**Blood bank: A website that assists anyone in need of blood or wants to donate blood**

by

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**Abstract**

This is an online web-based initiative that assists anyone in need of blood donors from various hospitals and blood donation centers near them or who wants to donate blood. This website seeks to make it convenient for both donors and recipients of blood. We are using three different technologies for our web-based service. The frontend is built using the React.js framework. For the backend, Flask framework is used, and the database for managing the information and data transfer is done over MongoDB. This online blood donation management system maintains the list of blood donors and helps the recipients easily track and search for suitable donors.

**Introduction**

Blood is needed for organ transplants, accidents, and cancer therapy, among other things. "Blood is necessary for several treatments and surgeries, and still a limited resource. The need for blood is about ten million units per year in the USA." (Management of Blood Donation System: Literature Review and Research Perspectives 2016). If someone wants to donate blood, look for a donation camp or go to a blood bank. The manual blood donation method has several drawbacks. It is time-consuming, often leads to inaccurate results, requires many personnel, lacks donor information, data retrieval takes a long time, and has a low accuracy percentage. It is tough to reach the appropriate donor in an emergency. People still die in some countries because of an inadequate supply of blood products (World Health Organization 2014).

The website is divided into several modules. Starting with an authentication system that is essential to verify the donor and recipient's identity and record and manage all activities. The website will be asking for their registered identity cards for verification. JWT will be used for all transmission between the frontend and backend. JWT (JSON Web Token) is a good way of transmitting information securely. Because JWTs can be signed – for example, using public/private key pairs – we can be sure the senders are whom they say they are. This removes any possibility of phishing or any scam. The authentication module is only a one-time module to be used by new users (JSON Web Token Introduction 2022). After verification, the user can manage all the information on the profile page, such as full name, email address, phone number, and address. A powerful password system has been maintained as the system stores the users' private and sensitive information. On the main page (dashboard), users can check all the available donors and recipients in their region. They can also search for donation centers close to them along with the rating provided by the user and contact details. The website also provides an appointment system that assists the users in managing appointments and booking slots at hospitals and donation centers. The hospital will post its available date or time on the schedule, and the donor can make an appointment after confirming it.

References

Auth0.com. (n.d.). JSON web tokens introduction. JSON Web Token Introduction. Retrieved May 25, 2022, from https://jwt.io/introduction.

Baş Güre, Seda & Carello, Giuliana & Lanzarone, Ettore & Ocak, Zeynep & Yalcindag, Semih. (2016). Management of Blood Donation System: Literature Review and Research Perspectives. 169. 121-132. 10.1007/978-3-319-35132-2\_12.

World Health Organization: http://www.who.int (2014).