**CHAPTER 2**

**Review of Related Literature and Studies**

**Related Literature**

A blood bank is a bank of blood or blood components, gathered as a result of blood donation, stored and preserved for later use in blood transfusion. The blood bank monitors the results and performance of the blood donation activity such that relevant and measurable objectives of the organization can be checked. They are providing the efficient search who needs the blood in their own city as fast as possible. The Blood Bank involves, first the staff will give a registration form to write all information of the donor, next it will interview about the donor health history and check the temperature, pulse, blood pressure for testing purposes if the donor is qualified , next after the donor is qualified for donating a blood the staff will insert a sterile needle for the blood draw and last the staff will give a snack to the donor for refreshment and the donor can leave the site after 15 minutes.(VikasKulshreshtha,Dr. SharadMaheshwari)

Blood Bank in India is the first product resulted out of the community welfare initiative called 'People Project' from uSiS Technologies. Universally, 'Blood' is recognized as the most precious element that sustains life. It saves innumerable lives across the world in a variety of conditions. Donating Blood in india is a safe process. A sterile needle is used only once for each donor and then discarded. Blood donation is a simple four-step process: registration, medical history and mini-physical examination, blood donation and refreshments. Every blood donor is given a mini-physical examination, checking the donor’s temperature, blood pressure, pulse and hemoglobin to ensure it is safe for the donor to give blood. The actual blood donation typically takes less than 10-12 minutes. The entire process, from the time you arrive to the time you leave, takes about an hour and 15 min. (Blood Bank India)

Blood Bank supply chain can be divided into four main steps, collection, transportation, storage and utilization. First, the blood is collected: donors are checked in blood centers to assess their eligibility and, if eligible, theymake the donation. Once the blood is gathered, tests are independently performed oneach individual’s blood in order to prevent infectious diseases (screening process). Afterwards, the blood is transported and stored. Components are then distributedto the hospitals based on their inventory needs. Finally, it is transferred to the ﬁnalusers for transfusion. (Seda Bas, GiulianaCarello, EttoreLanzarone, ZeynepOcak, SemihYalerndag 2016)

The CMC Blood Bank provides safe and quality blood and blood components for its patients. It also aims to promote voluntary blood donation to ensure steady supply of blood and components. CMC blood bank conducts mobile donation programs in government and private agencies. The following blood and components are available in CMC Blood Bank are whole blood, packed red blood cell, fresh frozen plasma, platelet concentrate. After the donation of the volunteer donor’s the blood will put a label and transport to the laboratory. Whole blood that donate are separate into essential components. And the blood will test to ensure the safety blood supply. The blood will store in a large refrigerators and freezers, all blood components are packed in a special temperature controlled container. (Calamba Medical Center)

The Blood Bank is one of the major components of a hospital, concerned with various activities including donor registration, physical examination, blood grouping, blood infectious tests, component separation, blood requisition and cross match. The Blood Bank module provides ready information about blood reserve/stock, daily cross-matched details, total daily blood requisitions and information regarding blood and donor. The features are registration of donors, blood donation, need based request processing (fresh blood and stored blood) cancellation, returning of issued blood bags, transfusion details, sterility investigations and discard details and interbank transactions. (CSM Technologies)

All information from the literature that stated in above is very important to the study since it gives an idea to the researcher on how the blood bank works and what are the function on each blood bank to provide a specific blood group of a patient that need a blood urgently.

This paper addresses the modeling and simulation of blood collection systems in France for both fixed site and mobile blood collection with walk in whole blood donors and scheduled plasma and platelet donors. Petri net models are first proposed to precisely describe different blood collection processes, donor behaviors, their material/human resource requirements and relevant regulations. Petri net models are then enriched with quantitative modeling of donor arrivals, donor behaviors, activity times and resource capacity. Relevant performance indicators are defined. The resulting simulation models can be straightforwardly implemented with any simulation language. Numerical experiments are performed to show how the simulation models can be used to select, for different walk in donor arrival patterns, appropriate human resource planning and donor appointment strategies. ([Health Care Management Science](https://link.springer.com/journal/10729))

The Information from this literature gives the researches the on how the blood banks works and process of each activities in providing blood to users of the systems or research.

Blood donation is an essential activity to acquire blood as a raw material into the blood supply chain. It must be managed effectively together with other processes in blood management. In this research, the pattern of blood donors’ behaviors based on factors influencing blood donation decision is conducted using online questionnaire. These factors, i.e., altruistic values, knowledge in blood donation, perceived risks, attitudes towards blood donation, and intention to donate blood, are analyzed to find out the possibilities for individuals to become blood donors. The surveyed data are used for machine learning techniques of Artificial Intelligence to classify the blood donor group into donors and non-donors. Moreover, the accuracy testing of the surveyed information is conducted using the Artificial Neural Network (ANN) and Decision Tree techniques in order to predict from a series of individual blood behavior data whether or not each individual is a donor. The results indicate that the accuracy, precision, and recall values of ANN technique are higher than those of the Decision Tree technique. Thus, the development of blood donor classification model leads to an improvement of the blood acquisition in Thailand. (World Congress on Engineering and Computer Science)

Blood donation is one of the most important part of our research since it is composed of Blood searching and donations. The information that is given above really helps us to make our research since it involves Blood management system.

**Related Studies**

The following data below were gathered from different related studies made by other researchers that provide guidance in the conduction of the researcher’s study.

