



Online Platform for Blood Donor and Requester Management System in Bhutan

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ABSTRACT

In many occasions when a critical patient requires blood; normally routes through their family, friends, and their community. This process is observed to be time-consuming and might lead to health risk for the patient. Even though there are accessible information and technology and available social media users, people find challenges in receiving blood donor. Therefore, android based application 'Save Life by Donating Blood' (SLDB) is developed to overcome inconveniences for the critical patient, their guardian and donor. This application allows users to view detail information of donor and communicate as and when an emergency occurs. Interested blood donor can register into the app filling their required details. Any general blood seeker can request blood donor online, by downloading this application. It is designed with the prototype using Adobe XD, and Android Studio is used as front-end for actual app development using java language and backend firebase database. The app SLDB have features such as; text message, send mail, and directly correspond (call). This app can be upgraded with additional features such as in-app chat features, blood seeker and donor locator through Google map, and also potential donor can view donation activity through a graphical user interface and develop iOS compatible.

Keywords: Android, blood, donor, seeker, SLDB

I. INTRODUCTION

Blood is an essential element in human life and most emergency cases, it is the blood which is required the most as compared to other human composition. In many occasions, when blood is required during an emergency, people searching for blood donors usually route through their family, friends, and their community. It is often noticed that hospitals or blood banks and clinics face challenges in providing matching blood for the emergency patient. The process of finding a blood donor with an existing scenario is observed to be time-consuming and leading to health risk for a critical patient. Even with social media, reaching out to mass and appropriate individual for a blood donor is merely impossible.

Health organizations in Bhutan have been trying to manage through blood bank wherever needed as well as organize campaigns in collecting blood and other procedures such as managing, approving blood requests and updating donors' information. Despite adequate blood banks, it is still challenging to receive blood from matching donor. In such a situation, there is some solution that solves the problem of insufficient blood bank stocks that is through the use of smartphone application. Android application "Save Life by Donating Blood", is developed specifically to search for blood donors as per their desired location and blood type; create faster communication channel and place an immediate request. In this app, the user will be able to contact the donor in real-time and get donation after verifying their blood type and necessary details. Besides, hospitals can also use this app to search for blood donor and contact the blood donors in their vicinity or nearby places based on their location. The registered donors will get the notification, call or email about the blood needed at a specific clinic where they can go and donate the blood. This app provides blood seekers with the functionality to request, call, send message and mail to blood donor instantly as well as provides editable functionality to the donor if in case any changes to be made for all time.

II. RELATED WORK

"Blood Bank Management Information System in India" introduces the review of main features, merits and demerits provided by the existing Web-based Information System for Blood Bank [1]. This study describes the composition of a various existing system and provide some more idea for improving the existing system which describes the benefits of management information system in blood bank [2]. The paper is focused on the blood bank management information system. It discusses the beneficiaries of the blood bank management information system.

With those papers referred, our project could be the side to side beneficiary to the Bhutanese locale with this type of system. "Android Blood Bank" describes the android application which timely updates the information regarding donors where the admin accesses the whole information about the blood bank management system [3]. Blood is an important aspect of all living things. It proves to be a lifesaving component in case of emergency requirement. None of the online blood banks offers direct contact between donor and blood bank. This is the major drawback of the existing system. "Bhutan Blood4life" application was developed and managed by G2C under Ministry of Health which updates information about the blood donation campaign held and awareness program organized in Bhutan. The system hardly uses the user information from the registered users to get the donor for donation as well as seek the donation. They limit the donor and seeker communication channel so the new system is developed to overcome this limit.

The existing system is time-consuming; require more manpower and it is costly. The currently proposed system will provide the voluntary donors to register themselves as a donor by providing information such as name, blood group, contact information and based on information provided the recipients can contact the donors.

III. AIMS AND OBJECTIVES

A. Aims

The application aims to create a wider blood donor community in Bhutan, able to receive and donate blood in the fastest way.

B. Objectives

- Enable donor and receiver accessible to each other and know their location, blood type and other details.
- Blood seeker to call blood donor for clear communication.
- Reduce time taken to find donor and receiver during an emergency.

IV. METHODOLOGY

The android based application was developed using a 'Waterfall model'. The development is shown in the figure below. The process includes the turn back the possible process of development which benefits the developer to turn back any time of development, testing or debugging phase. The process starts with the requirement gathering, analysis, design, implementation, testing, deployment, and maintenance phase.

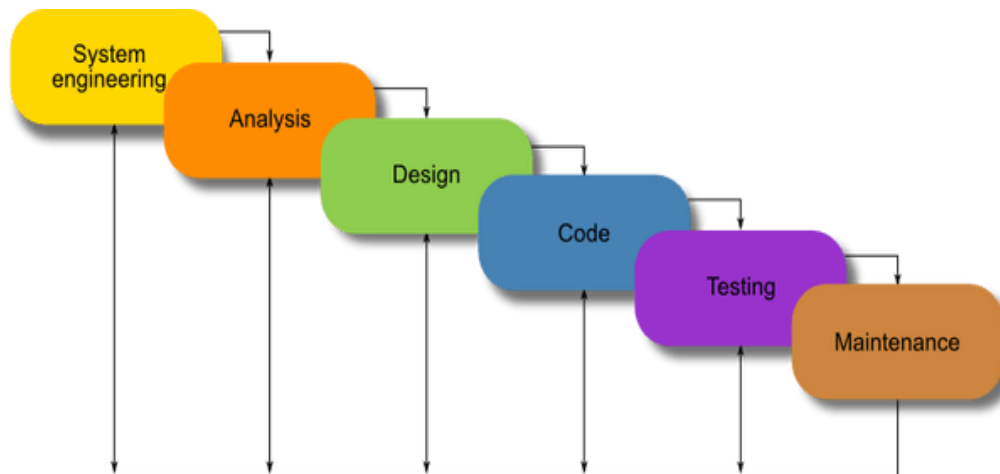


Figure 1: Waterfall model

All the requirement was gathered through the study of the previous system, their drawbacks and accordingly additional new features that is feasible to the user. Doctors and health personnel of the nearby hospital were also interviewed on the need for such an application. With the information gathered, further study was conducted on the end-users' information and limitation of an existing system. Each time a development phase was completed; we verified with the information gathered and meet users' aspect. During the development process, testing and debugging was conducted to administer the proper functioning of the developed application. The application is implemented after thorough and clean checking of the developed activity. Every time there arrives the bugs in the application, maintenance was the top priority to meet the end-users' expectation.

