Integrating blood bank inventory management with a Cloud based decision making system for blood donation service

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ABSTRACT

Blood requirements are increased in the recent years. Often there is an immediate requirement for blood. Though there is an increase for blood requirement, the blood donation percentage in India is only 5%. The emergency requirements of an overload in order to overcome this situation we have developed an application that good or come these difficulties. This application is made for both individual users and blood banks. Blood banks often either side of the stocks of one particular blood group end up being short with certain blood groups. This application will help in transporting the excess units of blood from one blood bank to fulfill the shortages of blood unit in another blood bank. An individual user sends the queries requesting for a specific blood group to the server via Google Cloud messaging (GCM). The processing of the query takes place in the server and notified those as a response to those people who satisfy the specified query. The GPS coordinates of sent to the requester when the donor accepts this malfunctions.

I. INTRODUCTION

The only way of obtaining blood is through donations, often in developed countries, donors voluntarily donate blood for their community. This is not the case in developing countries such as India. In
II. EXISTING SYSTEM

When details are entered manually, it becomes very hectic to track the various fields like blood groups, members, last blood donated, etc. Now the database becomes a huge task and it is difficult to fetch the information and it is difficult to maintain, leading to errors and delayed results. Often it becomes difficult to identify professional donors, this will lead to time-lapse whenever there is an emergency requirement. Even blood banks don’t keep track of their stocks. Many hospitals track blood banks to fulfil the requirements. when blood banks run out of their stocks, the hospital becomes helpless to fulfil the need in the limited time. even blood banks don’t keep track of their stocks. There are also several other web portal created for the purpose of blood donation. These platforms do not keep updating the donor information regularly and it is inefficient. The main disadvantage is that the systems are in-efficient to handle multiple request at the same time and leads to error results. There is no security for any of the information stored in the database and it is very time-consuming to retrieve the information.

III. PROPOSED SYSTEM

Any individual or Blood Bank who is involved in blood donation can enroll themselves in the application by entering the required details. There is a separate portal for the individuals' and separate portal for blood banks. However they both will be integrated and will contain different set of information that is to be given while registering in the application. These portals are managed by the administrator. He /she can modify the information that is given by the user. Some of the admin operations include cancellation, expansion, alter the data if required. This framework was developed by keeping in mind how the end result would look like after it is being linked with the database. The URL has been designed and outlined by using the Java advancements and utilizing the MYSQL server. The SQL Association technic is utilized for the arrangement of the database network.

Security has been given a major care in order to protect the information that the user enters while enrolling himself/herself in the database. It is ensured that the personal information given are used in legitimate manner in order to prevent the misuse of important personal information fed into the system. The encryption techniques that is used in the system will ensure that the information doesn’t goes to a random third gathering. The information transmission between the application and remote is incorporated using a system called Geographic Information System. We have developed an android application to look through and monitor the crisis situation like accidents closely. This application is developed to meet the unpredictable requirements of blood bank for medical services. It uses AES encryption technique to store information and GPS to track the donor's location. The block diagram of the system is shown in Figure 1.

IV. PROJECT DESCRIPTON

The sole purpose of this project is finding the nearest blood donor and the details of the donor will be collected upon the donor’s consent. The modules which are present are user registration, blood bank registration, request for blood, donor notification, location tagging and tracking, blood bank inventory management.

User Registration:This module is used to gather all the required information from the user and store it in the database. The details that has to be given by the user are name, age, contact number, address, gender, blood group, user ID, password, last blood given date. We have implemented an algorithm to classify the blood donors in this system, and also to categorize the donors and classify them. This is done
in order to access the information from the database quickly and accurately when there is a need for an immediate requirement.

**Blood Bank Details Portal:** Blood banks play a pivotal role in organizing blood donation service. In this module, we get the details from the blood bank in order to enroll them into our application and manage their inventories. The details that are collected from the banks initially enrolled are registration number, name, location, contact number, user ID, and password. These details have to be entered by the blood bank manager, to implement the classification algorithm and store them in the database. The registration module’s architecture has been shown Figure 2.

