INSTITUTE FOR ADVANCED COMPUTING AND SOFTWARE DEVELOPMENT AKURDI, PUNE

Documentation On

"Organ Donation Management System"
PG-DAC SEP 2021

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1. INTRODUCTION.

Introduction:

The Online Organ Donation Management System (OODMS) is developed mainly for donors, patients, and other health centers to manage donor registration and user maintenance. It is an online system that only can be accessed or valid in a particular state. The public can retrieve information about organ donation on this website. People who are interested can register themselves through this system. The application will be processed by the administrator and each donor will receive information about their application status. Furthermore, the authorized user's account will be maintained by the administrator. The donor record will be managed by an administrator. The only administrator has the authority and privileges to print organ list reports and total donation reports according to the district from 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 a three-tier architecture system that involves the 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. This Online Organ Donation Management System will help to improve the performance of the current situation and overcome the problems that arise nowadays.

Problem Statement:

This report discusses the result of the work done in the development of "Websites for Organ donation on React-js as a Front-end Platform and "My SQL" as database and JAVA SpringBoot As a Back-End Platform. The development of an application provides a good connecting facility between all pages, also the back-end and My-SQL are most important to save all the data related to the application

Aims and Objective:

Background And Motivation
The definition of our problem lies in a manual system and a fully automated system.
  * MANUAL SYSTEM: The system is very time-consuming and lazy. This system is more prone to Errors and sometimes the approaches to various problems are unstructured.
  * TECHNICAL SYSTEM: With the advent of the latest technology if we do not update our system then our business results in losses gradually with time. The technical systems contain the tools of latestTrend i.e. computers printers, fax, Internet, etc. The systems with this technology are very fast, Accurate, user-friendly, and reliable.

Objective
  Need for Organ Donation Websites:
  * To promote organ donation for transplantation as a treatment for many life-threatening diseases including heart disease, kidney disease, liver disease, diabetes, and cystic fibrosis
  * To educate and inform the community, patients and their families, and health professionals about organ and tissue donation to markedly improve rates of donation.
  * To work in partnership with the Department of Health (DOH), clinicians, and hospitals to promote

best practice professional training and ensure that the family of every potential donor is offered the option of donation in a caring and respectful manner.

   * To provide support, care, information, and advocacy for people with end stage organ failure, donor families, living donors transplant recipients, and their families.

   * To provide policy advice to DOH, clinicians, and hospitals.

   * Assuring compliance with all external regulatory bodies, including but not limited to: the Organ Procurement and Transplantation Network (OPTN), the United Network for Organ Sharing (UNOS), Centers for Medicare and Medicaid Services (CMS) Conditions of Participation (COP), the Missouri State Department of Health (DOH), The Joint Commission (TJC) Standards

   * Ensuring the program's accreditation

   * Identifying opportunities for improvement

   * Prioritizing performance improvement and patient safety projects within organ transplantation

   * Continuously audit compliance and regulatory standards related to organ transplantation

   * Ensuring policies and procedures applicable to organ transplantation are evidence based, regularly reviewed and audited for compliance.

2.OVERALL DESCRIPTION.

Proposed Methodology:

The objective of Organ donation management system is to provide an online web-based solution for healthcare use. In this application all data will get stored of donors and patients related to organ donation, etc. It is Easy to use. Using this system patients can get the required organ from donor as soon as donor enters there data in the system. This website provides a way for patients to get the required organ from donor easily, increase the efficiency and speed up all works to be completed. At admin side a person can view the most suitable donors and patients. Every donor and patient will have unique login id and password. Admin will have full authority to add or delete the donors and patients. Admin can also add new centers. Admin have full authority to add, delete, modify the center in the system. Hence this process also helps in maintaining consistency and integrity. The donor can readily store and retrieve the data by department wise through online. This system helps the user to generate the rapid matching of organs for patients. As soon as the patient gets the donor organ and admin receives it, admin can able to send the notification to the patients mail address by pressing the save button. Then patient will get the mail with all the details of donor.

Operating Environment:

Server Side:

Processor: Intel® Xeon® processor 3500 series

HDD: Minimum 500GB Disk Space

RAM: Minimum 4GB

OS: Windows 10, Linux **6**

Database: MySQL

Client Side (minimum requirement):

Processor: Intel Dual Core

HDD: Minimum 80GB Disk Space

RAM: Minimum 2GB

OS: Windows , Linux

Design and Implementation Constraints:

Introduction to MySQL :

- MySQL database –MySQL is a relational database management system based on the Structured Query Language, which is the popular language for accessing and managing the records in the database. MySQL is open-source and free software under the GNU license. It is supported by Oracle Company.

