly used in data modeling.

- **E-R Diagram**

ER-Diagram is a data modeling technique that graphically illustrates an information system's entities and the relationships between those entities.



**Fig.3: ER-Diagram**



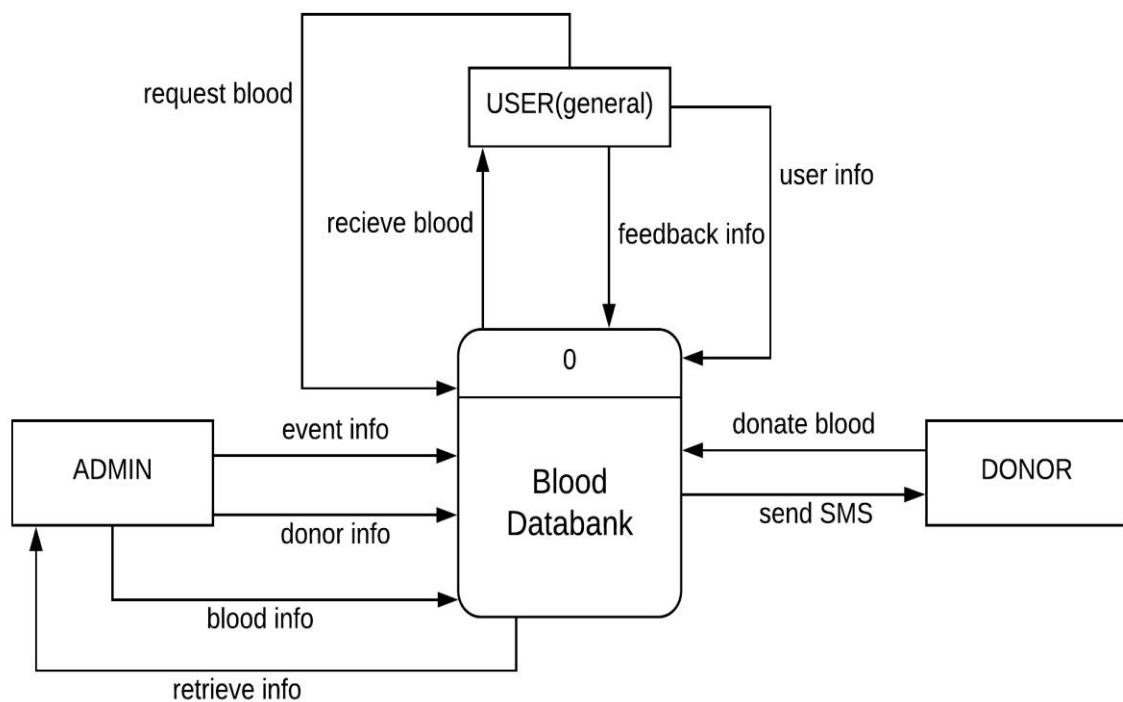
### 2.4.2 Process Modeling

Process modeling graphically represents the process that capture, manipulate, store, and distribute data between a system and its environment and among system components. Each process transforms inputs into outputs.

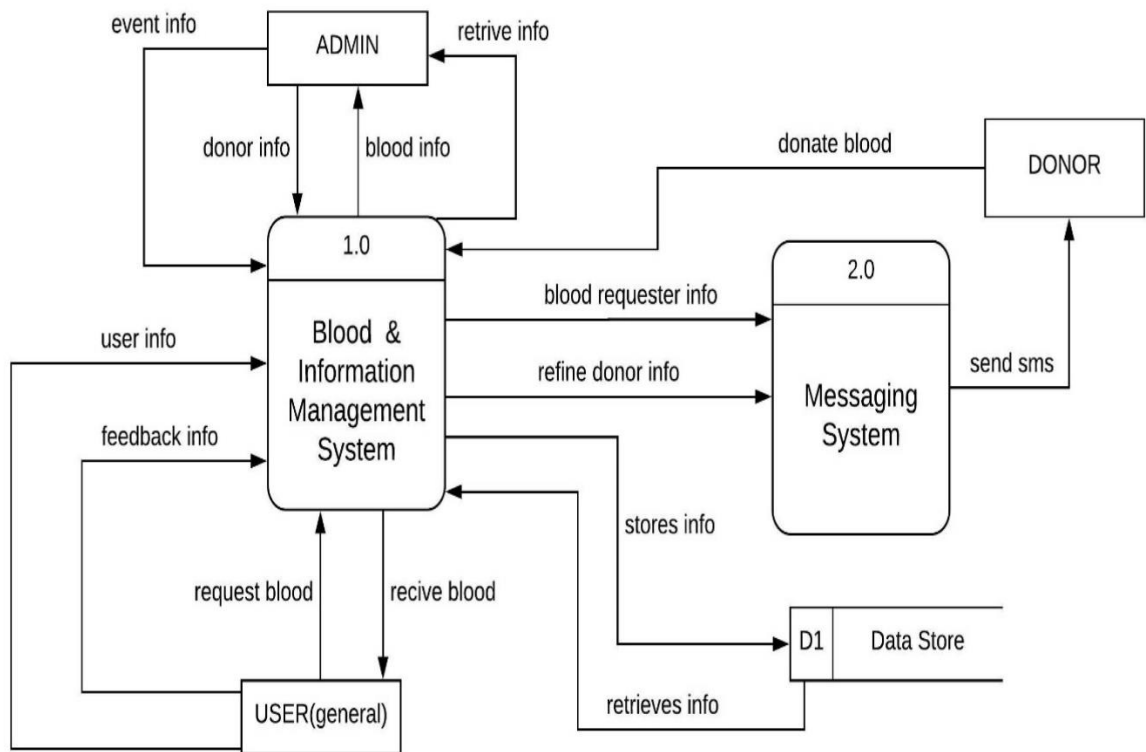
Data Flow Diagram (DFD) is commonly used in process modeling.

