Online Blood Donation Reservation And Managementsystem In Jeddah

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Abstract: Web-based Blood Donation Management System is a management system website that enables individuals who want to donate blood to help the needy. It also enables hospitals to record and store the data for people who want to communicate with them, and it also provides a centralized blood bank database. The system is developed by using HTML, PHP, and MySQL as a database system to manage and store the data. The Waterfall Methodology, which is the traditional version and the classic approach of a system development life cycle, is used to develop and build the web-based blood bank. The system targets three types of user: the public who wants to donate blood, the recipients who need the donated blood, and the hospitals who that work as an intermediary to manage the communication between the donors and recipients. The main objectives for developing the website is to educate the community on the benefits of blood donation, develop a Web-Based Blood Bank System to manage the records of donors and recipients, and encourage voluntary blood donation, easily accessing any information about blood type and the distribution of the blood in various hospitals in Jeddah, based on the hospital needs.

1. Introduction

Blood donation is the process of transferring blood from a healthy person to someone who needs it. It "occurs when a person voluntarily has blood drawn and used for transfusions and/or made into biopharmaceutical medications by a process called fractionation."

Blood donation is very important health care and blood is a very unique and precious resource because it only can be obtained from blood donors. Donors participate to save many human beings each year, although some still die or suffer because of the lack of access to a safe blood transfusion (WHO, 2010).

Blood is the "gift of life" that transfers from a healthy individual to others who are sick and in actual need of blood. In one hour's time, from one unit of blood, red blood cells can be extracted for use in trauma or surgical patients. The liquid part of the blood, which called Plasma, is given to patients who have clotting problems. The third component of blood is platelets, which clot the blood when there are cuts and are often used in cancer and transplant patients. In a recent study supported by the National Blood Foundation, more than 5,000 individuals who were blood donors were asked why they donate blood, and the answer of three-quarters of the respondents was that they give blood to help others and giving blood makes them feel good about themselves (AABB, 2013).

Although the number of people who need blood is increasing and the availability of blood is decreasing there is no central Blood Bank that can manage the blood donation in Saudi Arabia.

Each hospital has its own Blood Bank and its own procedures. Each Blood Blank is responsible for the management and control of transfusions and processing; it is also responsible for collecting the units and for the donor services (Alabdullateef, 2011).

The general idea of the study is to develop a Web-Based Blood Bank to manage the records of the donors and the people who need blood. It educates the public on the benefits of blood donation to motivate them to donate blood for the people who need it. Millions of Saudis need blood transfusions each year, some of them need blood transfusions to replace the blood lost during surgery or after having serious accidents that cause them to lose some of their blood. Others may need blood because of illnesses such as anemia, cancer, bleeding disorders, and disorders of the immune system (NIH, 2012). Doctors may give the person whole blood or part of the blood, depending on the person's condition. Some people need red cells only if they are anemic or if they lost a lot of blood after having a serious accident. For those who are bleeding too much during surgery, they need plasma, and for those who have cancer or bleeding problem, they need platelets (Kids Health, 2012).

The aim of the study is to develop a Web-Based Blood Bank System to manage the records of the people who need blood so the donors can easily find them and donate blood to them.

2. Problem Statement

The number of people who need blood is increasing in Jeddah and there is not enough blood available to cover that need. It is not that people do not want to donate blood, but because they have no idea where they can donate and what are the benefits of donation. It is important for the people who are excited to donate, but yet are very busy, to be sure where and when they can donate in advance, instead of more manually trying to find where and when they can donate when they are free. In addition, when the employees keep many records for the same donor, human error is possible (TUAN, 2006).

Jeddah Blood Bank website will manage the records of donors and people who need blood to help the people who need blood find the appropriate donors as soon as possible.

3. Recommended Solutions

The person who need to blood may use different ways, such as:

• Asking family and friends for a suitable blood donor.

• Make several contacts at hospitals to find a blood donor.

• Search via the internet for donors by using social media like Twitter and Facebook.

• Use the Jeddah Blood Bank website to find donors and the hospital that makes a blood donation.

The best solution it is use the Jeddah Blood Bank website to help the needy find blood donors in quick, perfect and safety way also with less effort.

4. Objective

Because it is hard for public sometimes to know about the blood donation events, the website will help them to stay up to date with all the big blood donation events that any hospital in Jeddah offers (TUAN, 2006).

• Educate the community on the benefits of blood donation.

• Develop a blood management information system to manage the records of blood donors.

• Ease the distribution of blood in various hospitals in Jeddah, based on hospital demands.

• Encourage voluntary blood donation.