- Our MySQL tutorial includes all topics of MySQL database that provides for how to manage database and manipulate data with the help of various SQL queries. These queries are: insert records, update records, delete records, select records, create tables, drop tables, etc. There are also given MySQL interview questions to help you better understand the MySQL database.

Introduction to ReactJs :

- ReactJS is a declarative, efficient, and flexible JavaScript library for building reusable UI components. It is an open-source, component-based front-end library responsible only for the view layer of the application. It was created by **Jordan Walke,** who was a software engineer at **Facebook.** It was initially developed and maintained by Facebook and was later used in its products like **WhatsApp** & **Instagram.** Facebook developed ReactJS in **2011** in its newsfeed section, but it was released to the public in the month of **May 2013.**

- Today, most of the websites are built using MVC (model view controller) architecture. In MVC architecture, React is the 'V' which stands for view, whereas the architecture is provided by the Redux or Flux.

- A ReactJS application is made up of multiple components, each component responsible for outputting a small, reusable piece of HTML code. The components are the heart of all React applications. These components can be nested with other components to allow complex applications to be built of simple building blocks. ReactJS uses virtual DOM-based mechanism to fill data in HTML DOM. The virtual DOM works fast as it only changes individual DOM elements instead of reloading the complete DOM every time.

- To create React app, we write React components that correspond to various elements. We organize these components inside higher level components which define the application structure. For example, we take a form that consists of many elements like input fields, labels, or buttons. We can write each element of the form as React components, and then we combine it into a higher-level component, i.e., the form component itself. The form components would specify the structure of the form along with elements inside of it.

Introduction of Spring-Boot:

- Spring Boot is an open-source Java-based framework used to create a micro Service. It is developed by the Pivotal Team and is used to build stand-alone and production-ready spring applications. This chapter will give you an introduction to Spring Boot and familiarizes you with its basic concepts.

- Micro Service is an architecture that allows developers to develop and deploy services independently. Each service running has its own process and this achieves the lightweight model to support business applications.

<div align="center">

3. Requirements Specification.

</div>

External Interface Requirements:

User Interfaces:

- All the users will see the same page when they enter in this website. This page asks the users a username and a password.
- After being authenticated by correct username and password, user will be redirect to their corresponding profile where they can do various activities.
- The user interface will be simple and consistence, using terminology commonly understood by intended users of the system. The system will have simple interface, consistence with standard interface, to eliminate need for user training of infrequent users.

Hardware Interfaces:

- No extra hardware interfaces are needed.

- The system will use the standard hardware and data communication resources.

This includes, but not limited to, general network connection at the server/hosting site, network server and network management tools.

Application Interfaces:

Web Browser:
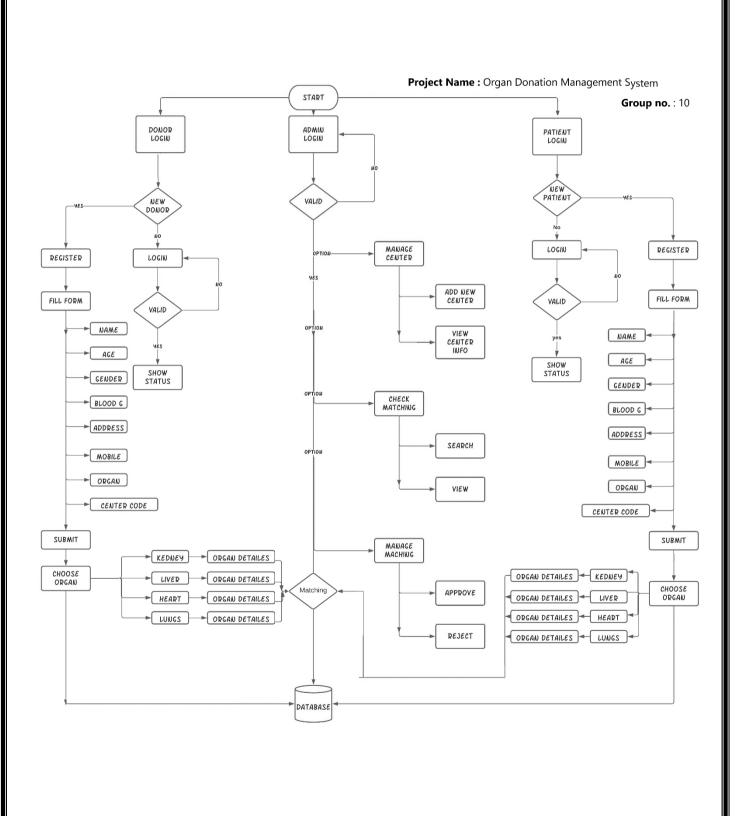
The system is a web-based application; clients need a modern web browser such as Mozilla Firebox, Internet Explorer, Opera, and Chrome. The computer must have an Internet connection in order to be able to access the system.