- **DFD**

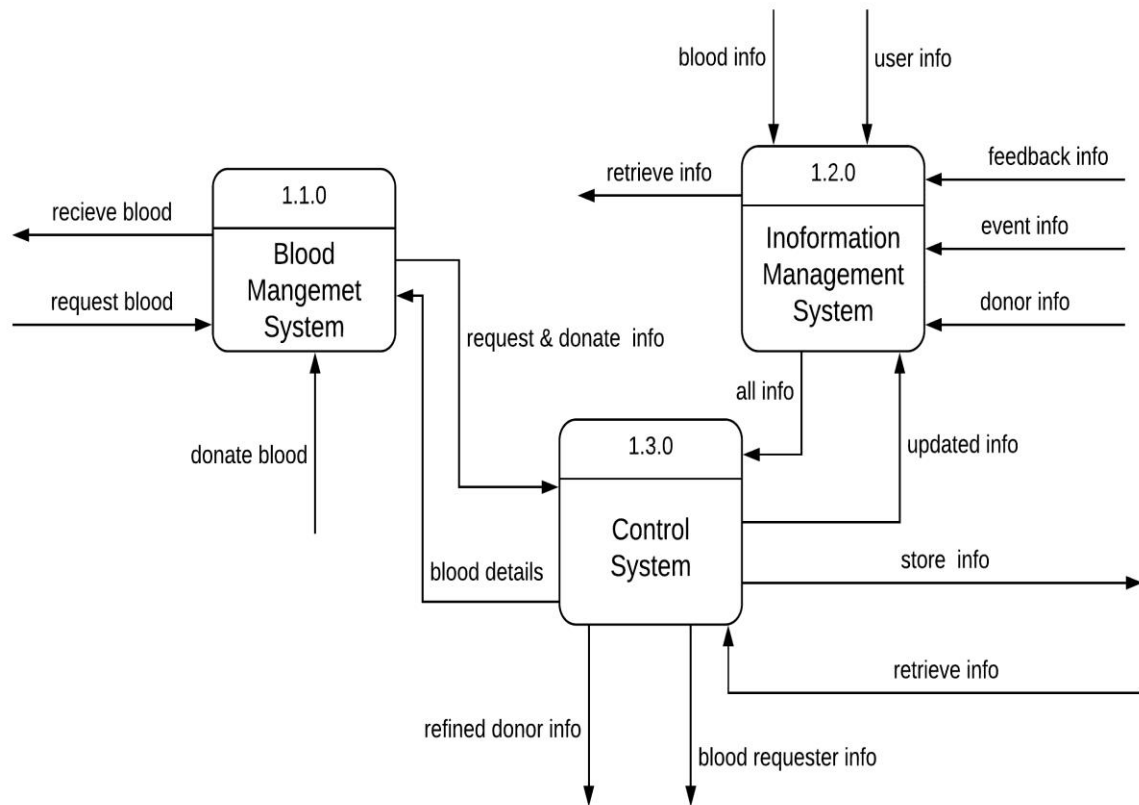
A DFD is a pictorial representation of the movement of data between entities and the processes and data stores within a system. They can be used to analyze an existing system or model.



**Fig.4 Context Diagram/0-Level DFD**



**Fig.5: Level-0 DFD**



**Fig.6: Level-1 DFD**

## Chapter 3: System Design

### 3.1 Database Schema Design

A database schema represents the logical configuration of all or part of a relational database. It can exist both as a visual representation and as a set of formulas known as integrity constraints that govern a database. Those formulas are expressed in a data definition language, such as SQL. As part of a data dictionary, a database schema indicates how the entities that make up the database relate to one another, including tables, views, stored procedures, and more.

