Blood Bank information System Using Android Application

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***Abstract*— Availability of blood during emergencies is highly critical for every single living thing. There are number of electronic blood donation centers for effective communication between them and medical facilities. None of the online blood donation center offers the immediate contact amongst beneficiary and them. This is the real downside of the current framework. The existing frameworks are tedious; require more labor and expensive.**

This paper presents a correlation between existing blood bank framework and enhanced framework to improve the effectiveness. The new considerations may increase the efficacy of current blood banks and help to upgrade from ordinary desktop framework to portable framework. The proposed work further discusses the components of enhanced framework in numerous perspectives such as the data being stored, data for future applications like kind of blood groups being donated and received by the individuals.

Keywords*— *Management Information System (MIS); Blood bank; donor; acceptors; Blood Bank Information System; administrator

I. INTRODUCTION

The requirement for the blood is essential for treatments in Hospitals and other medical centers especially during emergencies. To save the life there is a need of blood for every individual. The primary aim of a blood bank is to receive the blood from different donors, to screen the database of blood groups and to provide the adequate blood whenever required to the hospital during crises. The blood bank manager manages the information i.e. process the available data. This process is known as Management Information System (MIS) [1]. The MIS consist of input, output, and data processing for useful information and further control. There are numerous factors to validate the need of the MIS such as increased complexity, global competition, economy, social constraints etc. The blood bank managers use the available information system [2-4] to take appropriate judgments to tackle difficulties. The computer information is available in oral as well as written forms by suitable processing. The information processing includes the computer-based application areas such as DSS, MIS and AIS the virtual office and knowledge based systems.

Cloud based technologies may prove to be important in delivery of blood during emergencies. Android Based blood bank Application in Cloud Computing has been presented in [5-6]. The blood donor information and management system optimization using a web based Android application has been presented by Priya et al. [7]. A mobile phone application is being developed to enable the searching of the nearest blood donor volunteer and the further communication with him/her in the emergency situations by Turhan [8]. The upkeep data of available blood of different groups and donors in nearby area may play a crucial role for the timely treatment of patients in emergency situations. The Blood Inventory Control System through Computerized Inventory Control has been discussed by Catassi and Petersen [9]. The blood bank area may be benefitted by Data mining. This may be a basic tool to investigate the collected data by blood banks through their information systems. The classification and prediction about the blood donors turnout per their age and blood group has been presented by Sharma and Gupta [10] by using J48 algorithm and Weka tool.

In many countries the participation from donors is going to be restricted due to apprehensions regarding health effects and an overall lack of information of general masses concerning the importance and no risk involved in blood donation. Many individuals wrongly believe that donating blood is not safe. The various reasons that may affects the donor numbers across Canadian metropolitan areas have been discussed by Saberton et al. [11]. The facility to recognize individual blood donors may leads the blood banks and welfare organizations to prepare the strategies for arranging blood donation camps in an effective manner. The blood donation trend using the CART decision tree algorithm has been discussed by Santhanm and Sunderam [12]. The scarcity of blood is an important factor while

treating during medical emergencies. Premasudha [13] has presented a Geographic Information System (GIS) integrated with blood bank information system to help the blood bank persons to improve and upkeep the available blood by reviewing the classification, spatial distribution of donors and describing the blood bank amenities. All these concerns have been covered using several GIS functions including network analysis, buffer analysis and overlay analysis.

The proposed work may make the procedure of blood donation centers less tedious. In this there are different modules for contributor, recipient, and blood donation center. Giver needs to enlist himself to utilize this enhanced blood donation framework. The beneficiary likewise needs to enroll themselves at blood donation center to check the blood accessibility. The blood donation center administration offers functionalities for fast access to benefactor records gathered from different parts of the nation. It empowers observing the outcomes and execution of the blood gift movement to such an extent that significant and quantifiable targets of the association can be checked. This paper is organized as follows: In Section II Framework of Blood Bank Information System is discussed. Layout for android application is explained in Section III. The algorithm of the proposed system is stated in Section IV. Result has been discussed in section V. At last, the conclusion is stated in the final part.

