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IoT Based Integrated Hospital And Blood Bank Handling And Control System

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ABSTRACT

Due to the globalization, vehicle traffic has increased more than 30%in a decade. And due to the increase of pollution it causes various or hazardous problems. Increase of traffic causes many accidents as well. In all these cases, in order to save the life of a human being, operation is a must needed criteria. Every operation needs blood. Due to the lack or unavailability of blood we observe lot of deaths. Our project will help to overcome the problem regarding the blood availability issues faced by hospitals during the golden hour and this paper says about the connectivity of various hospitals with the blood bank and the donor and how our system fulfilled the need of blood with a connection of internet.

I. INTRODUCTION

Database is used to store many information and has application in storing data or information for many purposes like grocery and etc. There are many nowadays terabytes are most high. In future we can get petabyte and exabyte as common to handle more we need to introduce a multi resource to it where it can have more/massive data here massive data centers are part of cloud computing [1]. With the increase in the growth of the applications in the field of World Wide Web (WWW) so do many users there will be clashes and poor quality always that is web server cannot handle too many at a time. In general, ordinary web server works on principle of first come first serve (FIFS) is its principle [2]. There are many researches done and webserver where it cannot protect many requests hence new server is designed with specific strategy such as single thread of control. To improve the quality of web server many researches are done[3]. Many users who need more data will outsource them from cloud where due to more users. It has been delayed in retrieval of data from the cloud. At present for retrieval Boolean method is used if keywords matched then only file will be found else no. To overcome this multi keyword is used and to control data leakage some technique is used [4].To provide security blowfish algorithm is used where this algorithm gives output exactly as the input given (25-bit input given 25 bits output). Firewall was present and till today it is more fast and secure and also, they control packets on basis of listed rule (set of condition and action). So the information like (destination IPsource IP etc.) that come in should waste match the condition then only packets will be accepted or else rejected. In some traditional firewalls there is waste of time in verifying which was published in previous search. Hence this tree rule firewall can operator very fast and offer less conflict and hybrid tree rule firewall [5].

The Electronic Health Record in Healthcare Management System is a major step towards maintaining the health record of the country's population. Emergency Medical System (EMS) is a revolutionary approach to emergency medical treatment in some medical emergency. The electronic healthcare data storage, update and retrieval using Cloud Computing can be controlled using the mobile system. It also observes that people are in severe danger due to unavailability of hospitals during the time of need. In order to make the effective usage of the golden hour it is very important that automatic applications must be used for decision making, maintain up to date status of the hospital [5]. The people related to the person in medical emergency can be updated regarding the medical emergency and it can also manage the health record of the user [6]. The medical counselling of the patient can be done which enables the doctor to prescribe the medicine through phone itself. This system traces the location of nearest available hospital and also contacts its ambulance emergency system and simultaneously it accesses Electronic Health Record of emergency patient that can critically assist during the golden hour in the pre-hospital treatments and also provides continuous information about the incoming patient to the hospital. It uses android based platform for tracing the location [7].

II. BLOOD BANK HANDLING SYSTEM

Fig 1. Shows the block diagram of working procedure of Blood bank handling system. Here the service provider leads a main role. Service provider server is acting as a information provider for connected devices to the server. Always in the back end the blood donor and the working service provider will ping to the server for

any information. Once next of Blood got generated from hospitals, the hospital maintenance server need to check for the blood group. It will start comparing obtained information with the stored information and the matched blood group will be selected and patched with the message.

