Blood Info – Empowering Blood Donation through Technology

Arvind Kumar Patel[1], Koustubh Pal[2*], Manthan Agarwal[3], Sachin Verma[4], Ayush Shukla[5]

[1]*Assistant Professor, Department of Computer Science and Engineering, Raj Kumar Goel Institute of Technology, Ghaziabad, India*
[2,3,4,5]*Student, Department of Computer Science and Engineering, Raj Kumar Goel Institute of Technology, Ghaziabad, India*

Abstract: The "Blood Info" app is designed to facilitate communication between healthcare providers, track patient blood utilization, and provide decision-making support for transfusion management. The app incorporates various features such as real-time data entry, alerts, and notifications, and a dashboard for easy visualization of key data points. The development process involved input from healthcare professionals, including physicians, nurses, and laboratory technicians, to ensure that the app met their needs and could be easily integrated into their workflow. User testing was also conducted to evaluate the usability of the app and gather feedback for further improvements. Overall, the Blood Management app has the potential to improve patient outcomes and enhance communication between healthcare providers. Further research is needed to evaluate the effectiveness of the app in real-world settings.

Keywords: Transfusions, Blood banks, Android, Kotlin, Drones, Donations, Donor.

1. Introduction

A blood donating app can be a valuable tool in emergencies, as it can help save time and potentially save lives. With the use of a mobile app, individuals can quickly and easily register to donate blood and provide information on their blood type and location. Healthcare professionals can then access this information in an emergency allowing them to quickly identify potential donors and contact them for blood donations.

In addition to facilitating blood donations in emergencies, a blood donating app can also help reduce wait times for blood transfusions and increase the availability of blood products. By connecting donors with blood banks and hospitals in real time, the app can help ensure that blood products are available when and where they are needed.

Moreover, a blood donating app can also provide educational resources to potential donors, helping to dispel myths and misconceptions about blood donation and encouraging more people to donate blood. The app can also provide information on donation centers and blood drives in the area, making it easier for individuals to find a convenient time and location to donate blood.

Overall, a blood donating app can be a powerful tool in promoting blood donation, increasing the availability of blood products, and saving lives in emergencies.

2. Methodology

The methodology used for developing an Android-based blood info application involves several stages, including research, design, development, and testing. The following is a brief overview of the methodology for developing an Android-based blood info application.

A. Research

The first step in developing an Android-based blood info application is to conduct extensive research to understand the requirements and expectations of potential users. This research can be done through surveys, focus groups, and interviews with healthcare professionals, blood donors, and recipients. The research should also include an analysis of existing blood info applications to identify gaps and areas for improvement.

B. Design

The next step is to design the application based on the research findings. The design process should include wireframing and prototyping to ensure that the application meets the needs and expectations of users. The design should also take into consideration the user interface, user experience, and the application's overall look and feel.

C. Development

Once the design is complete, the development stage begins. This involves coding the application using Java or Kotlin programming languages, integrating the application with databases, APIs, and other third-party tools, and ensuring that the application is compatible with various Android devices.

D. Testing

The testing stage involves conducting various tests, such as functional testing, usability testing, and performance testing, to ensure that the application is bug-free and meets the requirements and expectations of users. The testing stage should also include beta testing, where a select group of users are invited to test the application and provide feedback.

E. Deployment

The final stage is the deployment stage, where the application is released to the Google Play Store for download. The deployment stage should also include post-release support and

*Corresponding author: koustubhpal02@gmail.com

maintenance to ensure that the application remains up-to-date and bug-free.

3. Features and Need for Online Blood Donation System

An online blood-donating app can offer several facilities that make it easier for individuals to donate blood, find blood donors, and connect with blood banks and hospitals. Some of the facilities that an online blood donating app can provide include:

A. Donor Registration

An online blood donating app can allow individuals to register as blood donors by providing their personal information, blood type, and contact details. This information can be used to match donors with patients who require blood transfusions.

B. Donor Matching

The app can use algorithms to match potential donors with patients who require blood transfusions based on their blood type, location, and availability.

C. Blood Donation Scheduling

The app can allow donors to schedule appointments to donate blood at a nearby blood bank or donation center.

D. Blood Donation Tracking

The app can allow donors to track their blood donation history and receive alerts when they are eligible to donate blood again.

E. Emergency Blood Requests

The app can allow hospitals and healthcare professionals to request blood donations in emergencies, and send alerts to donors who are a potential match for the patient.

F. Greater Reach

Online blood donation platforms can connect donors and recipients from a wider geographic area, making it easier to find blood donors in remote or hard-to-reach areas.

