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SRS Document of

Blood Management System

Group-07
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I. Abstract

A blood management system is a healthcare process that focuses on optimizing the use of blood products to improve patient outcomes, reduce transfusion-related risks, and conserve valuable resources. The system includes strategies such as preoperative optimization, intraoperative blood conservation, and postoperative monitoring. The goal is to minimize unnecessary blood transfusions while providing appropriate transfusion support to patients who require it. A well-designed blood management system can improve patient safety, reduce costs, and enhance overall healthcare quality.

Key Words: Blood inventory management, Blood wastage reduction, Donor, Receiver, Transfusion, Blood availability tracking, Blood wastage reduction

II. Acknowledgement

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Chapter-01

Introduction

1.1 Introduction

The number of persons who need blood are increasing in large number day by day. To help people who need blood, Blood Management System can be used effectively for getting the details of blood donors having the same blood group and within the same city. With the help of Online Blood Management System, people who are having the thought of donating blood gets registered in this platform giving his total details.

This Blood Management System is available to everyone easily. A person who likes to donate blood gives his entire details. This system also helps people who need blood by giving the details of the donors by searching. Which Receiver need blood they can register in this system and search donor then contact with donor.

The present project has the following features-

- Registering the Donors
- Registering the Receivers
- Searching a Donor
- Give blood to the patient

1.2 Problem Statement

This project is designed for successful completion of a project on blood management system. The basic building aim is to provide blood donation service to the city recently. Blood Bank Management system is a web-based application that is designed to store, process, retrieve and analyze information concerned with the administrative and inventory management within a Blood Bank. This project aims at maintaining all the information pertaining to blood donors, different blood groups available in every Blood Bank and help them manage in a better way. Project aim is to provide transparency in this field, make the process of obtaining blood from a Blood Bank hassle-free and corruption-free and make the system of Blood Bank Management effective.

1.3 Objective

The main objective of this specification is to support the automated tracking of blood products from the initial ordering of a blood transfusion for a patient, through to the taking of a blood sample for cross matching, to administration of a blood transfusion and subsequent updates to care records. To allow the probable recipients to make search and match the volunteer donors, and make request for the blood.

A blood management system aims to improve the efficiency and effectiveness of blood donation programs, enhance donor recruitment and retention efforts, and ensure a safe and adequate blood supply for patients in need. The following are the main objectives of a blood management system:

1.3.1 To streamline the blood donation process:

The blood management system project aims to streamline the blood donation process by automating donor registration, ensuring proper donor screening, and tracking the blood supply chain from donation to transfusion. This was help reduce the time and effort required to manage blood donation programs and improve the quality and safety of the donated blood.

1.3.2 To improve donor recruitment and retention:

The project aims to improve donor recruitment and retention efforts by providing tools for targeted outreach and recruitment of potential donors, enabling donors to easily schedule appointments, and tracking donor history and preferences to facilitate donor retention efforts. This was help increase the number of donors and ensure a steady supply of blood for patients in need.

1.3.3 To enhance inventory management:

The project aims to enhance inventory management by tracking the availability and expiration of blood products, maintaining optimal inventory levels, and ensuring that blood products are appropriately matched with patients in need. This was help reduce waste and ensure that blood products are available when and where they are needed.

1.3.4 To facilitate distribution and transfusion:

The project aims to facilitate the safe and efficient distribution of blood products to healthcare providers, track transfusion events, and monitor adverse reactions. This was help ensure that patients receive safe and appropriate blood products and reduce the risk of adverse reactions.

1.3.5 To reduce cost associated with blood procurement, distribution:

The project aims to reduce costs associated with blood procurement and distribution by improving the efficiency of blood donation programs, enhancing inventory management, and reducing waste. This was help healthcare organizations save money and allocate resources more effectively.

1.4 Motivation

Blood transfusions are essential for saving lives and improving patient outcomes in various medical settings, such as emergency departments, surgical suites, and intensive care units. However, blood transfusions are associated with significant risks, such as transfusion reactions, infections, and transfusion-related acute lung injury. Additionally, blood products are expensive and in limited supply, which makes the efficient use of blood resources critical. These factors have motivated healthcare providers to implement blood management systems (BMS) that optimize the use of blood products while ensuring patient safety.

A BMS is a comprehensive program that includes strategies to minimize blood loss, promote blood conservation, and manage anemia in patients. It involves the coordination of multiple healthcare providers, including physicians, nurses, laboratory technicians, and transfusion specialists, to ensure appropriate blood utilization. A BMS also includes a robust information system to monitor blood utilization, provide decision support, and enable quality improvement initiatives.

One of the primary motivations for implementing a BMS project is to reduce unnecessary blood transfusions. Studies have shown that up to 50% of blood transfusions may be inappropriate, and unnecessary transfusions are associated with increased morbidity, mortality, and healthcare costs. A BMS can help identify patients who are at high risk of transfusion and implement strategies to reduce the need for transfusions, such as using blood-sparing surgical techniques, optimizing hemoglobin levels, and administering erythropoietin.

Chapter-02

Project Management Plan

2.1. Project Organization

There are several reasons why a blood management system project is necessary. Firstly, the demand for blood and blood products is increasing, and there is a need to ensure that the supply is sufficient to meet the demand. Secondly, blood is a perishable commodity, and there is a need to ensure that it is stored and transported under the right conditions to maintain its quality. Thirdly, the safety of the blood supply is of utmost importance, and there is a need to ensure that blood products are screened for infectious agents and other contaminants before they are transfused to patients.

A blood management system project can help to address these challenges by providing a centralized system that can track the entire blood supply chain. The system can monitor the blood inventory levels, predict the demand for blood, and ensure that the right blood products are available when needed. It can also monitor the temperature and storage conditions of blood products during transportation and storage, to ensure that they are maintained within acceptable levels.

Furthermore, a blood management system project can improve the safety of the blood supply by providing a platform for screening blood products for infectious agents and other contaminants. The system can also provide real-time alerts to healthcare providers if any abnormalities are detected in the blood products, allowing for prompt intervention to prevent adverse events.

2.2. Lifecycle Model Used

The lifecycle model used for a blood management system project typically includes the following phases:

- Requirements Gathering:

The requirements gathering phase involves collecting and analyzing the business requirements for the blood management system. This phase typically involves working closely with stakeholders, such as clinicians, laboratory technicians, and supply chain experts, to understand their needs and requirements.

- Development:

The development phase involves building the blood management system based on the design created in the previous phase. This phase includes writing code, creating databases, and integrating third-party systems.

- Testing:

The testing phase involves testing the blood management system to ensure that it meets the defined quality standards. This phase includes unit testing, integration testing, and system testing.

- Deployment:

The deployment phase involves deploying the blood management system into production. This phase includes installing the system, configuring it for the production environment, and training end-users.

- Maintenance:

The maintenance phase involves providing ongoing support and maintenance for the blood management system. This phase includes monitoring the system, addressing any issues that arise, and making updates and improvements as needed.

2.3. Risk Analysis

The development of a blood management system involves a certain level of risk. These risks could result in delays, cost overruns, or even project failure. To minimize these risks, a risk analysis must be conducted during the project planning phase. In this article, we explored the risk analysis for a blood management system.

The risk analysis for a blood management system involves the following steps:

- Identify Risks:

The first step in the risk analysis process is to identify potential risks. These risks could be related to the application's scope, schedule, resources, technology, or any other area that could impact the application's success.

- Assess Risks:

The next step is to assess the likelihood and impact of each identified risk. This involves analyzing the probability of the risk occurring and the potential consequences if it does.

- Prioritize Risks:

Once the risks have been assessed, they should be prioritized based on their likelihood and impact. The highest priority risks should be addressed first, followed by the lower priority risks.

- Mitigate Risks:

The next step is to develop a plan to mitigate each identified risk. This could involve implementing risk management strategies such as risk avoidance, risk transfer, risk reduction, or risk acceptance.

- Monitor Risks:

The final step is to monitor the identified risks throughout the application's lifecycle. This involves keeping a watchful eye on the risks and taking proactive steps to prevent them from occurring or escalating.

The risk analysis for a blood management system is an essential step in the project planning process. It helps to identify potential risks that could impact the application's success and provides a framework for

addressing those risks. By conducting a thorough risk analysis and developing a risk management plan, we could minimize the risks associated with the blood management system and ensure its success.

2.4. Hardware and Software Resource Requirements

A blood management system requires adequate hardware and software resources to operate efficiently and effectively. The hardware and software requirements for such a project must be identified and analyzed during the planning phase to ensure that we had access to the necessary resources. In this article, we explored the hardware and software resource requirements for a blood management system.

