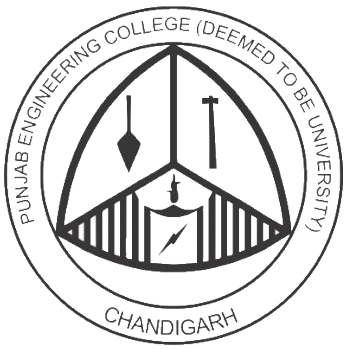

PUNJAB ENGINEERING COLLEGE

(Deemed to be University)
Chandigarh

Department of Computer Science & Engineering

"Every Drop Counts"

BLOOD BANK MANAGEMENT SYSTEM

Submitted to : **Prof. Rajesh Bhatia**
Prof. Shilpa Verma
Miss Pansy Nandwani

Submitted by : Harsh Sambyal (19103001)
Vageesh (19103002)
Ankit Bansal (19103038)
Nischal Chaudhary (19103055)

Acknowledgement

Most importantly, our group is sincerely thankful to Prof. Rajesh Bhatia and Miss Monika for giving us proper guidance to complete our project. Without their support we wouldn't be able to complete this project. We are also thankful to Prof. Shilpa Verma who also gave us proper guidance for completing our project.

Finally, we would like to give our special thanks to Punjab Engineering College, Chandigarh for giving us enough knowledge and skills that made us to innovatively and successfully research and compile this project.

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1. Abstract:

Manually and physically operating the blood bank system actually faces many obstacles in the currently existing scenario as it is challenging to make up for rare blood groups promptly in case of urgent requirements which in turn leads to fatality due to lack of blood during surgeries. Moreover, the existing way of blood bank system are exhausting and time consuming as the stock of blood and routine transactions are made without a proper frame of storing necessary data in a well-maintained manner for efficient use in case of any future requirements. The prior aim of this model "Every blood count" designed by our team is to make all the procedures regarding Blood Bank Management purely automated because with the help of computerised functioning, all the operations can be faster and more precise. Furthermore, the probability of errors will be reduced to great extent as compared to manual operations. Model purpose is to initially cover the perimeter of a small area and provide assistance to the blood needy patients as we will establish contact with the hospitals in the decided perimeter and further will store the information of Donors, recipients, Hospitals involved, authenticate reports of the patients, trauma cases (in case any) requiring emergency blood. The Recipients and volunteer Donors will login into the system through authenticate system involving third party browsers like Chrome etc. The system will make the use of the collected information to make blood arrangements details, necessary actions to be taken and to make the elaborated reports of the donors and the recipients. This model will also comprise of an emergency section where all the priority recipients who are in extremity of blood requirements and whose lives are at stake and must be prioritized first so as to help give them hopes for life.

2. Introduction

A blood donation is a process whereby a person voluntarily has blood drawn to be used for future transfusions when in need at hospitals for treatment procedures that require them. Donation may be of whole blood (blood drawn directly from the body) or of specific components of the blood; such as red blood cells, white blood cells, plasma, and platelets. Blood banks often participate in the process of collecting blood and other procedures such as managing stocks, approving blood requests and updating donation information.

The inspiration of this project is to improve blood banks in Chandigarh and to develop a blood bank information system which focuses on making an online system that is accessible for both donors and administrators. Donors can directly receive information regarding their previous blood donations, including their blood results and donation history, in order to easily schedule their next donations. They can also update the personal information through the system, without having to contact the blood bank registry.

The system is also developed for the administrators, who are the main authority in the system. Administrators can add, modify, delete, and query any donation information if necessary. The administrator is also responsible for responding to the hospital's blood requests and checking the stocks in the blood bank's inventory.

3. Problem Statement:

The following problem arises when using a typical blood bank's existing system:

• ***Lost or damaged card (P1):***

A typical membership card can easily get damaged if it is exposed to the sunlight or weather and this causes to ruin the card's barcode which is significantly important for retrieving records. If the card gets lost or stolen, the donor has to make a replacement card to keep their membership at the blood bank.

• ***Donation record accessibility (P2):***

The donor ID card is the only tangible evidence that contains the donor's recent donation records, if the card gets lost, donors may find it difficult to schedule their next appointment since they are not able to see the last time they had donated blood.

• ***Blood result notifications (P3):***

After the process of blood donation, the donor will receive a card that only contains their name and blood type. They will not be notified of their blood result unless they request that information from the blood bank.

• ***Blood stock management (P4):***

Blood banks are required to maintain account of blood bags in the inventory. This increases with each blood donation recorded in our system, and decreases

as they are checked out upon hospital requests. Our system will need to keep the information up-to-date to ensure correctness of the inventory.

• ***Mailing by postal system (P5):***

Blood banks will only mail donors when the donated blood is disqualified, however, this mail is sent through the postal system to the donor's given address. If the donor's address is recorded incorrectly, the mail will be sent to the wrong address and the donor will never be notified that their blood is rejected and given the reason for that.

4. User Requirements:

There are two internal users involved in this system. The user requirements are considered as follows:

Donor:

1. To be able to view their donation records, including where and when they made donations, and the blood results for each, to learn of their donated blood quality and schedule their next donations. (Solving P2, P5)
2. To be notified of the blood results of their previous donation by e-mail, to know the success of their donation. (Solving P3)

Administrator:

1. To be able to create, update, delete, and query donor's records in order to manage donor information.
2. To be able to create, update, delete, and retrieve donation records to manage information about donations made.
3. To be able to deposit donated blood into inventory when donations are made.
4. To be able to withdraw blood from the inventory and keep a record of blood stocks to always keep count of the blood bags.
5. To be able to create, update, delete, and retrieve request records from hospitals to manage hospital requests for blood.
6. To be able to create, update, delete, and query hospital's records in order to manage hospital information.

7. To be able to send e-mails to donors for their user account and blood results through the system.
8. To be able to send e-mail responding to hospitals for their blood requests through the system. (Solving P5)

5. Objectives:

The goal of the project is to develop a web application for blood banks to manage information about their donors and blood stock.
The main objectives of this website development can be defined as follows:

1. To bridge the gap between blood banks, hospitals, volunteer donors and needy people, through this system.
2. To facilitate the search process for needy people and make it easier than before.
3. To reduce the data entry process.
4. To develop a system that provides functions to support donors to view and manage their information conveniently.
5. To maintain records of blood donors, blood donation information and blood stocks in a centralized database system.
6. To inform donors of their blood result after their donation.
7. To support searching, matching and requesting for blood convenient for administrators.
8. To provide a function to send an e-mail directly to the donor for their user account and the hospital, the availability of the blood bag.

6. Scope of the project:

The system functions and features of our system will include the following:

- **Registration:**

  This function allows the donor and administrator to register as a user to interact with the system. The system requires the user to login before viewing and editing any information.