• Reduce human error when employees keep the records.

5. Literature Review

This section explores literature review. For more details, see table 1

5.1 Bharat Blood Bank in India [2005]

Donors in India who want to donate blood can register at Bharat Blood Bank after reading the basic constraints of donating blood. Bharat Blood Bank requests the donor's name, password, and ID to allow the donor to access his account, which contains information about his date of birth, blood group, gender status, weight, email ID, mobile no, city, address, state, and information about kidney, cancer and heart disease, and date of his last blood donation. After that, the people who need blood can browse the site and display the list of blood donors.

BhartBloodBank.com allows recipients to search by area to have more reachable donors. The website provides the phone number to the recipients to make contact with the donor. Also, BharatBloodBank.com provides information about Blood Donation, such as tips, scientific information, facts, etc. It selects other blood banks for blood donation. BharatBloodBank.com offers these services for free. Further, the site doesn't use the collected information for any commercial purposes (Bharat Matrimony Group, 2005).

5.2 Blood Banks Delhi in India [2003]

It is a web-based blood bank management website that offers several services, including (Singh, 2003):

• The possibility of the donor to register online to donate blood.

• The possibility of citizens to get all the details about the donation camps.

• Help to provide blood supply for the different groups from other blood banks.

• The site has benefit for citizens by conducting all operations through online services such as registration and search for details of blood camps.

5.3 Online Blood Donation Reservation and Management System in Malaysia [2006]

It is an online blood donation reservation and management system in Malaysia used by the hospital blood bank. It is a web database that contains donor and blood stock information and it has the ability to keep track of the blood stock in the hospital and the donation records of the donors.

This website will enable the public to make online reservations and includes online advertising for all the blood donation events. The hospital managers can manage the donors and blood stock appointments. The targeted users are the manager from National Blood Center, the public who want to donate blood, and the staffs from participating hospitals (TUAN, 2006).

5.4 A Web-based blood donor MIS in Uganda [2009]

A web-based blood Management Information System (MIS) was developed to improve the lives of the vulnerable in Uganda, besides providing adequate supply of blood.

The study objectives were to develop a web-based blood management system to help in the management of blood donors' records and make it easy to distribute the blood in different parts of the country, based on each hospital's demands. With the use of IT technology, now relevant and timely blood-donor reports easily can be generated and hence facilitate planning and decision making. It is an automated information system as a solution to routinely collected, accurate, and readily available information in blood transfusion services. It enables monitoring of the results and performance of the blood donation activity (Fredrick, 2009).

5.5 Blood Bank Management System in India [2006]

India has annual needs of about 5.0 million units of blood each year. And, it actually collects around 3.50 million units per year. A blood-bank management system was designed to fetch blood donors and receivers through the shared software platform. Donors can register on the website and enter their information.

This system makes it readily available, safe blood and other blood components, which can offer moral and accepted way, consistent with the long term welfare of the community. That actively encouraged voluntary blood donations, motivates and maintains good records of indexed blood donors, and educates the society about the advantages of donating blood. This also will work as a site for the interaction of best practices to reduce unneeded use of blood and assist the State in achieving higher efficiency and self-sufficiency in the blood operation (Alexander, et al, 2006).

Table 1: comparison between blood bank systems

Name	Place	Year	Done by	Objective
1. Bharat Blood Bank	India	2005	Bharat Matrimony Group	It allows recipients to reach donors. It created a database of donors, classified by locality. Donors in India who want to donate blood can register, after reading the basic constraints of donating blood. Also, anyone can refer friend(s) by just providing their email IDs. Blood recipients can browse the site and display the list of blood donors who are close to their locality.
2. Blood Banks Delhi	India	2003	XO InfoTech Ltd. ,Gurgaon	Helps to provide blood supply of the different groups from other blood banks, provides service through online registration of blood donors, and gives news and details about blood donation events
3. Online Blood Donation Reservation and Management System	Malaysia	2006	TehGeok Tuan	It enables the donors to make online reservation and to know about all the blood donation events.
4. A Web-based blood donor MIS	Uganda	2009	Kanobe Fredrick BA, PGDCS	It enables result and performance monitoring of each blood donation activity in a confidential, convenient, and secure way.
5. Blood Bank Management System	India	2006	Alexis Alexander CibiChacko Lekshmi V.R. Soumya P. Sadanandan	Developed a web portal to facilitate the interaction between the demand for blood and provider. This system makes available safe blood and other blood components, which can offer moral assistance, consistent with the long term welfare-being of the community.
6.Wiqaih	KSA	2012	Abdullah Akheriv, Msaad Rasheed, Hisham Aelkezlan Ibtisam Miqren, Mohamed Ibrahim ,Nayef Aelkezlan	Linking those wishing to donate with regulators. and which blood banks across the automated system. Is easy to use and both sides can cooperate to achieve the overall vision for system protection.
7. Online Blood Donation Reservation and Management System in Jeddah	Jeddah	2013	Sara Abdulkarim, Afnan Al-Madani, Shatha Al-Amri, Bayan Bashamakh and Abeer Al-Ghamdi	Developing a blood MIS to manage the records of the people who need blood so the donors easily can find them and donate to them.

