An Efficient online blood bank service using cloud based database system

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Abstract: - 1 in 7 people entering a hospital need blood. For every 2 seconds someone is in need of blood. Health care services are very essential and are basically important as well. With the usage of technology and latest methodology these services can be delivered in a better manner. Lotr of things change with the advancement of medical science, many synthetic substitutes are used but there are no substitutes for human blood. The collected blood has a shelf life of 42 days and so blood which is available in the emergency situation is considered precious. A fast communication can be very useful in medical emergencies. Consider having a faster and updated data flow in any e-service related to health care, which will surely boost the communication of data and can possibly save human lives. Having technologies like cloud computing at your disposal can be very efficient when coupled with Real-time Databases.

Keywords: cloud computing, online blood bank, e-services, No Sql database, BaaS, PaaS.

I. INTRODUCTION

As we all know the availability of blood is very important in any medical case. The availability of the right type of blood group in the right time for the blood requestor can be a life saver. Since there are no synthetic replacements for human blood there is an evergreen demand for blood or blood donors. The fact that the shelf life of blood is approximately 42 days makes the blood or blood donor more valuable. The preservation of blood is not very promising given their shelf life so we constantly need blood from donors at the required time. In order to be effective we need faster communication between the donor, requestor and the blood bank. The implementation of blood bank service as an e-service can possibly remove the communication barrier. Although there are telephonic services even with all time hotlines they are on the costlier side to maintain the telephonic services and staff to handle several requestors and donors simultaneously.

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II.   EXISTING SYSTEM

The conventional system that exists today in under developed countries and in certain developing countries are dependent on paperwork. Sometimes even records are maintained in traditional hard copies or local databases. This traditional system includes donor or requestor filling a few basic details in a form which is not very much welcoming in emergency situations. Collecting details through paper is not very efficient as there is a possibility of human error while filling the form.
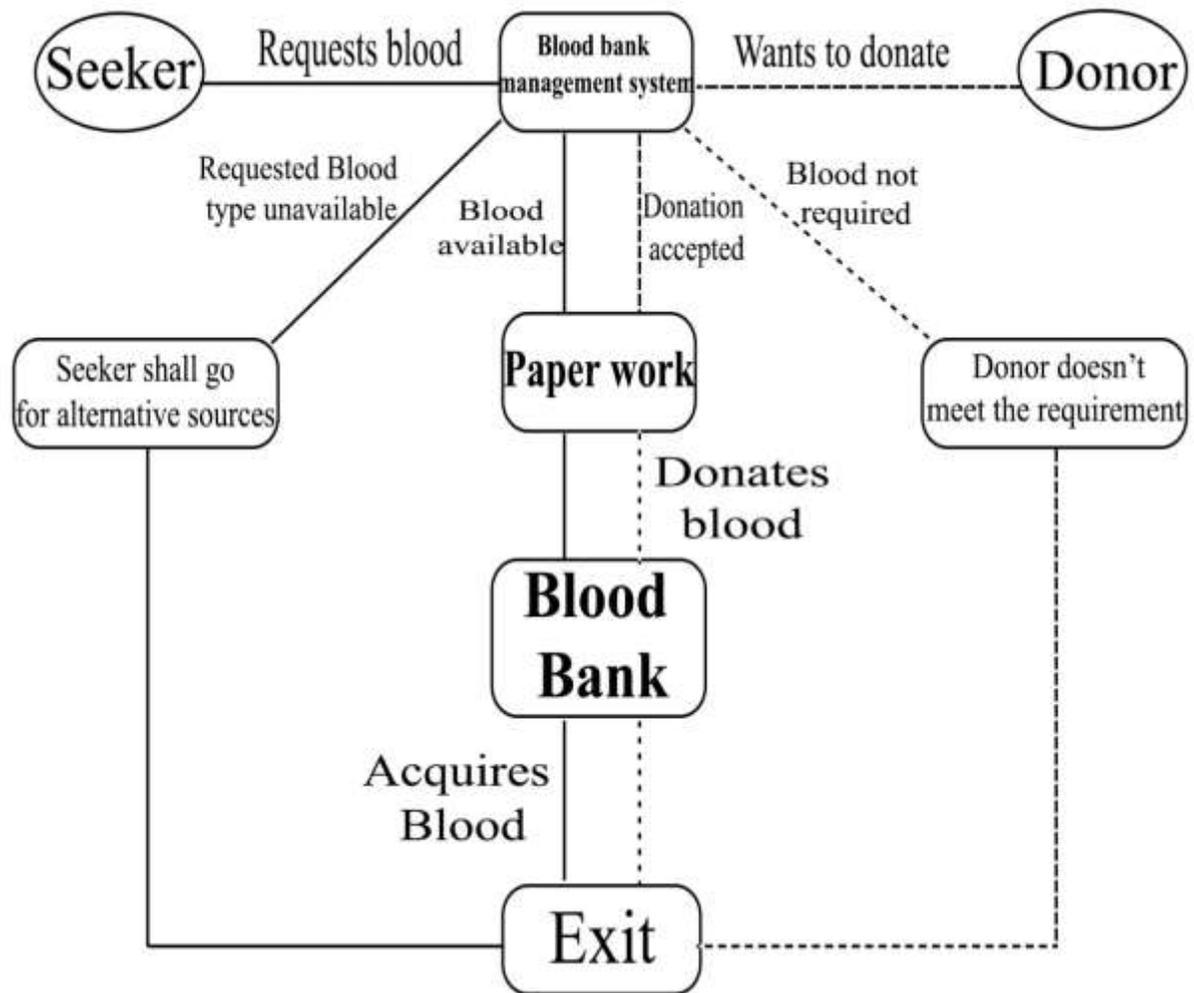

