



R.M.D. ENGINEERING COLLEGE

(An Autonomous Institution)

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DEPARTMENT OF INFORMATION TECHNOLOGY

21IT413 INTERNSHIP

BLOOD BANK MANAGEMENT SYSTEM

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20IT401 SOFTWARE ENGINEERING LABORATORY

OBJECTIVES:

- To understand the software engineering methodologies for project development.
- To gain knowledge about open source tools for Computer Aided Software Engineering.
- To develop an efficient software using case tools.

SOFTWARE REQUIRED:

Open source Tools: Star UML / UMLGraph / Topcased

Prepare the following documents for each experiment and develop the software using softwareengineering methodology.

1. Problem Analysis and Project Planning -Thorough study of the problem – Identify Projectscope, Objectives and Infrastructure.

2. Software Requirement Analysis - Describe the individual Phases/modules of the project andIdentify deliverables.

3. Data Modelling - Use work products – data dictionary, use case diagrams and activitydiagrams, build and test class diagrams, sequence diagrams and add interface to class diagrams.

4. Software Development and Debugging – implement the design by coding

5. Software Testing - Prepare test plan, perform validation testing, coverage analysis, memoryleaks, develop test case hierarchy, Site check and site monitor.

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INDEX

SL.NO	NAME OF THE EXPERIMENT
	BLOOD BANK MANAGEMENT SYSTEM
1	Problem Analysis 1(a)Problem Statement 1(b)Project Planning
2	Software Requirement Analysis
3	Modeling 3(a)Design 3(b)Data Dictionary
4	Implementation
5	Testing - Test Cases
6	Documentation

Ex.No 1(a)**PROBLEM ANALYSIS****Problem Statement**

A blood bank is a center where blood is collected from donors, tested, stored, and distributed to those who require it. It is essential to maintain the availability of safe blood and blood products for transfusion, as it can save lives in emergency situations. However, managing the blood bank and its operations can be a complex task.

The objective of this project is to develop a Blood Bank Management System that automates the process of managing blood bank operations efficiently. The system should be user-friendly and easy to navigate, enabling the users to register as donors, schedule appointments, and request blood products. The system should also allow the blood bank staff to manage donor information, blood stock levels, and blood product requests.

The system should have the following features:

- Add a blood donor details w address, blood type, date of last donated blood and phone number
- Check for Blood availability
- System to reject available blood based on expiry date
- Alerts when stock goes beyond a threshold (again this depends on blood type)
- Quantity threshold configuraiton against blood type
- Expirty date settings for blood type

Analysis

The Blood Bank Management System is an essential system that aims to automate and streamline the blood bank's operations. The system should have various features to manage the donor information, blood stock, etc. Let's analyze each of these features in detail.

1. Donor Management:

The donor management feature should allow the blood bank staff to manage donor information, including donor details, medical history, and donation history. The system should keep track of each donor's blood type, last donation date, and the number of donations made to ensure that the donor is eligible to donate.

2. Blood Stock Management:

The blood stock management feature is crucial to the Blood Bank Management System. The system should allow the blood bank staff to manage the blood stock levels, including the number of units available for each blood type. The system should also notify the staff when the stock level falls below the minimum threshold and provide the details of the units available

3. Appointment Scheduling:

The appointment scheduling feature should allow donors to schedule appointments for blood donation. The system should enable donors to select a preferred date and time for their donation and notify them of their scheduled appointment.

4. Reports and Analytics:

The reports and analytics feature should generate reports and analytics on blood stock levels, donations, and blood product requests. The system should allow the blood bank staff to access the reports and analytics and make data-driven decisions.

Feasibility study

Technical feasibility

The Blood Bank Management system(BBMS) runs with a minimum system resources:

- Apache netbeans
- JFrame
- Mysql

Above said system resources are available as open source. Hence it is feasible to develop BBMS in this environment.

Operational feasibility

As the system has JFrame based GUI no special skill set is required for working with the system, hence it is operationally feasible.

Economic feasibility

As the BBMS requires minimum system resources, hence it is economically feasible.

Ex.No 1(b)**PROJECT PLANNING****1. Overview**

A blood bank management system is a software application designed to manage the activities of a blood bank, including inventory management, blood donation, blood testing, and distribution of blood and blood products. The system helps to maintain accurate records of blood donors and their donations, blood testing results, and blood product distribution..