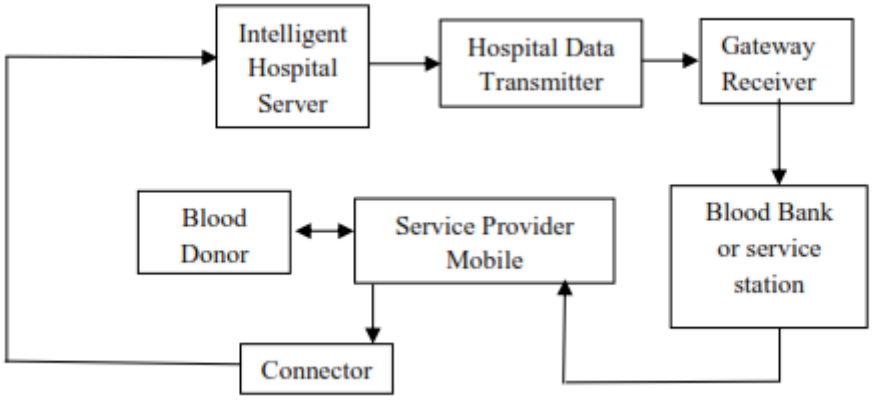

Figure 1. Blood bank handling system

Next job is to identify the hospital location. Hospital maintenance cloud will fetch the information of hospital address with the help of GPS connected or previous stored database and the same info is again patched with the message with the separator And Same information will be sent to service provider cloud. At this moment service provider cloud is acting as server and hospital maintenance cloud is acting as client for the same server. Once the information is received from the service provider cloud, the job of service provider cloud is to identify the location of hospital first. To identify the location it should get the location of hospital. It decodes the received message, identify the hospital address and start sending the same information with the blood group information to the service provider and blood donor. In the same time it start starts making the query with the nearest blood bank available with the help of previously stored data. The channel is open for reception of acknowledgement. Once the acknowledgement is received it will check whether it is from blood donor or from the blood bank.

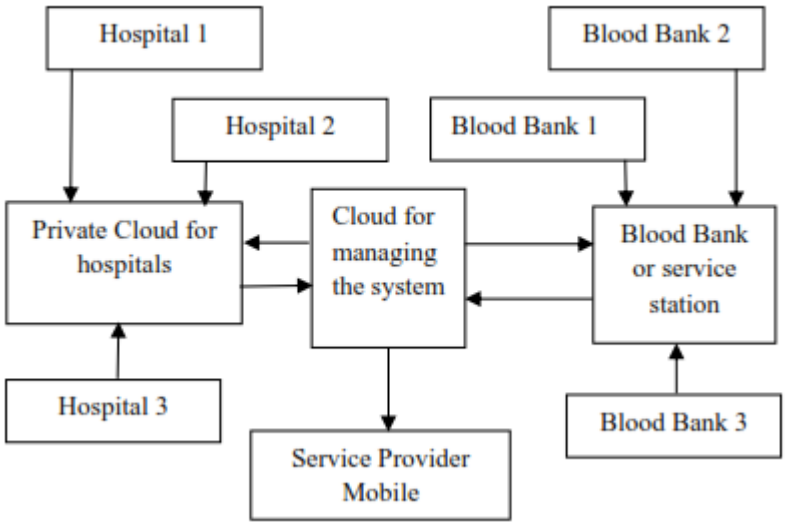

Figure 2. Blood request receiving and conformation system

Fig 2. shows the block diagram of Blood request receiving and confirmation system. In this we use the three private clouds namely hospital cloud for hospital maintenance and service provider cloud to provide the

information needed for customer and blood bank cloud.To handle the or else to receive the blood required information.

a). Private hospital maintenance cloud

Each hospital is having a client which is responsible for collecting information regarding the blood. Separate website has been designed and maintained in all the hospitals. We have the option to enter the needed blood group, urgency of need, the address of the hospital in a specific provided space. We also provide an option in which once the hospital opens a website automatically the address will be updated on to the website. The cloud is maintained in such a way that it had the security control over all the hospitals to avoid the unwanted or unauthorized connections to the server. We use the get and put secured methods for any data transmission in a cloud. Once it is enabled in a hospital the same PC is connected to private hospital maintainance server. This server is having the capability to access the 100s of hospitals at a time and provide the exact info regarding the blood to the connected clients.

