



Organ And Blood Donation System Using Machine Learning Xgboost

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Abstract: The Online Organ Donation Management System is developed mainly for general hospitals (GH), clinics and other health center to manage the donor registration and user maintenance. It is an online system which only can be access or valid in Malacca state. The public can retrieve information about organ donation in this web site. People who interested can register themselves through this system. An analysis study has been done based on the current manual system and all the problems statements and requirements have been identified. Moreover, OODMS is three tier architecture systems which involve client tier, business tier and database management tier. The interfaces for OODMS have been designed according to the requirement and needs of the current market Rather than that; this system also has been tested and evaluated in real life. Online Organ Donation Management System will help to improve the performance of current situation and overcome the problems that arise nowadays.

Keywords: Organ Donation, Deceased Donor, Promotion donor, Transplantable Organs

I. INTRODUCTION

In the healthcare context, organ donation has raised to great importance in the last years. Improvements in medical techniques and pharmacological anti-reject therapies have made donation a powerful and valid way to treat diseases. Thanks to this, and to the relevance that mass media put on it, the number of donors is constantly increasing all over Europe. The decision to assign an organ from a particular donor to a particular recipient is a very complex process which can be decomposed into the following activities. Gather, store and manage a mandatory set of personal and medical information about each recipient and each donor (ex: blood group, weight, height, tissues characteristics, In presence of a donor, find a group of potential recipients which are compatible with the donor with respect to the mandatory sets of information stored. Among the group of potential recipients, find the one that best fits with the donor.

This decision is taken not just on the base of medical parameters (such as the current health state of the patient), but also on the base of logistical considerations (such as the possibility to transport the organ from the donor's to the recipient's hospital and the availability of medical teams to perform the operation) On top of this, there is a very strict constraint in time. Donors are usually persons who have been involved in serious accidents and are kept artificially alive though cerebral death has been stated. In such patients is extremely difficult to maintain acceptable vital parameters for a long time, and any variation in them can lead to the loss of organs.

A. OBJECTIVE

Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities. When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow.

B. SCOPE

Organ Donation System Is Immense, as it involves saving and improving lives through the selfless act of donating organs and improving medical treatments. It addresses the critical gap between organ supply and demand, offering hope to those in need of transplants. However, challenges like organ shortage and ethical considerations also shape its scope. Advances in technology and awareness campaigns contribute to a positive outlook for the future of organ donation.



II. RELATED WORK

Paper [1] Today's organ donation and transplantation systems pose different requirements and challenges in terms of registration, donor-recipient matching, organ removal, organ delivery, and transplantation with legal, clinical, ethical, and technical constraints. Therefore, an end-to-end organ donation and transplantation system is required to guarantee a fair and efficient process to enhance patient experience and trust. In this paper, we propose a private Ethereum blockchain-based solution to enable organ donation and transplantation management in a manner that is fully decentralized, secure, traceable, auditable, private, and trustworthy. We develop smart contracts and present six algorithms along with their implementation, testing, and validation details. We evaluate the performance of the proposed solution by performing privacy, security, and confidentiality analyses as well as comparing our solution with the existing solutions. We make the smart contract code publicly available on Github.

Paper [2] The scarcity and exigency for blood and organs has created many discrepancies in current approaches. These have created the criteria for malpractices such as organ trafficking and black market selling. This research presents a solution with a secured-smart blood and organ donation web developed system, allowing both patients and healthcare providers to access information about the blood and organ processing records. The database would be managed using the Blockchain technology which could be only accessed by authorized users. Finally, tracking all registered donors, the proposed system generates a smart identity developed by Ethereum Smart Contract (ESC). System predicts blood demand for the future ten years using Linear Regression Model with 0.998 of high R-squared accuracy value. This reduces shortages and wastage of blood. Also, using global positioning system and K-Nearest Neighbors Machine Learning algorithm the system finds the best matches among donors and seekers according to the nearest location. Further, the system will automatically send questionnaires for registered users to identify and evaluate their awareness and issues about organ donation. Overall, this study aims for a secured and transparent web application. Thus, it facilitates an innovative and a productive blood donation and organ transplantation process in Sri Lankan healthcare sector.

