

SRS - WAREED APP

01

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1. introduction

A blood bank system plays a crucial role in ensuring the availability of safe and adequate blood supply for transfusion needs. Every year, millions of people worldwide rely on donated blood for various medical treatments and emergencies. A well-managed blood bank system acts as a lifeline, connecting voluntary donors with patients in need, and maintaining a steady inventory of blood components. By providing a centralized source of blood collection, testing, storage, and distribution, a blood bank system plays a vital role in saving lives and improving the quality of healthcare services. In this introduction, we will explore the key components, functions, and importance of a comprehensive blood bank system in today's healthcare landscape.

1.1 scope

A blood bank system plays a critical role in the healthcare sector by ensuring the availability of safe and adequate blood supply to those in need. It is an essential component of any medical infrastructure, contributing to saving lives and improving patient outcomes.

1.2 document structure

1. Introduction:

This section provides an overview of the blood bank system, highlighting its software concept, functionalities, and features.

2. Description Overview:

In this section, we present a comprehensive overview of the blood bank system, including the key functional aspects, the types of users involved, and the necessary tools for software implementation.

3. User Requirements:

This section outlines the specific requirements of the blood bank program or system, detailing its objectives and intended purpose.

4. Use Cases:

Here, we illustrate the interaction between users and the blood bank system, presenting various scenarios and actions performed by different users.

5. External Interface Requirements:

This section specifies the components that interface with the blood bank system, encompassing the user interface, hardware, and software integrations.

6. Nonfunctional Requirements:

These requirements encompass the limitations and specifications imposed on the blood bank system, encompassing factors such as security, performance, and data protection

1.3 constraints

The program comes with certain restrictions that users should take into consideration. These include the requirement of an internet connection to access time and location information, as well as personal data like phone numbers, email addresses, and blood type.

1.4 references

<https://flutternalk.com/best-database-for-flutter/>

<https://www.geeksforgeeks.org/functional-vs-non-functional-requirements/>

2. System Overview Description

"Wareed," our user-friendly blood bank application, simplifies the blood donation process by connecting donors with those in need. It not only makes scheduling appointments easy but also informs you when you are eligible to donate again. Through real-time matching, "Wareed" ensures that your blood donations have an immediate impact, and timely notifications keep you updated on nearby donation opportunities and emergency requests. Blood banks benefit from improved inventory management, while you, as a donor, play a vital role in saving lives in your community. "Wareed" is all about simplicity, efficiency, and making a meaningful impact through blood donation.

2.1 Product Perspective

1. Donors:

- Perspective: Donors view "Wareed" as a user-friendly platform for blood donation.
- Key Focus: Convenience in registering, scheduling appointments, and receiving timely notifications about donation events.
- Value: A seamless and accessible way to contribute to the noble cause of blood donation.

2. Blood Bank Administrators:

- Perspective: Administrators see "Wareed" as a comprehensive tool for blood inventory management.
- Key Focus: Efficient tracking of blood inventory, reporting capabilities, and coordination of blood drives.
- Value: Effective resource allocation, minimizing waste, and supporting healthcare facilities.

3. Hospitals and Healthcare Professionals:

- Perspective: Hospitals view "Wareed" as a vital resource for blood supply management.
- Key Focus: Real-time blood availability, streamlined blood requests, and integration with patient management systems.
- Value: Ensuring timely and safe blood transfusions for patients in need.

2.2 Product Function

1. Donor Registration and Profiles:

- Allows individuals to register as blood donors.
- Manages donor profiles with personal information, contact details, and blood type.
- Stores donation history and eligibility status.

2.Donation Scheduling:

- Enables donors to schedule appointments for blood donations.
- Provides a calendar and notification system for upcoming donation events.

3.Real-Time Blood Availability:

- Offers hospitals and healthcare facilities access to real-time data on blood availability.
- Allows for immediate requests for specific blood types and products.

4.Donor Notifications and Engagement:

- Sends timely notifications to donors about upcoming donation appointments, blood drives, and urgent blood requests.
- Encourages regular participation and engagement with the cause.

5.Health Check and Eligibility Screening:

- Administers health assessments and eligibility screenings to ensure donors meet necessary health criteria before donating blood.

6.Security and Data Protection:

- Implements robust security measures to protect donor and patient information.
- Ensures compliance with data privacy regulations and standards.

7.Compliance and Regulations:

- Ensures that the application complies with all relevant regulations and standards for blood donation and healthcare data.

2.3 User Classes and Characteristics

In the "Wareed" application, there are different types of users, each with specific roles. Blood donors are individuals who willingly sign up to donate blood, receiving notifications about nearby donation drives and managing their appointments. Recipients, typically healthcare facilities, request blood and get real-time notifications about available donors. Blood banks and administrators handle inventory, process donations, and ensure data security. Altogether, these user classes work together to maintain a steady blood supply and promote voluntary blood donation through "Wareed."

