



## International Journal of Innovative Research in Computer and Communication Engineering

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# Optimal Solution for Searching Availability of Blood in Blood Banks using Smart Blood Finder App

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**ABSTRACT:** In case of emergency needs the most important lives saver necessity is Blood. Blood Banks are the main providers of blood who receives blood from various donors, monitors the blood groups database and in case of emergencies makes the available to the hospital whenever needed. The major problem faced by the main blood providers and the need is the availability of donor at right time. We hereby took a step forward to build a system to create a network of people who can help each other in need. We propose an application where the Blood banks can timely update the Blood Stock availability and donor and register themselves to donor and user can find blood availability nearby him/her. In the urgent time of a blood requirement, user can quickly check for blood banks, hospitals or donor as per requirement matching a particular or related blood group and reach out to them through the App. Application tends to provide list of blood banks in user area. A large number of blood donors are attracted using an Android application. Since almost everyone carries a mobile phone with him, it ensures instant location tracking and communication. Registered user, who is willing to donate blood can pledge him/her to donate and will be able to access the service. In this application we are using the GPS technology that will be used to trace the way to the blood bank. The user will get the route to reach the desired location and he/she won't have to ask manually, therefore time can be saved.

**KEYWORDS:** National Institutes of Health (NIH), Management Information System (MIS), National Organ & Tissue Transplant Organization (NOTTO), Food Drug Inspector(FDI), Blood Donation Chain (BD Chain), World Health Organization (WHO).

### I. INTRODUCTION

Blood donation is the process of transferring blood from a healthy person to someone who needs it. It occurs when a person voluntarily has blood drawn and used for transfusions and/or made into biopharmaceutical medications by a process called fractionation. Blood donation is very important health care and blood is a very unique and precious resource because it only can be obtained from blood donors. Donors participate to save many human beings each year, although some still die or suffer because of the lack of access to a safe blood transfusion (WHO, 2010). Blood is the "gift of life" that transfers from a healthy individual to others who are sick and in actual need of blood. In one hour's time, from one unit of blood, red blood cells can be extracted for use in trauma or surgical patients. The liquid part of the blood, which called Plasma, is given to patients who have clotting problems. The third component of blood is platelets, which clot the blood when there are cuts and are often used in cancer and transplant patients. Although the number of people who need blood is increasing and the availability of blood is decreasing there is no central Blood Bank that can manage the blood donation in India.

Each hospital has its own Blood Bank and its own procedures. Each Blood Blank is responsible for the management and control of transfusions and processing; it is also responsible for collecting the units and for the donor services.

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The general idea of the study is to develop a Smart Blood Finder Application is to manage the records of the donors and the people who need blood. Others may need blood because of illnesses such as anemia, cancer, bleeding disorders, and disorders of the immune system (NIH, 2012).

Doctors may give the person whole blood or part of the blood, depending on the person's condition. Some people need red cells only if they are anemic or if they lost a lot of blood after having a serious accident. For those who are bleeding too much during surgery, they need plasma, and for those who have cancer or bleeding problem, they need platelets (Kids Health, 2012).

The aim of the study is to develop a Smart Blood Finder System to manage the records of the people who need blood they can find the available of blood in nearby blood banks also can find the appropriate donors who can easily donate blood to them.

## II. PROBLEM STATEMENT

In spite of the potential availability of the blood donors not more than 5% of the total Indian population donates blood. Advancement and surgeries in medical science has increased the blood demand. Also blood-donors usually don't come to know about the receivers in need of the blood. These reasons motivate us to develop a more efficient system that will assist in exploring information to the people about the present blood donation system. As the existing application lack the concept of Blood Availability in Blood Banks as well as donor interested in donating the blood this application overcomes the drawbacks by introducing the concept of sharing Blood Banks contacts and blood availability in Blood Banks as well as Donor details available nearby depending on the constraint for donation required for particular donor.