![Figure 2 User Module architecture](image)

**Request For Blood:** Whenever, there is a need for blood, the blood group and the location where the blood is required is been updated through this application. The request is been sent as notification to the donors pertaining to the same blood group. All other corresponding associated information are sent to the donor.

**Donor Notification:** This process occurs when there is a request for a particular blood group. The nearest available blood donor will be notified when there is a requirement posted by the user. The user will have to open the notification and the application will be opened and the user will be given two options as ‘accept’ or ‘ignore’. The user can either accept the request or ignore it. The nearest blood banks will also receive a similar notification to help in regulating the effective request management.

**Location Tagging & Tracking:** To ensure the privacy of information, the details of the donors are not sent to the requester with the donor’s consent. Only after the donor accepts the request by opening the notification, his/her details will be made available to the user who has sent the request. If the donor is not accepting the the request, then the request will be pushed to the nearest donor with a pop-up notification. The latitude number and the longitude number is been tracked to ensure the accuracy of the location.

**Blood Bank Inventory Management:** The blood banks after signing in with the application, they have to update their stock of blood and the collection date of each unit. This gives a clear picture of the inventory that the blood bank is holding. If there is a shortage or excess in any particular unit of blood, request can be made through the application and the request will be fulfilled by the nearest available Blood Bank. The blood banks come to a mutual understanding and this would help in achieving effective management of inventories, minimize wastage and handle shortages.

**Dashboard:** After signing in, the first screen that comes up is the dashboard. The dashboard consists of three sections. Profile, search and request. The profile will display the user’s and the blood bank’s details. The user and the blood bank will be allowed to edit or update the information present in that section. Search option displays the news feed of various blood donation camps and non-urgent requests. This search window would be essential for those donors who are ready to donate blood, but are unaware of the place where they could donate blood. The request section is used to make emergency request. Clicking on this section will navigate to the request for blood module to make blood request.

Encryption plays a vital role to ensure the privacy of user data. The data entered by the user are encrypted using the encryption calculation methodology called as advanced encryption standard (AES). There is a finite field called Galois fields in AES calculations that enables scrambling data easily and effectively to...
mathematical operations. Security, cost & implementation are the elements that choose & determine the AES calculation. The principle of this design is a combination of substitution and permutation & the network is known as the substitution & permutation network.

Different unified modelling language charts are used to manage the Framework configuration designing for the execution of all the above mentioned tasks.

To manufacture anything, configuration acts as an important building to portray the product that said to be manufactured. In order to convert our necessities into portraying the product that is built, the procedure of programming configuration is followed. The quality is rendered in programming only during the configuration. The prerequisites of any problem is interpreted precisely with the help of configuration.

Figure 3 shows the use case diagram of the system that is being developed. The use case diagram shows that the registration is made by the user and is authorized by the administrator. The login and event details are given by the user, and he books the event. The administrator further provides the confirmation and the user shares the location. Figure 4 The sequence of transactions involved for processing is clearly described in the sequence diagram. User, event, location and admin are the sequences in the system.
The three levels in the data flow diagram are level 0, level 1, and level 2 respectively. These have been clearly shown in figures 6, 7, and 8 respectively.

V. RESULT

The JAVA implementation of the system are shown in the successive screenshots. The output screenshots are shown in the figures 9, 10, 11 and 12.
This figure 13 gives a clear view of all the table headings and the datatype for each heading. This is the format in which the user inputs data and the information is stored, which can then be accessed when required. Figure 14 show the GPS working of the system. Once the donor accepts the request, their location and the contact information is made available to the requester in the application. The user can then call the donor and communicate for blood.

VI. CONCLUSION

This paper proposes the idea of finding the nearest donor, track their location with the help of the app and helps in receiving blood during emergency situations. Blood Bank management system have also been proposed in this system to manage the stocks of blood units in blood banks and also provides a platform for exchange of blood between banks to manage shortages and prevent excessive stocking.

REFERENCES