2. Goals and Scope

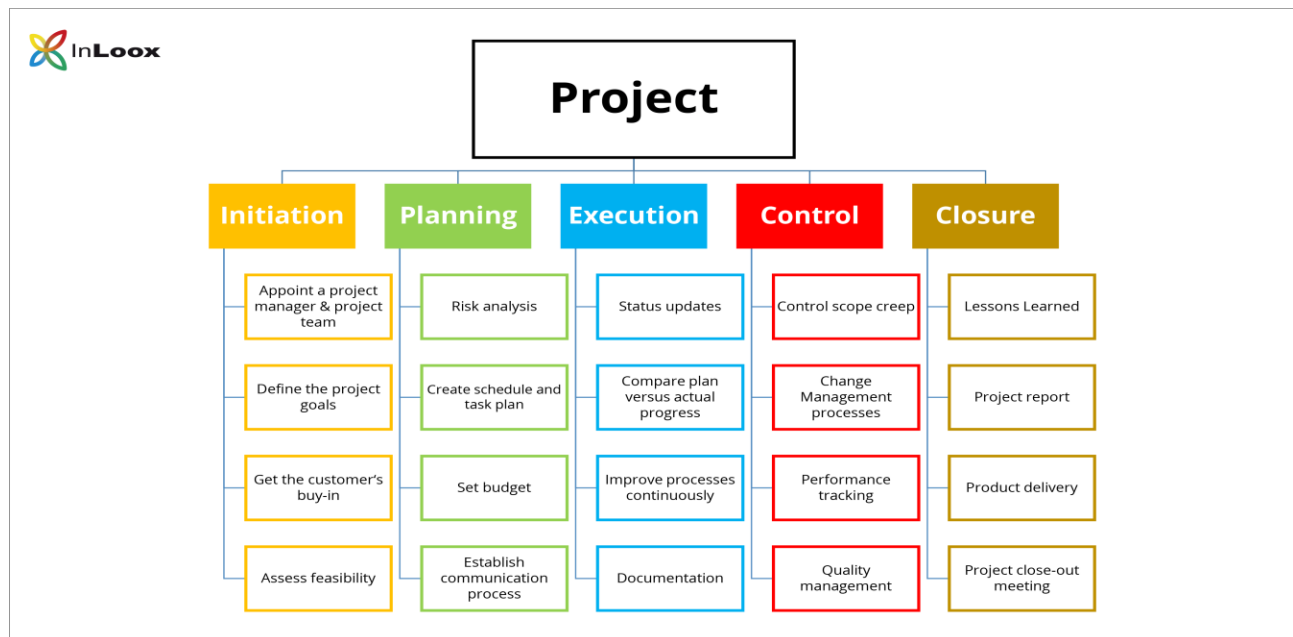
- **Goal :** The goal of a blood bank management system is to ensure the safe, efficient, and effective management of blood and blood products, from donation to transfusion
- To automate the Blood Bank Management System with the following functional goals
 1. Login admin
 2. Adding User Details.
 3. Updating User Details
 4. Deleting User Details
 5. Generating Reports
 6. Searching for Donor
 7. Stock management
 8. Increasing the stock
 9. Decreasing the stock
 10. Alter when the blood is expired

Scope :

- The specification builds on the experience of IT technology in blood transfusion that is currently available and informs both Connecting for Health (CfH) and commercial companies producing both hardware and software.
- The main objective of this specification is to support the automated tracking of blood products from the initial collection of the blood unit to the final ordering and purchase of the units by hospitals.

Schedule and Budget

Work Breakdown Structure



Schedule and Milestones

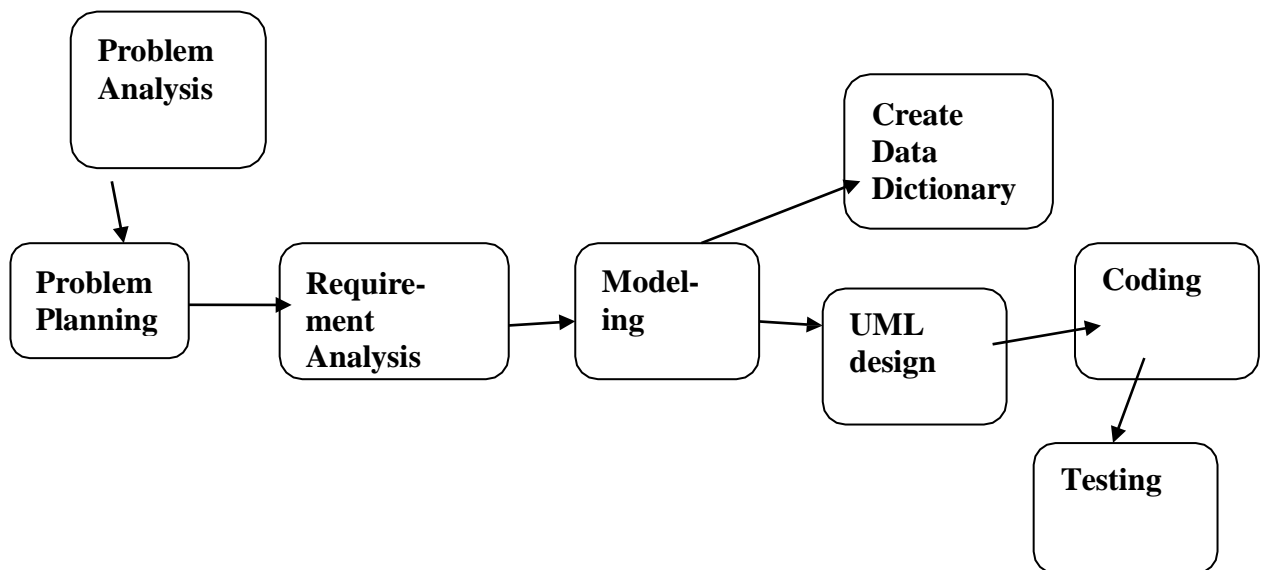
Milestones	Description	Milestone Criteria	Planned week
M0	Problem Analysis		1 st week
		Problem statement, Analysis, Feasibility Study	
M1	Project Planning		2 nd week
		Scope and concept described	
M2	Requirement Analysis		2 nd and 3 rd week
		Draft SRS, Design Specification, Test Plan, Requirement Analysis (Final)	
M3	Study of UML Notations		3 rd week
		Architecture reviewed and stable	
M4	Modeling		4 th week
		Software Design, Data Dictionary	
M5	Implementation		5 th week
		Coding of functionality, Debugging, System Test Plan	
M6	Testing		6 th week
		Database & System Integration , Acceptance Testing	
M7	Documentation		7 th week
		User Manual	

Budget

Category	Budget for Period in kUS\$					
	M0-M1	M1-M2	M2-M3	M3-M4	M4-M5	M5-M6
Human Resources (internal)						
Human Resources (external)						
Purchases (COTS)						
Equipment						
Premises						
Tools						
Travel costs						
Training						
Review activities						
Other						
Total	1	1	2	5	2	1
Total cumulated	1	2	4	9	11	12

For a detailed list of costs of all resources see <document> [x].

Development Process



Risk Management

Risk management is an essential component of project planning. Risk management in software engineering entails identifying and estimating the likelihood of risks in order of their impact on the project.

Software development is a high-level activity that employs a wide range of technological advancements. Every software development project contains elements of uncertainty due to these and other factors. The amount of risk associated with each project activity determines the success of a software development project. It is not enough to simply be aware of the dangers. To achieve success, project management must identify, assess, prioritize, and manage all major risks..

