Abstract

Blood is one of the most important elements of human body. Blood can be defined as the fluid we have in our bodies that carries oxygen from the lungs to the rest of the body. It also carries waste to be eliminated from the body. We have between 4 and 6 liters of blood in our adult bodies depending on size. Millions of people need blood every year. There are tens of thousands of pints of blood that are needed every day to help people. Due to deficiency of blood a person can suffer from serious health issue and may even die. Medical science cannot produce blood but with the blessing of medical science blood can be transferred from one person to another. A lot of people's live can be saved if blood donors are easily available.

In case of emergency needs the most important lives saver necessity is Blood. Blood Banks are the main providers of blood who receives blood from various donors, monitors the blood groups database of emergencies makes the available to the hospital whenever needed. The major problem faced by the main blood providers and the need is the availability of donor at right time. We hereby took a step forward to build a system to create a network of people who can help each other in need.

We propose an application where blood seekers can search the reliable blood donors in moment of need. And donor can register themselves to access other donation services like locations of donation centers. The urgent time of a blood requirement, user can quickly check for donor as per requirement matching a particular or related and reach out to them through the App. The proposed system tends to provide list of Donation Centers in user area. A large number of blood donors are attracted using application. Since almost everyone carries a mobile phone with him, it ensures instant connection and communication. In this application seekers can communicate with donor via an SMS or a phone call. The user will get the route to reach the desired location and he/she won't have to ask manually, therefore time can be saved.

Connecting blood donors and needy reduces time which increases the possibility of saving lives and also eliminates the shortage of blood.

CHAPTER 1: Introduction

1.1 Background:

Currently, Blood bank has computerized system to record donor resources and donation information, like name, location, blood group, weight, age, blood quantity per group, donation history and test results of every donation. To distribute blood, Blood Bank sends the blood to the desired place however far it may be. The donor are informed the next date of donation only during the moment of their current donation, thus no distance notification are given to them on future.

This project is aimed to developing an online Blood Donation Information. The entire project has been developed keeping in view of the distributed client server computing technology, in mind. Smart Blood Bank is to act as an important role in saving life of human being and which is also its main aim.

Those this application help blood seeker to select the right donor online instant using details along with the blood group. The archive the main aim of this project, this application is reduce the time to a great extent that is spent in searching for the right donor and the availability of blood required. Thus this application provides the required information in no time and also helps in quicker decision making.

Smart Blood Bank system is developed so that users can view the information about registered blood donors such as name, address, blood group, phone numbers and other such personal information. Through this application any person who is interested in donating the blood can register himself by filling some mandatory personal and medical details. The project also has logical page where the user is required to fill some mandatory details and only then can view the availability of reliable donors and also register to donate blood if he /she wishes to. The system also allows doctor or admin to record and manage the donations. And Admin is the main authority who can do addition, deletion, and modification if required.

The project is about to automate the donation processes where a donor is informed for the donation via an SMS or a call and this can be done anytime , anywhere with anyone in need.

The impact of technology is seen in any field it being used , is our great expectation that the proposed system will motivate more people to donate blood. Since the system connect needy and donor physically, donors will get an actual feeling of saving lives.

Smart Blood Bank will allow user to interconnect with any resources (donors or hospitals) with less effort and less time. Connecting blood donors and needy reduces time which increases the possibility of saving lives and also eliminates the shortage of blood.

For distant seeker who can't get the access of blood bank in the moment of need, Smart Blood Bank will be their best hope.

System's Feature:

User login: This allows only the registered users to login in order to use application.

Donor details: This module helps the donor to insert all the necessary details that are personal information and medical information plus the blood group which together helps to select a donor

Procurer details: The android mobile user can view all the donor details and select the required donor on the basis of the basis of the donor's information.

Front End: android SDK, WEB HTML

Back End: SQL

1.2 Problem Statement:

In present scenario searching for blood donors can take place through blood bank. Due to a shortage of blood banks in the islands, it services are not all the time reliable to users during emergencies especially to those in remote areas. So far it is a time consuming process. Because it is having lots of manual works. It is waste of time to go to Blood Bank and find out particular group is not available and most of the time user has to wait in queue.

Health center are constantly depending on blood bank supply for treatment and expectation .And for some limiting factors that the current system faces , most of the time these facilities may lack the required blood type and to wait for supply from the bank can waste a lot of time. Some time, to get the services seeker use their extra hours to move extra miles toward town to get the services from health centers that have the supply.

Furthermore, in our country blood resources lack in the quantity which is barrier to people lives. This is simply because people are not motivated on donating blood, donors are not donating blood in a specific time interval as suggested by blood bank and also people don't get the clear picture on how their donation involves in a life savings.

In spite of the availability of the potential blood donors not more than 5% of the total Tanzania population donates blood. Advancement in medical science has increased the blood demand. Also blood-donors usually don't come to know about the need for blood. These reasons motivate us to develop a more efficient system that will assist the present blood donation system.

There are some people who are willing to help during the moment of need, but they often don't find the chance to. Since in order to become a donor in the current system is long and boring process to many people, many of them don't feel their effort in donating blood.

1.3 Problems Solution and Scope:

The Scope of the project is that in a very short span it provides user with many facilities. It provides an elegant management of blood, list of hospitals and reliable donor. We want to build a network of people who can help each other during an emergency

The main purpose of this project is to interconnect hospital, donors and needy into a single network , which do validation and store various data and information of blood and health of each individual.

This system is aimed to store data over centralize server consisting of database where the individual's information cannot be accessed by a third party.

The Mobility provided by android based system which is accessible on mobile through application are available on the go.

Thus the system will:

- ✓ Enable any individual legitimate to be a blood donor to donate blood during the moment of need. This will reduced the complexity of registration thus more donor will be interested. This will increase reliability of blood bank services both during emergencies and at distance locations.

- ✓ Allow user to ask for blood from reliable donors via an SMS.
- ✓ Will gives chance to those who are willing to help during the moment of need. Donor may be motivated by physically involving in saving patients life, thus increasing motivation.
- ✓ Automatically send notification to the donor when the time for the next donation is approaching. Furthermore, when blood bank run short of certain blood type, the application can find several donors to refresh the supply.
- ✓ Disseminate important information about blood donation and how individuals can cooperate in saving other's lives. Policies based on facts and findings that can be reviewed and commented over by global users. This will not only help to increase the rate of spread of information on the important of donating blood but also create continuous connection between blood bank and future donors. As a result, number of donors may increase with not much effort.

The vision here is to encourage medical treatment on saving life in many situations and places. And this can best done by virtually connecting all actors including donor and blood seeker 24/7 around the island. The feeling that everybody gets blood based treatment anywhere, anytime with the push of few buttons.

1.4 Objectives:

Our objective is to build both web and mobile application which will create a huge blood donation community, who will be able to receive and donate blood in the fastest way possible. We want that no Tanzania will suffer from lacking of blood. No matter how rare the blood group is a needy person will always get a match of his or her blood group. The donor and receiver can find each other via the mobile application and the nearest donor with the most similar features will be marked as best match.

The main purpose of this project is to interconnect all the blood banks, hospital, donors into a single network, validation, store various data and information of blood and health of each individual.

The objectives of this project are:

- ✓ To create user database by using my SQL so that the user's information can be accessed through internet.
- ✓ To create graphical design of the proposed system
- ✓ Building web application that can be integrated with the system architecture.
- ✓ Building android application using Android Studio that can be integrated with the system architecture.

1.5 Literature Review:

The main purpose of our project is to build a Blood Donation Application that is user friendly and has the intelligence to find the best matches of blood donors by analyzing the nearby donor's profile. We believe that our Blood Donation Application will bring the donors and receivers so close that blood donation will no longer be a matter of risk and worries. At the beginning of the project we have researched on some secondary resources based on this.

From these sources, we have been able to know the existing functions and determined our work outline.

T.Hilda Jenipha and R.Backiyalakshmi, made a cloud based blood donation app and we get to know about this from their paper "Android Blood Donor Life Saving Application in Cloud Computing". Where the contact details will appear in alphabetical order on the screen. In case of urgent blood requirement, one can quickly check for contacts matching a particular or related blood group and reach out to them via Phone Call/SMS through the Blood donor App. Their Blood Donor App provides list of donors in your city/area. According to them, Cloud- based services can prove important in emergency blood delivery since they can enable central and immediate access to donors' data and location from anywhere. Since almost everyone carries a mobile phone with them, it ensures instant location tracking. The location-based app, operational on android platform, will help users easily find donors of matching blood groups in their location and can be accessed via their mobile numbers.

Android Blood Bank shows the details of application which updates the information of donors where admin accesses every information of blood bank management system. This app gives the list of the blood banks depends on the user's location. Optimization of Blood Donor Information and Management System, they provide an efficient blood donor information and management system based on GPS integrated in android application. The service provided by the system is valuable to health sector where the blood is considered for the safety of the patient.

1. 6 Feasibility study report:

Preliminary investigation examine project feasibility, the likelihood the system will be useful to the organization. The main objective of the feasibility study is to test the Technical, Operational and Economical feasibility for adding new modules and debugging old running system. All system is feasible if they are unlimited resources and infinite time. There are aspects in the feasibility study portion of the preliminary investigation:

- ✓ Technical Feasibility
- ✓ Operational Feasibility
- ✓ Economic Feasibility

Technical feasibility:

The technical issue usually raised during the feasibility stage of the investigation includes the following:

- ✓ Does the necessary technology exist to do what is suggested?
- ✓ Do the proposed equipments have the technical capacity to hold the data required to use the new system?
- ✓ Will the proposed system provide adequate response to inquiries, regardless of the number or location of users?
- ✓ Can the system be upgraded if developed?
- ✓ Are there technical guarantees of accuracy, reliability, ease of access and data security?

Earlier no system existed to cater to the needs of 'Reliable Donation Services'. Since the current system developed is technically feasible, and the proposed system is to automate some aspect of previous system. It is both web and Android based user interface for audit workflow at Blood Bank. Thus it provides an easy access to the users.