II. Framework of Blood Bank Information System

Blood is valuable and it spares many lives the world over in assortment of conditions. The framework of blood bank information system is dependent on database. Web services and mobile services use the database from cloud. Framework include:

Web services: Web services have been used to search out for the donor through website.

Mobile services: Mobile services used to search the donor through mobile app.

Database: Cloud is used for database. All the information has been used by websevices and mobile services. Proper updation of donor and accepter is needed.

User: Ultimate user in the framework of the system is the patient/ acceptor. Information of donor is accessed by patient/ acceptor whenever required/ needed.

All the required information has been checked thoroughly.

A blood data framework is essentially a place where the gathered blood and the blood items are put away. The primary aim of E-blood framework is to interconnect all the blood gatherings of the state into a solitary system, approval, stockpiling and flow of different live information and data by utilizing calculation innovation. Such framework can amass every one of the information of every single individual into readable reports to help basic leadership from viable giver screening to ideal blood dispersal in the field.

The information which is put away on the figuring gadgets may help general society for any easy access to the status of blood availability in framework with the aim that can put a request or tell specific blood aggregate in close-by blood bank (Especially uncommon gatherings) spare a profitable life. Blood is considered as a critical perspective that manages life. The term blood donation center alludes to a place where the put away blood is legitimately tried to diminish the danger of transfusion occasions.

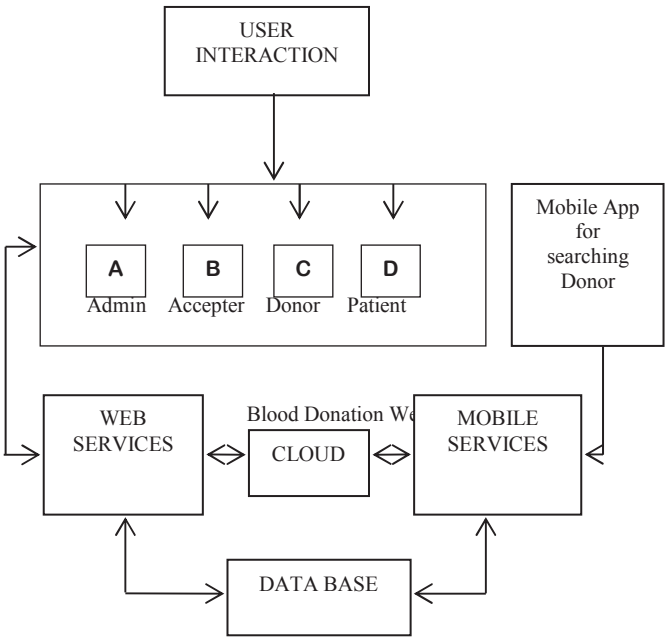

Fig. 1 Frame work of Blood Bank Information System

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The existing blood donation center gives extraordinary ID to givers to monitor records of benefactor and in addition to recover the contributor's data if required in future. This procedure is exceptionally tedious as time is essential factor because of the fast perishable nature of blood and certain

cases require blood inside less time amid such basic circumstances. Further, the records are kept up in huge inventory.

III. Layout of Android Application

The layout of blood bank information system is shown in Fig. 2. The blood bank information System application is made using Android studio.