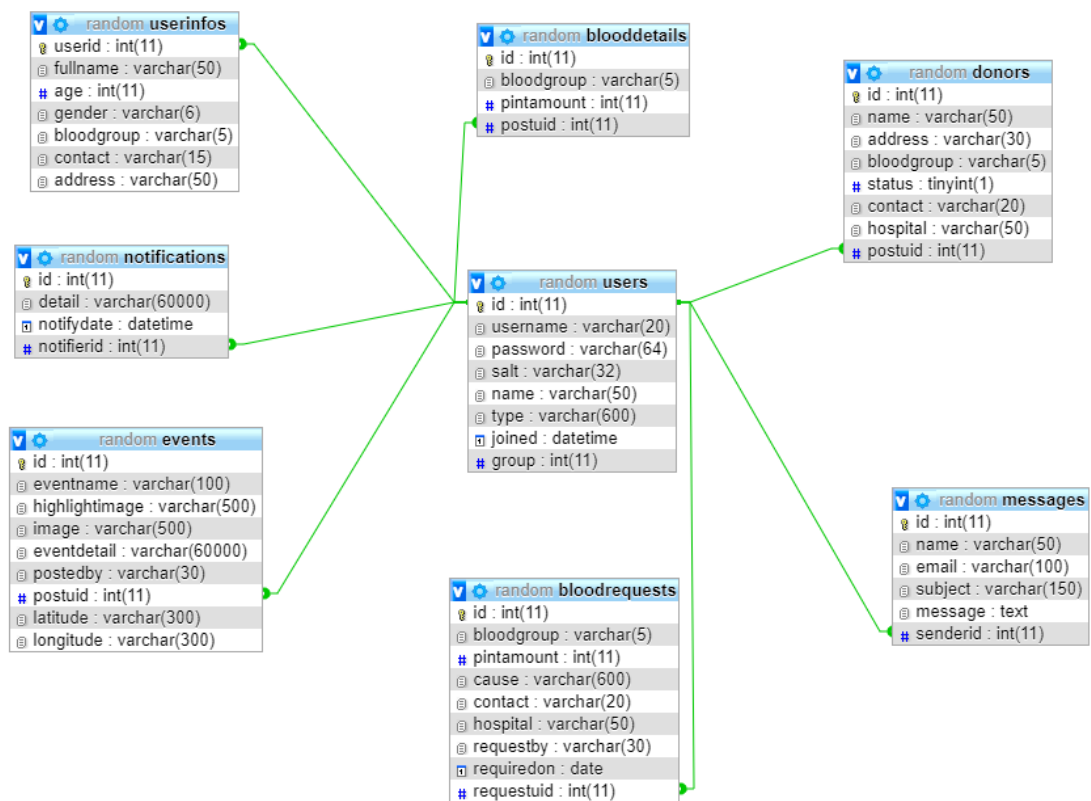
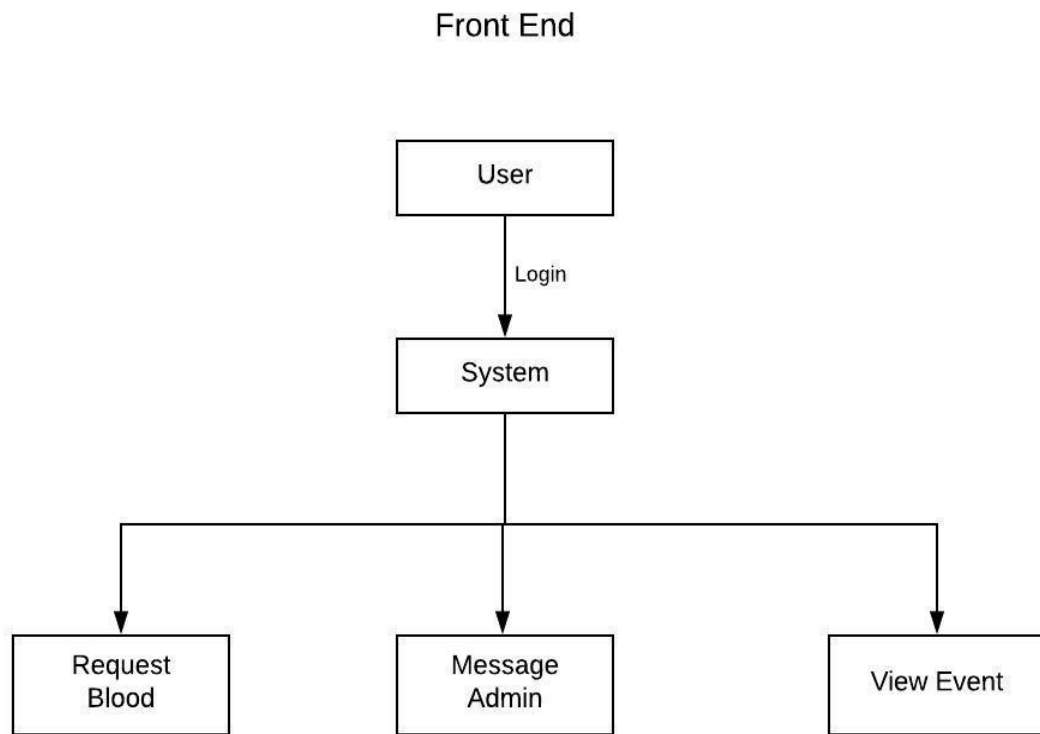


