Information System Supporting Blood Donation

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Abstract. The Information System Supporting Blood Donation is designed to streamline the process of connecting donors with recipients through a centralized and efficient platform. The system facilitates real-time donations, manages blood bank inventory, and handles recipient requests, ensuring timely access to life-saving resources. By integrating donor eligibility verification and allowing searches by location and blood type, the system reduces delays in emergency situations. This digital approach enhances transparency, reduces manual errors, and encourages regular blood donations through reminders and awareness features. Ultimately, the system aims to improve the efficiency of blood supply management, foster community participation, and save lives through a reliable, user-friendly, and accessible solution.

Keywords: Blood donation, blood type, blood bank inventory management, emergency response, community participation

INTRODUCTION

The blood donation is the voluntary act of giving blood to help save the lives of individuals in need. As the blood cannot be artificially produced, patients depend entirely on the generosity of donors. To recognize this life-saving act, the world celebrates World Blood Donor Day on June 14 every year. This day raises awareness about the importance of safe blood and honors voluntary donors for their contribution. The motto for World Blood Donor Day 2025 is "Give blood, give hope: together we save lives". Every few seconds, someone somewhere needs blood due to accidents, surgeries, or medical conditions, and just one donation can save up to three lives. Thus, donating blood is not only a noble act but also a responsibility that strengthens community solidarity and humanity. This system improves response time, ensures efficient resource use, facilitates blood donation, and promotes community involvement in the donation process.

PROBLEM

The primary issue that the system addresses is the lack of a centralized, efficient, and user-friendly system to manage blood donations, donor information, and blood requests. Individuals in urgent need of blood often struggle to find compatible donors due to poor coordination and information gaps. This results in delayed medical treatments and, in some cases, the loss of lives. The absence of a streamlined platform for both administrators and users (donors and recipients) interfere with the effectiveness and reach of blood donation efforts. Therefore, it is clearly necessary for a digital solution that ensures timely access to donor

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information, enhances communication, and supports organized, data-driven management of blood donations.

APPROACH

This system consists of two roles. Administrator and User. The Users can view blood donation campaigns to learn about ongoing or upcoming donation events. The Users can also donate blood and contribute to the cause. Additionally, they have the option to contact the admin for assistance or inquiries. The Users can view the list of available blood donors and search for specific blood types. In an emergency case, the users can submit a blood request. They can also view announcements to stay informed about updates, alerts, and other important information related to blood donation.

The admin panel in the system allows the administrator to perform a wide range of functions after successfully logging in with valid credentials. Once logged in, the admin can manage blood types by adding, updating, or deleting information related to different blood groups. They can add new blood donor records and view a list of all registered donors. The admin also has the ability to create and view blood donation campaigns to facilitate organized blood collection efforts. In addition, the administrator can access users' contact information and view blood requests submitted by individuals or hospitals. They can manage the existing blood donor data, including editing or removing records, and are also responsible for managing announcements, such as updates or important notices. All these operations interact with the central database to store and retrieve relevant information. Finally, the admin can log out of the system to end the session securely.