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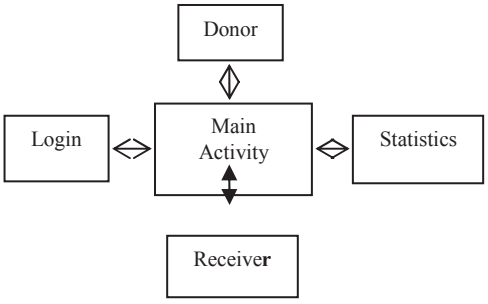

Fig. 2 Layout of blood bank information system

The application contains features like Donor Form, Receiver Form, Transactions, Statistics, Blood Group, and more (Fig.3). This may allow user to choose a particular blood group and record. The availability of the same will be given by the application

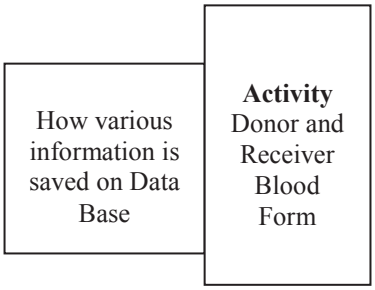

Fig. 3 Memory and activity interface in a blood bank information system

To profit most from the Android, one must have the capacity to refactor and investigate their applications to best utilize the structural and formative toolset that Android studio helps. This helps the engineers to make, oversee and execute their applications, for example, movement and feature amusements. With the above perceptions it can be inferred that android blood bank application has exceptionally boundless field and has got enormous sum potential and ability in the field of liveliness and representation. The blood bank information system application has been successfully completed and executed.

IV. Algorithm of Proposed Blood Bank Application

The outcome of this application is notification and response from blood bank for blood. The central blood bank will have a database of the count of blood packs for the respective blood groups. If any of the count goes low, the system will notify the authorities and a blood camp may be organized for the filling of the blood shortage. The smaller blood bank may also work in the similar fashion, just when there will be any shortage the central bank will be informed and the blood will be made available. The algorithm of the proposed work is mentioned below. The inputs I and P are of character type.

The major steps are-

Step 1: If User is registered then provide User Id (I) and password (P) else Create new account;

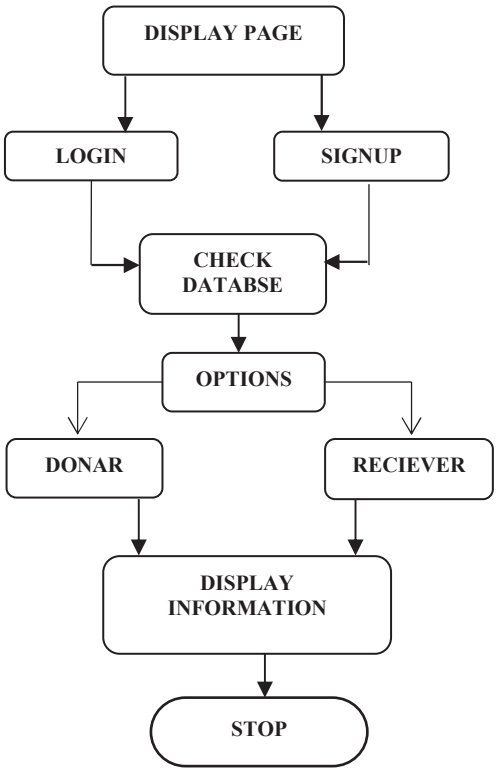

Fig. 4 Flow Chart of Blood Bank Information system

Step 2: While blood stock gets low Send notification to donors for blood donation camp;

Step 3: If there is request from user for blood, this will be displaying in the database.

Step 4: Check for blood availability at blood bank;

Step 5: If blood is not available send notification from blood bank to the registered Donors;

Step 6: Check conditions for blood donation and other factors and previous history;

Step 7: If conditions are satisfied accept it;

Step 8: If Conditions are not satisfied then send notification to other donors who are eligible;

The steps are also explained pictorially with the help of flow chart in Fig. 4.

This has been observed that the registration and donation system highly affect the entire process but only little percentage of the inquiries are dedicated to increase these features. There is requirement of more suitable analysis and further studies for this stage. The management of donor's database has a remarkable effect on the efficiency of the entire process and their inspiration. The performance of the system may be improved by increasing the number of donations. However, an effective management of the registered donor's database is required.