Fig.7: Database Schema

## 3.2 Interface Design

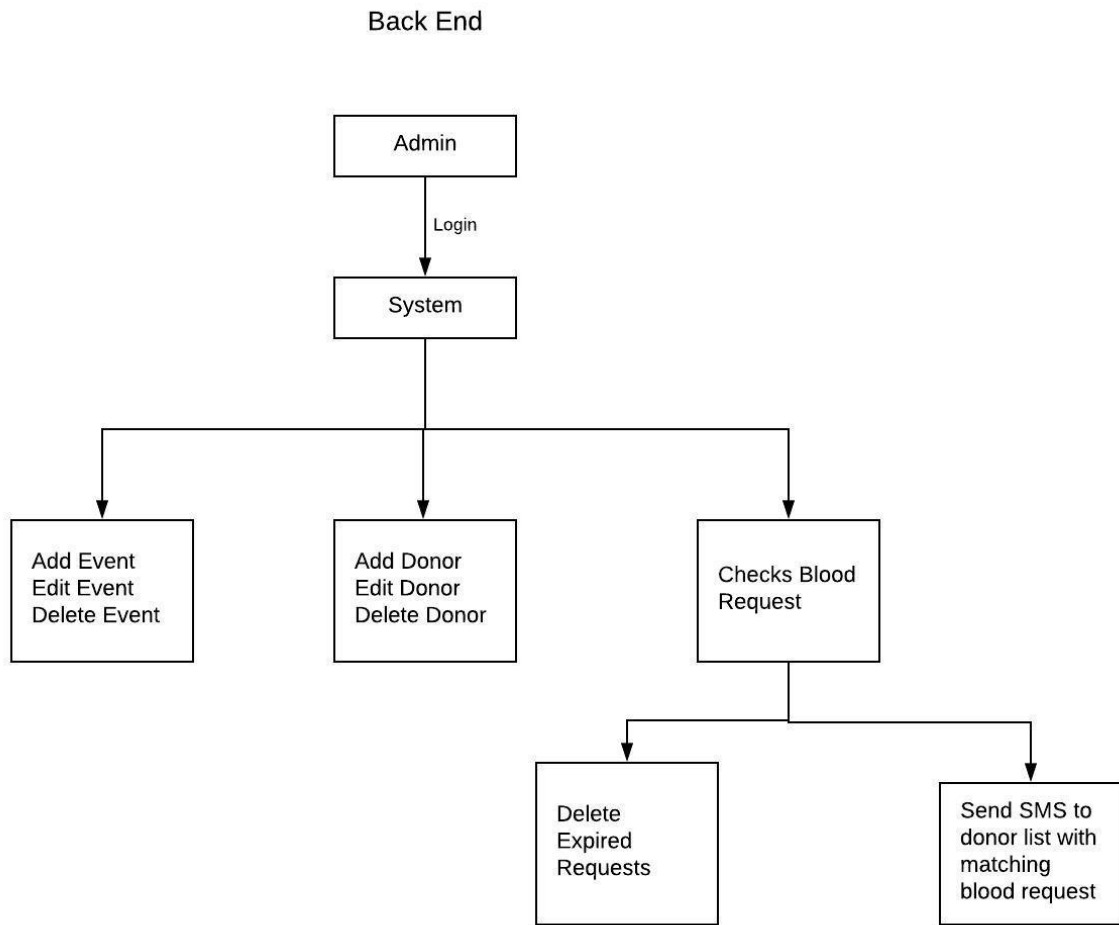
### 3.2.1 User Interface Design



**Fig.8: Structure of User Interface**

Front end design is the interface which appears when the users are browsing the website. The front end provides the login and registration service to access different services. The user can request for blood after login to the system using request blood form. The user can message the admin and view the nearby event.

### 3.2.2 Admin Panel Design



**Fig.9: Structure of Admin Panel**

Admin Panel is the interface where administrations and other site officials with appropriate privileges can manipulate the content of the website. A single admin panel interface has been used for both the admin as well as blood bank with separate privileges.

The admin can

- add, edit and delete event.
- add, edit and delete donor
- check blood request

## **Chapter 4: Implementation and Testing**

### **4.1 Implementation**

Implementation phase is one of the important phases of project development. In this phase we implement our conceptual design into the working program by using various tools. The successful implementation of project is nearer steps towards the project completion. Project implementation was not an easy step to us as we encountered various issues related to the programming logic as challenges.

Our project is completely based on V model so if the requirement changes then there is no big deal in changing the system's part. The application should maintain a database that contains the list of donors which consists of fields: Name, Blood group, Location and Number or email address if required. Also, another database is maintained by the application that keep records of the donors who donated the blood. It should contain the fields: Date, Name, Blood Group, Location and Number. Whenever there is blood request, the software searches the database for the list of available donors based on the location (may be defined via hospital name/location). It then sends SMS to the concerned donors which is another important requirement of the software "SMS Integration".

Google map API is integrated with the system so that user can search the near by events.

#### **4.1.1 Overview of Development Methodology**

System "Blood Databank" is developed based on V Model. The first phase of V model is business need and it falls under the category of requirement analysis and gathering. After gathering the requirements feasibility study of the system was studied. After feasibility, we start designing the entire system as per the requirement. When the designing is done we start creating the module for each component. The creating of module is done in coding part. Once coding is done we start testing the individual modules and testing is known as unit testing. Unit testing of each component must be done and are completed. Some of the major unit testing are testing the SMS sending process, registering the new user with form validation, login page and many more. Once unit testing is completed we start integrating the system that are linked with each other. Once the whole system is integrated we start the integration testing. For example, we request the certain amount of blood and ask admin to





**Documentation Tools:**

- Lucid Chart was used for designing of:
  - Data flow diagram
  - Use Case diagram
- ERDPlus was used for designing of ER Diagram.
- MS Project was used for creating Gantt Chart.
- MS Word was used as a text editor for documentation process.

**4.1.3 Listing of major classes and files**



## 4.2 Testing

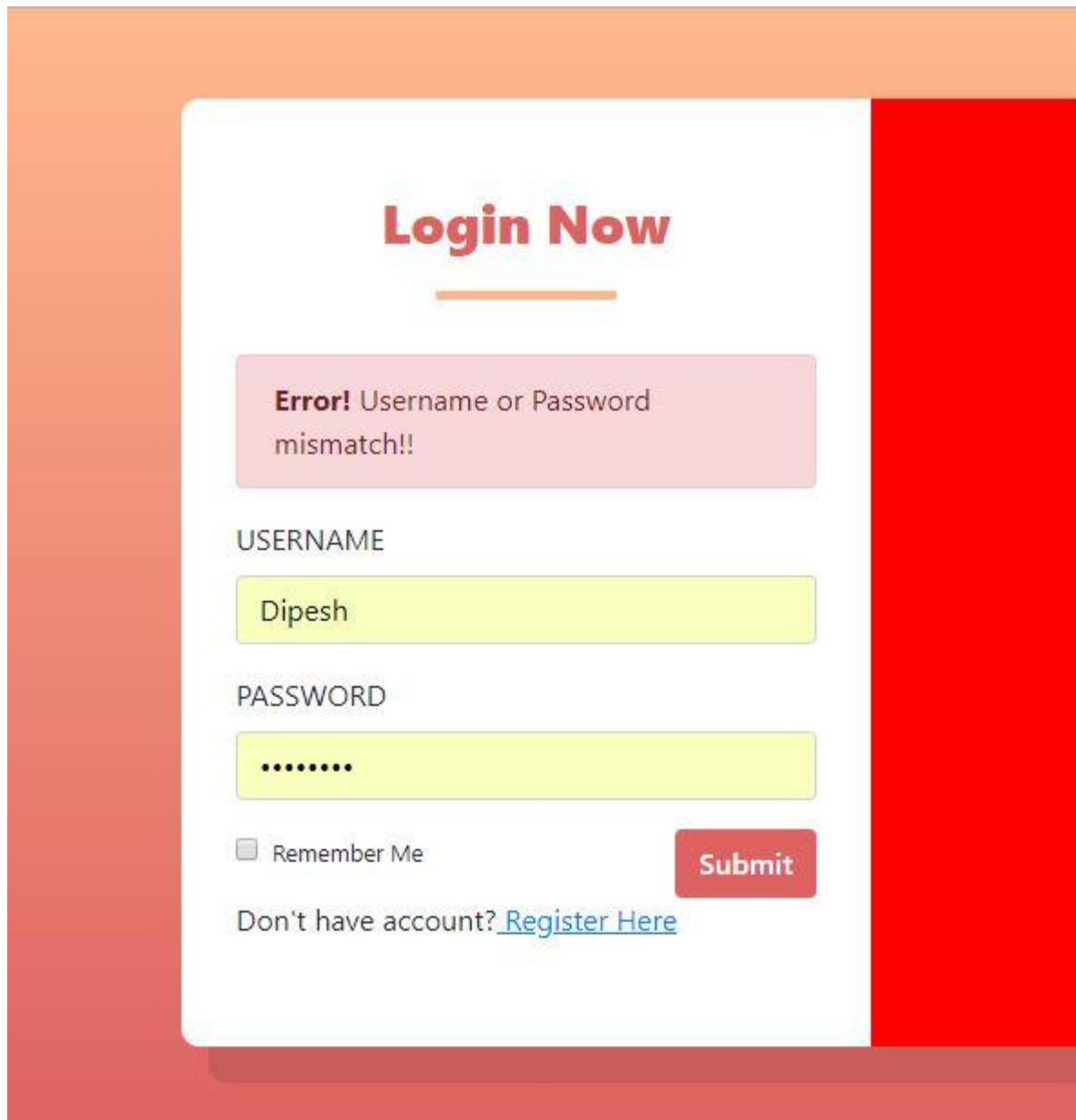
The testing phase can be carried out manually or by using automated testing tools to ensure each component works fine. After the project is ready we tested its various components in terms of quality, performance to make it error free and remove any sort of technical jargons. The testing phase can be carried out manually or by using automated testing tools to ensure each component works fine.