Online Blood Bank aim that the blood donors can register to this system by entering their profile information. It Aim is to provide transparency in this field, make the process of obtaining blood from a blood bank hassle free and corruption free and make the system of blood bank management effective. The user can send Blood request and they can check the donors list. The modules are Login module, in the login module user can login to the system by entering login id and password. Blood search module, in the blood search module user can search different types of blood group by entering blood group. If it has stock then they can order blood packages else they can request with donors.City module, this module is very important categorize city wise blood record. Admin module, the admin are the management where admin will manage all features of the website. Banking module, the customers payment report stores in banking module. Report module, the admin can take month wise, date wise, year wise report. Blood stock module, this shows stock details of the blood with different groups.This system supports multiple users and this system generates different types of report.(Shiva Prasad 2016).

The Online Blood Bank is big contribution to research project since the project are based on the blood banks which get an idea that the donor registers to the given form of the website by entering all information and stored it in database and also the user have a capability to request/reserve specific blood groups and check/search the donors list.

Based on the researcher. Blood Bank Management System (BBMS) is a Web based application that is designed to store, process, retrieve and analyse information concerned with the administrative and inventory management within a blood bank. This project aims at maintaining all the information pertaining to blood donors, different blood groups available in each blood bank and helps them manage in a better way. The modules are the following, donor registration, send request, log in, and search blood. In donor registration the volunteer donor enter all information that given in the form like fullname, address, contact number, specific blood group,etc. In send request the user will enter all information of the patient like patient name, specific blood group to request, the hospital and address, contact number and address. In log in after the donor already register, the donor will log in and enter his/ her username and the password. And last the search blood, the user will check/search specific blood group that he/she want to look for.

The Blood Bank Management System is a great project, it can help with our project to have an idea to make a web based blood banking system which can access by an authorized administrator to maintain all information by the blood donors and blood groups in three blood banks within Misamis Occidental and also to make the process from a blood bank hassle free and effective.

The Blood Donation Management System is to create an e-Information about the donor and organization that are related to donating the blood. Through this application any person who is interested in donating the blood can register himself Moreover if any general consumer wants to make request blood online he can also take the help of this site. Admin is the main authority who can do addition, deletion, and modification if required. Online Blood Donation management System project is aimed to developing an online Blood Donation Information. The features are the following, Donor registration and blood collection. Blood requisition/ issue.User access control. Detailed donor database. Maintain and update unique donor identification. Search facilities by donor, patient, doctor, blood bag, and other recognizing factors. Powerful search for donors by blood group, sex location, telephone number.Sends various auto-SMS for alerting donor and reminding location and time. And adequate security to protect user’s potential information. (K M Akkas Ali, IsratJahan, Md. Ariful Islam, Md. Shafa-at Parvez).

Since our project is a web based it authorize by an administrator which we get an idea that the administrator has a capability to add, delete and modify the information given by the donor and also to confirm a blood reservation/request by a user.

[4] Blood Bank Management System provides list of donors in your city/area. The main objective is to automate the complete operations of the blood bank. The Blood bank needs to maintain thousands of records. It would also ease the task of searching for blood of the required blood group and would instantly get the required type through this website. This is a web-based database application system that is to be used by the blood banks or blood centers as a mean to advertise the nationwide blood donation events to the public and at the same time allow the public to make online reservation and request for the blood. For internal works and activities as well as for interaction with public, internet is used. This system also has the ability to keep track of the donor's information and the blood stock in the blood bank. The technology used for front end is JSP, Bootstrap, Java and for back end MySQL is used.(Prof. AnimeshTayal, HarshadGahare, Akshay Patel, Sagar Jog, Pratik Jain and Jaya Dhawale 2016)

So, this study it is a big contribution to our project since the study it gives full information that we need to our project since our project has a capability of a user to reserve and request a specific blood group.

Online Blood Donation system provides communication between the Blood Donors and Patients compatibly. Web based matcher draws up acceptable Blood Donors information for Patient by using Knowledge based Rules. Moreover, the Web-based system provides more suitable application for health care and life saving processes. This system can be extended to other welfare societies and health organizations. (S S Tint, H Mai)

Since our project is blood banking system it also provides communications to other blood banks and users that matches their needs and information for the patients. the system also provides life saving process like easy access to blood donors for faster data gathering for their patients how is on danger stage of life. This system may also use to other Health organization around the province.

The blood bank management information system offers functionalities to quick access to donor records collected from various parts of the country. It enables monitoring of the results and performance of the blood donation activity such that relevant and measurable objectives of the organization can be checked. They are providing the efficient search who needs the blood in their own city as fast as possible. Blood donation and transfusion is an un-ignorable part of today’s modern medicine and health care. Blood management has been considered as a challenging task because of life threatening nature of blood products. A very punctual administration is must due to its rapid perishable nature and required timely processing of blood and its related components. E-blood bank is an integrated blood bank automation system. The main purpose of E-blood bank is to interconnect all the blood banks of the state into a single network, validation, storage and circulation of various live data and information by using computation technology. Such system is able to assemble all the data of each and every individual into legible reports to support decision making from effective donor screening to optimal blood dissemination in the field.( T Pandit, S Niloor, A.S. Shinde)

Since our project is all about blood banking our project aims to give quick access and results that every users need. It also enable admin to monitor every blood conditions for the conditions of the bloods. it gives also one big and easy access storage for data all over the province.