- **View and edit information online:**

  Donors are allowed to view their blood donation records online by their given account. They can also edit their personal information through the system.

- **Data is input by the Administrators:**

  The donor's information and donation records can be sent from the hospital to the administrator by calling or e-mail. The administrator is responsible for keying the received data into the system.

- **Recording donation records:**

  The system is able to record data of whole blood which is sent from the hospital.

- **Manage blood inventory:**

  The system uses a First-In-First-Out stock management, where the blood stock that is checked-in to the system first will be the first one given to the hospital when requested. When the blood stock is expired, the administrator is responsible for removing the stock from the inventory and updating the system.

- **Blood requests:**

  The hospital can request blood via e-mail and by calling to the blood bank. Patients can also request blood online using our website.

- **Notify by E-mail:**

  The donor's account and generated password will be sent via e-mail, following by their blood result of the previous donation sent in a separated e-mail. Hospitals can also receive e-mail responding to their requested blood whether it is available in our stock or not.

7. Cost and Benefit Analysis

Cost Analysis

GoDaddy - Web Hosting (Economy)

- 1 website
- 100 GB storage
- Unmetered bandwidth
- 1 free domain
- Rs 1197/year

Benefits Analysis

1. Users do not have to contact the hospital to know the results of their blood donation. They can view their results through the website by logging-in with their username and password.
2. The reports and information are kept in electronic form and can be easily maintained by the administrators, and donors may access their donation records whenever they want to.
3. The reports of donations are kept in electronic files so that they may last longer and have less chance of being lost or damaged.
4. Administrators of the system can easily manage blood stock and blood withdrawals that have been requested by the hospitals.

8. Methodology

- **Project Identification and Selection**

  In this project, we aimed to develop an online blood bank system which will focus mainly on managing the donor's blood information. Anyone who is interested in blood donation can donate the blood at the hospital or blood donation centres.

- **Project Initiation and Planning**

  To begin the project, we have gathered user requirement of this system and prepare the scope and objective. The results from this phase are scope and limitation, objectives, cost and benefits, feature of the proposed system and user interface design.

- **Analysing System needs**

  We have studied and identified problems of existing system, then we develop data flow diagram for the existing system. We also develop data flow diagram (DFD) and entity relation diagram (E-R diagram) for the proposed system.

- **Designing the Proposed System**

  Based on the analysis phase, we converted E-R diagram into relational database model and created data dictionary and DFD and user interface are designed in this process.

- **Development of the Proposed System**

  In this phase, we are going to convert the design of proposed system to computer software, which includes computer programming using phpMyAdmin as a software tool written in PHP, which is intended to

handle the administration of MySQL, and translating the design specifications into the computer code.

- **Testing the Proposed System**

  This step is the process of testing whether the programming code will work correctly with the conditions in our system or not. In this phase, we will fix bugs in order to produce a system with maximum performance.

- **Implementing the Proposed System**

  We wish to launch this system on the internet, so that donors are able to view their blood donation records online and administrators can create, update, delete, and query records conveniently.

- **Analysis of the Existing System**

  There are two types of process in the existing system: the blood donation process by donors, and the blood request process by patient. In both processes, an administrator is in charge of managing the blood inventory in the blood bank.

