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# INTRODUCTION

## Project Overview: -

Patients with severe liver disease or numerous clotting factor deficits, as well as those who have undergone trauma, burns, or shock, frequently get plasma. The patient's blood volume is increased as a result, which can aids in blood coagulation and helps to prevent shock. The number of people with Covid-19 infection has increased, as has the demand for the plasma of patients who have recovered. The antibodies that are already in our systems can aid someone in overcoming the infection.

Plasma donation saves lives, and donors' and blood/plasma facilities' communication is key to this. Smart apps are increasingly viewed as a crucial communication tool, and if they are created with the users' requirements and preferences in mind, plasma donation could make the best use of them.

## Purpose: -

In our opinion we intend to create an application that is user-friendly for people who require plasma or who wish to donate plasma to anyone who is in need.

However, during design and development, areas of concern including privacy and secrecy should be taken into account. Age was found to be a contributing factor that might reduce donors' propensity to use apps. This system is used if anyone needs a Plasma Donor.

This system comprises of Admin and User where both can request for a Plasma.

* Both parties can Accept or Reject the request.
* The person who wants to donate his/her plasma needs to register in our application providing required information which are name, age, blood group, phone number, and location, etc.
* Patients who need plasma can also fill the form to request the plasma. Patients can directly call the donor by taking his/her contact number from the application.
* User can also search based on location they are living

.  Just a single search allows anyone to reach maximum number of plasma donors in minimum possible time .

# LITERATURE SURVEY

## Existing Problem:

People have to find them physically by visiting hospitals register book and reaching out recovered donors’ home and sometimes they will be not available at their places and will be went on work. In this type of scenarios, diseased persons health gets more worsened. This is an expensive and will not work as effectively at emergency situations

Several experiments have been carried out over the years by different groups ofresearchers. Here are some of the following groups:

1. Denuis O'Neil (1999). "Blood component" Archived from the original onJune 5, 2013. Normally, certain amount of human body weight comes from blood. For adults, it is 4-6 liters of blood. This essential liquid plays an important role in transporting oxygen and nutrients to cells and removing carbon dioxide, ammonia and other waste products. Blood is a very commontissue composed of over 4000 different types of components.

2. Ways to keep your plasma healthy, Original Archived November 1, 2013, Accessed November 11, 2011. Plasma donation is one of the most accepted practices for saving lives, while earning a few dollars. The whole process can take some time, but it's well worth it once you experience it a few times. Accepting money in exchange for plasma is welcome. It's a move when you feellike you're not just a hero, but you're adding value to yourself. The term "healthy" does not mean only in the absence of disease. It also means that you are healthy enough.

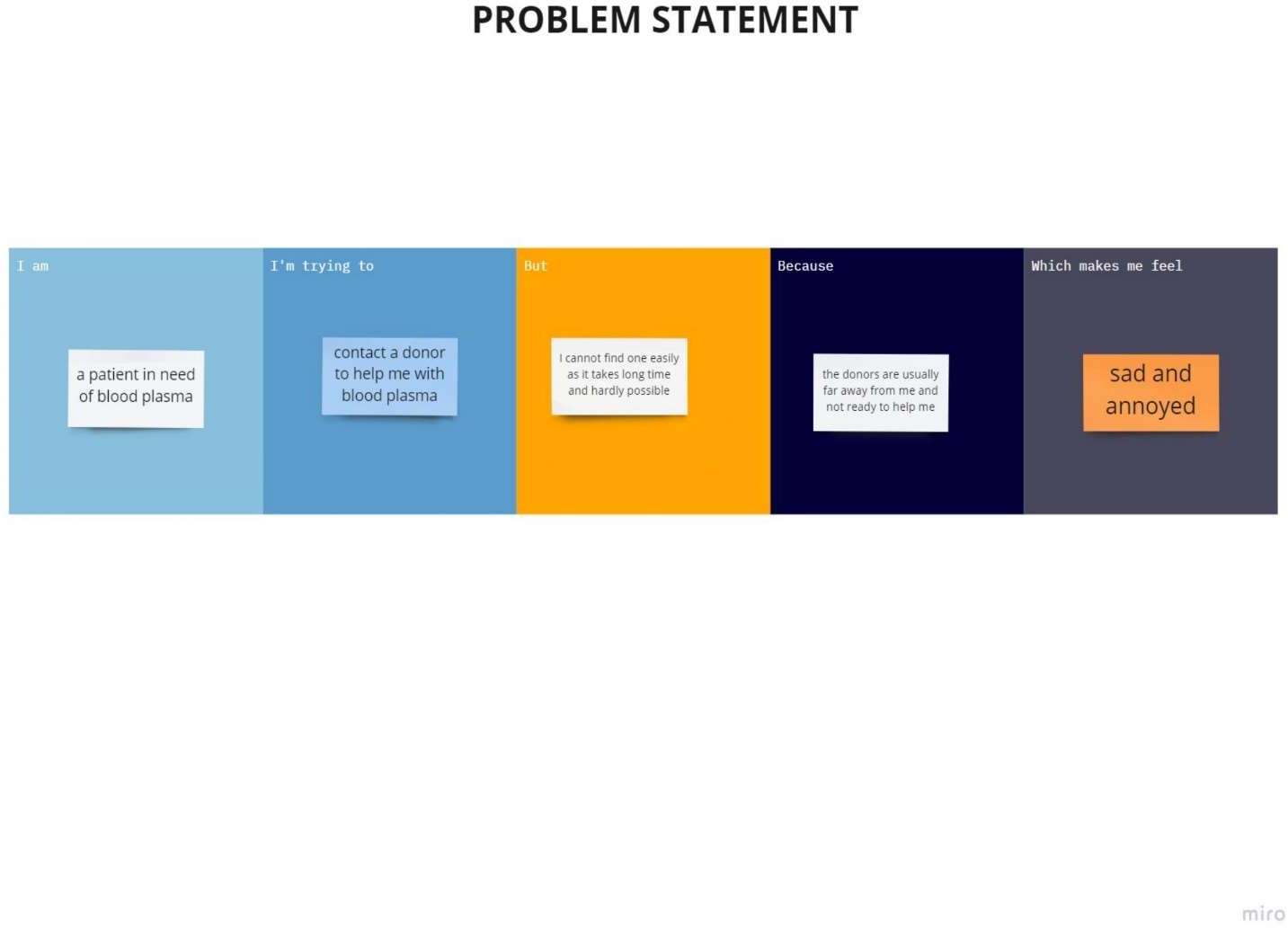
3. Ripathis S, Kumar V, Prabhakar A, Joshi S, Agarwal A (2015). "MicroscalePassive Plasma Separation: A Review of Design Principles and Micro devices," J. Micromech Micro 25 (8): 083001; Plasma separation is of great importance inthe fields of diagnosis and healthcare. Due to the lagging transition to micro scale, these recent trends are a rapid shift towards shrinking complex macro processes

4. Guo, Weijin; Hansson, Jonas; van der wijngaart, Wouter(2020).”Synthetic Paper Separates Plasma from Whole Blood with Low Protein Loss”. AnalyticalChemistry.92 (9): 6194-6199

5. CMR Technical Campus, India. Kalpana Devi Guntoju, Tejaswini Jalli, Sreeja Uppala, Sanjay Mallisetti(2022). The main goal of our project is to design a userfriendly web application that is like a scientific vehicle a rapidprocess to find plasma.

