SCALABLE BLOOD REQUIREMENTANALYSIS SYSTEM USING LOCATION BASED SERVICES

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***Abstract*—** Blood is an important part of human life, with no replacement. Blood donation is the only source of blood, and locating voluntary, unpaid donors is the most important activity in the world. Blood banks have a responsibility to provide adequate and safe blood to the community. The risk of transfusion-related heritable diseases is highest when blood is provided by paying donors. Blood donation is a type of location-based service where many lives can be lost due to the difficulties of providing a proper blood bag. Traditionally, donor hemovigilance is usually performed by individual collection centers to strengthen donation procedures within their own organization. A web based project is being developed in this work to monitor all processes of blood donation and transfusion and to help the users in such a way that users can locate different volunteer blood donors and blood banks in their locality through GPS and then request for the blood in case of emergency.

Keywords— Blood Donor, GPS, Location based services, Blood bank, Prediction

1. INTRODUCTION

The World Health Organization (WHO) suggests that nations focus on youth to achieve 100 percent compulsory unpaid donation of blood by 2020. Donated blood can preserve survival for people who already lost large amounts of blood from traumatic burns, obstetric and gynecological hemorrhages, or surgical and stem cell transplants, as much as for patients with symptomatic anemia. Blood is the origin of creation, which is one of the greatest gifts. Health banks around the world face health crises. The requirement for blood is rising alarmingly and the available supply of blood is inadequate to meet the demand. The only source of blood is through blood donation Liu et al.[2017].Generally, donors are classified as:

- Voluntary,
- Family replacement remunerated or paid donors, and
- Autonomous donors.

A variety of studies was conducted to determine people's understanding, mindset, and experience of blood donation. And being excited or discouraged about donating blood is still difficult. Additionally, it should be remembered that blood supply is sufficient, according to demand, and is supplied from low-risk populations Minnich et al.[2015].

In India, 50 percent –60 percent falls between the ages of 18 and 65, but we are still facing a blood shortage due to the daily patient population increasing more than blood donors. Furthermore, recruiting unpaid blood donors on a voluntary basis poses major barriers for transfusion services worldwide. Despite of contextual understanding, medical science students provide a positive perspective on voluntary blood donation, and can be a vital group for educating other friends and family regarding blood transfusion use Wang et al.[2015].

India's undergraduate medical students have joined forces to create an independently operated association named the Blood Donor Association (BDA), which has worked successfully for 40 years to ensure full flow of qualified blood donors and to coordinate daily blood donation initiatives to increase public awareness. A large portion of mobile apps now offer Location Based Services (LBSs). LBS users can continuously collect information from the LBS servers by capturing locations in real-time. Such apps include navigation, identifying points of interest (POIs), checking public transit timetables etc Yiu et al.[2008].

The development of LBSs has resulted in a major increase in personal geo-data transmission, usually incorporating location data originally detected by the positioning system with high precision. The lack of secure and reliable control and access to all these sensitive personal location information can result in serious privacy issues. Following current efforts to balance accessibility / service quality and privacy protection, there are still two

Barrier preventing users from having adequate usage.[2011].

As a result, users of location-based social networks who require user-to-user connections are unable to preserve privacy. Maintaining user-to-user privacy interactions is a challenge, as trust relationships among users vary not only in terms of social context but also in terms of complexities of time and space domain. Security in the treatment of blood donors is also a significant concern.

The main contribution is

- To develop a website to include all the relevant features to provide a means of communication between blood seekers, blood donors & blood banks.
- To help the users in such a way that users can locate different volunteer blood donors and blood banks in their locality through GPS and then request for the blood in case of emergency.

The paper is aligned as follows: Section II reviews background of resource allocation algorithms. Section III discusses the proposed system model with results. Section IV summarizes the current work.

2. RELATED WORK

Some early scientific studies on blood donation identified the average blood donor as a White male with some college or professional training in his thirties, and likely to be in a Piliavin white collar job [1990].Nonetheless, more recent work has shown that the donor population is more equivalent in respect of age and gender with the general population, though donors still seem to be adequately educated and compensated Kleinman, & Garratty [2001].Such trends have balanced the characteristics of the Sanquin donor community in the Netherlands[2005]. Many studies have requested donors and non-donors to donate blood for their reasons, or refrain from donating.