- ✓ The software and hard requirements for the development of this project are not many and are already available in-house at Blood Bank or are available as free as open source. The work for the project is done with the current equipment and existing software technology.
- ✓ The database's purpose is to create, establish and maintain a workflow among various entities in order to facilitate all concerned users in their various capacities or roles. Permission to the users would be granted based on the roles specified.

- ✓ Therefore, it provides the technical guarantee of accuracy, reliability and security.

Operational feasibility:

Proposed projects are beneficial only if they can be turned out into information system. That will meet the organization's operating requirements. Operational feasibility aspects of the project are to be taken as an important part of the project implementation. Some of the important issues raised are to test the operational feasibility of a project includes the following: -

- ✓ Is there sufficient support for the management from the users?
- ✓ Will the system be used and work properly if it is being developed and implemented?
- ✓ Will there be any resistance from the user that will undermine the possible application benefits?

This system is targeted to be in accordance with the above-mentioned issues. Beforehand, the management issues and user requirements have been taken into consideration.

- ✓ So there is no question of resistance from the users that can undermine the possible application benefits.
- ✓ The well-planned design would ensure the optimal utilization of the computer resources and would help in the improvement of performance and reliability to users. It is clear that the system will work properly if developed and implemented.

Economic feasibility:

A system can be developed technically and that will be used if installed must still be a good investment for the organization. In the economic feasibility, the development cost in creating the system is evaluated against the ultimate benefit derived from the new systems. Financial benefits must equal or exceed the costs.

- ✓ The system is economically feasible. It does not require any addition hardware or software. Since the interface for this system is developed using the existing resources and technologies available at Blood Bank, There is nominal expenditure and economical feasibility for certain.
- ✓ Based on number of automation the propose system will offer, its profit outweighs the cost it needs to becomes fully functional.

CHAPTER 2: methodology

2.1 Software development approach:

Object oriented approach best suits for our project's scope because:

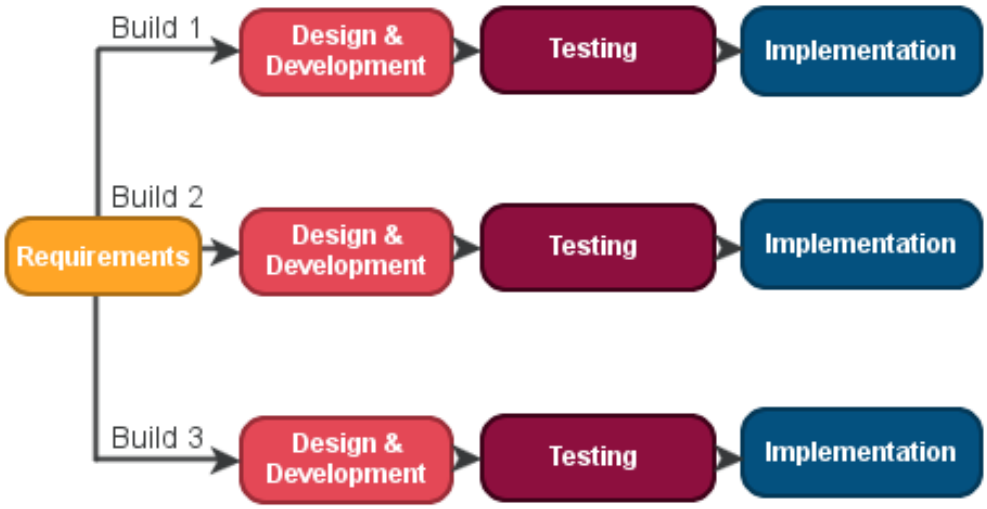
- ✓ This approach defined the project as a set of components. Then these components can be analyzed and ordered so that the most difficult components are implemented first. Addressing hard problem as early as possible allows the expended .This reduce project risk.
- ✓ Also this approach allows us not worry about having too many details, instead more detailed planning is for current and subsequent iterations.
- ✓ OOAD is friendly to change in scope and requirements, thus gives a wide ground for changes.

2.2 Software development life cycles model (SDLC)

An **iterative life cycle model** does not start with a full specification of requirements. In this model, the development begins by specifying and implementing just part of the software, which is then reviewed in order to identify further requirements. Moreover, in iterative model, the iterative process starts with a simple implementation of a small set of the software requirements, which iteratively enhances the evolving versions until the complete system is implemented and ready to be deployed. Each release of Iterative Model is developed in a specific and fixed time period, which is called iteration.

Advantage of using Iterative model:

- ✓ Some working functionality can be developed and early in the software development life cycle (SDLC).
- ✓ It is easily adaptable to the ever changing needs of the project as well as the client
- ✓ It is more cost effective to change the scope or requirements in Iterative model.
- ✓ Risks are identified and resolved during iteration; and each iteration is an easily managed.
- ✓ Parallel development can be planned.
- ✓ Testing and debugging during smaller iteration is easy.



2.3 System Architecture

The system architecture explains how this Smart Blood System works.

If Needy asks for Donor for his/her need. The system send a request to the Database to check the availability of Donor according to the Patient's required Blood Group and location. Then the system replies to the patient with donor list around his or province. Also donor, admin and doctor can access system's feature and send different transaction to the server.

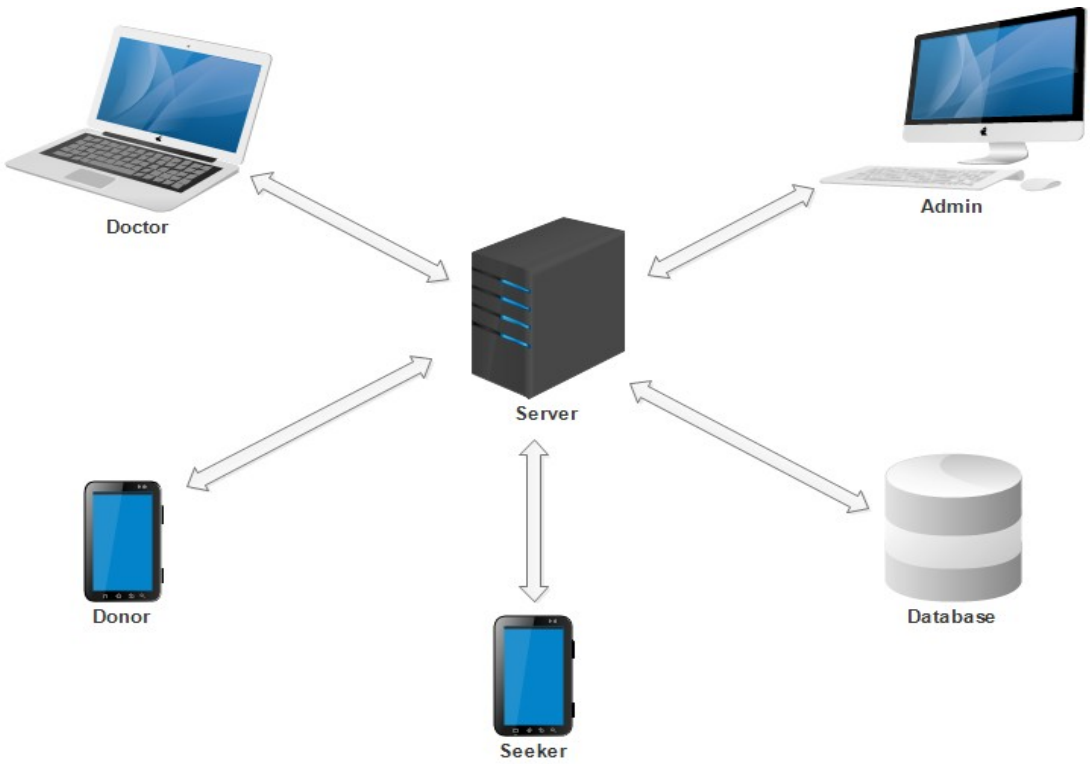


Figure 1: System Architecture

2.4 Software development tools:

- Operating system : Windows (10, 7) OS
- Platform:JDK8, android 4.3, 4.1
- Language :Java, XML, PHP, SQL, JavaScript and HTML
- MySQL database
- Android studio v3.3
- REST API
- Android development tool(JDT)

CHAPTER 3: Requirements Analysis and Modeling

3.1 Requirements Determination

3.1.1 Information gathering techniques:

Interviewing, as will be seen in interview report, clients suggest there is very high demand to automate some activities of their current system.

- ✓ Lack of reliability of the services, sloppy, boring and time consuming processes, are among the common claims to current system.
- ✓ It is not hard to find donors but to find donors who are willing to help

Reading documentation of current system:

- ✓ To know their policy, goal and vision.
- ✓ To be aware of their challenges and yet monitored plan to handles them.

Observing users and their interaction with blood bank:

- ✓ By looking the interaction between the client and employees.
- ✓ How bank managements handles employees, actions and decisions.

3.1.2 Functional requirements:

System must:

- ✓ Allow user to register in order to gain membership in it
- ✓ Allow user to login according to their user-type (admin, doctor, donor, seeker)
- ✓ Notify donor via SMS where needed.
- ✓ Allow donor to confirm the requested donation.
- ✓ Allow blood seeker to ask for the blood.
- ✓ Allow seeker to search for donors based on location and blood type.
- ✓ Allow blood seeker to view donor list and select the desired blood donor and the make a call or send an SMS.
- ✓ Allow health centers to record the issued donation
- ✓ Allow blood bank to ask reliable donor to refresh the blood supply.
- ✓ Broadcast policies and motivation to global users.
- ✓ Send an invoice to blood seeker and health center on their request to the system

3.1.2 Nonfunctional requirement

- ✓ The system should be reliable within 24/7.

- ✓ The user who is already registered to the system and its profile related information is stored and maintained for the further validation and verification of the users.
- ✓ The access permissions for system data may only be changed by the system's administrator.
- ✓ System shall be able to process a notification in 3 second or less
- ✓ The system should only notify donor that have at least 3 months since last donation.
- ✓ 3 wrong login attempts will gives users an alternative to changes their login details through security question.