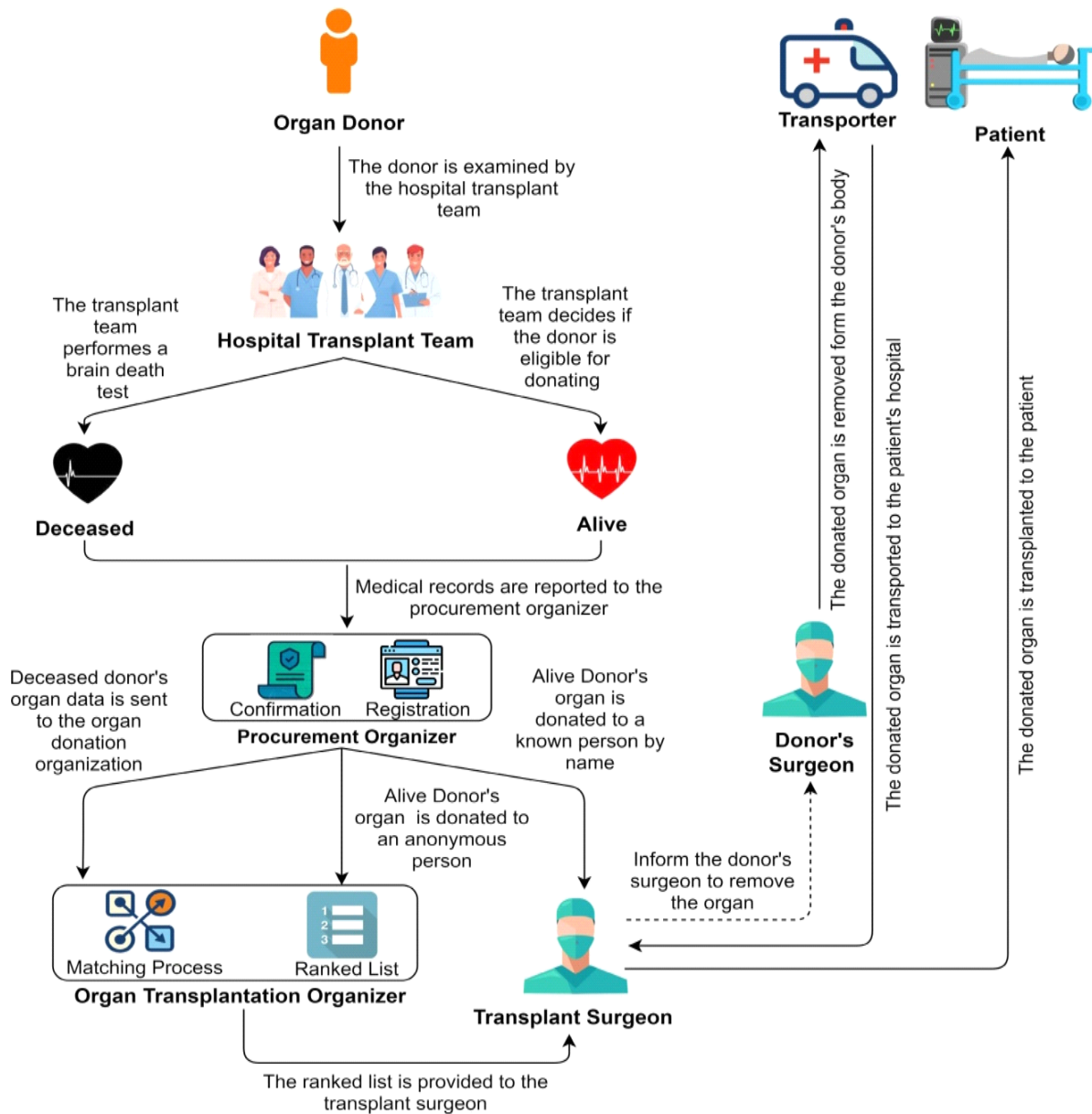
Paper [3] In today's era of digitisation, many technologies have evolved that every manual work can be digitally automatized. In the digital automatizing process, security and privacy are the most important and highly demanding aspects. Blockchain offers many features that can be used in almost every sphere of life. Features like decentralisation, transparency, privacy makes it an extremely useful technology. Therefore, by making use of all these features, several problems in healthcare sector can be solved like removing complex network of third parties and lack of traceability of transactions. This paper presents a decentralised, secure and transparent organ and tissue transplant web application (also called DApp), which not only nullifies the role of any third party involved in the organ.