Delivery Plan

Ident.	Deliverable	Planned Date	Receiver
D1	Analysis and Feasibility Report	1 st week	Client
D2	Project Plan	2 nd week	Client
D3	SRS	3 rd week	Client
D4	Design	4 th week	Client
D5	Test Plan	5 th week	Client
D6	Code	6 th week	Client
D7	Test Report	6 th week	Client

Ex.No.2 SOFTWARE REQUIREMENT ANALYSIS**Software Requirement Specification(SRS)****1. Introduction**

A blood bank is a cache or bank of blood or blood components, gathered as a result of blood donation, stored and preserved for later use in blood transfusion. Recent ages in most of the cases there is a need of blood to the injured patient. It will take so much of time to search for the required group of the blood.

The main objective of the Secured Integration of Online Blood Bank System is to provide information about the blood banks, the type of blood is available, and how much quantity is therein. Every blood bank will be maintained accordingly. For the Patient angle also the integration of blood banks to the hospital will be very helpful to make the request online to get the blood directly to the hospital.

1.2 Scope of the product

The specification builds on the experience of IT technology in blood Transfusion that is currently available and informs both Connecting for Health (CfH) and commercial companies producing both hardware and software.

The main objective of this specification is to support the automated tracking of blood products from the initial collection of the blood unit to the final ordering and purchase of the units by hospital.

1.3 Definitions, acronyms and abbreviations

BBMS-Blood Bank Management System

DOB-Date of Birth

SQL-Structured Query Language

GUI-Graphical User Interface

1.4 References

- (i) Roger s Pressman ,”Software Engineering -a practitioner's approach” 7th edition
- (ii) Ian sommerville , “software engineering “ 9th edition

1.5. Overview of the remainder of the document

The SRS will provide a detailed description of the Blood Bank Management System. This document will provide the outline of the requirements, overview of the characteristics and constraints of the system.

Section 2 of this document provides the General description such as Product perspective, Product functions and the characteristics of the user's of this product. Section 3 describes the Specific requirements which cover the functional, non-functional and interface requirements. This is obviously the most substantial part of the document but because of the wide variability in organizational practice, it is not appropriate to define a standard structure for this section. The requirements may document external interfaces, describe system functionality and performance, specify logical database requirements, design constraints, emergent system properties and quality characteristics.

2. General Description

Product Perspective

This system includes both offline and online components. The collection of blood will be manual through Blood Donation Camp. The donor can either register on the Blood Bank website on his own or can visit the Blood Donation Camp and the responsible authority at the camp can do the registration for the donor. An online database is maintained with all the information about the donors.

Once the blood is collected it stored in a safe place. An online Blood Inventory Database is maintained as well for the Blood Units collected. From here a small sample of the blood units are sent to the Testing Unit. Here the blood samples are tested to determine whether they are fit to be used or not. A report is made by the lab technician and is sent back to the Blood Bank. Based on the reports received the Blood Bank Inventory is updated-some blood samples might need to be discarded as they are not fit for use.

Hospitals place orders from this Blood Bank. A record of the order and payment is maintained by both parties. Once the order is placed the Blood Bank Manager send the receipt. Once the hospital makes the payment the order is delivered by the Blood Bank staff.

A complete database of all the staff working in the Blood Donation Camp as well as the Blood Bank is maintained.

Product functions

According to this product, a Donors can create an account back at home or register themselves at the spot of blood camp before donating blood. The Hospital Manger has to register the Hospital which act as an acceptor here. The details of the blood inventory i.e., the availability of a particular type of blood is regularly updated and maintained by the Inventory Manager. It is a confidential data so the access is only with the administrators. The registered hospital can place an online order. The order is processed by the Inventory Manager who can check the database of the blood units. If the required blood type and the amount is available, it notifies the corresponding hospitals. When the Hospital Manager confirms the Order, the details are being sent to it.

User characteristics

There are mainly four users interacting with each other in this system: Receptionist, Hospital Manager, Blood Camp Doctor, Inventory Manager.

The Blood Camp Doctor who collects the blood units from the donors with proper procedure. After the collection and packaging of the blood, the Doctor sends the samples to the Lab Technician for Blood testing and the rest of the blood units to the blood inventory. The Lab Technician carries out test on each blood sample. He sends the blood report to the Inventory Manager.

The Inventory Manager carefully studies the report. According to which he/she discards the unfit blood and store the healthy blood in the respective places. Then he/she updates the required changes in the blood inventory database. He/she keeps a track of the date of the blood was newly stored in the inventory and its expiry date.

The Hospital Manager places an order for the blood units as per the Hospital's requirement. The Inventory Manger go throughs the order. After confirmation, he requests the hospital manager to do the payment. When the order is confirmed and the payment is done, the Delivery Boy delivers the blood units very carefully at the Hospital. The Hospital Manager checks and maintains the details.

General constraints

- The ADMIN is constrained to create an account first to avail the services.
- The internet connection is also a constraint for this web application.
- The web application is also constrained by the database capacity so it works well with a smaller number of donors and hospitals.
- The access to manage the databases are different for different people. The receptionist is given the access to maintain the database of the registered donors and hospitals. The inventory manages is allowed access to update the inventory details and payment of the order placed by the hospitals.

Assumptions and dependencies

- The users have sufficient knowledge of computers.
- The users know the English language, as the user interface will be provided in English
- It is assumed that the users have enough resources to run the web application i.e a mobile phone or a computer that supports the required functions.
- It is assumed that the online payments carried out are looked by the respective bank administrators.
- The web application depends on the application such as Oracle and MySql for creating and managing the database.
- The front end is designed with the help of netbeans, JFrame work.

3. Specific requirements

Functional Requirements

This section describes in detail all the functional requirements.

(It shows what the system can do)

1. Login
2. Adding Donor.
3. Updating Donor
4. Deleting Donor
5. Stock Details
6. Generating Reports
7. Viewing/Searching for Details.