3.2 Requirement Structuring

3.2.1 Process Modeling:

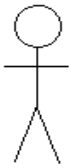
Process design involves the activity of determining the workflow, equipment needs, and implementation requirement for the project. Typically there is number of tools involved that has been used to design the process. In the proposed system the design used was objected oriented where use case, class diagram and sequence diagrams have been used.

3.2.1.1 Use Case Diagrams:

Use case Diagrams represent the functionality of the system from a user's point of view. Use cases are used during requirements elicitation and analysis to represent the functionality of the system. Use cases focus on the behavior of the system from external point of view. **Actors** are external entities that interact with the system. Examples of actors include users like administrator, blood donor, doctor …etc., or another system like central database.

USE CASE: shows processes within the system.

DATA FLOW: shows the relationships between an actor and the use cases.



ACTOR: is the one who interact with the system

For the proposed system four actors will be shown and their process within the system. The process will be shown from donor, blood seeker, doctor and admin.

Use case For Admin Module

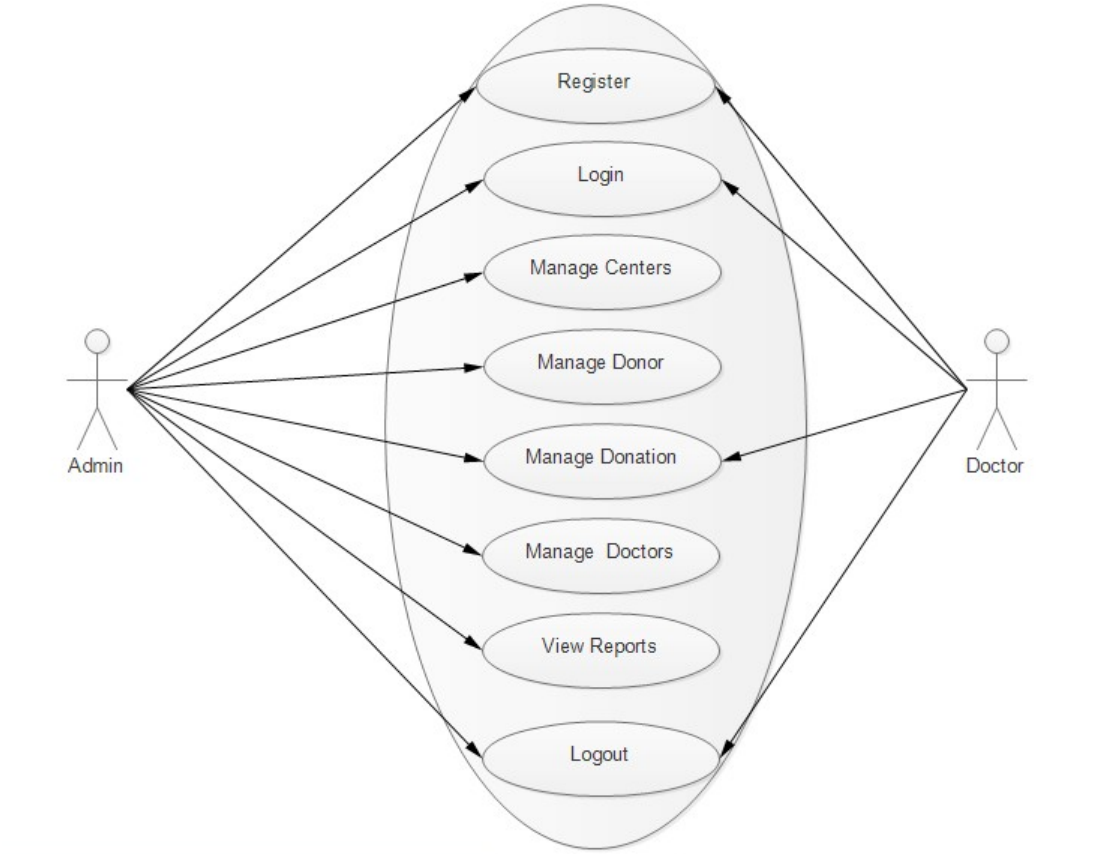


Figure 2: Admin and Doctor Use Case diagram

Donor Use Case Diagram

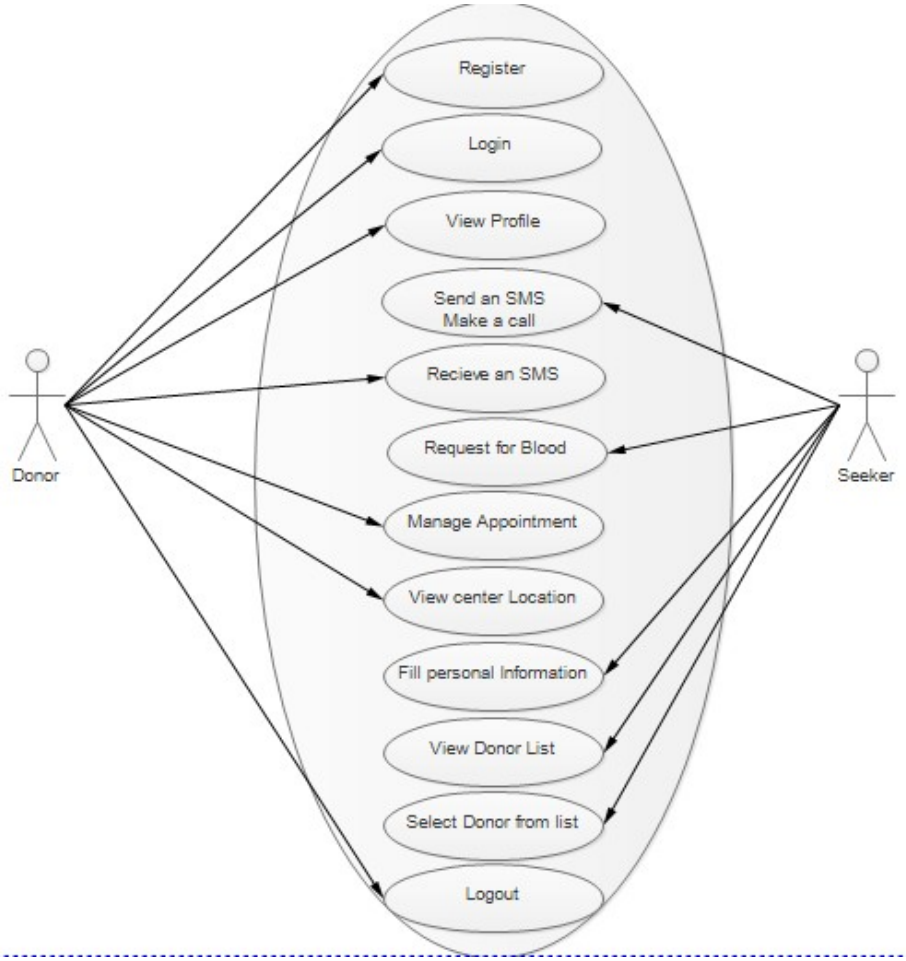


Figure 3: Donor and Seeker Use Case

3.2.1 Data Modeling:

3.2.2.1 Class diagram

A class diagram in the Unified Modeling Language is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

The following class diagram shows the illustration of the relationships and source code dependencies among classes in the Unified Modeling Language (UML).

A UML class diagram is made up of:

- ✓ A set of classes and
- ✓ A set of relationships between classes

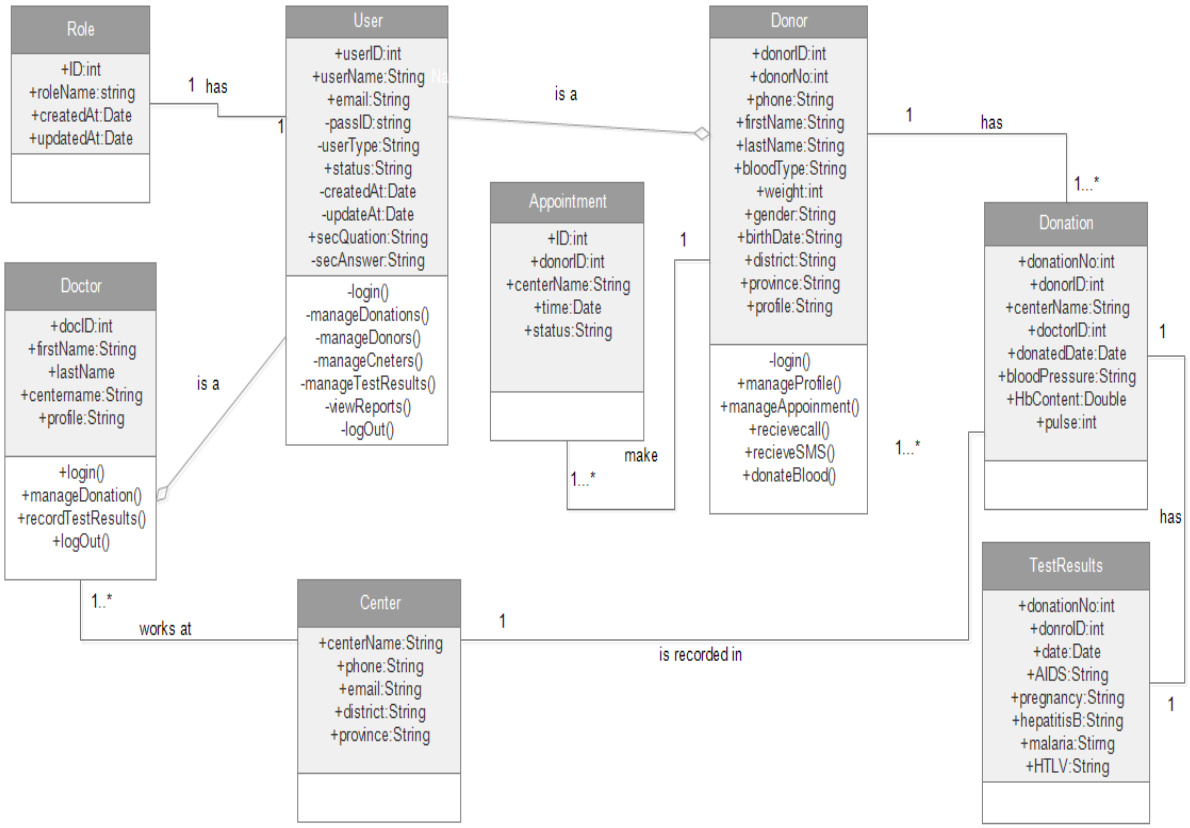


Figure 4: Class Diagram

3.2.2.2 Entity relationship diagram

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties.

