**“Online Blood Donation Management System”**

**Feasibility Study Report**

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**1. Introduction**

**1.1 Overview of the Project**

The Blood Donation Agent is to create an e-Information about the donor and organization that are related to donating the blood. Through this application any person who is interested in donating the blood can register himself in the same way if any organization wants to register itself with this site that can also register. Moreover, if any general consumer wants to make request blood online he can also take the help of this site. Admin is the main authority who can do addition" deletion" and modification if required. It also refers to a practice where people donate their blood to people so it helps them with their health problems. Blood is one of the most essential fluids of our body that helps in the smooth functioning of our body. If the body loses blood in excessive amounts, people to get deadly diseases and even die. Thus, we see how blood donation is literally life-saving which helps people. It is also a sign of humanity that unites people irrespective of caste, creed, religion and more.

**1.2 Objectives of the Project**

The objectives of this project is to

-Provide safe and quality blood and blood components collected from voluntary donors, round the clock, at affordable cost to the general public and free of cost to the poor.

-Make sure that donated blood, or blood products, are safe before they are used in blood transfusions and other medical procedures.

-Collect data about donors and seekers who are interested in donating blood or who require it.

-Find nearby blood camp drives, blood banks, schedule appointments and contacts.

-Intend to the people who live in Pyay to get a happier and longer life.

**1.3 The Need for the Project**

There is a constant need for a regular supply of blood because it can be stored only for a limited period of time before use. Regular blood donation by a sufficient number of healthy people is needed to ensure that blood will always be available whenever and wherever it is needed. Here are some key points to consider when highlighting the need for a blood donation project:

**Life-Saving Potential:** Blood donation is essential for medical treatments, surgeries, trauma care, and various medical conditions. It plays a direct role in saving lives.

**Medical Emergencies:** Hospitals and healthcare facilities rely on a steady supply of blood for emergencies like accidents, surgeries, and childbirth complications. An insufficient blood supply can lead to unnecessary fatalities.

**Natural Disasters and Calamities:** In the aftermath of natural disasters, accidents, or large-scale emergencies, there is often an increased demand for blood due to injuries and medical emergencies.

**Cancer Treatment:** Many cancer patients undergoing chemotherapy or radiation therapy experience a decrease in their blood cell counts, necessitating frequent blood transfusions.

**Elective Surgeries:** Scheduled surgeries, including organ transplants, cardiovascular procedures, and joint replacements, require a reliable blood supply to reduce the risk of complications.

**Pregnancy and Childbirth:** Complications during pregnancy or childbirth can lead to excessive bleeding, which can be life-threatening for both the mother and the baby. Adequate blood reserves are crucial in such situations.

**Blood Disorders:** People with blood disorders like hemophilia may require regular infusions of clotting factors derived from donated blood.

**Economic Impact:** A blood donation project can have a positive economic impact by reducing the overall cost of healthcare due to the availability of a stable blood supply.

**1.4 Overview of Existing Systems and Technologies**

Blood donation systems and technologies have evolved significantly over the years to improve the efficiency, safety, and accessibility of blood collection and distribution. Our system is mainly concerned with technology, automation, and data management to ensure a safe and reliable supply of blood products for healthcare institutions and patients in need.

Main Technology associated with our system

-web programming technologies (HTML,CSS,JS,JSP)

-MySQL (Database)

-Diagram and Design Tools (Visio, Microsoft project)

**1.5 Scope of the Project**

Main actors of our system are:

-Blood Donor Center

-Blood Donors

-Hospital

-Administrative Staff (collecting blood and managing blood stocks, approving

blood requests, updating donations and updating available blood types)

Main use cases associated:

1.Blood Donor Center can

1. Donor Registration and Profile Management

2. Appointment Scheduling

3. Eligibility Screening

4. Donation Process Management

5. Biometric Authentication

6. Blood Collection and Processing

2. Blood Donors

1. Donor Registration

2. Appointment Booking

3. Eligibility Check

3. Administrative Staff

1. View statistical details

**1.6 Deliverables**

A web-based software system. This contains a central database and functionalities for various stakeholders. Since many numbers of stakeholders are involved, different GUIs will be provided to different users.

**2. Feasibility Study**

**2.1 Financial Feasibility**

Being a web application BDS will have an associated hosting cost. Since the system doesn't consist of any multimedia data transfer, bandwidth required for the operation of this application is very low.

