

A Secure Cloud Computing Based Framework for the Blood bank.

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Abstract - A blood Bank can be defined as a bank or storage place where blood is collected, preserved and used whenever needed or demanded. Everyone is aware that the traditional blood bank management system includes paperwork. Its way of working is not efficient enough at the time of emergency situations. The main aim of creating cloud-based blood bank system is to make the blood available on time to the people, even in emergency situations. With the help of this project, the user can be able to view information about every entity related to blood bank i.e. hospitals, donors, a location of another blood bank etc. The security factor is maintained properly. Every time the new user accesses the system as a donor, he/she has to register himself/herself and provide a proof of their identity like license or government document on which the blood group of the person is mentioned. This project will consist of the android application which can be used in the smart phones; it will contain all the information of the donor and nearby hospitals. The application will also contain a GPS (Global Positioning System) system to track the location of the nearby blood banks or hospitals. Every registered user will get the notification regarding health checkup drives, blood donation camps in particular area etc. As the person did not need to go out far, for the search of the blood banks and hospitals, this application helps to save the time to a great extent. This also helps in correct and quick decision making.

Index Terms - Blood bank, Cloud Computing, Donor, Hospitals.

I. INTRODUCTION

Blood contribute to 7% of total body weight, so to maintain the specific amount of blood in the body is necessary for a human to survive. Studies show that for every moment, to save their life someone needs blood [5]. Especially in the rural area the facility provided by the blood bank system is not appropriate due to lack of availability of information and amount of blood in one specific blood bank. The main idea behind the paper is, to improve the blood bank system working, management etc, with the help of cloud computing technology. The project provides a platform using which the information about the donor, its location, nearby blood bank etc are available for the requester requesting it. Location can be made visible to the user by the use of GPS technology [2]. The paper includes brief information about working with the blood bank management system, its services and various technologies like cloud computing, android application, web technology etc. The entities involved in the cloud-based blood bank management system are as follows:

- **Requester:** The person who needs the blood from blood bank because of accident, disease, surgery etc.
- **Donor:** The person who is healthy enough to donate the blood to the blood bank for saving a person's life is the donor. The person having appropriate body weight, hemoglobin and no acute or chronic disease can become the donor.
- **Blood Bank:** Blood bank can be simply defined as a section of the blood bank where the blood is stored and tested, to reduce the risk at the time of transfusion

The system Consist of an android application or website that the user can access. The system gives

unique identification to its every user. This unique identification can help the user in future correspondence. The blood bank management system can update their information on daily basis. Administrator plays an important role in the system as he is responsible for collecting information about the donor, blood group and sorts them according to area wise and GroupWise respectively. All this information will be collected in the central repository and this center repository will be stored using the cloud. The requester can get the information about blood as per his need which will help them in emergency situations [3]. The problem may arise if the requested blood group will not be available in any of the blood banks. The requested amount of blood units will be made available to the requester from the blood bank [1]. Cloud computing technology is used in this application because cloud computing is the latest and efficient way of server-based computing. Cloud provides good backup recovery, flexibility, and increased security. Cloud provides three types of service models namely:

- Infrastructure as a service model
- Software as a service model
- Platform as a service model

II. TECHNOLOGIES USED

1. **PaaS (Platform-as-a-Service)** : It will be used for Developing our application on cloud platform.
2. **Ehcp (Easy Host Control Protocol)** : It will be used for hosting our application.
3. **NoSQL** : The use NoSQL is create and maintain database as it provides the mechanism of storage and retrieval of data.
4. **GPS (Global Positioning System)** : It is used for tracking the location of nearby blood bank or donor.