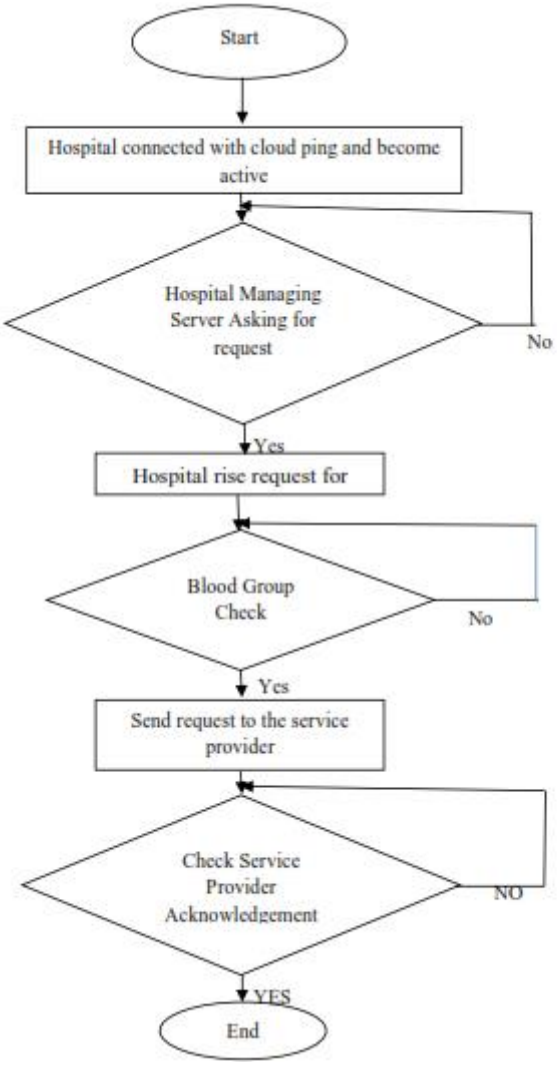

Figure 3. Algoritham flow of Hospital to service provider connection

b). Service provider cloud

This is the mediator between blood bank and hospital. The whole job of collecting the info regarding the need of blood to the providing the needed blood to the hospital will be taken care by the service provider server. In this server, all the service provider is connected as well as blood donor is connected. The design of cloud is in such a way that it is having the ability to receive the info from the private hospitals regarding the need of blood and website is having the space for new entry service provider. In that we provide the space to

enter new service provider information regarding his mobile number, addresses, will be given and updated to website. We also provide an option of Blood donor connectivity. This works like in a website of service provider option will be provided for new entry blood donor. He can enter his info in a website and make it updated. Now, the service provider cloud is having the info regarding the service provider as well as blood donor. One more job need to be done is connection of private hospital and service provider cloud and blood bank cloud and in the back end of service provider cloud information regarding the blood bank means the address and contact details and their website access will be provided and updated in a cloud.

c). Blood bank handler cloud

This is having the ability to maintain ask the blood banks present over the world. Each blood bank before updating the server we have the option to update the addresses and website and access over the website present in blood bank should be done. Now blood bank server is having the info regarding all the blood banks.

III. ALGORITHAM FLOW OF HANDLING AND CONTROL SYSTEM

Fig 3. Shows the flowchart of the algorithmic flow of hospital to service provider connection. Once the hospital is switched on, the job of each client to ping the server which is handling all the data regarding the hospital.

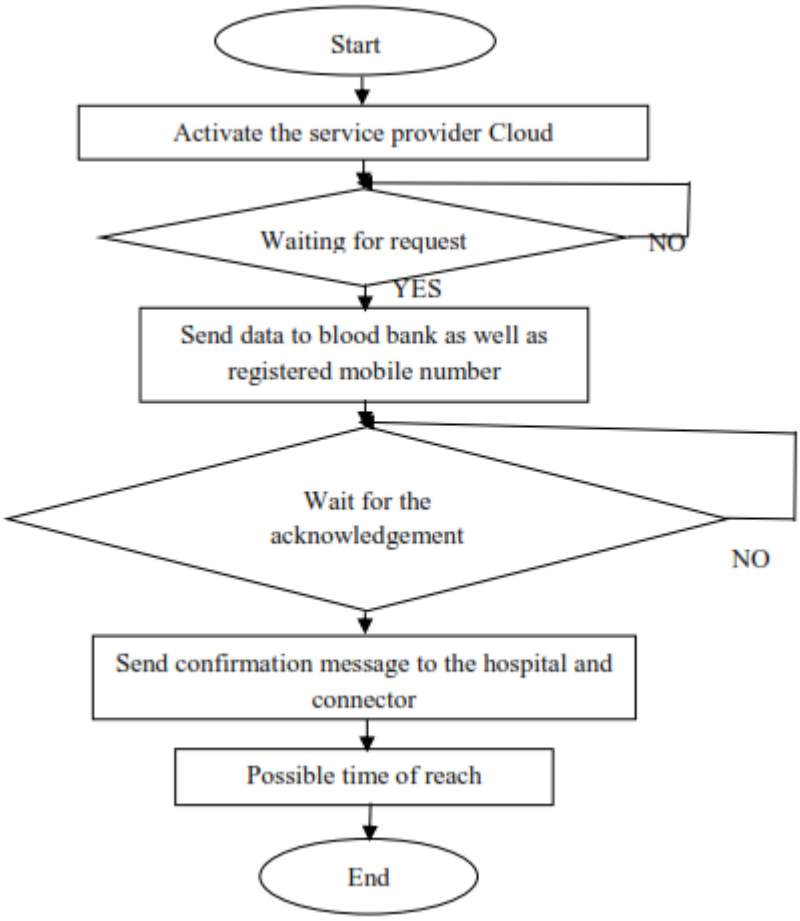

Figure 4. Algorithm flow of data transmission between the service provider to blood bank