## References: -

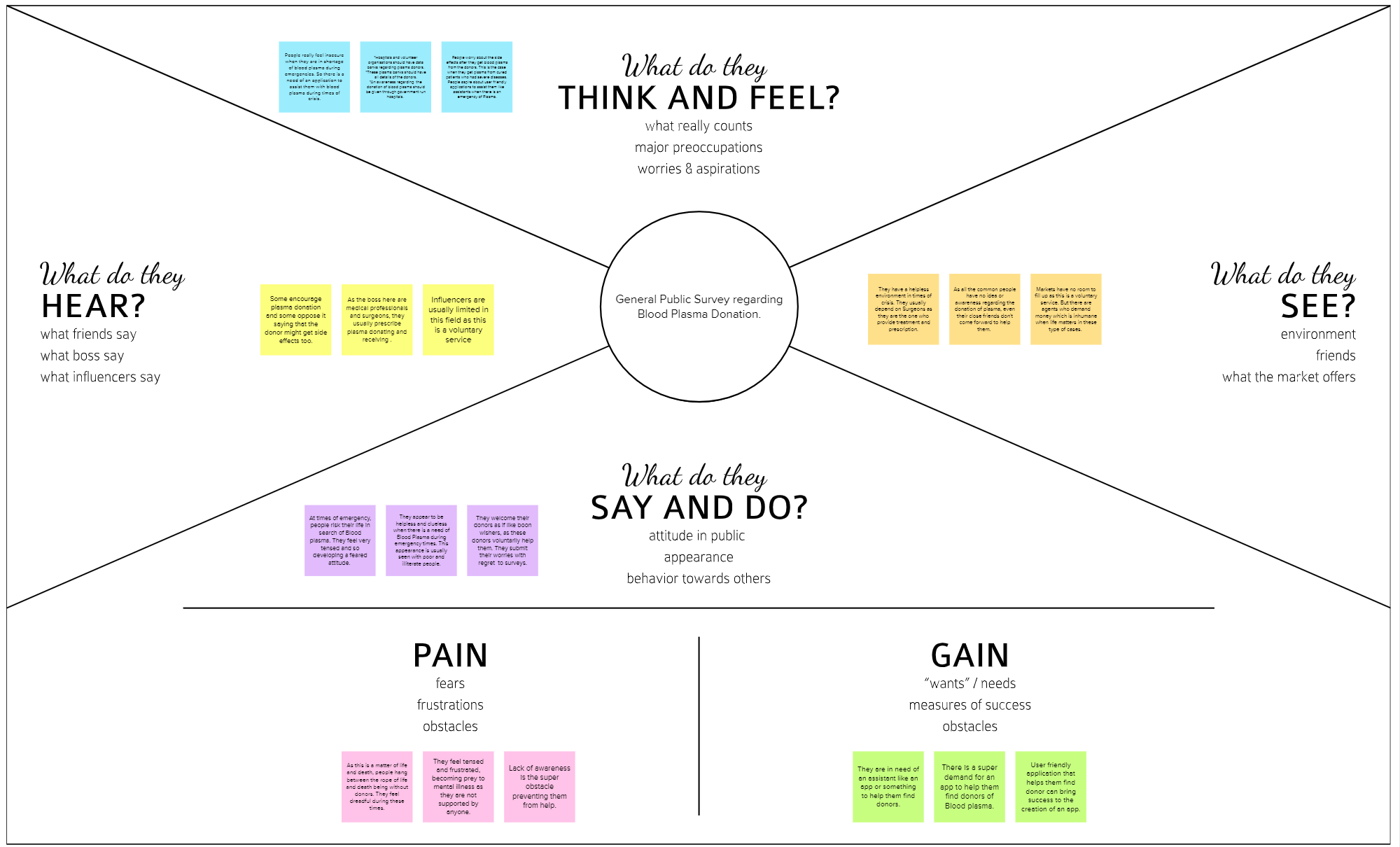
* 1. ***Problem Statement Definition: -***



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Problem Statement**  **(PS)** | **I am (Customer)** | **I’m trying to** | **But** | **Because** | **Which makes me**  **feel** |
| PS-1 | A patient in need of blood plasma | Contact a donor to help  me with blood plasma | I cannot find one easily as it takes  long time and hardly possible | The donors are usually far away  from me and not ready to help me | Sad and annoyed |

# IDEATION & PROPOSED SOLUTION

## 3.1. Empathy Map Canvas:-



***Ideation & Brainstroming:-***

Plasma is used for the treatment of serious health problems. This is why there are blood drives asking people to donate blood, plasma . Plasma is utilized to treat different irresistible sicknesses and it is one of the most established strategies known as plasma treatment. During Coronavirus emergency the necessity for plasma expanded radically as there were no immunization found to treat the contaminated patients, with plasma therapy the recovery rates where high but the donor count was very low and in such situations it was very important to get the information about the plasma donors. Saving the contributor data and telling about the ongoing givers would be some assistance as it can save time and assist the clients with finding the vital data about the contributors.

## Proposed Solution:-

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Parameter** | **Description** |
| 1. | Problem Statement (Problem to be solved) | People who are in need of plasma are increasing day by day. Plasma is necessary to help our body to recover from injury, distribute nutrients, remove waste and prevent infection, while moving throughout our circulatory system. It is not that people don’t want to donate plasma, but they have no idea where they can donate. We are designing a platform which contains all  the information regarding Plasma donation. |
| 2. | Idea / Solution description | Ours is a mobile application which aims to serve as a communication tool between plasma donation organizers and plasma donors. To become a member of our system, donors need to create their profile by providing their information like name, blood group, email address, phone number, password and exact location from ‘Google Map’, which are integrated with this application. This mobile app  always keep updating the location of the donor. |
| 3. | Novelty / Uniqueness | Users can submit their comments if they had any difficulties during donation process. This app  automatically keeps showing the plasma donors nearby. Donor will save the donor card digitally. |
| 4. | Social Impact / Customer Satisfaction | This app will make revolutionary changes to the medical system as people will be able to donate plasma and serve the mankind. It can also help the people to know about the benefits of plasma donation, so that their small contribution can  help one person to save his/her life. |
| 5. | Business Model (Revenue Model) | There are many private sectors and NGOs, who organize plasma donation camps. Even collaboration with companies like Biolife, and other pharmaceutical companies use plasma to make treatment for conditions such as immune deficiencies and bleeding disorder in order to  increase revenue. |
| 6. | Scalability of the Solution | This application has the ability to handle more donors and provide users with good user experience. It handles the traffic, responding  accurately and reacting to the growing number of requests. |

Application contains two roles:

 Admin

* If the user wants to donate or receive they have to register with their personal details.
* After successful registration of user.
* A successful registration email is send to the user.
* After successful registration user will be directed to home page.
* They will be asked to press whether they will be donor or receiver.
* If the user is donor then he/she will fill the donation interest form which includes their Name, blood group details, location, last time donated date , phone number, email id.
* After filling the donation form he/she will redirected to page in which he/she can download the ecertificate.
* If the user is receiver then he/she can see the list of donors available and they can raise their request and contact donor directly.

Admin:

* Admin can login using their credentials.
* Admin can edit the request.
* Admin can delete the request.
* Admin can add volunteers.

## Problem Solution Fit:-

#### Uniqueness:-

A User Interface is simple for users to understand. We can use the application anywhere anytime. The user immediately need the plasma for their treatment but the plasma is not available in nearby hospitals, then user can use this application to raise request and directly contact the donor , request them to donate the plasma. Hospitals can also raise request donors for donation. Somebody wants to donate blood and plasma but they don’t know the way to donate then they use this application which will simple to use and it will save lives of many people. Today many of them have mobile phones they can install this application and use it to save the lives of people.

# 

# REQUIREMENT ANALYSIS

## Functional Requirements:-

Following are the functional requirements of the proposed solution.

|  |  |  |
| --- | --- | --- |
| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | User Registration | Registration through Email and Social media accounts |
| FR-2 | User Confirmation | Confirmation via Email  Confirmation via OTP |
| FR-3 | User Login | Login through registered email id |
| FR-4 | User Examination | Medical Examination before donating |
| FR-5 | Recipient Request | The recipient makes request for blood type for plasma |
| FR-6 | Donor Request Alert | The Donor gets alerted through email |
| FR-7 | Closed Request Verification | Donor gets an e-certificate and rewards once donation  is completed |
| FR-8 | Videos and Donation camps | Users can look up the benefits of plasma donation and  information related |
| FR-9 | Chat Assistant | Helps to solve queries related to donation within the  app |

## Non- Functional Requirements:-

Following are the non-functional requirements of the proposed solution.