III. EXISTING SYSTEM

The information collected from the blood bank and hospitals describe the working of the blood bank system. Blood cannot be produced artificially in the laboratory. Thus to satisfy an increased need of blood, blood collection should be increased. Various promotional activities are conducted by the blood bank and hospitals to enhance the donor to donate blood, as the amount of blood in the bank depends on a number of donors. Information like phone number, email, address etc is collected by the donor and stored after they complete their blood donation. The system that exists today is dependent on paperwork. To donate and receive the blood from the bank, the donor and receiver has to fill the form consisting of the basic details

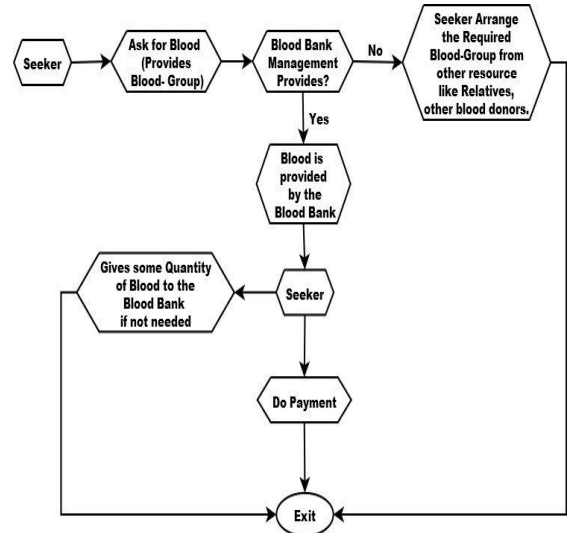


Fig.3.1. Existing System

IV. PROPOSED SYSTEM

To get started with our application user need to first download the application. Once the application is downloaded user will be provided with two options on screen. First is, log in and second is, sign in option. If the user is already registered, then he/she can go for the first option and login. If the user is using the application for the first time then he/she has to create an account by providing details like name, address, contacts, date of birth, blood group, and email id. The user has to upload his/her license or id proof on which blood group is mentioned. The user can anytime update his/her information. After registration is done the user can access the application, provided the user has internet access.

Once the user is signed in he/she will be provided with various options like:

- Blood camp
- Search donors
- Search blood banks
- Request for blood
- Nearby hospital
- View notification
- Emergency contact details

Just by selecting any of the options mentioned above he /she will get the information accordingly like information about blood camp, the nearby hospital, any notification etc.

All the detail of the blood donor, hospital is stored in database. Security care is taken; the confidential data can only be access by the administrator. Data of each user is stored safely on cloud [5]. By using this application the user will not have to search for the blood in case of emergency and can directly get the detail of required blood donor by accessing this application.

No	Author	Techniques Used	Advantages	Disadvantages of Existing System
1	1. T.Hilda Jenipha 2.R.Backiyalakshmi	<ul style="list-style-type: none"> • Cloud for Data storage and GPS tracking • Web Technology for online blood bank • Android Application for smartphones 	<ul style="list-style-type: none"> • This project is to create a web application using the cloud [2]. • This will help to control donor service and create a database which holds data of the blood in each area using the cloud. • Using website people will be able to see the available blood in the blood bank. The person who needs the blood has to register on the website and local clients who need to donate blood in cases of need. • This website will help to improve public awareness and increases the supply of the blood. 	<ul style="list-style-type: none"> • To overcome the drawback of offline blood bank system we have proposed the system using Cloud Computing in which the users can view the information of nearby donors, hospitals, blood banks. • The application can be used online as well as offline. • The scope of the project is very short span but it provides users many facilities like a list of hospitals , blood banks , donors etc. • This helps to interconnect all the blood banks, hospitals, donors into a single network, validation, store various data and information of blood and health of each individual.
2	1. Alimentally M. Mostafa 2. Ahmed E. Youssef 3. Gamal Alshorbagy	<ul style="list-style-type: none"> • Ontology interface system • Emergency Service provided by national/regional donors database • Blood donation campaign service • Blood Donation Registration Service • Blood Donation Reservation Service 	<ul style="list-style-type: none"> • This project uses cutting-edge information technologies of cloud computing and mobile computing [6]. • This will help to communicate with blood donors and blood donation centers so that patient can get the blood on time. • It also combines the blood data scattered among different areas across the country to improve the service of the blood bank system • The person who needs the blood can install the application on their Smartphone's and can easily find the blood in less time • It also helps establish a blood donation community through social networks such as Facebook and Twitter. 	<ul style="list-style-type: none"> • The offline blood donation process takes lot of time and effort from both donors and centers since there is no concrete information system that allows donors and blood donation centers communicate with each other to minimize time. • Most blood banks work Independently and are not connected with other which affect the blood donation services quality. • Seeker will be able to use the BDS as an application installed on their Smartphones to help them complete the blood donation process with minimal effort and time. This will overcome the disadvantages of the existing system.