Non- Functional Requirements

Usability

- The system is user friendly and self-explanatory.

Reliability

The system has to be very reliable due to the importance of data and the damages incorrect or incomplete data can do.

Availability

The system is available 100% for the user and is used 24 hrs a day and 365 days a year.

The system shall be operational 24 hours a day and 7 days a week.

Mean Time Between Failures (MTBF)

The system will be developed in such a way that it *may* fail once in a year.

Mean Time to Repair (MTTR)

Even if the system fails, the system will be recovered back up within an hour or less.

Accuracy

The accuracy of the system is limited by the accuracy of the speed at which the employees of the library and users of the library use the system.

Maximum Bugs or Defect Rate

Not specified.

Access Reliability

The system shall provide 100% access reliability.

Performance**Response Time**

The system shall respond to the member in not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs.

The requirements may document external interfaces, describe system functionality and performance, specify logical database requirements, design constraints, emergent system properties and quality characteristics.

3.3 Hardware and software requirements

3.3.1. Hardware Interfaces

- ☐ Processor: Pentium or Higher.
- ☐ RAM: 312MB or Higher.

3.3..2. Software Interfaces

- ☐ Operating System: Unix, Linux, Mac, Windows etc..
- ☐ Development tool: netbeans, JFrame work
- ☐ Data Base: MySQL
- ☐

3.4 External Interfaces

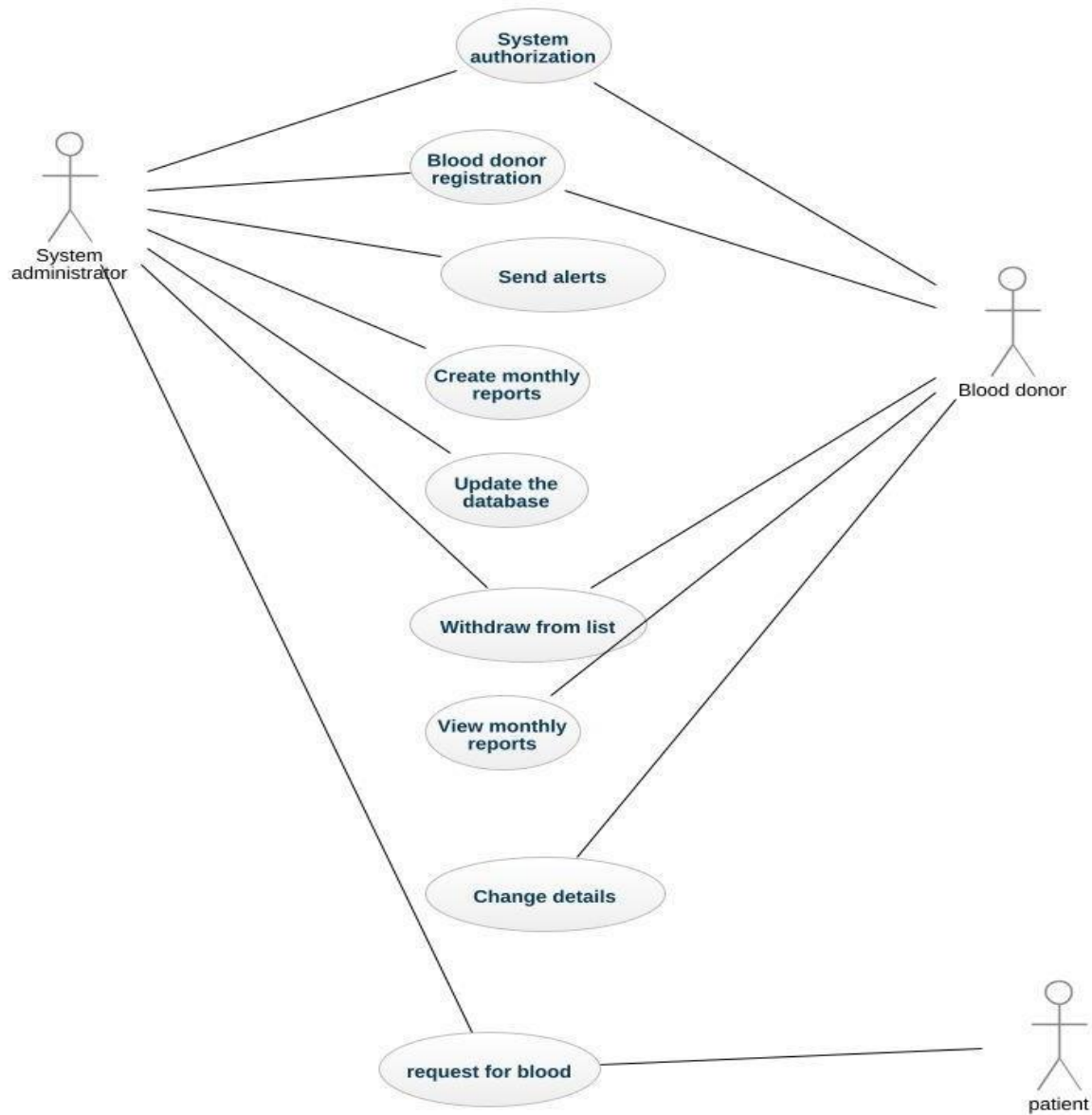
User Interfaces

The user-interface of the system shall be designed as shown in the user-interface prototypes.