Homomorphic encryption (HE) allows for special simulations of the cipher-text domain. In the HE-focused PA-LBS program, LBS users demand privacy protection for the locations that have been encrypted. Regrettably, the HE- based method has very restricted application since only certain simple operations can be conducted in the cipher- text domain [1].

K-anonymity protects The user identity by enabling the user to send applications from a region only if there is at least 1 other user in that sector. The LBS server provides services based on the specified area, and not the exact position of the user. It ensures the LBS user is distinguished from at least k– 1 other clients by sacrificing the test's accuracy.

K-anonymity is able to provide scalability by setting a larger k for stronger assurance of privacy, or a smaller k for better efficiency. However, k's distribution is highly reliant upon nearby users k – 1. If no users are within a relatively close range, time stamping cannot be achieved and therefore no privacy-aware services are available Gkoulalas-Divanis et al.[2010].

K – 1 camouflaged locations are created and recorded in k-camouflaging based PA-LBS to demand service with the real spot. The LBS server must answer each of the k service queries and cannot distinguish the actual user location from the camouflaged ones k – 1.Furthermore, LBS users will provide the exact output of the server. Such a program promotes a more practical aspect of the k-anonymity associated with flexible privacy guarantee. Even so, a random collection of camouflage points without a robust privacy policy contributes to vulnerability in attacks on location analysis. In addition, k-camouflaging results in a lack of user-side communication costs in accessing and requesting services, since multiple requests are sent and multiple responses are provided in the provision of service Chow et al.[2007].

Across the world, blood procurement processes are carried out in a structured manner. Blood banks must follow various approaches to encourage people to become a registered volunteer donor and ensure effective recruitment for blood. Market research experts describe the various generations identified within the population of blood donors. A large portion of this population has the social character of being digital natives whose smart-phones are omnipresent. To this end, the principles of service-oriented architecture are specifically applied in network architecture as well as process designs.

Despite all the advancements in medicine and technology, a particular therapeutic method of removing blood, blood components or blood products has not yet been identified. Therefore, a need for a network consists of a backbone that allows the exchange of data between various types of information systems, a web portal and mobile phone apps to ensure user interaction.

3. PROPOSED METHODOLOGY

The web-based project created which will play a key role in saving human life and which is also its main purpose has developed a website which provides all the features necessary to have a means of communication between blood seekers, blood donors and blood banks. This will allow users to locate various volunteer blood donors and blood banks in their locality via GPS, and then ask for blood in case of emergency. Users will be able to view information about various blood banks along with the blood in their registry, information about users of registries that need blood in case of emergency, and

blood donors that want to donate blood if necessary. The personal information about blood donors will be stored in the backend database. A detailed guide on the software will be given to the blood bank administration for future management of the system. A user manual with some basic descriptions about the software and its features should be provided to the system administrator.

The blood bank management system showed a lot of inefficiency and inefficiency in the current system that had resulted in the effects of the management. The software, which was manual based on paper card for collecting data from blood donors, keeping records of blood donors and disseminating results to blood donors, had drawbacks that required IT-based solutions. Delays and occasional inability to access historical documents characterized the program.

4. PROPOSED PROCEDURE

- The proposed Blood Bank management program supports people who need blood by providing them all the information about the supply of the blood type or about donors of the same blood group.
- Our website runs 24x7 so users can get blood donor information whenever they want. Blood donors can also sign and save other people's lives.
- When blood is needed in the surgery, people have far less time to get the blood at their hands, so if he gets the details like who can give him blood in his city's life- saving time.
- Algorithm used : Apriori Algorithm

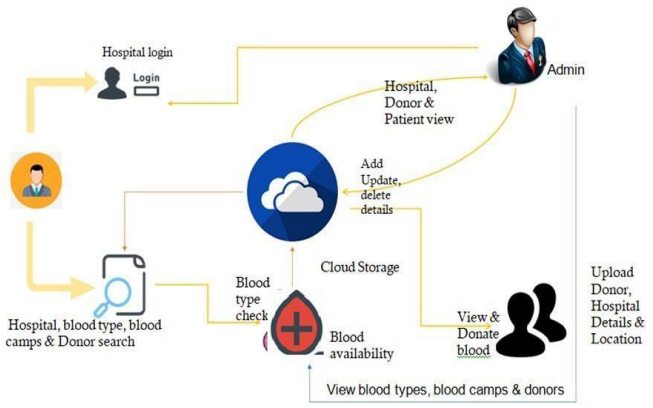

Figure1. Proposed Location based Blood bank system

A. Donor Module

The donor module is on how this software handles blood donation processes. The blood donor can consider the closest blood banks accessible according to their current location, depending on the GPRS feature used in this system.