Fig.1- Existing Blood bank system

Most of the existing e blood bank services uses conventional technology and are not generally ready to adopt a better technology due to the fact that there are several complications in moving the older data into a newer platform and given that it cost a bit expense and work.

III.   PROPOSED SYSTEM

The objective here is to improve the existing system with the utilization of latest technology. The traditional usage of papers to fill forms is replaced with web based digital forms and the biggest leap is achieved in the records storage system. In the traditional methods the records are stored in handwritten or printed hard copies, some might be stored in digital form but in local data bases. Here we are improving the storage system by implementing technologies like cloud computing. The data collected from the web based digital forms are stored in cloud based databases. In our case we are using Google firebase which is cloud storage system. The main advantage of using cloud storage is not only having all the data stored in servers with backup but also the fact that your data is under industrial grade security. There under industrial grade security. There are many other good advantages for preferring cloud storage over local storage, like cloud services are scalable on the user's demand.
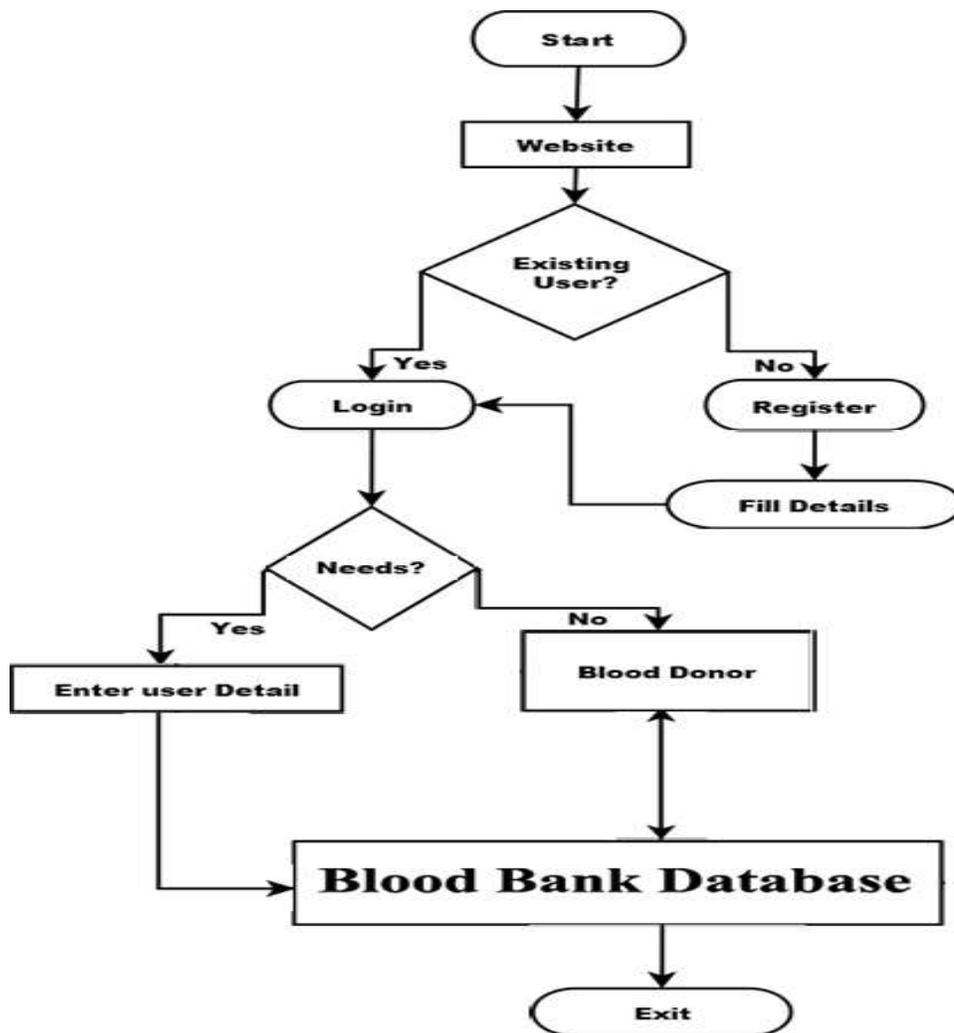

Fig.2- Proposed system (Activity diagram)

Another big advantage of using Google firebase is that it is a real-time database. Which means the data is updated instantly in real-time. So there will be very negligible latency in the data given by the user and storing speed

is very useful in healthcare applications especially blood bank which need fast communication to act faster in delivering blood on demand in the emergency period.

Blood banks can be integrated with the website to have user a broad view on blood availability and nearby blood bank. However Blood bank shall not follow the procedure of regular users, the admin shall be responsible for integrating or registering the blood bank into the website provided the Blood bank is ready to store their data in cloud database. After the admin integrates the Blood bank into the website, the Blood bank can perform actions like update and modify their data.