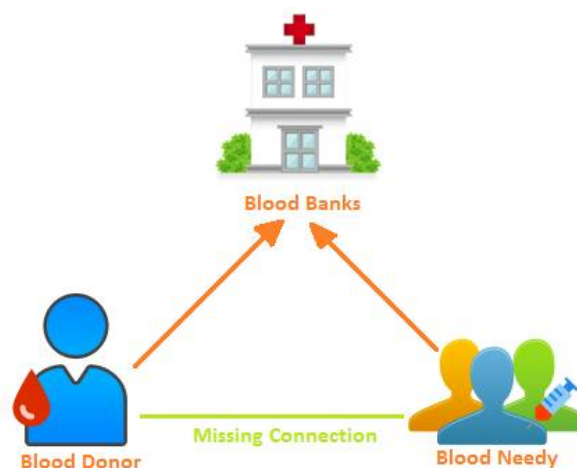


Figure1: Problem statement

## III. MOTIVATION

Our analysis points out the high number of papers related to the management of storage and distribution phases. Indeed, Fig. 2 shows the percentage of the existing works for each phase. It can be seen that, even though the arrival of donors and the registration and donation system strongly affect the entire BD chain, only the 1% of the investigations are devoted to improve these aspects. Hence, we found out the necessity of more adequate analyses and studies for this phase.

In particular, a relevant problem is the management of donors' appointments and visits, as it has a significant impact on the effectiveness of the entire BD chain and on donors' motivation. Increasing the number of donations improves the performance of the system, but also an effective management of donors' arrivals along with the days may optimize the daily production of bags with respect to the demand. Indeed, an unbalanced feeding of blood bags undermines the

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entire BD chain; this is not only a theoretical problem, but from the discussion with several blood providers this is the actual bottleneck of the entire system in the practice. Returning donors' appointments could be scheduled in advance, but not all donors are willing to accept pre-scheduled appointments, or they often require appointments at the beginning or at the ending of the day rather than at noon. Thus, an important future research is the development of optimization models and techniques for providing an efficient appointment scheduling, also in the light of balancing the production. The existing studies solved these problems by using simulation models; however, they do not fit the DB system since they do not take walk-in donors into account. The historical data collected by the BD centers can be exploited in these models, to forecast the walk-in donors' arrivals and increase the efficiency of the system. An effective application system is also needed in BD, as

