

Project Report On



## **Vital-Drop (Blood Bank Management)**

Submitted in partial fulfillment for the award of  
**Post Graduate Diploma in Advanced Computing**

from

**C-DAC ACTS (Pune)**

Guided by

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Centre of Development of Advanced Computing (C-DAC), Pune



# **CERTIFICATE**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that

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Rahul Patil - 240840120127

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have successfully completed their project titled

**“Vital-Drop (Blood Bank Management)”**

Under the Guidance of **Mr. Salman Kavtekar**

Project Guide

HOD ACTS



# ACKNOWLEDGEMENT

This project “**Vital-Drop (Blood Bank Management)**” was a great learning experience for us and we are submitting this work to Advanced Computing Training School (CDAC ACTS).

We all are very glad to mention the name of **Mr. Salman Kavtekar** for his valuable guidance to work on this project. His guidance and support helped us to overcome various obstacles and intricacies during the course of project work.

Our most heartfelt thank goes to Ms **Swati madam** (Course Coordinator, PG-DAC) who gave all the required support and kind coordination to provide all the necessities like required hardware, internet facility and extra Lab hours to complete the project and throughout the course up to the last day here in C-DAC ACTS, Pune.

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# 1. Introduction

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## **Purpose:**

The purpose of this document is to deliver a detailed depiction of the E- Blood Bank. It will explain the function and characteristics, the boundaries and purpose of the system, and all external environment restrictions under which this system must operate and react successfully.

The software System, an E- Blood Bank (EBB) will be designed for blood bank related services. The purpose of this system is to combine all databases of blood banks as well as the records of blood donation and consumption. It will help seekers to find the blood availability and donor to donate blood at a blood donation centre.

More specifically, this designed system will allow registered users to search for blood and make a request online.

## **Scope:**

EBB will be always available for users where they can access the functionalities provided by the web application. The system provides secure registration and profile management facilities for users. It will have adequate searching mechanisms to get information about blood bank related facilities. The system also provides an easy solution for the registered seekers to request a specific type of blood online using the internet and also allow donors to book the schedule online for the blood donation.

## **Overview:**

Developing an online platform is a job that requires equal share of technological expertise and sound decision making. This website offers smoother experience to use provided services. Developers make it sure that the site is high on responsiveness and low on tech errors, which is the most favourable selling point of this web application.

Also from the service perspective, users usually get the blood bank services with ease on websites, as they get all the details available there. EBB provides seekers to find required types of blood by spending less time, besides the whole and sole purpose is to provide blood bank facilities to users with minimum efforts.

### **Overall Description:**

Blood For Lives is an online website, an outstanding way of bringing users on an online platform to provide blood bank related facilities in an efficient manner. This website provides an Interactive interface through which a user can interact with different areas of the application easily by maintaining the blood stocks as well as user's information. EBB provides a simple interface and platform to ease the process of getting the information about blood availability online. It includes smooth functionality and efficiency that get the user's work done. Blood For Lives keeps the information about the blood stock and user data updated.

Users are classified into three parts: the Administrators, Donors and Consumers.

### **Administrator:**

He or she is a verified/ authorized person in the EBB who is allowed to organize blood donation camps and he can manage the requests for blood as well as he/she can give confirmation about blood donation status of donors. Admin is responsible for monitoring functions and procedures on the platform. Admin can manage or view all the functionalities as given below

View or update the data of blood donation and blood seeking request.

View and manage the appointments/events.

### **Consumer:**

He or she is a verified user of a website who is intended to get blood via EBB. The consumer must have an Email-Id and password to make a request. If the consumer is not registered, they will have to register themselves by navigating to the sign up page.

**Donor:**

He or she is a verified user of a web application who is intended to donate blood via OBBMS. The donor must have an Email-Id and password to do donation of blood. If the donor is not registered, they will have to register themselves by navigating to the signup page.

## 2. Software/Hardware Requirement

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### **Server:**

Processor: Intel Core i5 or equivalent AMD processor.

RAM: Minimum 8GB RAM.

Storage: SSD storage for improved performance.

Network: Ethernet or Wi-Fi connectivity.