4. Logical Database Design

- Admin Database
- Staff Database
- Blood Inventory Database

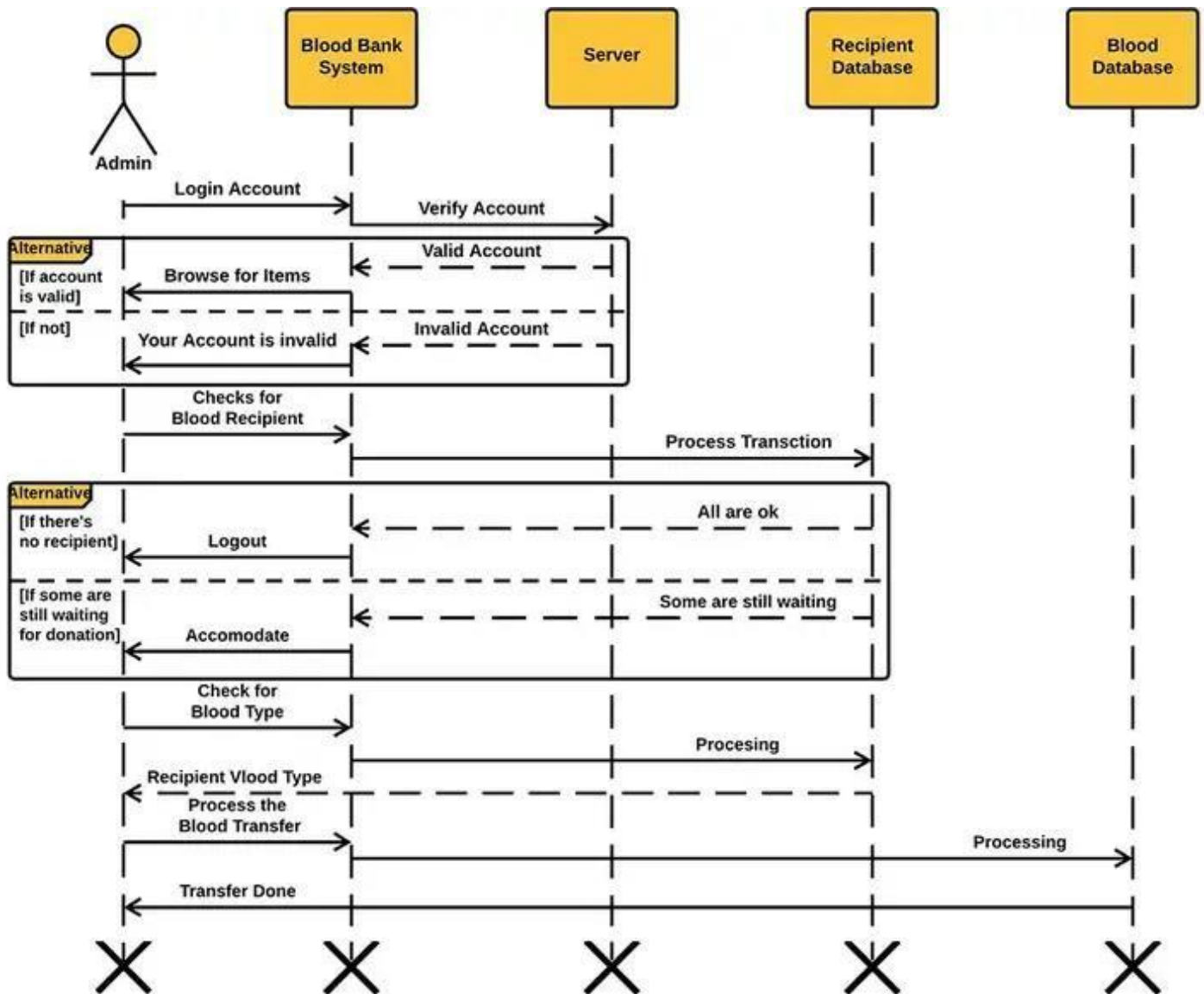
Result: Thus the Software Requirement Specification Document for Blood Bank ManagementSystem has been completed.

Ex.No. 3**MODELING****(i) Design model –UML diagrams****Use case diagram****Step 1:start ARGO UML->Create-> Use Case Diagram**