2.4.1 Hardware Requirements

The hardware requirements for a blood management system include:

- Servers:
  The application requires at least one server to host the application and the associated databases. The server should have sufficient processing power, memory, and storage capacity to handle the expected load.

- Network:
  The application must be accessible over the network, either locally or remotely. A reliable and secure network infrastructure is necessary to ensure that users can access the application when needed.

- Workstations:
  Users require workstations or computers to access the application. The workstations should meet the minimum hardware requirements to run the application smoothly.

- Printers:
  The application generates reports and other documents that require printing. Printers must be available, reliable, and easily accessible to users.

2.4.2 Software Requirements

The software requirements for a blood management system include:

- Operating System:
  The server and workstations require an operating system that is compatible with the application. The operating system should be reliable and easy to maintain.

- Database Management System:
  The application requires a database management system to store and retrieve data. The database management system should be reliable, secure, and scalable to handle future growth.

- Web Server:
  The application requires a web server to host the web interface. The web server should be reliable, secure, and capable of handling the expected load.

- Antivirus and Security Software:
  The application must be protected from viruses and other security threats. Antivirus and security software should be installed on all workstations and servers to ensure data security.

2.5. Deliverables and Schedule

The success of any project depends on proper planning and scheduling of deliverables. A blood management system is no exception. In this article, we explored the deliverables and schedule for a blood management system.

2.5.1 Deliverables

Deliverables are the tangible and intangible products or services that we had to deliver to the stakeholders. The deliverables for a blood management system include:

- Project Charter: The project charter is a document that outlines the project's purpose, goals, objectives, stakeholders, and project team.

- Requirements Document: The requirements document outlines the functional and non-functional requirements of the blood management system application.

- Design Document: The design document outlines the system architecture, database design, and user interface design.

- Test Plan: The test plan outlines the testing procedures and protocols that we used to ensure that the blood management system application meets the functional and non-functional requirements.

- User Manual: The user manual provides instructions on how to use the blood management system application.

- Training Plan: The training plan outlines the training procedures and protocols that we used to ensure that stakeholders can effectively use the blood management system application.

2.5.2 Schedule

The schedule for a blood management system should outline the timeline for each phase of the project. The schedule should include:

- Planning Phase: The planning phase should include the development of the project charter,

requirements document, and design document.

- Development Phase: The development phase should include the coding of the blood management system application, testing, and bug fixing.
- Implementation Phase: The implementation phase should include the deployment of the blood management system application, user training, and system documentation.
- Maintenance Phase: The maintenance phase should include ongoing system updates, bug fixing, and user support.

2.6. Monitoring, Reporting, and Controlling Mechanisms

Monitoring, reporting, and controlling mechanisms are essential components of any project management approach. A blood management system is no exception. In this article, we explored the monitoring, reporting, and controlling mechanisms for a blood management system.

2.6.1 Monitoring

Monitoring is the process of tracking project progress, identifying potential problems, and implementing corrective measures. The monitoring mechanism for a blood management system should include:

- Milestones: We identified key milestones for the project and track progress against these milestones.
- Metrics: We established metrics to track the quality, performance, and progress of the blood management system application.
- Risk Management: We should have continuously monitored and manage potential risks that could impact the project's success.
- Budget Tracking: We should have monitored project expenditures against the project budget to ensure that the project remains within budget.

2.6.2 Reporting

Reporting is the process of communicating project progress and status to stakeholders. The reporting mechanism for a blood management system should include:

- Progress Reports: We provided regular progress reports to stakeholders, including updates on milestones, metrics, and risk management.
- Budget Reports: We provided regular budget reports to stakeholders, including updates on project

expenditures and budget projections.

- Issue Reports: We provided issue reports to stakeholders, including updates on potential problems and corrective measures.

2.6.3 Controlling Mechanisms

Controlling is the process of implementing corrective measures to ensure that the project remains on track. The controlling mechanism for a blood management system should include:

- Change Control: We implemented a change control process to manage changes to the blood management system application's scope, requirements, and design.

- Issue Management: We implemented an issue management process to manage potential problems and implement corrective measures.

- Quality Assurance: We implemented a quality assurance process to ensure that the blood management system application meets the functional and non-functional requirements.

2.7. Impact of the project on individuals and organizations

Blood is a life-saving commodity that is essential in medical treatments, surgeries, and emergencies. Therefore, managing blood donations, storage, and distribution is critical to ensure the timely and efficient delivery of blood products to patients in need. To address this challenge, a blood management system was launched to enhance the existing manual blood management system. The purpose of this article is to examine the impact of the project on individuals and organizations involved in blood management.

2.5.1 Impact on individuals

The implementation of the blood management system has had a significant impact on individuals involved in the process of blood donation, storage, and distribution. Firstly, donors can now easily register and schedule their donations through the application, which has reduced the waiting time and increased the number of donations. This has not only improved the donor experience but also increased the availability of blood products for patients.

Secondly, the application has improved the traceability of blood products, reducing the risk of errors and increasing patient safety. Medical staff can now easily access information on the donor, the blood product, and its location, which allows for faster and more accurate tracking and tracing. This has also reduced the time spent searching for blood products, allowing medical staff to focus on patient care.

Finally, the blood management system has improved the transparency and accountability of blood management. All transactions related to blood donation, storage, and distribution are recorded in the

application, providing a complete audit trail. This has reduced the risk of fraud and corruption, ensuring that blood products are distributed fairly and equitably.

2.5.2 Impact on organizations

The implementation of the blood management system has also had a significant impact on organizations involved in blood management. Firstly, the application has improved the efficiency and effectiveness of blood management. The automation of blood management processes has reduced the time and cost associated with manual processes, allowing organizations to manage blood products more efficiently. This has also enabled organizations to respond more quickly to emergencies and disasters.

Secondly, the application has improved the quality of blood management. The enhanced traceability and accountability provided by the application have improved the quality of data, reducing the risk of errors and improving decision-making. This has also improved the overall quality of blood products, ensuring that patients receive safe and effective treatments.

Finally, the blood management system has improved collaboration and communication between organizations involved in blood management. The application allows for real-time sharing of information, reducing the need for manual communication and improving collaboration between blood banks, hospitals, and other organizations involved in blood management.

Chapter-03

Requirement Specifications

3.1. Stakeholders for the system

Stakeholders are individuals or organizations that have an interest or concern in the success of a project. Identifying and engaging stakeholders is critical to the success of any project, including a blood management system. The purpose of this article is to identify and discuss the stakeholders for a blood management system.

- Blood Donors: Blood donors are one of the primary stakeholders in a blood management system. The application should be designed to provide a seamless and user-friendly experience for donors to register, schedule, and track their donations.

- Healthcare Providers: Healthcare providers, including doctors, nurses, and laboratory technicians, are critical stakeholders in a blood management system. They rely on the availability and quality of blood products to treat patients, and the application should be designed to improve the traceability, accountability, and efficiency of blood management.

- Blood Banks: Blood banks are responsible for collecting, testing, storing, and distributing blood products. They are essential stakeholders in a blood management system , as the application should be designed to enhance the efficiency and effectiveness of their operations.

- Hospitals: Hospitals are the primary users of blood products, and they rely on the availability and quality of blood products to treat patients. They are critical stakeholders in a blood management system , as the application should be designed to improve the traceability, accountability, and efficiency of blood management.

- Regulatory Agencies: Regulatory agencies, such as the Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC), are responsible for ensuring the safety and efficacy of blood products. They are essential stakeholders in a blood management system , as the application should comply with their regulations and standards.

- IT Department: The IT department is responsible for designing, developing, and maintaining the blood management system application. They are critical stakeholders in the project, as the application should be designed to meet their technical requirements and standards.

- Project Managers: Project managers are responsible for the successful implementation of the blood management system. They are critical stakeholders in the project, as they oversee the project's progress and ensure that it meets its objectives, budget, and timeline.