### 4.2.1 Unit Testing

During the coding phase each individual module was tested to check whether it works properly or not. Different errors found during unit testing were debugged. Some of the major test cases are listed below:

#### Test Case 1: User Login

S. No.	Test Inputs	Expected Output	Actual Output	Result
1.	Username: Dipesh Password: Bhandari	Login should be success.	Login Successful	Test Successful
2.	Username: Dipesh Password: Acharya	Login Unsuccessful	Username or password mismatch.	Test Successful

A login form titled "Login Now" with a red error message "Error! Username or Password mismatch!!". The form includes fields for "USERNAME" (containing "Dipesh") and "PASSWORD" (containing "\*\*\*\*\*"). There is a "Remember Me" checkbox and a "Submit" button. A link "Register Here" is provided for users without an account. The form is set against a background with orange and red gradients.

## Login Now

**Error!** Username or Password mismatch!!

USERNAME

Dipesh

PASSWORD

\*\*\*\*\*

☐ Remember Me

Submit

Don't have account? [Register Here](#)

**Fig 11. Test Case for User Login**

## Test Case 2: New User Registration

S. No.	Test Inputs	Expected Output	Actual Output	Result
1.	Username: Bijay Password: Karki Password Again: Karki Your Name: Bijay Karki	Registration should be failed.	Password must be a minimum of 6 length.	Test Successful
2.	Username: Bijay Password: Karki123 Password Again: Karki123 Your Name: Bijay Karki	Successfully Registered.	Successfully Registered.	Test Successful

## Register as New User

password must be a minimum of 6

USERNAME

PASSWORD

PASSWORD AGAIN

YOUR NAME

Fig 12. Test Case for New User Registration

**Test Case 3: Sending SMS**

<b>S. No.</b>	<b>Test Inputs</b>	<b>Expected Output</b>	<b>Actual Output</b>	<b>Result</b>
1.	Token = 'Token number' From = DEMO To = 'Phone number' Text = 'Text you want to send'	Text message should be sent to given phone number.	Text message sent to phone number	Test Successful

**Test Case 4: Request for blood**

<b>S. No.</b>	<b>Test Inputs</b>	<b>Expected Output</b>	<b>Actual Output</b>	<b>Result</b>
1.	Blood Group: A+ Amount: 10 Cause: Accident Phone Number: 123 Hospital: Kapan Hospital Date: 09/17/2018	Phone number should be 10 character. And we are using 3 character. So, submission should be failed.	Popup message on Phone Number: Please lengthen this text to 10 characters. (You are currently using 3 characters)	Test Successful
2.	Blood Group: A+ Amount: 10 Cause: Accident Phone Number: 9843313377 Hospital: Kapan Hospital Date: 09/17/2018	Request should be accepted.	Request Accepted.	Test Successful

# REQUEST FOR BLOOD



A+

▼

Pint Amount

10

Cause

Accident

Contact

123

Hospital

Kapan Hospital

Required On

09/17/2018

Request



Please lengthen this text to 10 characters or more (you are currently using 3 characters).

**Fig 13. Test Case for Request for blood**

**Test Case 5: Feedback**

<b>S. No.</b>	<b>Test Inputs</b>	<b>Expected Output</b>	<b>Actual Output</b>	<b>Result</b>
1.	Email address: ss Subject: Message:	Message should not be sent because there is an invalid email and subject and message is empty.	Popup message on Email address: Please include '@' in the email address. 'ss' is missing '@'. Message is not sent.	Test Successful
2.	Email address: akshachrya@gmail.com Subject: Message:	Message should not be sent because subject and message are empty.	Popup message on Subject and Message: Please fill out the field.	Test Successful
3.	Email address: akshachrya@gmail.com Subject: About the System Message: System is working fine.	Message should be sent.	Message is sent.	Test Successful



# CONTACT US



Email Address

ss|



Please include an '@' in the email address. 'ss' is missing an '@'.