IV.   METHODOLOGY AND ARCHITECTURE

As we intend to improve the existing system, here we provide a basic platform for users to donate or seek blood from data provided by Blood banks. The admin is tasked to maintain the web application which registers users and after login they are allowed to either donate or seek for blood browsing through the information provided by the blood banks or volunteering donors.
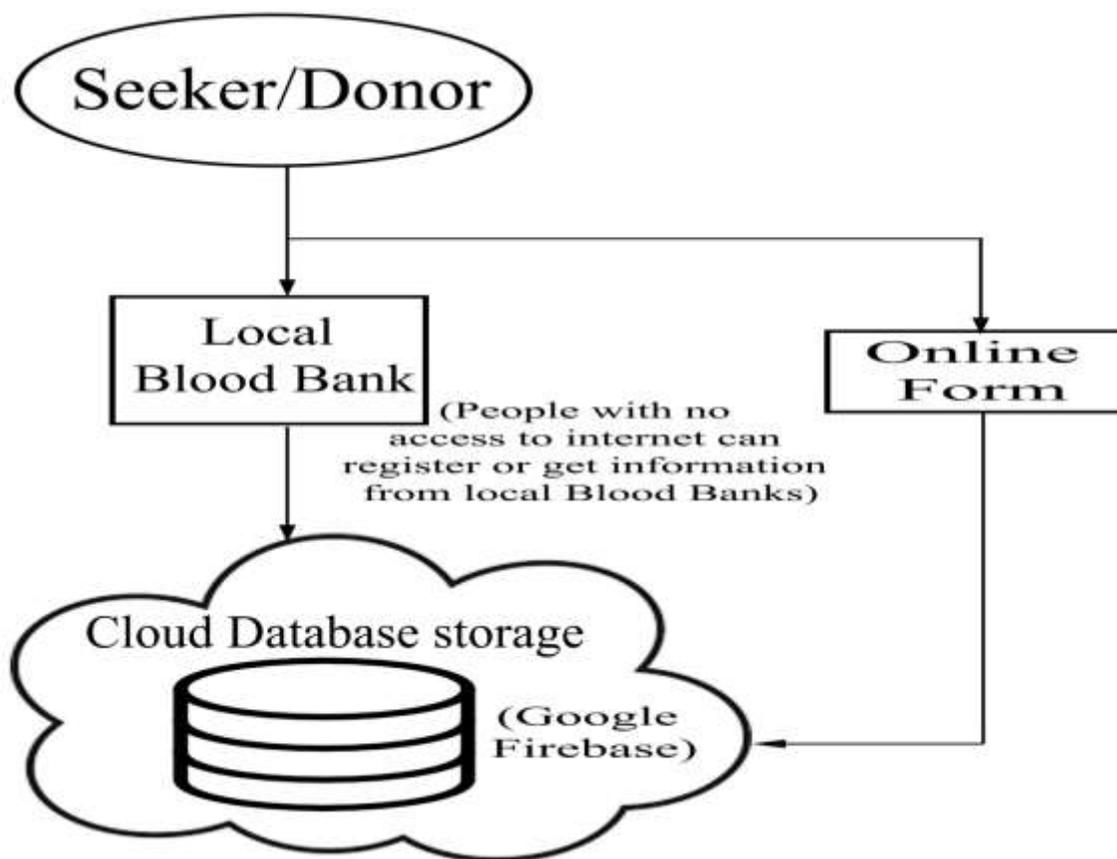

Fig.3- System architecture

The user data is stored in cloud database as well the blood bank data which are integrated to the website by the admin. The blood banks can directly updated or modify their data in the cloud database and the rest is managed