3.2. Use case model.

3.2.1. Graphic use case model

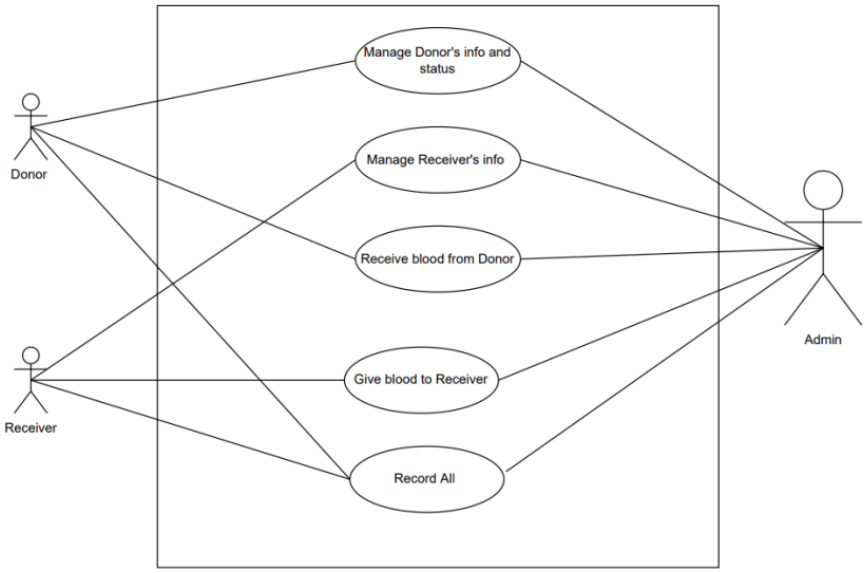

Figure-01: Use case model of Blood Management System.

3.2.2. Textual Description for each use case

Here's a description of the roles of admin, donor, and receiver in a blood bank system:

- Admin: The admin is responsible for managing the blood bank system. This includes overseeing the registration of donors and receivers, managing inventory, coordinating blood donation drives, and ensuring compliance with regulatory standards. The admin also manages the user accounts, including creating and deleting accounts, and granting permissions to access the system's features. They also generate reports and statistics related to blood bank operations and manage the system's security and backup.

- Donor: The donor is an individual who donates blood to the blood bank system. They can register themselves in the system and schedule an appointment to donate blood. The system collects their personal and medical information, including their blood type, and tracks their donations. Donors can also view their donation history and receive notifications about their eligibility to donate blood again. They can also update their personal and medical information as needed.

- Receiver: The receiver is an individual who needs blood for medical treatment. They can register themselves in the blood bank system and provide their medical information, including their blood type, to request blood. The system matches their blood type with available blood in the inventory and notifies the receiver of the availability of the blood. The receiver can schedule an appointment to receive the blood and track the status of their request. Once the blood is received, the system

updates the inventory and the donor's donation history.

Overall, the roles of admin, donor, and receiver are essential for the successful functioning of a blood bank system. The system is designed to meet the specific needs of each role and ensure the efficient and secure management of blood bank operations.

3.3. Rationale for our use case model:

In the blood management system application project, the interaction between the components and the environments of the system was explained through a series of use case diagrams. These diagrams depicted the various actors and use cases that were involved in the system.

The use case diagram showed the interaction between the donor and the system. The donor was the actor in this case, and the use cases included registering as a donor, providing blood samples, and scheduling appointments for blood donations.

The use case diagrams provided a clear and concise visualization of the interaction between the components and the environments of the system. This helped us to better understand the requirements of the system and ensure that all necessary use cases were included in the final product.

3.4. Non-functional requirements

Non-functional requirements are essential aspects of any software development project, including a blood management system. Non-functional requirements are the quality attributes of the system that are not directly related to its functionality but are critical to its overall performance and usability. In this article, we discussed the non-functional requirements for a blood management system.

- Performance: Performance is a crucial non-functional requirement for a blood management system. The system should be designed to handle a large volume of data, including donor and receiver information, blood type, inventory, and requests. It should be able to handle multiple requests simultaneously without compromising the system's speed or responsiveness.

- Scalability: The blood management system should be scalable, meaning that it can accommodate increasing amounts of data and requests as the user base grows. It should be able to handle the addition of new users and blood banks without affecting its performance or usability.

- Reliability: The blood management system should be reliable, meaning that it can operate continuously without interruption or failure. It should be designed to prevent data loss or corruption in the event of a system failure or power outage. It should also have backup and recovery mechanisms to ensure that the system can be restored quickly and without data loss.

- Security: Security is a critical non-functional requirement for a blood management system. The

system should be designed to prevent unauthorized access, ensure the confidentiality of donor and receiver information, and prevent data theft or loss. It should include measures such as encryption, access controls, and audit trails to ensure the security of the system.

- Usability: The blood management system should be designed with usability in mind. It should be easy to navigate and use, with intuitive user interfaces and clear instructions. It should also be accessible to users with disabilities, such as vision or hearing impairments.

- Compatibility: The blood management system should be compatible with a range of devices, platforms, and operating systems. It should be designed to work with common web browsers and mobile devices, ensuring that users can access the system from anywhere and on any device.

Non-functional requirements are critical aspects of a blood management system. We considered performance, scalability, reliability, security, usability, and compatibility when designing the system. By ensuring that these non-functional requirements are met, the blood management system can deliver a high-quality, efficient, and secure system that meets the needs of its users.

Chapter-04

Architecture

4.1. Architectural style(s) used

The architectural style used in the development of an application played a critical role in its performance, maintainability, and scalability. In this article, we will discuss the architectural style(s) used in the blood management system.

Architectural Styles:

The blood management system utilized a multi-tier architecture style. This architecture style divided the application into three distinct tiers, including the presentation tier, application tier, and data tier.

- The presentation tier: This tier was responsible for rendering the user interface of the application. The presentation tier of the blood management system application was built using AngularJS, a front-end development framework that facilitated the creation of dynamic and responsive web pages.

- The application tier: This tier was responsible for the business logic of the application. It received user input from the presentation tier, processed it, and sent the output back to the presentation tier. The application tier of the blood management system application was built using Spring Boot, a popular Java-based web framework that simplified the development of robust and scalable web applications.

- The data tier: This tier was responsible for storing and managing the data used by the application. The data tier of the blood management system application was built using MySQL, an open-source

relational database management system that provided fast and reliable data storage.

The multi-tier architecture style used in the blood management system provided several benefits, including scalability, maintainability, and separation of concerns. By using AngularJS, Spring Boot, and MySQL, we were able to develop a high-performing and reliable application that met the requirements of the end-users.

4.2. Architectural model

The architecture of an application played a critical role in determining its performance, maintainability, and scalability. In this article, we will discuss the architectural model of the blood management system.

Architectural Model:

The blood management system utilized a client-server architectural model. This model was based on the principle of dividing the application into two distinct parts, including the client-side and server-side.

- The client-side: This part of the application was responsible for rendering the user interface of the application. It included the presentation tier, which was responsible for the user interface design and interaction. The client-side of the blood management system application was built using AngularJS, a front-end development framework that facilitated the creation of dynamic and responsive web pages.

- The server-side: This part of the application was responsible for the business logic and data storage of the application. It included the application and data tiers. The application tier was responsible for processing user input and generating output, while the data tier was responsible for storing and managing the data used by the application. The server-side of the blood management system application was built using Spring Boot, a popular Java-based web framework, and MySQL, an open-source relational database management system.

The client-server architectural model used in the blood management system provided several benefits, including scalability, maintainability, and separation of concerns. By using AngularJS, Spring Boot, and MySQL, we were able to develop a high-performing and reliable application that met the requirements of the end-users. The architectural model also facilitated the development of a modular and flexible application, which could be easily updated and modified to accommodate future requirements.

4.3. Technology and software used

The Blood Management System utilized a range of technologies and software to support its development and operation. Two of the most critical components were the MySQL database and the NetBeans Integrated Development Environment (IDE).

MySQL was widely used open-source relational database management system that was employed to store and manage the blood inventory data, including information on blood types, units available, and donations. MySQL provided excellent scalability, reliability, and security, making it an ideal choice for

the blood management system application.

We had chosen NetBeans as the primary IDE for the development of the blood management system application because of its ease of use and flexibility. NetBeans allowed the developers to write, edit, and test code quickly and efficiently, reducing development time and increasing productivity.

NetBeans was an open-source IDE that supported multiple programming languages, including Java, C++, and HTML5. It provided a range of features that made it an ideal tool for developing complex applications, including code editing, debugging, and profiling.

The use of MySQL and NetBeans together had allowed We to build a robust and reliable blood management system application. MySQL provided the necessary data storage and management capabilities, while NetBeans facilitated the development of the application's front-end and back-end components.

Overall, the use of MySQL and NetBeans had played a critical role in the development of the blood management system application. By leveraging these technologies, we were able to develop a high-quality application that had met the requirements of the end-users while providing scalability, reliability, and security.