Therefore the blood donor will have to sign on the application for authentication purposes, and donate the blood to a different blood bank. These blood donors can also be contacted later based on the availability status they have updated to the program for further contact if blood is needed in their blood group.

B. Hospital Module

This module is the process by which recipients may request the correct amount of blood from the blood bank. The recipient will use the specific hospital Id that is registered in the hospital database. Only applications made by a registered I d hospital would be considered eligible. Once obtaining the correct amount of blood, the applicant will verify the blood supply of all blood groups in all registered blood banks available in the Program. So the request is not sent to a blood bank which lacks the requisite blood.

C. Blood Bank Module

This module is the process of how to treat requests from recipients for the blood needed. Next the Blood Bank checks whether the request is a valid one. It scans the records of the hospital after confirmation to ensure that the right blood volume is not available at that hospital, and after fulfilling the order. The blood bank module also contains the blood from other sources and from registered donors who have retained their status as readily available for further interaction when desperately needed.

5. EXPERIMENTAL ANALYSIS

The Proposed experiment includes additional features which makes the system model to be more efficient by comparing it to other blood bank management systems. The Comparison of the proposed work is graphically represented for illustration below.

Figure2. Donor Registration

Figure3. Blood Donor and Hospital request from Admin

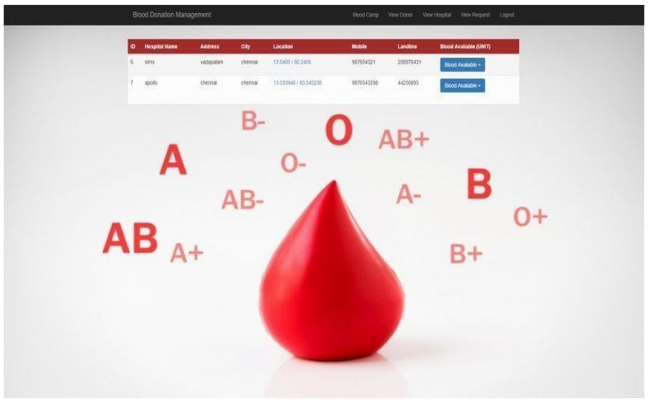

Figure4. Blood Available List

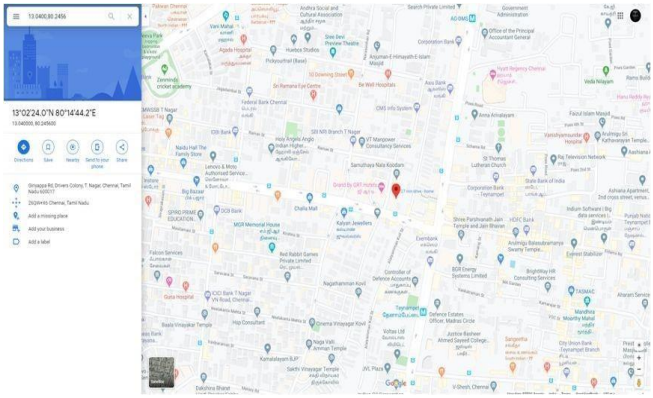

Figure5. Location Available List

6. CONCLUSION

Automation of the current manual blood bank management system will solve these problems. The proposed system is designed to help the Blood Bank administrator meet Blood's demand by submitting and/or fulfilling Blood's request as and when necessary. The proposed method offers the systematic solution to bridging the difference between the Recipient, Donor, and Blood Banks. This application should give all three parties common ground. The software application offers a way for the hospitals and blood banks to connect and synchronize. This also provides them the ability to connect with local emergency donors. The database is an integral part of the program. The hospital and blood bank records must be periodically reviewed for accuracy for smooth running of the system. The proposed program uses Google Maps to provide an effective way for the user to find nearby donors / blood banks.

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