9. Logical Design of Proposed System

a. Data Flow Diagram - Level 0

Figure 9.1: Data flow diagram - Level 0

b. Data Flow Diagram – Level 1

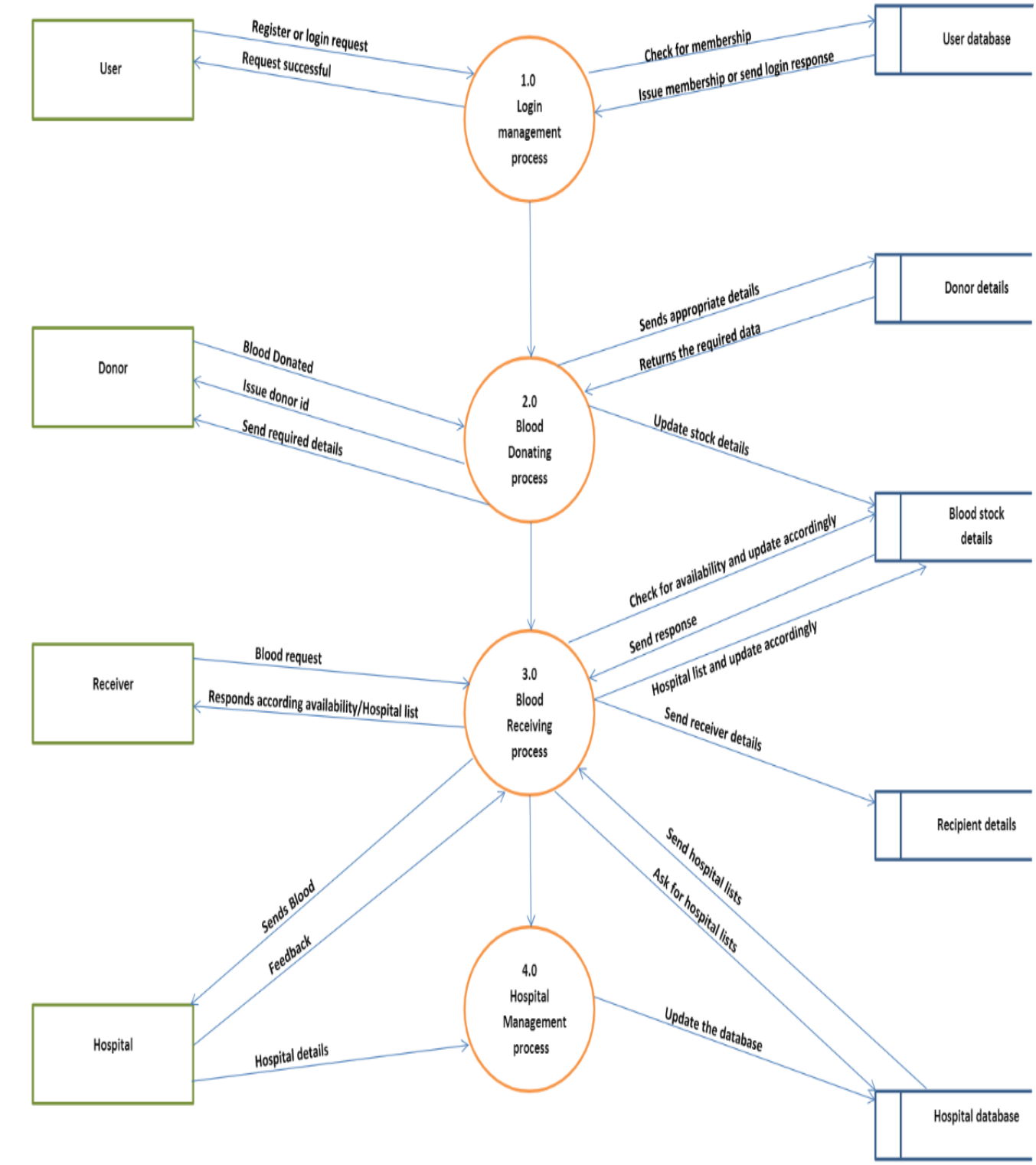

Figure 9.2: Data Flow Diagram – Level 1

c. **Entity Relationship Diagram:**

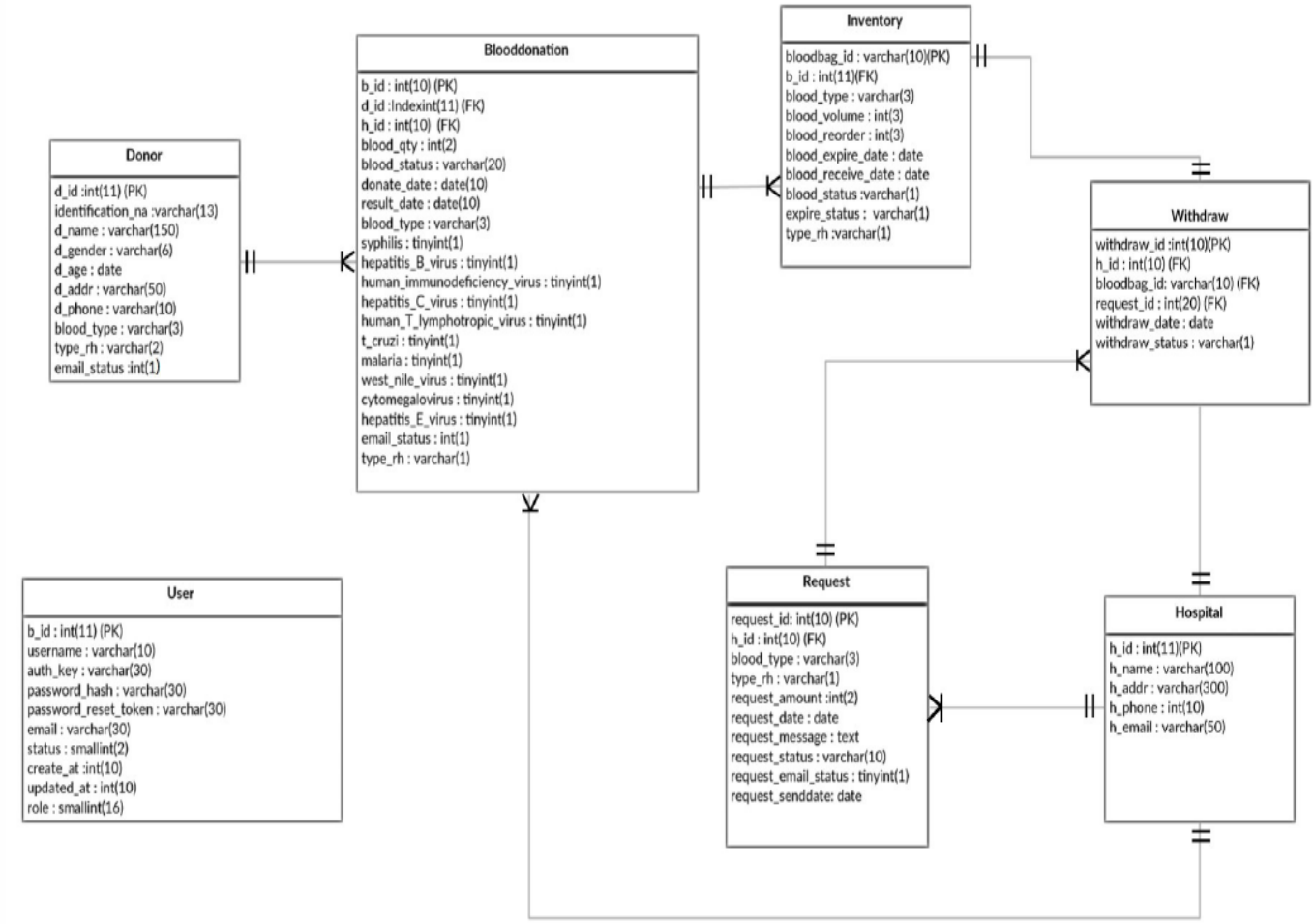

Figure 9.3: Entity Relationship diagram of Blood Bank management system

d. Data Dictionary:

User : Contains general information of a User

Column	***Type***	***Description***	***Example***
user_id(PK)	**INT(11)**	**Unique key to identify each user**	**1**
password_hash	**Varchar(255)**	**generate hash for password**	**13QtBx5UYoH3Fg9S**
username	**Varchar(60)**	**email address that user use for register to system**	**abc@gmail.com**
created_at	**datetime**	**Date and time of new username created**	**01/03/2017 13:05:23**

Table 9.1: Data Dictionary - User

Donor: Contains general information of a Donor

Column	Type	Description	Example
d_id(PK)	Int(11)	Unique key to identify donor	1
d_name	Varchar(50)	Name and username of donor	Alexander washington
d_age	Int(11)	Donor's age	25
d_addr	Varchar(200)	Address od donor	424 trapha bkk 1200025
d_gender	Varchar(6)	Gender of donor	Male,female
d_phone	text	Contact number of donor	9438227836
h_id(FK)	int(10)	Key to identify each hospital	1234985600
blood_type	varchar(3)	Blood type of donor	AB
type_rh	Varchar(10)	Identify special type of blood	Rh positive ,Rh negative

Medical_certificate _submitted	**varbinary(100)**	**Has the donor Submitted his/her medical certificate**	**report.pdf**

Table 9.2: Data Dictionary- Donor

Recipient : contains all the information of patient

Column	Type	Description	Example
p_id(PK)	**Int(11)**	**Unique identity given to the patient**	**55665652354**
p_name	**Varchar(50)**	**Name of the patient**	**Mohit kumar**
p_age	**Int(10)**	**Age of the patient**	**30**
p_contact	**text**	**Contact number of the patient**	**9468127389**
p_addr	**Varchar(50)**	**Address of the patient**	**9, friends market , opp SBI , Chandni chowk, delhi**
p_email	**Varchar(50)**	**Email of the patient**	**xyz@gmail.com**

require_date	**text**	**On which day he requires blood**	**28/05/2020**
req_blood_group	**Varchar(3)**	**Blood group that is required**	**AB**
rh_type	**Varchar(20)**	**Special type of blood required**	**Rh positive ,** **Rh negative**
Emergency_case	**Varchar(5)**	**is this an urgent case**	**'YES' or 'NO'**

