

“BLOOD BANKING VIA CLOUD COMPUTING USING ML TRACKING THE REAL TIME LOCATION OF DONOR”

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Abstract:

Blood banks play a vital role in hospitals and across the country, ensuring safe and timely blood transfusions. However, traditional paper-based blood bank management systems are inefficient, particularly during emergencies when fresh blood is urgently needed. Our projects main aim is to develop a digital blood bank management system that allows users to easily access information related to blood banks and their entities. This project aims in developing a cloud-based blood banking system and will also include tracking the locations of nearby blood donors as well as hospitals using ML. This system saves time to a great extent as a person does not need to go out in search of a blood bank. Many blood donation management system exist, but they do not incorporate real-time location tracking of blood donors using machine learning. In today's busy world, finding willing blood donors can be challenging, particularly during emergencies when fresh blood is urgently needed. This system aims to explore potential of location-aware computing to track blood donors and identify the nearest available donor in case of emergencies or when fresh blood is required.

Keywords: Machine Learning (ML), Cloud Computing, Tracking.

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1. Introduction

The future of blood banking, where cutting-edge technology is revolutionizing the way blood donations are managed and tracked. Blood banks are now able to follow the position of blood donors in real-time with the help of cloud computing and machine learning, which has made the donation procedure more effective, precise, and quick than ever.

Traditionally, blood banks have relied on manual processes and paper records to manage donor information and track blood inventory, which can be time-consuming and prone to errors. However, with cloud computing, all donor data is securely stored in the cloud, allowing for easy access and management from anywhere, at any time. This eliminates the need for cumbersome

paper records and enables blood banks to efficiently track donor information, blood inventory, and donation patterns in real-time.

Machine learning algorithms are also leveraged in this system to analyze donor data and predict donation patterns. By analyzing various factors such as blood type, donation history, and other relevant criteria, these algorithms can identify eligible donors and anticipate blood shortages or surpluses. This allows blood banks to proactively manage their blood supply, ensuring that blood products are available when and where they are needed the most. This application uses cloud computing technology to improve the blood bank system, particularly in rural areas where there may be limitations in information availability and blood inventory management. The central concept is to establish a platform that empowers requesters to easily obtain information regarding blood donors, their geographical whereabouts, and the proximity of nearby blood banks, and other relevant details. The location information can be made available to the users through GPS technology. This paper explores the concept of a blood bank management system, including the services it offers and the integration of cutting-edge technologies such as cloud computing, Android applications, web technology, and more to elevate the effectiveness and productivity of the blood bank system. By leveraging cloud computing technology, the proposed system aims to address the limitations of the traditional blood bank systems and provide a more robust and accessible platform for managing blood donation and requests. The entities that are a part of the cloud-based management system for blood banks are as follows: Requester: The individual who requires blood from a blood bank due to an emergency or critical medical situation like injury, illness, surgery, or other circumstances [4]. Donor: The healthy person who gives blood to the blood bank in order to save a life is the donor. Anyone who has a healthy body weight, appropriate hemoglobin, and no acute or persistent illnesses qualifies as a donor. Blood Bank (NGO): A blood bank is just the area where blood is kept and examined to lower the danger when transfusing it. The user can access the system through an Android application. Every user of the system receives a unique identifier. The user may benefit from this identity in subsequent correspondence. Daily information updates are possible because of the blood banks' administrative system. The primary repository, which will host all this data once it has been obtained, is held using the cloud framework Hadoop. According to his needs, the requester can receive information on blood, which will be useful in an emergency. We have used cloud computing because it is the newest and most effective kind of cloud-based computing, it is used in this application. Good backup recovery, flexibility, and better security are all provided by the cloud.

This project aims to help additional blood bank management systems be completed successfully. The project's main objective is to make blood donation services available more precisely in emergency situations. This Android application, called Altruistic, is created to handle, store, analyze, and assemble information on inventory and administrative management in a blood bank. The goal of this project is to keep all data about blood donors and the numerous blood types that are available at each blood bank, track the donors' location at Realtime, and assist

them in managing all the blood banking related entities more effectively. The objective is to raise transparency in this sector, make it easy and fraud-free to receive blood from a blood bank, and increase the management system for blood banks' effectiveness.

