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Implementing PWA and call system for blood request management system using Data Mining

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Abstract*:* Blood is main constituent of the human being and is one of the most necessities of life. The runtime availability of blood donors is less in India causing loss of life. The purpose of project is to develop a blood request system and overcome the unsolved problems. In this we propose a Progressive Web Application (PWA) for the blood request system. The application makes possible an interaction between users and the blood banks all over the city. The system created will show the availability of blood units all over the city and will provide the service as soon as possible. The application will send request according to what type of blood group it is and as soon as possible the blood unit will be delivered to the needy. The system broadcasts the message to the registered donors and thereby fulfilling the request of blood unit by runtime available donor. Using this service we have made an attempt to make use of the capabilities of mobile phones and turn them into lifesaver mobile health care service which is convenient to users.

Key words: PWA, Donor, Call System, Blood request.

I. INTRODUCTION

Blood is one of the most important necessities of our life there is not a viable replacement for human blood. Blood adds to sparing a huge number of lives every year in both routine and crisis circumstances. The yearly prerequisite of blood in our country is approx. 5crore units of blood out of which max 80 lakhs units of blood were collected. Emergency situation for blood arises in every 2 seconds. According to global statistics India requires about 38000 blood units. Blood donors act as boon to help & save life's of patients .Blood donors act as doctors in saving human life's just by donating blood. Blood Donation is when blood is drawn voluntarily which can be whole blood or of specific components directly.

Rapid growth is seen in number of mobile phones users in developing and developed countries. Mobile phones information and communication technology are utilized by M-Health for the delivery of health services. Previously the blood donation systems were not that reliable as they use to search for the donors get blood and stock them up. Stocking blood units is slow process as resulting into donors showing lesser interest in donating blood.

In case of emergency situations like operation or during regular treatments patients relatives are asked to go to blood bank and check whether the required blood type is available or not. Relatives need to find donor in case of emergency who has the similarity of blood group with patients which is very hectic and there is no guarantee that donors will be available or not.

Traditional methods such as information brochures, video and awareness camps are used to attract more donors. Applications designed using modern technologies have been implemented to attract blood donors and increase donation rate. On internet several applications and websites related to blood banks are available but it is difficult to determine which one of them is usable and helpful. User is provided with lesser security. Due to incapability's of existing systems people who are willing to help and donate hesitate. "Blood On Call" facility provided by the State of Maharashtra provides the users to call 104 helpline numbers for door step delivery of blood. This facility is not efficient as the time taken to process the query is more and awareness regarding this helpline is less resulting in total failure of this facility.

In this paper we propose Blood Call System which uses the capabilities of latest technologies like Progressive Web based Application and other tools available to bridge gap between existing inefficient systems. Our proposed system is able to facilitate wider range of people and thus acting as a boon.

II. LITERATURE SURVEY

There are various online application available for blood donation but none of them is as efficient because privacy of user is not maintained and also user need to install those app in phone consuming more memory. Also only few applications provide the tracking of blood. At the time of requirement of blood, website and apps only provide information about donors and not blood banks. It becomes difficult for user to contact blood banks and get blood unit from them as there is no source to deliver the blood to the user. These systems do not focus on the inconvenience of users in the emergency situation.

Here we provide you the information of related android application and web sites:-

1. Friends2Support.org:

It's a website and android based application. It provides the information of blood donors but does not provide the information of the blood bank. And privacy is also not protected.

2. BloodDonationReminder:

User friendly environment allows donor to select date of next donation. Notification are given to user when their date of next donation is arrived.

3. American Red Cross Blood Bank:

Through this application client can plan arrangement, track total donation, gain rewards and welcome other to go along with them on a lifesaving group. Yet, there are a few restrictions of this application: In this application, there is no utilization of GPS. This is site and android application framework which work intelligently in America for general blood gift framework in its country. This office isn't accessible in India.

4. MPlus/Kerala Blood Bank

An Android application for Keralites with highlight of blood giver information bank of Kerala, sending request to MPlus clients and react specifically send to needier. This application is just for blood donation and it not utilize the GPS framework.

5. Donor2Donor:

Donor2Donor platform provides a platform to encourage blood/organ donation. Among people's awareness is spread to voluntarily donate blood/organ. Donor2Donor application arranges donors, yet does not assure availability of required blood group

Following table shows comparison of various application.

