Development of Application to Find A Nearby Live Blood Donor Using the Updated Location e-Information

Hasibur Rahaman[1], Dr. M. A. Khan[1*], Iskedaheer Alam[1], Khayrul Alam[1], Sumon Mondal[1], Alimuzzaman Khan[2]
[1]Dept. of Electronics and Telecommunication Engineering, BSMRSTU, Gopalganj, Bangladesh.
[2]Programmer ICT Division, Govt. Bangladesh.
[*]corresponding author: asad.khan@bsmrstu.edu.bd, arzu1013@gmail.com

Abstract – *The primary goal of this research work is to develop a mobile application to find a nearby blood donor using an updated location of the donors. In existing technologies, the updated locations of the donors cannot be found, i.e., if any donors change their location, existing technologies cannot find their updated location. This is a major problem of the existing apps. In this research work, people who need blood can get the live e-Information with updated location of the nearby donor who wants to donate their blood. Through this application, any person who is interested to give the blood can register himself. Besides, if any client needs to make demand blood online, he can likewise take the assistance of this App, the looking would be faster so they can discover required subtleties quickly. This versatile application targets serving human wellbeing. This research mainly consists of two types of users. Donor who can access the information and register himself as a donor on this mobile application and admin is the main authority who can do addition, deletion, and modification of a donor in the database if required.*

Keywords: *Actual donor, Blood donor location, E-blood, Live update donor.*

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I. Introduction

Now a days, the number of people in need of blood transfusion is abruptly increasing as well as the blood donor due to the awareness of the people. A blood donation happens when an individual intentionally has blood drawn and utilized for transmission. Donation might be the entire blood, or of explicit segments straightforwardly. The major intention is to gather the blood from a wide range of sources and sufficient to fulfill the demand from those in need. For that, a management system is needed between the blood donor and the blood receiver. Otherwise, the mismanagement will seriously hamper the goal of its benefits for the human being. Research has been wanted to have the perspective on disseminated engineering knowledge, utilizing the capacity of the information base. The capacity for this site for the reason to store the databank has been arranged. A login id and keyword are provided to the donors which encourages them to effectively store the current data with respect to the blood donation maturity date. The given user credentials such as the login id or password are kept secure by using the Encryption and Hashing method as described in [1]. It will not cost to the blood receivers who need to collect blood for crisis conditions yet bring back the smile all over and blood donation is done when a donor deliberately agrees for donating blood. The donated blood might be utilized for transmission or it could be isolated into a singular part to be utilized later as required. In some critical circumstances where the blood bank is unable to supply the demand, then direct contact is needed with the donor. In this scenario, the donor's updated location with e-information is needed urgently, to find the nearby available donors. Therefore, an application with the updated location is developed, which will give the information on the available nearby donors.

II. Literature Review

In the existing literature, the emergency system were a blood receiver can get help from the blood bank management system are described in [2] - [3], but the blood bank system have many problems such as shortage of required blood, time duration to keep the blood safe, need to maintain a refrigeration system and also need to deal with business issue. An android based cloud computing blood donor searching system is available in

[4] - [5] where the blood receiver needs to send a long SMS first then wait for replying SMS from the blood bank. This method of donor searching process is complex and not feasible in critical emergency situation due to long messaging time. A blood donation system (BDS) application is available in [6] where the user can get the information of the donors but does not ensure the donors are available nearby the receiver. A Bhowmik alongside other researchers, proposed a portable application where anybody can look for the required blood bunch in their closest location [7]. It is an all-inclusive exploration as this application is created to help various platforms like Android, Windows Phone or iOS, where simply enlisted individual can get ready to access the support of the blood donor. A. Naser alongside his colleagues planned another versatile application to follow blood contributors [8]. This application straightforwardly associates the end client with the benefactors in season of crisis, this application additionally offer support with the end goal that the donors can cooperate among themselves and furthermore with the blood bank of hospitals. Additionally, Jenipha and Backiyalakshmi proposed the cloud based Android Blood Donor App [9]. The cloud-based organizations enable emergency blood movement since it had brief permission to donor's information and location. It is an area based application, where it helps in discovering benefactors to coordinate blood bunches concerning the area and clients can likewise get to their portable numbers for unconstrained assistance in the event of crisis.

A large number of blood donations occurs every day such as voluntary blood donation programmers [10]. Chau et al and other researchers have widely broke down the linkages identified with the blood donation to the area in which donors are willing to donate blood [11]. This exploration was done utilizing contributor's previous donor profiles to help in the arrangement of a fresh blood donor community for the Hong Kong Red Cross. Their discoveries give relationships between the spatial distance and the motivation for the blood benefactors which is the uniqueness of this examination.