Communications Interfaces:

- This system uses communication resources which includes but not limited to, HTTP protocol for communication with the web browser and web server and TCP/IP network protocol with HTTP protocol.

- This application will communicate with the database that holds all the booking information. Users can contact with server side through HTTP protocol by means of a function that is called HTTP Service. This function allows the application to use the data retrieved by server to fulfil the request fired by the user.
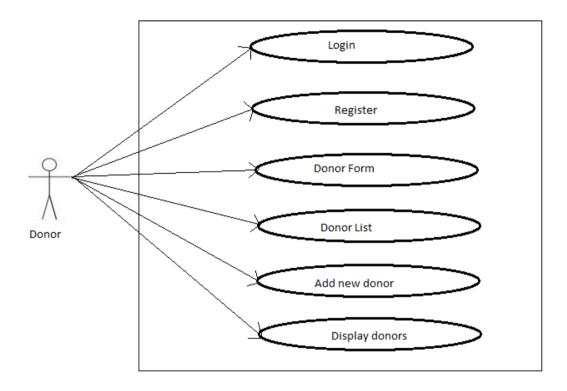
4. System Diagrams.

- Flow diagram:

Project Name : Organ Donation Management System

Group no. : 10
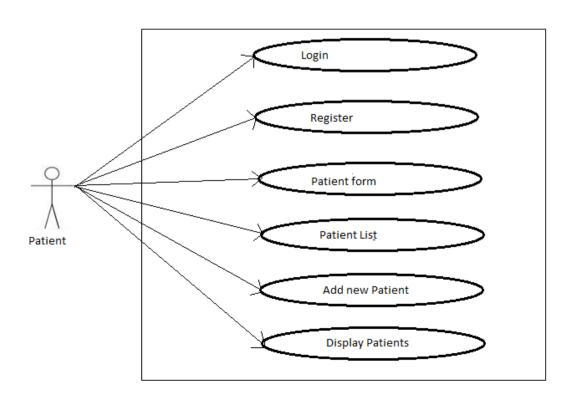
- Use Case Diagram:
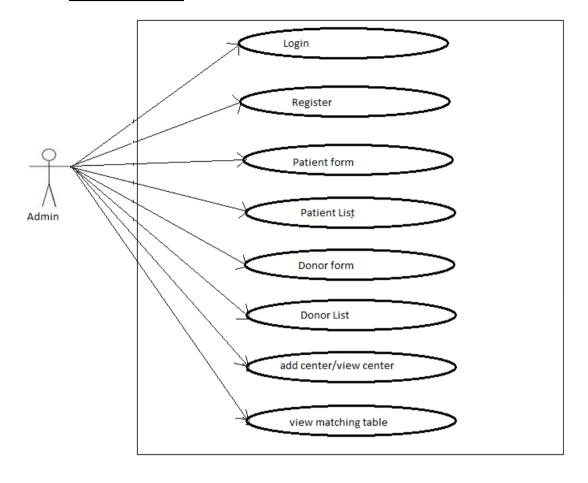
    🔸 **Donor Use-case:**
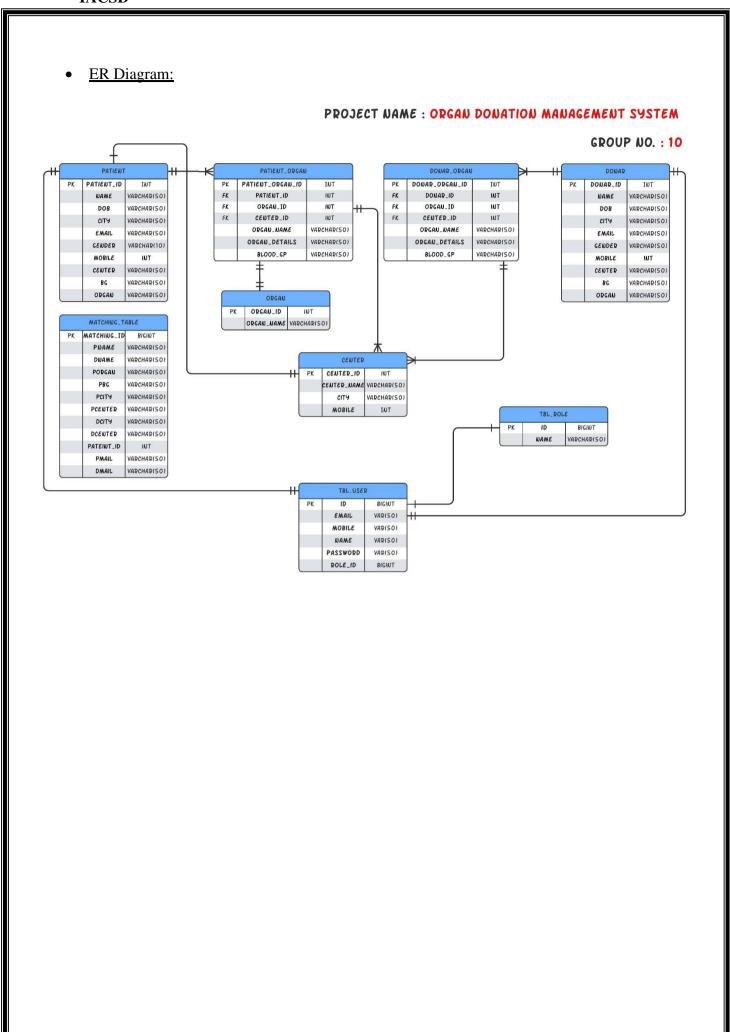
    🔸 **Patient Use-case:**