Chapter-05

Design

5.1. GUI (Graphical User Interface) design

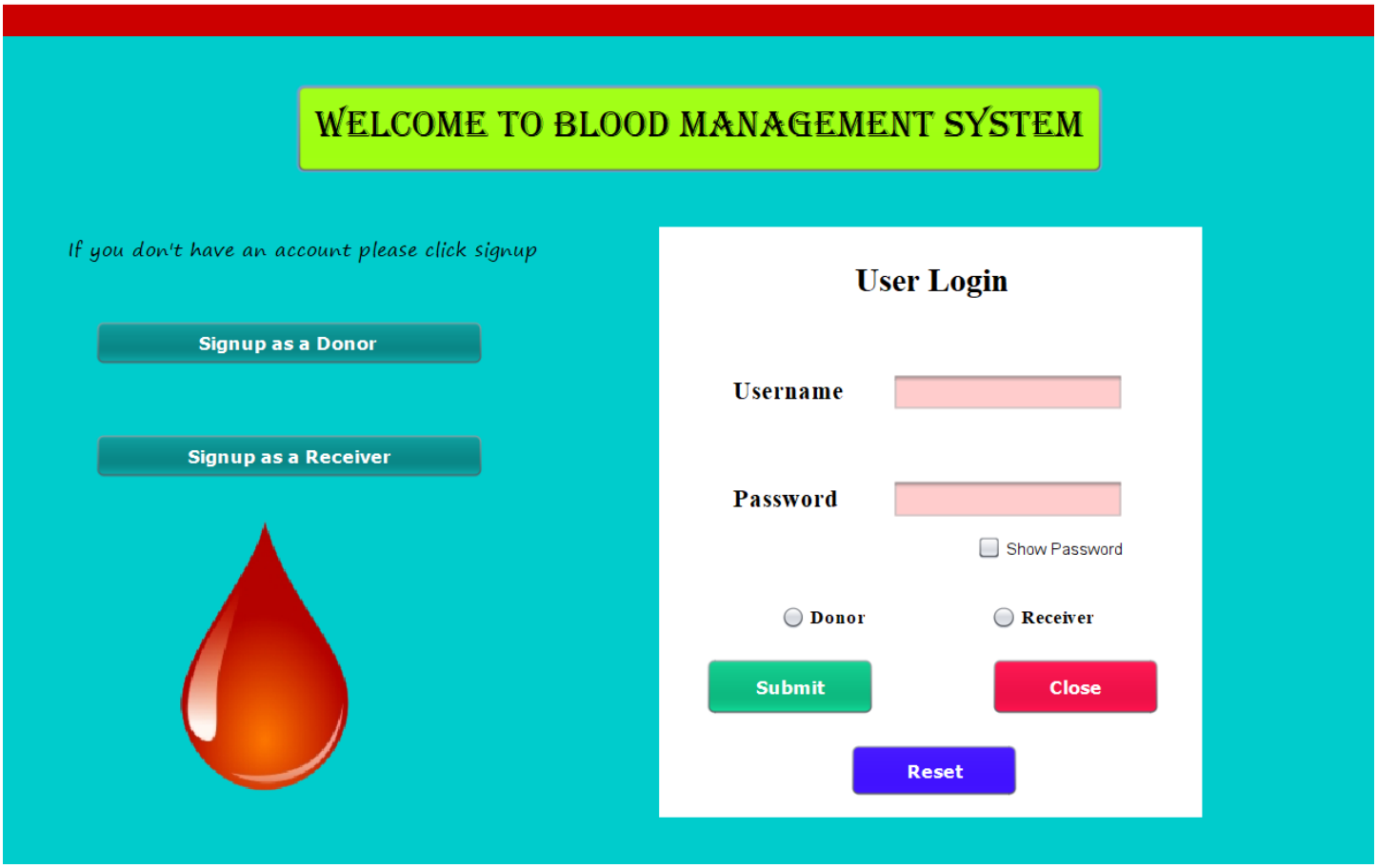

Figure-02: Graphical User Interface

5.2. Activity Diagram

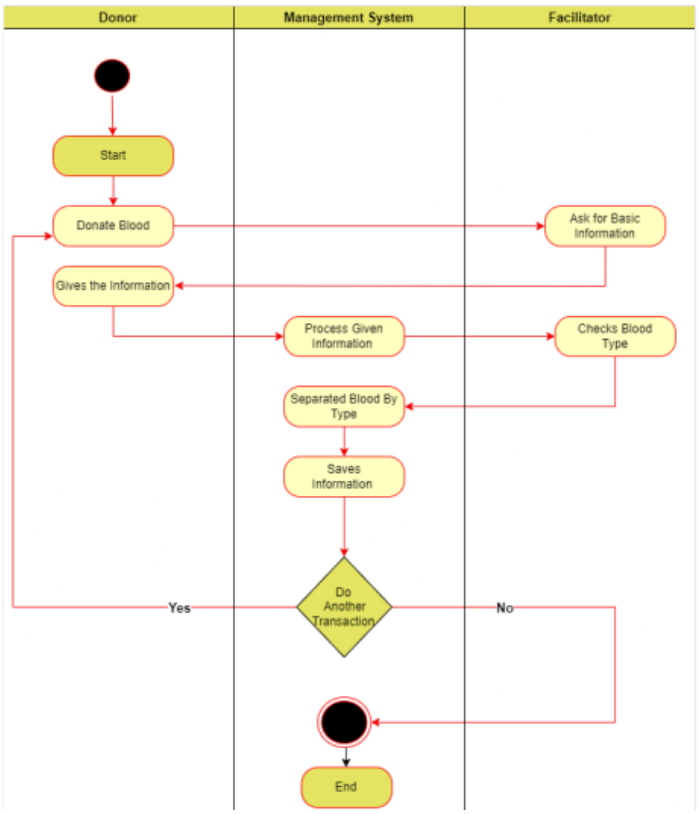

Figure-03: Activity Diagram of Blood Management System.

5.3. Dynamic model – sequence diagrams

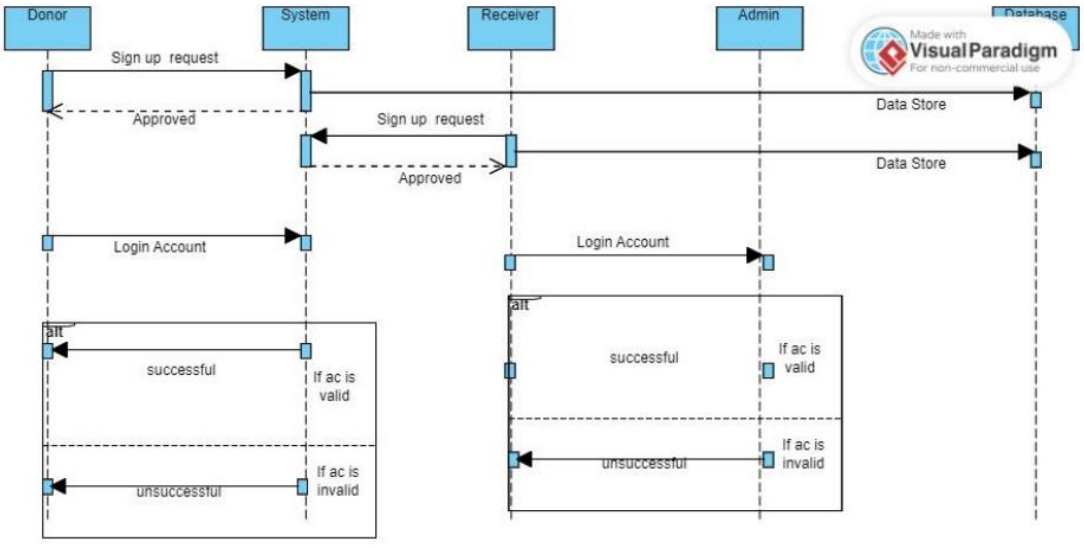

Figure-04: Sequence Diagram of Blood Management System.

5.4. Use Case Diagram

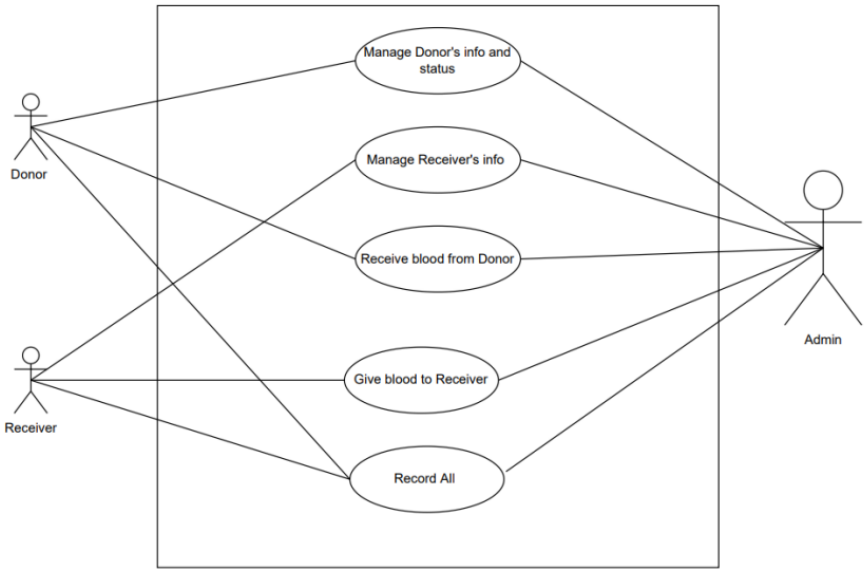

Figure-05: Use Case Diagram of Blood Management System.