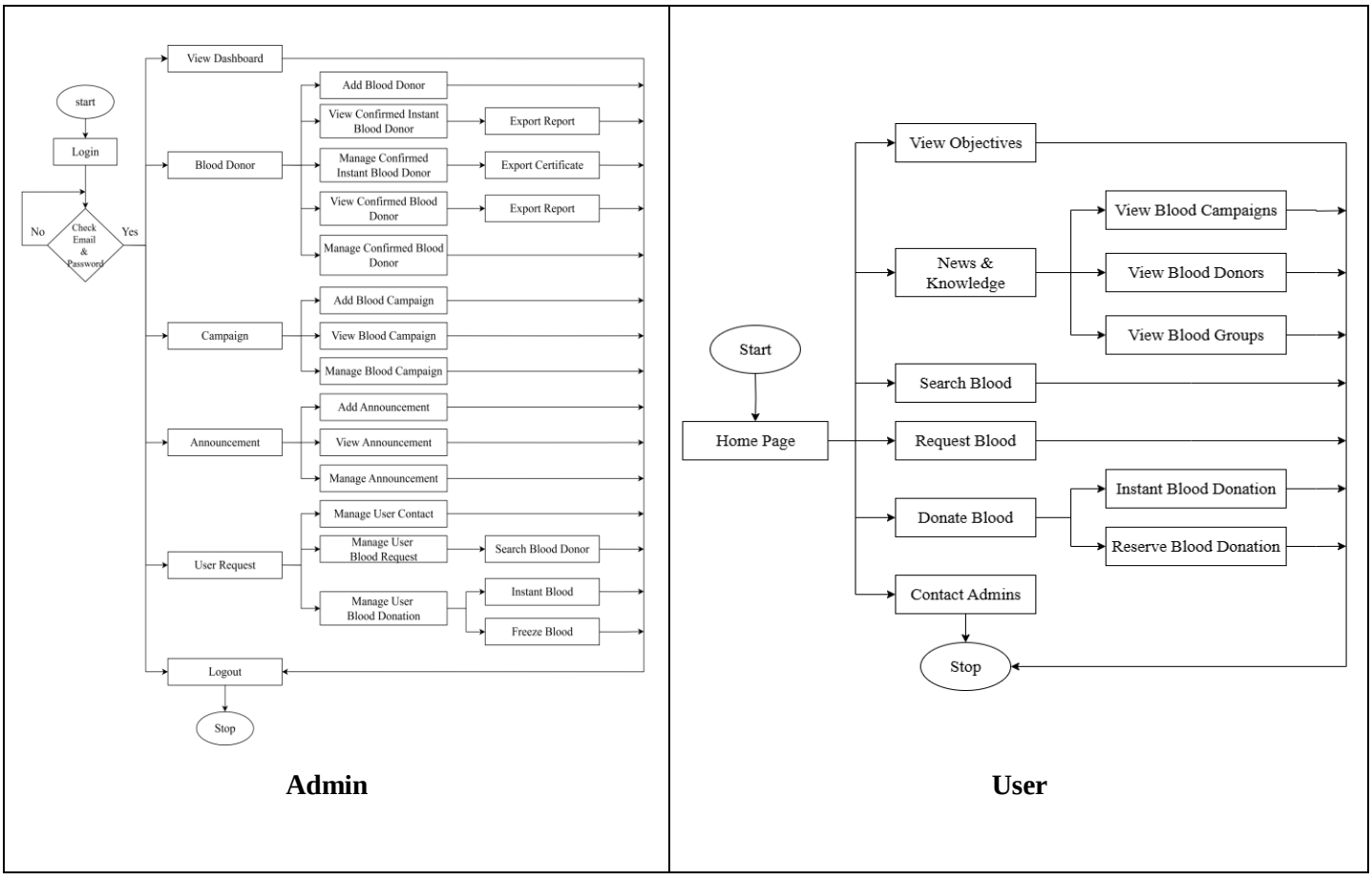

Figure 1: System Flow Diagram of the System

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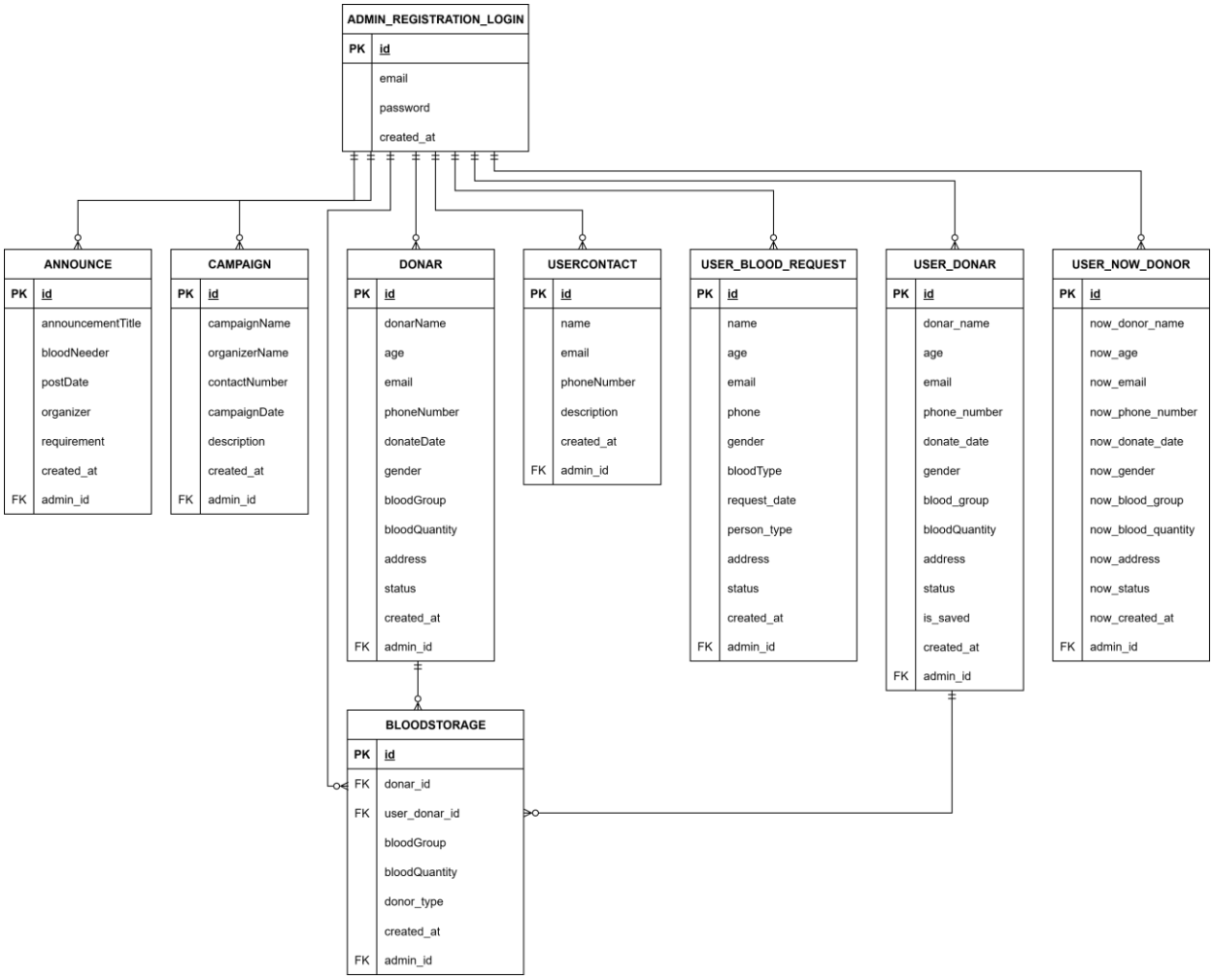