No	Author	Techniques Used	Advantages	Disadvantages of Existing System
3	1. P. Priya 2. V. Saranya, 3. S. Shabana 4. Kavitha Subramani	<ul style="list-style-type: none"> • Technopedia • Geographic Information System • Blood bank • Push technology 	<ul style="list-style-type: none"> • This project, propose an efficient and reliable blood donor information and management system using Android mobile application [3]. • This system is a web-based android application which helps to reduce the human mistakes which are done in the existing system. • This is integrated framework which has a cloud-based application on mobile devices. 	<ul style="list-style-type: none"> • The primary disadvantage of the existing system is that there is a concern of many discomforts in immediately following the process. Discomfort in the process is typically minor. The users feel weak and light-headed for several hours following the procedure. • There is no proper care of a person who donates blood to patients. i.e. there is no information about the person who has donated.
4	1.Deepak Pandey 2.Achal Umare 3.Dr.R.S.Mangrulkar	<ul style="list-style-type: none"> • Authenticated Logins with Encryption scheme with Data Upload and Dataset Generation Modules. • Mining Engines for Blood Distribution. • Email Services for user verification and forgot password services. 	<ul style="list-style-type: none"> • E-Blood Bank System based on latest technology of cloud computing is proposed[7] • The goal is to provide the blood available on time and encourage communication between the blood donor and blood donation center • It is also helpful in the combination of the accessibility of blood data scattered among various blood banks and health care associations over the country to improve blood donation benefits quality. • This project will also help to enlist donors to get warnings on urgent blood necessities cautions the client or the user can scan for the closest blood donation center or the required donor at the closest area, and reserve an appointment. 	<ul style="list-style-type: none"> • This project mainly aims to solve the problem by tracking these donors with the help of cloud. • The admin can validate or update the information accordingly in the cloud and even sends an alert to the donors in case the matched donor is found.

