BLUD- The Blood Donation Application

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Introduction

- The "BLUD" project aims to revolutionize the blood donation process by providing a robust and efficient platform that connects blood donors with individuals or organizations in need of blood.

Motivation

- The "BLUD" project aims to tackle the challenges and inefficiencies in the blood donation process by creating a comprehensive and user-friendly platform that addresses the issues of maintaining accurate donor and recipient information, thereby streamlining the process and ensuring timely blood supply to save lives.

Scope of our project

- Developing a scalable and user-friendly mobile application for blood donors and recipients.
- Utilizing WhatsApp Business API for efficient donor communication and confirmation.
- Implementing real-time tracking of available donors to optimize blood supply management.
- Displaying a live blood request feed to connect donors with recipients promptly

Tech Stacks Used

- Flutter
- Figma
- NodeJS
- Firebase

System Requirement Specification

- Gap Analysis

Existing Systems	**Analysis**
Simply Blood App	The app had delay in generating OTP for login services. However,after login there are errors in the live updating of blood requests and the app had a poor notification system.
UBlood App	Although the app has location selection system, there are multiple bugs while providing location information. The app is also reluctant to find the status of blood banks in specific areas.
Blood Friends App	The number of hospitals and blood banks listed in the app is very less and doesn't provide status of local hospitals and small scale blood banks in an area.

Figure: Gap Analysis

System Requirement Specification

- Problem Statement
  - To develop a user-friendly and efficient mobile application for blood donation activities with direct alerting and confirmation system and to promote blood donation as a social service among the people.
- System Model
  - The system mainly consists of App interface, server, database and micro-services. The user interacts with the app interface which consists of functional activities of blood donation.