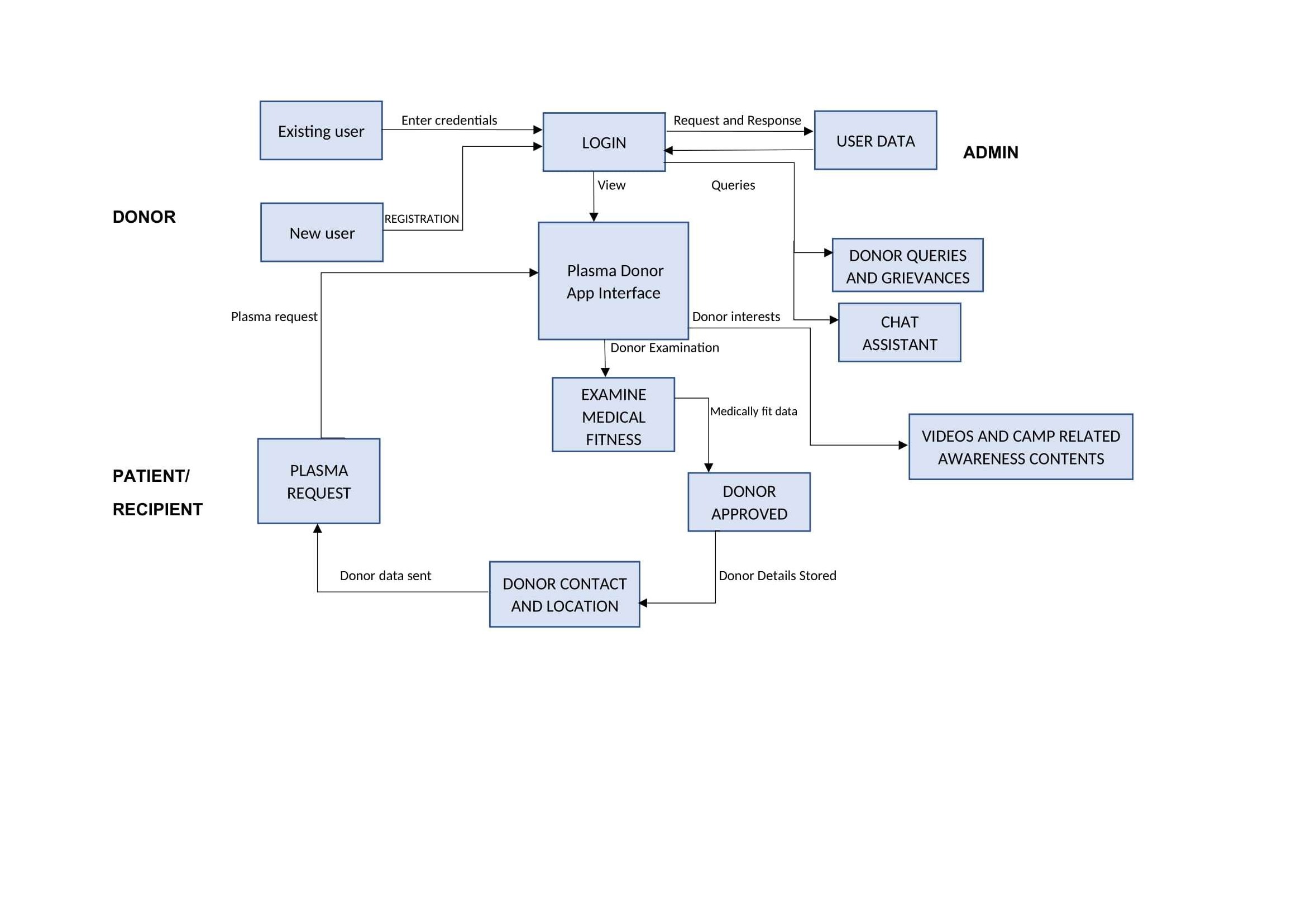
|  |  |  |
| --- | --- | --- |
| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | This app is easy to use, easy to learn and navigate. Tasks such as booking a donation appointment could be completed in few steps and no instructions  and training are required and this app is usable by people of all age group. |
| NFR-2 | **Security** | This is a secure web application plus a secure database system that provides a safe environment for patients, doctors and transplant centres to create online profile for patients seeking living donors of plasma. Fake login and bots are carefully  removed. |
| NFR-3 | **Reliability** | All information that the user enters into the app is voluntary and the user can cease the usage at any time and delete their profile. If the user has shared any information through social network portals, it can also be removed. This app creates a friendly  bond with the donors. |
| NFR-4 | **Performance** | There is no lag during usage and the user can experience a glitch free usage. The user also gets  route and tips on how to travel conveniently to the donation point. |
| NFR-5 | **Availability** | This App will be available on Google Play store and  App Store and also in web. |
| NFR-6 | **Scalability** | This App has ability to handle multiple donors at a time and provides users with good user experience and reacts fast according to growing number of  requests. |

# PROJECT DESIGN

## Data Flow Diagrams: -

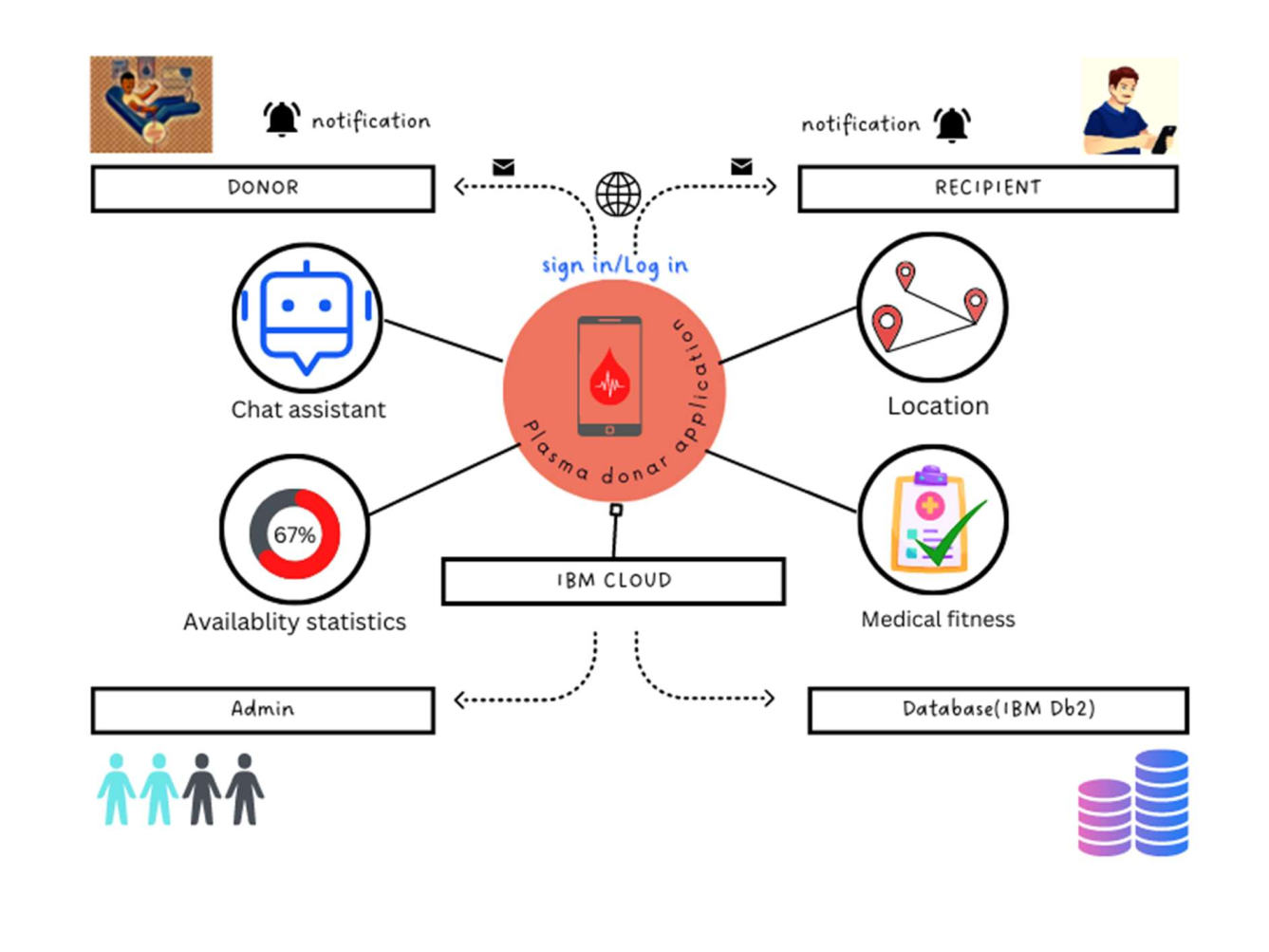
### Data Flow Diagrams:

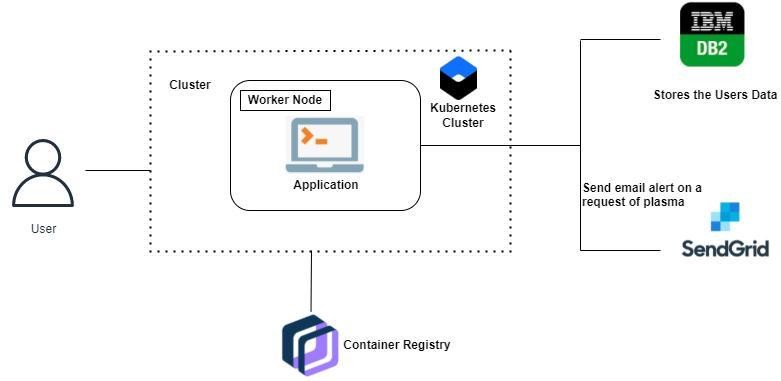
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFDcan depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



## Solution & Technical Architecture: -

Solution Architecture: -

Technical Architecture:-



***5.3 User Stories: -***

**User Stories:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **User Type** | **Functional**  **Requirement (Epic)** | **User Story Number** | **User Story / Task** | **Acceptance criteria** | **Priority** | **Release** |
| Customer (Mobile user) Donor | Registration | USN-1 | As a user, I can register for the application by entering my email, password, and confirming my password. | I can access my account / dashboard | High | Sprint-1 |
|  |  | USN-2 | As a user, I will receive confirmation email once I have registered for the application | I can receive confirmation email & click confirm | High | Sprint-1 |
|  |  | USN-3 | As a user, I can register for the application through Social media accounts | I can register & access the app with Social media  account | Low | Sprint-2 |
|  |  | USN-4 | As a user, I can register for the application through Gmail other Email services | I can register the app with email account | Medium | Sprint-1 |
|  | Login | USN-5 | As a user, I can log into the application by entering email & password | I can register and access user profile with Gmail account | High | Sprint-1 |
| Patient | Recipient | USN-6 | As a requester, I can request the blood group for which I need plasma | I can get plasma from donors when available | High | Sprint-2 |
| Customer (Web user)  Donor | Profile | USN-7 | As a user, I can see registration page, login page and chat bot for which the user can access to donate and to request for the  required blood group plasma. | I can login through email and social media account for registration. | Medium | Sprint-2 |
| Customer Care Executive | Help desk /User support for App | USN-8 | As a helpdesk supporter, I can solve the queries and grievances of the user | I can reply to queries and give solutions to problems | High | Sprint-3 |
| Administrator | Registration support | USN-9 | As an admin, I can view the database of the registered user | I can check and verify the registered user’s login  credentials | Medium | Sprint-4 |
|  | Dashboard | USN-9 | As an admin, I can manage plasma requests and other technical glitches in the app | I can check request  numbers and troubleshoot problems in the app | Medium | Sprint-4 |
| Chat Assistant | Dashboard | USN-10 | In addition to customer care executive, I can help with user’s queries within the app | I can reply to user’s queries in the app | Medium | Sprint-4 |

# PROJECT PLANNING AND SCHEDULING

# Sprint Planning

Sprints are the backbone of any good Agile development team. And the better prepared you are before a sprint, the more likely you are to hit your goals. Spring planning helps to refocus attention, minimize surprises, and (hopefully) guarantee better code gets shipped. The main event during agile methodology is the sprint, the stage where ideas turn into innovation and valuable products come to life. On one hand, agile sprints can be highly effective and collaborative. At the same time, they can be chaotic and inefficient if they lack proper planning and guidance. And for this reason, making a sprint schedule is one of the most important things you can do to ensure that your efforts are successful.

We categorized the sprint as 4 phases for creating the application

* + - Sprint 1 is about creating the login page and the register page.
    - Sprint 2 is about sending the confirmation mail to the users during registration.
    - Sprint 3 is about as a user, can log into application by entering email and password.
    - Sprint 4 is about as user, can register and make request for plasma donation via portal.

Milestone and Activity list

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Functional Requirement (Epic)** | **User Story Number** | **User Story / Task** | **Story Points** | **Priority** | **Team Members** |
| Sprint-1 | Simulation creation | USN-1 | Connect with python code | 2 | High | Ragamaliga D S  Shabana Ashmi M  Swarnadevi V  Abi R |
| Sprint-2 | Software | USN-2 | Creating an IBM Watsonin Cloud platform | 2 | High | Ragamaliga D S  Shabana Ashmi M  Swarnadevi V  Abi R |
| Sprint-3 | MIT App Inventor | USN-3 | Develop an Plasma donor application | 2 | High | Ragamaliga D S  Shabana Ashmi M  Swarnadevi V  Abi R |
| Sprint-4 | Dashboard | USN-4 | Design the Modules andtest the app | 2 | High | Ragamaliga D S  Shabana Ashmi M  Swarnadevi V  Abi R |
| Sprint-5 | Web UI | USN-5 | To make the user to interact with software. | 2 | High | Ragamaliga D S  Shabana Ashmi M  Swarnadevi V  Abi R |

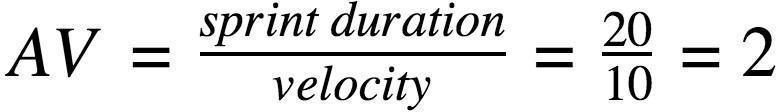
#### Sprint Estimation and Delivery Schedule:

**Project Tracker, Velocity & Burndown Chart:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Total Story Points** | **Duration** | **Sprint Start Date** | **Sprint End Date (Planned)** | **Story Points Completed (as on Planned End Date)** | **Sprint Release Date (Actual)** |
| Sprint-1 | 20 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 20 | 29 Oct 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 20 | 05 Nov2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 20 | 12 Nov 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 20 | 19 Nov 2022 |

**Velocity:**

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let’s calculate the team’s average velocity (AV) per iteration unit (story points per day) .



**Burndown Chart:**

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile [software development](https://www.visual-paradigm.com/scrum/what-is-agile-software-development/) methodologies such as [Scrum.](https://www.visual-paradigm.com/scrum/scrum-in-3-minutes/) However, burn down charts can be applied to any project containing measurable progress over time.

# CODING & SOLUTIONING

## SendGrid

SendGrid is a cloud-based SMTP provider that allows you to send email without having to maintain email servers. SendGrid manages all of the technical details, from scaling the infrastructure to ISP outreach and reputation monitoring to whitelist services and real time analytics.

SendGrid provides two ways to send email: through our SMTP relay or through our Web API. SendGrid provides client libraries in many languages. This is the preferred way to integrate with SendGrid. If you choose to use SendGrid without a client library, the Web API is recommended in most cases as it is faster, provides some beneft with encoding, and tends to be easier to use. SMTP provides many features by default, but is harder to setup.

### Web API

* + - The Web API has some advantages over SMTP:
    - If your ISP blocks all outbound mail ports and your only option is HTTP.
    - If there is high latency between your site and ours, the Web API might be quicker since it does not require as many messages between the client and server.
    - If you do not control the application environment and cannot install and configure an SMTP library.
    - If you build a library to send email, developing against a web API provides quicker development.