TABLE I. COMPREHENSIVE ANALYSIS OF DIFFERENT CLOUD BASED FRAMEWORK FOR BLOOD BANK

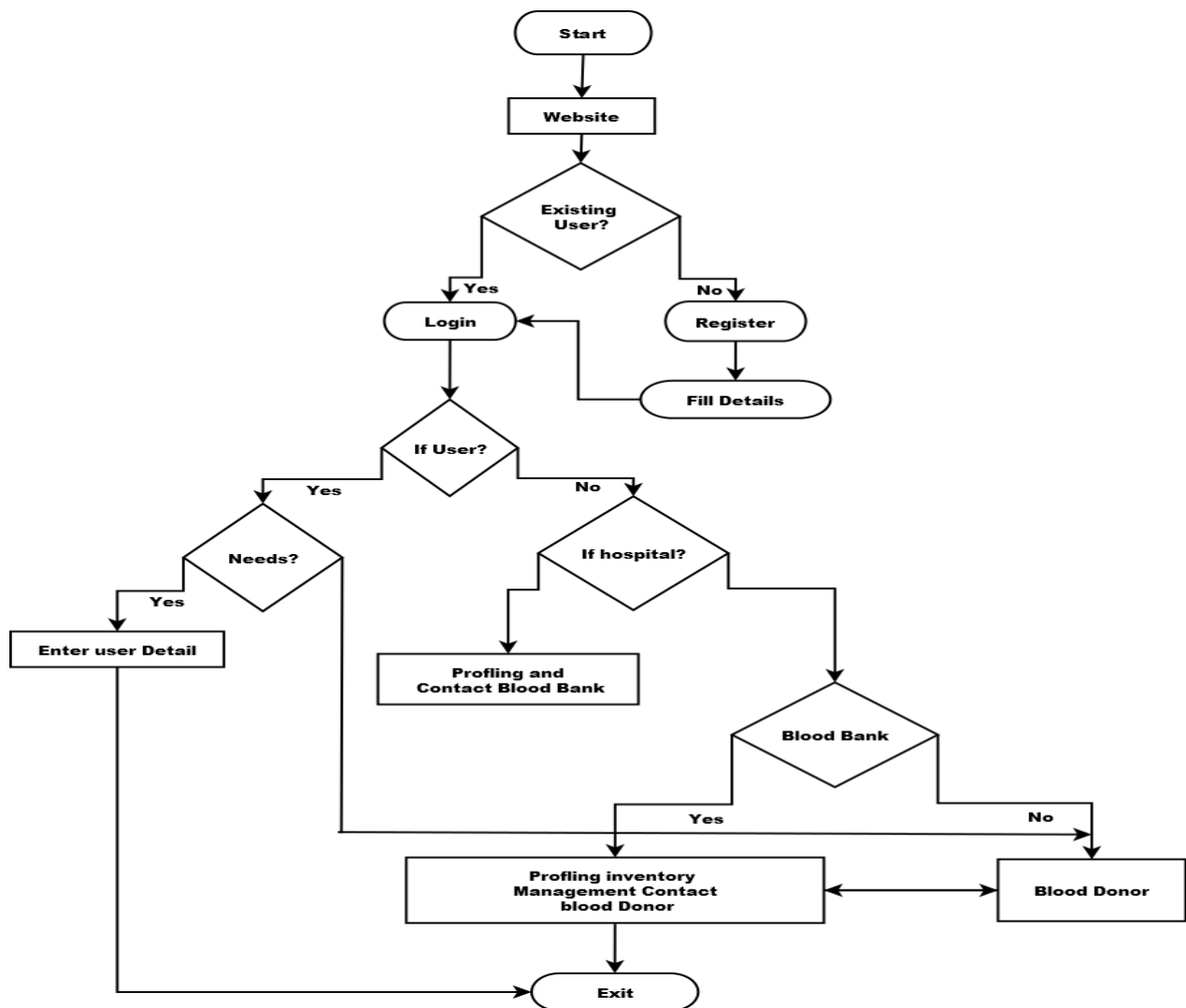


Fig 5.1 System Architecture

V. PROPOSED FRAMEWORK

Fig.5.1 depicts the system architecture which describes the flow of data process. User will be provided by the website where they have to register themselves. If they had already registered they can directly login and use the system. The system will process the data as per login type i.e. if normal user login they can directly specify their request and it be processed as soon as possible. If user login as hospital or blood bank they have right to profile and update their blood bank data. The website also

provides donors personal data to the user in case the requested is not available anywhere.

Fig.5.2 depicts Physical framework the working of the system begins with the user of the system. Whenever the user wants to use the system he can access the system by logging in to the system. The user of the System can be the Requester searching for the required blood group, admin of the system or the partners associated with the system. After the user login himself to access

the functionality of the system, the system provides different functionality to the user as per his login.

1. Requester: If the user login to the system as requester then he can directly make a request for the required blood group. After receiving the request the control moves to the database stored in a cloud, to check whether the required blood group is available or not. If, the blood group is available then information regarding the same is made available to the user as quickly as possible.

2. Partner: If the partners such as different blood banks, hospitals login the system, then they are provided with the different functionality then that of the user. The partner user is allowed to add delete, update, and view their specific inventories when required. They do not have access to the other data of the database except their inventories.

3. Admin: Admin is the important part of the system. Whenever the admin login to the system he is allowed all the access right to the database stored in the cloud. He is the person responsible for handling the efficient working of the system. In

case any problem arises the admin must try to resolve it and make system work again.