2. Literature Survey

No	Author	Techniques Used	Advantages	Disadvantages of Existing System
1	A Secure Cloud Computing Based Framework for the Blood Bank	<ul style="list-style-type: none"> • Machine Learning • K-Means Clustering • Geographic Information System 	In order to enhance the blood bank system's services, it also combines blood data that is dispersed across the nation in various locations.	The majority of blood banks operate independently and are not interconnected, which has an impact on the caliber of blood donation services.
2	Mobile-Based Location Tracking without Internet Connectivity using Cloud Computing Environment	<ul style="list-style-type: none"> • Latitude and Longitude Algorithm • Kalman Filter Algorithm 	<p>This Project TrackMobile Location without internet connectivity</p> <p>It gives accurate Location of mobile</p> <p>Make blood availability in less time</p>	

3	Towards an Efficient and secure Blood Bank Management System	<ul style="list-style-type: none"> • Computer Aided Emergency Service System • Database with Anti-GPS Mobile System. 	Computer Base dSystem Dependent on hospital data for the donor's location	Mobile-Based System Independent of the hospital database for the location of the donor.
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3. Methodology

User Side

- A. The user must first download the application in order to begin using it.
- B. The user will see two options on the screen after downloading the application. Sign in and log in are the first two choices. If the user has already registered, they can select option one and can log into the application.
- C. When a user is using the application for the first time, they will need to create an account by providing various details including their name, address, contact information, date of birth, blood type, and email address [4]. A copy of the user's Aadhar card, driver's license, or other form of identification that displays their blood type must be uploaded.
- D. Information can be updated at any moment by the user. After completing registration, those who have internet access can access the application.
- E. Provided with various options like:
 - Home
 - Register as Donor
 - Nearby hospitals
 - Nearby hospitals
 - Nearby hospitals
 - Blood Requirement
 - Feedback to user
 - Rewards to Donor
 - Profile
 - Logout

- A. Simply by choosing one of the mentioned options, the
- B. user will receive the relevant information, such as details on the need for blood, the location of the closest hospital, any notifications, etc.
- C. The user must update current location so that the user can view nearby hospitals.
- D. Databases are used to store all the information on blood donors and hospitals. Due to security precautions, only the administrator has access to the private data. The cloud securely stores each user's data. The user of this application won't need to look for blood in an emergency because they may access this application to acquire the information, they need about the needed blood donor.
- E. Once the NGO verified the user then only the user can login. Once the user registered themselves as a donor then the NGO will send the mail regarding date, time and hospital where donor can visit and donate the blood according to the requirements.
- F. Sometime it may happen that the donor gets rejected because of he/she is not eligible like weight is less than 50, hemoglobin is less, because of any disease, alcoholic blood etc. in that case donor gets mail regarding rejection.
- G. If the donor fits to the criteria the donor can come and donate the blood.
- H. After donating the blood successfully the donor will get reward and it will be notified through mail.
- I. After that the user must give the feedback (rating).

NGO Side

1. To begin using our application the NGO will need to download it first.
2. NGO needs to now login with user ID and password.
3. Various options will be provided to the NGO like:
 - Home
 - Verify Donor
 - Nearby hospitals
 - Nearby donors
 - Slot book for Donors

- Rewards to Donor
- Feedback to user
- Profile

4. The NGO can verify the donors, book slots for donors when blood is required, grant rewards to donors after successful blood donation, give feedback to the users if they are not eligible for blood donation.

4. Proposed System Architecture

The frontend and operation of the application logic are created using the Android Development Studio for the current architecture, while the Spyder oversees the backend. Data is stored in a cloud database called Hadoop so that it may be accessed from anywhere. When a hospital needs blood in an emergency, our initiative is beneficial for both the donors and the hospitals since our system maintains the donors' locations in real-time, making it simple to locate donors in the nearby locality.

