

Divine Lifesavers Blood Bank

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Abstract

Donating blood is a vital part of healthcare and saves many lives every year. However, there are persistent blood supply shortages in many places, including Ghana, which frequently causes patients in need to wait potentially fatally long. Conventional blood donation procedures are beset by inefficiencies that delay the matching of donors and recipients and dissuade people from donating with onerous documentation. This study presents an online blood donation system that provides a safe, effective, and easily accessible way to link blood donors and those in need in order to address these issues. The project includes a thorough analysis, with the system being designed and developed using HTML, CSS, JavaScript, PHP, and MySQL, as well as the Agile methodology. The goals of the system include making blood donation easier, improving productivity, getting more donors involved, protecting data, raising awareness, and improving the healthcare system as a whole. By offering a creative solution to blood donation problems, this paper hopes to benefit the healthcare industry by ultimately saving lives and enhancing the effectiveness of healthcare.

Keywords: Donating blood, MySQL, Conventional blood donation, Blood transfusions, Red Cross Blood Bank

INTRODUCTION

Background of the Research

Given that blood donation saves millions of lives annually, it is an essential component of healthcare. Blood transfusions are the only option for therapy for patients experiencing severe blood loss as a result of trauma, surgery, or illnesses like cancer alongside anemia in many countries. Unfortunately, there is frequently a blood shortage in the world, particularly in Ghana, which presents a serious problem for the nation's patients and medical professionals [1]. Traditional donations of blood processes also have a number of drawbacks, such as the requirement that donors personally visit blood banks or donation centers, which can be an expensive and bothersome process. An infrastructure for online blood donation that links blood donors with patients or hospitals in need of blood is becoming more and more necessary to address these issues. Users can search for and request blood donations online through an online blood donation system, which also offers a platform for donors to register. This system has the potential to enhance the number of blood donors while streamlining the exchange of blood process and making it more accessible to those in requirement.

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Statement of the Problem

There are a number of challenges associated with the traditional methods of blood donation, which an online system can help to address. The goal of an online donated blood system is to provide a quick, easy, and reliable means of matching blood donors with recipients of transfusions. Due to the many shortcomings of traditional blood donation processes, an efficient online system connecting

donors and recipients is required. One of the main challenges with traditional donation is the lengthy process. When someone in need requires a blood transfusion, medical professionals frequently experience delays in locating suitable funding sources, which could be lethal in an unexpected situation [2]. An on the web blood drive framework can help lessen this issue by making it possible donors to register their availability online and facilitating quicker The corresponding between donors and recipients [3]. Traditional donation methods may also be ineffective due to laborious paperwork and manual registration procedures, which would reduce the rate of participation [4]. In contrast, an online blood donation system makes the registration process easier, which makes blood donors more accessible and convenient [5]. More people donate blood as a result of this increased efficacy, which raises the total amount of healthy blood that is available. Scalability is a crucial consideration when developing an online blood donation system. In addition to having an extensive user base, the platform must be adaptable enough to grow and change over time [6]. Utilizing an architecture with capacity and flexible design principles ensures that the entire system can change to meet the ever-changing needs of donated blood campaigns. To summarize, the online blood donation technique's problem outline focuses on the shortcomings of current giving practices, including expansion problems, inefficiencies, and delays. The online system can improve the efficiency of blood donation procedures and perhaps save lives by offering a safe and easy-to-use platform for matching donors and recipients.

Objectives of the Study

By taking an extensive approach, the online blood donation system hopes to improve the process of giving blood as well as the healthcare system. By simplifying the donation process and reducing wait times, the technology aims to speed up blood transfusions for patients in need by providing an inexpensive a platform for donors to sign up and take part. Additionally, the system seeks to increase donor participation by offering a useful and user-friendly interface, as well as to improve donor governance by way of organized record-keeping and effective means of interaction.. By putting strong data protection procedures in place, donor information security is ensured as a high priority. Furthermore, by serving as a tool to raise awareness of the importance of blood donation and the qualifying necessities, the system supports broader initiatives pertaining to public health. The ultimate objective of the online blood drive system is to produce.