By defining the entities, their attributes, and showing the relationships between them, an ER diagram illustrates the logical structure of databases. ER diagrams are used to sketch out the design of a database.

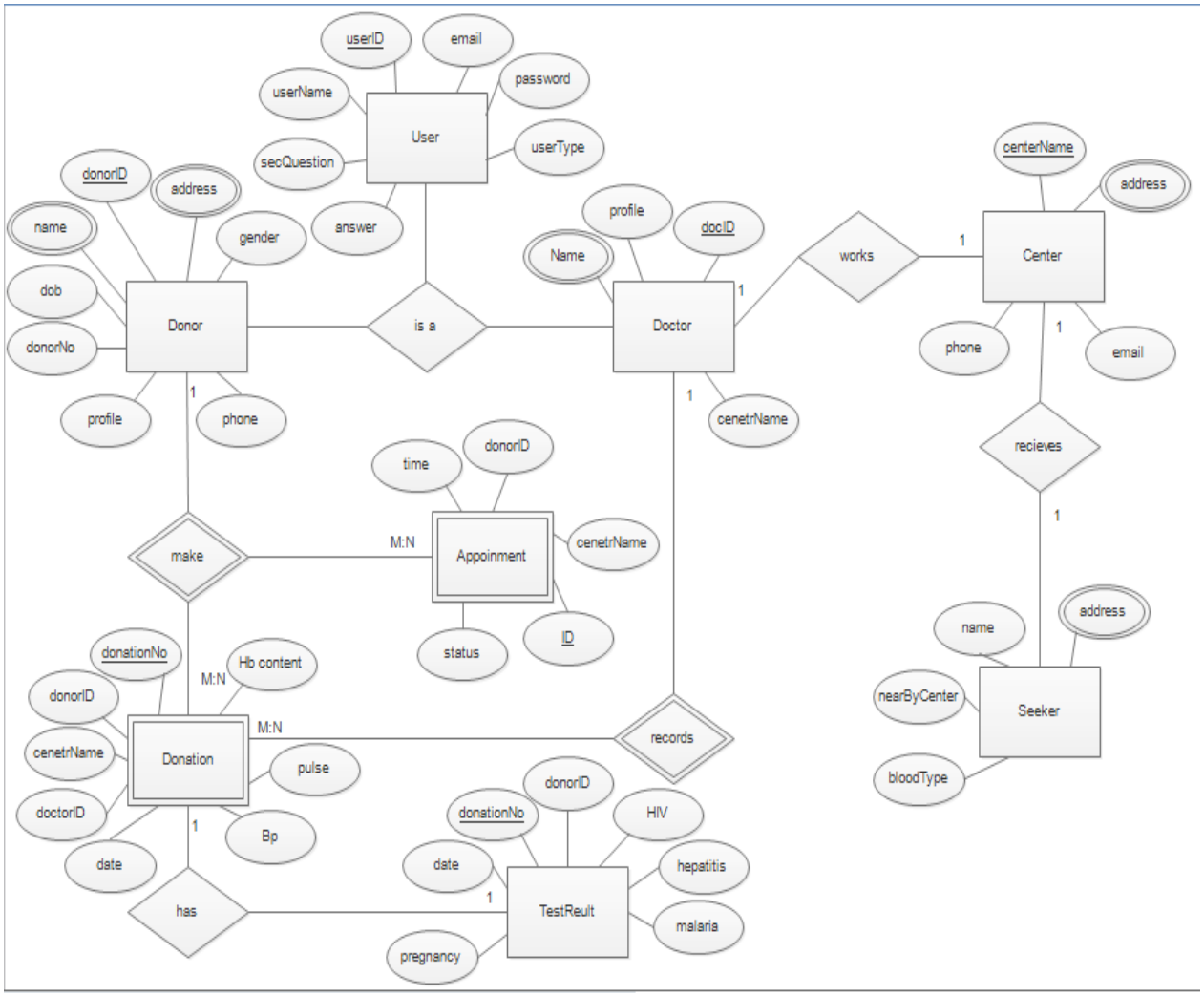


Figure 5: Entity Relationship Diagram (ERD)

CHAPTER 4: System Design

4.1. Architectural design

4.2. Database Design

4.2.1. Relational Model

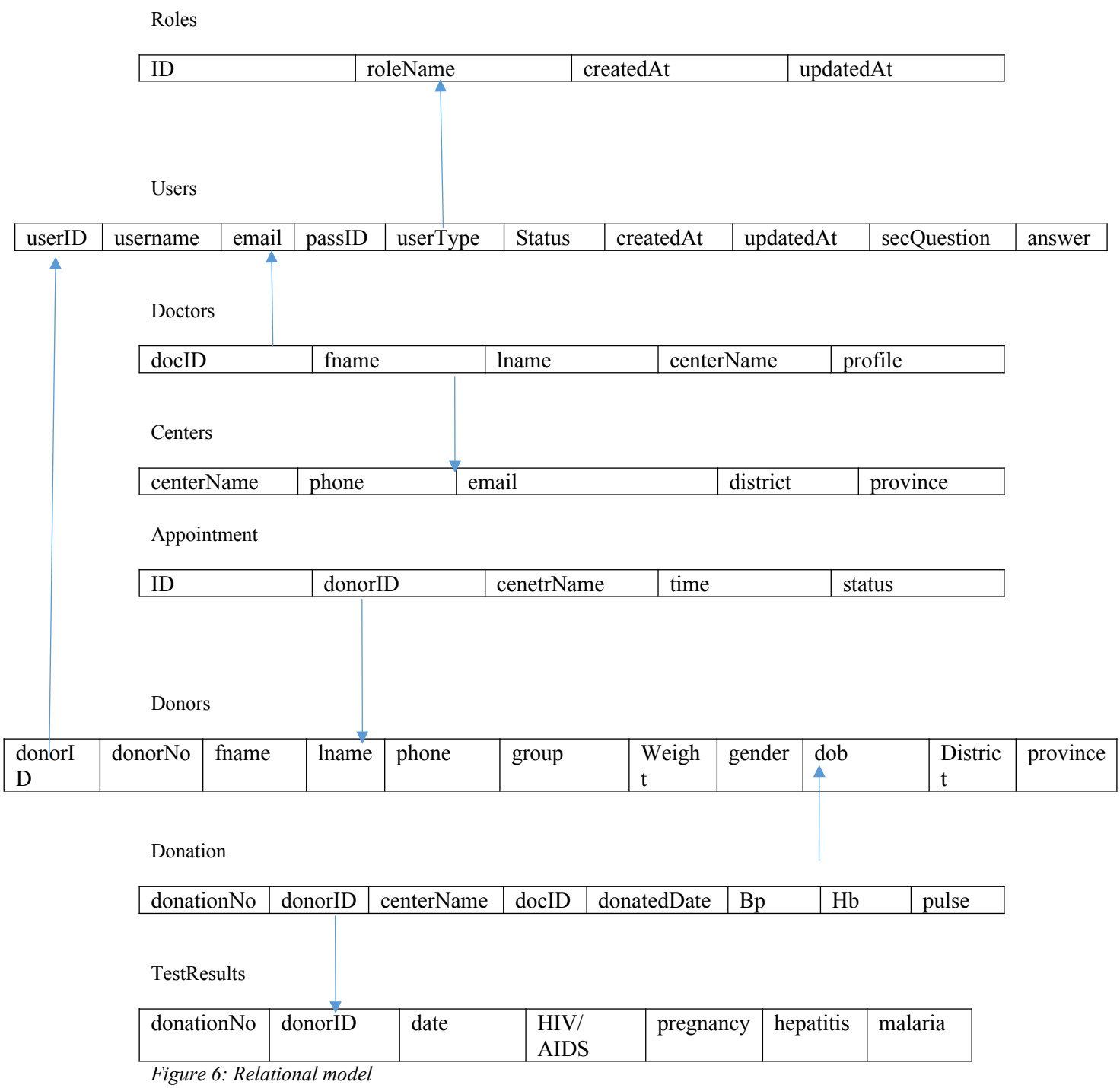


Figure 6: Relational model

4.2.2. Data Description

4.2.3. Data Dictionaries

A Data dictionary provides detailed information about the business data, such as standard definitions of data elements, their meanings, and allowable values. Data Dictionary will provide more detail about each attribute of a business concept.