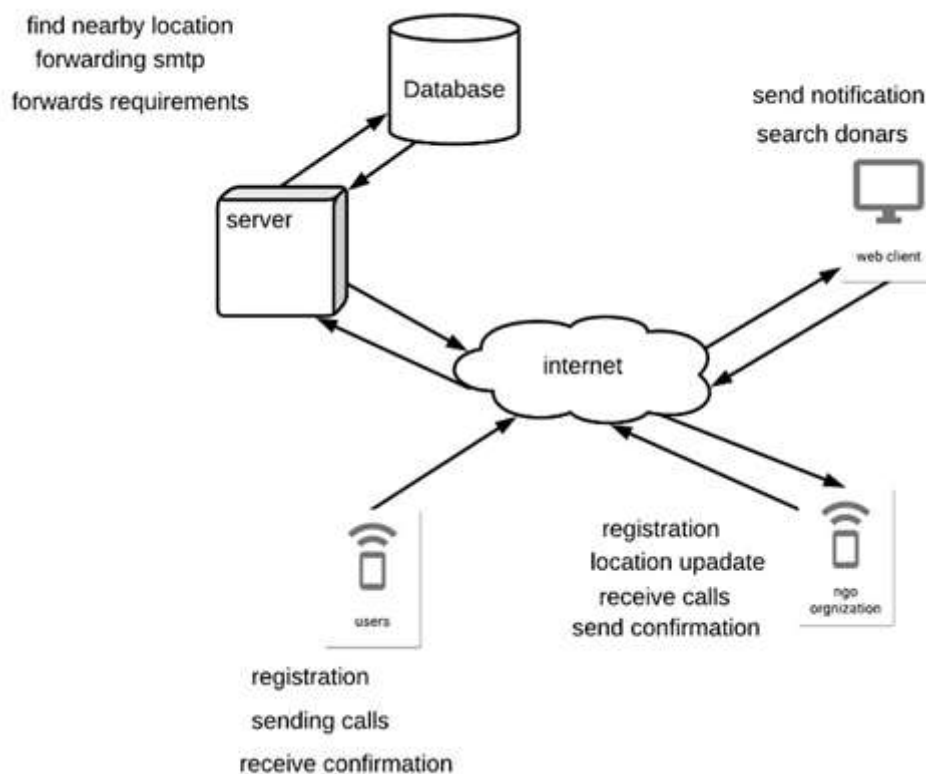


Figure 4.1: System Architecture

5. Problem Statement

There are numerous systems for managing blood donors, but no system can track the blood donors' real time locations. Locating the right donor becomes a challenge, resulting in an

imbalance in the availability of blood, particularly when there is an urgent need for blood in an emergency it becomes challenging to locate the right donor.

6. Conclusion

This proposed blood banking via cloud computing and machine learning with real-time tracking of donor locations is a game-changing approach that is transforming the blood donation process. With improved efficiency, accuracy, and responsiveness, this innovative system has the potential to save more lives by ensuring an adequate and timely blood supply for those in need. This project aims to locating and mobilizing the nearest blood donor when urgently blood needed. Having both an android application and web application server provides flexibility and accessibility to user. It enables efficient management of blood you enhance donor engagement, and streamline blood donation process. By leveraging machine learning algorithms, real-time location tracking of donors can provide valuable insights into behavior, preferences, and availability. This can help blood banks optimize their operations, improve donor retention, and ensure timely availability of blood units to meet patient needs.

Cloud computing allows secure and scalable storage and processing of large amount of data. The integration of cloud computing and machine learning in blood banking contribute to more effective and efficient blood donation programs, ultimately saving lives and improving healthcare outcomes. In this project donor also get blood donation certificates, which can serve as a motivation for donor to continue donating blood. The blood donation certificate can acknowledge the contribution of donors and recognize them for their lifesaving efforts. This recognition serves as an incentive for donors to make repeat donations and helps raise awareness about the crucial importance of blood donation within the community.

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