The researcher in [12]-[14] has created an application to locate the blood donors near the user. The application also provides a list of donors in the user's area. In [15]-[17] the authors have developed a mobile based donor's search application, but they are all are suffering from computational complexity because of the multitasking activities between different parties such as to connect with blood bank, hospital, and donors. Recently in [18] the authors have clearly describe how an efficient mobile application can be designed. According to the above existing works, a simple mobile application is needed which will focus only on the nearby live valid donor for seeking the emergency blood donation. The focus of this research is to give the exact nearby blood donor with detail updated location using e-information.

III. Development of the Modules

Component and display of the framework can be referred to Fig. 1 and Fig. 2. It consists of:

- Admin
- Donor
- Acceptor

A. Admin

An individual who can notice and keep up the entire framework.

The functionalities are:-

- Edit account
- Update and change databank
- Observe and eliminate donor
- Logout
- Admin keeps up the security of the framework.

B. Donor

Donor an individual who donate blood willingly.

- Every donor has a personal account.
- The choices given to each enlisted benefactors.

C. Acceptor

Acceptor is someone who view and use this app. Functionalities of acceptor:

- Search the blood donor nearby
- Request of report to the Admin panel
- Help desk assist the illiterate people to find the proper blood group people
- contact with the donor via the phone or email

IV. Use Case Diagram

A usage case diagram is the essential type of framework/programming prerequisite for another product program unformed. Use cases specify the expected behavior and not the exact method of making it happen. Use cases once specified can be denoted both textual and visual representation. A vital idea of a utilization case displaying is that it encourages us to plan a framework from the end client's viewpoint. It is a powerful method for imparting framework conduct in the client's terms by determining all remotely obvious framework conduct.

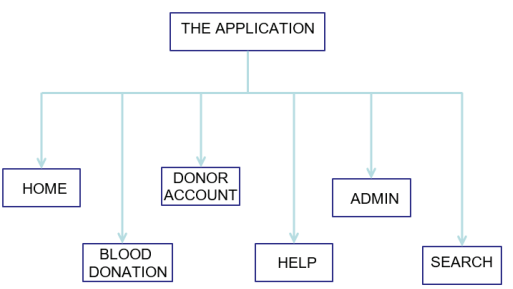

Fig. 1. Basic structure of the mobile application

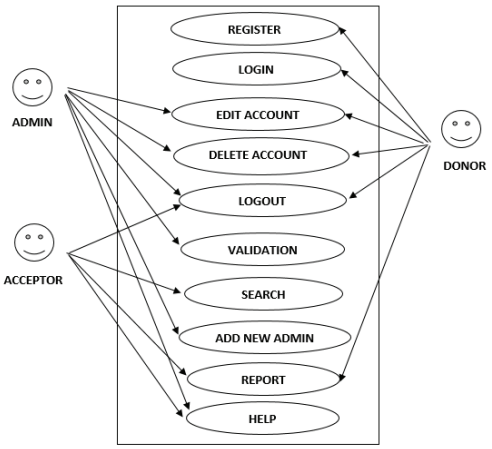

Fig. 2. Main components in the framwork and their functionalities

V. Data Flow Diagram

Data flow diagram (DFD) explicitly demonstrates the capacities, or cycles, which catch, control, store, and circulate information between a system and its environment and between components of a system (refer to Fig. 3(a) and Fig. 3 (b)). The visual presentation makes it a decent connection among the user and the system designer. The design of DFD permits to begin from a wide outline and grow it to a progressive system of point by point graphs.

DFD has been frequently utilized because of the following reasons:

- Logical data flow of the system
- Determination of actual system development requirements.
- Simplicity of the notation
- Establishment of manual and automotive framework requirements.