users

Column	Type	Null	Default	Links to
userID *(Primary)*	int(11)	No		
userName	varchar(255)	No		
email	varchar(255)	No		
passID	varchar(255)	No		
utype	int(1)	No		roles -> id
status	varchar(10)	No		
createdAt	timestamp	Yes	*NULL*	
updatedAt	timestamp	Yes	*NULL*	
secQuestion	varchar(250)	No	Who is your favourite aunt?	
secAnswer	varchar(250)	No		

donors

Column	Type	Null	Default	Links to
donorID *(Primary)*	int(11)	No		users -> userID
donorNo	int(11)	No		
fname	varchar(50)	No		
lname	varchar(50)	No		
phone	varchar(20)	No		
bloodType	varchar(3)	No		
weight	int(3)	No		
gender	varchar(6)	No		
birthDate	date	No		
district	varchar(100)	No		
province	varchar(100)	No		
profile	varchar(250)	No		

doctor

Column	Type	Null	Default	Links to
docID *(Primary)*	int(11)	No		users -> userID
fname	varchar(30)	No		
lname	varchar(30)	No		
centerName	varchar(30)	No		center -> centerName
profile	varchar(30)	No		

donation

Column	Type	Null	Default	Links to
donationNo *(Primary)*	int(11)	No		
donorID	int(11)	No		donors -> donorID
centerName	varchar(30)	No		center -> centerName
docID	int(11)	No		
donatedDate	date	No		
bloodPressure	varchar(7)	No		
haemContent	varchar(7)	No		
pulse	varchar(7)	No		

roles

Column	Type	Null	Default	Links to
id *(Primary)*	int(1)	No		
roleName	varchar(30)	No		
createdAt	timestamp	No	CURRENT_TIMESTAMP	
updatedAt	timestamp	No	0000-00-00 00:00:00	

testresults

Column	Type	Null	Default	Links to
bagNo *(Primary)*	int(11)	No		donation -> donationNo
donorID	int(11)	No		
date	date	No		
HIV/AIDS	varchar(8)	No		
pregnancy	varchar(8)	No		
hepatitis B/C	varchar(8)	No		
HTLV	varchar(8)	No		
maliria	varchar(8)	No		

center

Column	Type	Null	Default	Links to
centerName *(Primary)*	varchar(30)	No		
phone	varchar(20)	No		
phone2	varchar(20)	No		
district	varchar(100)	No		
province	varchar(30)	No		

appointment

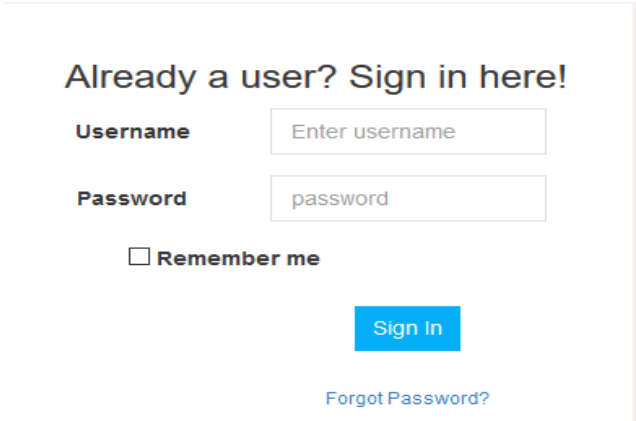
Column	Type	Null	Default	Links to
ID *(Primary)*	int(11)	No		
donorID	int(11)	No		donors -> donorID
cneterName	varchar(30)	No		center -> centerName
time	date	No		
status	varchar(20)	No		

4.3. User Interface Design

4.3.1. Forms and Reports

Web Login Form

This page will enable user to login by using valid Username and password.



Android Login Form

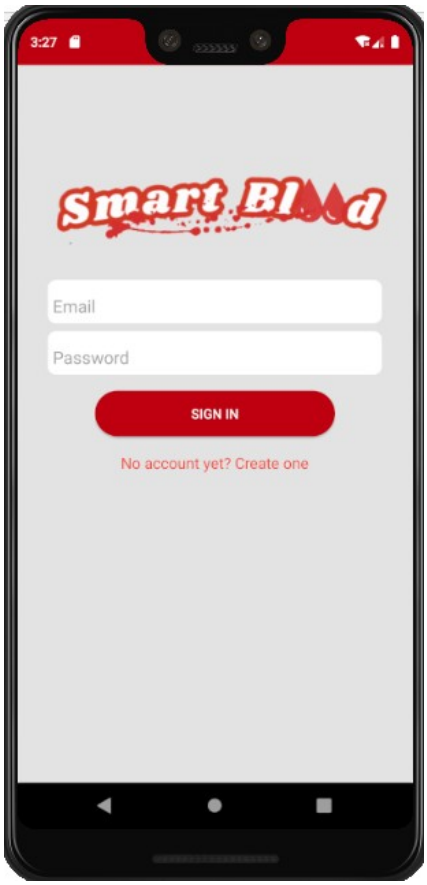
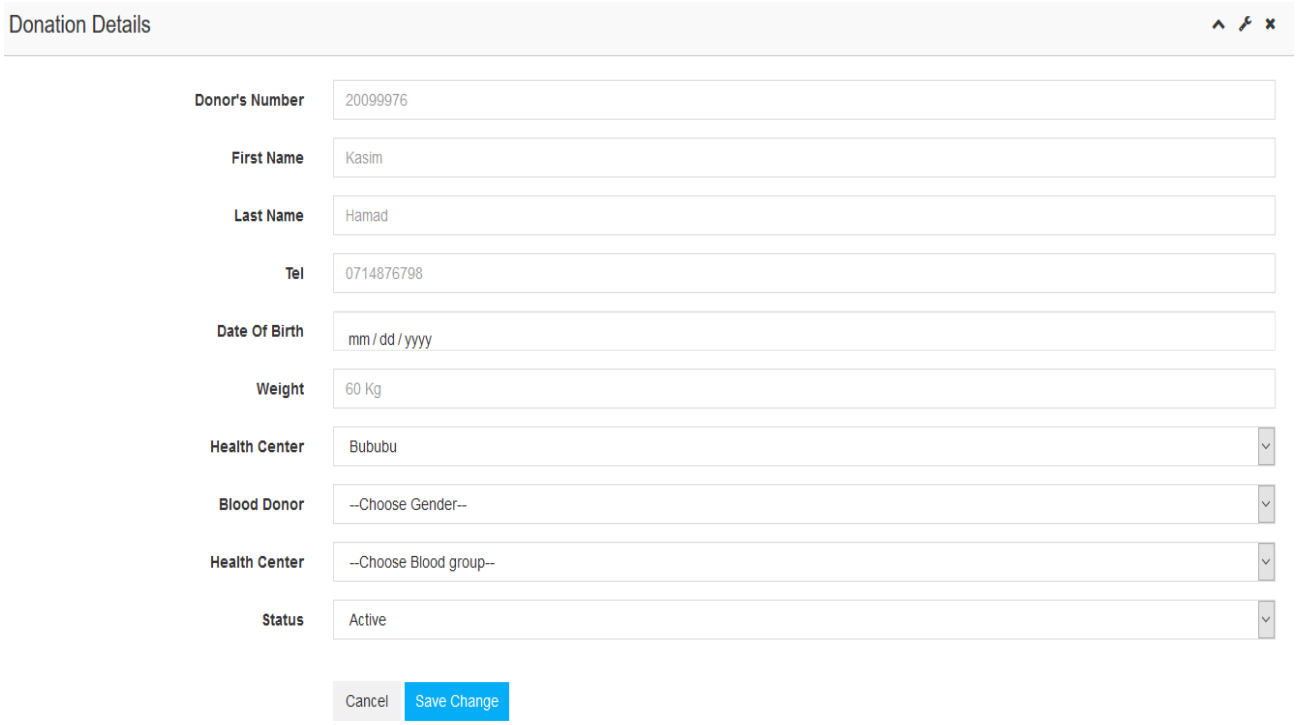


Figure 7: Singin form

Donor Registration Form in web system

This page will allow Admin to register donors



Donor Registration Form in android system

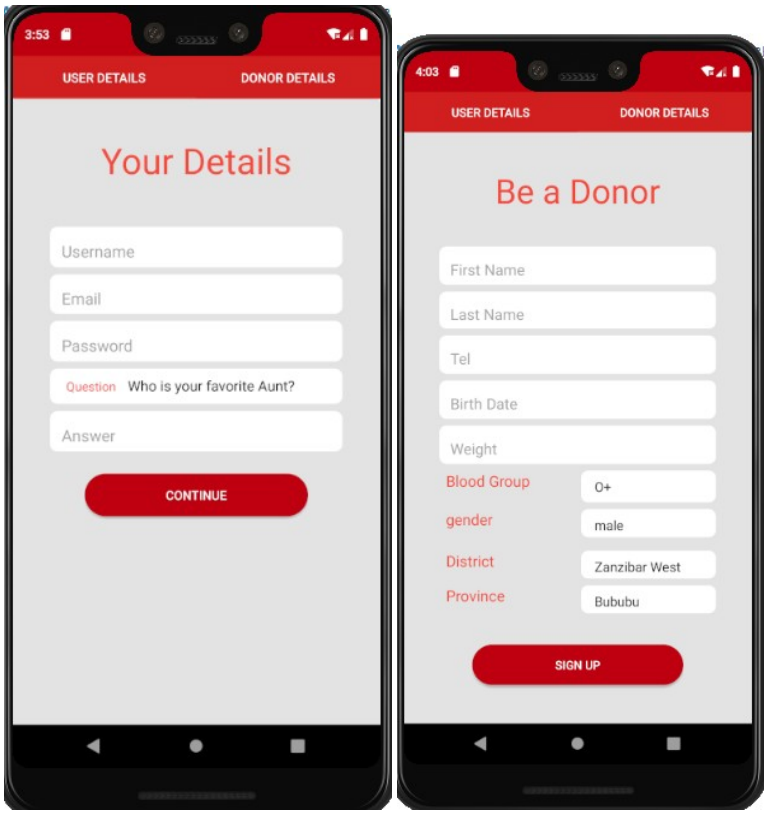


Figure 8: Registration form

Donation Form

Admin and Doctors will record donation with this form.