LITERATURE REVIEW

An online blood donation system is a web-based platform that links The bloodstream donors and recipients. The Red Cross Blood Bank Information System is defined by [7] as an information management system that aids in the administration of donor records and the blood bank in the research they did titled "A Study on Blood Bank Management." Through the use of a password, an authorized blood bank administrator was able to log in and effortlessly manage the patient and donor records. Numerous features were offered by the system, such as the primary database, easy donor data addition and updating, fast access for system content via login, and a search code for finding donors who were on a specific basis. Getting the blood bank operational was the system's primary goal. Every kind of blood bank can use this system, which was made to fit them all [8]. The program can be used and deployed in multiple blood banks after it has been effectively carried out. Blood Management, Donor Registration, Blood Their booking, Donor Blood Test, Recipient Management, Blood Stock, Blood Management, Blood Management, Blood Management, and User Login Screen are all included in this application. Medical professionals, hospital administrators, and blood bank receptionists were the intended users of the application developed by the researchers. The researchers found it challenging to envision the app's functionality because the authors neglected to include screenshots of the system prototypes and did not discuss their research methodology [9]. There was no explanation of their samples, respondents, or sampling methods. The researcher then intended to supply screenshots of the system prototypes, figures that elucidate the system, and additional diagrams that can aid other researchers in visualizing the evolution of online blood donation systems [10, 11]. Additionally, the researcher will go into detail about the sample plans, statistical techniques, and research methods that will be applied to the data analysis. All medical facilities should use a computerized platform to manage

data in blood bank systems, according to the findings of the study "Blood Bank Management System Using Rule-Based Method" [12]. It was also noted that both the hospital and the user suffered from the outdated system. One of the drawbacks found was that the blood bank employees had to record the donor's information each time the donor gave blood, which resulted in duplicates donor records as well as the possibility of data loss or disappearance over time. As a result, that writer created a web-based system to assist blood centers in quickly and easily recording donor information. To guarantee what was the right choice at the appropriate moment, the system employed rule-based decision-making. Additionally, the system has the ability to notify donors if a specific blood type is required. She created an incremental model-based blood donation system. She had selected this model due to its ability to create an automated system through a cycle of moves as well as its benefits, which include easy-to-understand period flow, the ability to make changes at any time, and the ability to develop another system nevertheless in the event of a mid-phase error, which can be fixed during the process of being tested. The investigator involved in this study found that the system's developer neglected to incorporate a feature that would have allowed users to verify the availability of blood bags and the products' expiration or shelf life. Consequently, these will be incorporated by the academic into the process he has developed to improve transfusion safety.

The authors about the study "Development of an Integrated Online Blood Donation System" [13] created an online blood donation system with the goal of streamlining the transfusion, inventory management, and blood donation procedures. The system included recipient matching, inventory management, blood testing, and donor registration features. Based on input from users, the study assessed the system's efficacy and discovered that it greatly increased blood bank operational efficiency, decreased errors, and upgraded the general caliber of blood transfusion care [14].

METHODOLOGY

The methodology used in the ongoing study concerning internet-based donations of blood systems is presented in this section. It describes the database management software that was used, the data structure, data collection strategies, and data analysis methodologies. It also concentrates on the software programs used to finish the investigation.

Data Collection

The study used a descriptive research design with the goal of examining and characterizing the features and conditions of online blood donation platforms as they exist today. An extensive analysis of the attributes, advantages, and drawbacks of these systems was made possible by their design. To obtain a thorough grasp of the subject, the research design also made it easier to collect both qualitative and quantitative data. Both primary and secondary data collection techniques were used to obtain pertinent information. Surveys and interviews conducted online were used to gather primary data. Administrators of blood banks, employees, and system users were given online surveys to complete in order to get their opinions, experiences, and input on the use and efficiency of online blood donation platforms. Closed-ended as well as open-ended questions were included in the survey questionnaire in order to collect both quantitative and qualitative data. Numerous parties that are critical to the system's use and effective implementation are included in the project's study population. The population includes potential blood donors, patients, blood banks, medical facilities, blood donation drive organizations, and event planners, all of which contribute to the growth and impact of the platform. Unstructured interviews were carried out with the participants in the study [15]. The purpose of the interviews was to learn more about their opinions on the advantages, usability, and the features of online blood donation platforms. Secondary data was gathered from a number of sources, including credible electronic databases, books, conference papers, and scholarly journals. A significant collection of secondary data was the literature review carried out in Chapter Two, which gave a foundation of current understanding and research findings on online blood donation systems. To find trends, recommended procedures, and gaps in the field, a critical analysis of secondary data was conducted [16].