The system will follow the freeware software standards. No cost will be charged from the blood donors and blood receivers. Bug fixes and maintaining tasks will have an associated cost. At the initial stage the potential market space will be contributions received from outside donors and social welfare organizations.

**2.2 Technical Feasibility**

Project BDS is a complete web-based application. The main technologies and tools that are associated with OES are HTML, CSS, JSP, MySQL, JS, NetBeans, Diagram tools (NCLASS, Microsoft Project, Visio, Draw.IO). Each of the technologies is freely available and the technical skills required are manageable. 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. Initially the web site will be hosted in a free web hosting space, but for later implementations it will be hosted in a paid web hosting space with a sufficient bandwidth. Bandwidth required in this application is very low, since it doesn't incorporate any multimedia aspect. From these it's clear that the project BDS is technically feasible.

**2.3 Resource and Time Feasibility**

**(1) Resource feasibility**

Resources that are required for the Blood Donation project include:

- Programming device (Laptop)

- Hosting space (freely available)

- Programming tools (freely available)

- Programming individuals

So, it’s clear that the Blood Donation project has the **require resource feasibility**.

**2.4 Risk Feasibility**

Risk feasibility can be discussed under several contexts.

**Risk associated with size**

**(1) Estimated size of the product in line of codes:**

The size of the codebase for a "risk associated with size" assessment tool in a blood donation risk feasibility system can vary significantly depending on the complexity and specific features of the application. The estimation of lines of code (LOC) for this component would depend on factors such as the programming language, the level of detail in the assessment, the user interface, and any additional functionalities.

**(2) Estimated size of the product in number of programs:**

The number of programs or modules required for a blood donation risk feasibility system can vary significantly based on the specific features, architecture, and design choices. The complexity of the system and the desired functionality will determine the number of programs needed. This application would be the core program that manages the overall functionality of the blood donation risk feasibility system. It handles user interactions, data input, and coordinating the various components of the system. In a simple system, this could be the only program.

**(3) Size of database created or used by the product:**

The choice of database management system (e.g., MySQL, SQL Server) can affect the storage efficiency and database size. The number of donors, the frequency of donations, and the level of detail in the data will all impact the database size. The size of the database will grow over time if you retain a long history of donor records.

**Users of the product:**

Donors, medical professionals, donation centers, system administrators, health authorities, researchers, IT Support, recipients and hospitals are determined by the system's design and requirements.

**Number of projected changes to the requirements for the product? Before delivery? After delivery:**

The number of projected changes to the requirements for a blood donation feasibility product can vary widely depending on several factors, including the clarity of initial requirements, the complexity of the project, stakeholder feedback, evolving regulations, and unforeseen challenges. It's common for stakeholders, including users and clients, to provide feedback and request changes during the development process. These changes may arise as a result of usability testing, design reviews, or evolving needs. After the product is deployed, users may provide feedback based on their real-world experiences.

**Amount of reused software:**

Efficient software reuse requires proper documentation, version control, and a clear understanding of how existing components can be integrated into the new project. Ultimately, the goal of software reuse is to maximize efficiency and maintainability while delivering a high-quality product that meets the needs of users in the blood donation feasibility domain and use some JSP libraries to incorporate additional functionalities.

**Development environment risks**

A development environment for a blood donation system, like any software project, can have various risks and challenges that developers and project managers need to address. Here are some common development environment risks associated with a blood donation system:

**Data Security Risks:**

1.Unauthorized Access: Developers must implement robust access controls to prevent unauthorized users from accessing sensitive donor and patient data.

2.Data Breaches: Inadequate security measures can lead to data breaches, compromising donor and patient privacy.

3.Compliance and Regulatory Risks: System Reliability and Availability:

4.Downtime: Unplanned downtime can disrupt blood donation processes and negatively impact patient care. Developers need to ensure high system availability.

**Performance Issues:** Scalability and performance issues can lead to system slowdowns or crashes during peak usage times.

**Data Accuracy:**

1.Data Integrity: Inaccurate donor or patient information can lead to medical errors. Developers should implement data validation and verification mechanisms.

2.Data Duplication: Duplicate records can create confusion and affect data analysis. Developers should implement strategies to prevent and manage duplicates.

