



Implementing Blood Bank Tracking System with Information Security Using Fuzzy Logic

Mr. J Jerin Jose¹_{M.E} J Keerthi² M Reddy Asha³ T Ravindra⁴ K Jayanth⁵ M Zaamin Koonari⁶

¹Associate Professor, ^{2,3,4,5,6}UG Student ^{1,2,3,4,5,6}Department of Computer Science and Engineering
^{1,2,3,4,5,6}Siddharth Institute Of Engineering & Technology, Tirupathi, Andhra Pradesh, India.

ABSTRACT

A network-based system called Blood Bank Management is intended to store, process, retrieve, and analyse data related to the administrative and inventory management within a blood bank. This project intends to keep all the data regarding blood donors, the various blood types accessible in each blood bank, and assist them in managing more effectively. The goal is to increase openness in this industry, make it simple and free of corruption to receive blood from a blood bank, and improve the efficiency of the blood bank management system. Instead of storing blood, we are stocking the names of blood donors because our client is not interested in doing so. Blood donors must register in the database if they are interested in giving blood. There are no issues with the idea because there is no blood storage. In order to find the closest and most appropriate donors, the proposal integrates Nearest Neighbor Search with Fuzzy Expert. The need for blood must be expressed, and we provide the donor's information. Whether they are available or not, the donors are allowed to adjust their status.

Key words: *fuzzy, neural networks, fuzzy AI, and blood bank management system*

INTRODUCTION

One of the most important components, and the "river of life," is blood. There are several situations where the demand for blood is urgent. The online blood bank with an automatic call routing feature will be of tremendous assistance during these crucial times. Now, we're going to use the direct call routing feature to do this. A predetermined methodology is used to identify the best donor at each stage. Comparing this type of system to the current ones available, it is more advantageous because it always allows for direct interaction with the donor. Compared to a messaging-based system or a simple internet-based database system, this aids in receiving a prompt response. Using this approach, the blood requirement can be met right away. About 40 lakh units of blood are available, despite the fact that the country needs 4 crore units of blood annually. Worldwide, there are numerous online blood banks, but none of them allow for direct communication between the donor and recipient. This is frequently a severe drawback in situations where there is an urgent need for blood. With the creation of an immediate connection between the donor and the recipient, our project seeks to overcome this kind of communication barrier. "Blood Bank" suggests creating a platform where people in need of blood and willing blood donors can interact. The primary goal of the proposed effort is to provide assistance to those who need blood donors who are willing to give it and who can do so quickly. Only a pitiful forty thousand units of the roughly four crore units of blood that the state requires each year are currently available. Every two seconds, someone needs to be transfused. Every day, more than 38,000 units of blood must be donated. Every year, thirty million units of blood components are transfused.

READING SURVEY**Automatic blood bank database online:**

There are numerous online blood bank databases, but none of them allow for direct communication between the donor and beneficiary. This is a significant disadvantage, especially when there is an immediate need for blood. Our project provides a direct call routing method using Asterisk hardware in an effort to break down this communication barrier. A blood bank database is built by compiling information from numerous sources, including blood banks, hospitals, non-profit organisations, and the NSS, using an online interface. The gathered information will be kept on a main server. To connect to this central server, call the toll-free number that will be assigned to it. In developing this algorithm, the donor's willingness and proximity to the location where the call is coming are also taken into consideration. The best qualified donor is identified using the algorithm. The needed person's call is directed to the qualifying donor's phone from the server. The costs associated with consulting an online database, calling potential donors, and confirming their readiness to donate blood when there is an urgent need are significantly reduced by such a system.