G. Real-Time Information

Online blood donation platforms can provide real-time information about blood availability and emergency blood requests. This means that donors can quickly respond to requests for blood and help save lives.

H. Convenience

Online blood donation platforms offer a convenient way for donors to schedule appointments, track their donation history, and receive alerts when they are eligible to donate again. This can help encourage more people to donate blood regularly.

I. Reduced Administrative Burden

Online blood donation platforms can automate many administrative tasks such as donor registration, blood typing, and matching. This can help reduce the workload on blood banks and hospitals, allowing them to focus on providing care to patients.

J. Increased Transparency

Online blood donation platforms can provide greater transparency around blood donation, allowing donors to see how their blood is being used and how it is helping to save lives. This can help encourage more people to donate blood and increase trust in the blood donation system.
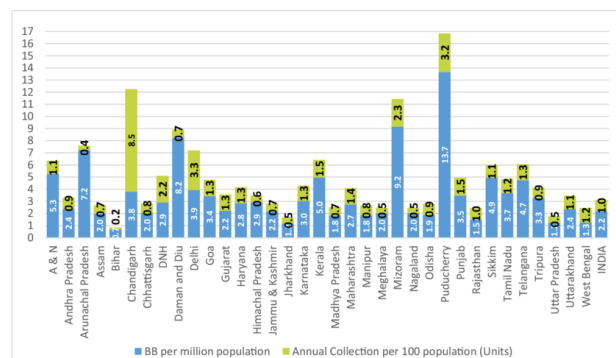

Fig. 1. Availability of blood banks and annual collection in India 2018

4. Advantages in Rural Areas

Blood donation apps can offer several advantages in rural areas where it may be difficult to organize blood donation campaigns or reach potential donors through traditional methods. Here are some advantages of blood donation apps in rural areas:

A. Convenience

Blood donation apps offer a convenient way for donors in rural areas to schedule appointments, track their donation history, and receive alerts when they are eligible to donate again. This can help encourage more people in rural areas to donate blood regularly.

B. Reduced Costs

Blood donation apps can reduce the cost of organizing blood donation campaigns in rural areas. Rather than having to pay for advertising, transportation, and other expenses associated with traditional campaigns, blood donation apps can provide a more cost-effective solution.

C. Increased Awareness

Blood donation apps can help raise awareness about the importance of blood donation. This can help educate people in rural areas who may not be aware of the need for blood donation and encourage more people to become donors.

D. Improved Coordination

Blood donation apps can help improve coordination between blood banks, hospitals, and donors. This can help ensure that blood is available when and where it is needed.

Where People Are Most Willing to Donate Blood
"I frequently give blood to help others" (share agreeing)"

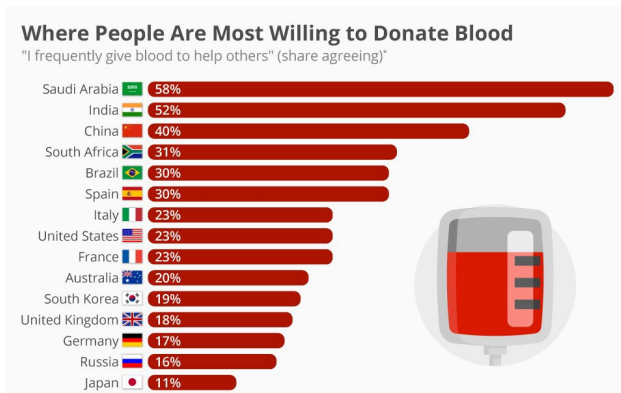|	
Saudi Arabia	58%
India	52%
China	40%
South Africa	31%
Brazil	30%
Spain	30%
Italy	23%
United States	23%
France	23%
Australia	20%
South Korea	19%
United Kingdom	18%
Germany	17%
Russia	16%
Japan	11%

Fig. 2. Percentage of people in the country who donate blood willingly

5. Future Scope

The use of drones for blood donation has the potential to revolutionize the way blood products are delivered in emergencies, particularly in remote or hard-to-reach areas. Here are some potential future scopes of blood donation through drones:

A. Faster Delivery

Drones can deliver blood products faster than traditional ground transportation methods, reducing the time it takes for blood products to reach patients in need. This can be especially critical in emergencies where every minute counts.

B. Improved Access

Drones can be used to deliver blood products to remote or hard-to-reach areas that are difficult to access by traditional transportation methods. This can help improve access to blood products for patients in these areas.