⬧ Admin Use-case:

- <u>ER Diagram:</u>

PROJECT NAME : ORGAN DONATION MANAGEMENT SYSTEM

GROUP NO. : 10

PATIENT

PK	PATIENT_ID	INT
	NAME	VARCHAR(50)
	DOB	VARCHAR(50)
	CITY	VARCHAR(50)
	EMAIL	VARCHAR(50)
	GENDER	VARCHAR(10)
	MOBILE	INT
	CENTER	VARCHAR(50)
	BG	VARCHAR(50)
	ORGAN	VARCHAR(50)

PATIENT_ORGAN

PK	PATIENT_ORGAN_ID	INT
FK	PATIENT_ID	INT
FK	ORGAN_ID	INT
FK	CENTER_ID	INT
	ORGAN_NAME	VARCHAR(50)
	ORGAN_DETAILS	VARCHAR(50)
	BLOOD_GP	VARCHAR(50)

DONAR_ORGAN

PK	DONAR_ORGAN_ID	INT
FK	DONAR_ID	INT
FK	ORGAN_ID	INT
FK	CENTER_ID	INT
	ORGAN_NAME	VARCHAR(50)
	ORGAN_DETAILS	VARCHAR(50)
	BLOOD_GP	VARCHAR(50)

DONAR

PK	DONAR_ID	INT
	NAME	VARCHAR(50)
	DOB	VARCHAR(50)
	CITY	VARCHAR(50)
	EMAIL	VARCHAR(50)
	GENDER	VARCHAR(50)
	MOBILE	INT
	CENTER	VARCHAR(50)
	BG	VARCHAR(50)
	ORGAN	VARCHAR(50)

MATCHING_TABLE

PK	MATCHING_ID	BIGINT
	PNAME	VARCHAR(50)
	DNAME	VARCHAR(50)
	PORGAN	VARCHAR(50)
	PBG	VARCHAR(50)
	PCITY	VARCHAR(50)
	PCENTER	VARCHAR(50)
	DCITY	VARCHAR(50)
	DCENTER	VARCHAR(50)
	PATEINT_ID	INT
	PMAIL	VARCHAR(50)
	DMAIL	VARCHAR(50)

ORGAN

PK	ORGAN_ID	INT
	ORGAN_NAME	VARCHAR(50)

CENTER

PK	CENTER_ID	INT
	CENTER_NAME	VARCHAR(50)
	CITY	VARCHAR(50)
	MOBILE	INT

TBL_ROLE

PK	ID	BIGINT
	NAME	VARCHAR(50)

TBL_USER

PK	ID	BIGINT
	EMAIL	VAR(50)
	MOBILE	VAR(50)
	NAME	VAR(50)
	PASSWORD	VAR(50)
	ROLE_ID	BIGINT

5. Table Structure.

- **Center :**

Field	Type	Null	Key	Default	Extra
center_id	int	NO	PRI	NULL	auto_increment
name	varchar(50)	YES		NULL	
city	varchar(50)	YES		NULL	
mobile	bigint	YES		NULL	