Once the hospital server pings the main server, main server will take the hospital in consideration of active. Next step is to generate a query from hospital managing server regarding the request from any hospital. If request isn't found again search for the request. If it is found, ask for the decoding the received message and finding out blood group requested from the hospital. If any match is found, send the request to service provider or else wait for the match. Even after the 10secs match isn't found, then a pop up message should be displayed on the hospital

server display saying that not found. Once after sending the request to the service provider, wait for the acknowledgement from the service provider regarding the reception and end it.

Fig 4 shows the algorithm flow of data transmission between the service provider to blood bank. Once the service provider cloud is activated just check for any request from client. If it's not there wait until the request is found. If the request is found decode the same message and information of Blood and address after that send the information to registered mobile number of donor and wait for the acknowledgement. If it is received send the confirmation message to hospital and approximate availability of blood.

IV. DISCUSSION

Fig. 5 graph describes the facts and figure regarding the percentage of population having the respective blood group.

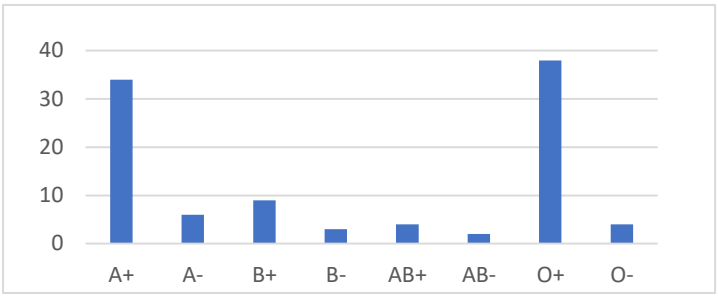

Figure 5.

It is observed that O+ being the universal blood group is having the maximum numbers followed by the A+ blood group. It is to be noted that the blood groups like AB-, B- is present in very less percentage of the population highlighting the unavailability of the respective blood group during the time of need. The following graph picturizes the countries which have the national guidelines with respect to the clinical usage of blood in the respective regions across the globe. It is to be noted that maximum number of countries in Africa and Europe are having the national guidelines with respect to the clinical blood usage but the countries having the national guidelines in other regions like south east Asia and east Mediterranean are less in number. It is also observed that including the regions like America which are way forward with regards to the development in infrastructure and other aspects have got comparatively less number of countries with the national guidelines regarding the clinical blood usage.

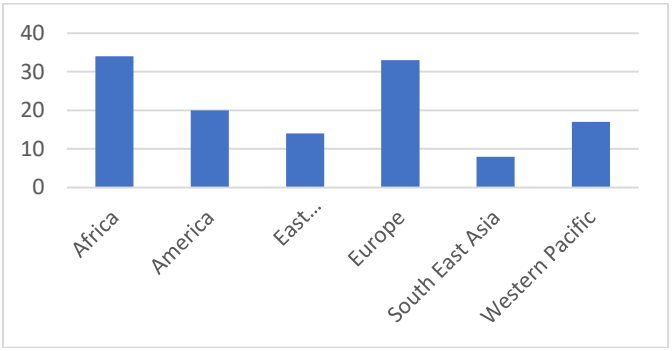

Figure 5

The graph below describes the countries which are enabled with the systems to keep the track of the adverse transfusion events happening in the respective region. It is to be noted that the regions of America and Europe are having a greater number of countries enabled with the system to keep a track of adverse activities happening due to blood transfusion. However It is to be observed that the adverse events which happen after the blood transfusion are minor events which can be treated easily.

V. CONCLUSION

The need for blood in the world is increasing day by day but that need is not being fulfilled at the expected rate. Most of the operating procedures performed at the hospitals need the transfusion of blood. Our

project aims at fulfilling the needfor blood within golden hour and there by saving lives. We also aim at taking the projects to the greater scales by not only increasing the region of operation but by integrating three clouds discussed into a single cloud and thereby reducing the maintenance cost and also establish mobile blood banks capable of accepting the donated blood at any reachable location.

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