ABSTRACT

With the revolution of communications nowadays, people need technologies developments in all domains, especially in health domains. This paper presented an application with a system designed to provide all of the information available for the blood group or clique that is always demand on an ongoing basis. This system is characterized by ease of use and contact with other donors and the needy for different blood groups. The application is installed on smart devices to ensure the arrival of the largest possible number of blood donors in the country. It works on the smartphones with IOS system by the blood bank employee. It linked the blood bank with the donors by sending messages to the donor who could donate only blood types which enables the patient to take advantage of them.

KEYWORDS

Blood Bank, Smartphone, blood bank system, Health System, IOS system, IPhone application.

1 INTRODUCTION

"We make a living by what we get. We make a life by what we give." Winston Churchill. [1]

There is no doubt that mankind achieved many great things in medicine in the 20th and 21st century. One the most important achievement was blood transfer and blood banks. However, without technology the medicine will not be developed. It is even impossible to imagine medicine without technology.

One of the high achievements in medicine was blood transfer. In 1901, blood types were discovered by Karl Landsteiner [2]. Moreover, Ludvig Hektoen an American pathologist suggested that the blood transfer should be done among the same blood group [3]. However, in 1940, the U.S government tried to organize blood donation by establishing the national blood collection program. In 1941, Shocking from Peril Harbour attacks, The Red Cross started a blood donation program for the U.S military figure [4]. Since then, the need for blood donation has not changed. Wars, accidents, natural calamities and chronic disease are the entire major factor in developing blood banks and their systems.

In the past years, people have also witnessed a revolution in communications. Social networks have become part of the daily life. People are spending most of their time communicating with their friends and it is so easy to get addicted to it. Nevertheless, Social network is a market of ideas where people share their experience, and seeking help. One of the most common use of social network is looking for a blood donor. It is very difficult because it is not easy to find someone who is willing to donate his blood and has the appropriate type of blood. Many people find it very annoying and time wasting.

However, no one can deny the development in communication in the last years, which are, can only be described as a revolution. People are spending more time in social networking chatting, arguing discussing and seeking help. Many people who need blood donor are using social networking to find one. For example, if
someone has an accident and he needs blood, his family and friends will directly post in the social networks asking for blood donors. Nevertheless, it is not that easy to find a blood donor who is willing to donate his blood and has the needed blood type.

Nevertheless, one problem is still disturbing blood banks, which is how to reach people with the required blood type and who are willing to donate.

That is how the idea of this project "The Blood Bank application" came out. This project is designed to make finding a blood donor who has an appropriate type of blood and willing to donate easier and time saving by using smartphones with IOS system. This project is an application that can only be used by the blood bank employee, and its idea is very simple. Instead of randomly looking for a donor, this program is linked to the blood bank database will send messages to people who are registered in the blood bank as a constant donor and have the required blood types. It will save time and effort for both the people who are working in the blood bank and those who need blood. Moreover, since this program is linked to the blood bank database, it will directly send messages to the donors as soon as there is a shortage in the blood supply informing them with the type if blood is needed.

2 RELATED WORK

Haneen Tanni, Alaa Sarhan, Raya Khwayreh and Razan Assaf in their paper have explained a Blood Bank application on Android system, which was operated in Palestine, which is a merge between the Website and the application on the mobile phone. The project aims to communicate with donors and the needy through SMS messages [5]

Mohammed Almalki and others demonstrated that the program of Blood Bank-mail, which the Saudi Ministry of Health adopted it, is the provision of a huge database for donors of blood. The project aims to communicate through the presentation of the figure for the donor and is an online database and no on-site communication mechanism and donate by sending text messages to the site and make an appointment to make a blood donation [6].

Seighali, Fariba, and others, have described that the Blood Bank of Azerbaijan project is a project in collaboration with the Blood Bank Department of the UNDP and the Ministry of Health. The idea goes back to the provision of a database to facilitate the process of communication with others as well as the work of counting the number of communicable diseases [7].