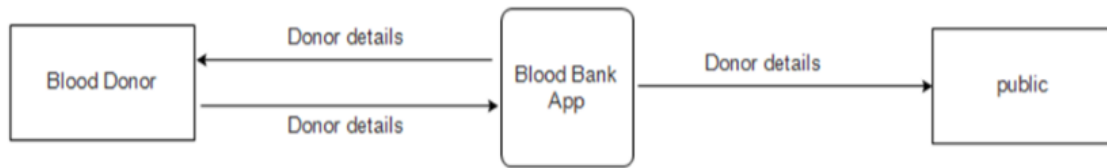


Figure 2: Context Diagram

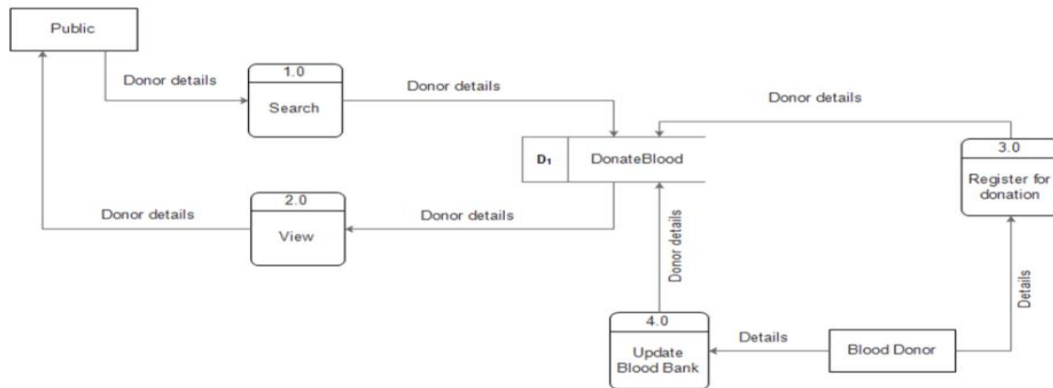


Figure 3: Data Flow Diagram

V. RESULT

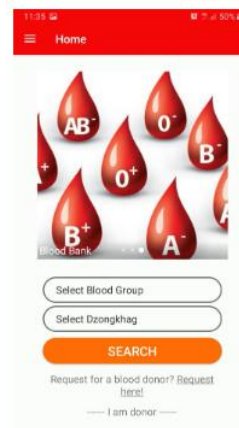
The development of the system is to benefit the social community and it has always been a key interest of this project. During the developmental phase, it has received positive feedback which indicates the benefits from the use of the application. Especially blood seeker who need blood as well as the one who seek blood donor on behalf of a patient. The existing system available has reached few literate local people and most of the people around the country are not aware of such a system. However, this project system has the aim to reach out to most people in the community since it is user friendly, effective and efficient which will benefit simply by downloading this app.

A. Welcome Screen and Home Screen

As the app is launched the welcome screen appears, further leading to the home page and the Home page provides the users with the searching interface where they select the required information in the field and search for the donor.



Img1 – Welcome Screen



Img2 –Home Screen

B. Search Donor, Donors' list and Donor Details

User can search for donor providing details such as blood group and preferable location (Dzongkhag) as displayed below. The details of a donor from the searched list will be displayed. The blood seeker can choose any of the options button listed in the screen to contact the donor via sending a message, calling directly or email for communication.



Img3 - Search Donor



Img4 - Donors' list



Img5 - Donor Details

C. Slide Menu, Sign Up Form and Request Form

When the user swipes to the Menu bar, it will direct to menu option with menu items: Login, Signup, Search by Blood Group, Search by location, Request, About Us and how to use the app?

From the slide menu, the user can click the sign-up items to register as a blood donor by providing the detail information into the field and selecting the terms & conditions, the user will be able to register to the system. The user can request for the blood donation by dropping the request message in the app given below. The requested page can be open by clicking the requested link in the Menu.



Img6 - Slide Menu



Img7 - Sign Up Form



Img8 - Request Form



CONCLUSION

The application 'Save Life by Donating Blood' is specially designed to be used by patients seeking blood, registered blood donors, hospitals and Basic Health Units. This will help the users to locate different volunteer blood donors and hospitals in the locality and then request for the blood in case of emergency. The users will be able to view information about different blood banks along with their repository, the information of the registered users who need blood in case of emergency and blood donors who wish to donate blood when required.

The android based application was developed mainly to give user-friendly interface, easy to use features, reliable and to have a portable version of blood donor and seeker management. With this mobile Application (SLDB) every blood seeker can get access to donors anytime they want by searching registered donors' list, as well as the voluntary donor, can register to this app for donation. In future, the application has a provision to integrate GPS locating and chat features to accelerate searches for donors and make iOS compatible. Therefore, this app will assist the patients in seeking blood to locate and search for blood who needs blood anytime and anywhere.

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