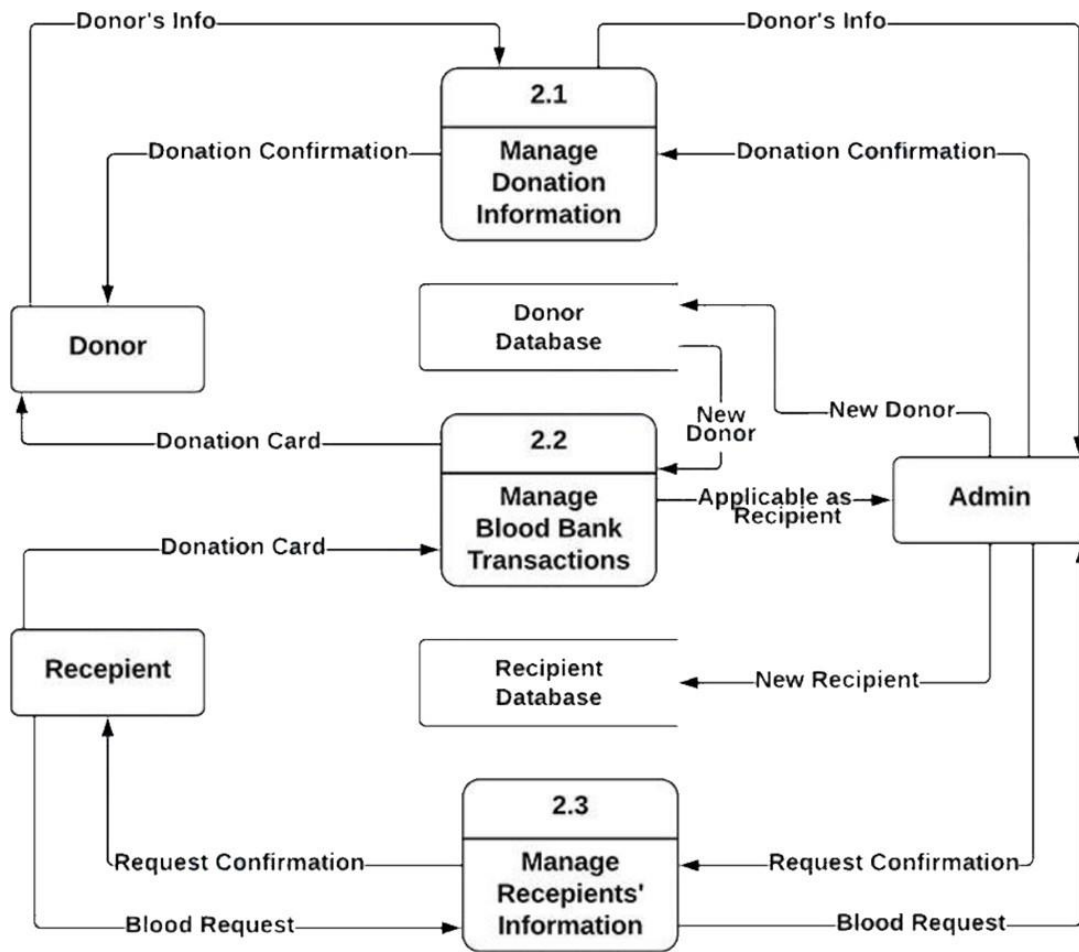
Activity Diagram for BBMS



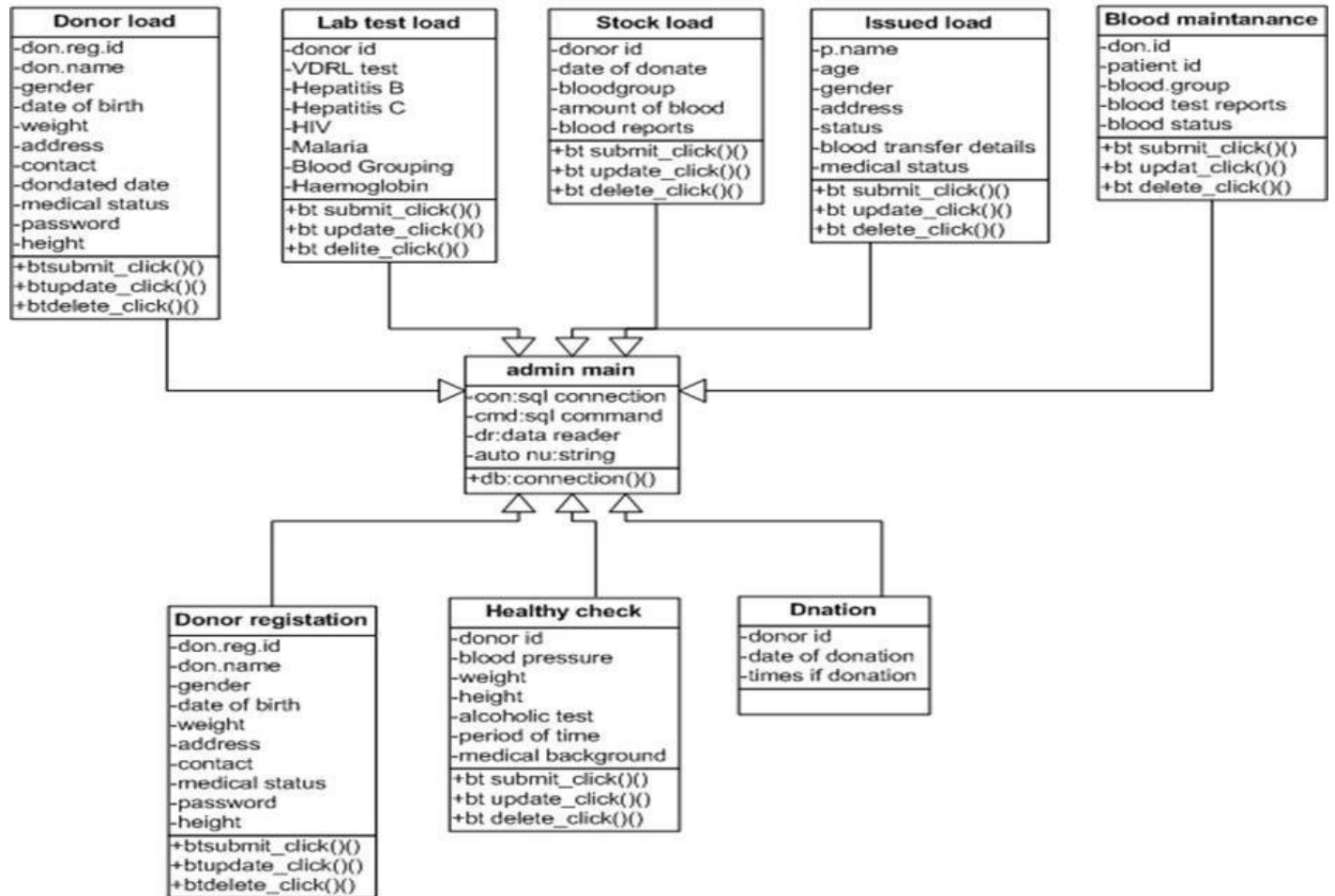
Sequence diagram for BBMS



Data flow diagram for BBMS



Class Diagram



Ex.No.3 (b) DATA DICTIONARY**Donor Details**

S.No	Name	Alias Name	Where Used/How Used	Supplementary Data	
				Data Type	Limitations
1	Donor name		Hospital, Display	string	Up to 50 char
2	Donor ID	-	Donor, Display	integer	Up to 10digits
3	Blood Type		Hospital, ,Display	string	Up to 20 char
4	Address		Hospital, Display	string	Up to 500 char
5	Mobile No		Hospital, Display	string	Up to 10 digit

Stock Details

S.No	Name	Alias Name	Where Used/How Used	Supplementary Data	
				Data Type	Limitations
1	Blood Type	-	Hospitals, Borrow, Display	string	Up to 20 char
2	Units	-	Hospitals	int	Up to 10 digits
3	name		Hospitals	string	Up to 50 char
4	Mobile number		Hospitals	string	Up to 10 digits
5	Address		Hospitals	string	Up to 100 char