5.5. Data Flow Diagram

5.5.1 DFD Level 0 Diagram:

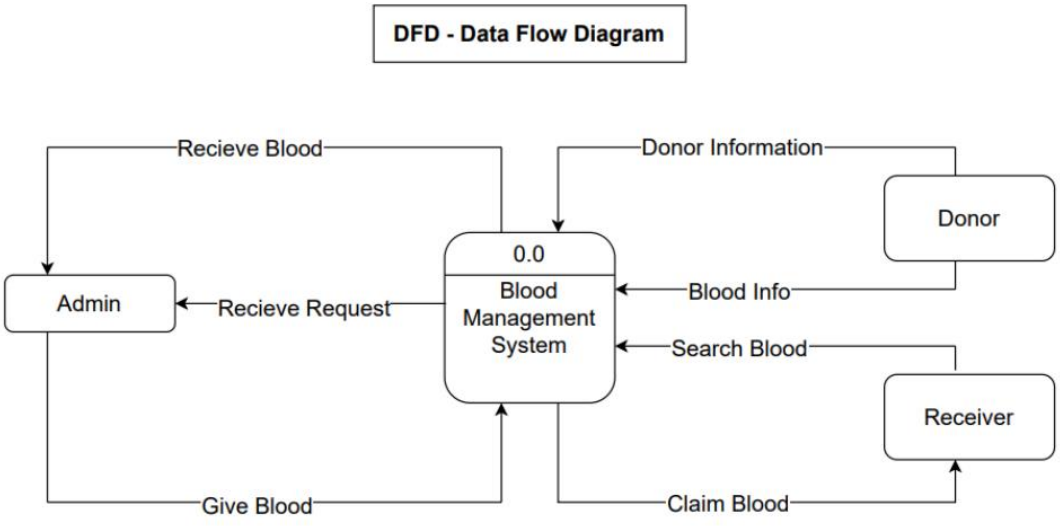

Figure-06: DFD Level 0 Diagram of Blood Management System.

5.5.2 DFD Level 1 Diagram:

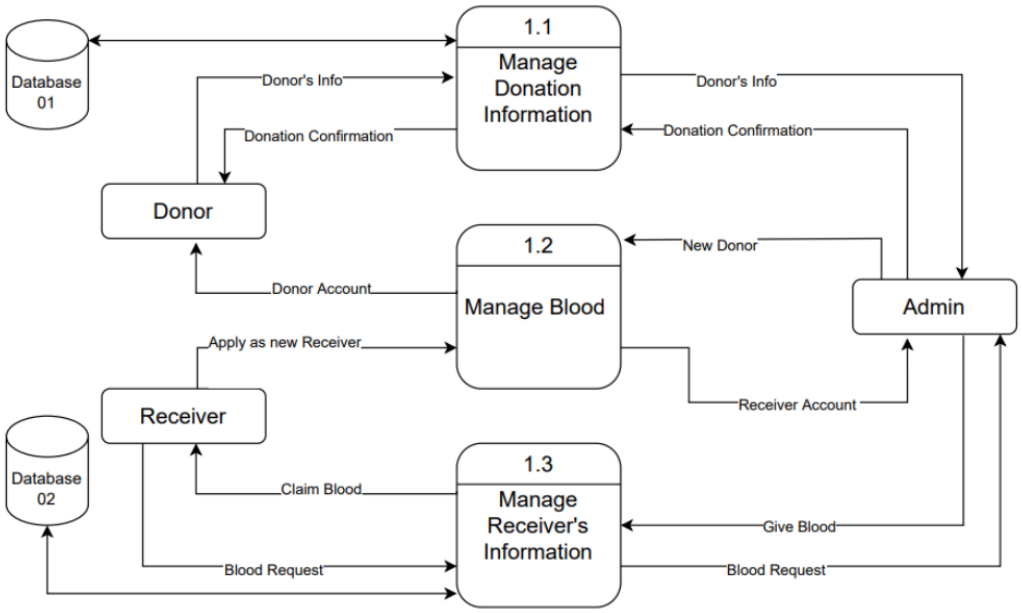

Figure-07: DFD Level 1 Diagram of Blood Management System.

Chapter-06

Test Plan

6.1. Requirements/specifications-based system level test cases

Here are some requirements/specifications-based system level test cases for a blood management system:

1. Login and Authentication:
    - Test case 1: Verified that the user can log in with valid credentials.
    - Test case 2: Verified that the user cannot log in with invalid credentials.
    - Test case 3: Verified that the user is redirected to the login page after logging out.
2. Donor Management:
    - Test case 1: Verified that a new donor can be added to the system.
    - Test case 2: Verified that the system prevents the addition of duplicate donor records.
    - Test case 3: Verified that the system can search for donors based on various criteria such as blood group, age, and gender.
3. Blood Product Management:

- Test case 1: Verified that the system can track the inventory of blood products accurately.
- Test case 2: Verified that the system can allocate blood products based on the donor's blood group and availability.
- Test case 3: Verified that the system generates alerts for expired or nearly expired blood products.

4. Reporting:
    - Test case 1: Verified that the system can generate reports on donor details based on various criteria such as blood group and donor type.
    - Test case 2: Verified that the system can generate reports on the inventory of blood products.
    - Test case 3: Verified that the system can generate reports on transfusion activities.
5. Security and Access Control:
    - Test case 1: Verified that only authorized users can access the system.
    - Test case 2: Verified that the system logs all user activities.
    - Test case 3: Verified that the system enforces access controls to ensure that users can only perform actions based on their roles and permissions.

These are just a few examples of the requirements/specifications-based system level test cases for a blood management system. It is essential to test the system thoroughly to ensure that it meets all the requirements and specifications and is reliable, accurate, and secure.

[NB]-The test case is added at the end of the report.

Chapter-07

Cost

7.1. Cost estimation

The cost estimation for a blood management system was depend on various factors such as the size and complexity of the system, the technology and tools used, the development team's experience and location, and the development timeline. Here are some of the cost components to consider:

1. Development Team: The cost of the development team was depended on their location, experience, and skillset. A team of experienced developers was generally cost more than a team of less experienced developers.
2. Development Tools and Infrastructure: The cost of development tools and infrastructure such as hardware, software, and licenses, was depend on the technology stack used in the system.
3. Development Timeline: The development timeline was determined the cost of the project. A longer development timeline was generally result in higher costs, as the development team was required more time to complete the project.
4. Maintenance and Support: The cost of maintenance and support should also be factored into the overall cost of the system. This includes ongoing support, bug fixes, and updates.
5. Testing and Quality Assurance: The cost of testing and quality assurance is an essential component of the development process. This includes unit testing, integration testing, system testing, and user acceptance testing.
6. Training and Documentation: The cost of training and documentation should also be considered, as the system was required training for end-users and documentation for support and maintenance.

Based on these factors, the cost estimation for a blood management system can range from tens of thousands to hundreds of thousands of dollars or more. It is important to conduct a detailed analysis of the project's requirements and specifications to obtain an accurate cost estimate. Additionally, it is important to factor in contingency costs to account for unexpected expenses or changes to the project scope.