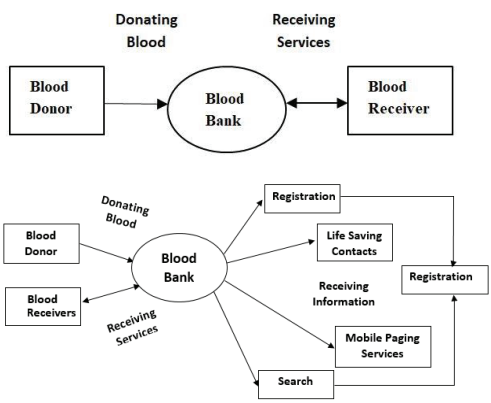

Fig. 3. (a) Simple Data Flow Diagram and (b) Advanced Data Flow Diagram

VI. The System Tools

Here we have utilized the accompanying framework instruments for building up the mobile application; JavaScript, Kotlin, PHP and Firebase. JavaScript upon the host setting in which it is inserted to give these structures. Kotlin is incorporated as an option in contrast to the standard Java compiler. The Android Kotlin compiler allows the client to pick between focusing on Java 6 and Java 8 viable byte code. The web worker yields the after effects of the deciphered and executed PHP code, which might be any sort of information, for example, created HTML code or paired picture information. Firebase gives a constant data set and back end as an administration.

VII. Results

Output Display:

The results are displayed with a screen which is called output display. The output display is the mobile or computer screen where the user is able to see the information. The working process of this application is described step by step below.

a. First Look:

The first page of the the mobile application is shown in Fig. 4.

Fig. 4. First look of the mobile application

b. The Registration process:

The registration process is described by the following steps.

- **Step 1**: Insert the country code and mobile number as shown in the Fig. 5.

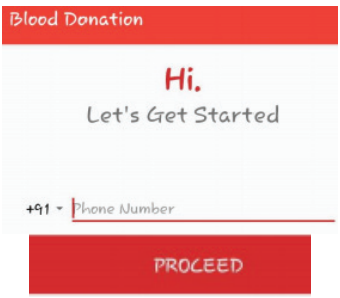

Fig. 5. Insert the country code and mobile number

- **Step 2:** Need to verify the inserted mobile number using six numbers OTP sent to the mobile SMS as shown in Fig. 6.

Fig. 6. Verifying the mobile number using the OTP

- **Step 3:** Need to provide personal information according to the query as in Fig. 7.

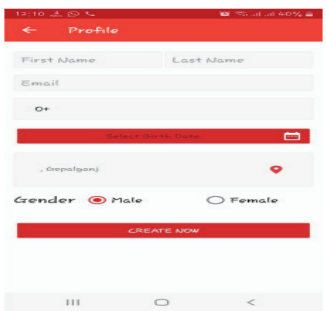

Fig. 7. Provide the personal information of the donor

- **Step 4:** Click the "CREATE NOW" button (refer to Fig. 7) to complete the registration process.

Then the user profile will be created and the donor's personal information will be visible as shown in Fig. 8.

Fig. 8. Donor's personal information page

c. The Donor searching process by the Acceptor:

For searching a donor, the user needs to click on the plus button. Then need to choose the required blood group by clicking "SUBMIT" button to get the location of the nearby donors' information (refer to Fig. 9 and Fig. 10).

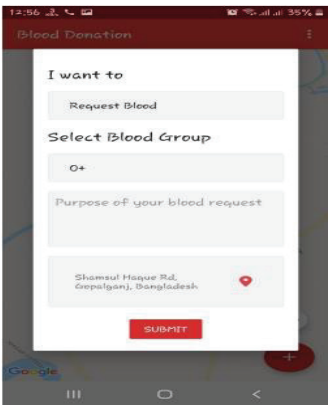

Fig. 9. Finding the location of the donor by the acceptor

d. Final search result page:

The existing application uses a multi-tasking activities by getting information from blood bank, hospital and then nearby donor but our application gives the nearby donors information directly. Therefore, this application can claim less computational complexity with less execution time for searching nearby donors.

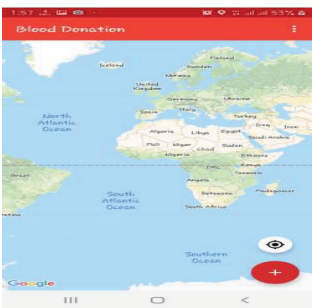

Fig. 10. Final search result page of the mobile app with the location

VIII. Conclusion

The main objective of this research work is to develop an efficient blood donor managing system with apposite support. This is a live nearby blood donor searching system, where the nearby blood donor with updated location will be shown to the blood receiver. So this is a special feature of a live donor searching system which helps human being to get the exactly required blood donor in an emergency case. Furthermore, the donor will get benefits of not getting unnecessary phone call before maturing to donate the blood. This is key facilitator for the medical services area, it additionally bolsters one of the significant functionalities of the blood donation center. Framework can be extended with accessibility over around the world, coming to as close as conceivable of the donor from the crisis zone. The application is accessible for all devices, for example, IOS and MAC.

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