- **Donor :**

Field	Type	Null	Key	Default	Extra
donar_id	bigint	NO	PRI	NULL	auto_increment
name	varchar(45)	YES		NULL	
city	varchar(45)	YES		NULL	
dob	varchar(45)	YES		NULL	
mobile	bigint	YES		NULL	
email	varchar(45)	YES		NULL	
center	varchar(45)	YES		NULL	
gender	varchar(45)	YES		NULL	
bg	varchar(45)	YES		NULL	
organ	varchar(45)	YES		NULL	

- **Matching**

Field	Type	Null	Key	Default	Extra
matching_id	bigint	NO	PRI	NULL	auto_increment
pname	varchar(50)	YES		NULL	
dname	varchar(45)	YES		NULL	
porgan	varchar(45)	YES		NULL	
pbg	varchar(45)	YES		NULL	
pcity	varchar(45)	YES		NULL	
pcenter	varchar(45)	YES		NULL	
dcity	varchar(45)	YES		NULL	

dcenter	**varchar(45)**	**YES**		**NULL**	
patient_id	**bigint**	**YES**		**NULL**	

- **Organ**

Field	Type	Null	Key	Default	Extra
organ_id	**int**	**YES**	**MUL**	**NULL**	
organ_name	**varchar(45)**	**YES**		**NULL**	
organ_id	**int**	**YES**	**MUL**	**NULL**	

- **Patient**

Field	Type	Null	Key	Default	Extra
patient_id	**bigint**	**NO**	**PRI**	**NULL**	**auto_increment**
name	**varchar(45)**	**YES**		**NULL**	
city	**varchar(45)**	**YES**		**NULL**	
dob	**varchar(45)**	**YES**		**NULL**	
mobile	**bigint**	**YES**		**NULL**	
email	**varchar(45)**	**YES**		**NULL**	
center	**varchar(45)**	**YES**		**NULL**	
gender	**varchar(45)**	**YES**		**NULL**	
bg	**varchar(45)**	**YES**		**NULL**	
organ	**varchar(45)**	**YES**		**NULL**	

• **tbl_user**

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	
email	varchar(255)	NO		NULL	
mobile	varchar(255)	NO		NULL	
name	varchar(255)	NO		NULL	
password	varchar(255)	NO		NULL	
role_id	bigint	YES	MUL	NULL	
id	bigint	NO	PRI	NULL	

• **Tbl_role :**

Field	Type	Null	Key	Default	Extra
id	bigint	NO	PRI	NULL	
name	varchar(255)	NO			

• **Queries designed using SQL commands**

1. **To display the centers information on the cenerlist component of react**

@Query("FROM Center b WHERE b.name LIKE %:searchText% OR b.city LIKE %:searchText% OR b.mobile LIKE %:searchText%   ORDER BY b.name ASC")

2. **To display the donars information on the donarlist component of react**

@Query("FROM Donar b WHERE b.name LIKE %:searchText% OR b.city LIKE %:searchText% OR b.language LIKE %:searchText%   OR   b.organ   LIKE %:searchText% OR b.bg LIKE %:searchText% ORDER BY b.email ASC")

3. **To display the donars on the basis of the city blood and organ**

@Query("FROM Donar b WHERE b.bg LIKE %:blood% AND b.city LIKE %:city% AND b.organ LIKE %:organ% ORDER BY b.email   ASC")

4. **To add the data for matching with considering the blood group and organ name**