Subject

Message

Send

**Fig 14. Test Case for Feedback**

### Test Case 5: Add Event

S. No.	Test Inputs	Expected Output	Actual Output	Result
1.	Event Name: Blood Donation Event Detail: ..... Posted By: Location: Marker on Lat: 27.7029      Lon: 85.3223 Image: 74796_big.jpg	Error should be occurred because Posted By is left blank.	Error! Posted by is required.	Test Successful
2.	Event Name: Blood Donation Event Detail: ..... Posted By: Akash Acharya Location: Marker on Lat:27.7029      Lon: 85.3223 Image: 74796_big.jpg	Error shouldn't be occurred because longitude and latitude are defined and every column are fill properly.	Event should be added.	Test Successful

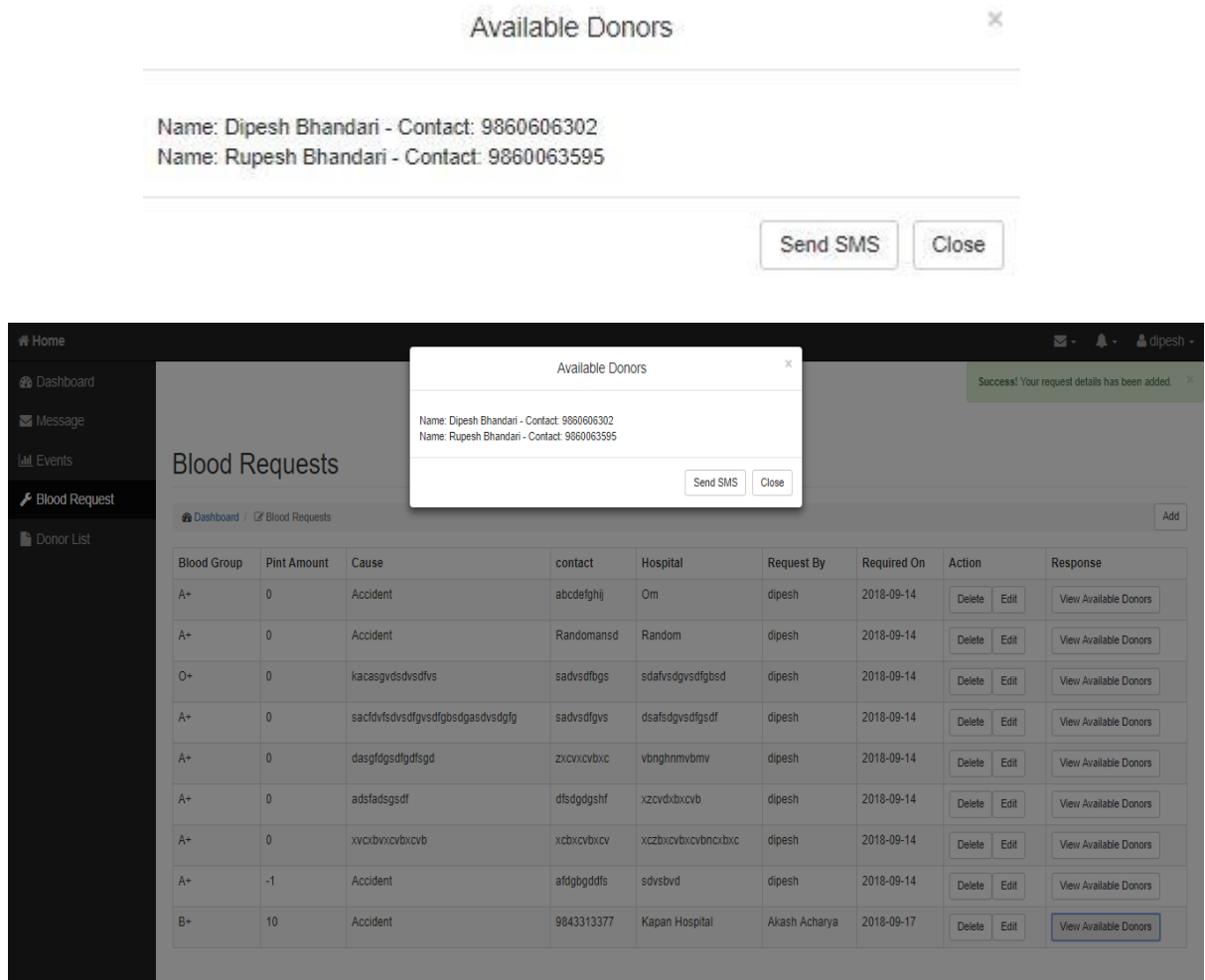
#### 4.2.2 Integration Testing

Integration testing was done after unit testing by combining different individual modules.

Some of the major test cases are listed below:

**Test Case 1: Request for Blood and blood donor list is available for SMS**

<b>S. No.</b>	<b>Test Inputs</b>	<b>Expected Output</b>	<b>Actual Output</b>	<b>Result</b>
1.	<p><b>Request for blood from user</b></p> <p>Blood Group: B+</p> <p>Amount: 10</p> <p>Cause: Accident</p> <p>Phone Number: 9843313377</p> <p>Hospital: Kapan Hospital</p> <p>Date: 09/17/2018</p> <p><b>Admin will view available donors by clicking “View Available Donors” button.</b></p> <p>Available Donors (with same blood group) will be shown with name and contact.</p> <p><b>Using Send SMS button</b></p> <p>By clicking Send SMS Button the blood request message will be sent to available donor.</p>	<p>The donor list should be filtered by blood group and available donor should be shown. The donor should be available for sending SMS.</p>	<p>The donor list is filter by blood group and available donor is shown. The donor list is available for sending SMS.</p>	Test Successful



**Fig 15. Test Case for Request for Blood and blood donor list is available for SMS**

#### 4.2.3 System Testing

System testing has done after integrating testing in order to ensure that the whole systems functions properly. After the integration testing the whole system working process was checked. The output was as per the system specifications and hence the system was found to work properly.