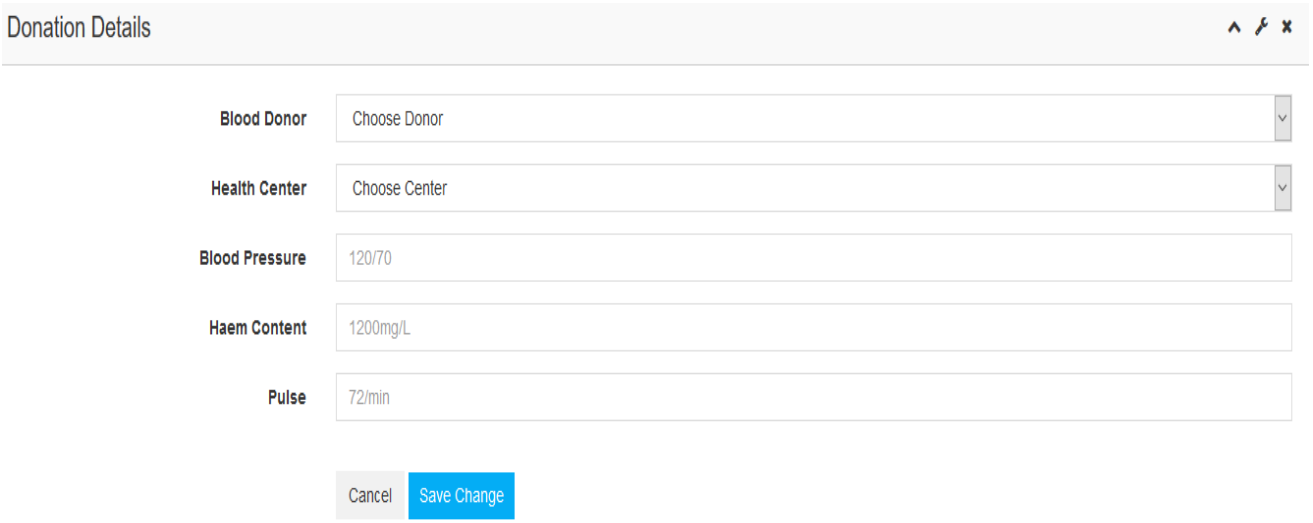


Figure 9: Donation form

Center Form

This form will allow Admin to hospital where blood donation can take place

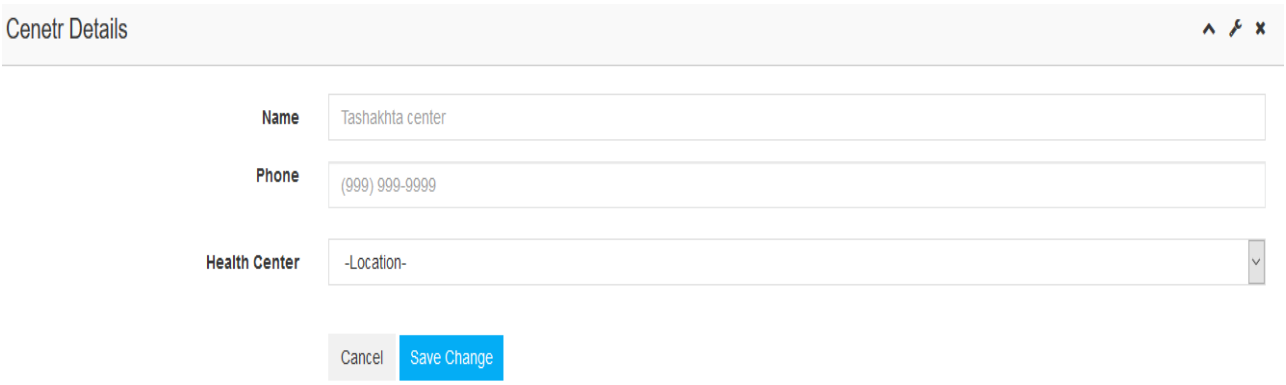


Figure 9: Donation form

Blood request Form and related activities

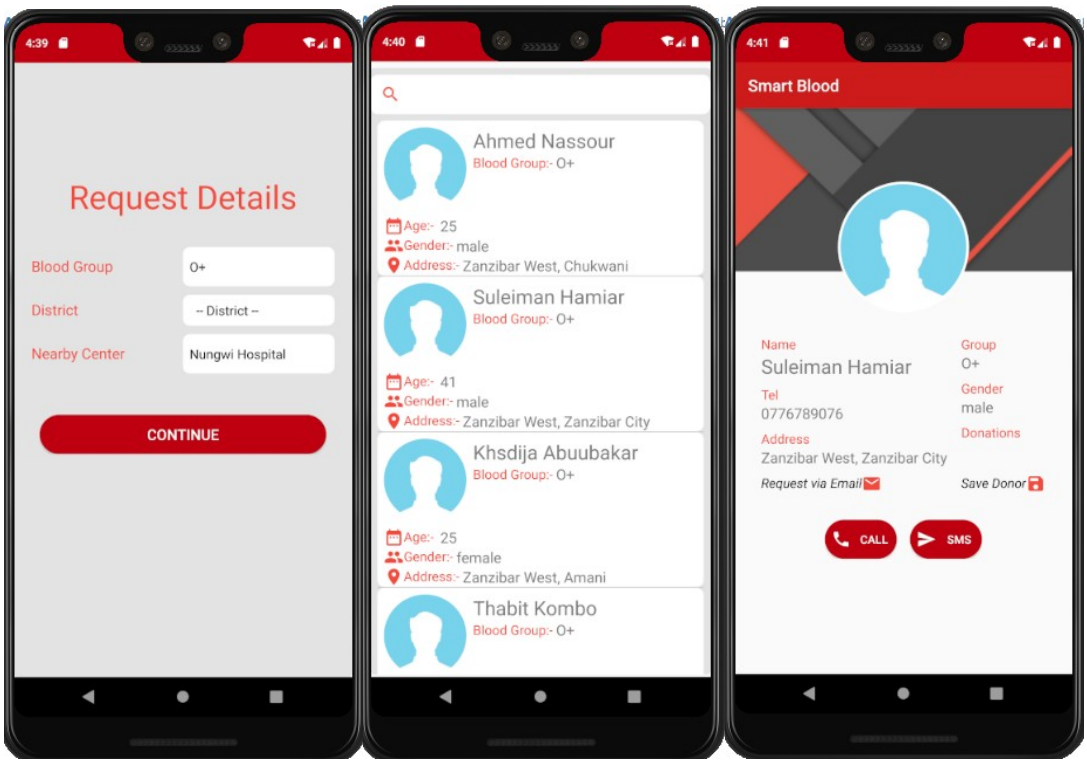
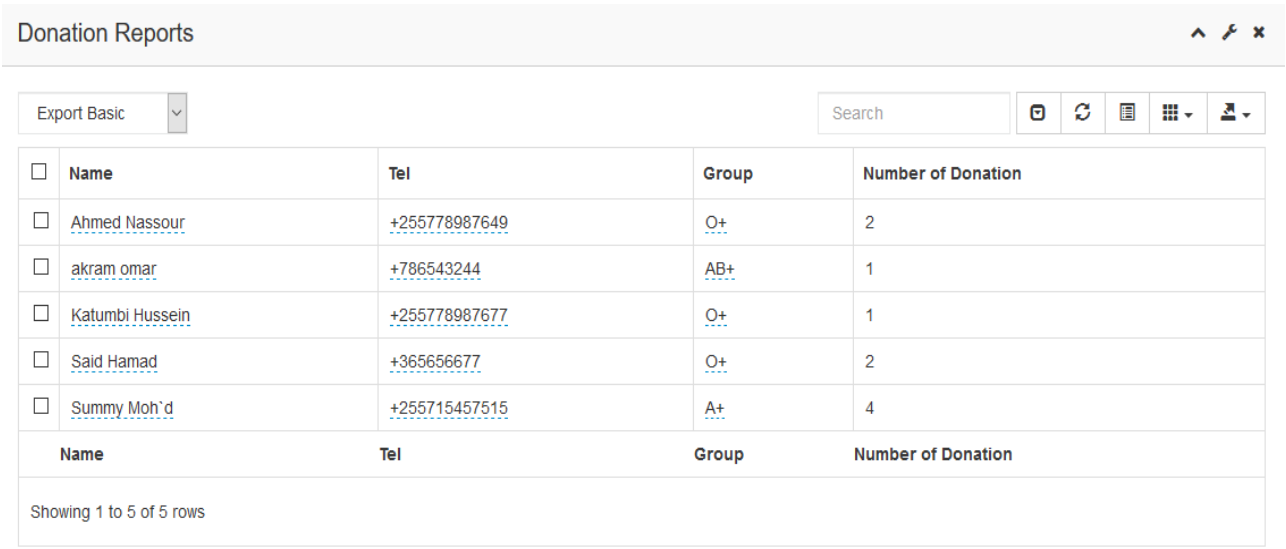


Figure 10: Blood request form and related activity

Donation Reports

This page shows the reports on every donor and the number of donation he/she made.



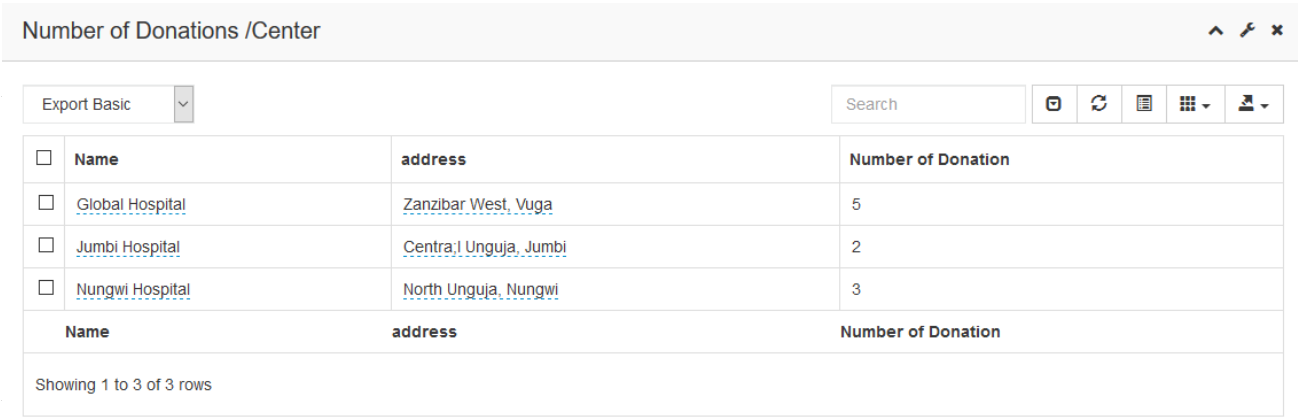
Name	Tel	Group	Number of Donation
Ahmed Nassour	+255778987649	O+	2
akram omar	+786543244	AB+	1
Katumbi Hussein	+255778987677	O+	1
Said Hamad	+365656677	O+	2
Summy Moh`d	+255715457515	A+	4
Name	Tel	Group	Number of Donation

Showing 1 to 5 of 5 rows

Figure 11: Donation report

Center Reports

This page shows the reports on every center and the number of donations it has been recorded there.



