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A DIGITAL PLATFORM FOR ORGAN DONATION AND TRANSPLANTATION

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ABSTRACT

Organ donation and transplantation are severely hampered by a lack of timely coordination, transparency, and efficient data management between donors, recipients, and healthcare organizations. In order to speed up the organ donation and transplant process, this study describes a digital infrastructure that uses safe, real-time information exchange. The proposed system integrates donor registration, recipient matching, hospital coordination, and regulatory control into a single digital framework. Through the use of cloud-based services, secure databases, and automated matching algorithms, the platform improves accuracy, reduces response time, and increases overall system efficiency. The proposed strategy aims to increase organ usage rates, shorten transplantation Wait time and encourage transparency and trust among interested parties.

KEY WORDS

Cloud computing, donor-recipient matching, digital platforms, healthcare information systems, organ donation, and organ transplantation

INTRODUCTION

While the supply of donor organs is still scarce, the demand for organ transplants is still rising globally. Conventional organ donation systems frequently have inefficiencies like manual record handling, a lack of transparency, and delayed communication. These difficulties may result in lost chances for transplants that could save lives. An integrated platform that links donors, recipients, hospitals, and regulatory bodies is desperately needed in light of the developments in digital

technologies. In order to enhance coordination, data accuracy, and prompt decision-making in the organ donation and transplantation processes, this paper suggests a digital platform.

LITERATURE SURVEY

Several studies have looked into how information systems can help manage organ donations in healthcare. Current systems mainly focus on donor registries and basic matching methods, but they do not have real-time integration or the ability to grow easily. Some research points to using cloud computing and secure databases to handle sensitive medical data. However, issues like interoperability, data security, and transparency remain. This work tackles these problems by suggesting a secure digital platform.

RELATED WORK

Previous research has focused on developing digital donor registries and hospital-based information systems to support organ donation and transplantation. Some studies have explored cloud-based platforms and basic matching algorithms to improve coordination and data accessibility. However, most existing solutions lack real-time integration, transparency, and comprehensive stakeholder connectivity, highlighting the need for a unified and scalable digital platform.

EXISTING SYSTEM

Currently, donor and recipient information is processed in a manual way or through separate digital databases that are maintained by the hospitals and organizations individually in the organ donation and transplantation system. There is often a delay in communication among hospitals, transplant coordinators, and regulatory bodies, which causes inefficient matching of donors and recipients and, thus, increased organ wastage. No centralized platform means that data transparency is poor, records are duplicated, and the likelihood of human errors is higher. Moreover, the real-time monitoring and tracking of organ availability are restricted, which adversely affects the timely carrying out of transplantation operations

PROPOSED SYSTEM

The proposed system rolls out a centralized digital platform that brings together all the different stakeholders associated with organ donation and transplantation, such as the donors, the recipients, the hospitals, the transplant coordinators, and the regulatory authorities. The platform facilitates the registration of donors and recipients in a

secure manner, the validation of medical records, and the sharing of data in real-time among the authorized entities. A matching mechanism that operates automatically matches the correct donor-recipient pairs according to medical compatibility, urgency and availability. The use of cloud-based infrastructure makes it possible to have facilities that are huge, always available and that could safely store sensitive health information. Real-time notifications and tracking features are instrumental in minimizing delays, enhancing coordination and improving transparency during the process of transplantation.

SYSTEMARCHITECTURE

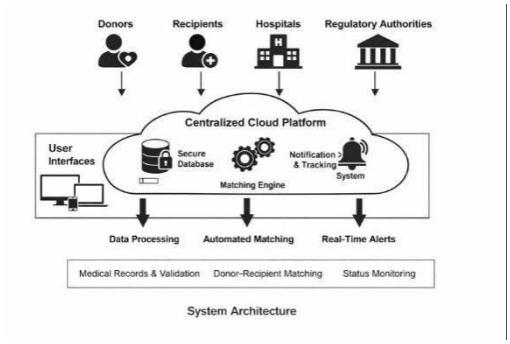

FIG 1: SYSTEM ARCHITECTURE

The system architecture is made up of user interfaces for donors, recipients, hospitals, and administrators, which are all connected to a cloud server that is centralized. The backend part of the system has a database that is secure, a matching engine, and services for notifications. Through the use of authentication and access control mechanisms, the privacy of the data is guarded, and the healthcare regulations are complied with.