### SMTP Relay

* + - If you are integrating SendGrid with an existing application, setting up the application to use our SMTP relay is easiest, as it only requires modifying SMTP configuration.
    - Change your SMTP username and password to your SendGrid credentials.
    - Set the server host name to smtp.sendgrid.net
    - Use ports 25 or 587 for plain/TLS connections and port 465 for SSL connections.

#### Code:

*sendgridmail*

import sendgrid

import os

from sendgrid.helpers.mail import \*

api\_key = "SG.XetJv3WqSfyN2Jx\_PYI3YQ.QdmtXUQpcTpjqkFjR-6ptyXyp7k-rM92gYFdBMJzTfU"

sg = sendgrid.SendGridAPIClient(api\_key)

from\_email = Email("sabanaashmi22022002@gmail.com")

to\_email = To("dsraga7@gmail.com")

subject = "Your little efforts can give others second chances to live life."

content = Content("text/plain", "Thank you for choosing our plasma donor application for donating plasma. Your account has been created and one step ahead to go, please verify your email ID.")

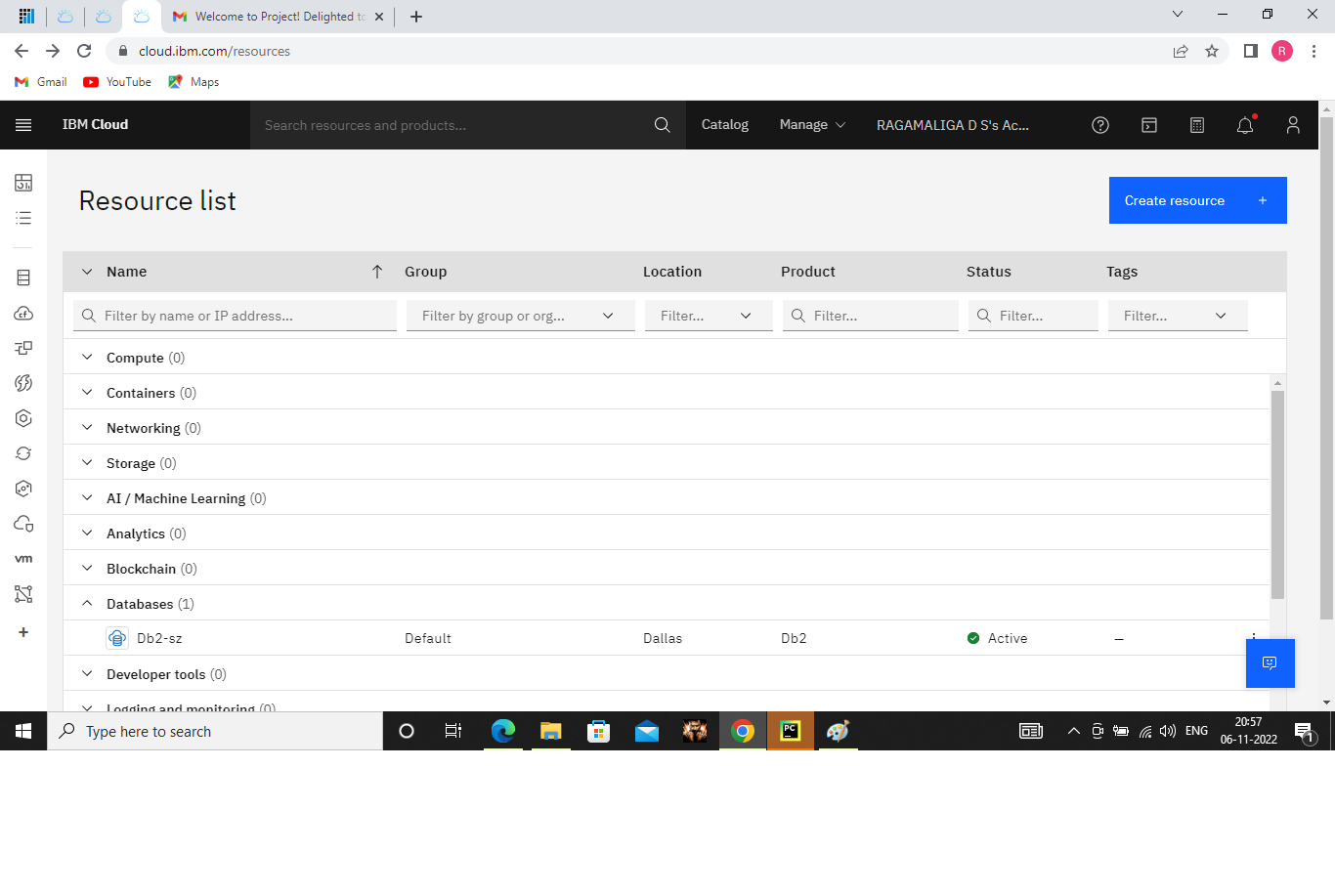
mail = Mail(from\_email, to\_email, subject, content)

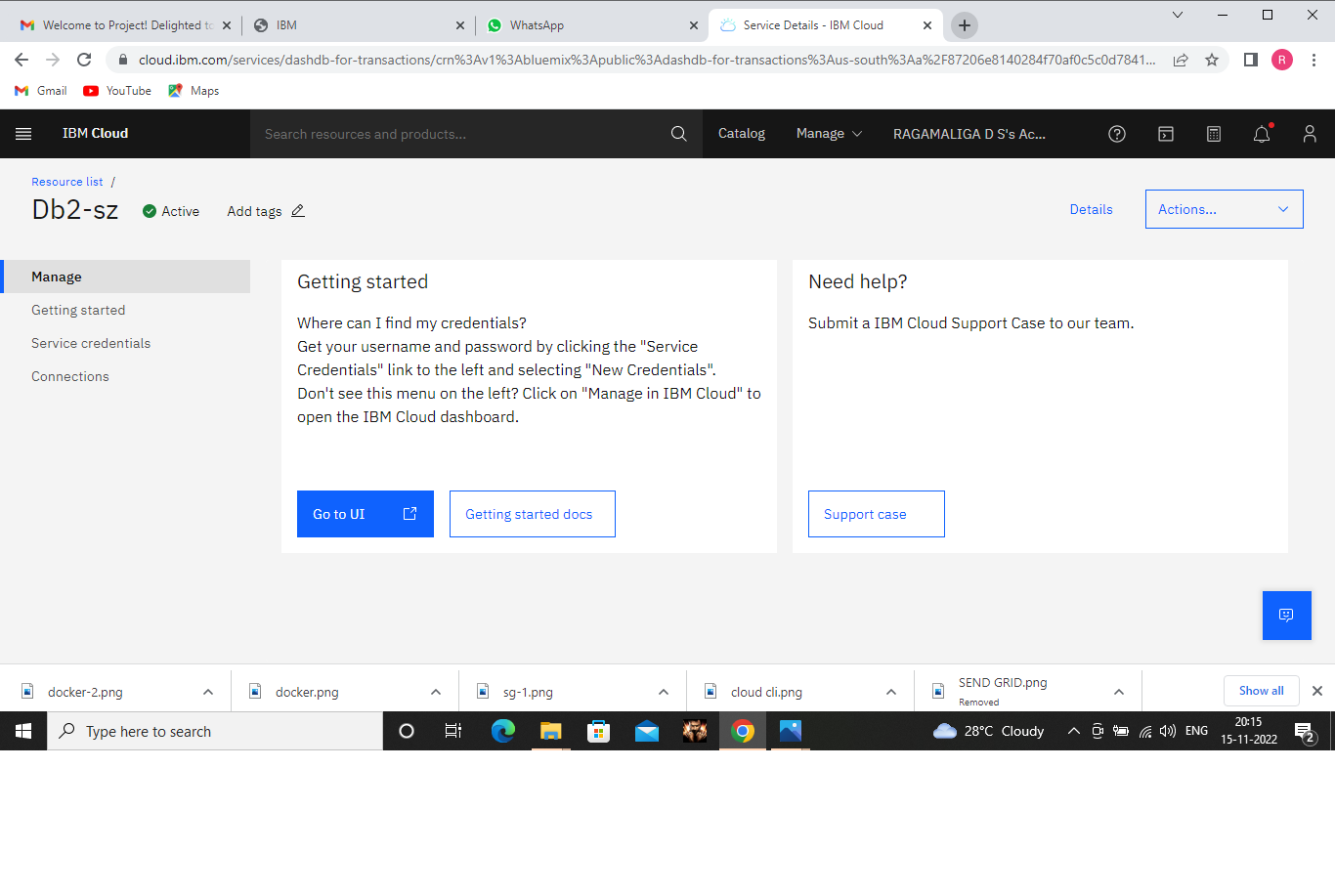
response = sg.client.mail.send.post(request\_body=mail.get())