Development Methodology

The Software Development Life Cycle (SDLC) is the name of a development methodology used in software engineering. The stages of the Life Cycle of Software Development are designed to enhance better planning and management during the software development process. It is regarded as a division of the life stage of systems development as well. A few popular approaches to creating methodology are waterfall, extreme programming, spiral development, rapid application development, incremental and iterative growth, prototyping, and agile methodology. The author has chosen to employ agile software development methodology for this project because it is better suited for simultaneous incremental and iterative advancement [17].

DISCUSSION

The Online Blood Donation System is implemented in this component, and the results are discussed in relation to the project's goals and customer demands. The system was developed in accordance with the conceptual principles delineated in section three, utilizing the selected methodology.

System Requirements

Both the computer administrators and potential users will need the system to do several of things when it is completed. These eventually function as the system's needed and can be broadly classified into operational or unusable rules.

Functional Requirements

- i. Donor Authorization: Permit people to sign up and submit personal data in order to become donors.
- ii. Search: Users can use this feature to look for available blood groups as well as donors.
- iii. Blood Bank Administration: Provide tools for tracking donations and donor information.
- iv. Finding and Blood Request System: Put machine learning in place to match patients and donors according to location and blood type.
- v. Communication and Notifications: Provide tools that allow donors and medical facilities to receive alerts and notifications.
- vi. Security and Privacy: Guarantee user privacy, data security, and adherence to data protection laws.
- vii. Scalability: Build the system to be able to effectively manage an increasing number of users and data volumes.

Non-Functional Requirements

- i. The term reliability standards: As the total amount of concurrent users or data levels rise, the system's performance and response rate should not change. The layout of the system should be adaptable enough to enable future integration with other systems if necessary.
- ii. Requirements for usability: The system must have an eye-catching, interacting, and user-friendly graphic user interface. Even someone with no prior computer experience should be able to easily operate it.
- iii. Security prerequisites: The login area of this system needs to be extremely secure. This is due to the fact that certain privileges are exclusive to administrators.
- iv. The process of implementation requirements: PHP, HTML, and Cascading Style Sheet (CSS) are the primary front-end programming languages and tools used in the system's implementation. The data in the database is maintained at the back end using MYSQL.
- v. Need for portability: The system must function on all major platforms. No particular technology, including an operating system, web server, or database, should be able to restrict this system.

Hardware and Software Used

RAM	4 GB (Minimum) 8 GB (Recommended)
Operating System	32 bit x86 (Minimum) 64 bit x64 (Recommended)
Hard disk	Minimum 250 MB Free Memory

Processor	Dual Core 2.80 GHz or Higher
Screen Resolution	1366 x 768 (Optimal)
Graphics Card	Minimum 1 GB
Platform	Windows 8/10/11 with SP1

For the development of this project we needed a source code editor so we have used VS-code for this purpose and we also needed a browser to run or check every time when we do any change in our project so we have used chrome browser.

Tools and Techniques

We have developed this project on windows by using many programming languages like HTML, CSS and JavaScript. And to program this whole project we needed a source code editor on which we can write our codes so we have used Sublime Code for this purpose. For the technique we used in this project, we have first gathered all the necessary details that are required for our project and then proceed for it and completed all the related programming:

- Hypertext Markup Language (HTML) indicates the structural semantics of text, including headings, paragraphs, lists, links, quotes, and other elements, making it possible to create structured documents. Thus, we created the pages of our website using HTML.
- A type of stylesheet language called Cascading Style Sheets (CSS) is used to specify how an HTML document is presented. The way that elements should appear on screen is specified by CSS. in writing, speaking, or using other media. We have added colors and images to our pages using CSS to make them look good.
- JavaScript (JS) With the help of the code language JavaScript, you can add sophisticated functionality to web pages. Every logic we employed in our project was coded using JavaScript.

Implementation

Deliver further details on the various features listed below, highlighting their benefits over current blood donation procedures in the process. You can also include citations to relevant studies or demonstrate how your system differs from others in the field. The phase of carrying out the project involves putting theory into practice. The researcher develops the programs that help the system meet its goals and the interfaces that will communicate with the large number of users beginning at this point (Figures 1 and 2).

Register your Details here to Donate Blood

Donate Blood and Save Human Life's

*Name:

* Age:

* Email:

Gender Male
 Female
 Others

*Blood Group:

* Mobile Number:

* State:

* District:

Figure 1. Portal to donate blood.