by the admin. With read and write access given to Blood banks they are able to upload and manage data efficiently from their site and the admin take of the part where the data is live to the users of the website.
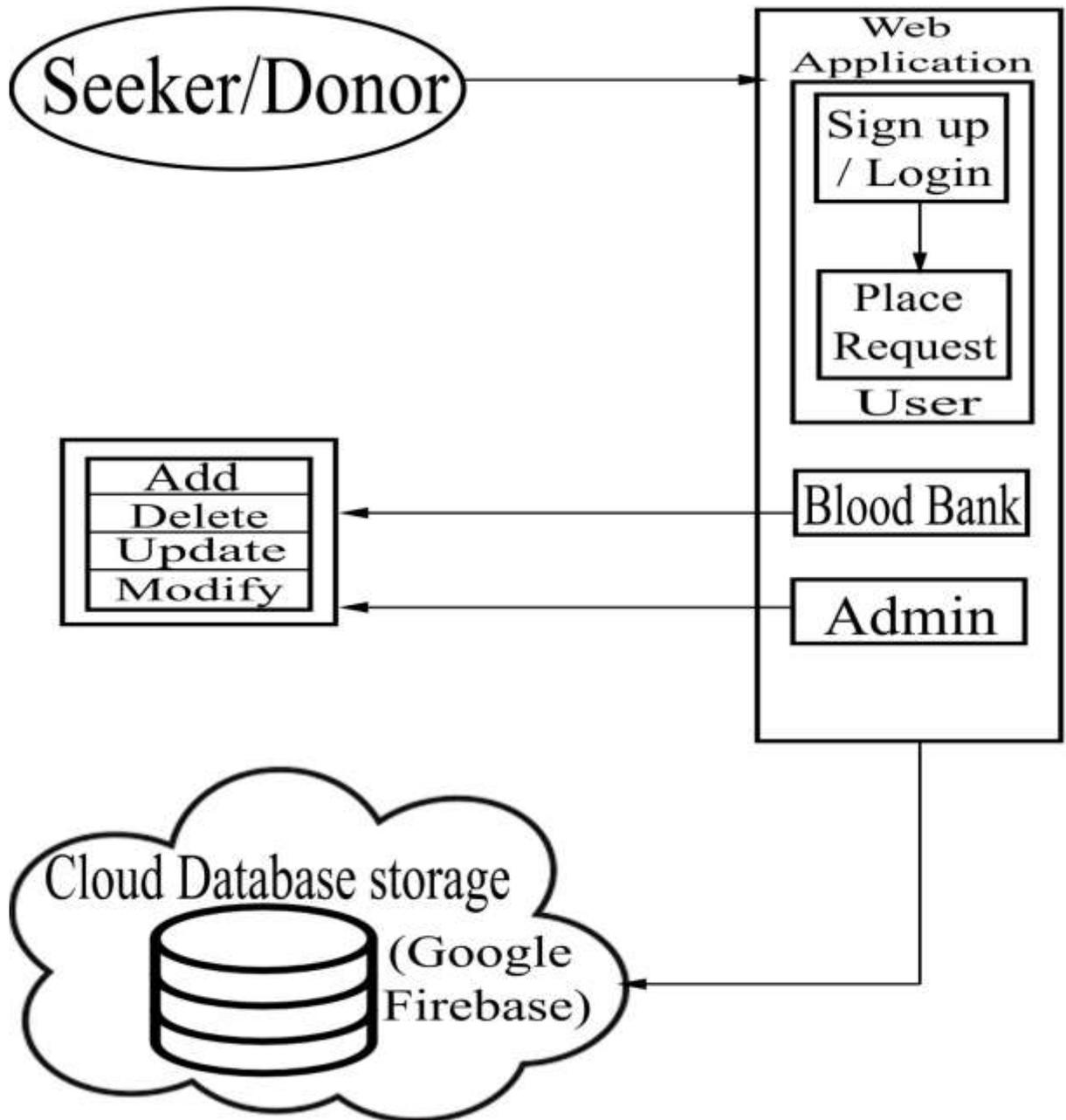

Fig.4- Physical system architecture

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V. RESULTS AND FINDINGS

For implementation purpose a sample digital donor form is created to get and store information to the cloud database. As tested the data is synchronized in real-time and also every connected device receives that updated data within millisecond.

Another great feature noted is that the firebase apps remain responsive even during offline since real-time database SDK provided by the Google Firebase persists the data to your device disk and when connectivity is reestablished the client device gets synchronized with the current server state and receives all the changes it missed.

Given the speed and security provided by this cloud based database, this improved implementation on the existing system significantly increases the quality of service provided by Blood banks.

Donor registration

Donor Name

muthu

Contact Number

8832457139

Blood Group

A+

Submit

VI. CONCLUSION AND FUTURE SCOPE

So it is fair to say that real-time cloud databases are better that regular cloud databases and far better that the local databases which are conventional storage systems in many Blood bank services. Any healthcare service needs to be fast as timely deliverance of information and agile communication is very vital in emergency situation. The quick updation in real-time databases makes the blood availability almost in live count. It is clear that only Blood banks but other healthcare services also should try to adopt real-time cloud database services.

As for further development in the future, if we continue to use Google Firebase there is so much room for improvement. Some good improvements like Google Firebase offers feature to report crashes and bugs which enables the developer or admin to quickly restore the issues. Another great feature is that notifications and messages to targeted audience which will be beneficial to both the seekers and donors of blood.

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