Ex.No.4**IMPLEMENTATION****Home Page:**

```

<!DOCTYPE html>
<html lang="en">

<head>

    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
    <meta name="description" content="">
    <meta name="author" content="">
    <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
    <script src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>
    <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.16.0/umd/popper.min.js"></script>
    <script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>
</style>
</style>
</head>

<body>
<div class="header">
<?php
$active="home";
include('head.php'); ?>

</div>
<?php include'ticker.php'; ?>

<div id="page-container" style="margin-top:50px; position: relative;min-height: 84vh; ">
    <div class="container">
        <div id="content-wrap" style="padding-bottom:75px;">
            <div id="demo" class="carousel slide" data-ride="carousel">

                <!-- Indicators -->
                <ul class="carousel-indicators">
                    <li data-target="#demo" data-slide-to="0" class="active"></li>
                    <li data-target="#demo" data-slide-to="1"></li>
                </ul>

                <!-- The slideshow -->
                <div class="carousel-inner">
                    <div class="carousel-item active">
                        
                    </div>

```

```

<div class="carousel-item">
  
</div>

</div>

<!-- Left and right controls -->
<a class="carousel-control-prev" href="#demo" data-slide="prev">
  <span class="carousel-control-prev-icon"></span>
</a>
<a class="carousel-control-next" href="#demo" data-slide="next">
  <span class="carousel-control-next-icon"></span>
</a>
</div>
<br>
<h1 style="text-align:center;font-size:45px;">Welcome to BloodBank & Donor Management System</h1>
<br>
<div class="row">
  <div class="col-lg-4 mb-4">
    <div class="card">
      <h4 class="card-header card bg-info text-white" >The need for blood</h4>

      <p class="card-body overflow-auto" style="padding-left:2%;height:120px;text-align:left;">
        <?php
          include 'conn.php';
          $sql=$sql= "select * from pages where page_type='needforblood'";
          $result=mysqli_query($conn,$sql);
          if(mysqli_num_rows($result)>0) {
            while($row = mysqli_fetch_assoc($result)) {
              echo $row['page_data'];
            }
          }

        ?>
      </p>
    </div>
  </div>
  <div class="col-lg-4 mb-4">
    <div class="card">
      <h4 class="card-header card bg-info text-white">Blood Tips</h4>

      <p class="card-body overflow-auto" style="padding-left:2%;height:120px;text-align:left;">
        <?php
          include 'conn.php';
          $sql=$sql= "select * from pages where page_type='bloodtips'";
          $result=mysqli_query($conn,$sql);
          if(mysqli_num_rows($result)>0) {
            while($row = mysqli_fetch_assoc($result)) {
              echo $row['page_data'];
            }
          }

        ?>

```

```

    </p>

    </div>
</div>
<div class="col-lg-4 mb-4">
    <div class="card">
        <h4 class="card-header card bg-info text-white" >Who you could Help</h4>

        <p class="card-body overflow-auto" style="padding-left:2%;height:120px;text-align:left;">
            <?php
                include 'conn.php';
                $sql=$sql= "select * from pages where page_type='whoyouhelp'";
                $result=mysqli_query($conn,$sql);
                if(mysqli_num_rows($result)>0) {
                    while($row = mysqli_fetch_assoc($result)) {
                        echo $row['page_data'];
                    }
                }

            ?>
        </p>

    </div>
</div>
</div>

<h2>Blood Donor Names</h2>

<div class="row">
    <?php
        include 'conn.php';
        $sql= "select * from donor_details join blood where donor_details.donor_blood=blood.blood_id order by rand() limit
6";
        $result=mysqli_query($conn,$sql);
        if(mysqli_num_rows($result)>0)
        {
            while($row = mysqli_fetch_assoc($result)) {
                ?>
                <div class="col-lg-4 col-sm-6 portfolio-item" ><br>
                <div class="card" style="width:300px">
                    
                    <div class="card-body">
                        <h3 class="card-title"><?php echo $row['donor_name']; ?></h3>
                        <p class="card-text">
                            <b>Blood Group : </b> <b><?php echo $row['blood_group']; ?></b><br>
                            <b>Mobile No. : </b> <?php echo $row['donor_number']; ?><br>
                            <b>Gender : </b><?php echo $row['donor_gender']; ?><br>
                            <b>Age : </b> <?php echo $row['donor_age']; ?><br>
                            <b>Address : </b> <?php echo $row['donor_address']; ?><br>
                        </p>
                    </div>
                </div>
            }
        }
    </div>

```

```

    </div>
  </div>
<?php } } ?>
</div>
<br>
<!-- /.row -->

<!-- Features Section -->
<div class="row">
  <div class="col-lg-6">
    <h2>BLOOD GROUPS</h2>
    <p>
      <?php
        include 'conn.php';
        $sql=$sql= "select * from pages where page_type='bloodgroups'";
        $result=mysqli_query($conn,$sql);
        if(mysqli_num_rows($result)>0) {
          while($row = mysqli_fetch_assoc($result)) {
            echo $row['page_data'];
          }
        }
      ?></p>
    </div>
    <div class="col-lg-6">
      
    </div>
  </div>
<!-- /.row -->

<hr>

<!-- Call to Action Section -->
<div class="row mb-4">
  <div class="col-md-8">
    <h4>UNIVERSAL DONORS AND RECIPIENTS</h4>
    <p>
      <?php
        include 'conn.php';
        $sql=$sql= "select * from pages where page_type='universal'";
        $result=mysqli_query($conn,$sql);
        if(mysqli_num_rows($result)>0) {
          while($row = mysqli_fetch_assoc($result)) {
            echo $row['page_data'];
          }
        }
      ?></p>
    </div>
    <div class="col-md-4">
      <a class="btn btn-lg btn-secondary btn-block" href="donate_blood.php" style="align:center; background-color:#7FB3D5;color:#273746 ">Become a Donor </a>
    </div>
  </div>