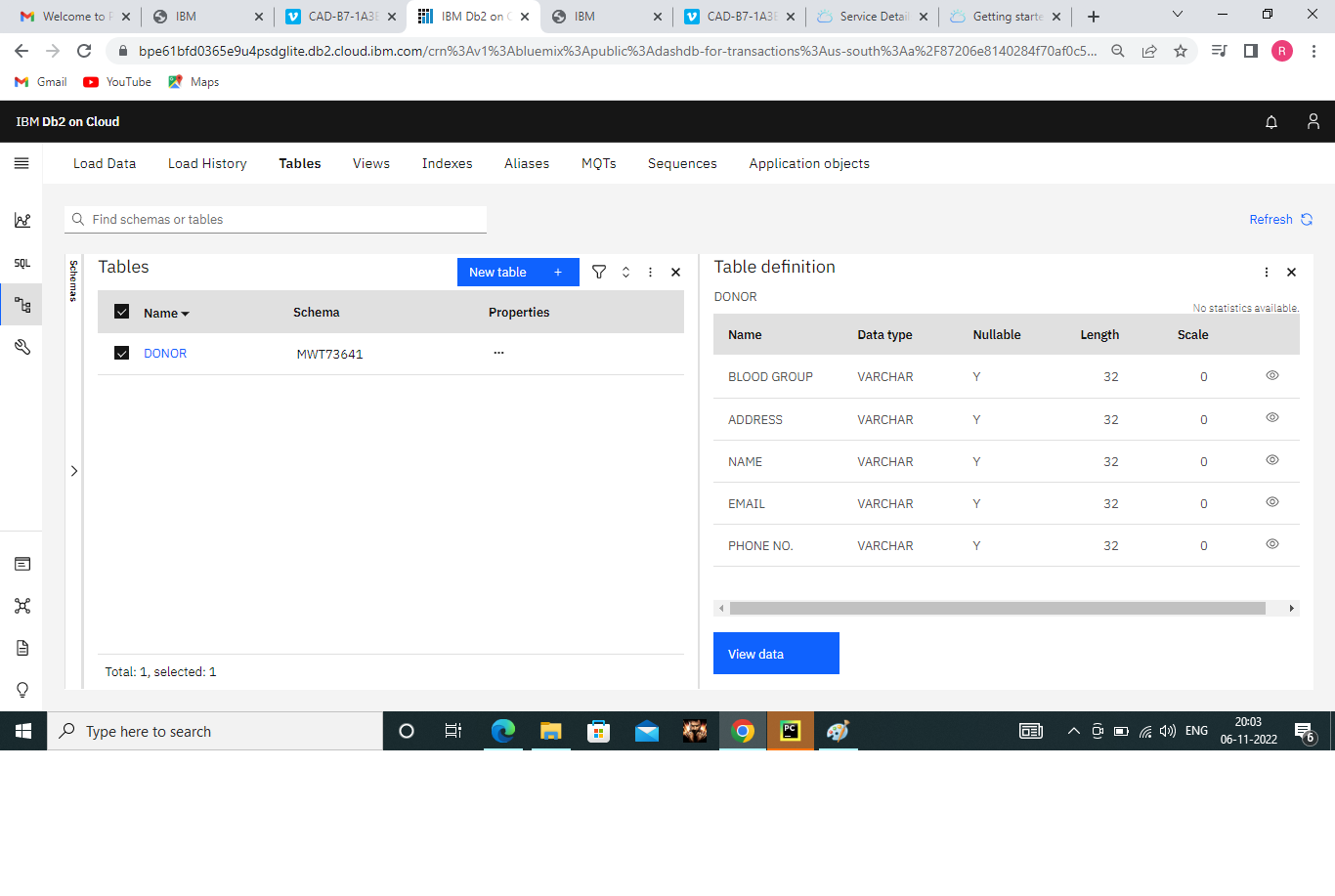
print(response.status\_code)

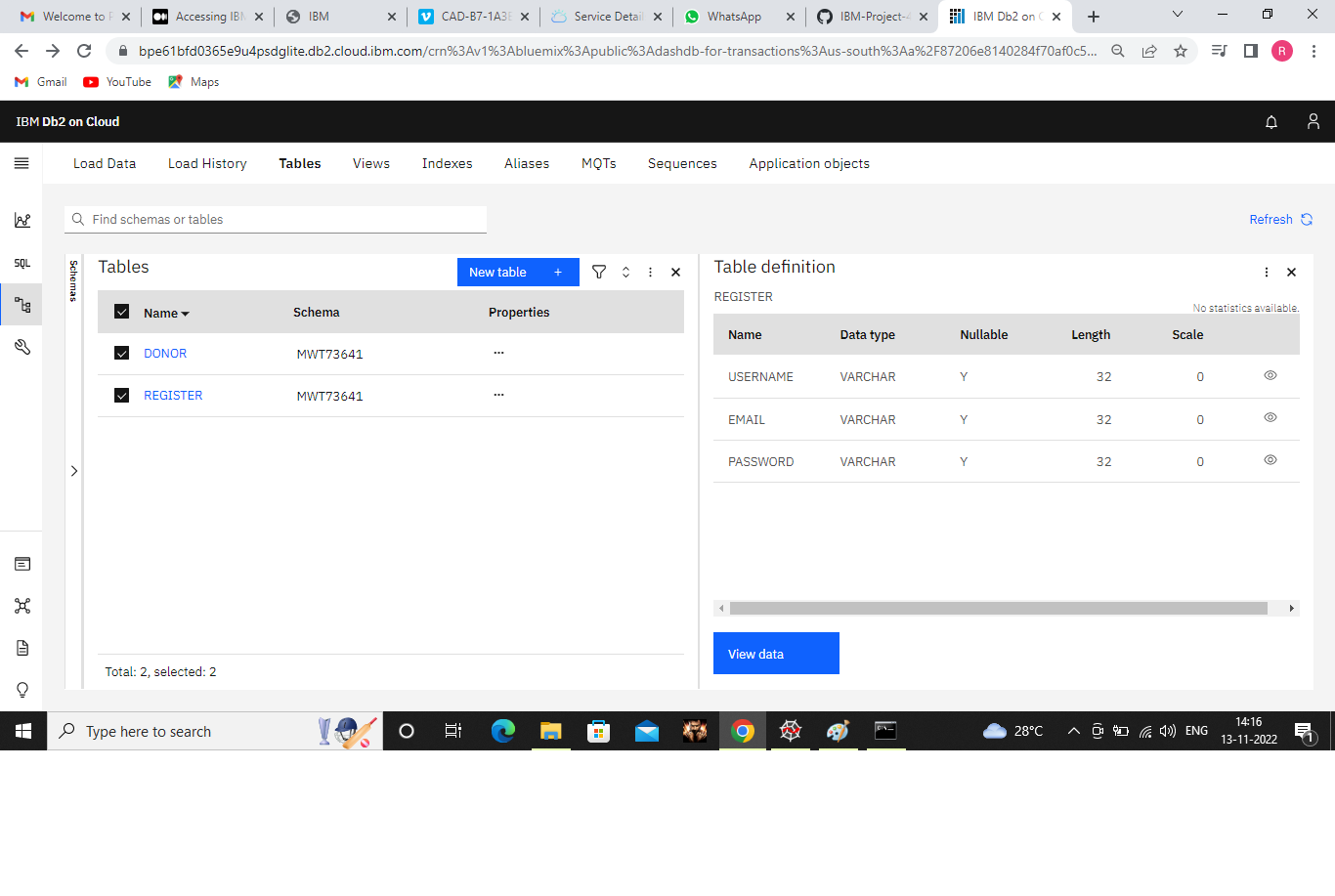
print(response.body)