Operating System: Linux distribution (Ubuntu, CentOS) preferred for server deployment.

### **Client Devices:**

Processor: Dual-core processor or higher.

RAM: Minimum 4GB RAM.

Storage: Sufficient storage for caching and local data.

Network: Ethernet or Wi-Fi connectivity.

Browser: Compatible with latest versions of popular browsers like Google Chrome, Mozilla Firefox, and Safari.



### 3. Tools and technologies used

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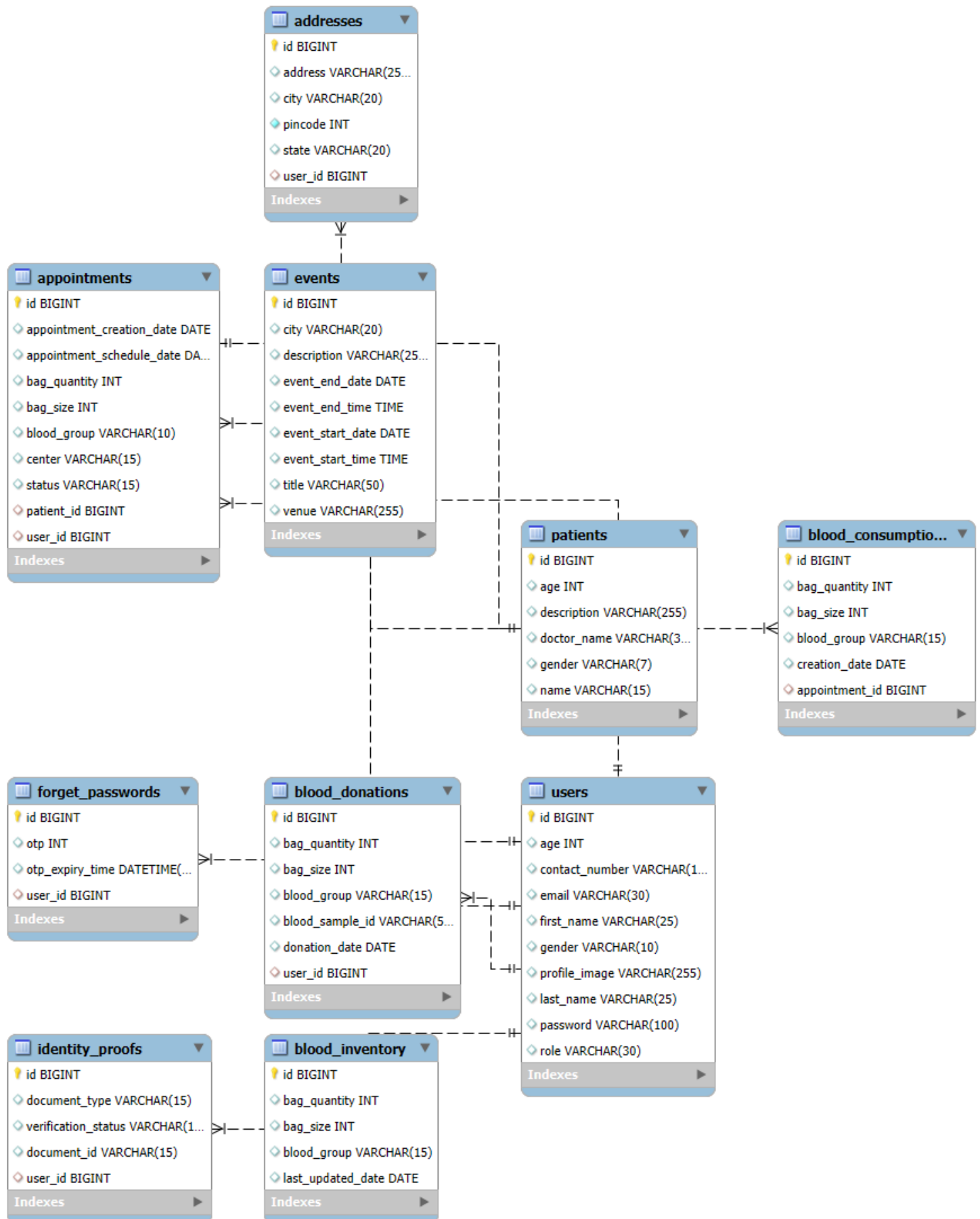
- Spring Boot
- Spring Data JPA
- RESTful Web
- Node JS
- Express JS
- Spring Web
- MYSQL Aiven Cloud Database
- JWT
- Git
- Spring Security
- React JS
- HTML and CSS
- Axios