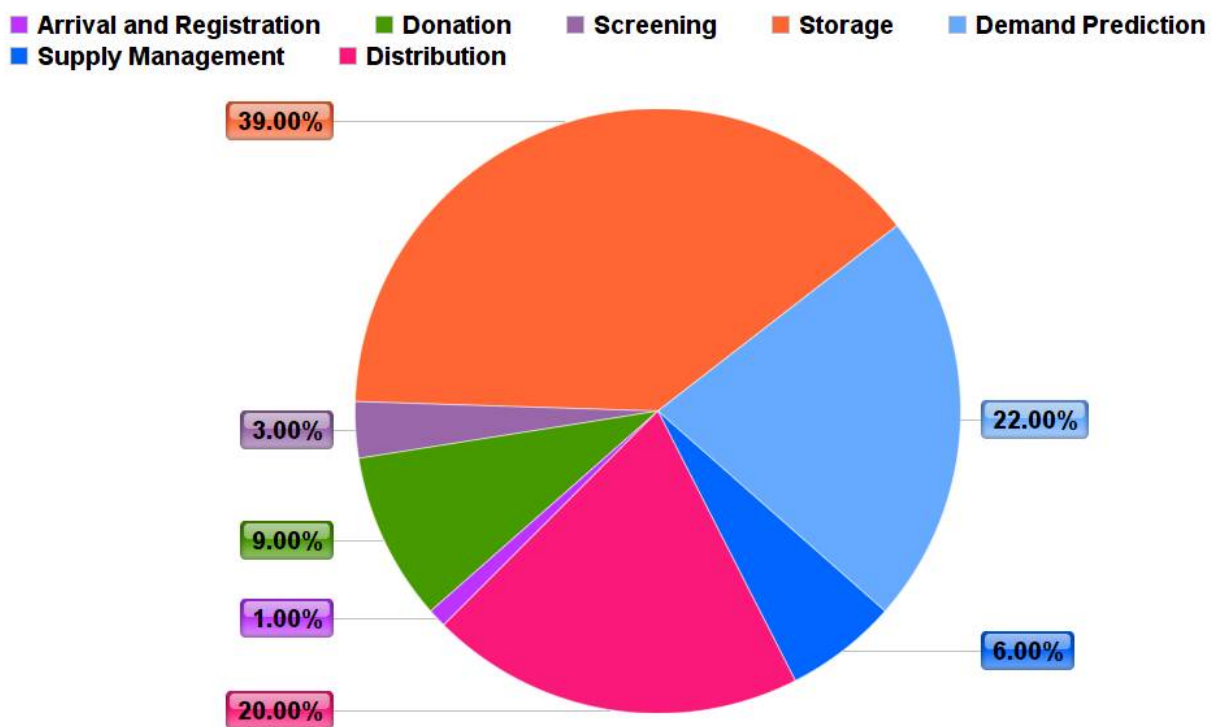


Fig. 2: Percentage of the existing works for each phase, considering 156 papers on blood management found in the literature (research updated at December 2014; papers on social and physiological aspect neglected)

Smart Blood Finder System is a concept to combine the donation system with donors, Blood Providers and Blood Needy preferences and their points of view. Such an application system (e.g., an on-line system) could be a solution to join donors, Blood Providers and Blood Needy at the same platform and to encourage volunteer donations and Smart Blood Supply.

Storage is another important step of the system. A successful storage management should guarantee a proper balancing between the blood to hold and that to transfer, to keep blood in optimal conditions and to avoid expiring and discharging.

This also stresses the importance of an adequate feeding with respect to the demand.

The storage problem is widely studied in the literature (the 39% of the investigations in Fig. 2). Existing models are generally based on the analysis of the normalized stock level, and they aim at predicting and reducing outdated bags and blood shortage. Nevertheless, an integrated management with blood feeding, i.e., with donor appointment scheduling, might increase the efficiency of the whole BD chain and reduce both outdated bags and blood shortage.



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As mentioned, demand prediction is another crucial issue in BD system management. Inaccurate estimations of blood demand may lead to disruptive consequences.

For example, underestimation leads to low quality of the service, out-of-stock and additional expenses; on the other hand, overestimation leads to overproduction and overstocking, together with increased costs and clinical and ethical problems in throwing bags away. Demand variation is an important factor to which the entire process must properly react; for example, blood inventory management becomes critical in case of increased demand, and the related decisions must be taken on time. However, meeting the demand is not easy since also the number of donors is difficult to foresee; hence, an integrated approach that considers the variation of both demand and donor arrivals should be required to better manage the BD chain.

Finally, transportation and delivery of blood products are largely addressed by means of optimization tools. Generally, the existing works deal with the routing of delivery vehicles for the distribution of blood components. As a future research line, with the increase in the use of blood components, an emerging logistics problem is the distribution of different products, while taking into account both their different shelf lives and cost minimization (multi criteria objective).

## IV. LITERATURE REVIEW

This section explores literature review. For more details, see table 1

### 1. Android Blood Donor Life Saving Application in Cloud Computing

Emergency situations, such as accidents, create an immediate, critical need for specific blood type. In addition to emergency requirements, advances in medicine have increased the need for blood in many on-going treatments and elective surgeries. Despite increasing requirements for blood, only about 5% of the Indian population donates blood. In this paper we propose a new and efficient way to overcome such scenarios with our project. T.HildaJenipha&R.Backiyalakshmi, (2014) has introduced new idea, just touch the button. Donor will be prompted to enter an individual's details, like name, phone number, and blood type. After that your contact details will appear in alphabetical order on the screen; the urgent time of a blood requirement, you can quickly check for contacts matching a particular or related blood group and reach out to them via Phone Call/SMS through the Blood donor App. Blood Donor App provides list of donors in your city/area. Use this app in case of emergency. A large number of blood donors are attracted using an Android application. Cloud-based services can prove important in emergency blood delivery since they can enable central and immediate access to donors' data and location from anywhere. Since almost everyone carries a mobile phone with him, it ensures instant location tracking and communication. The location-based app, operational on android platform, will help users easily find donors of matching blood groups in their location and access their mobile numbers for instant help. Only a registered person, with willingness to donate blood, will be able to access the service.

