**PLASMA DONOR APPLICTION**

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PLASMA DONOR APPLICTION

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.

The United States’ blood supply chain is experiencing market decline due to recent innovations in surgical practice, transfusion management, and hospital policy. These innovations strain US blood centers, resulting in cuts to surge capacities, consolidation, and reduced funding for research and outreach programs. In this study, we use data from a regional blood center to explore the application of contemporary machine learning algorithms for modeling donor retention. Such predictive models of donor retention can be used to design more cost effective donor outreach programs. Using data from a large US blood center paired with random forest classifiers, we are able to build a model of donor retention with a Mathews correlation of coefficient of 0.851.

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Blood Bank Management Using Agile Design process

Agile methodology is a routine used for the development of the project which supports the respond to the volatility of building software through incremental, iterative work pace. A mobile application is developed using agile techniques. In this paper, a new and productive approach is proposed to solve the problem of blood bank management using UML and XP techniques. Just with simple touch donor will be requested to enter a person's details like name, telephone number, age, weight, date of birth, blood bunch, and address. At the time of emergency, information regarding donor can be checked using GPS nearby. Once the application is invoked, the user can enter the blood group which they require, it will show the donor details nearby and send an alarm message to the user. If the donor agrees for the request an OTP is sent for the verification process. If in case the donor rejects the request the next donor is automatically searched. Once the donor gives the blood it will remove the donor detail for next a quarter of a year.

PROBLEM STATEMENT:

During COVID 19 crisis the requirement for plasma increased drastically as there were no vaccinations found in order to treat the infected patients. In such situation it was very difficult to find the plasma donor, check whether the donor was infected previously and was recovered, and which donor is eligible to donate plasma was a challenging task. As the plasma therapy was one of the ways to treat the infected patients getting the donor details played a major role.

Convalescent Plasma Therapy: Data Driven Approach For Finding the Best Plasma Donor

Convalescent Plasma Therapy is an investigational therapeutic method recommended as a treatment strategy for COVID- 19 as vaccines, and proper treatment methods were unavailable. The therapy involves transfusing antibody contained plasma from the COVID recovered individuals (donors) into critically affected patients. It can accelerate the recovery of the recipient. The effectiveness of antibodies is affected by the health and clinical history of donors, according to research. It implies the possibility of implementing Machine Learning Classification models for predicting the Eligible donors (who meet the threshold antibody level for donation) and Regression models to predict the antibody level value of a donor from the person's clinical history before conducting tests for the same. The proposed system can help the health authorities approach the most probably efficient donors for the therapy rather than wasting time and test kits on a random donor who may or may not be eligible. The results from various ML algorithms trained on a synthetic clinical history dataset are examined and assessed as significant to some degree. The system has to be validated against real data to arrive at reasonable conclusions. This paper demonstrates how a data-driven solution is more beneficial than the conventional methods for donor search.

The blood donation process is an incredibly safe medical practice. Still, beliefs, attitudes of people, and their level of awareness may affect it. In order to measure the level of awareness and knowledge among the people, a real-time cross-sectional study was organized at ‘King Abdulaziz Medical City’ (KAMC). This was also done to detect the problems in the whole process of blood donation. The key problems reported for not donating blood were that donating blood did not cross their mind (32.4%) followed up with ‘No time available in schedule for donation’ which added up to around 45%. Finally, the main reason being the difficulty in accessing the blood donation center which encompasses 61.3%. This is due to unawareness in the society regarding the blood donation process. Sound data-driven machine learning techniques can be used for predicting donations and supply needs which in turn can improve the entire supply chain.

INCREASING DEMAND FOR PLASMA-DERIVED THERAPIES

Demand for plasma-derived therapies is increasing, which drives an increase in the demand for plasma for fractionation. This is the case despite the existence of recombinant and other alternatives. Not all conditions have alternatives to plasma-derived therapies and patients differ in their need for treatment. This explains the co-existence of plasma-derived and other therapies.

DEMAND FOR PLASMA IS DRIVEN BY THERAPY IN HIGHEST DEMAND

The protein which requires the largest amount of plasma based on the patient needs and how much of this protein plasma contains, is the key in determining the demand for plasma. Today, the protein with the highest demand is immunoglobulin. Hence, immunoglobulin has to bear a large share of raw material costs.

PRODUCTION PROCESS OF PLASMA-DERIVED THERAPIES IS LONGER AND MORE EXPENSIVE

The production process of plasma-derived therapies is much longer and more expensive than production of traditional pharmaceuticals. Production of plasma-derived therapies can require 7-12 months from donation to delivery of the therapy to patients, compared with around 2-3 months for traditional pharmaceuticals. Furthermore, raw material costs are the primary cost component for plasma-derived therapies, while for traditional pharmaceuticals the largest cost component is sales and marketing.

RISKS FOR SUPPLY IF TENDERS ARE NOT CAREFULLY DESIGNED

The large share of the total costs from raw materials lowers the flexibility for developers and manufacturers of plasma-derived therapies in setting prices. This is especially true for immunoglobulin, which has to bear a large share of the raw material costs. Hence, tender specifications and pricing can have large effects on ability to supply. There are examples of tendering practices leading to therapy shortages (e.g. the UK and Romania).

THE PLASMA-DERIVED THERAPIES INDUSTRY SUPPORTS THE EUROPEAN ECONOMY

The plasma-derived therapies industry supports the European economy through direct, indirect, and induced effects. The direct economic effects relate to production within the plasma-derived therapies industry. The indirect effects estimate the value created by sub-contractors to the plasma-derived therapies industry, e.g. at plasma collection centres, cleaning companies, or IT solution providers. The induced effects represent the value created when employees, both in the industry and its sub-contractors, spend their income. Our indicative analysis suggests that the order of magnitude of these types of impact could be 9.7 billion EUR.

DONOR COMPENSATION TO INCREASE PLASMA SUPPLY ALSO SUPPORTS THE ECONOMY AND EMPLOYMENT

The spending of donor compensation supports an estimated 76 million EUR per year of the induced effect and 1,100 full-time equivalent jobs from compensations to plasma donors in Germany, Austria, the Czech Republic, and Hungary.

PLASMA DONATION CENTRES HAVE POSITIVE EFFECTS ON THE LOCAL COMMUNITY

Plasma donation centres can themselves have positive effects on the local community through a number of different channels such as employing staff, using local contractors, employees spending their income, collaborative partnerships, and by being a gathering point in the local community.

CONCLUSION:

Plasma is a liquid portion of blood; it is a mixture of water, proteins and salts. Antibodies are proteins made by the body in response to an infection. People fully rescued from COVID19 are encouraged to donate plasma, which can help to increase the lifespan of other patients becausetheir plasma contains antigens which helps the affected person to recover faster. These immunoglobulin give your immune system a way to fight the virus when you are sick, so your plasma can be used to help others fight off illness. Individuals must fully resolve symptoms for at least 14 days prior are eligible to donate.

FUTURE ENHANCEMENTS:

Upgrading the UI that is more user-friendly which will help many users to access the website and also ensures that many plasma donors can be added into the community. Using elastic load balancer, it helps to handle multiple requests at the same time which will maintain the uptime of the website with negligible downtime.