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Blood Bank Management System

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Abstract

The blood bank management system is a crucial tool for maintaining the inventory of blood donations and blood samples. In this paper, we propose the design and implementation of a blood bank management system using a Database Management System (DBMS) and Java Database Connectivity (JDBC). The system will help in the efficient management of blood donations and blood samples. The system will also allow for tracking of donor information, blood types, and inventory records. The system is implemented in Eclipse IDE and provides an easy-to-use interface for managing blood donations and monitoring inventory levels.

Objectives:

1)Efficient Blood Inventory Management:

The primary objective of the blood bank management system is to efficiently manage the blood inventory. The system should provide real-time data about the available blood units, their expiry dates, and the blood type. This will help blood banks to manage their inventory efficiently, reducing wastage, and ensuring that the right blood type is available when needed.

2)Accurate and Timely Reporting: The system should provide accurate and timely reports on blood stocks, blood donations, blood testing, and blood transfusions. The system should allow blood banks to generate reports on a daily, weekly, or monthly basis, and the reports should be easily accessible to healthcare professionals and other authorized personnel.

3)Donor Management: The system should allow blood banks to manage their donor database effectively. The system should

maintain a record of all donors, their blood types, and their medical history. It should also enable blood banks to track their donors' donation history, contact information, and eligibility status.

5)User-Friendly Interface: The system should have a user-friendly interface that is easy to navigate for both blood bank personnel and donors. It should be designed to minimize data entry errors and provide clear instructions to users.

6)Integration with Existing Hospital Management Systems: The system should be designed to integrate with existing hospital management systems, such as electronic health records (EHRs) and laboratory information systems (LISs). This integration should enable healthcare professionals to easily access and share blood donation data across different platforms.

Overall, the objective of the blood bank management system is to ensure that the blood donation process is efficient, safe, and meets the needs of hospitals and patients. The system enables blood banks to manage donor information and blood inventory records efficiently, and it enables hospitals to request and receive blood donations quickly.

Introduction

Blood donation is a life-saving process that can help save the lives of people in need. Blood banks play a crucial role in maintaining a steady supply of blood for transfusions. The blood bank management system is a web-based application that manages the process of blood donation from registration to distribution. The blood bank

management system is a tool that can help in the efficient management of blood donations and blood samples. The system can help in maintaining the inventory of blood samples, tracking the donor and recipient details, and other relevant information. The system can also help in ensuring the availability of blood when required and avoiding wastage of blood samples.

Present day blood bank storage is file based. The current blood bank management system relies on spreadsheets, papers, and files that are arranged in alphabetical or numeric order to store data and information related to blood, donors, and recipients. However, this paper-based recording system makes retrieving data and information a challenging and time-consuming task. Donors' test results are also recorded on papers, making the system prone to errors and mistakes, which can endanger human lives. Moreover, the system's poor efficiency adds to the problem, as retrieving information about blood, donors, or recipients is a tedious process that requires a significant amount of time.

To address these issues, each hospital should maintain its own record of patients and blood banks, making the information easily accessible. Implementing a blood bank management system would provide several benefits, such as maintaining accurate records and simplifying the process of checking the availability of blood. This upgrade from the current manual process would significantly improve the clarity and simplicity of the work, as the manual process is very time-consuming.

Literature review:

The three research papers provided in references address the topics of automated blood bank management systems, blood donation and transfusion, and the use of technology in blood banks. These papers highlight the significance of managing the inventory of blood banks, minimizing wastage, and ensuring the safety of donated blood.

The first paper titled "A Comprehensive Study on Blood Donation and Transfusion" provides an overview of the current status of blood donation and transfusion in India. The study highlights the increasing demand for blood and the challenges faced by blood banks in meeting this demand. The paper also discusses the importance of donor recruitment, donor screening, and the proper storage and handling of blood products.

The second paper titled "Design and Development of Automated Blood Bank Management System" presents a system that manages the process of blood donation, transfusion, and inventory management. The system provides a platform for blood banks to manage their operations digitally, eliminating the need for manual record-keeping. The study highlights the importance of automation in blood banks, which can enhance efficiency, reduce errors, and minimize the risk of transmission of infectious diseases.

The third paper titled "Blood Bank Management System" provides an overview of a software system that manages the blood inventory and donor information for a blood

bank. The study highlights the importance of technology in blood banks and how a software system can help streamline processes and reduce errors. The paper also discusses the challenges faced by blood banks, such as the shortage of blood supply and the need for proper testing and screening of donors.