The latest cloud computing technology will be used in this system. The PaaS (Platform as a service model) Deployment model will be used. Databases will be created and managed using the Oracle database. The database will contain the information regarding all the entities is stored in the cloud server for the special purpose. Normal database server would also provide facility to store large data but cloud provides additional features like flexibility, disaster recovery, automatic update etc. More data from different location need to be stored on this database which would have been difficult to the management with normal database server. GPS (Global Positioning System) will be used to get location of the nearby blood bank, which would make it easier for the seeker to find the blood when needed in emergency situations.

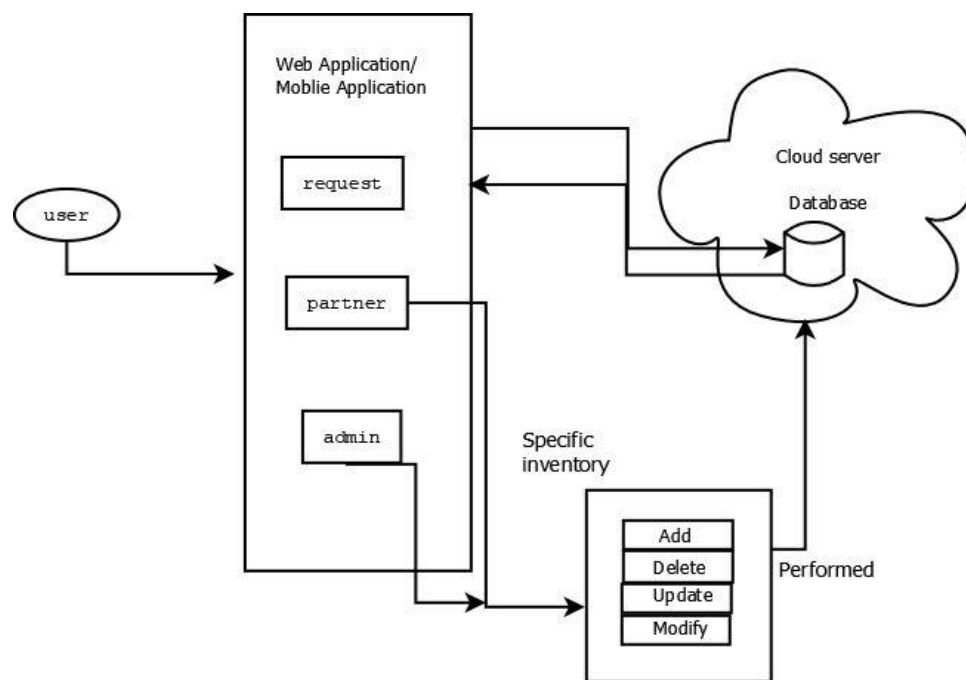


Fig 5.2 Physical Architecture

VI. CONCLUSION

This paper proposed the reliable online cloud-based blood bank system. Latest technology and information system plays a vital role in blood bank system and its services, as its quality improves. The system is beneficial for both requester and donor too. Due to this System, the bridge between donor and the requester is reduced and their

Communication improves. Thus, providing the requested blood on time to the requester, when needed. The health sector will be definitely benefited by the services provided by the system as patients safety and life is considered valuable[4].The purpose of the project is, sometimes patients life is at risk if the appropriate amount of blood is not made available to him

whenever needed. Even if blood units are present in the blood bank and the requester is not aware of it, then it is of no use. This system prevents such situations, as every requester will be able to know about the blood bank and blood unit nearby. The GPS Technology will be used to make the nearby blood bank location visible to the requester. The database containing all information about the blood bank's location, available blood group, donor's information etc will be maintained and updated.

VII. FUTURE SCOPE

In future, the service provided by the system is needed to be carried on with the SMS services. In the area where still people are not connected to the internet, this SMS service will be useful for them. The donor will receive an SMS from the seeker. The contact detail of the seeker will be encoded in some other form. The main purpose is to provide this blood bank facility without internet access.

VIII. ACKNOWLEDGMENT

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