Storage is also an important stage of this process. An effective storage management system must ensure an adequate matching between the blood to hold/ transfer. It helps to store blood in optimal conditions and avoid expiring and discharging. To predict and reduce outdated bags and blood shortage the existing blood bank models are normally rely on the investigation of the normalized stock level. An integrated management approach with blood data feeding may increase the efficiency.

V. RESULTS

In this work emphasis has been put on application development for portable devices like mobile phones using available software. The application developed is an attractive app useful for customers having low device memory in applications. This app can be downloaded in any android versions above than 4.1 (Jellybean). The main advantages of the proposed application are-

Increased engagement and interactions: This able to help the user to access the app so efficiently which does not includes any pop-ups, banners etc. User may engage with their own task and simultaneously can see the whole year transaction reports.

Instant Access: App does not require much time to open and perform its task. This can be accessed instantly.

Increased security with existing systems: It stores all the data in a database which is authenticate data and can be seen through all out the months without any problem.

More efficient business process: Mobile apps offer quick information and instant support to customers all the time and everywhere they needed. All the key information are available on their mobile device just a click away. Many new technologies such as push alerts may also be sent to their mobile phones when new data or updates are available.

VI. SNAPSHOTS

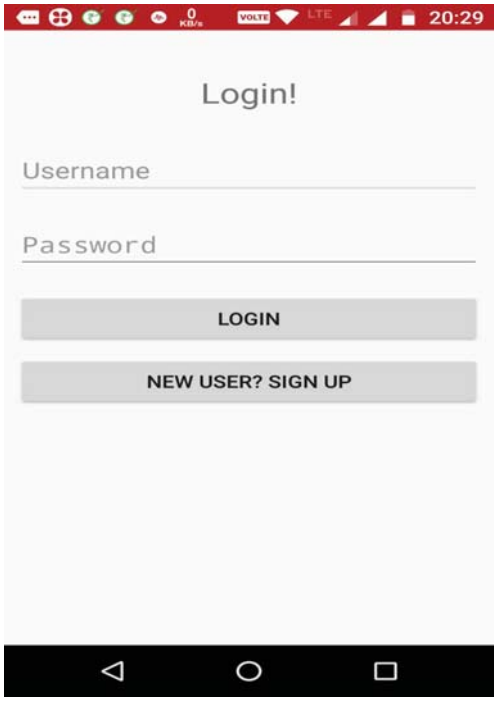

Fig 5. Snapshot of Login Interface

The fields (fig. 5) are bound with proper validations described below:

- User needs to create an account.

- If account is already created, then login with user name and password.