Table. 1 Comparison of Various application

Application Name	Call system	Web site	Android app	Tracking	Availability		Delivery	Privacy	Reminder	PWA
					Blood Bank	Donor				
Friends2Support	No	Yes	Yes	No	No	Yes	No	No	No	No
American Red Cross Blood Bank	No	Yes	Yes	No	No	Yes	No	No	Yes	No
MPlus/Kerala Blood Bank	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No
BloodDonationReminder	No	No	Yes	No	No	No	No	No	Yes	No
Donor2Donor	No	Yes	Yes	No	No	Yes	No	No	No	No

III. EXISTING SYSTEM

Researches were made on the existing systems which are in the form of android applications and websites. Gist of the research provided with information that the blood donor were readily available at required time. Registered donors were displayed in the search result. Nearby donors are preferred first and tracked by the Geographic Information System (GIS). Information about donors is provided and willing blood donors can register on the application. Following Fig 1(a) and Fig 1(b) represents existing system architecture.

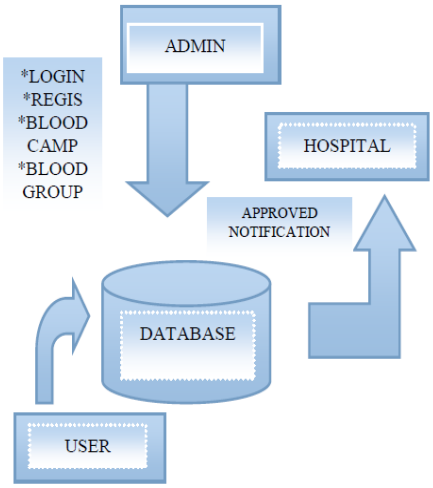

Fig 1(a) Existing System

The applications made for blood donation mainly consists of Admin, Donor, Patient, Database and Application

Admin:

The admin has access rights to change the password, maintain donor's privacy and update the details. The update operation regularly checks the expiry date of blood units and if the blood unit is expired the unit is being replaced with the new blood unit.

Donor:

Each donor is provided with a unique donor id and password for login by the system. Donor is provided with various features like discovering blood unit type, blood camp details. The session can be logged out easily for privacy purposes.

Patient:

In case of emergency patient can request for blood. In this situation patient's condition is considered and accordingly the application searches for the donor and blood unit is provided.

Application:

During emergency this application searches blood donor. The donor is being tracked by GIS. The existing system generates one time password (OTP) when the donor accepts the request to donate the blood. The application maintains the record of user, blood camp details, blood transfusion and etc.

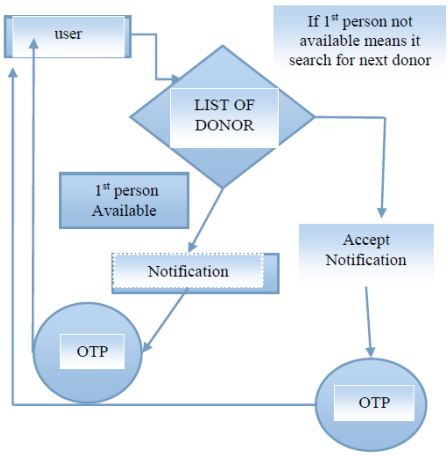

Fig 1(b) Existing System

IV. PROPOSED SYSTEM

Our proposed Blood Call System uses the capabilities of latest technologies like Progressive Web based Application and a call system. Research suggested that certain changes in the existing system will turn the incapable system into an efficient one. Instead of having a web application and an android application separately, we are providing Progressive Web applications (PWA) that combine the best of the web and the best of apps. They are reliable, fast, engaging and secure.

Following Fig 2(a) and Fig 2(b) represents proposed system architecture.

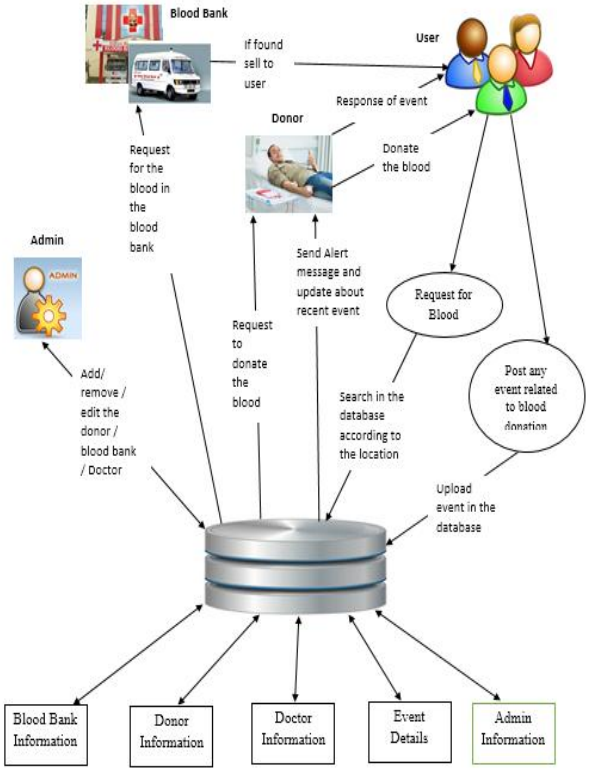

Fig 2(a) Architecture of proposed PWA

Proposed system contains following modules:

Admin of PWA:

Admins are given the authority to manage the information about all blood banks, mobile vans and donors who are registered with the application. In addition to this, admin can also add or remove the blood banks as well as donors.

Admin of Call system:

When the user contacts our system, it's an admins job to fulfill the user's requirement. Admin of call system is responsible for managing the emergency situation and request for enquiry of blood data.

In an emergency situation, admin will first find blood in blood banks and mobile van and if blood is not available in them then it will search for donor by connecting with user through call.

Donors:

Through donor_id and password donor gets login into the system. Many facilities are provided to donors such as change password, change email-id. Donor not only get an alert message from a system after a span of 90 days for donation of blood but also get an notification about different events related to blood donation camp. In case of emergency, donor gets a call from an admin to ask if he is available or not to donate blood at that time. If available, location of donor is also get tracked for better results.

User:

User is one which request for blood. User can make use of PWA or call to call system to fulfill requirement of blood. User can also add different events related to blood donation camps into the system.

Admin of Blood bank:

Manger of blood banks and doctors are managed by admin of blood banks.The daily count of blood units available in the blood banks are updated by blood bank manager. All the information about manger of different blood banks is stored in database. Doctor is responsible for updating the information about donor's health.

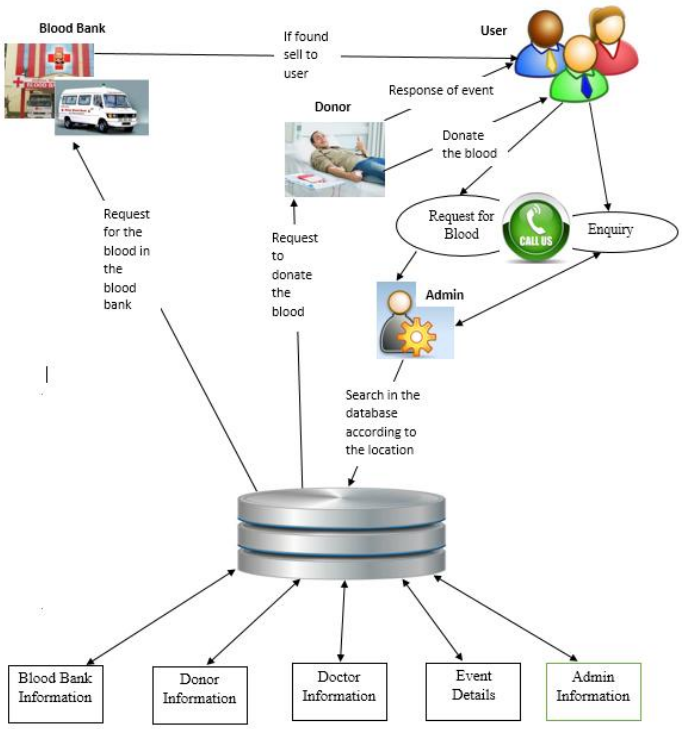

Fig 2(b) Architecture of proposed Call System

Database:

Information of blood banks, mobile vans, donor and Doctor is stored in database using Mysql in tabular format. MonogDB is used to store all the information about events like location of event, duration of event, etc. Required information is retrieve from database by using different techniques such as data mining, matching patterns, etc.

Application:

The application is designed to provide blood units in minimum time using different resources. When request for blood is arrived, it is first search in all the nearby blood banks and mobile vans and if required amount is available then it is delivered through system's volunteer to the requester. And if it is not available there, then system check whether the donor is available or not and GIS and GPS system are used to track donor. OTP is send to user for the confirmation of requirement of blood units. Through phone calls and message mechanism conformation of donor is done. Notification of events is also send through system. Online form for donor is provided through system followed by general physical examination by doctor.

V. CONCLUSION

The application that our system proposes is the best possible workable idea for the delivery of blood in less span of time. This paper introduced those applied outline and improvement of provision for blood conveyance. We believe that our proposed application is best result and provide convenient access to the blood donors and requester to handle the emergency situation.

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