Automated blood bank design and implementation using embedded systems:

Automated Blood Bank is a companion piece that creates a platform for volunteer blood donors and people in need of blood. With the help of a promising Android application and enthusiastic blood donors, the goal is to meet every blood need in the nation. With the use of a low-cost and low-power Raspberry Pi B+ kit, the proposed effort seeks to break down this communication barrier by creating a direct connection between the donor and the recipient. Only a Micro USB power supply with a 5V and 2A output is needed. The only form of communication is SMS (Short Messaging Service), which works with all mobile phone models. A initiative called "Automated Blood Bank" unites those in need of blood and willing blood donors on one platform. The goal of this project is to assist those who need blood donors who are willing to give it and who can do so quickly. Automatic Blood Bank works to aid victims, patients, and those in need of blood. The goal is to find folks who are in need of blood and connect them with those who are willing to donate. The proposed work investigates how to locate blood donors utilising a Smart Card Processor that is GSM-based and a Raspberry Pi B+ Kit. "The hope of every Indian in quest of a voluntary blood donor" is the vision.

Blood bank management system:

Currently, the only way for the general public to learn about blood donation activities is through traditional media, such radio, newspaper, or television commercials. On any of the portals, there is no information on the blood donation programmes. The blood bank now uses an outdated manual system. The manual system has issues with keeping track of the donors' records. It's possible that the donor's data weren't stored securely or that they went missing as a result of disasters or human mistake. In addition, if the staff maintains multiple records for the same donor, mistakes could happen. Volunteer donors are not listed in a centralised database. Currently, the only way for the general public to learn about blood donation activities is through traditional media, such radio, newspaper, or television commercials. On any of the portals, there is no information on the blood donation programmes. The blood bank now uses an outdated manual system. The manual system has issues with keeping track of the donors' records. It's possible that the donor's data weren't stored securely or that they went missing as a result of disasters or human mistake. In addition, if the staff maintains multiple records for the same donor, mistakes could happen. Volunteer donors are not listed in a centralised database.

CURRENT SYSTEM

The system that is currently in place is manual. In this system, a person in need of blood must visit one of the hospitals, blood banks, or clinics that are located in or close to their area. Similar to this, a donor who wishes to donate blood must manually look for blood donation facilities. That will take a long time and is a very risky technique. Here, organisations (hospitals, blood banks, and clinics) keep a record of all the donors' and searchers' information in books. We have very little security with the manual system, and some data may be lost accidentally.

The system that is currently in place is manual. With this arrangement, a blood donor must visit a hospital to obtain blood.

There are blood banks or clinics nearby or at his place. Similar to this, a donor who wishes to donate blood must manually look for blood donation facilities. That will take a long time and is a very risky technique. Here, organisations (hospitals, blood banks, and clinics) keep a record of all the donors' and searchers' information in books. We have very little security with the manual system, and some data may be lost accidentally. Report generation in this system is highly difficult, which means it will take a lot of time. It's a constrained system that's not very user-friendly. It takes a lot of time to do specific information searches, which is quite important. Users are unable to restrict access to the information.

IMPLICATIONS OF THE CURRENT SYSTEM

- The limited system and unfriendly user interface make report generation exceedingly difficult and time-consuming.
- Finding specific information requires a lot of time and is very important.
- Users are unable to restrict access to the information.