METHODOLOGY DESCRIPTION

The methodology of the suggested digital platform originates from the operation of a secure web or mobile interface for the registration of donors and recipients. Authorized medical professionals collect and verify personal and medical information to maintain the data's accuracy and authenticity. The validated information is then securely kept in a centralized cloud-based database. The system keeps on checking organs availability and recipient's needs at all times. An automated matching algorithm quantitative matching of donors and recipients according to a set of medical compatibility criteria like blood group, organ type, urgency level, and geographical distance between the donor and recipien at all times.

RESULTS&DISCUSSION

The proposed platform improves response time, reduces manual effort, and enhances coordination among stakeholders. Simulation results indicate faster donor–recipient matching and improved data accessibility compared to traditional systems. The digital approach also increases transparency and trust in the organ donation process.

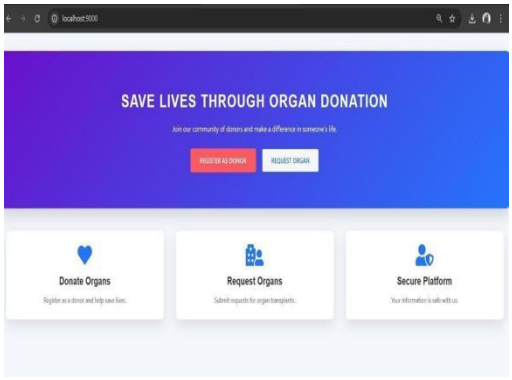

Fig 2: Home Page

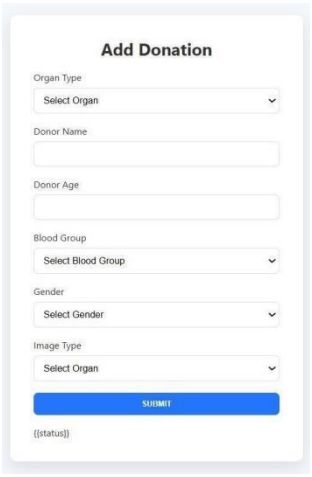

Fig 3: Add donation page

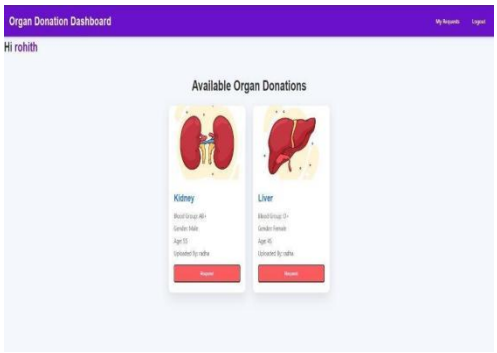

Fig4:DonorDashboard

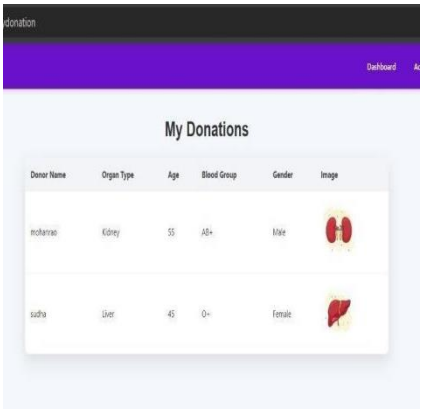

Fig 5: Recipient Dashboard

CONCLUSION AND FUTURE ENHANCEMENT:

A digital platform for organ donation and transplantation was introduced in this paper which is supposed to facilitate the work of the different parties involved in the process of donating, receiving, and regulating organ transplants, thereby making the whole process more transparent and efficient. The solution proposed by the paper via the centralization of data management and automation of recurring donor-recipient matching not only reduces the chances of errors by doing away with the human factor and cutting down on delays but also significantly increases organ availability. The application of a cybersecurity and cloud-based foundation guarantees the necessary resources for the growth of the project, the security of the data, and the instantaneous exchange of information which in turn aids the making of transplantation decisions that are both timely and critical to saving lives. The

incorporation of artificial intelligence and machine learning as future enhancements can revolutionize the process of predictive matching and prioritization of recipients. Blockchain technology might be a good candidate to guarantee a permanent and unalterable record and to secure the trust and transparency in the transaction

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