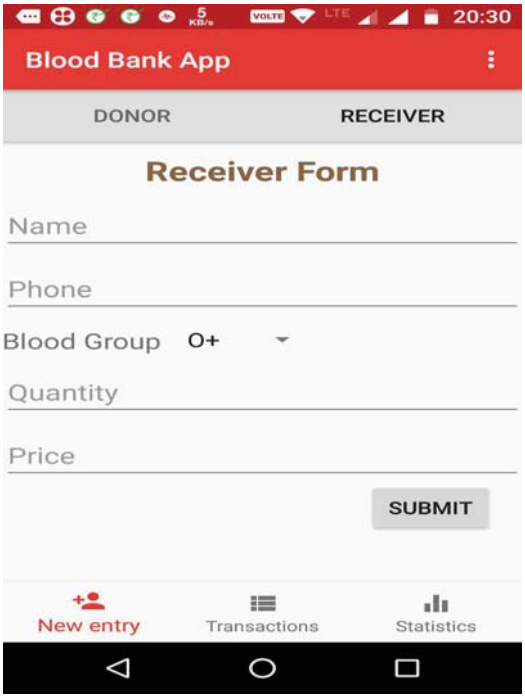

Fig 6. Snapshot of Receiver Form

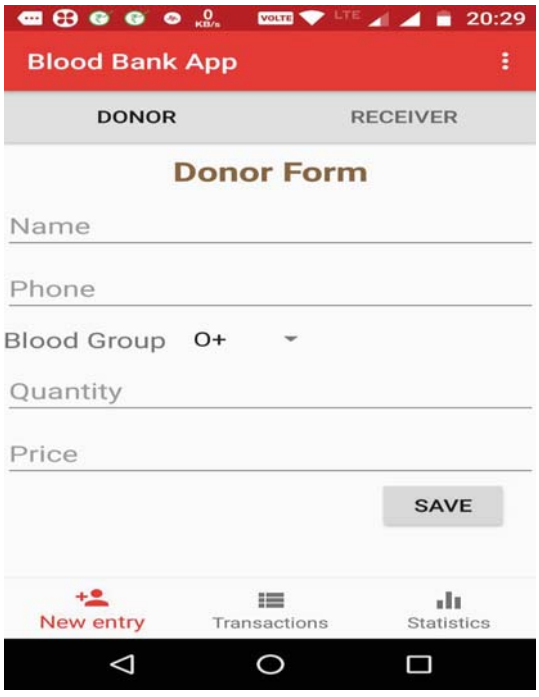

Fig 7. Snapshot of Donor Form

In the fields(fig. 6(, the individual who wants to receive the blood should filled his/her appropriate details.

- There are four related fields which needs to be filled appropriately by the receiver.

In this fields, the individual who wants to donate the blood should filled his/her appropriate details.

- There are four related fields which needs to be filled appropriately by the donor.

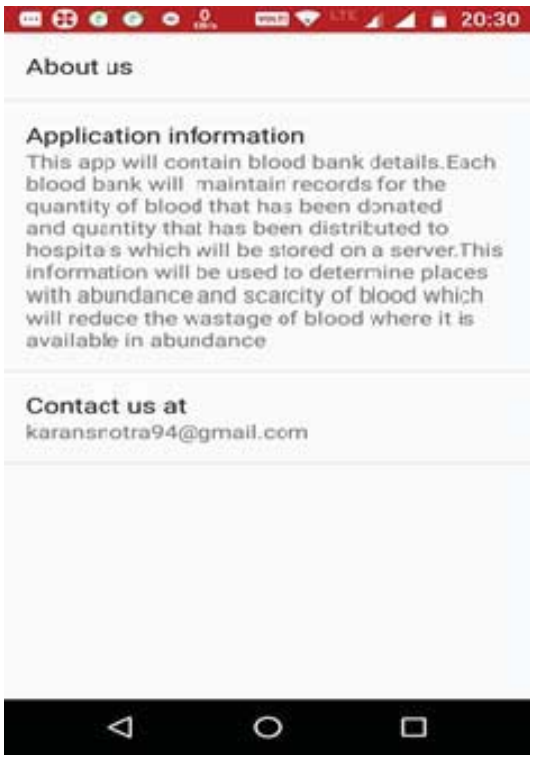

Fig 8. Snapshot of About Application Information

This field (Fig. 8) tells about the application information.

- It also includes email-id of the developer.

VII. Conclusions

The proposed Android is more user-friendly and easy to use as compared to existing blood bank apps. In existing interfaces their statistics shows how many units of required blood group are available. The reports section shows the month in which blood group are being distributed and

received. In this interface donor's name registration, phone no and blood groups need to be donated are included. It also includes the blood quantity to be stored in the app database. This can be called as new entry as a user may enter his/her details in the database. While in the receiver's form this has individual's name, phone no (which a user can contact), their blood groups need to be received and the total amount of quantity. After submitting these data in the database, these fields are visible during transaction process. This shows how much quantity of blood has been donated/received to the/by user. Thus this work may increase the usefulness of the existing blood banks and help to upgrade from conventional framework to more convenient and user supportive framework.

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