Chapter-08

Result

8.1. Result

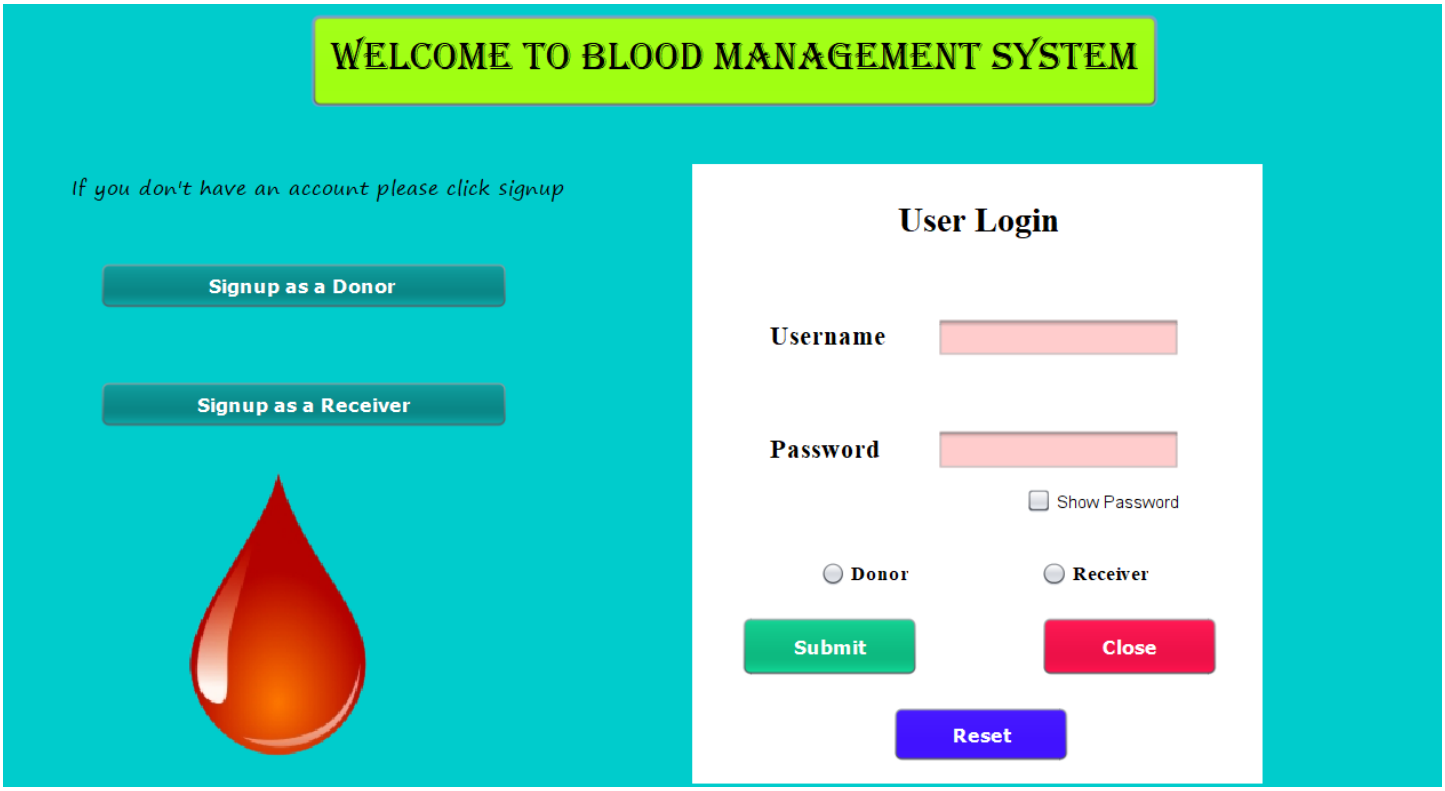

Figure-08: Home Page

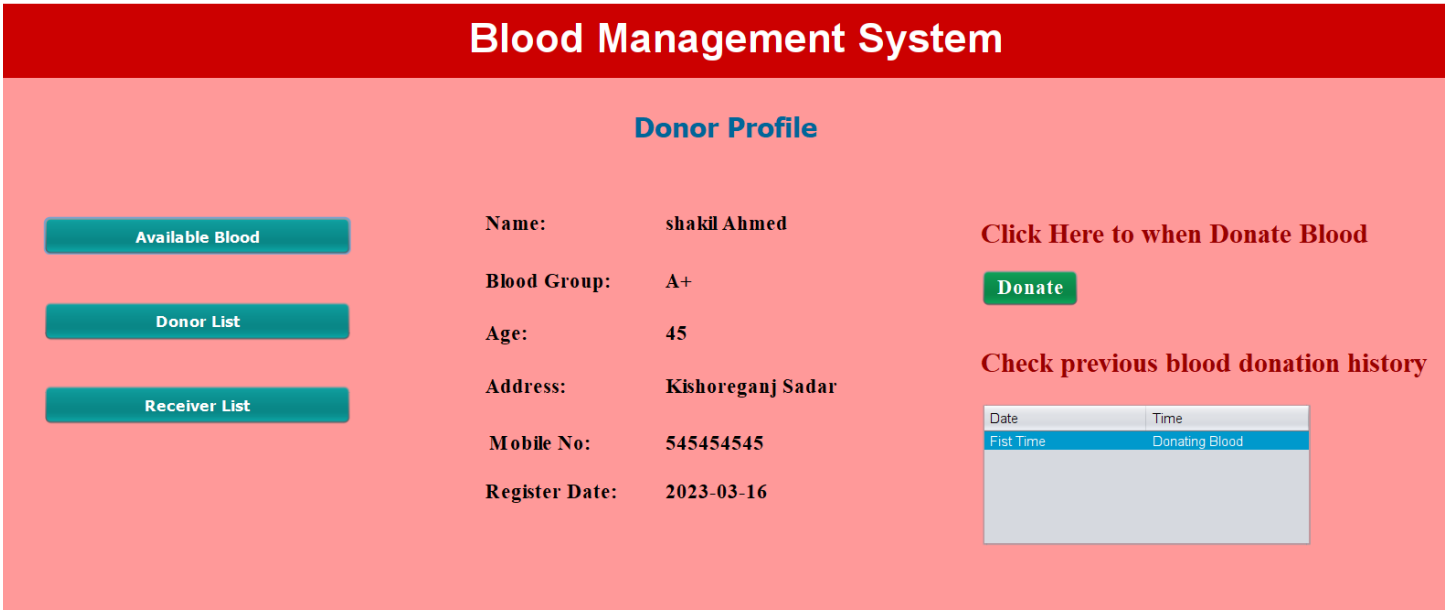

Figure-09: Donor Profile Page

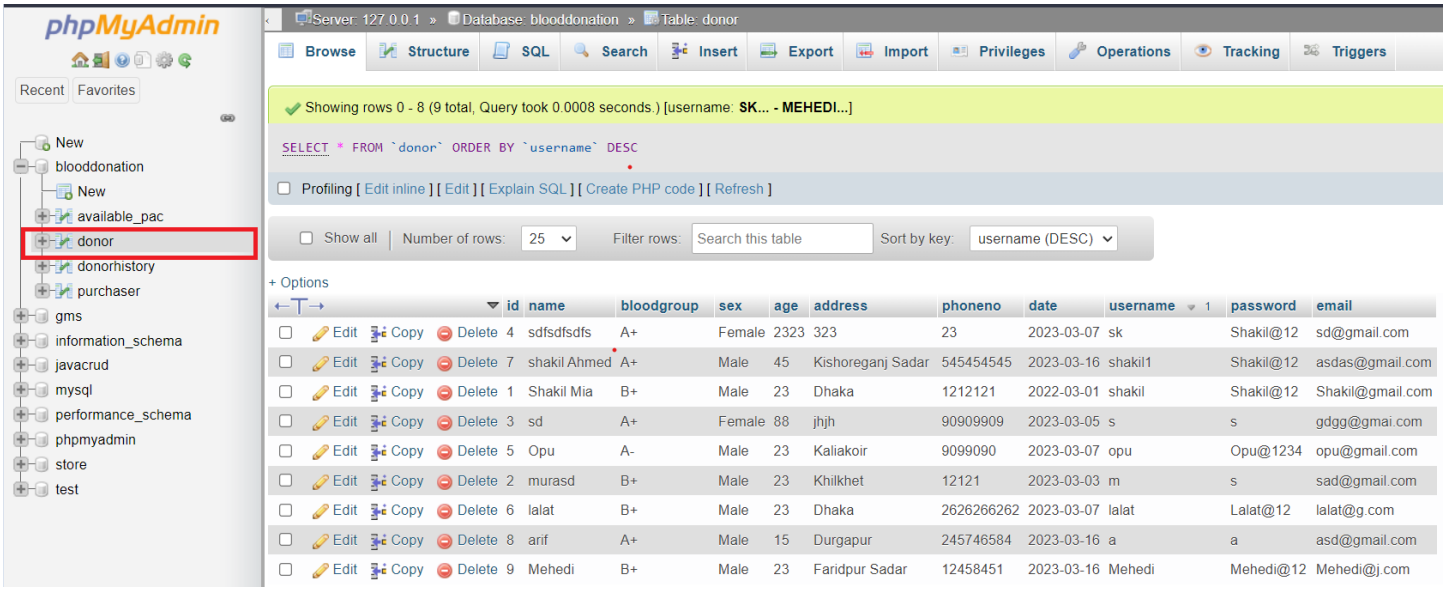

Figure-10: Donor Profile in Database

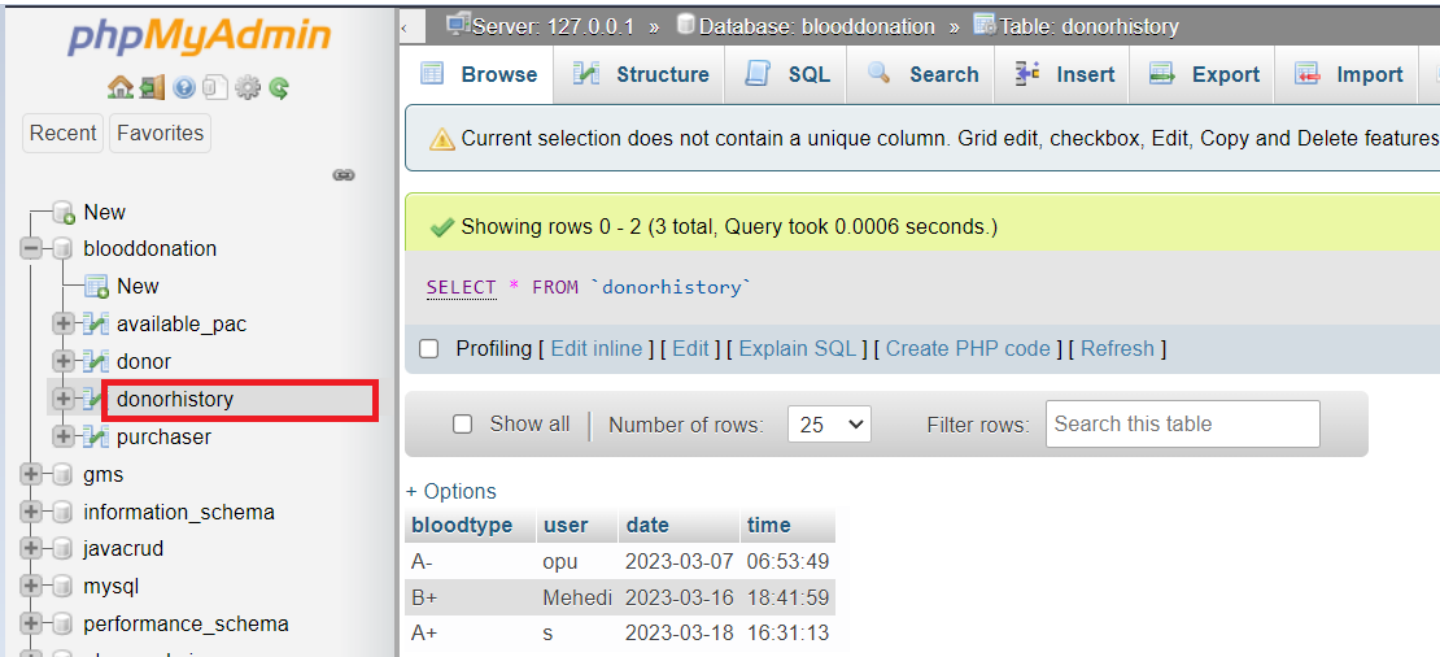

Figure-11: Donor History in Database

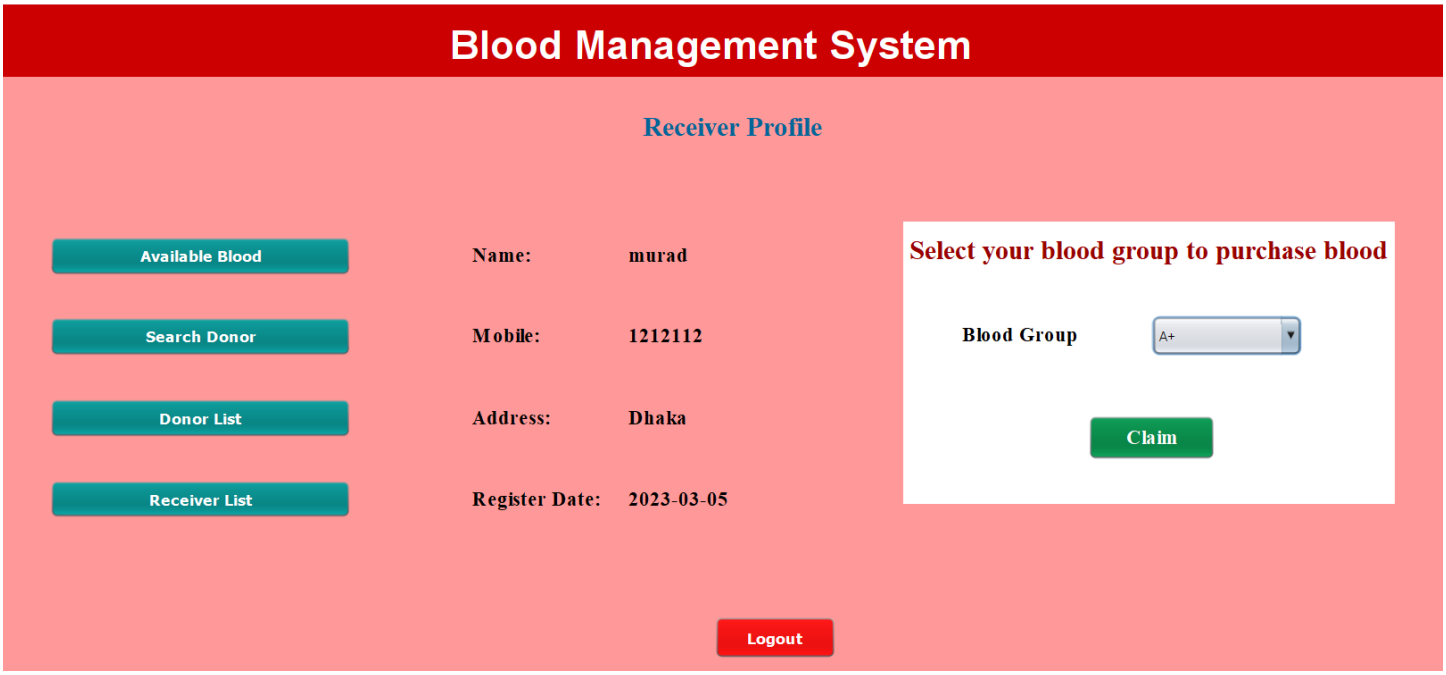

Figure-12: Receiver Profile Page

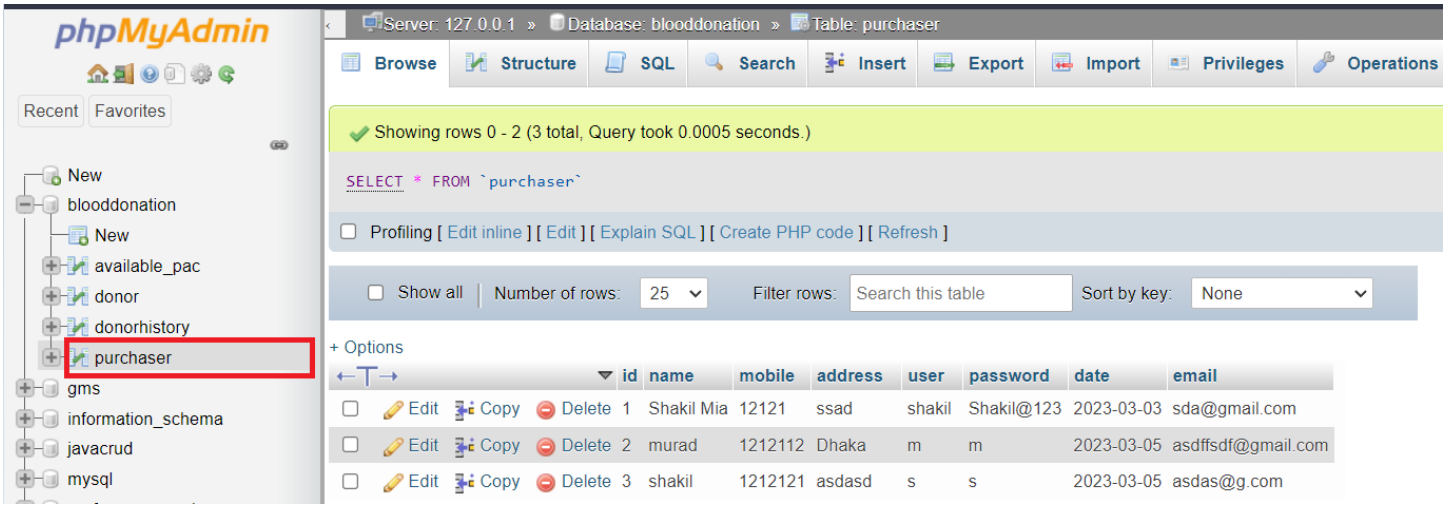

Figure-13: Receiver Profile in Database