1. Spring Boot: Utilized to develop the backend of the application, providing a robust framework for building Java-based web applications with ease.
2. Spring Data JPA: Implemented for data access, allowing seamless interaction with the MySQL database to store and retrieve sports data efficiently.
3. RESTful Web Services: In the context of an e-commerce web application like Book Charm, RESTful web services play a crucial role in facilitating communication between the frontend and backend components. These services adhere to the principles of Representational State Transfer (REST), which emphasizes a stateless, standardized approach for building web services

4. Node JS: Employed for web scraping, enabling the application to extract live scores and match details from various sports websites and APIs.
5. Express JS: Express.js is a web application framework for Node.js that simplifies the creation of robust, scalable APIs and web applications by providing a set of middleware and routing mechanisms. It streamlines the process of handling HTTP requests, making it efficient for building server-side components in a Node.js application.
6. Spring Web: Used for handling web requests and responses, managing controllers, and serving static resources to the frontend.
7. Aiven cloud database MySQL: Chosen as the relational database management system to store book data on cloud ,including user detail ,seller detail, book information and admin details.
8. JWT (JSON Web Tokens): Implemented for secure user authentication and authorization, ensuring that only authenticated users can access into account and buy books and seller can add books .
9. Axios: In the context of a web application like Book Charm, Axios is likely used as a client-side HTTP library. Axios simplifies the process of making asynchronous HTTP requests from the frontend (React.js) to the backend (Node.js/Express.js). It is instrumental in fetching data from the server, handling API calls, and facilitating smooth communication between the frontend and backend components, ensuring efficient data retrieval and seamless user interactions in the e-commerce application
10. React: Employed to build the frontend of the application, offering a component-based architecture for creating dynamic and interactive user interfaces.

11. CSS: Used for styling the frontend components with utility-first CSS classes, allowing for rapid prototyping and customization of the user interface.
12. Git: Implemented as a version control system to track changes in the source code, enabling collaboration among developers, and facilitating code management and deployment workflows.

## 4. Project Database Diagram



## 5. Advantages

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- Use of MySQL Cloud Database
  - The Book Charm project utilizes the Aiven cloud-based MySQL database for efficient and scalable data management. Here are key points about its integration:
  - 1. Reliability: Aiven offers a reliable database solution with high availability, ensuring uninterrupted service for Book Charm users.
  - 2. Scalability: The cloud-based nature of Aiven allows seamless scalability, accommodating the growing data needs of the e-commerce application.
  - 3. Managed Services: Aiven provides managed MySQL services, handling administrative tasks such as backups and maintenance, reducing the operational burden on the development team.
  - 4. Security: The Aiven platform prioritizes data security, implementing encryption and access controls to safeguard sensitive information stored in the MySQL database.
  - 5. Automatic Backups: Book Charm benefits from automatic backups provided by Aiven, ensuring data integrity and easy recovery in case of unexpected issues.
  - 6. API Compatibility: Aiven supports standard MySQL APIs, facilitating seamless integration with the backend components of the Book Charm web application.
  - 7. Developer-Friendly: The Aiven platform offers a developer-friendly environment, making it straightforward for the development team to configure and manage the MySQL database for Book Charm.
  - 8. Cost-Effective: Aiven's cloud-based model allows cost-effective utilization, enabling Book Charm to pay for the resources it consumes without the need for extensive infrastructure management.