Name	address	Number of Donation
Global Hospital	Zanzibar West, Vuga	5
Jumbi Hospital	Centra;l Unguja, Jumbi	2
Nungwi Hospital	North Unguja, Nungwi	3
Name	address	Number of Donation

Showing 1 to 3 of 3 rows

CHAPTER 5: System implementation and testing

5.1 Technologies

This chapter presents the results of the implementation of the system. The system is made up various components each of which performs a specific role to achieve the

objectives of this project as stated earlier in the project report. The technology now days is too high in such a way you can choose which do you prefer most for developing web system and as well as android system. For this project some common technology and tools were used. These are as follows:

- ✓ Mozilla Firefox browser, for developing databases and web system testing.
- ✓ Sublime Text and Android studio for programming both web and android system.
- ✓ MySQL Server, apache server in XAMP Control Panel where the database system was created.
- ✓ At the back end, PHP was used for creating some function such connect MySQL database to web app and validations
- ✓ And for client side we used html5 for creating webpage and by style webpage, where CSS and BOOSTRAP were used for styling. We also used JAVASCRIPT with some of its library such as JQUERY and AJAX for viewing data and client side verification.

5.2. Database implementation

5.2.1 Internal Schema of database (database schema)

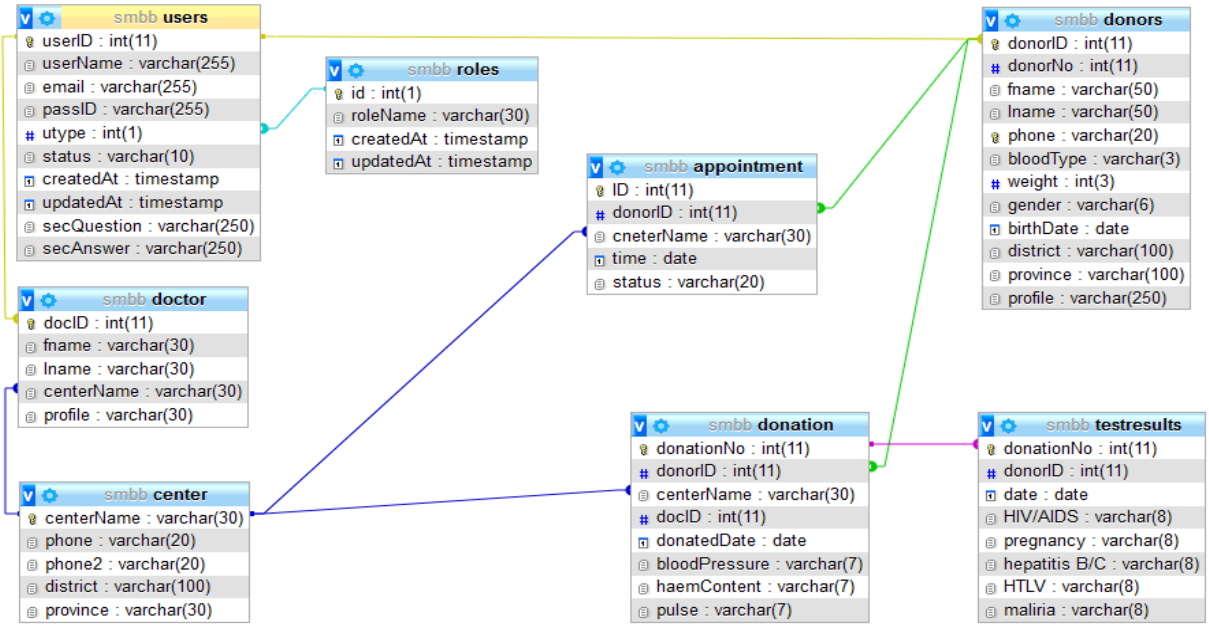


Figure 13: Database Schema

5.3. Testing

5.3.1. Components testing

Components of Smart Blood Bank that need testing are:

- ✓ The Graphical User interface
- ✓ Database Components
- ✓ Security Management

5. 3.1.1. The Graphical User Interface testing

All three users will be able to interact with the system easily. And each user login separately with distinct role, i.e admin, donor and doctor.

- User authentication. This will allow a valid user to log into system and thus perform activity according to their roles. By using a form with strong validation of user, user will log into the system by entering their user name and password… The following code check if user exist in database and work fine:

```php
<?php

session_start();

if(isset($_POST["submit"])) {
   require_once('connection/config.php');
   $myusername =$db->real_escape_string($_POST['username']);
   $mypassword =$db->real_escape_string($_POST['password']);
   $newpassword=sha1($mypassword);
   $sql = "SELECT * FROM users inner join roles on utype=roles.id WHERE userName = '$myusername' and passID = '$newpassword'";
   $result = $db->query($sql) or die(mysqli_error());
   $count = mysqli_num_rows($result);
   //detect error in query
   if (!$result){
      printf("Erro: %s\n", mysqli_error($db));
      exit();
   }
   if($count==1) {
      $row = mysqli_fetch_array($result);
      if ($row["status"] == 'active') {
         $_SESSION['login_user'] = $myusername;
         $_SESSION["user_role"]=$row["id"];
         header("location:home.php");
      }else{
         header("location:index.php?error=Your account hase been blocked!");
      }
   }else {
      header("location:index.php?error=Wrong Username/password");
   }
   $db->close();
}
?>
```

- User Management. In SMBB, system administrator will manage all users by adding them, update their information and deleting if required.

5.3.1.2 Database Components

This component is placed at back of the system in such a way user cannot interact with it. And it performs all database Transaction when user is interacting with the system. Using phpmyadmin we managed to create a database tables as shown below:

	Table	Action	Rows	Type	Collation	Size	Overhead
☐	appointment	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	48 KiB	-
☐	center	Browse Structure Search Insert Empty Drop	3	InnoDB	latin1_swedish_ci	16 KiB	-
☐	doctor	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	32 KiB	-
☐	donation	Browse Structure Search Insert Empty Drop	10	InnoDB	latin1_swedish_ci	48 KiB	-
☐	donors	Browse Structure Search Insert Empty Drop	15	InnoDB	latin1_swedish_ci	32 KiB	-
☐	roles	Browse Structure Search Insert Empty Drop	3	InnoDB	latin1_swedish_ci	16 KiB	-
☐	testresults	Browse Structure Search Insert Empty Drop	0	InnoDB	latin1_swedish_ci	16 KiB	-
☐	users	Browse Structure Search Insert Empty Drop	18	InnoDB	latin1_swedish_ci	32 KiB	-
	8 tables	Sum	49	InnoDB	latin1_swedish_ci	240 KiB	0 B

Figure 14: Database components

5.3.2. System testing

After testing each system component, we then tested a system as whole. And the result was smooth working system in every implemented part. As the system can generate reports and allow different user function based on their roles.

5.4. User Interfaces

Donor view Interface

This interface show list of donors registered in the system.

