LITERATURE REVIEW

COVID-19 recovered plasma donors :

A way to forecast protection from later infection is serological testing. This potential is highly dependent on antibody levels demonstrating satisfactory agreement with virus neutralization tests that are the industry standard. In order to determine the diagnostic value of the available serological tests in predicting virus neutralizing activity of serum samples taken 5-7 weeks after the onset of symptoms from 101 donors with a history of COVID-19, the purpose of their study was to collect serum samples from donors who had a history of the disease. Various ELISA tests were used to assess the immune responses to Receptor Binding Domain (RBD), Spike1 and 2, and Nucleocapsid antigens. An evaluation of the serum samples' neutralizing antibody activity used a cell-based virus neutralization technique. Serological testing is a method for predicting protection from subsequent infection. This potential is primarily contingent on antibody levels showing satisfactory agreement with the industry-standard virus neutralization tests. The goal of our study was to gather serum samples from donors who had a history of the disease in order to assess the diagnostic value of the available serological tests in predicting virus neutralizing activity of serum samples taken 5-7 weeks after the onset of symptoms from 101 donors with a history of COVID-19.

Human plasma and urine specimens and its clinical application:

In particular, UDP-sugars are a major source of energy, essential elements of the extracellular matrix, involved in the reactions of glycosylation and glucuronidation, and function as significant signaling molecules via the P2Y14 purinergic receptor. The UDP-sugar composition of biological fluids has not received enough attention despite playing a crucial role in a number of physiological and pathological processes and having the potential to serve as biomarkers. For the simultaneous quantification of UDP-glucose, UDP-galactose, UDP-glucuronic acid, UDP-N-acetylgalactosamine, and UDP-N-acetylglucosamine in human blood and urine, we developed a liquid chromatography electrospray ionization tandem mass spectrometry in multiple reaction monitoring mode. Perchloric acid and ammonium formate were added to samples in a way that was superior to previous techniques for recovering UDP-sugar and that also greatly increased chromatographic stability.

Post-HSCT graft failure due to refractory human cytomegalovirus successfully treated with haploidentical donor-derived immunoglobulins and stem cell graft infusion:

An substantial contributor to transplant-related morbidity and mortality is still human cytomegalovirus (HCMV). Due to the lack of preexisting memory T-lymphocytes specific for HCMV in the donor and the destruction of the recipient's cellular immunity as a result of the conditioning regimen, the incidence of HCMV recurrence in the donor seronegative (D-)/recipient seropositive (R+) group is significantly higher than in other serostatus combinations. the example of an 8-year-old Bangladeshi E-thalassemic girl who received hematopoietic stem cell transplantation from an unrelated, HLA-matched donor and was seropositive for human cytomegalovirus (HCMV). Even though commercial pooled anti-CMV

immunoglobulin (Ig) was given as antiviral prophylaxis starting on day +1, fast viral reactivation hampered the post-transplant course, and foscarnet therapy was started. Targeted immunotherapy was suggested as a second-line therapy because the virus was resistant to treatment and quickly caused full bone marrow loss. We chose the patient's mother, who displayed a high HCMV antibody titer, as the donor of virus strain-specific anti-HCMV Ig and T-lymphocytes with the assumption that the patient and her family members may have been exposed to similar HCMV strains. After two blood transfusions from the mother plasma, the viral infection was completely cleared.

Blood care service:

In health care systems, blood management services are essential to saving lives. In such systems, when a unit of blood is required, if the system is not able to provide it on time, sometimes this may lead to patient death, especially in critical cases. Unfortunately, even if the required blood unit is available within the system, contradictions may occur and the required blood unit may not be allocated to critical cases on time, due to the allocation of these units to lower priority cases or due to the isolated operate of blood banks within these systems. So, to overcome these obstacles, we proposed a real-time system on a cloud, to managing blood units within the whole health care system. This system will allocate blood units depends on the deadline and the severity of the case that needs blood, in addition to the types, quantities, and position of available blood units. Where, this system eliminated the need for human intervention in managing blood units, in addition to offering the ability to easily develop the system to deal with new urgent requirements, which need new methods of managing blood units; as is happening today with the COVID-19 epidemic. This system increases the performance, transparency, reliability, and accuracy of blood unit management operations while reducing the required cost and effort.

Cloud environments:

This component includes the main management server and the main data store. The main management server is the heart of the system and the most important part of it, which is what, distinguishes the system from the rest of the previous systems. It contains real-time algorithms for allocating, managing, and distributing blood units according to the precedence of incoming requests and depending on the resources available locally or in other blood banks in the system. All user authentications are only made by the server. The main data store contains the main database of blood units and donors and blood units request queue for all blood banks. The main data store enables the rest models in the system to access the database and update it easily and without conflict. The cloud environment also contains authentication operations, which allow only registered users to access the system. In addition, the cloud environment will contain the status web page, which displays general information about the level of storage and needs for blood units to the public and the users concerned. Here, we relied on the services provided by Microsoft (Azure) for the great capabilities it provides, especially in addressing server problems during times of increased usage pressure and the expansion and complexity of

databases. It is also the most suitable and closest option to the systems and applications already in use and the most popular choice for users.