C. Cost-Effective

The use of drones for blood donation can be more cost-effective than traditional transportation methods, particularly in remote or rural areas where the cost of transportation can be high.

D. Reduced Wastage

Drones can be used to deliver blood products on an as-needed basis, reducing the risk of wastage and ensuring that blood products are used effectively.

E. Improved Safety

The use of drones for blood donation can improve safety for both patients and healthcare providers. By reducing the need for ground transportation, the risk of accidents or other safety incidents can be minimized.

F. Easy User Interface

Designing an easy user interface for a blood donation app can help encourage more people to donate blood and make the process more user-friendly. Here are some features that can make the user interface of a blood donation app easy to use:

1) Simple Navigation

The app should have simple and intuitive navigation, making it easy for users to find what they are looking for. This can include clear menu options and easy-to-find buttons.

2) User-Friendly Forms

Forms used for registering donors and requesting blood should be user-friendly and easy to complete. This can include clear instructions and simple language, with a minimum of required fields.

3) Alerts and Notifications

The app should provide alerts and notifications to users about upcoming blood drives, their eligibility to donate, and any urgent requests for blood donations.

4) Personalized Dashboard

The app should offer a personalized dashboard that displays the donor's donation history, upcoming appointments, and eligibility to donate again.

5) Clear Messaging

The app should have clear messaging that explains the importance of blood donation, how the donation process works, and the impact that donations can have on the lives of others.

6) User Feedback

The app should allow users to provide feedback about their experience and suggest improvements for future updates. This can help the app developers understand user needs and make changes accordingly

6. Conclusion

Finally, the usage of blood donation apps can help to promote blood donation and increase the number of blood donors. The application facilitates and promotes regular blood donation. Furthermore, the app can be used to educate and teach potential donors about the value of blood donation as well as the qualifying requirements.

Furthermore, the blood donation application can aid in the management of the blood inventory and the provision of an adequate supply of blood in the event of an emergency. The app can track blood donors' locations and availability, making it easier to match them with patients in need.

Nevertheless, despite the potential advantages of blood donation applications, there are still certain issues that need to be resolved, including the necessity for a wider acceptance of the technology and maintaining the confidentiality and security of donor information. Applications for blood donation can enhance the blood donation procedure in general and save more lives. To encourage more people to donate blood and aid those in need, it is crucial to keep exploring and developing these applications.

References

[1] A Report on the "Assessment of Blood Banks in Telangana, India". Available online at: http://nbtc.naco.gov.in/assets/resources/reports/commonResource_15172 29433.pdf (accessed November 6, 2021)

[2] NACO. 2016 List of Licensed Blood banks in India. (2016). Available online at: http://www.naco.gov.in/state-wise-list-registeredlicensed-blood-banks (accessed November 6, 2021)

[3] Ministry of Health and Family Welfare Government of India. National Blood Transfusion Council. Donation Process. Available online at: http://nbtc.naco.gov.in/page/donationprocess/ (Accessed November 6, 2021)

[4] Health at Home Mobile Blood Bank. Available online at:

https://www.healthathomes.com/mobileblood-bank/
(Accessed November 6, 2021).

[5] India Today. Why India is facing a Huge Blood Crisis. Available online at:
https://www.indiatoday.in/mail-today/story/why-india-is-facing-a-huge-blood-crisis-1619927-2019-11-18 (Accessed January 1, 2020)

[6] Devanjan K. Srivastava, Utkarsh Tanwar, M. G. Krishna Rao, Priya Manohar, Balraj Singh, "A Research Paper on Blood Donation Management System," IJCRT, Volume 9, Issue 5 May 2021.

[7] M. Fathima, and A. Valarmathi, "Blood Bank Mobile Application," 2017.

[8] Aderonke Anthonia Kayode, Abidemi Emmanuel Adeniyi, Roseline Oluwaseun Ogundokun & Simon Agaba Ochigbo, "An Android based blood bank information retrieval system," Dec. 2022.

[9] Aderonke Anthonia Kayode, Abidemi Emmanuel Adeniyi, Roseline Oluwaseun Ogundokun and Simon Agaba Ochigbo. Published online 2019 Apr 29.

[10] Reem D. Ismael, Harith A. Hussein, Mahmood M. Salih, "Finding the Blood Donor and Inventory Monitoring via Mobile Application," Journal of Algebraic Statistics, vol. 13, no. 1, 2022.

[11] Impact of COVID 19 pandemic on blood transfusion services at a rural based district Hospital Blood-Bank, India 2022.

[12] Road Accidents in India 2021 by Ministry of road transport and highways transport research wing.