SUGGESTIVE SYSTEM

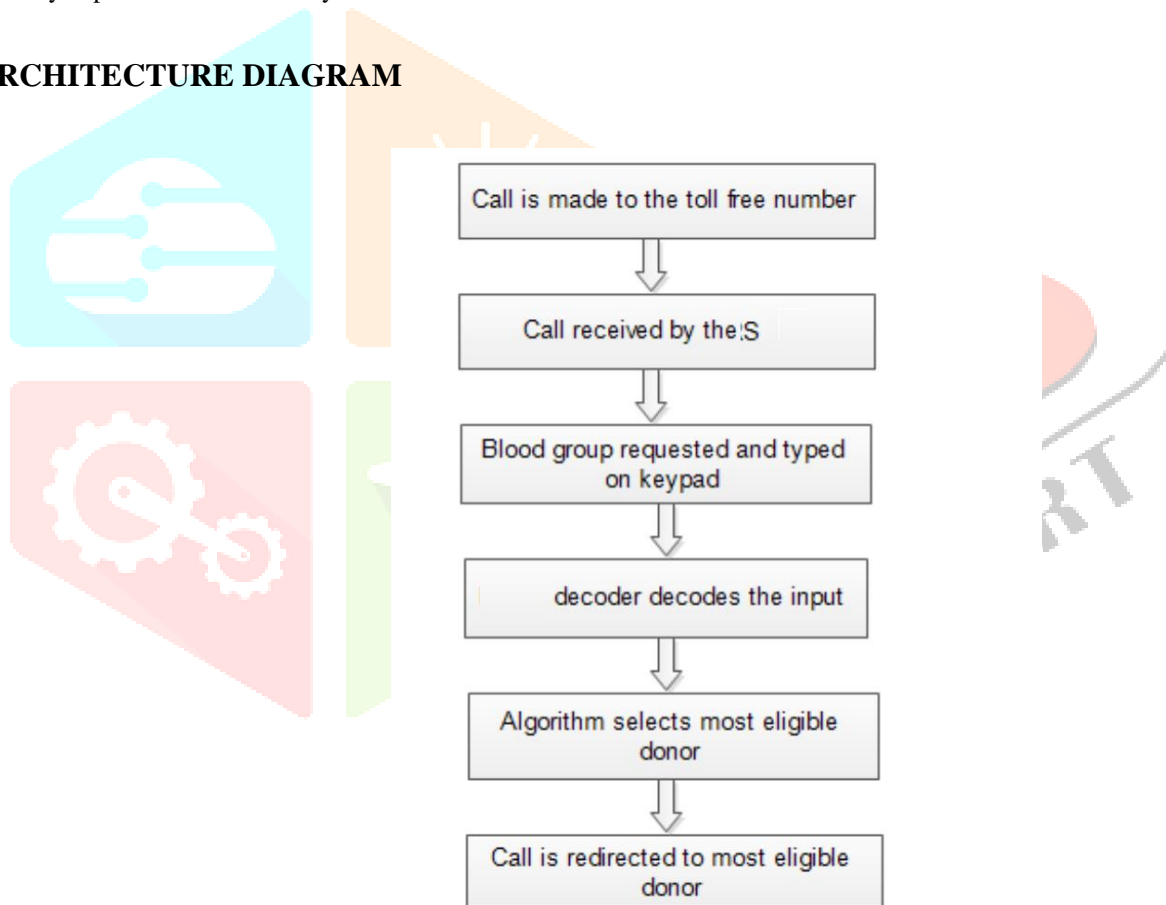
Via this method, donors can browse all of India's blood donation facilities online. Via this mechanism, a donor can ask a company for blood by submitting a request. The centres with blood can be easily searched by the seeker. Information about donors and seekers can be kept in a central database that the system can look after. A seeker may ask an organisation for the necessary blood type.

- Only users who have registered can access this application due to the specified authentication. It is possible to generate reports. The solution greatly simplifies and increases flexibility in overall project management.

ADVANTAGES OF THE PROPOSED SYSTEM

- Security integration • May enhance system functionality when looking for donations.
- Fuzzy expert will automatically match the donors to the needs.

ARCHITECTURE DIAGRAM



ALGORITHM:

ELIGIBLE DONOR FINDING ALGORITHM:

Input: Blood Group and location

Output: Most eligible donor

Algorithm:

- Step 1: Receive blood group from blood recipient and track location*
- Step 2: Select donors list and store it in list L1.*
- Step 3: Calculate duration d1 between oldest donation date and current date.*
- Step 4: Select donors list from L1 (duration > 56 days) and store it in L2.*
- Step 5: Sort the list L2 based on d1 (highest duration is on top).*
- Step 6: The sorted list L2 is the eligible donors list.*

Modules Description

Admin: He is the site's top user. He is willing to register organisations, benefactors, and seekers. He can update the system with information on the nation, state, and city. He is able to produce reports on groups, donors, and seekers.

Blood bank: An organisation needs to sign in to the system using its login information. It can take requests from donors and enter the information about their donations into the system. Similar to that, it can accept requests from blood donors based on the availability of blood.