**Integration Challenges:**

1.Interoperability: Blood donation systems often need to integrate with other healthcare systems (e.g., Electronic Health Records). Ensuring smooth data exchange can be challenging.

**User Training and Adoption:**

1.User Training: Staff members and volunteers must be trained to use the system effectively. Inadequate training can lead to errors and resistance to adoption.

2.User Experience: A poor user interface can hinder user adoption and productivity.

**Change Management:**

1.Resistance to Change: Stakeholders may resist adopting a new system, especially if it disrupts established processes. Change management strategies are essential.

**Testing and Quality Assurance:**

1.Inadequate Testing: Insufficient testing can result in the deployment of a system with critical bugs and vulnerabilities. Rigorous testing is crucial.

2.User Acceptance Testing: Ensuring that the system meets user requirements and expectations is vital for project success.

**Process issue risks**

Blood donation will follow RUP software development process. This provides the flexibility to accommodate changing software requirements of blood donation.

**Technical issue risks**

**System Downtime:** Unplanned or prolonged system downtime can disrupt blood donation processes, appointments, and data entry. Causes of downtime can include hardware failures, software bugs, or network issues.

**Data Loss:** Data loss can result from hardware failures, software glitches, or cyberattacks. Losing donor records, patient information, or historical data can have serious consequences.

**Performance Bottlenecks:** Poorly optimized databases, slow network connections, or inefficient code can lead to performance bottlenecks that cause slow response times, especially during peak usage periods.

**Security Vulnerabilities:** Security vulnerabilities, such as SQL injection, cross-site scripting (XSS), or insufficient authentication and authorization controls, can expose the system to data breaches and unauthorized access.

**Scalability Challenges:** As the number of donors and donation centers grows, scalability challenges may arise, impacting system performance and responsiveness.

**Mobile Accessibility:** Ensuring that the system is accessible and performs well on mobile devices can be technically challenging, especially if the user interface is not designed for mobile use.

**Network Latency:** High network latency can affect the real-time exchange of information between donation centers and blood banks, leading to delays in data updates and donor notifications.

**2.5 Social/Legal Feasibility**

Blood donation use freely available development tools, and provide the system as an open source systems. Only the maintenance cost will be charged from potential customers. JSP software libraries that are used in this system are free open source libraires. Since this new system eliminates the effort to make statistical distributions, it will have a great impact in blood donation system.

**3. Considerations**

**Performance:**

The application provides quick responses to user interactions. Performance should be optimized to minimize latency in loading pages, processing requests, and retrieving data.

MySQL will provide the adequate speed for database transactions. Since no big data analysis is done. MySQL is the ideal database for this project.

* Response time: less than 2 seconds
* Processing time: less than 2 seconds (no batch processing involved)
* Query and reporting times: yet to be tested
* Throughput: yet to be tested
* Storage: yet to be tested

**Security**

Security measures are provided in many aspects in this system.

**User authentication**

User authentication is a crucial aspect of a blood donation feasibility application to ensure that only authorized individuals can access sensitive donor and medical information. Implement a strong username and password authentication system. Encourage users to create complex passwords and enforce password policies (e.g., minimum length, special characters, expiration).

**Login details:**

Login details are a critical component of user authentication in a blood donation feasibility application. These details ensure that only authorized users gain access to the system's functionalities, including donor and medical data. Properly implementing and securing login details is essential to safeguarding user accounts and sensitive information in your blood donation feasibility application.

**Usability and ease of use:**

Software is user-friendly and accessible helps improve adoption, efficiency, involve potential users, such as medical professionals, donors, and administrators, in the design and development process. Design an intuitive and user-friendly interface that minimizes the learning curve. Use clear navigation, labels, and consistent design patterns to make it easy for users to understand and interact with the application.

**Capacity and Scalability**

Capacity and scalability planning should be an integral part of the application's architecture and development process and factors ensure that the system can handle an increasing number of users, donors, and data while maintaining performance and reliability.

**Availability**:

Availability is a critical aspect of a blood donation feasibility system, as it ensures that the application is accessible and functional whenever users, including donors and healthcare professionals, need it. High availability is essential to maintain the integrity of blood donation processes and healthcare operations.

**Maintainability**:

The application remains manageable, adaptable, and easy to maintain throughout its lifecycle. Emphasizing code quality, and implementing robust processes, and system remains efficient, reliable, and adaptable to changing needs.

**4. References**

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