In the Egyptian Study "Journal of Infectious Diseases and Therapy", the Blood Bank charity has been mentioned, which is works for the Blood Bank Charity evidence base contains the largest amount of data and blood groups in the possession of bodies and charities and collected in a centralized database. To get the biggest benefit for patients within the governors of Egypt. Limited to patients with chronic diseases who need blood transfusions on a regular basis for patients with diseases of the blood and kidneys, and other donors and provide them on a regular basis. [8]

Ibrahim and others have tackled in their paper to the Electronic system for blood banks, which are connected to a database of donors, and then it is communicating with these donors in the case of a lack of certain species through the application or mobile short messaging. Service based on two criteria: first, the platoon type of course, second, nearness the platoon's owner from the hospital. [9]

3 IMPLEMENTATION

Apache, MYSQL, Sublime text2, C-Objective x code, File PHP and Kuwait SMS were used in blood bank system

The following lines describe the blood bank system methods and pages:

Login to the system: At the beginning the user "administrator of blood bank" start the application then enter the user name and password, if the username and password
invalid, the application will notify the user to try again, else the user can use the application and start modification. That shown in figure 1.

![Figure 1. Login processes flowchart](image)

After the valid login processes the main menu will be shown, Main menu contain sex option: Blood inventory, Blood consumption, New blood donation, Add new donor, Blood donation campaign and the logout.

Each option had sub process that the user can use. As shown in figure 2.

![Figure 2. Main menu flow chart.](image)

The first option in the main menu is the blood inventory. That display the amount of each blood type also the amount of the palates. If the user press on blood inventory choice a notification message will appear, the user can editing the amount by clicking the blood type row. After editing the amount the user can save the modification and return to the main menu. (Figure 3)

![Figure 3. Blood inventory flowchart.](image)

The second option in the main menu is blood consumption, which is used if there are needs for donating, that consuming the needy amount from the blood inventory.

The third option in the main menu, which is new blood donation. It is used when there is new donation of blood type or palates blood to add it on the quantity in the blood inventory.

Figure 4 shows the flowchart of these two options: blood consumption and new blood donation.
The fourth option in the main menu is add new donor. It is used when the user want to add a new donor information in the database. (Figure 5).

Figure 5 shows a flowchart of the fifth option in the main menu, which is the blood donation campaign. The purpose from this process is to inform the donors about the existence of blood donation campaign in date and time specified. In order to encourage them to donate.

Figure 6 shows a flowchart of the last option in the main menu, which is the logout. It is used to end the application system.

4 RESULT AND DISCUSSION

Bank system has been tested to the blood bank donors who have been storing their data in the database: "name, blood type, mobile phone number, email "optional". The first implementation was with the consumption in blood type o+. Note that there was no shortage in blood inventory of any blood type. As shown in figure 8.
Figure 8. Blood inventory

Figure 9 shows the consumption of blood type "o+" and the amount "50".

When the user confirms the process, there will be an automatically shortage in "O+" blood type in the blood inventory, according to that process the system will send SMS message to the donor whom their blood type are "O+".

Figure 9. The consumption of blood type "o+"

Figure 10 shows the data table of the blood bank donor that include "first name, last name, blood type, mobile and email" which stored in the database.

Figure 10. Data table of blood bank donor

When the blood bank faces a shortage of any blood type, the application will send a message to the donor to informing them with the shortage in blood inventory.

The figure 11 displays the message has received by "Maha" and "Abdullah Ahmad" only because they carry an "O+" blood type.

Figure 11. The message sent to donors.

The second test was on the platelets, figure 8 shows that there is no shortage of platelets inventory. Figure 12 shows the consumption with the platelets with amount 20.

Figure 12. Adding platelets and the quantity.

The third application test was through the work of blood donation campaign on 05/27/2014 at 10:00 by aftermarket up to all donors of all blood types and let them know
this. To encourage them to donate blood. As shown in figure 13.

Figure 13. Informing all donor with the blood campaign.

5 CONCLUSION

This paper explained the proposed Blood bank system, which is linked the blood bank with the donors by sending messages to the donor who registered in the blood bank as a constant donor. To inform them of a shortfall in one of the blood groups both by his platoon. The application used by the blood bank employee through smartphones with IOS system. It characterized by ease of use in organizing the blood donation.

The benefits of blood bank system represented in:

1 New Donors.
2 Increased sharing.
3 Speed in knowing the shortage of blood inventory.
4 Saving the humanity and facilitating the process of finding a donor faster and in lower costs and losses.
5 Update data faster.

6 FUTURE WORK

In the future, there will be development for the system by adding several extra features such as the Donated able to communicate and interact with the system by sending some queries that are answered by one of the staff working in the blood bank. It also possible to add another service that asking the blood bank to send a medical team to the place where the donor in. especially for the old men and disabled people who cannot go out of their home easily have a chance to donate.

In addition, future expectations concerning that this application will be available for the donor to activate the communication by both parties.

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7 REFERENCES