System Requirement Specification

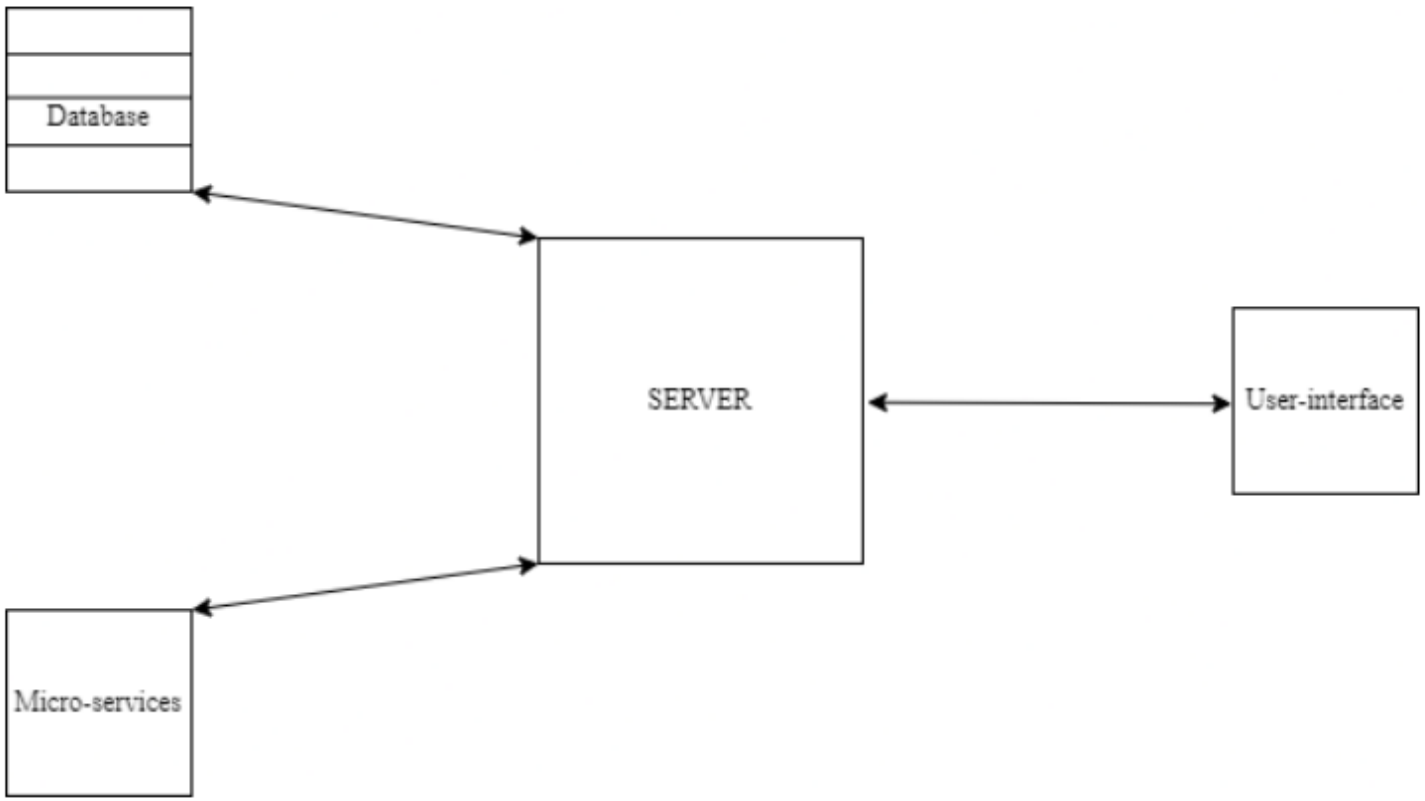


Figure: Architecture Diagram

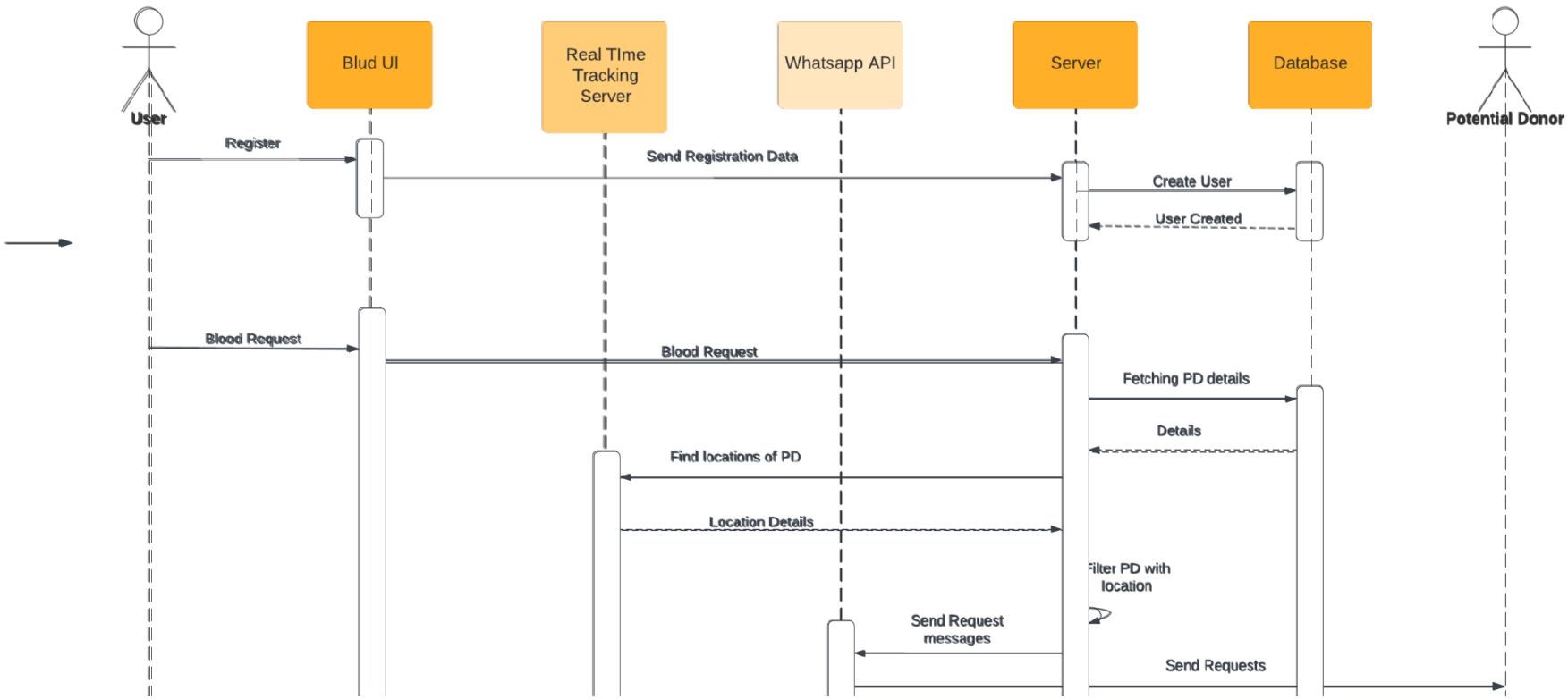
System Requirement Specification

- Software Requirements
  - The app must be connected with a stable network for live services.
  - The app must have access to storage, GPS, messages and call functions.