This project aims to create a web application known as cloud application for android mobiles. The sole purpose of this project is to develop a computer system that will link all donors. The system will help control a blood transfusion service and create a database to hold data on stocks of blood in each area as data on donors in each city. Furthermore, people will be able to see which patients need blood supplies via the website. They will be able to register as donors and thus receive an SMS from their local clients who needs blood to donate blood in cases of need. The website will help develop public awareness amongst its visitors of the hospitals' need for blood in order to supply the appropriate donors

### 2. Online Blood bank management system using android

The main aim of this project is to save lives of people by providing blood. Ashita Jain, AmitNirmal, NitishSapre, Prof ShubhadaMone (2016) introduced Online Blood Bank system using Android which is developed so that users can view the information of nearby hospitals, blood banks. This project is developed by three perspective i.e. hospital, blood bank and patient/donor. We have provided security for authenticated user as new user have to register according to their type of perspective and existing user have to login. This project requires internet connection. This application we are developing helps to select the nearby hospital online instantly by tracing its



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location using GPS. We are also providing a alert system for severe accidents as using that function an ambulance will be sent to your destination without any wastage of time. This application reduces the time to a greater extent that is searching for the required blood through blood banks and hospitals. Thus this application provides the required information in less time and also helps in quicker decision making.

### 3. Android Blood Bank

Blood is a saver of all existing lives in case of emergency needs. The task of blood bank is to receive blood from various donors, to monitor the blood groups database and to send the required blood during the need to the hospital in case of emergencies. The problem is not insufficient number of donors, but finding a willing donor at the right time. We want to build a network of people who can help each other during an emergency. This application timely updates the information regarding the donors where the administrator accesses the whole information about blood bank management system. Donor will be prompted to enter an individual's details, like name, phone number, and blood group. In the urgent time of a blood requirement, you can quickly check for blood banks or hospitals matching a particular or related blood group and reach out to them through the App. Blood bank App provides list of blood banks in your area. A large number of blood donors are attracted using an Android application. Since almost everyone carries a mobile phone with him, it ensures instant location tracking and communication. Only a registered person, with willingness to donate blood, will be able to access the service. In this application we are using the GPS technology that will be used to trace the way to the blood bank. The user will get the route to reach the desired location and he won't have to ask manually, therefore time can be saved.

Prof. Snigdha (2016) proposed an efficient and reliable android blood bank application. The service provided by the proposed system is needed and valuable to health sector where a quality of blood is considered for the safety of the patient. The donor will get himself registered through these improved system. In case of emergency requirement the blood donor can place a request. The wireless internet technique enables the flow of data to work more rapidly and conveniently.

Table 1: comparison between blood bank systems

Sr.No.	Year	System	Advantages	Limitations
1	2014	Android Blood Donor lifesaving application in cloud computing	Develop a computer system that will link all donor	It does not allow integration with blood donor management system
2	2016	Online Blood bank management system using android	For faster communication between agent using restful services	The system does not give emergency services
3	2016	Android Blood Bank	Wireless internet technique enable the flow of data to work more rapidly	It reveals real time location of donor which is not good for security purpose.
4	2016	An efficient android app for blood donation process	This application will help to develop public awareness along its visitor of the hospital	It does not have control limit over professional blood donors.

## V. PROPOSED SYSTEM

We have proposed an efficient and reliable smart blood finder application. The service provided by the proposed system is needed and valuable to health sector where a availability of blood is considered for the safety of the patient. The donor will get himself registered through these improved system. In case of emergency requirement the blood donor can place a request. The wireless internet technique enables the flow of data to work more rapidly and conveniently. The most significant results of this study are:

- Manage the records of donors, blood banks, and recipients.



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- Each Blood bank can register on the website and make its own account that contains information about the blood bank.
- Encourage voluntary blood donations.
- Make it easier for donors to find the appropriate recipients to whom to donate blood by searching in the website by blood type.
- Ease the distribution of blood in various hospitals.
- Hospitals, donors, and recipients can add their own comments in the feedback section about the website.
- Educate the community on the benefits of blood donation.

## VI. SYSTEM ARCHITECTURE

The person who need to blood may use different ways, such as:

- Asking family and friends for a suitable blood donor.
- Make several contacts at hospitals to find a blood donor.
- Search via the internet for donors by using social media like Twitter and Facebook.