Table 9.3: Data Dictionary- Recipient

Hospital: Contains general information of the Hospital

h_id(PK)	**Int(10)**	**Unique key to identify hospital**	**1234985600**
h_name	**Varchar(50)**	**Hospital name**	**Indraprastha Apollo hospital**
h_addr	**Varchar(255)**	**Address of hospital**	**Sarita vihar , Delhi - mathura road , New delhi**
h_phone	**varchar(15)**	**Contact number of hospital**	**029561335-3213**

h_email	**Varchar(50)**	**Contact email to hospital**	**apollohospital@gmail.com**

Table 9.4: Data Dictionary- Hospital

Inventory: Contains the inventory information

Column	Type	Description	Example
bloodbag_id (PK)	**int(11)**	**generate id to identify blood bag**	**1109746001**
h_id(Fk)	**int(10)**	**key to identify hospital**	**1234567890**
blood_type	**Varchar(3)**	**blood type of donor**	**AB**
blood_volume	**int(3)**	**Amount of blood in each bag**	**150 (cc)**
receive_date	**Datetime**	**Date of receive blood**	**28/04/2019**
type_rh	**text**	**Identify special type of blood**	**Rh positive,** **Rh negative**

Table 9.5: Data Dictionary- Inventory

e. Interface Design:

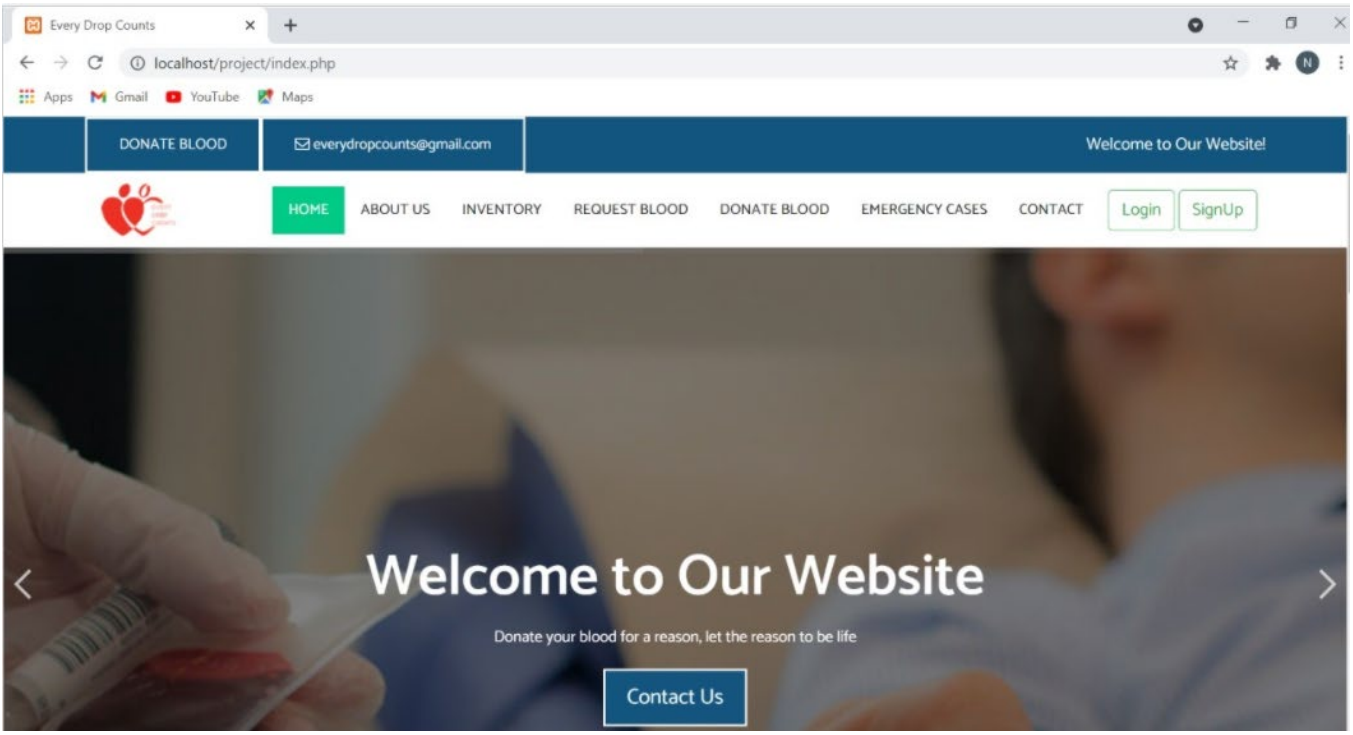

Figure 9.4: Home page view

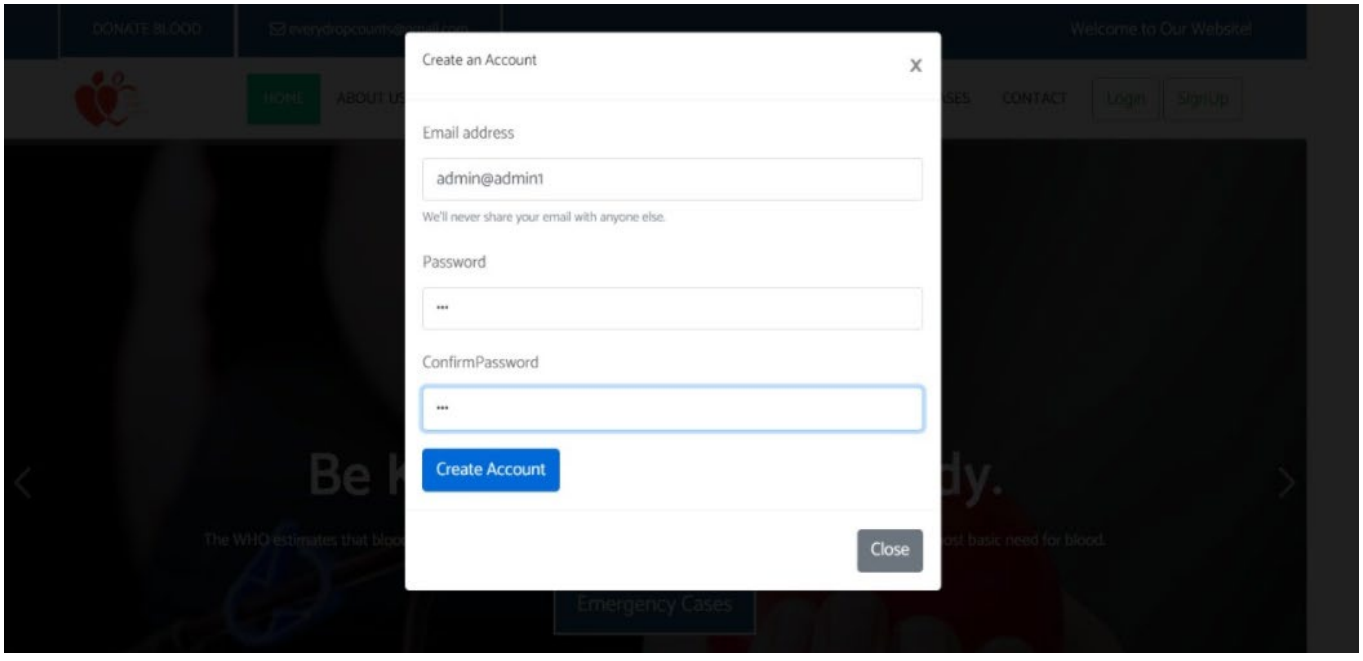

Figure 9.5: Sign-up page view

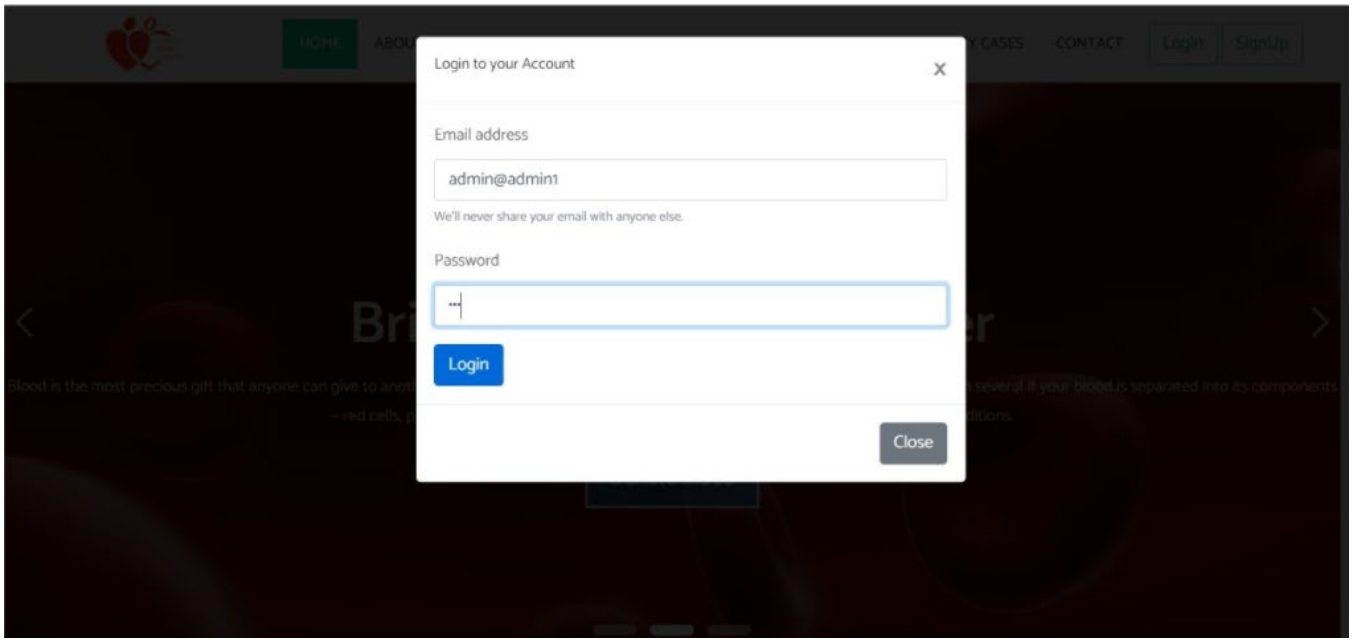

Figure 9.6: Log-in page view

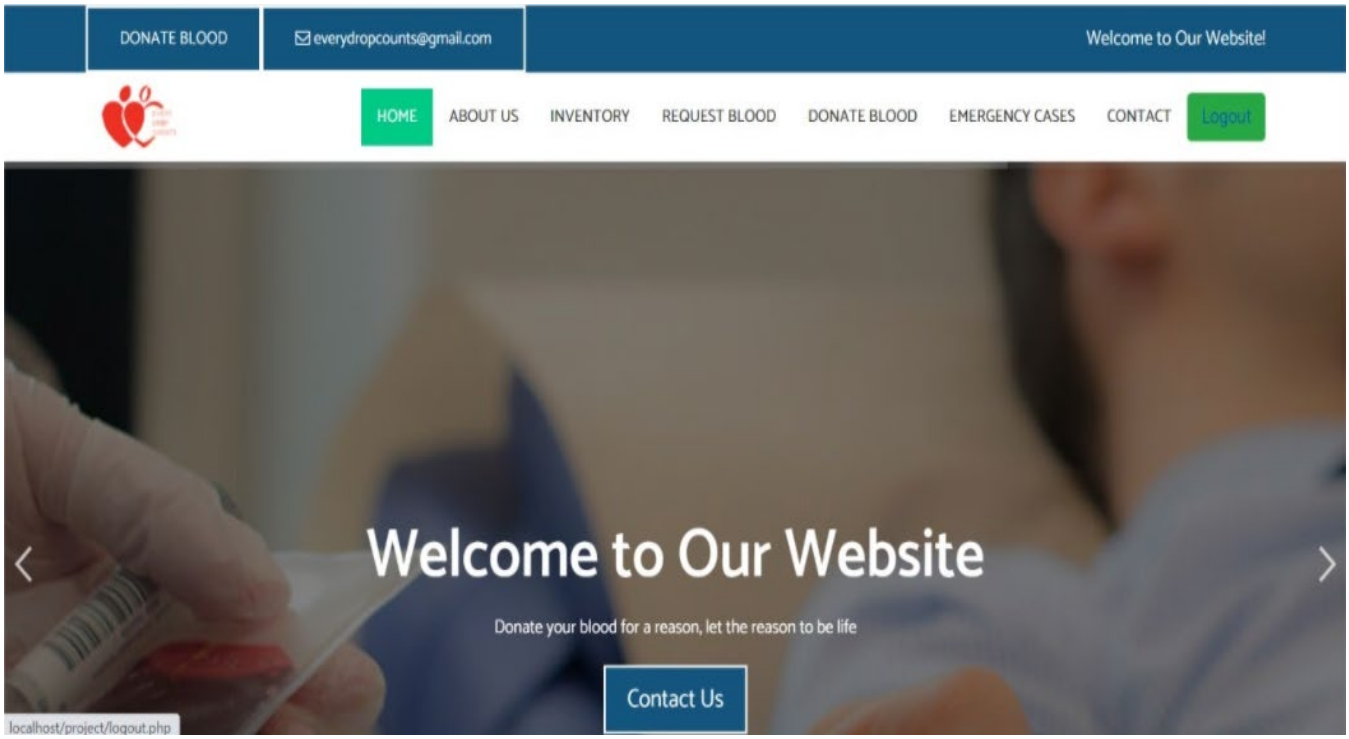

Figure 9.7: Home page view for authorized users

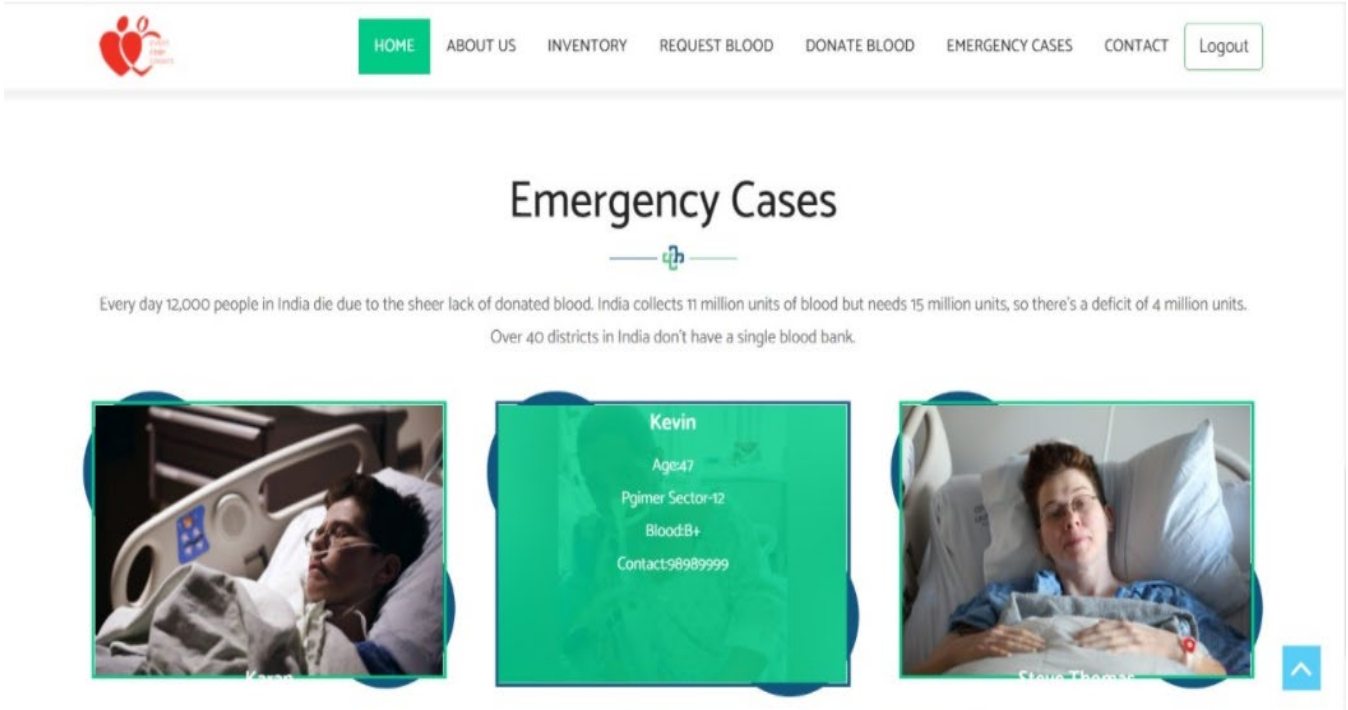

Figure 9.8: view Emergency cases page

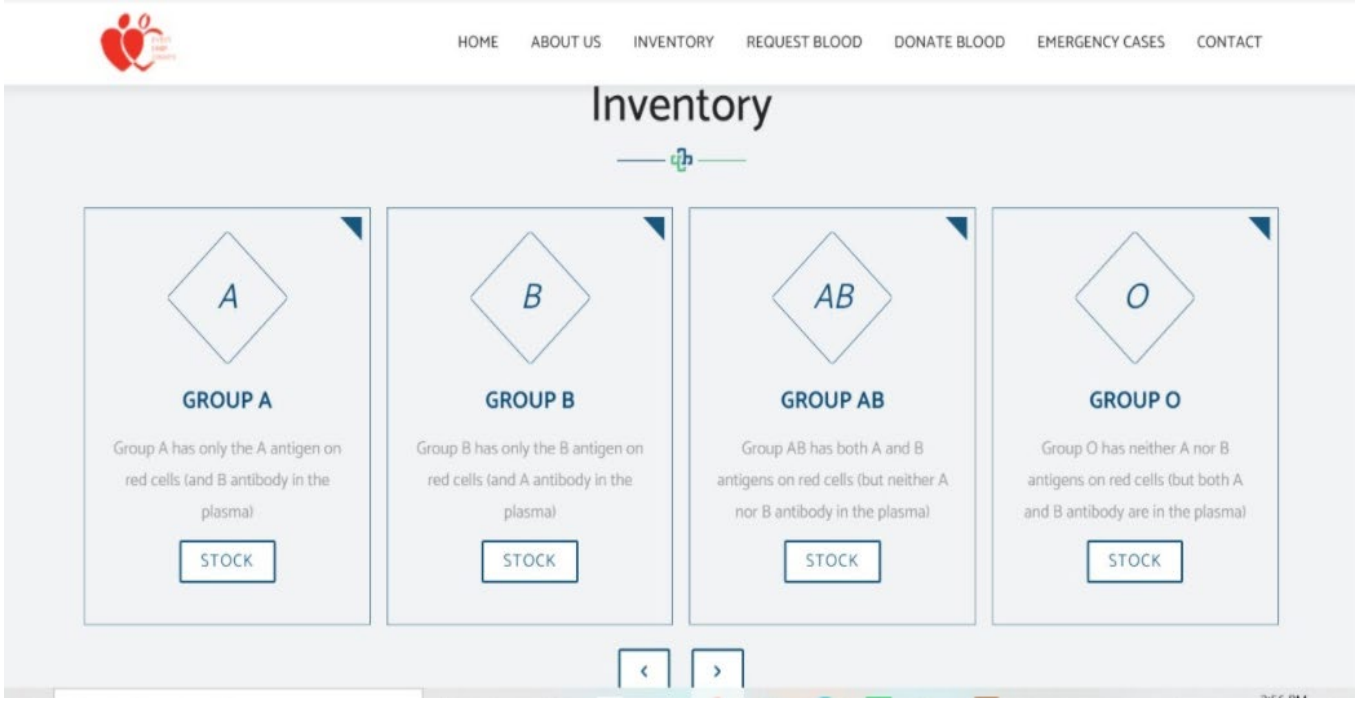

Figure 9.9: view Inventory page (01)