## **Chapter 5: Maintenance and Support**

### **5.1 Maintenance**

Blood Databank is implemented in the local server. For now, our system is implemented with XAMPP. When the new user registers in the system and added to the database, all the trainings set for the new users are needed to be maintained. In these types of cases, we need to train and maintain database time to time. Since our server is locally implemented and having the low memory, we might face the memory error in frequent amount of time. Therefore, we need to maintain the server frequently and we should need the records of donor for future reference. We need to purchase the external memory if needed under the circumstance followed by economic feasibility. Also, admin can edit, add and delete the event details, this can surely maintain the memory as event details can contain images and images have high memory.

### **5.2 Support**

We have used the advanced version of Waterfall Model i.e. V Model. V model focuses on verification and validation so we can quickly change the requirement of the system. If any changes need to be made then we can make it for sure in short period of time as V model allows us to do so. Admin can support the general user as user can send their feedback to admin directly. Support to general user is very important, so we allocate the access of admin panel to blood bank. If needed then we need to take cloud service for the data storage but this should be followed under economic feasibility of the project.

## **Chapter 6: Conclusion & Future enhancements**

### **6.1 Conclusion**

Today the world has become a global village where everything is online. There are so many webs based and mobile based solutions provided in the market for the comfort of the people. In today's era where ICT has touched each and every sector the concept of this project was developed in order to provide solution for blood request management. With the implementation of this system the users will be able to get their blood requirements as fast as possible. The patient, hospitals, blood bank and different other health related sectors will be benefited by this system.

During the entire project development period we were able to develop our skills. This project enabled us to manage time and resource besides of different constraints.

## 6.1 Future enhancements

Some of our future enhancements are:

1. For different locations we will setup different servers, so that system can run smoothly.
2. Data from blood bank will be linked in the system so users can take the advantage of getting choices in choosing the donor and blood can be easily available through donor.
3. Blood can be booked (may be commercially or not) for different certain cases like delivery, operations etc.
4. Developing the mobile based applications (iOS app and Android app).
5. We assure that we will provide the digital donor card to every people who have donated blood through our system and give them unique identifications so that they can be identified easily and we can provide the blood when they are in need.
6. Extra privilege will be given to the donor like rewards, awards to the donor. Some awards may be most frequently donor, easily available donor etc. this can motivate the donor to donate the blood.
7. Blood request will be done by sending just a SMS (offline mobile application) by using two-way SMS API.

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## Appendix

### Appendix A

Types/Levels of BTCs	Number	Coverage
Central BTSC	1	Kathmandu
Regional BTSCs	4	Biratnagar, Pokhara, Nepalgunj, Chitwan
District BTSCs	21	
Emergency BTCs	17	17 districts
Hospital units	25	In different hospitals and medical colleges
Total Units: 178652 (2008)		

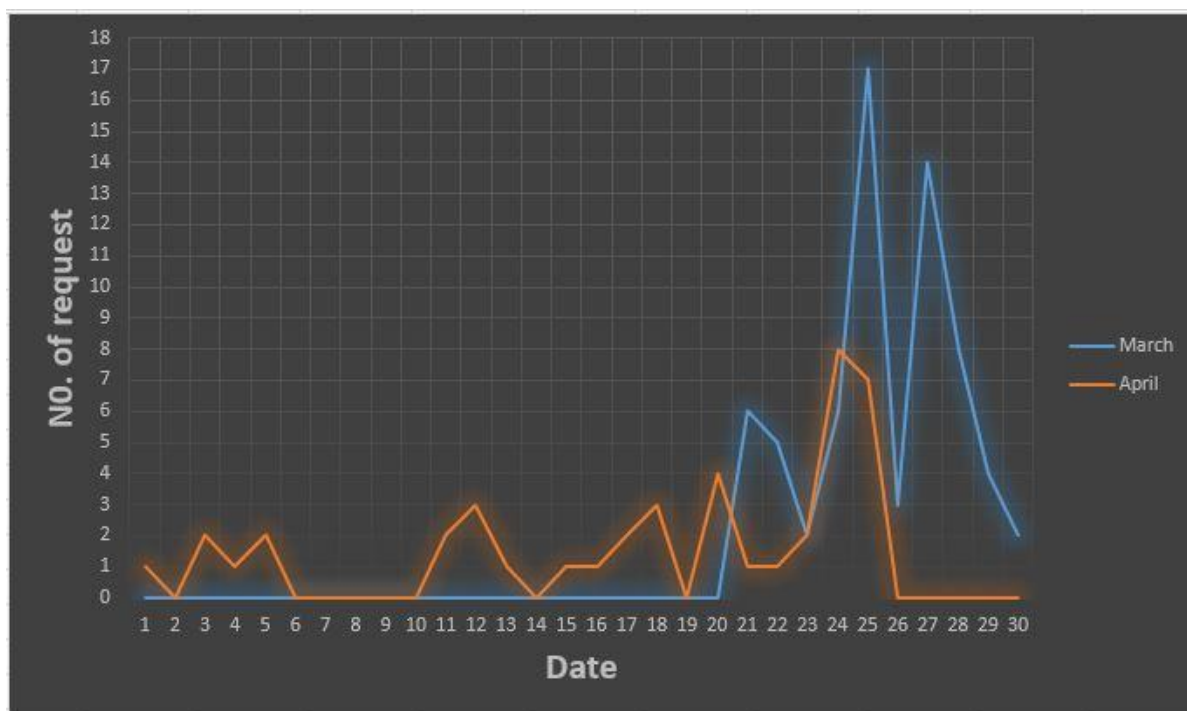
**Fig.16: Numbers of blood bank in Nepal**