@Query(value=" INSERT INTO matching (pname, dname, porgan, pbg, pcity,pcenter, dcity, dcenter) SELECT   patient.name, donar.name, patient.organ, donar.bg, patient.city, patient.center, donar.city, donar.center FROM   patient JOIN donar ON patient.bg=donar.bg AND patient.organ=donar.organ",nativeQuery = true)
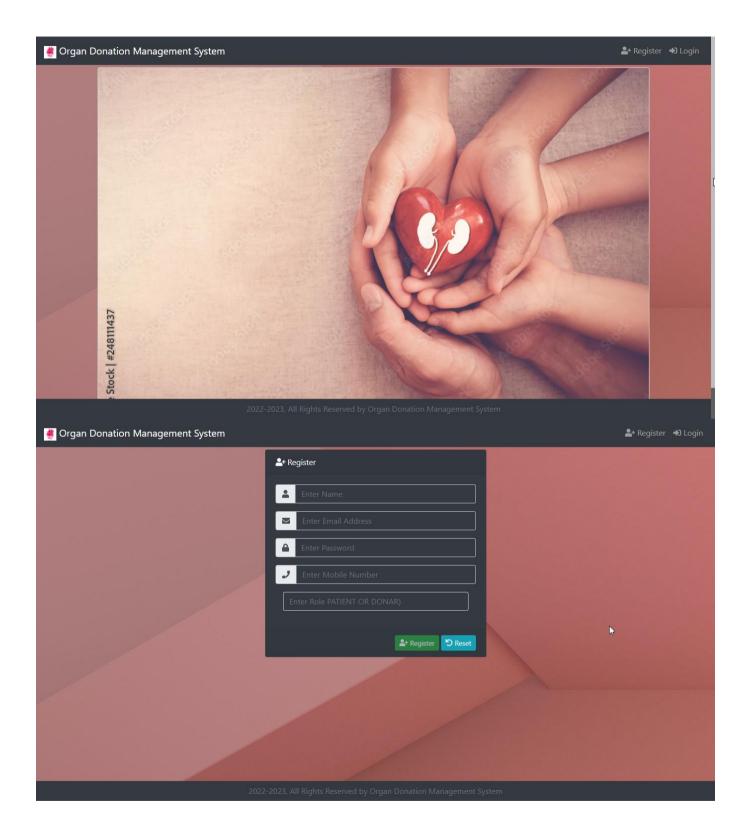
void insertMatchingTableData();

5. **To delete the matching (for updating the data all the time if donor get deleted by admin**

@Query(value="Delete from matching",nativeQuery= true)

6. **To display matched data on the matching table component in front end react.**
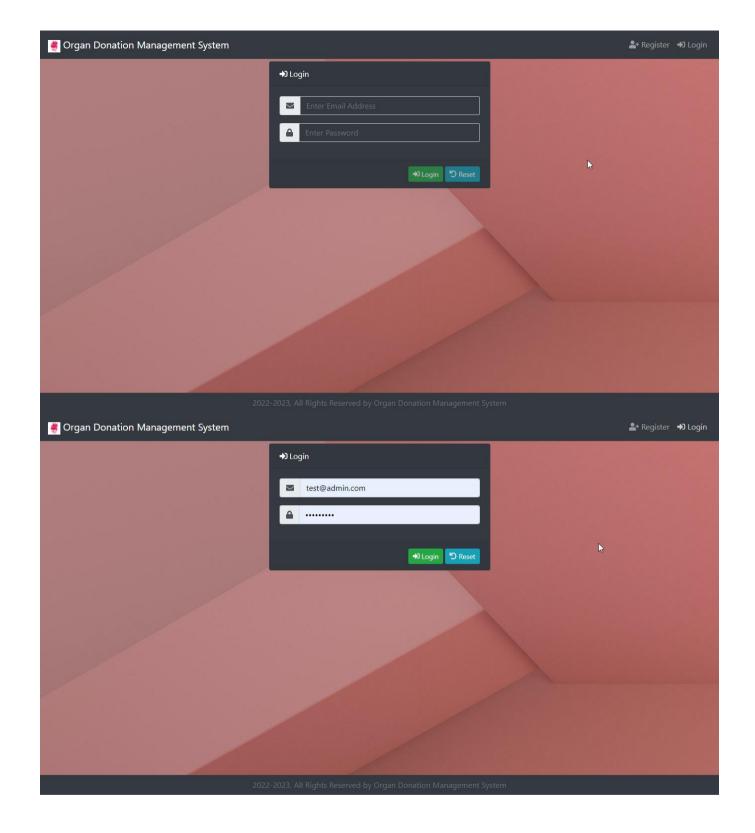
@Query("FROM Matching b WHERE b.pname LIKE %:searchText% OR b.dname LIKE %:searchText% OR b.porgan LIKE   %:searchText% OR b.pbg LIKE %:searchText% OR b.pcity LIKE %:searchText% OR b.pcenter LIKE %:searchText% OR b.dcity   LIKE   %:searchText%   OR   b.dcenter   LIKE %:searchText% ORDER BY b.pname ASC")
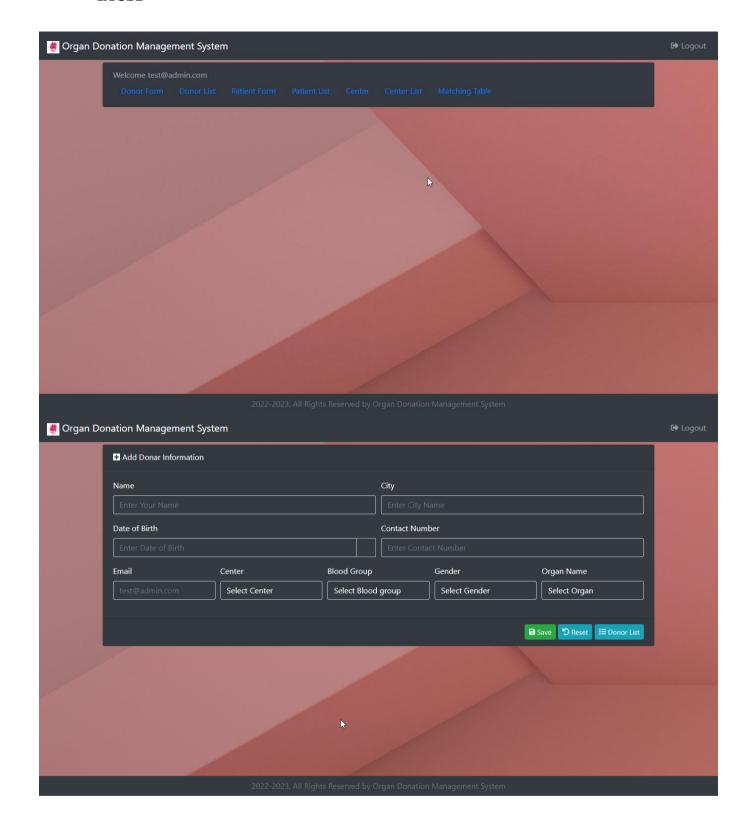
7. **to match the donors and patients organ,blood groups to insert the data in matching table**