Use the Smart Blood Finder Application to find donors and the hospital that makes a blood donation.

The best solution it is use the Smart Blood Finder Application to help the needy find blood donors in quick, perfect and safety way also with less effort.

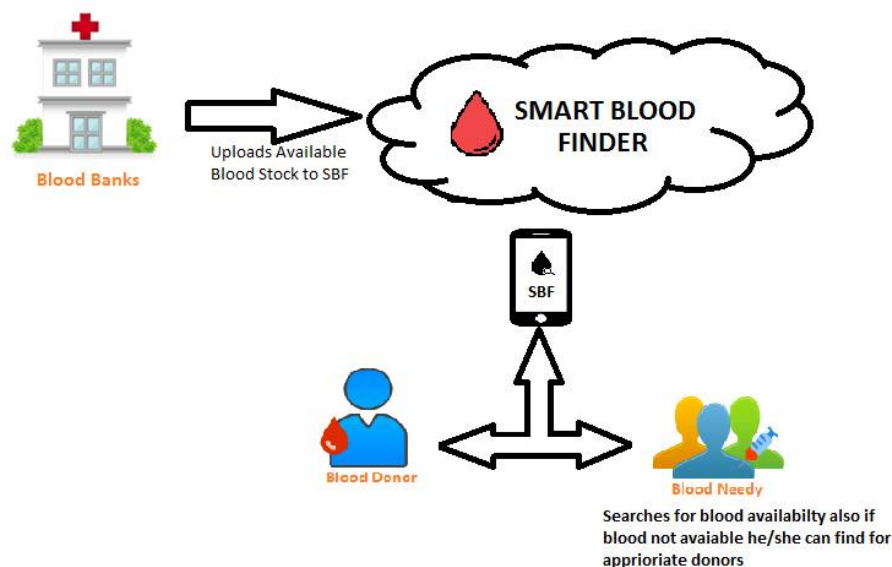


Fig. 3: System details of Blood needy contacting Blood donor/ Blood Service Providers through proposed system.

## VII. PROJECT IMPLEMENTATION

Tools and Technologies used –

**MySQL:** MySQL is an open source relational database management system (RDBMS) based on Structured Query Language (SQL). A relational database stores data in separate tables rather than putting all the data into one large repository. The tables are linked by defined relations making it possible to combine data from several tables upon request. MySQL runs on virtually all platforms, including Linux, UNIX, and Windows. Although it can be used in a wide range of applications, MySQL is most often associated with web-based applications. MySQL is very easy to use. With only a few simple statements, you can build and interact with MySQL. MySQL is scalable as it can handle any

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amount of data, up to as much as 50 million rows or more. MySQL is very friendly to PHP, the most appreciated language for web development. MySQL supports large number of embedded applications which makes it very flexible.

**ASP.NET:** ASP.NET is an open-source server-side web application framework designed for web development to produce dynamic web pages. It was developed by Microsoft to allow programmers to build dynamic web sites, web applications and web services. ASP.NET aims for performance benefits over other script-based technologies (including Classic ASP) by compiling the server-side code the first time it is used to one or more DLL files on the Web server. These dll files or assemblies contain Microsoft Intermediate Language (MSIL) for running within the common language runtime; this provides a performance boost over pure scripted languages and is similar to the approach used by Python and not dissimilar to JavaServer Pages. This compilation happens automatically the first time a page is requested (which means the developer need not perform a separate compilation step for pages). Dept. of Computer 21 Siddhant COE Smart Blood Finder 5.2.2.3 ASP.NET Web API: ASP.NET Web API is a framework that makes it easy to build HTTP services that reach a broad range of clients, including browsers and mobile devices. ASP.NET Web API is an ideal platform for building RESTful applications on the .NET Framework.

**XAMARIN:** When considering how to build iOS and Android applications, many people think that the native languages, Objective-C, Swift, and Java, are the only choice. However, over the past few years, an entire new ecosystem of platforms for building mobile applications has emerged. Xamarin is unique in this space by offering a single language C, class library, and runtime that works across all three mobile platforms of iOS, Android, and Windows Phone (Windows Phones native language is already C), while still compiling native (non-interpreted) applications that are performant enough even for demanding games.