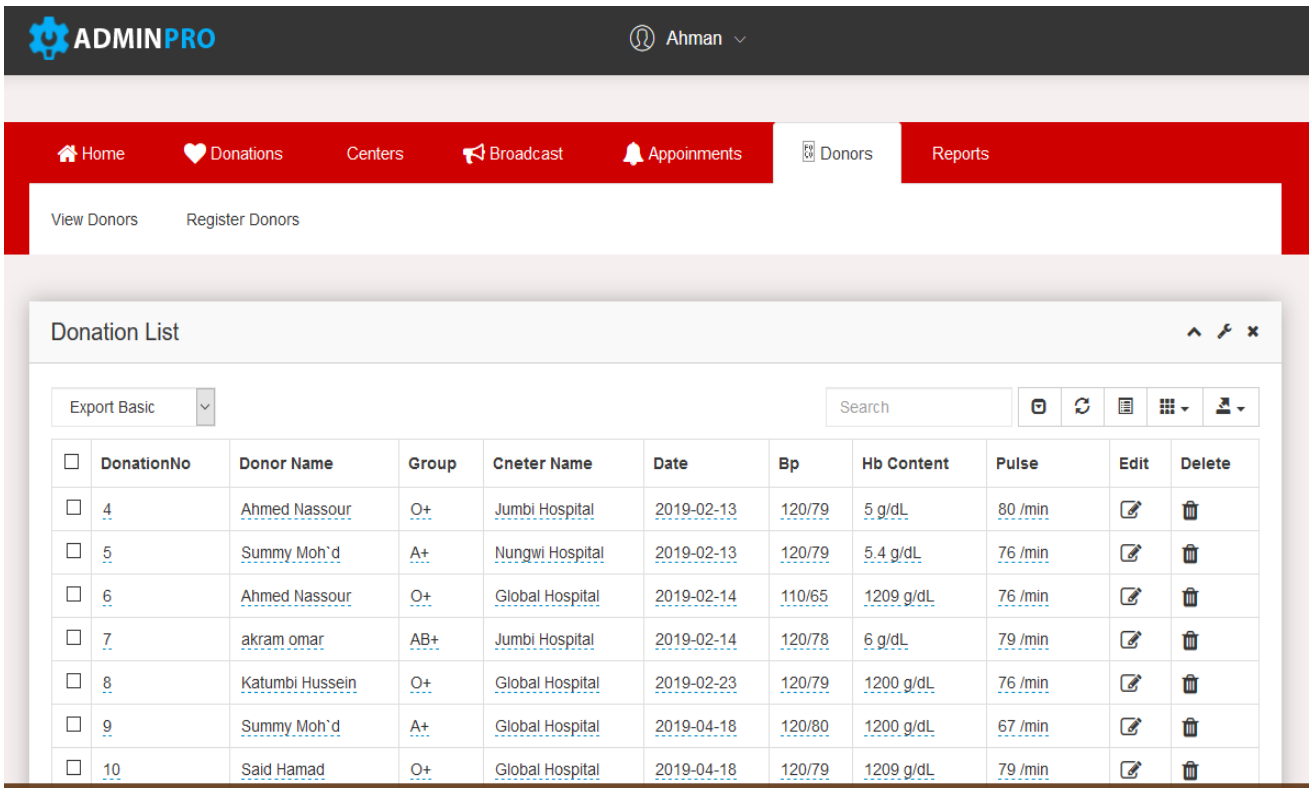
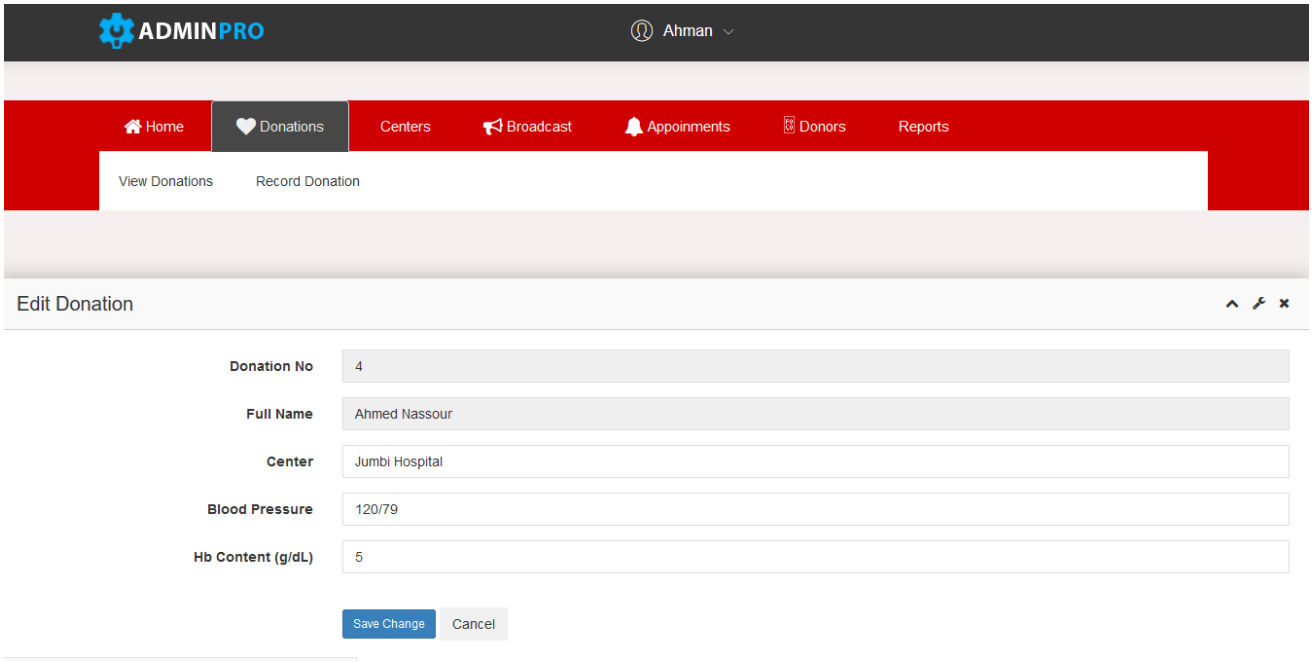


Figure 15: View Donor page

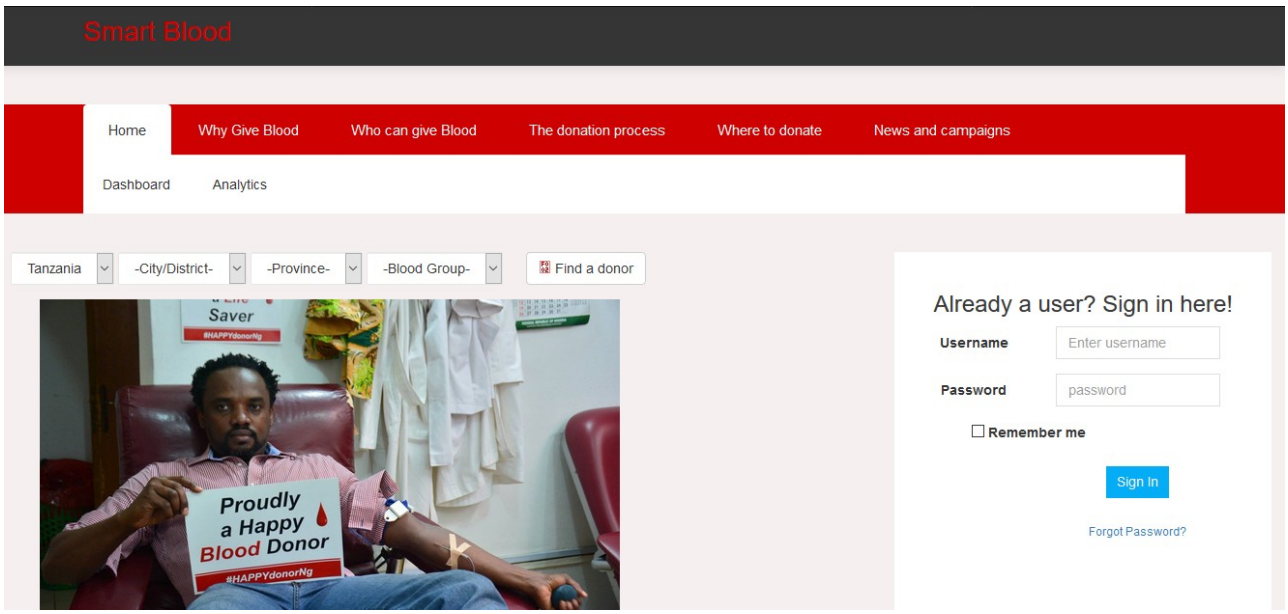
Donor edit Interface

This is donor edit page, where admin can edit particular donor's details.



Index interface

This is an index page where all process start. User login in right side.

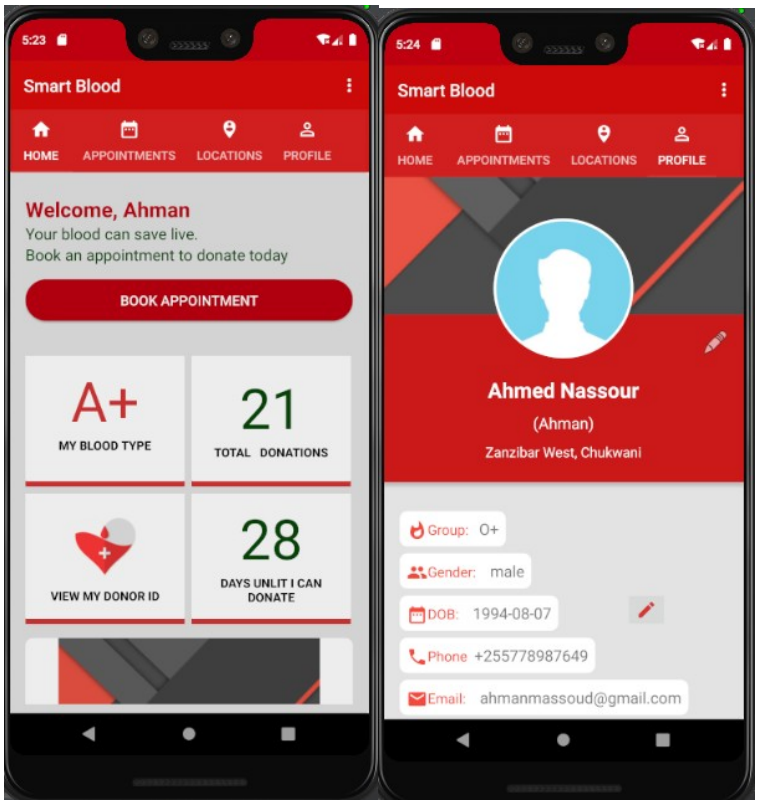


Android index interface

This is android main activity where all process start. Donor can login via top user icon. **Ef**

Donor Home page and Profile

Donor after login, the home activity contains 4 tabs which allow donor to operate his activity.



5.5. Strength ad Limitation of the system

Strength

1. Separate user account can be created
2. List of reliable donors are eligible for donation with contact details.

Limitations

1. Internet connectivity required.
2. Limited power supply
3. Android application installation

5.5.1. What is covered from requirements

According to both functional and nonfunctional requirements, the presented system has covered most of important features. The system's database allows users with different role to use different function as per user specifications.

- ✓ Admin can login and manage variety of resources like donors, health centers, donation doctors and view reports generated by the system.
- ✓ Donor can register via android application and manage his profile. Also the home page presents dynamic reports about his donation and appointment information.
- ✓ Blood seeker can fill some mandatory details and only then he can select desired donor from list of reliable donors and request for blood via phone call or SMS.

CHAPTER 6: Conclusion, Recommendations Challenges and References

CONCLUSION

The software makes it easy to find reliable blood donor required by the particular blood seeker in need. The seeker can know about the nearby donors with it necessary details based on its location and blood group. The overall basic information which is required for the donor is made available in the both web and android application hence making it easy for the user to operate. We have proposed efficient and reliable software. The service provided by the proposed system is needed and valuable to health sector where a quality of blood is considered for the safety of the patient. The donor will get himself registered through these improved system. In case of emergency requirement the blood donor can get a request from needy person and if agreed, they meet in nearby center for donation. With the reliable internet connectivity enables the flow of data to work more rapidly and conveniently.

Recommendations

Challenges

There is always a challenge when trying to fix a problem as we can mention a few here:

- ✓ Implementing new technology with lack of enough skill and time to study them.
- ✓ Unreliability of internet in the project lab this makes studying and instant building very difficult.
- ✓ The system user may need to be taught about the presented system, this is big challenge for us as is that simple capture people's mind.

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