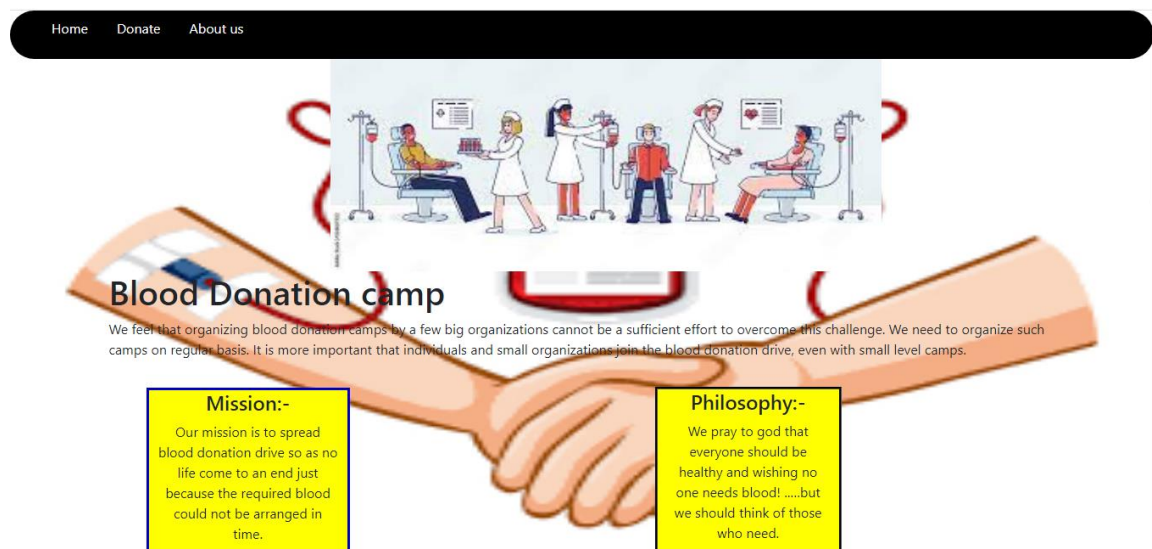


Figure 2. An overview of the system code.

RESULTS OF THE STUDY

If the project "The design and implementation of an online blood donation system" is carried out effectively, several positive outcomes are expected. Enhanced blood donation rates, more efficient blood bank operations, better blood supply for patients in need, organized and successful blood drives, data-driven insights for better decision making, enhanced stakeholder communication, elevated blood donation awareness, and the ability to expand the system to accommodate increasing requirements are some of these benefits. If the project "The design and implementation of an online blood donation system" is carried out effectively, several positive outcomes are expected. Enhanced blood donation rates, more efficient blood bank procedures, better blood supply for patients in need, organized and successful blood drives, data-driven insights for better decision making, enhanced stakeholder communication, elevated blood donation awareness, and the ability to expand the system to accommodate growing demand are some of these benefits.

CONCLUSIONS

To sum up, the charitable organization for the suggested online blood donation system has been established in Chapter One. It brought to light the value of blood donation in the medical field, the drawbacks of conventional donation techniques, and the requirement for a reliable online system. The system's goals, parameters, and rationale were spelled out in detail, with a focus on how it might enhance accessibility, effectiveness, and healthcare in general. Additionally described were the software tools for implementation, the Agile model, and the selected techniques. The online blood donation system that is being proposed seeks to improve the delivery of health care, guarantee donor security, streamline the donation process, and increase efficiency. The study proceeds to the review of literature, where previous studies and observations in the subject were examined, keeping these goals in mind.

Recommendations

The following suggestions are thus made for future researchers to take into consideration in order to enhance the system for a better delivery, as the researcher was hampered in the design of the online blood donation system by time constraints resulting from academic activities and a lack of resources.

- i. *Awareness and Promotion:* Create a plan to spread the word about the online blood donation system in order to motivate users to participate and donors to donate blood.
- ii. *Feedback Mechanism:* Include a feedback mechanism in the system to gather user feedback and make ongoing functional improvements.
- iii. *Scalability:* As the application platform becomes more well-known, take into account future scalability in the system design to handle an increasing user base and potential increases.

- iv. *Privacy and Security*: Put strong security measures in place to safeguard donor data, guarantee data privacy, and make sure that pertinent data protection laws are followed.
- v. *Additional Research*: Investigate the efficacy of online blood donation platforms in diverse medical settings, taking into account elements that impact their uptake and prosperity.
- vi. *User Involvement*: Make sure the system satisfies users' requirements and demands by involving users and stakeholders in the design and development process. By taking these suggestions into consideration, the online blood donation system has the potential to develop into an important healthcare tool that can save lives and increase the effectiveness associated with blood donation procedures.

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