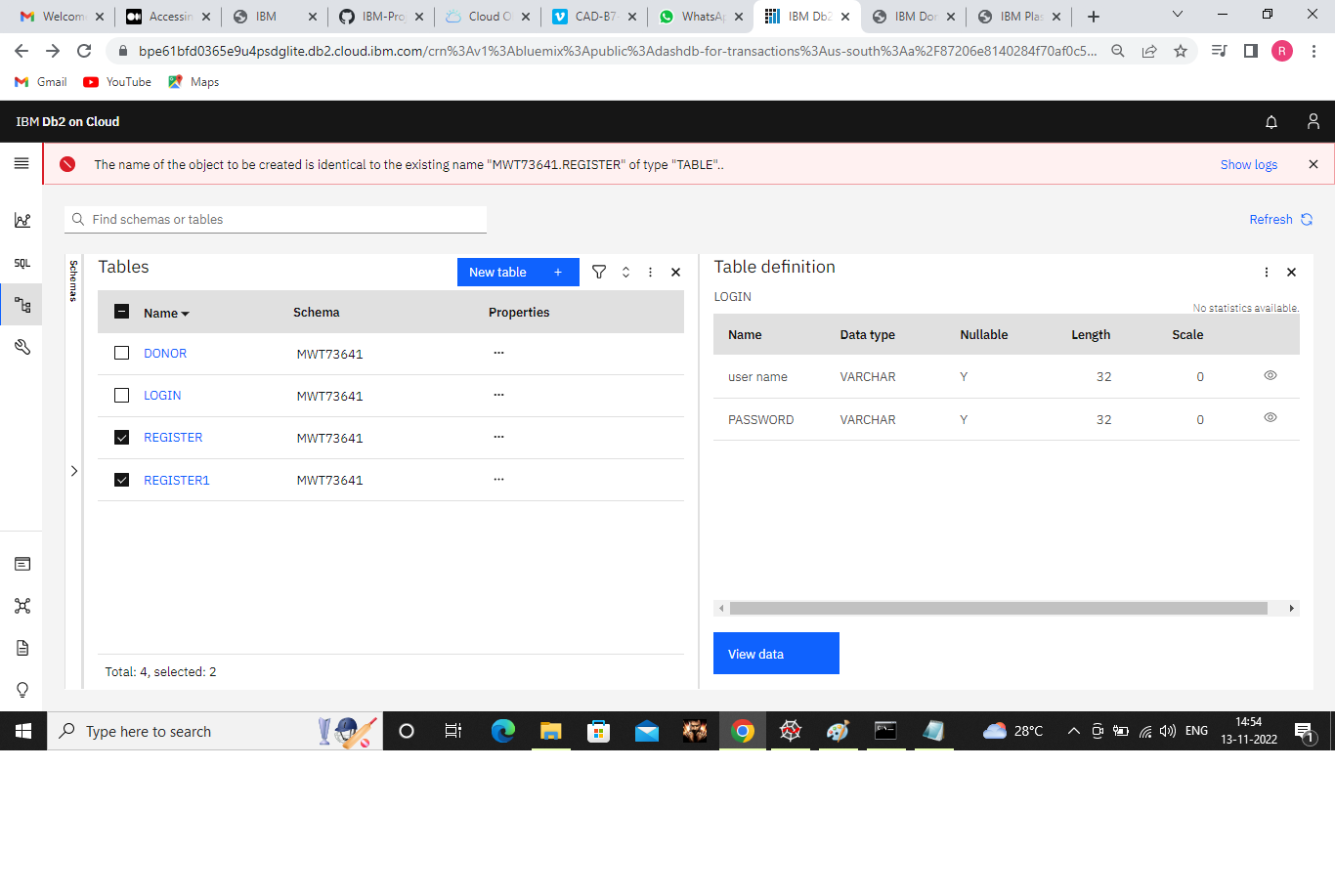
***Database Schema***

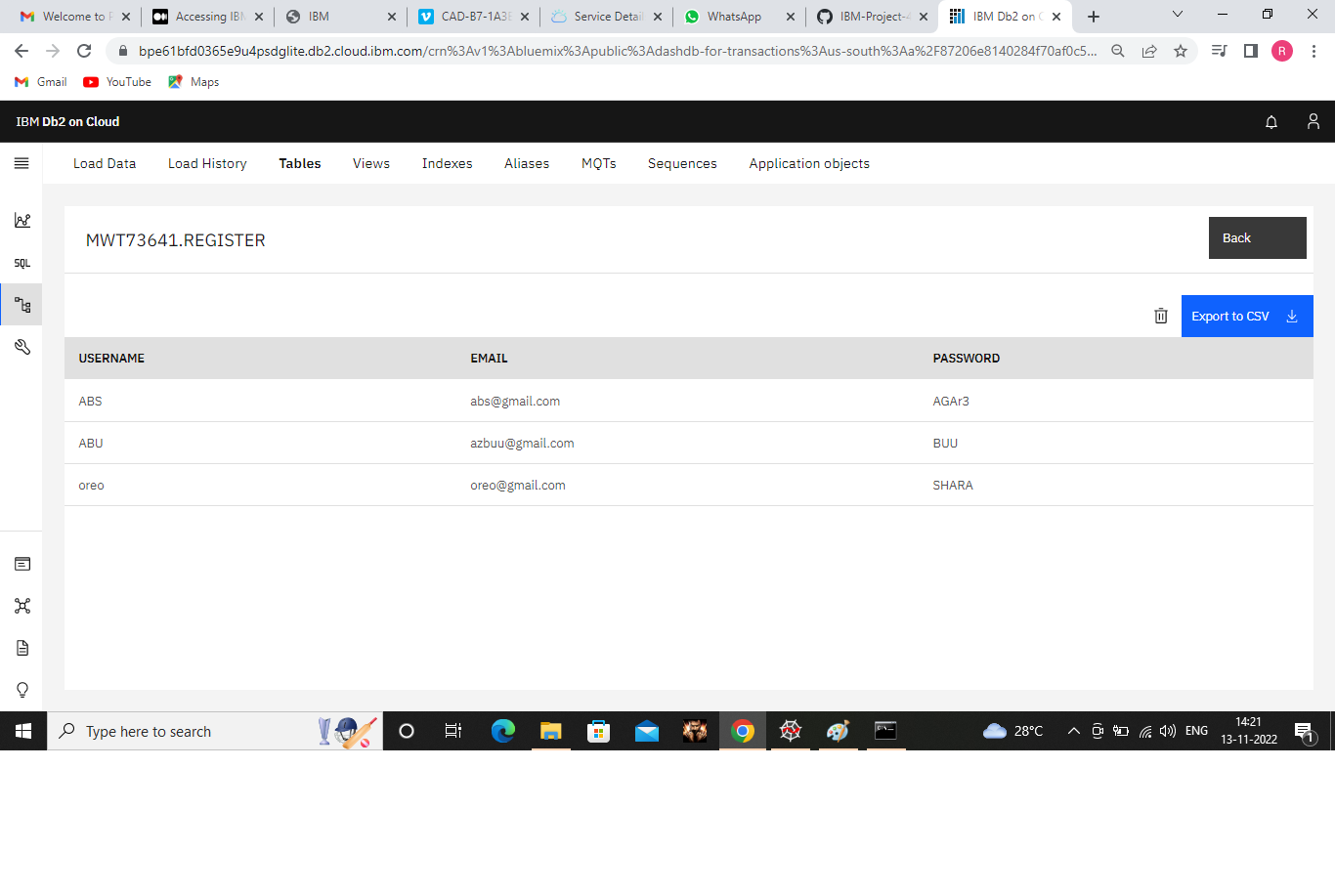












# RESULT

## Authentication Module

* + - Sign Up

New user or donor can create an account to use in the blood/plasma donor application and create a password for account verification and create an identity.