@Query(value=" INSERT INTO matching (pname,pmail, dname,dmail, porgan, pbg, pcity, pcenter, dcity, dcenter) SELECT   patient.name, patient.email,donar.name,donar.email,   patient.organ,   donar.bg,   patient.city, patient.center,   donar.city, donar.center FROM patient JOIN donar ON patient.bg=donar.bg AND patient.organ=donar.organ",nativeQuery   = true)

8. **To delete the matching made before opening the matching table component**

@Query(value="Delete from matching",nativeQuery= true)

9. **To display the patients information on the patient list component in react**

@Query("FROM Patient b WHERE b.name LIKE %:searchText% OR b.city LIKE %:searchText% OR b.language LIKE   %:searchText% OR b.genre LIKE %:searchText% OR b.organ LIKE %:searchText% OR b.bg LIKE %:searchText% ORDER BY   b.email ASC")

10. To display details based on the name entered in the usr_role

@Query("FROM Role WHERE name=:name")

11. To display the details by email (used for findbyEmail function)

@Query("FROM User WHERE email=:email")

Screenshots :

Organ Donation Management System   ☐→ Logout

Welcome test@admin.com

Donor Form   Donor List   Patient Form   Patient List   Center   Center List   Matching Table

Organ Donation Management System   ☐→ Logout

➕ Add Donar Information

Name   City

Enter Your Name   Enter City Name

Date of Birth   Contact Number

Enter Date of Birth   Enter Contact Number

Email   Center   Blood Group   Gender   Organ Name

test@admin.com   Select Center   Select Blood group   Select Gender   Select Organ

💾 Save   🔄 Reset   ☰ Donor List

Organ Donation Management System — Logout

Donor List

Name	City	Contact	Email	Center	Gender	Organ	Blood
Amol Mogare	Nashik	9456236589	amolmogare@gmail.com	Ashoka Hospital-Nashik	Male	Liver	B+
Dinkar Bhosale	Mumbai	8786878984	dinkar@gmail.com	Bombay Hospital-Mumbai	Male	Kidney	A+
Dinkar mandle	Nashik	8786878984	dinkar@gmail.com	Bombay Hospital-Mumbai	Male	Kidney	B+
Rahul Vaidya	Nashik	9856321456	harsh@gmail.com	Ashoka Hospital-Nashik	Male	Liver	B+
Mayur Kadam	Nashik	8786878984	mayurk@gmail.com	Bombay Hospital-Mumbai	Male	Kidney	B+