6. Methodology

We will use the waterfall methodology, which is the traditional version and the classic approach of system development life cycle. It describes the sequential and linear development method. Waterfall methodology has clear objectives and goals for each phase of the system development life cycle (Rouse, 2007).

The most important steps that have been taking to build the blood bank website are:

6.1 Initial stage

• Identify the problem.

• Search for similar research, determine the objectives of each system, and then summarize it in one table.

• Determine system objective.

• Read the available literature in the form of reports and brochures.

• Distribute a questionnaire.

• Analyze the questionnaire results.

• Identify the individuals' requirements and preferences.

• Determine the project plan.

• Determine the hardware and software needed to build the website.

• Identify the users

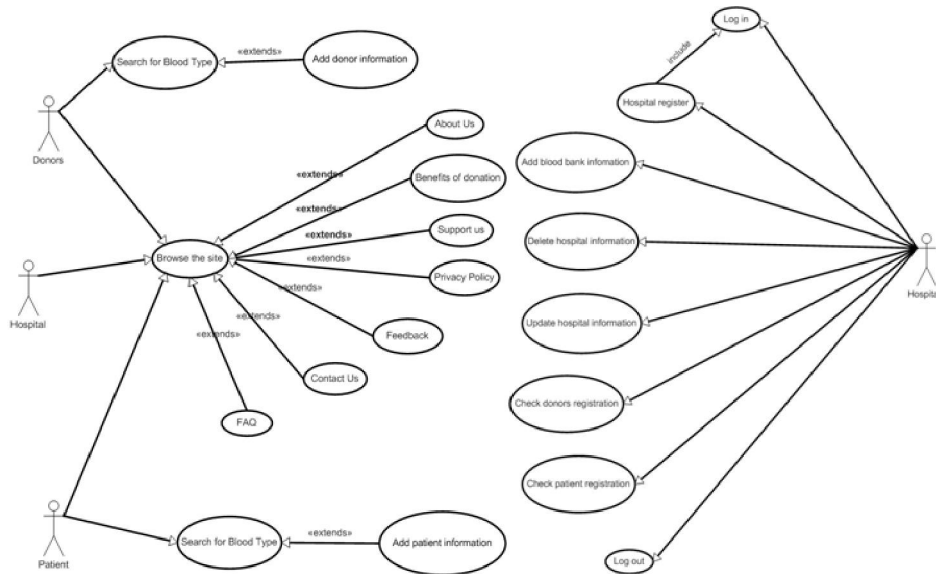Structure system requirements using Use Case Model shown in figure 1.

Figure 1: use case model for the website

6.2 Design stage:

How the application looks will be defined and prepared from the requirement specifications that were analyzed from the questionnaire.

The three designs that must be done in this stage are:

• Prototype Design
° Low Fidelity Prototype (shown in figure: 2).
° High Fidelity Prototype (shown in figure: 3).
• Database Design
° Physical Database Design.
• User Interface Design
° User Interface Design Principles.
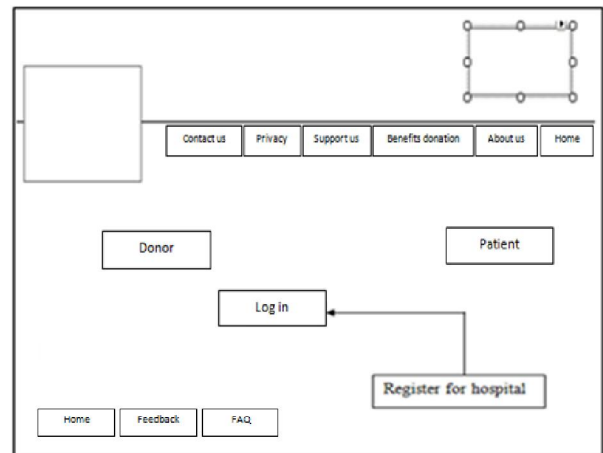° User Interface of the Project.