Donor: He needs to enter his login information into the system. He has the option to ask for blood donation on behalf of a charity. He may also check the status of his request. He can now see his blood donation. He is able to alter his password.

He must use his login credentials to access the system as a seeker. He has the option to ask a company for blood. He may also check the status of his request. He is able to alter his password. Reports The system generates a variety of reports. Reports on: 1. Donors; 2. Seekers 3. Report Registration by Organizations The system has a registration procedure. Each user must fill out the registration form completely, including their user name and password. Once a person has completed the registration process, only that user will be able to access the system by entering their user ID and password.

Authentication: Securing the system is all that is involved in authentication.

Here, each user must log in using the login page. The UN authorised users will only be allowed to log in. For system login, a user must enter their credentials, such as their user ID and password. The system keeps data for all users in order to do that. When a user inputs his user ID and password, the system checks the database to see if the user already exists. If the user is real, he can be considered a legitimate user. If not, the request will be rejected. Number of Admin, Donor, and Seekers.

The benefits of the system made available to the user serve to identify the project. Here are the advantages of this project: - It is a web-enabled project.

Users can enter data into this project's basic, interactive forms.

The client may enter the needed information with such ease, which is quite beneficial.

Regardless of what he is typing, the user is mainly more worried about the validity of the data. Every stage of any new creation, data entering, or updating is checked so that the user cannot enter inaccurate data, which could lead to issues in the future.

The user may discover that some of the information he initially submitted needs to be updated as the project progresses.

There are choices available to him for updating the records. Also, he is restricted from changing the primary data field. As a result, the data's validity is preserved to a greater extent.

The user has the choice of keeping track of the records he previously entered. With the range of choices he offers, he can view the desired records. The user is given links through framing from every section of the project so that he can move between options of the project as needed.

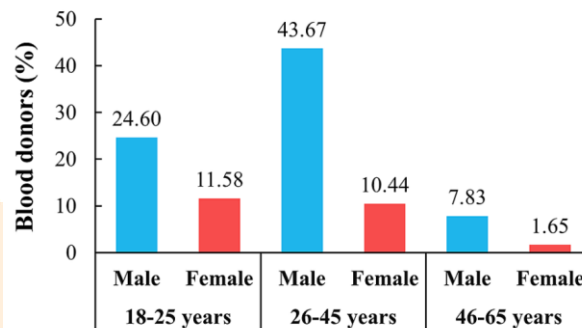
The user will undoubtedly find this to be very user-friendly and straightforward. In other words, we may conclude that the project is user-friendly, which is one of the main considerations of any good project. Because data is saved methodically and in a single database, data storage and retrieval will be quicker and simpler to maintain.

Faster information processing would considerably improve decision-making because it takes far less time to acquire data using a computer than it does using a manual system. Because the user can view the information from previous years at any moment, allocating sample results becomes significantly faster.

data transfer that is simpler and quicker because to modern computer and communication technology. These features will improve transparency, efficiency, and accuracy.

RESULTS

Characteristics of the studied population's demographics The majority of donors (54.11%) were between the ages of 26 and 45, followed by those between the ages of 18 and 25 (36.18%), and those between the ages of 46 and 65 (9.48%). In addition, male donors between the ages of 26 and 45 tended to be the most common, followed by donors between the ages of 18 and 25 and those between the ages of 26 and 45. Finally, male and female donors between the ages of 46 and 65 were equally common. Hence, young male donors made up the majority of donors (68.27%). The gender and age interaction did not, however, show any statistical significance according to the Chi-square test ($X^2 = 3.189$; $p = 0.203$).



CONCLUSION

The essential requirement for life is blood. While looking for blood donors, there are various options. The suggested approach will advance other blood donation systems by one step. Using this technique, the blood recipient can get in touch with the blood donor directly. Based on the blood group and location, an algorithm was created to locate the appropriate donor. People may not be able to access to the internet in order to search the existing online blood database systems when there is an urgent demand for blood. Computerized databases with automatic call routing capabilities are the best option for meeting blood needs right away.

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