Figure 2: Database Design

Figure 2 presents the Entity Relationship Diagram (ERD) for the information system for supporting the blood donation, illustrating the database structure and relationships between key entities. The ERD serves as the foundation for data modeling, ensuring referential integrity and efficient querying through well-defined primary and foreign keys.

In the information system for supporting the blood donation, the ER diagram consists of nine main tables. These tables include:

- admin_registration_login - stores admin information
- announce - contains announcement-related data
- bloodstorage – stores blood
- campaign – contains campaigns information
- donor – stores donor information
- user _contact- contains user-related data
- user_blood_request - contains blood request data
- user_donor - contains donor-related data
- user_now_donor - stores recent donor information

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RESULTS

Each page of the information system supporting the blood donation has been carefully designed to be simple and user-friendly. When it comes to blood donation, users (visitors) can easily access educational content, view the main page, check announcements, and find contact information for donors, all from mobile phones or other devices, without logging in. In contact us page, the users can provide feedback to share their opinions for improving the system or to express anything else they want to say. If the users are in a place without internet access, not being able to use the blood donation system can be a disadvantage. Therefore, the system will be improved in the future to make it more accessible, even in areas without internet connectivity.

This system allows the users to connect online directly, eliminating the need to visit a physical department. It primarily helps the users access accurate information about blood donation and facilitates the donation process. In addition, the system also offers an option to export a donation certificate for the blood donors, which can serve as proof of their contribution and recognition of their valuable support.

Figure 3: Home Page

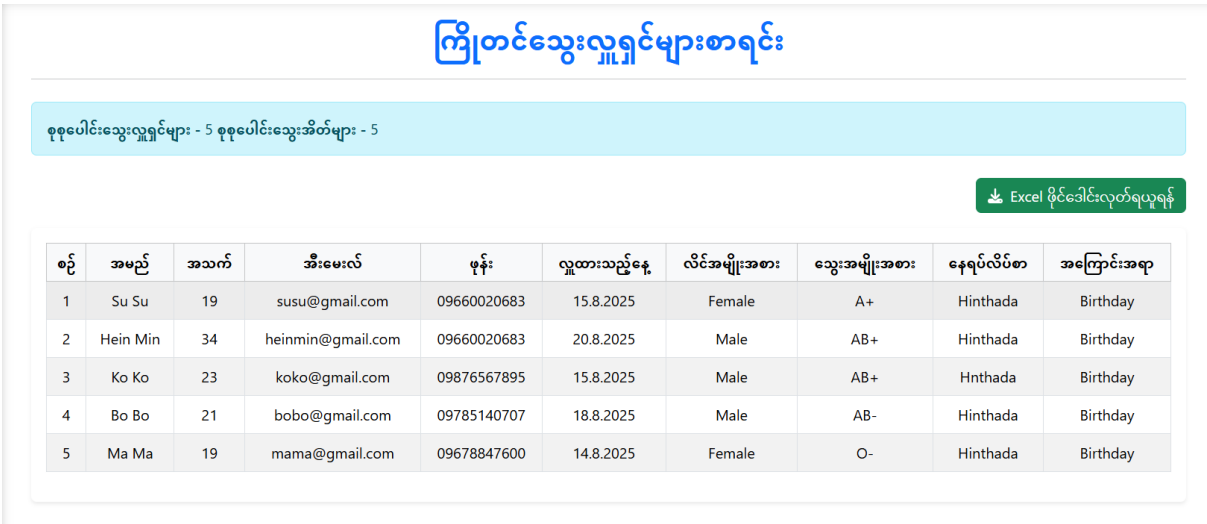

Figure 4: System Conclusion Report

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CONCLUSION

The information system supporting blood donation has highlighted the profound impact of voluntary donations in saving lives and strengthening communities. By fostering awareness, encouraging participation, and building a sustainable network of donors, the project has helped bridge the gap between donors and recipients. This initiative not only highlighted the importance of timely blood supply but also underscored the values of empathy, solidarity, and social responsibility. Moving forward, continued engagement and education will be the key to ensuring a consistent and reliable blood donation system, ultimately saving more lives and creating a healthier, more compassionate society. Furthermore, the integration of technology within the system has enhanced the efficiency and transparency of donor and recipient management. This project serves as a scalable and adaptable model for other regions facing similar challenges.

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