Smart devices application:

By using these components, the user can quickly and easily access the database. We have two types of applications; the first one provides the donation environment, which works as a user interface for blood donation camps to enter donor information, the location of the donation, and the type of blood units entered into the system. The application also provides the ability to receive messages addressed from the server, which contain information about the blood units required to be provided to meet the needs. The second application provides the requests environment which enables the authorized health staff to create requests for blood units through an interface to enter the required blood unit information, the patient's condition, and the location of the case. After allocating the blood unit, the applicant receives the allocation message from the server through the same application.

Blockchain-Based Management of Blood Donation:

Today's a large number of blood donation management systems fall short in providing traceability, immutability, transparency, audit, privacy, and security features. Also, they are vulnerable to the single point of failure problem due to centralization. In this paper, we propose a private Ethereum blockchain-based solution to automate blood donation management in a manner that is decentralized, transparent, traceable, auditable, private, secure, and trustworthy. The proposed solution stores non-critical and large data off-chain using the decentralized storage of the InterPlanetary File System (IPFS). We present the system architecture, sequence diagrams, entity-relationship diagram, and algorithms to briefly explain the working principles of our blood donation management solution. We evaluate the performance of our solution in terms of efficiency and effectiveness through performing security analysis.

ONLINE BLOOD BANK MANAGEMENT SYSTEM USING ANDROID:

Blood is one of the most critical element and it truly referred to as 'river' of life. There are number of scenarios where urgent need of blood comes. At these critical time, On-line Blood Bank project aims at maintaining all the information related to blood donors. The blood donors can register to this system by entering their profile information like name, phone number, age, weight, date of birth, blood group, address etc. At the emergency time of blood needed we can check for blood donor nearby by using GPS. Once the app user enter the blood group which he/she needed it will automatically show the donor nearby and send an alert message to the donor. “Direct contact between the donor and recipient” is the main concept of this project. Willingness of the donor, Location, Last donation date and blood group are the major four components considered in this project. It's aim is to provide transparency in this field, make the process of obtaining blood from a blood bank corruption free and make the system of blood bank management effective.

Blood donation and life saver-blood donation app:

“Blood” one of the most important necessity of our life. The numbers of blood donor is very less when compared with other countries. In our project we propose a new and efficient way to overcome such outline. Such as just touch the button donor will be ask to enter an individual's details like name, phone number, age, weight, date of birth, blood group, address etc. At the emergency time of blood needed we can check for blood donor nearby by using GPS. Once the app user enter the blood group which he/she needed it will automatically show the donor nearby and send an alert message to the donor. In case if the first donor is not available it will automatically search the next donor which is present in queue. If the donor accept the request then an one time password (OTP) will be send to the donor to verify. Blood donation app provider list of donor in your city/area. Once the donor donate the blood it will automatically remove the donor detail for next three months.

A Cross-Platform Blood Donation Application with a Real-Time, Intelligent, and Rational Recommendation System:

Blood or plasma transmission is one of the most effective treatments for critical diseases like Covid 19. Nowadays, voluntary blood donation has become the major source of blood supply. Several mobile applications are currently available to establish the initial communication between blood donors and receivers. Recommending the right potential donor during a blood search can save the life of a critical patient with an immediate response from the donor. However, the requirement of an advanced recommendation system has not been addressed by any of the existing mobile applications. In our research work, we have designed a real-time, intelligent, and rational recommendation system using sentiment analysis of the user's feedback, response rate of the donor, and the current geo-location information and finally develop a cross-platform application for blood collection and distribution system. To process and generate features from the user feedback, we have designed a Bi-directional LSTM-based deep learning model. The quality of the recommendation of the potential donors has significantly improved. Moreover, we have conducted rigorous requirement analysis from real users and evaluated the performance of our application through both indoor and outdoor testing.

Nearest Blood & Plasma Donor Finding: A Machine Learning Approach:

The necessity of blood has become a significant concern in the present context all over the world. Due to a shortage of blood, people couldn't save themselves or their friends and family members. A bag of blood can save a precious life. Statistics show that a tremendous amount of blood is needed yearly because of major operations, road accidents, blood disorders, including Anemia, Hemophilia, and acute viral infections like Dengue, etc. Approximately 85 million people require single or multiple blood transfusions for treatment. Voluntary blood donors per 1,000 population of some countries are quite promising, such as Switzerland (113/1,000), Japan (70/1,000), while others have an unsatisfying result like India has 4/1,000, and Bangladesh has 5/1000. Recently a life-threatening virus, COVID-19, spreading throughout the globe, which is more vulnerable for older people and those with pre-existing medical conditions. For them, plasma is needed to recover their illness. Our Purpose is to build a platform with clustering algorithms which will jointly help to provide the quickest solution to find blood or plasma donor. Closest blood or plasma donors of the same group in a particular area can be explored within less time and more efficiently.