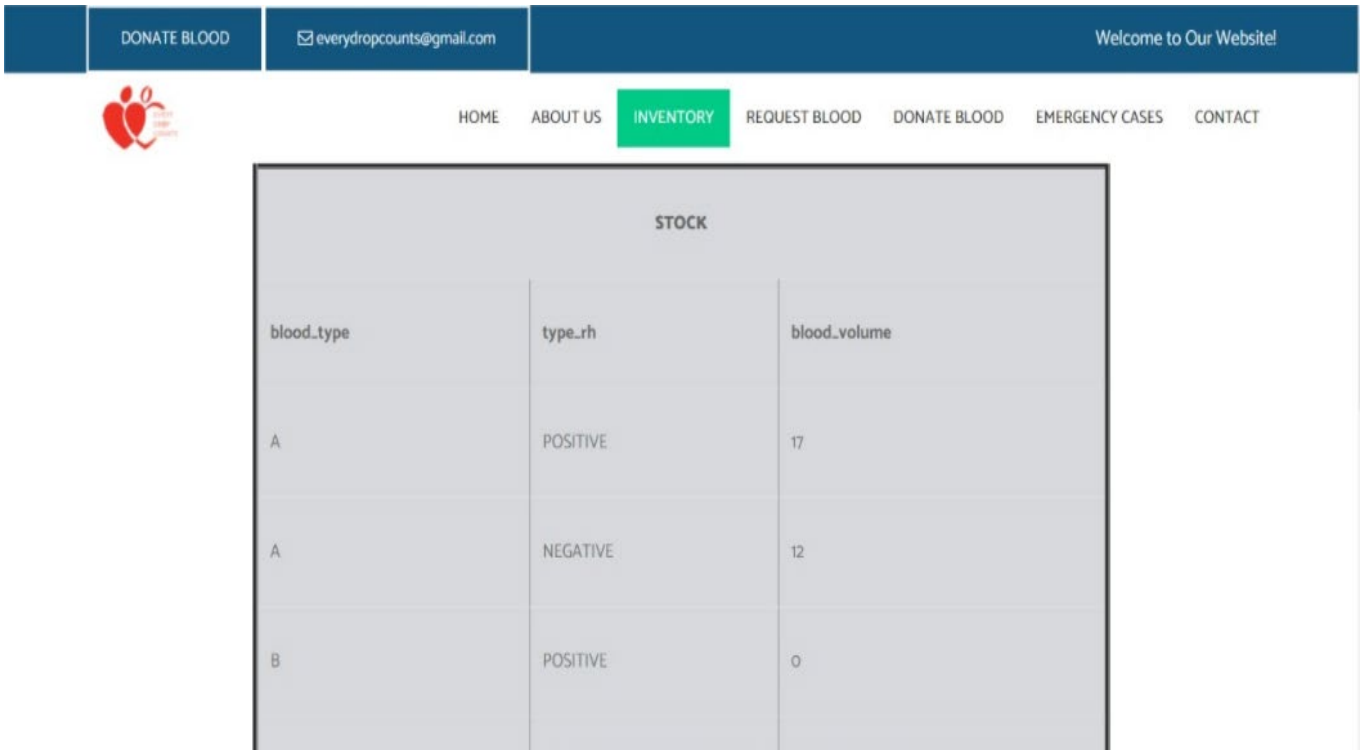

Figure 9.10: view Inventory Page (02)