- 9.Data Durability: With Aiven, data durability is enhanced through redundant storage and backup mechanisms, ensuring that critical information is safeguarded against data loss scenarios.
- Use of JWT for authorization
  - Stateless Authentication: JWT allows for stateless authentication, meaning server-side sessions or database lookups for authentication are not required, resulting in reduced server load and improved scalability.
  - Enhanced Security: JWTs are digitally signed, ensuring data integrity and preventing tampering or unauthorized access to user data. Additionally, since JWTs do not store sensitive information, they mitigate the risk of data exposure in case of a breach.
  - Cross-Domain Compatibility: JWTs can be easily transmitted over HTTP headers or URLs, making them suitable for use in cross-domain communication and enabling seamless integration with various frontend and backend technologies.

## 6. Screenshots

### A) User Related Functionalities

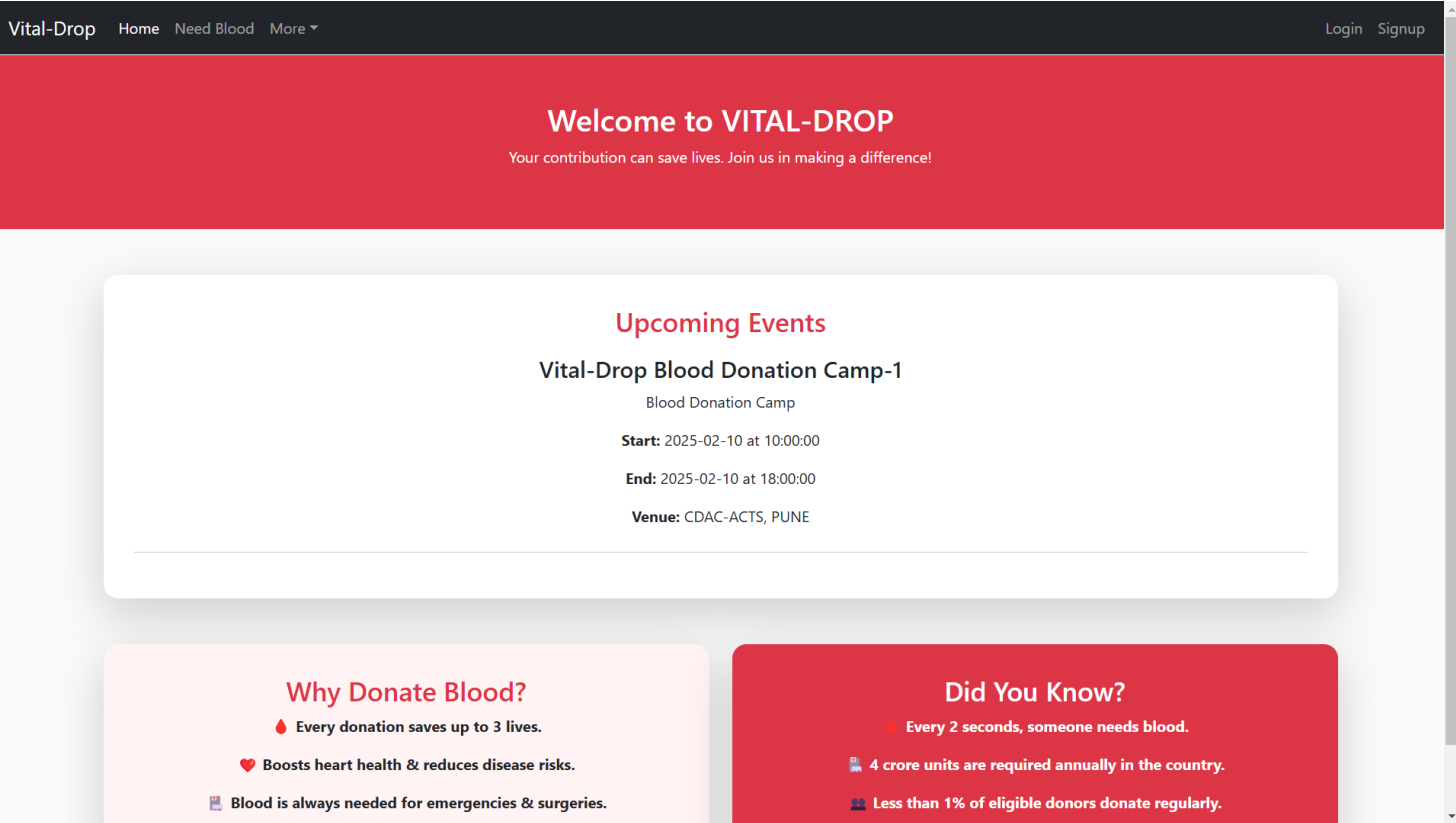


Fig-1: Home Page



## Login

Email

example@gmail.com

Password

\*\*\*\*\*

Login

Don't have an account? [Sign up](#)