2.4 Design and Implementation Constraints

We've developed our software using the open-source Flutter framework, which is powered by the user-friendly Dart programming language. Our primary objective is to expand the reach of our software, making it compatible with both the IOS and Android operating systems. Thanks to Flutter's modern approach, we can effortlessly create applications for mobile and desktop platforms. Our application is equipped to handle substantial volumes of data, particularly concerning donor information. To manage this data effectively, we've integrated SQLite, a reliable database system, into our Flutter apps for efficient data storage and retrieval.

2.5 Assumptions and Dependencies

Our application is designed with a strong focus on user accessibility and a personalized experience. To achieve this, we've integrated features that synchronize with the user's location, date, and time. With the user's explicit permission, this synchronization allows us to provide highly accurate and timely information.

For example, by knowing the user's location, we can suggest nearby blood donation drives or facilities, making it more convenient for them to contribute. The real-time synchronization with the date and time ensures that users receive notifications and updates at the right moments, such as reminders for upcoming donation appointments or urgent blood requests.

3. user requirements

3.1 logging system

3.1.1 signup :

creating an account for new users and these are the data required from the user :

- first name
- last name
- phone number
- national ID
- gender
- birthday
- blood type
- weight
- location

* these requirements are used in various features on the app

3.1.2 login :

- phone number
- verification code

3.2 main activity

3.2.1 location access

the application asks for permission to access the location of the user to provide the nearest blood banks

3.2.2 specify closest blood bank

user asked to choose the blood bank that he prefers

3.2.3 book an appointment

user should choose : date and time and donation type

3.2.4 appointment confirmation

app provide a summary about the booking information and asks the user to confirm the appointment , and decide whether he wants to add this appointment to the calendar or not .

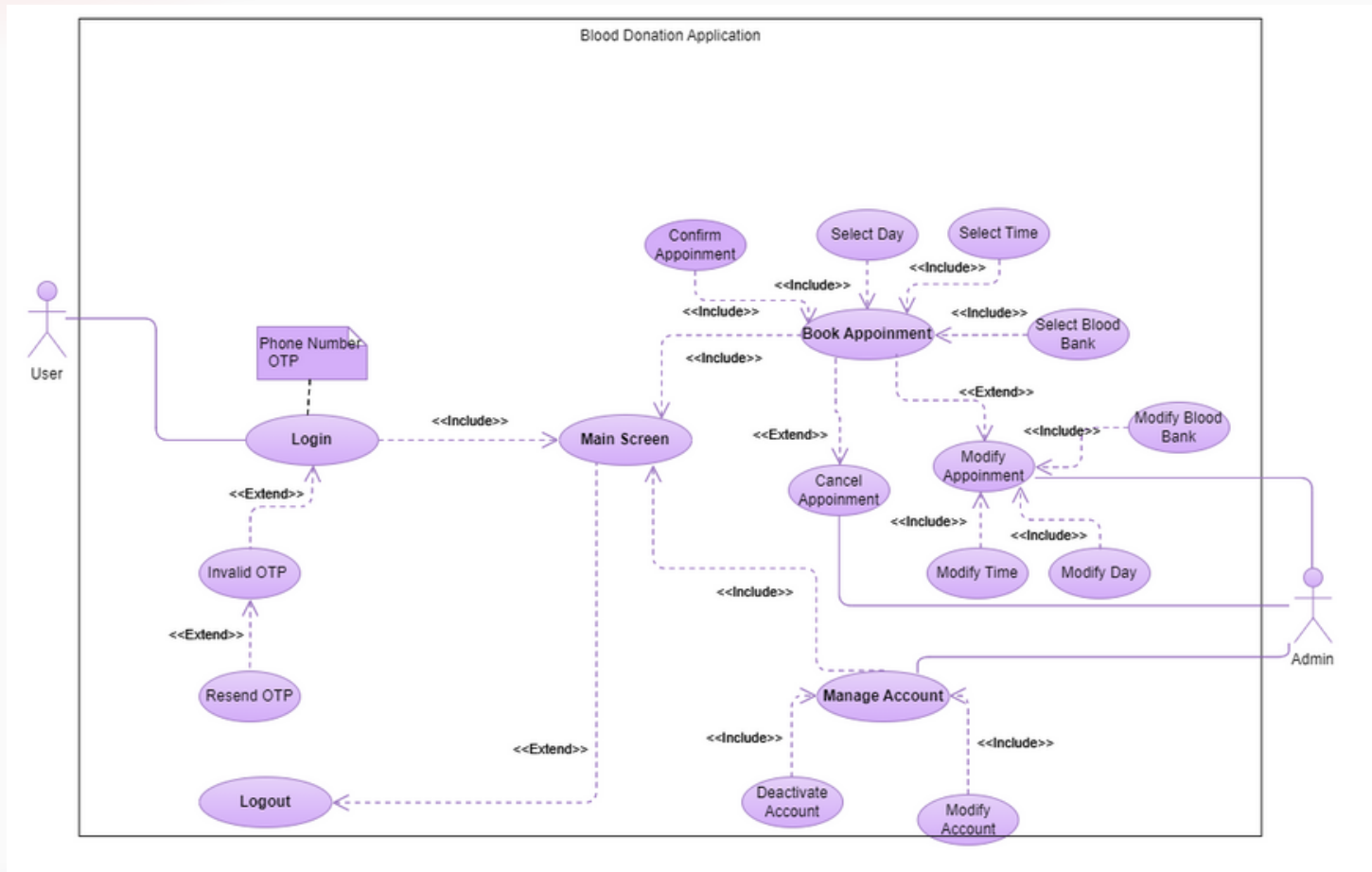
3.3 community

3.3.1 contacts access

application asks the user for permission to access his contacts so that he can have them as friends in the app and view their accomplishments and ranking on the city level or the app level .