Showing Page 1 of 4   First | Prev | 1 | Next | Last

Organ Donation Management System — Logout

Donor List

Name	City	Contact	Email	Center	Gender	Organ	Blood	Actions
Amol Mogare	Nashik	9456236589		Ashoka Hospital-Nashik	Male	Liver	B+	🗑
Dinkar Bhosale	Mumbai	8786878984		Bombay Hospital-Mumbai	Male	Kidney	A+	🗑
Dinkar mandle	Nashik	8786878984		Bombay Hospital-Mumbai	Male	Kidney	B+	🗑
Rahul Vaidya	Nashik	9856321456		Ashoka Hospital-Nashik	Male	Liver	B+	🗑
Mayur Kadam	Nashik	8786878984		Bombay Hospital-Mumbai	Male	Kidney	B+	🗑

Showing Page 1 of 4   First | Prev | 1 | Next | Last

Organ Donation Management System   ☛ Logout

➕ Add Patient Information

Name

Enter Your Name

City

Enter City Name

Date of Birth

Enter Date of Birth

Contact Number

Enter Contact Number

Email

test@admin.com

Center

Select Center

Blood Group

Select Blood group

Gender

Select Gender

Organ Name

Select Organ

💾 Save ↺ Reset ☰ Patient List

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Organ Donation Management System   ☛ Logout

➕ Add Patient Information

Name

Enter Your Name

City

Enter City Name

Date of Birth

Enter Date of Birth

Contact Number

Enter Contact Number

Email

test@admin.com

Center

Select Center

Blood Group

Select Blood group

Gender

Select Gender

Organ Name

Select Organ

💾 Save ↺ Reset ☰ Patient List

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Organ Donation Management System   ⟶ Logout

+ Add Center Information

Name

City

Enter Your Name

Enter City Name

Contact Number

Enter Contact Number

🖫 Save   ↺ Reset   ☰ Center List

Organ Donation Management System   ⟶ Logout

☰ Center List

Search

Name	City	Contact
Ashoka Hospiwtal-Nashik	Nashik	8786858483
Bombay Hospital-Mumbai	Mumbai	8090706050
Dinanath Mangeshkar Hospital	Pune	8652412356
Hiray Hospital	Nashik	9658623245
Jehangir Hospital-Pune	Pune	9898989796

Showing Page 1 of 2

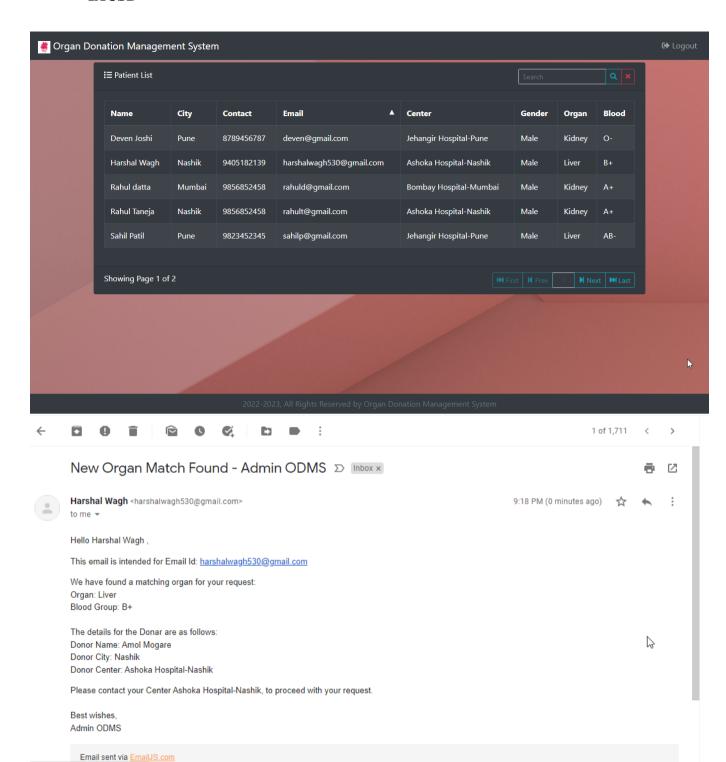◀◀ First   ◀ Prev   1   Next ▶   Last ▶▶

6. CONCLUSION

- Conclusion:

Thus we have successfully implemented organ donation database management which helps us in centralizing the data used for managing the tasks performed in an organ donation we have successfully implemented various functionalities of MySQL, ReactJs, and Spring Boot and created a fully functional database management system for organ donation.

- Future Scope:

This project can be enhanced further by adding live location of donors and patients and it will also possible to enhance the efficiency further by using graph data structure for finding shortest path on the basis of co-ordinates we get. The application is flexible enough to be modified and implemented as per future requirements. We have tried our best to present this organ donation matching application with intention to improve our nation's health care system.

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