**Fig2 – User Registration page**

## Login

Email

example@gmail.com

Password

\*\*\*\*\*

Login

Don't have an account? [Sign up](#)

**Fig 3 –User login page**

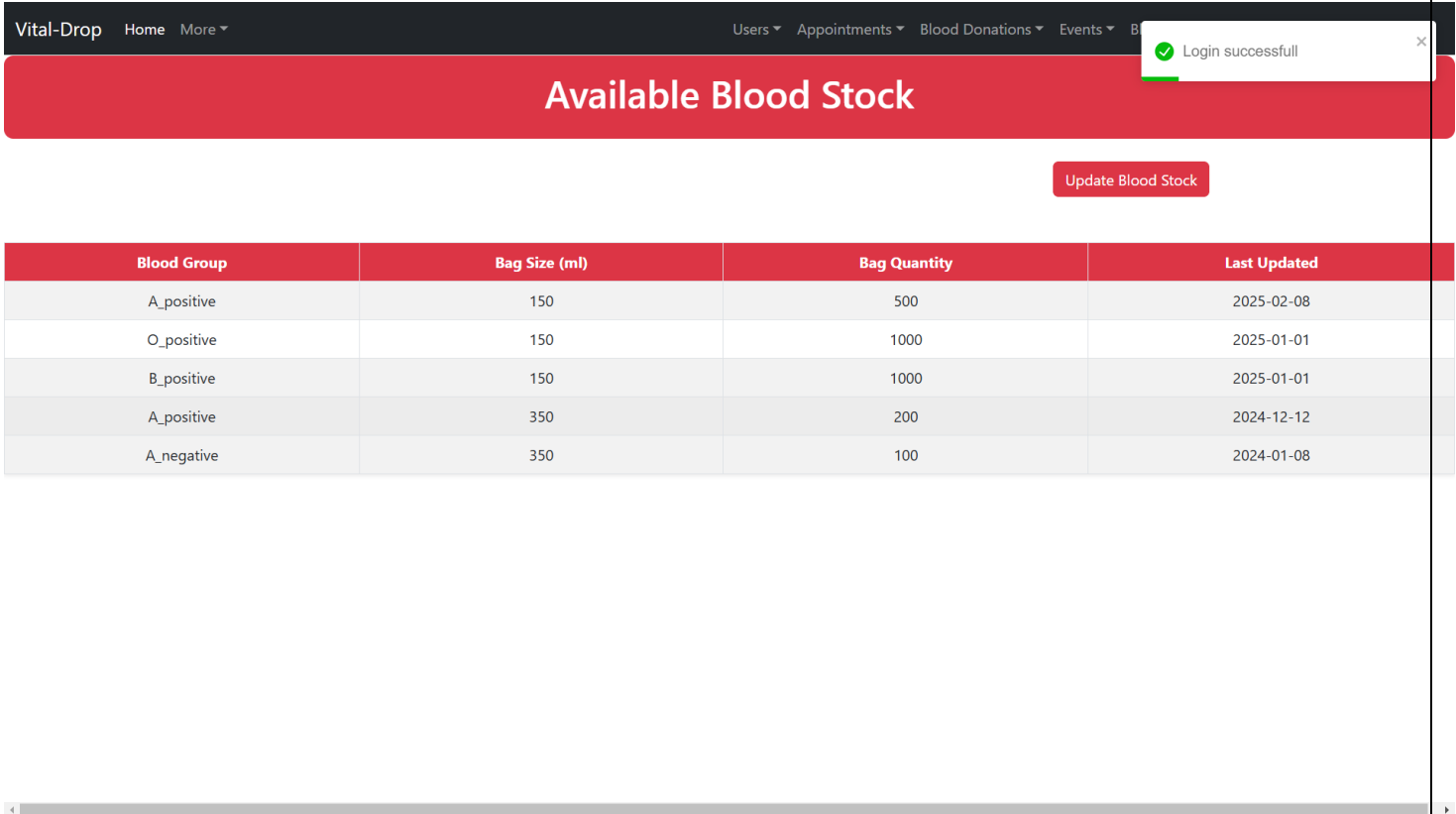


Fig 4 –Available Blood Stock

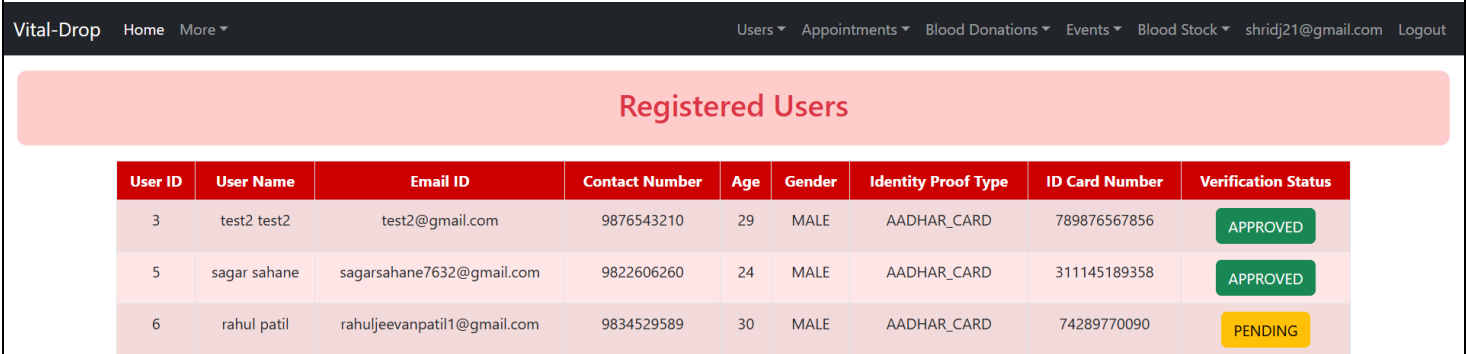


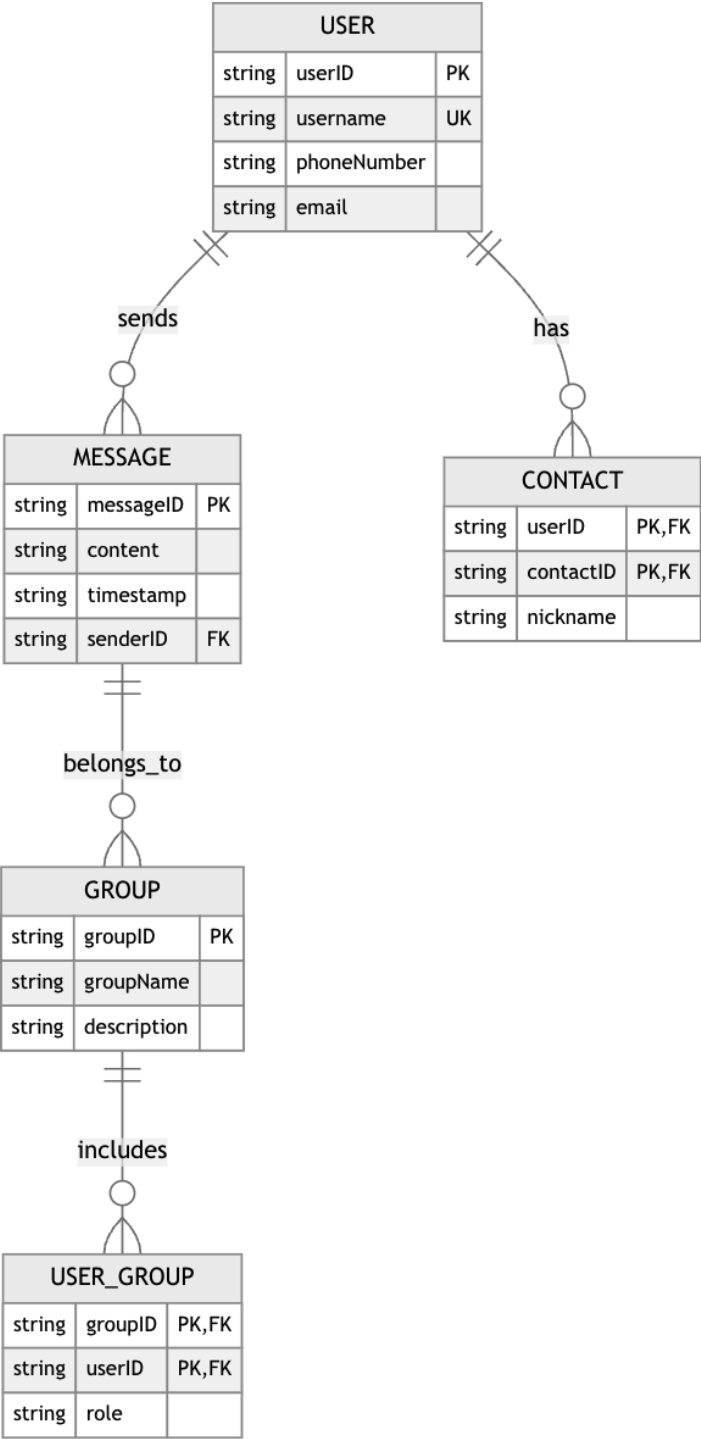
Fig 5 –Registered users

Pending User Verification

User ID	First Name	Last Name	Email ID	Identity Proof Type	ID Card Number	Status	
6	rahul	patil	rahuljeevanpatil1@gmail.com	AADHAR_CARD	74289770090	<div>✓ Approve</div>	<div>✗ Reject</div>

Fig 6 – User Verification

B) Use Case Diagram



## 7. FUTURE SCOPE:

### **Subscription-Based Model:**

Introduce a membership-based system where regular donors and organizations can subscribe for exclusive benefits such as priority appointment scheduling, health tracking, and early notifications for urgent blood requirements.

Implement tiered subscription plans to cater to individual donors, corporate sponsors, and healthcare institutions.

### **Mobile App Development:**

Develop a dedicated mobile application for iOS and Android to facilitate easy registration, appointment booking, and real-time tracking of donation events.