Paper [4] Approximately 22 people die every day in the USA due to a lack of organs for transplant. Research suggests that the most effective solution is to increase organ donor rates, current, proposals range from expanding the donor eligibility criteria (donor pool) to performing mass media campaigns. However, little is known about the extent in which activities on social media are associated with aspects (e.g. awareness) of organ donation. Our hypothesis is that social media can be utilized as a sensor to characterize organ donation awareness and population engagement in donation for each different organ. In this sense, we collected Twitter messages (tweets) regarding organ donation, and characterized organ awareness by aggregating tweets from users who mostly mentioned that organ. Similarly, we assessed the relative risk between the cumulative incidence of organ-related conversations inside and outside geographical regions to characterize them regarding organ donation awareness. Our characterization suggests that organ-related conversations on social media seems to be indeed associated with aspects of organ donation such as the co-occurrence of organ transplantations. Also, we found variations regarding the specific organs that are prominently discussed in each geographical region, and that such variations seem to be associated with aspects of organ donation in that region, for instance, the abnormal amount of conversations about kidneys in Kansas. Our findings suggest that the proposed approach has the potential to characterize the awareness of organ donation in real-time.

Paper [5] Not long ago organ transplants were headline news about frontier medicine; now they are commonplace. Today both the number of transplants and long-term survival are increasing. In addition, physicians have learned how to keep increasingly sick patients alive longer and how to make more people eligible for transplants. The dark cloud in this sunny picture is the shortage of donated organs. According to the United Network for Organ Sharing (UNOS), which coordinates transplant registration, 3448 people died in 1995 because organs were not available for them in time. Last summer there were about 47,000 Americans awaiting transplants, but if this year is similar to 1995, only about 40% of them will actually receive an organ. A third to a half of all people on waiting lists die before an organ can be found for them. This shortage raises several difficult ethical problems, which can only be outlined in the space available here. Topics discussed include: i) how should the limited supply of organs be distributed? ii) should donors be encouraged to donate by the use of financial incentives? iii) the definition of death; iv) animal donors; v) organs from healthy donors; and vi) the changing physician-patient relationship.



III. ARCHITECTURE DIAGRAM



IV. IMPLMENTATION

A. ORGAN DONOR:

Being an organ donor means choosing to donate your organs and tissues after death to save or improve lives through transplantation. It's a generous decision that can make a significant impact on someone else's life. If you have questions about organ donation, feel free to ask.

B. HOSPITAL TRANSPLANT TEAM:

Transplant teams play a vital role, ensuring organs find their way to those who need them most. It's a challenging but rewarding field. What interests you about hospital transplant teams. Hospital transplant teams are specialized groups of healthcare professionals dedicated to organ transplantation. They typically include surgeons, transplant coordinators, nurses, and support staff. Their main tasks involve evaluating potential recipients, coordinating organ matches, performing surgeries, and providing post-transplant care. It's a collaborative effort to give patients a new lease on life.

**C. PROCUREMENT ORGANIZER:**

A procurement organizer helps streamline purchasing processes, manage vendor relationships, and track orders. It ensures efficiency in acquiring goods and services for a business.

D. ORGAN TRANSPLANTATION ORGANIZER:

An organ transplantation organizer coordinates the complex process of matching donors with recipients, ensuring a smooth and ethical exchange of organs to save lives. They manage logistics, communication, and compliance with medical and legal standards.

E. TRANSPLANT SURGEON:

A transplant surgeon specializes in removing organs or tissues from one person (donor) and placing them into another (recipient) to treat organ failure or damage. It's a complex field that requires precision and expertise. A donor surgeon specializes in safely removing organs or tissues from living or deceased individuals for transplantation purposes, saving lives through the gift of organ donation.

V. CONCLUSION

Our project is very well versed to reduce the wasting of unvaluable human Organs in soil. Instead of that it will be used to make an another human to live for years. In this generation everything is reusable. Then why the organs cannot be reused

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