System Requirement Specification

- Hardware Requirements
  - The app should be utilizable on all range of smartphones
  - Required RAM of 2 GB or above

System Design



System Design

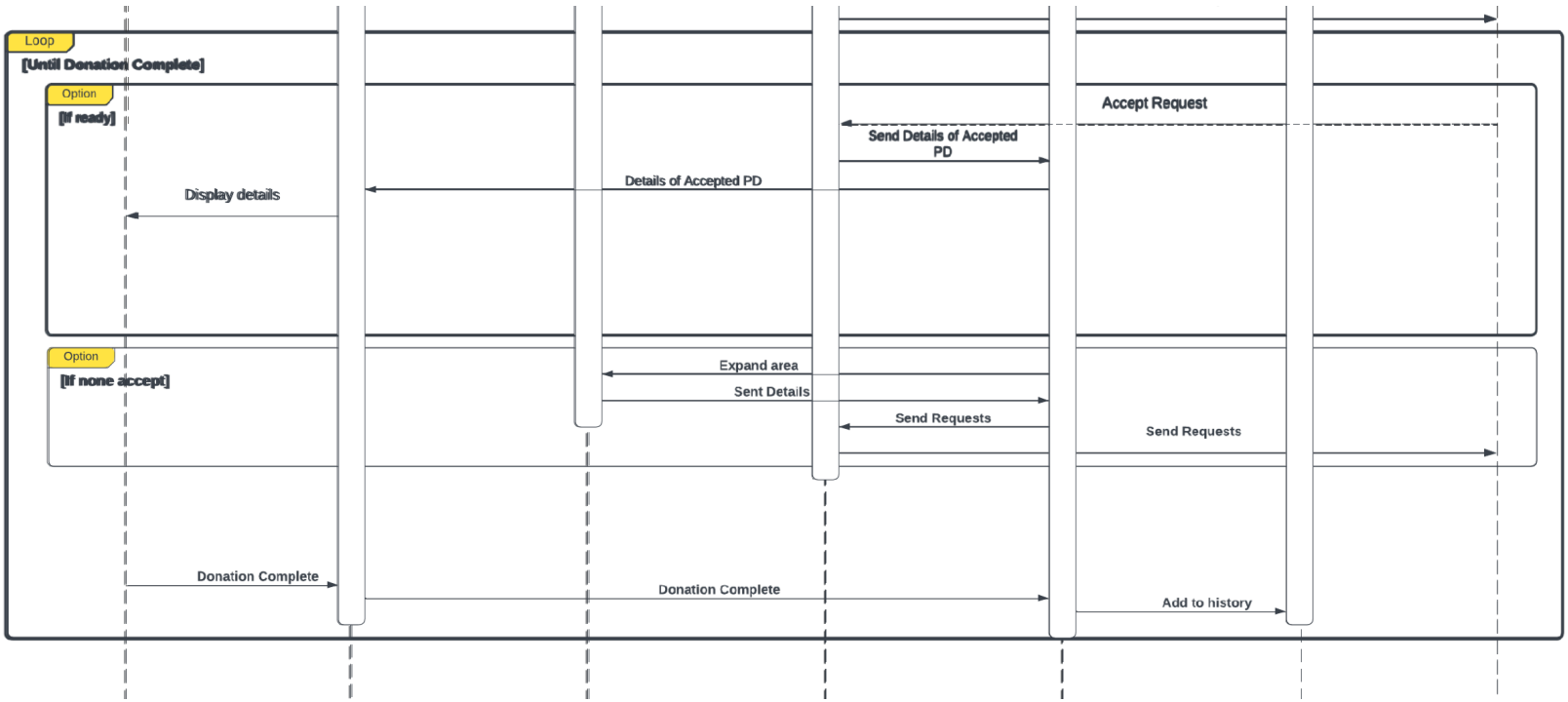


Figure: Sequence Diagram

User Interface

- It consists of:
  - Home page: Live donation requests corresponding to the blood group of the user and their status of donation are shown.
  - Consists two buttons one for requesting blood and other to see willing donors.
  - Consists of pages to view History of both donations and requests and a profile page to edit user details and to logout from the app.

Database

- The module is implemented using MongoDB. It facilitates the storage and provision of data such as user details that is collected during the registration phase, storing the details of potential donors when a user blood request is active.
- The firebase realtime database also facilitates the storage of more dynamic realtime data such as willing donors.

Server

- Server module in our application was implemented using NodeJS.
- This module deals with:
  - integrating the WhatsApp API
  - checking the location constraints and tracking location in realtime
  - increase the radius of the location search if the previous search finds unsuccessful
  - filtering the donor data, registration and login logic, OTP implementation and handling blood requests.

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Micro Services

- Micro services consist of two important components - WhatsApp API and Realtime Tracking Server.
- WhatsApp API: Used to sent the request message to filtered donors from the server through WhatsApp messaging and the allow the user to accept a blood request.
- The Realtime Tracking server: Used to find the locations of the potential donors and send the details back to the server for filtering and displaying it to the users.

Testing

- The various testing phases helped uncover potential defects, ensuring that the software product aligned with the expected requirements.
- By adhering to these testing methodologies, the Blud project achieved a higher level of confidence in its performance and behavior

Recommendations for Future Works

- Live location of available donors on the map: Enables real-time tracking and display of the geographical positions of blood donors who are currently willing and available to donate blood.
- Blood donation drives in collaboration with blood banks: Organized events or campaigns where blood is collected from voluntary donors in partnership with established blood banks.

Demo

Demo