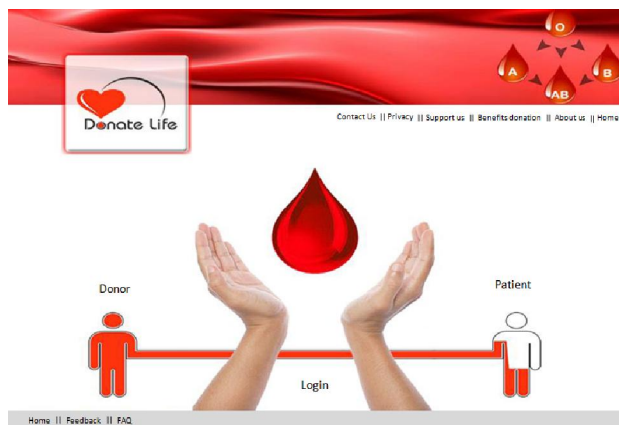
Figure 2: Low Fidelity Prototype

Figure 3: High Fidelity Prototype

6.3 Implementation stage

Implementation is the "doing" phase and it will help in putting all the planned activities into action and moving the project to service provision.

Languages used to implement blood bank website system

- HTML: Hypertext Markup Language, the basic function is creating web pages. The goal of the web browser is to read the documents as web pages; and it is also possible to include scripts written in several languages, such as JavaScript, which an impact on the behavior of web pages (Wikipedia, 2013).

- PHP: A scripting language that is integral part of HTML to add functionality that native HTML is unable to do. Originally designed for web development to produce dynamic web pages, "PHP allows you to collect processes and utilize data to create a desired output" (Bradley, 2013).

- MySQL: A database system, queries, and features easily paired with PHP because it works side by side with ease. Uses MSQL to store many kinds of data, information and graphics. Also it is easily accessible from anywhere in the world (Bradley, 2013).

- JavaScript: A programming language developed for the design of interactive sites and creating web applications. JavaScript can interact effectively with HTML source code, enabling web authors access to their sites with dynamic content (QuinStreet Inc, 2013).

Programs used to implement blood bank website system

- cPanel: Short for control Panel, it is a graphical control panel for websites, designed to simplify the management of the sites. CNN Panels control all aspects of the site through the façade. CNN Panel proprietary program is distributed through the company cPanel, and is designed for use by commercial web hosting services. Therefore, the

company does not offer discounted rates for personal use. In spite of this, the owners of non-profit organizations such as educational establishments and charities can request a license to use free of charge or at discounted prices (Wikipedia, 2014).

- Dreamweaver: It has many different CSS page layouts that can be used to build efficient and adapt existing pages. It also includes ability to add Ajax functionality to web pages. Ajax features implementation of web applications quickly and smoothly (Whiteman, 2009).

- Notepad + +: A source code editor that supports several languages and it uses pure Win32, which allows a high-speed implementation (Notepad++, 2011).

6.4 Testing stage

- Testing is a process of executing a system, program, or application with the intent of finding bugs and errors.

- The goal of testing is to make sure that all the available tasks in the system are working correctly and as required.

7. Results

The most significant results of this study are:

- Manage the records of donors, hospitals, and recipients.

- Reduce human error when employees keep the records.

- Each hospital can register on the website and make its own account that contains information about the hospital: the blood types needed and the blood types available.

- Encourage voluntary blood donations.

- Make it easier for donors to find the appropriate recipients to whom to donate blood by searching in the website by blood type; a list of hospitals that need that blood type will appear.

- Ease the distribution of blood in various hospitals in Jeddah, based on the hospital demands.

- Make it easier for recipients to find the appropriate donors by searching in the website by his blood type; a list of hospitals that have that blood type will appear.

- Develop a blood management information system to manage the records of blood donors.

- Hospitals, donors, and recipients can add their own comments in the feedback section about the website.

- Educate the community on the benefits of blood donation.

8. Conclusion

Universally, blood is recognized as the most important element that saves life. It saves countless number of lives across the world in various

circumstances. In today's world, where we can do many things from home, just by pressing one click, we can take advantage of that concept by making online solutions for the shortage of blood donors. The management information system helps to reduce the use of paper, so the probability of errors should be minimal. Researchers believe that improving the management information system for the blood bank will make revolutionary improvements in the system. This web-based blood bank is a small contribution to serve mankind. It can save lives by educating the public about the benefits of blood donation, encourage them to donate, and manage the records of donors and people who need blood, to help the people who need blood to find the appropriate donors as soon as possible in quick, perfect, and a safe way – with less effort.

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