KLE Technological University

DEPARTMENT OF BACHELOR COMPUTER APPLICATIONS

1. Title of the Project

'Organ Donation & Transplant Matching System'

2. Introduction

The Organ Donation & Transplant Matching System is a web-based platform designed to streamline and enhance the efficiency of organ donation and transplantation. By leveraging technology, this system simplifies donor registration, ensures secure data management, and optimizes the recipient matching process.

One of the primary challenges in organ transplantation is finding a suitable donor in a timely manner. Many patients face prolonged waiting periods due to the lack of a centralized system that tracks real-time organ availability and matches donors based on compatibility. The proposed system aims to address these issues by implementing an intelligent algorithm for recipient matching, which takes into account factors such as blood type, tissue compatibility, urgency, and geographical location. Additionally, the system allows hospitals to coordinate with each other, facilitating seamless organ transfers and transplant procedures.

Security and legal documentation are also critical aspects of organ donation. The platform ensures that donor consent forms and other legal documents are securely stored and accessible to authorized medical professionals. Emergency transplant requests can be handled efficiently, reducing delays and increasing the chances of successful transplants. Real-time updates keep recipients informed about their transplant status, enhancing transparency and trust in the system.

The system can generate reports on donation trends, success rates, and other key metrics. This information can be valuable for policymakers, medical researchers, and healthcare institutions looking to improve organ donation policies and strategies. Ultimately, the Organ Donation & Transplant Matching System aims to bridge the gap between donors and recipients, increasing the efficiency and success rate of transplants while ensuring ethical and secure management of the entire process.

3. Objectives of the Project

- Provide a platform for organ donor registration.
- Implement an intelligent recipient matching system.
- Track live organ availability across different locations.
- Enable hospital coordination for transplant procedures.
- Keep recipients updated on transplant status.
- Securely store and manage legal documentation.
- Handle emergency transplant requests efficiently.
- Organize waiting lists based on urgency and compatibility.
- Facilitate secure communication between hospitals and donors.
- Generate reports and analytics on donation trends and transplant success rates.
- Allow donors to update their medical history annually to ensure accurate and up-to-date records.

4. Scope of the Project

Included:

- User authentication and donor registration
- Recipient matching based on organ compatibility
- Live organ availability tracking
- Hospital coordination for transplant procedures
- Secure upload of legal donor documentation
- Emergency transplant request handling
- Waiting list management based on urgency
- Secure communication between hospitals and donors
- Reports and analytics on organ donation trends
- Annual donor information updates to maintain accurate health records

5. System Requirements

a) Software Requirements:

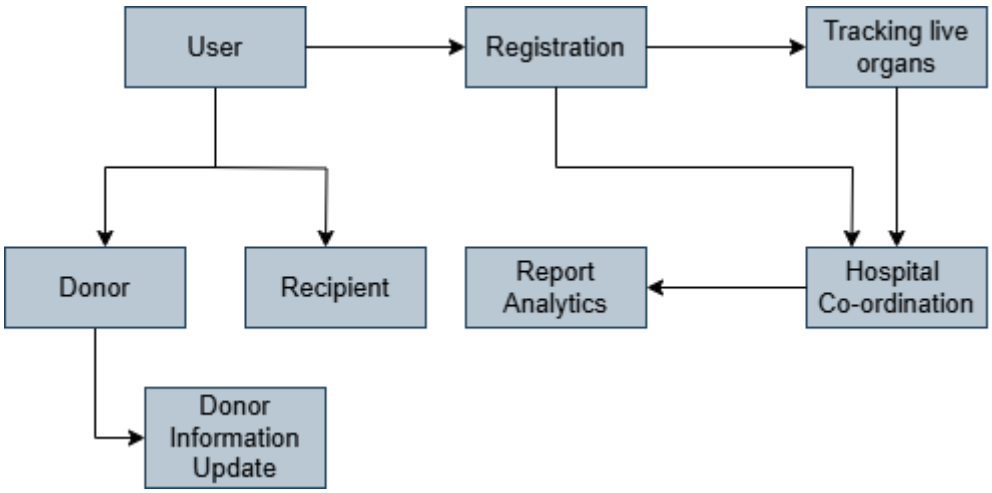
- Operating System: Windows
- Backend: Django
- Frontend: HTML, CSS, JavaScript
- Database: SQLite
- Development IDE - Python (programming language)

b) Hardware Requirements:

- Minimum 4GB RAM
- Processor: Intel i5 or higher

6. Methodology and System Design

The system follows an agile development approach with iterative testing and feature enhancements. It will be a web-based application ensuring secure data handling, encrypted communication, and real-time updates. Automated matching algorithms will enhance recipient compatibility and transplant efficiency. The platform will provide seamless user interaction, efficient data management, and optimized performance.



7. Non-Functional Requirements

1. Availability & Reliability – The system should always be available and work without crashes, ensuring smooth organ tracking and donor-recipient matching.

2. Security & Privacy – Donor and recipient data should be protected using strong security measures like passwords and encryption to prevent hacking.

3. Performance & Scalability – The system should work fast (matching donors within a few seconds) and handle many users at the same time without slowing down.

4. Usability & Accessibility – The system should be easy to use and accessible to all users, including those with disabilities.

8. Modules of the Project

1. User Management Module

- Handles user registration and authentication.
- Assigns roles (Donor, Recipient).
- Manages user profiles and access control.

2. Registration Module

- Differentiates and stores information about donors and recipients.
- Tracks registration date and user type.

3. Donor Management Module

- Collects donor details (age, blood type, organ type).
- Allows donors to update availability status.
- Links donors to the transplant matching system.

4. Recipient Management Module

- Stores recipient details (age, blood type, required organ).
- Matches recipients with potential donors.
- Tracks recipient status in the transplant process.

5. Transplant Matching Module

- Matches donors with recipients based on compatibility.
- Tracks transplant status (Pending, Approved, Completed).
- Links to organ tracking and hospital management.

6. Donor Update Module

- Manages updates on donor status.
- Tracks changes in donor availability.
- Records updates for transplant coordination.

7. Organ Tracking Module

- Monitors real-time movement of donated organs.
- Tracks organ status (In transit, Delivered).
- Links with hospitals and transplant teams.

8. Hospital Management Module

- Manages hospitals involved in organ transplants.
- Assigns hospitals to oversee organ tracking.
- Generates reports on transplant operations.

9. Report and Analytics Module

- Generates donor-recipient match reports.
- Provides transplant success analytics.
- Helps in decision-making for medical teams.

9. Technologies Used

- Frontend: HTML, CSS, JavaScript
- Backend: Django
- Database: SQLite
- Other Tools:

10. Expected Outcomes

- A fully functional Organ Donation & Transplant Matching System enables seamless donor registration and recipient matching.
- Real-time organ availability tracking helps hospitals make quick and informed transplant decisions.
- Automated alerts and notifications ensure timely updates for hospitals, donors, and recipients.
- Secure legal documentation management allows easy access to consent forms and compliance records.
- Data-driven reports and analytics provide insights into donation trends and transplant success rates.

11. Future Enhancements

- Database backup to the cloud to ensure secure storage, accessibility, and disaster recovery of critical data.

12. Conclusion

‘The Organ Donation & Transplant Matching System ensures efficient donor registration, recipient matching, and hospital coordination. It enhances transparency with real-time tracking, secure documentation, and automated alerts.’

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