Overall, these three papers provide insight into the challenges faced by blood banks and the importance of automated systems and technology in managing the inventory and operations of blood banks. These studies emphasize the need for efficient management of blood banks to ensure a safe and adequate supply of blood for patients in need.

Methodology:

1)Requirement Analysis: The first step is to identify the requirements for the system. This involves conducting a thorough analysis of the blood donation process and understanding the needs of the blood banks, hospitals, and other stakeholders. This information is used to develop a detailed list of functional and non-functional requirements for the system.

2)Design: Based on the requirements analysis, the system is designed. This involves creating a system architecture, designing the database schema, and developing user interface wireframes. The design phase also includes identifying the technologies and tools that will be used to develop the system.

3)Development: The system is developed using Java and JDBC in Eclipse IDE. The development process involves creating the necessary database tables, implementing the business logic, and developing the user interface. The system is developed in iterations, with each iteration adding new functionality and features.

4)Testing: Once the system is developed, it is tested to ensure that it meets the requirements and is free of bugs and errors. The testing process includes unit testing, integration testing, and system testing. The system is also tested for performance, scalability, and security.

5)Deployment: After testing, the system is deployed to a production environment. This involves setting up the necessary hardware and software, configuring the system, and migrating data from the old system, if applicable. The system is then made available to the end-users.

6)Maintenance: Once the system is deployed, it requires ongoing maintenance and support. This involves monitoring the system for issues, performing routine maintenance tasks, and providing user support. The maintenance phase also includes making updates and enhancements to the system as needed to address changing requirements or improve performance.

Throughout the project, an agile methodology can be used, which involves working in short iterations, frequent feedback, and continuous improvement. This approach allows for greater flexibility and adaptability to changing requirements

and ensures that the final product meets the needs of the stakeholders.

Software Requirement

The Blood Bank Management System is developed using Java and implemented in Eclipse IDE. The system uses a Database Management System (DBMS) and Java Database Connectivity (JDBC) technology to store and manage donor information, blood types, and inventory records.

The DBMS used in this project is MySQL, which is a widely used open-source relational database management system. The system uses JDBC to connect to the database and retrieve data. The Eclipse IDE is used to develop the user interface and the application logic.

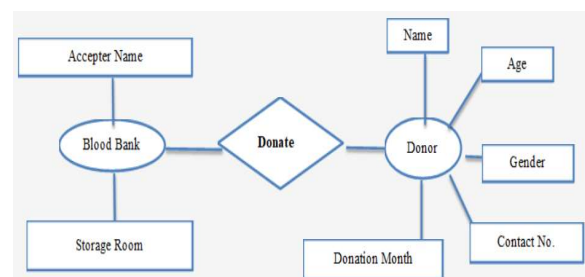
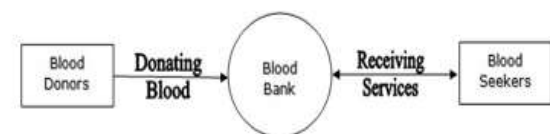
Operating System: windows 7 or above

Backend: MySQL

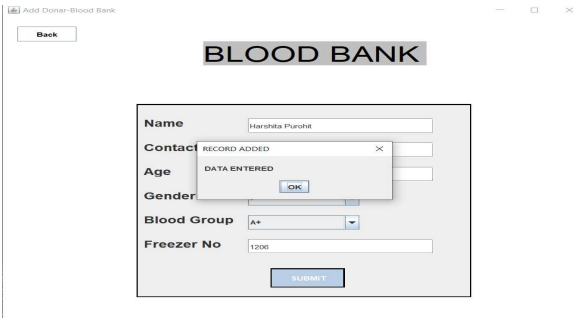
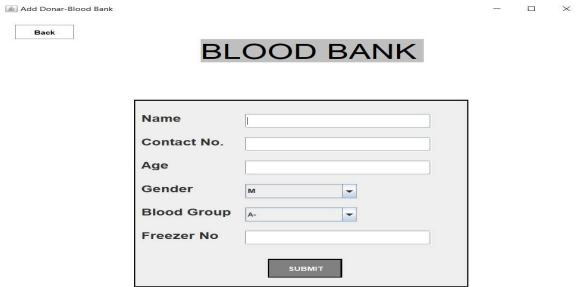
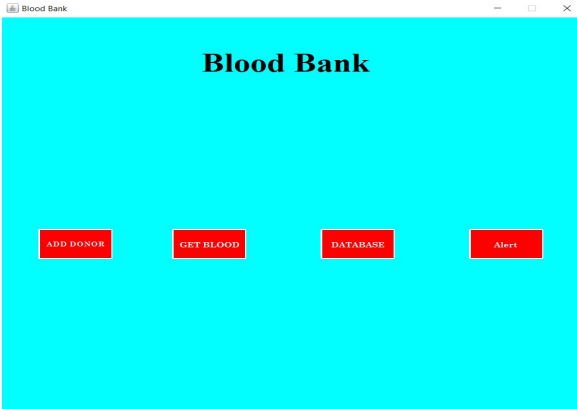
Frontend: Java