Optimize the mobile interface for seamless navigation, push notifications, and instant alerts for emergency blood requirements.

### **Enhance Personalization:**

Implement AI-driven recommendation systems to notify users about upcoming donation opportunities based on their eligibility, location, and donation history.

Enable user profiles to sync across devices, providing a consistent experience with health tracking, reminders, and rewards for regular donors.

### **Data Analytics and Reporting:**

Integrate advanced data analytics to generate reports on blood donation trends, donor retention rates, and blood supply-demand analysis.

Provide visual dashboards for hospitals and blood banks to track real-time inventory levels and forecast future blood requirements efficiently.

## 8. Conclusion

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The Blood Donation Management System successfully integrates advanced technologies to create a seamless and efficient platform for managing blood donations. Leveraging Spring Boot, Spring Data JPA, and RESTful Web Services, the system ensures secure user authentication, efficient donor management, and real-time blood inventory tracking. This project adopts a user-centric approach, incorporating technologies like Spring Boot, Node.js, React.js, and Aiven cloud-based MySQL database to deliver a scalable and reliable platform. With features such as real-time notifications, donor eligibility tracking, and hospital-blood bank coordination, the system optimizes the donation process while ensuring accessibility for donors and healthcare institutions.

Future enhancements, including a subscription-based model, can boost donor engagement and retention. Expanding the platform through a dedicated mobile application will further enhance accessibility and convenience for donors and medical professionals. The project stands as a testament to innovation, efficiency, and adaptability, striving to make a meaningful impact in the field of blood donation and healthcare management.

## 9. References

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7. <https://nodejs.org/>