## VIII. RESULT

### A. Web App

#### 1. Login Page

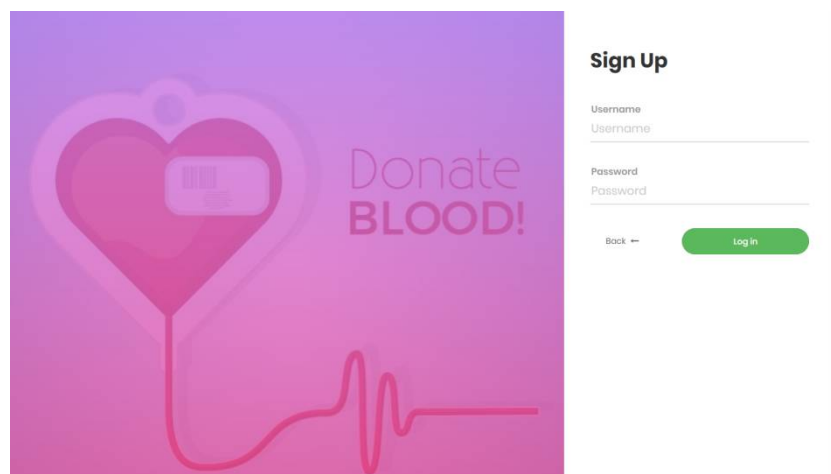


Fig. 4: This Figure shows the web app where Blood bank and admin can login



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## 2. Admin page for adding blood bank details.

Smart Blood Finder Home Blood Bank Logout

### Add Blood Banks

Blood Bank Name  Established Date

Name of Trust  License No.

Contact No.  Contact Person First Name

Contact Person Middle Name  Contact Person Last Name

Username  Password

Address

© 2018 - Smart Blood Finder

Fig. 5: This Figure shows the web app where Blood bank details will be added by admin for future access.

## B. Android Application

### 1. App Login Screen



Fig. 6: This Figure shows the android app where end user will login or register



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## 2. App Home Screen

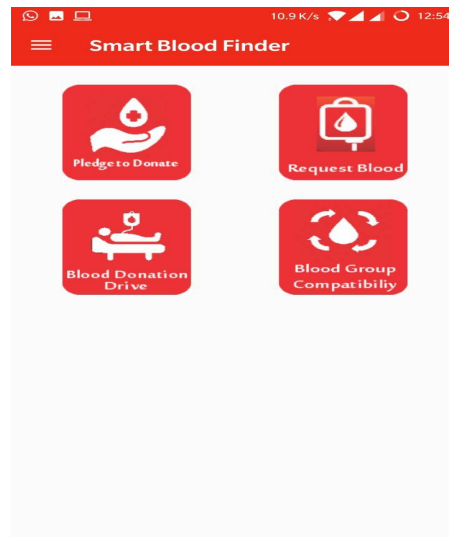


Fig. 5: This Figure shows the android app home screen

## 3. App Menu Screen

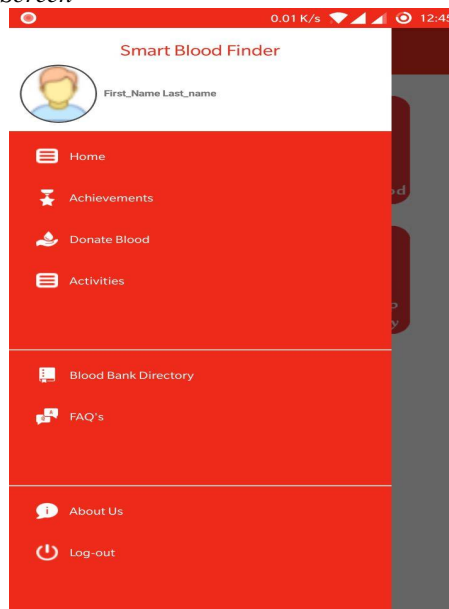


Fig. 5: This Figure shows the Android app side menu

## IX. CONCLUSION

In case of Emergency contacting bloodbanks for availability was difficult in existing systems, We have overcome the problem by adding the blood banks through webbased application, which will help user to contact blood bank and check availability.



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