```

</div>

</div>

</div>

<?php include('footer.php');?>

</div>

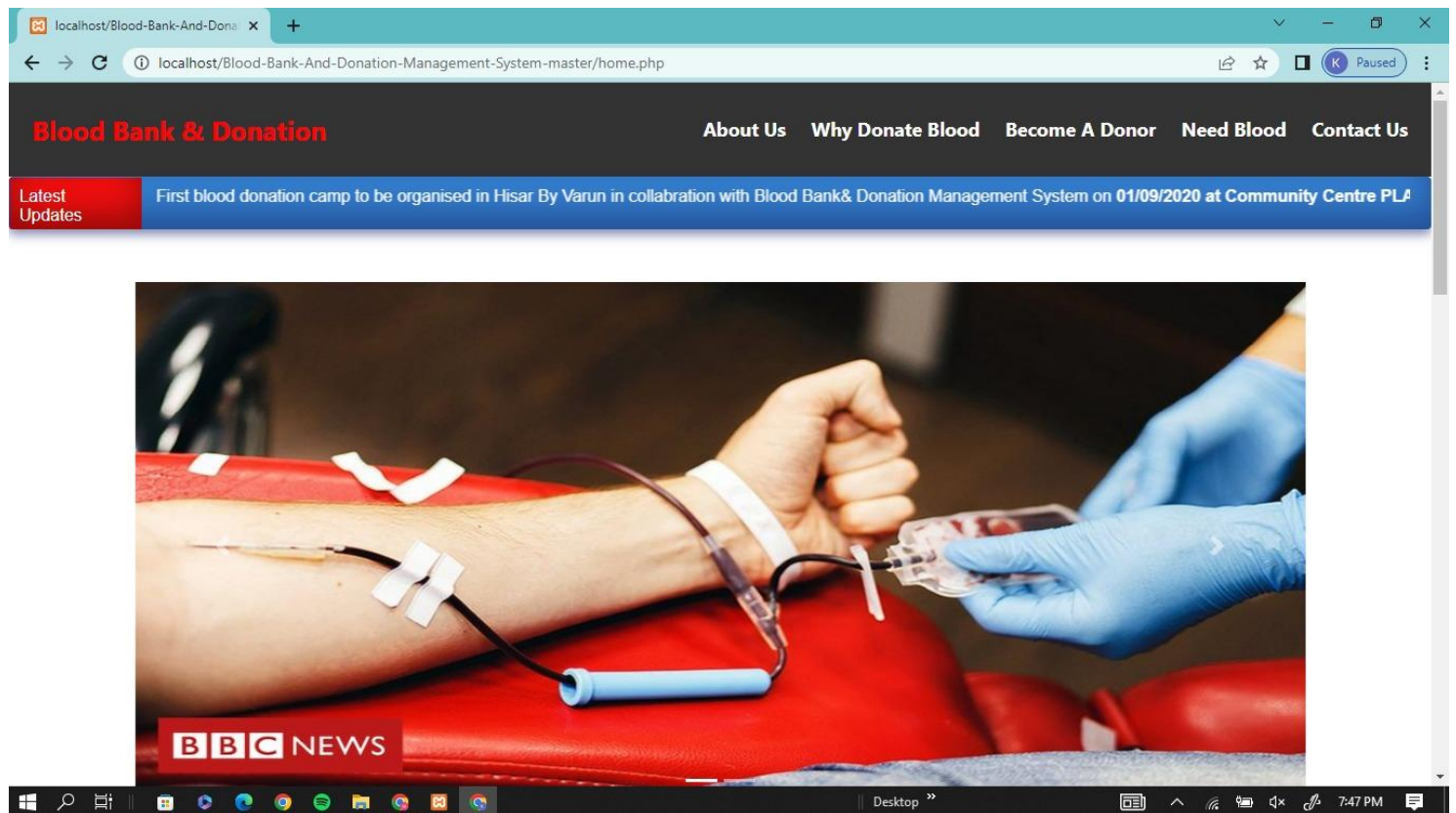
</body>

</html>

OUTPUT:

HOME PAGE:

LOGIN PAGE



ADD DONOR DETAILS:

Blood Bank & Donation About Us Why Donate Blood **Become A Donor** Need Blood Contact Us

Donate Blood

Full Name* Mobile Number* Email Id

Age* Gender* Blood Group*

Address*

COPYRIGHT © 2020
Blood Bank & Donation Management
ALL RIGHTS RESERVED

STOCK DETAILS:

Blood Bank & Donation Admin Panel Hello Saathath ~

Donor List

S.no	Name	Mobile Number	Email Id	Age	Gender	Blood Group	Address	Action
1	hasan	856631522	hasan@gmail.com	19	Male	A+	abc	DELETE
2	vetri	4568845451	suiieddhef@gmail.com	19	Male	A-	cba	DELETE

1

Ex.No 5**TESTING****Test cases:**

Name	Requirement	Description	Input	Expeted o/p	Actual o/p
Login	Username & password should be entered	Used to verify if actor is the authorized person or not	User,name,password	Valid msg	Valid msg
Login	Username & password should be entered	Used to verify if actor is the authorized person or not	User,name,password	InValid msg	InValid msg
Logout	Home page	Used to logout the application and go to login page	Home page of the application	Valid msg	Valid msg
check	Check if the required blood type are available	Used to issue blood	Request id, address, name	Valid msg	Valid msg
check	Check the stock of the blood	Used to check availability of blood	Admin id , password	Valid msg	Valid msg
return	Used to return user details	Used to check No.of donors available to donate blood	Admin id	Valid msg	Valid msg
return	Used to return stock details	Used to check available blood and units of blood available	Admin id	Valid msg	Valid msg
search	All info stored in database	View user details	Donor id, name, blood type , mobile no, address	Valid msg	Valid msg