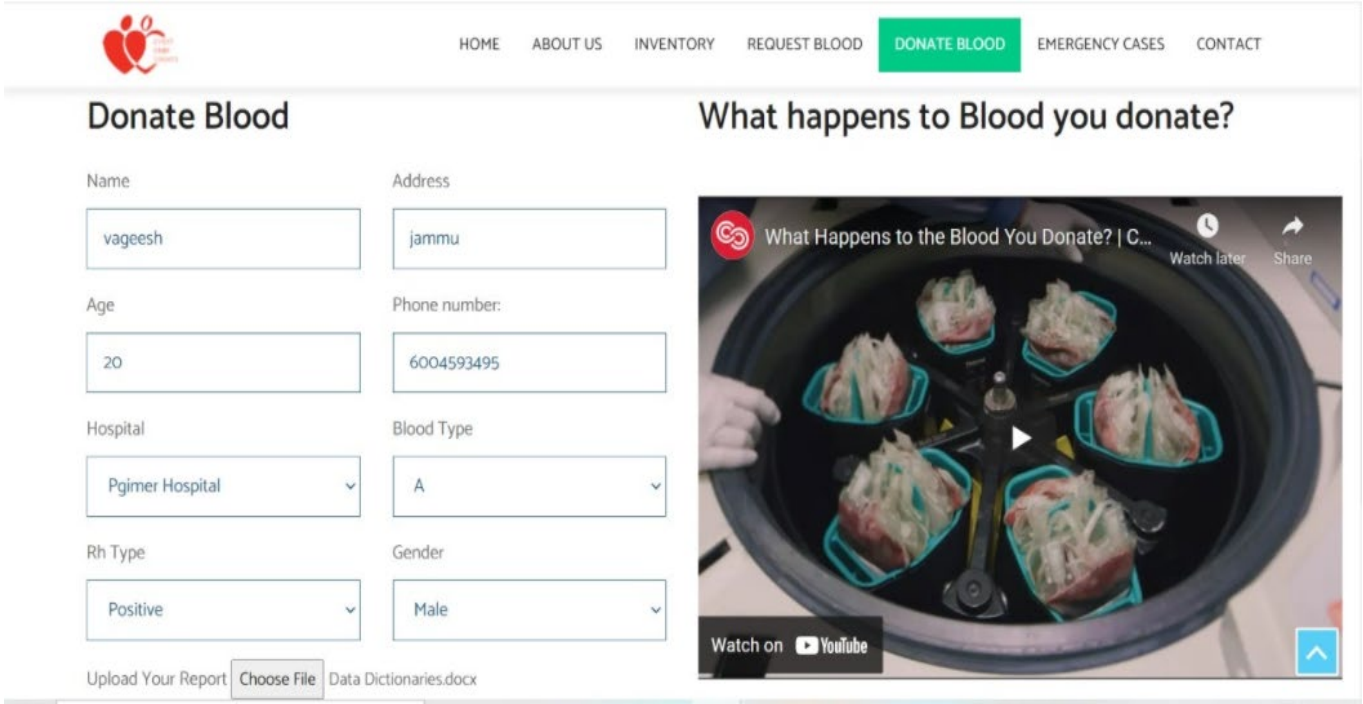

Figure 9.11: view Donate Blood Page

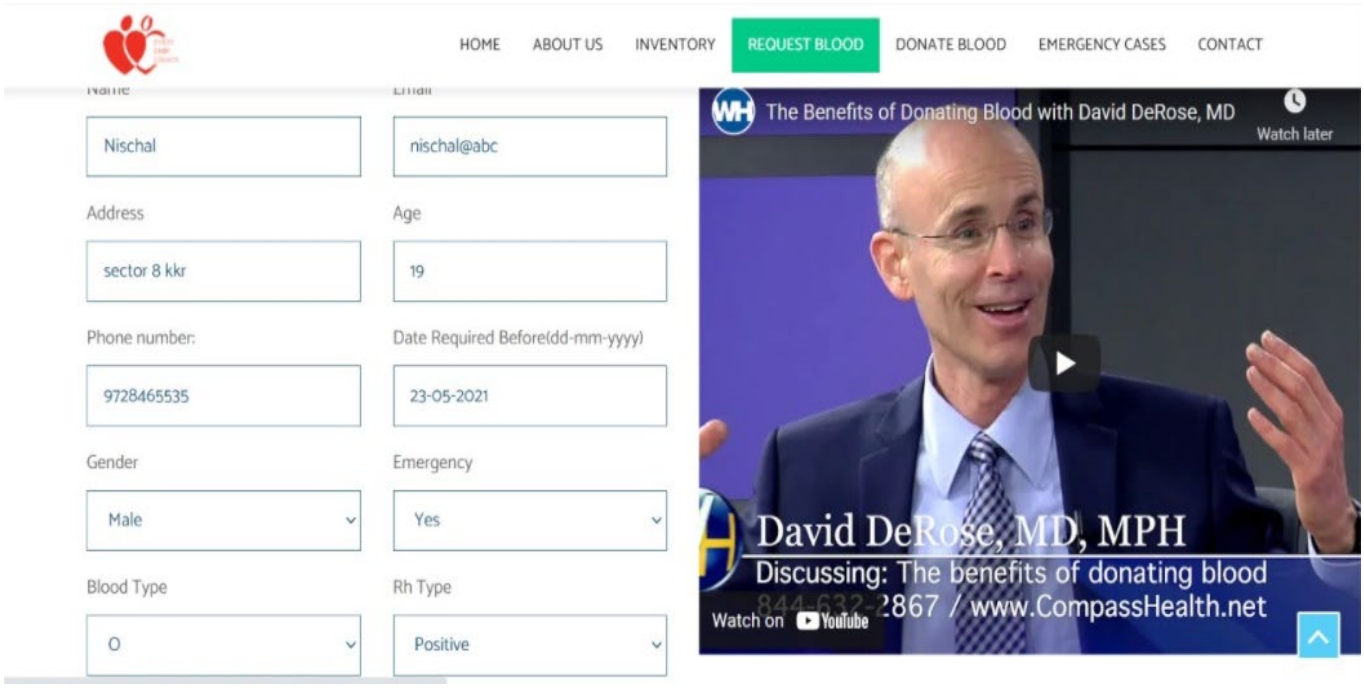

Figure 9.12: view Request Blood Page

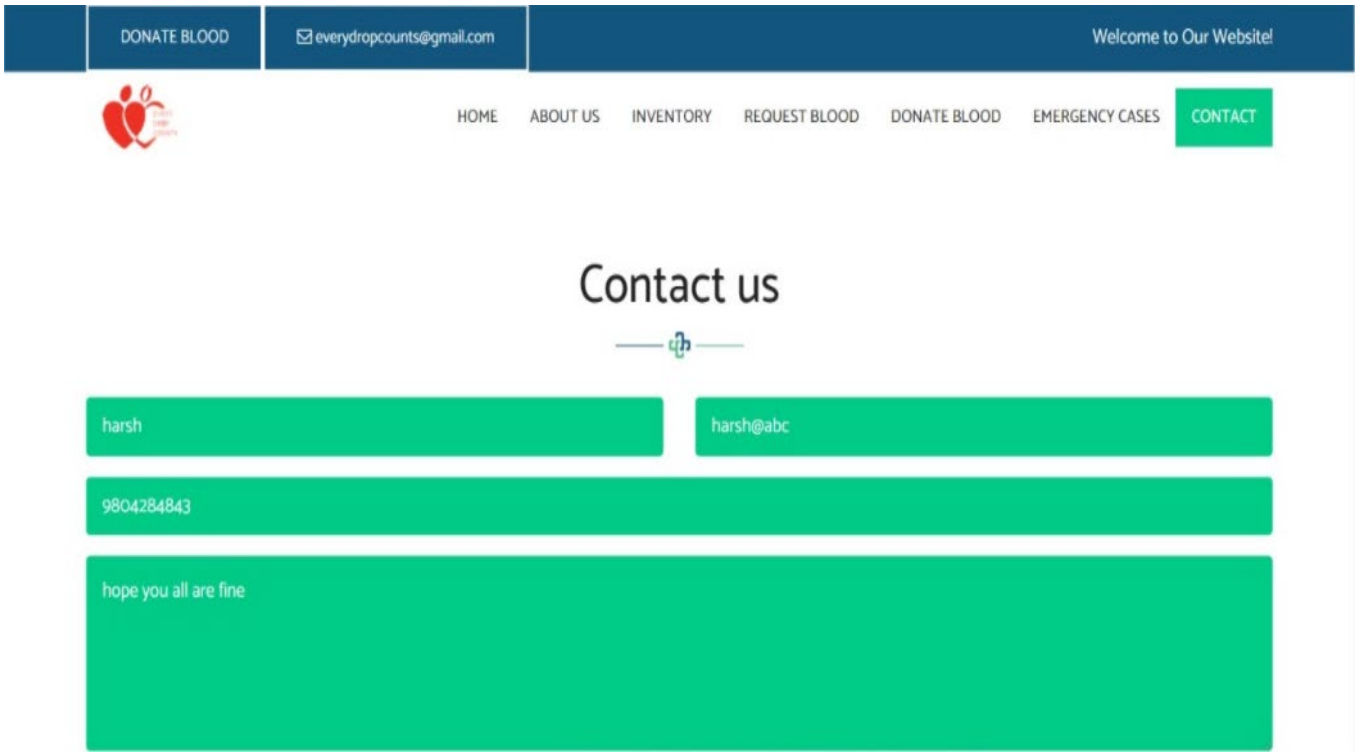

Figure 9.13: view Contact us page

10. Conclusion:

Therefore, we have achieved to tremendously reduce time, complexities and formal procedures relating to blood donation by making every aspect of stages involved in the blood donating process online on our portal which will in turn assist the patients to meet the acute and high priority requirements at our earliest convenience

11. Reference:

- http://www.redcrossblood.org/donating-blood/donation-faqs
- http://www.redcrossblood.org/learn-about-blood/blood-types
- https://en.wikipedia.org/wiki/Blood_type
- https://en.wikipedia.org/wiki/Rh_blood_group_system
- http://www.donateblood.com.au/eligibility/blood-testing-and-safety
- http://www.redcrossblood.org/learn-about-blood/blood-testing