### Appendix B

Date	Blood Group	Hospital	Location	Contact
3/21/2018	AB+	Medicity Hospital	Bhaisepti, Lalitpur	
3/21/2018	O-	Bir Hospital	Kathmandu	
3/21/2018	O+	Nepal Cancer Hospital	Harisiddhi, Lalitpur	
3/21/2018	B+	Bir Hospital	Kathmandu	
3/21/2018	A-	Life Guard Hospital	Biratnagar	
3/21/2018	AB+	Kanti Bal Hospital	Maharajgunj, Kathmandu	
3/22/2018	O+	Bir Hospital	Kathmandu	
3/22/2018	AB+	TUTH	Kathmandu	
3/22/2018	A+	Chauni Hospital	Kathmandu	
3/22/2018	A+	Nobel Hospital	Biratnagar	
3/22/2018	B+	Civil Hospital	Kathmandu	
3/23/2018	AB+	Nepal Cancer Hospital	Harisiddhi, Lalitpur	9847940273
3/23/2018	AB+	Motherland Hospital	Pepsicola, Bhaktapur	
3/24/2018	AB-	Bhairahawa Medical College	Bhairahawa	9847829858
3/24/2018	O-	Bir Hospital		9818738215
3/24/2018	O-	Gangalal		9847322053
3/24/2018	O+	Gangalal		9803989593

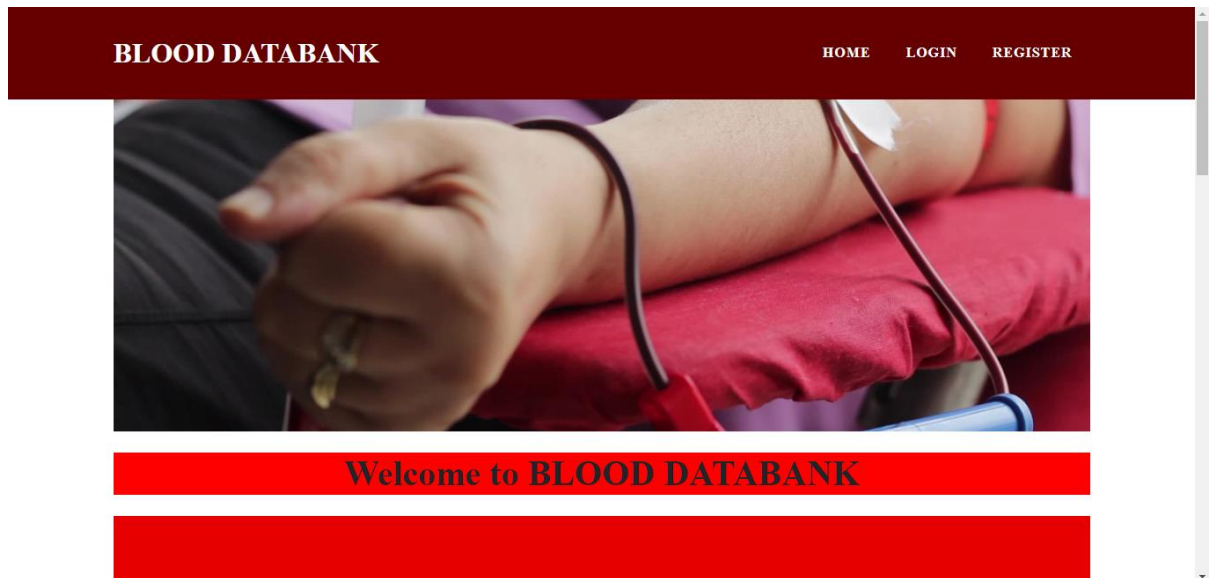
**Fig.17: Blood Request in Social Media**

## Appendix C

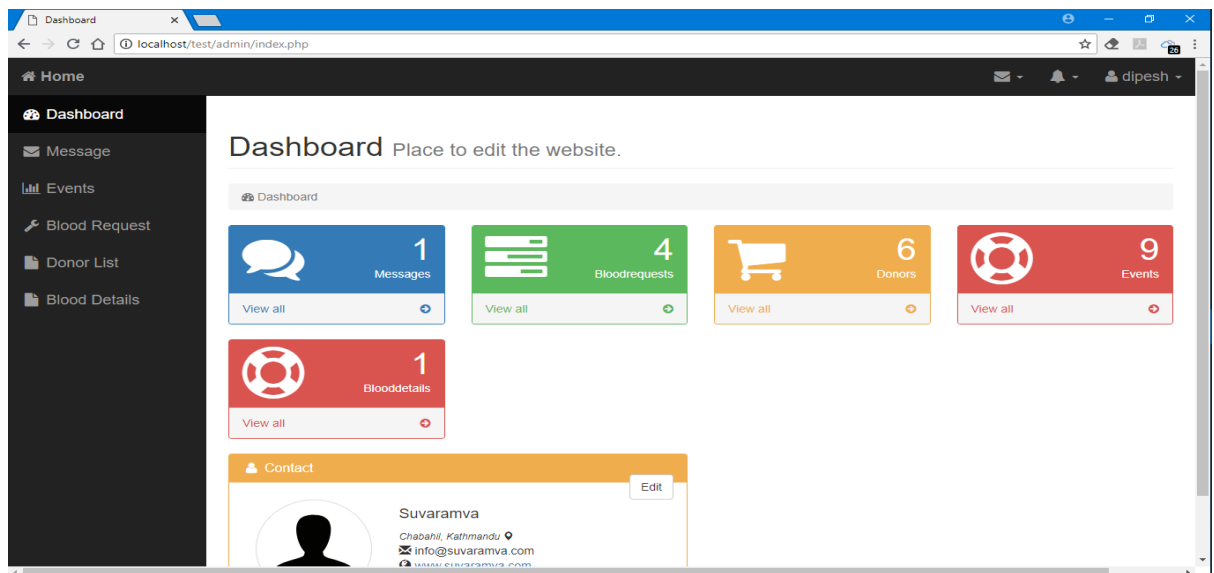


**Fig.18: Graph of blood request**

## Appendix D



**Fig.19: User Interface**



**Fig.20: Admin Panel**