Compilation: Eclipse IDE

E-R Diagram



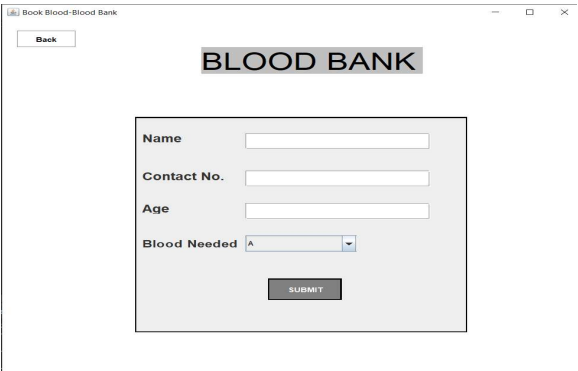
Screen Snapshots of Project



DATABASE



DATABASE





Conclusion

The Blood Bank Management System is a web-based application that manages the process of blood donation from registration to distribution. The system uses a Database Management System (DBMS) and Java Database Connectivity (JDBC) technology to store and manage donor information, blood types, and inventory records. The system provides an easy-to-use interface for managing blood donations, scheduling appointments, and monitoring inventory levels.

The Blood Bank Management System is designed to ensure that the blood donation process is efficient, safe, and meets the needs of hospitals and patients. The system enables blood banks to manage donor information and blood inventory records efficiently, and it enables hospitals to request and receive blood donations quickly. The system provides several reports that can be generated based on donor information, blood inventory levels, providing valuable insights into the blood donation process and enabling continuous improvement.

Overall, The Blood Bank Management System is an essential tool for managing the blood donation process and improving the efficiency and effectiveness of blood banks and hospitals. The system can be

improved by adding new features like integration with other systems, mobile application, analytics and reporting, online blood bank, and integration with IoT devices. These improvements can help in the efficient utilization of blood samples, reduce wastage, and ultimately save more lives.

Future Aspects of Project

The blood bank management system has the potential for further development and improvement. Some future aspects of the project include:

1)Integration with other systems: The blood bank management system can be integrated with other hospital management systems to provide a seamless experience for the hospital staff. This integration can help in the efficient sharing of data between different systems, reducing manual errors and improving overall efficiency.

2)Mobile Application: A mobile application can be developed for the blood bank management system. This application can allow donors to register and make appointments for blood donations. The application can also allow for tracking of the donor's blood donation history and provide notifications when their blood type is in high demand.

3)Analytics and Reporting: The blood bank management system can be improved by adding analytics and reporting capabilities. The system can generate reports on blood donation trends, inventory levels, and other relevant information. These reports can help blood banks in making informed decisions about blood donations and transfusions.

4)Integration with IoT Devices: IoT devices can be integrated with the blood bank management system to monitor the temperature and humidity levels of blood samples. This can help in ensuring that the blood samples are stored at the appropriate temperature and avoid spoilage.

5)Donor incentives program: The system can be enhanced to include a donor incentives program that rewards donors for their contributions. This would encourage more people to donate blood and help increase the overall blood supply.

References

1)Blood Bank System using Database Security Reema Agarwal¹, Sonali Singh²,

Chanchal Atal³, Dr. Danie Kingsley “(2020)

2)A Research Paper on Blood Donation Management System ¹Devanjan K. Srivastava, ²Utkarsh Tanwar, ³M.G.Krishna Rao, ⁴Priya Manohar, ⁵Balraj Singh ¹²³⁴Student, Computer Science Engineering, ⁵Assistant Professor, School of Computer Science Engineering ¹²³⁴⁵Lovely Professional University, Jalandhar, India

3) “A Study on Blood Bank Management System” by A. Clemen Teena, K. Sankar and S. Kannan, Department of MCA, Bharath University, Selaiyur, Chennai-73, Tamil Nadu, India