4. use Case

4.1 Graphical use case



5. External Interface Requirements

5.1 User interface

In our software, we use a clear and flexible UX \ UI that is easy to understand and interact with, So that the user can apply all reservation processes and manage his/her appointment in an easy and fast way. The program is accessible through the mobile application.

5.2 Hardware Interface

Mobile devices, servers, and internet connection.

5.3 Software Interface

- Operating systems:
 - The software will support IOS and Android to make it available for everyone.
- Database:
 - Since we used Flutter framework to be available for IOS and Android we used SQLite and MySQL is not an option since we cannot connect it directly to the IOS app.

5.4 Communication interface

The program supports any kind of update in the OS and we use simple electronic forms (HTML forms e.g. Input Types) and (HTML Geolocation API to get the geographical position of the user) To carry out his/her reservations and to give the user the nearest blood donation center and other functions of the program. Also, we use HTTPS protocol to encrypt the communications.

6. Non-Functional Requirements

6.1 Performance:

First of all the most important thing from this aspect is the response time, our application response quickly to the user actions such as registering as a donor, searching for blood availability, or scheduling appointments in milliseconds or seconds to ensure a smooth user experience. Also, the app have the capability to handle multiple requests simultaneously, where it manage a significant number of concurrent users without any performance degradation, and be robust enough to handle errors gracefully without causing any system failures or data loss. Last the application is highly available, ensuring minimal downtime and uninterrupted access, witch makes it capable of handling peak usage periods, especially during emergencies when blood needs are high.

6.2 Security

Since security is very important aspect, our app ensure confidentiality and implement secure user authentication mechanisms, such as passwords. And for the data integrity it employs encryption techniques and mechanisms to protect the user's personal and medical data. For data privacy the app adhere to data protection laws and regulations and maintain the privacy of users' personal and medical information, so It obtains the user consent for data collection and clearly state the purpose of data usage, and use anonymization techniques when sharing data for research purposes or with external entities. Lastly, it provides backup and recovery mechanism in place to protect against data loss or system failures, so regular data backups are performed, and data recovery procedures be well-documented and tested all to minimize the impact of any potential incidents.

6.3 Safety

Our app provides clear and accurate information about donation sites, and this is necessary to prevent donators from accidentally going to unauthorized or unsafe areas. It also provides safety instructions and guidelines for what the donor is required to do before and after their donation, this ensures the overall safety of the blood donation process and helps prevent potential health risks for the donor.

6.4 Software Quality Attributes

Finally we can say that our Wareed app provides Some key software quality attributes, It's Reliable ,and Perform every action quickly while handling a large number of users simultaneously even during peak donation times or emergencies, and this indicates that it has high levels of scalability.

Since we developed the app using good software engineering practices, allowing easy maintenance and updates. Proper documentation, clear code structures, and modularity enable future enhancements and bug fixes to be implemented efficiently.

Forther more, the most important thing that Wareed has a user-friendly interface, clear navigation, and provide appropriate guidance throughout the donation process. This attribute helps encourage user engagement and ensures that donors can conveniently access and input their information, there for, it's easy to use for both experienced and first-time users.

By ensuring these software quality attributes are met, the blood donation application can effectively support the needs of users, promote a positive user experience, and contribute to the efficiency and effectiveness of blood donation processes.

7. Requirements Engineering: Methods for Gathering, Analyzing, and Validating

Observation:

Purpose: Observe blood donation processes and workflows to identify pain points and areas for improvement.

How: Shadow donors, medical staff, and administrators during the donation process.

Use Case Analysis:

- Purpose: Identify, clarify, and organize system requirements.
- How: Develop use cases to describe the interactions between users and the system.
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Stakeholder Interviews:

- Purpose: Understand the needs and expectations of stakeholders involved in blood donation, such as donors, recipients, medical professionals, and administrators.
- How: Conduct one-on-one or group interviews with relevant stakeholders to gather insights.

Prototyping:

- Purpose: Create a visual representation of the application to gather feedback and refine requirements.
- How: Develop wireframes or mockups for key screens and functionalities.

8. Work section

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Introduction functional requirement	Shihanah Albadi
System overview	Deema Alnasser
External interface requirement	Joud Alolayan
Non-functional requirement	Danah Alkughail
System overview	Reema Alnasser
External interface requirement use case	Deem Alghurair
Non-functional requirement	Seera Alhatlani
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