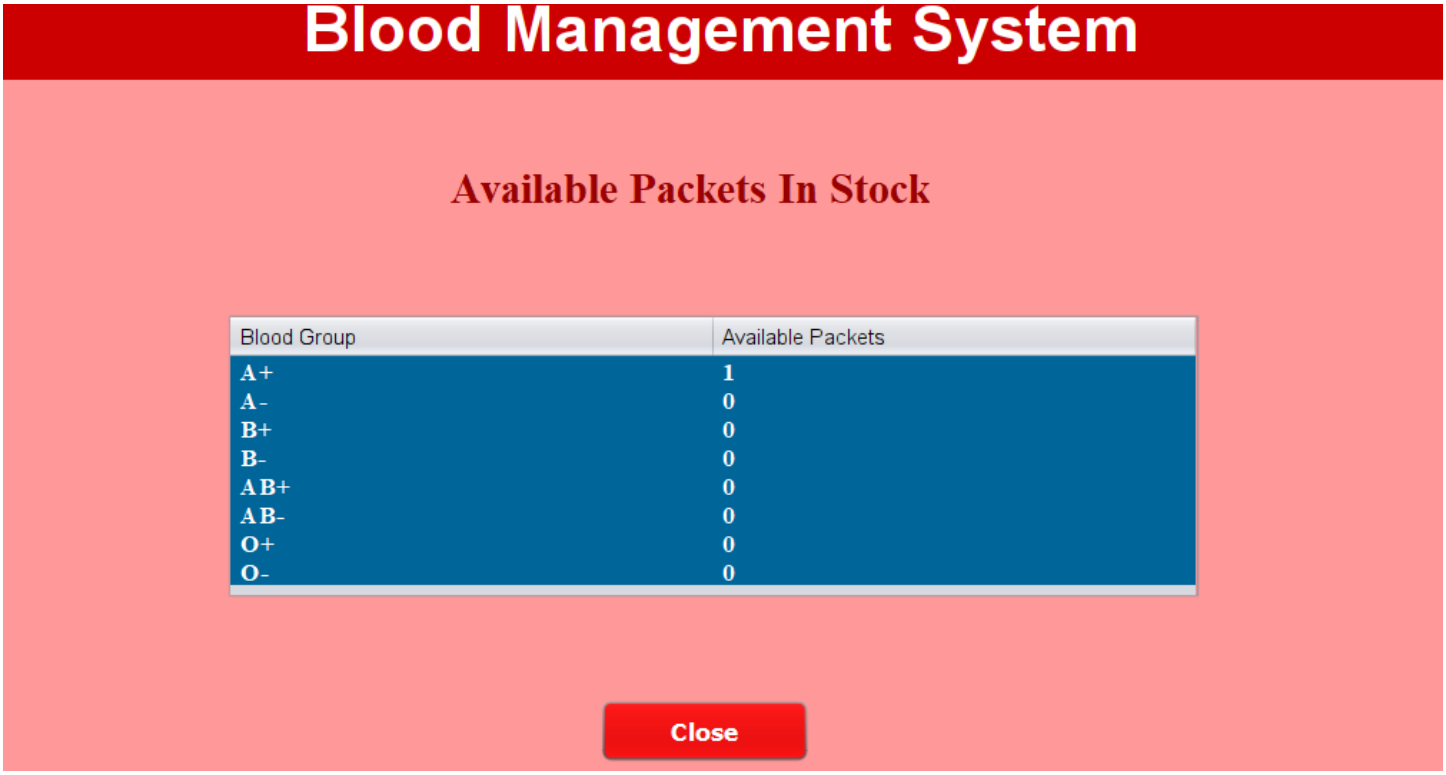

Figure-14: Available Blood Page

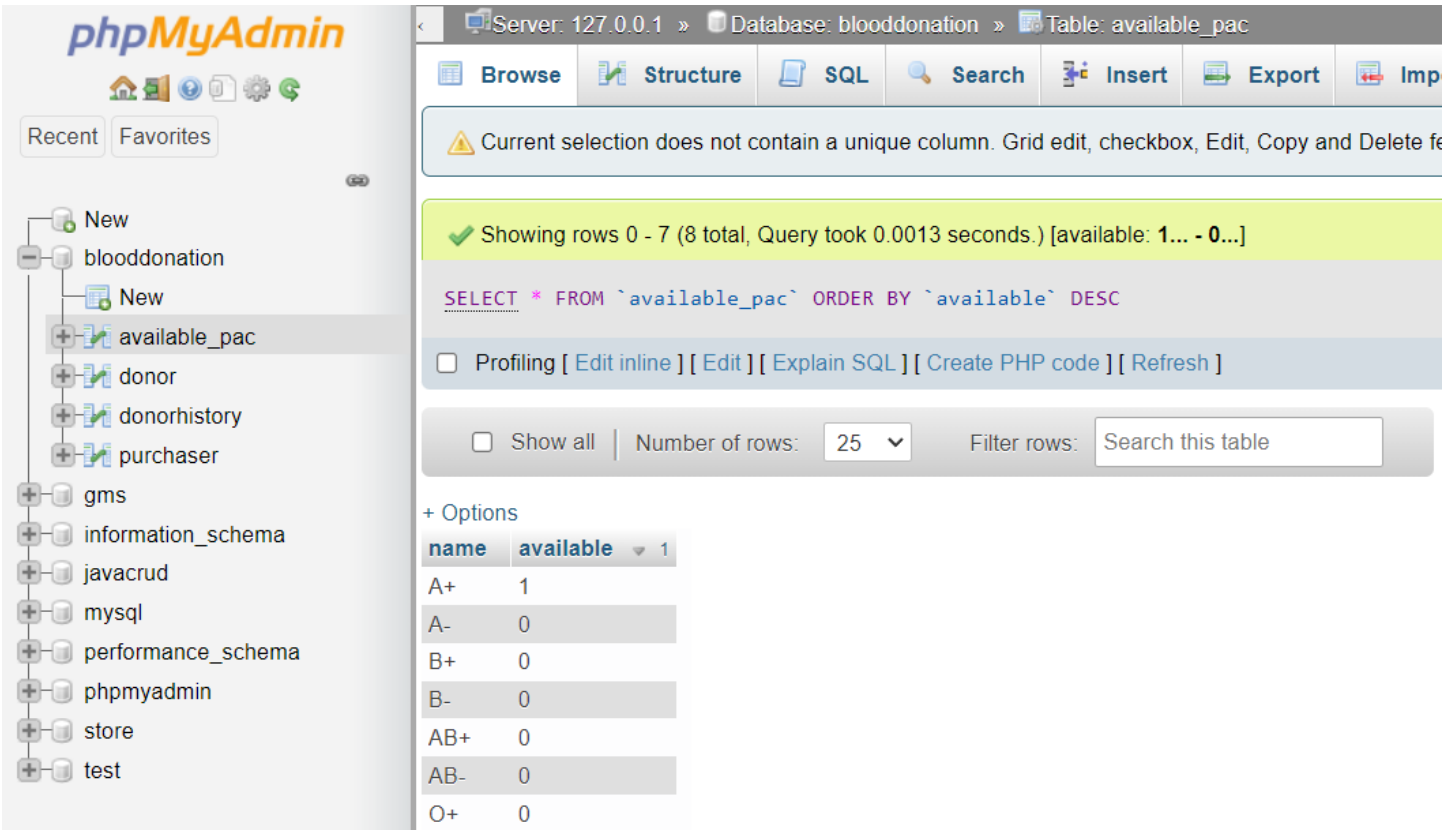

Figure-15: Available Blood in Database

Chapter-09

Conclusion and Discussion

The main goals and objectives of the study was to create a Blood Donation Management System in order to assist in the management of blood donor records and help to find a required blood donor in an emergency case by using modern technology. This system fulfills below requirements.

- To make probable receiver make requests for the blood and find voluntary donors quickly.
- To keep records about the donor and blood details to provide efficient donor and bloodstock management functions to the blood.
- Receiver can search by needed blood group or specific area also.
- Donor can see the last date of blood donation in his profile so, he can calculate 3 months easily when he available again.

Chapter-10

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