* + - Sign In

Donor Sign In to the account for viewing or editing location details and any other personal information.

* + - Account Verification

If donor changes their password or if they forget the password then we have to verify their account using mail verification.

#### Service Provider Module

* + - Add New Donor

User can be able to register to add donor details.

* + - List All Donor

User can be able to view all Donor who all use our Plasma Donor Application.

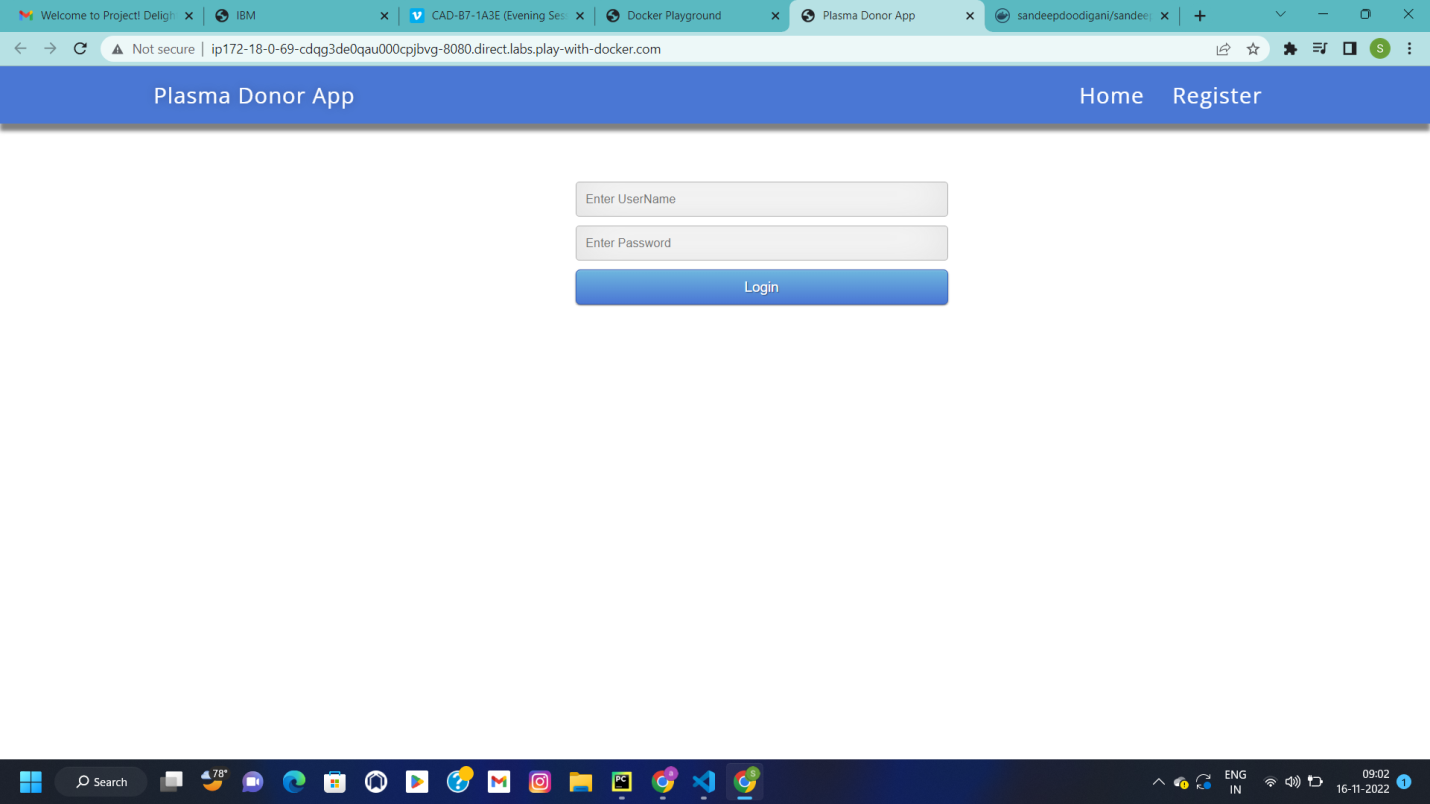
* + - Edit Customer Plan Details

User can be able to edit the existing Donor details as the Donor

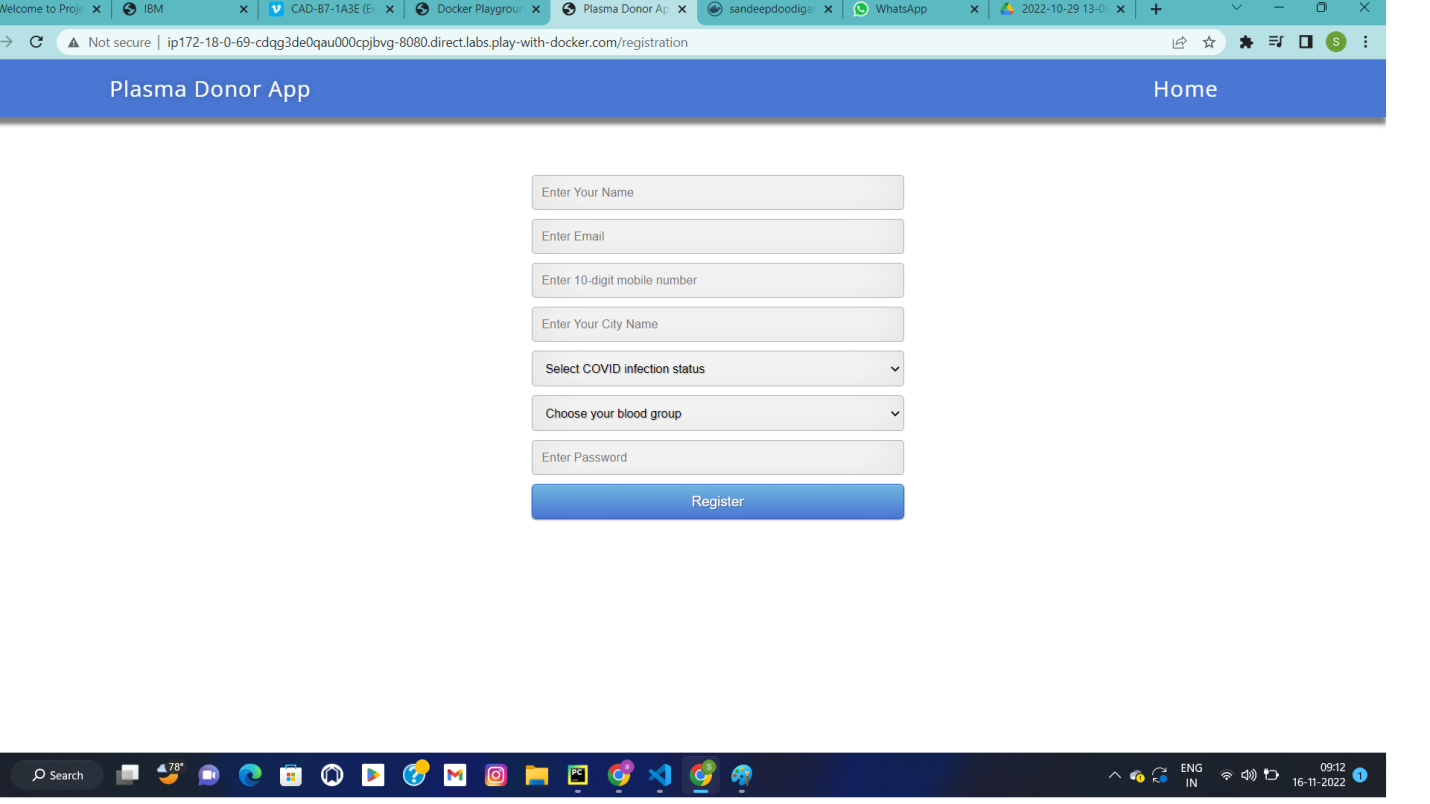
wish.

* 1. ***Screen Layouts***

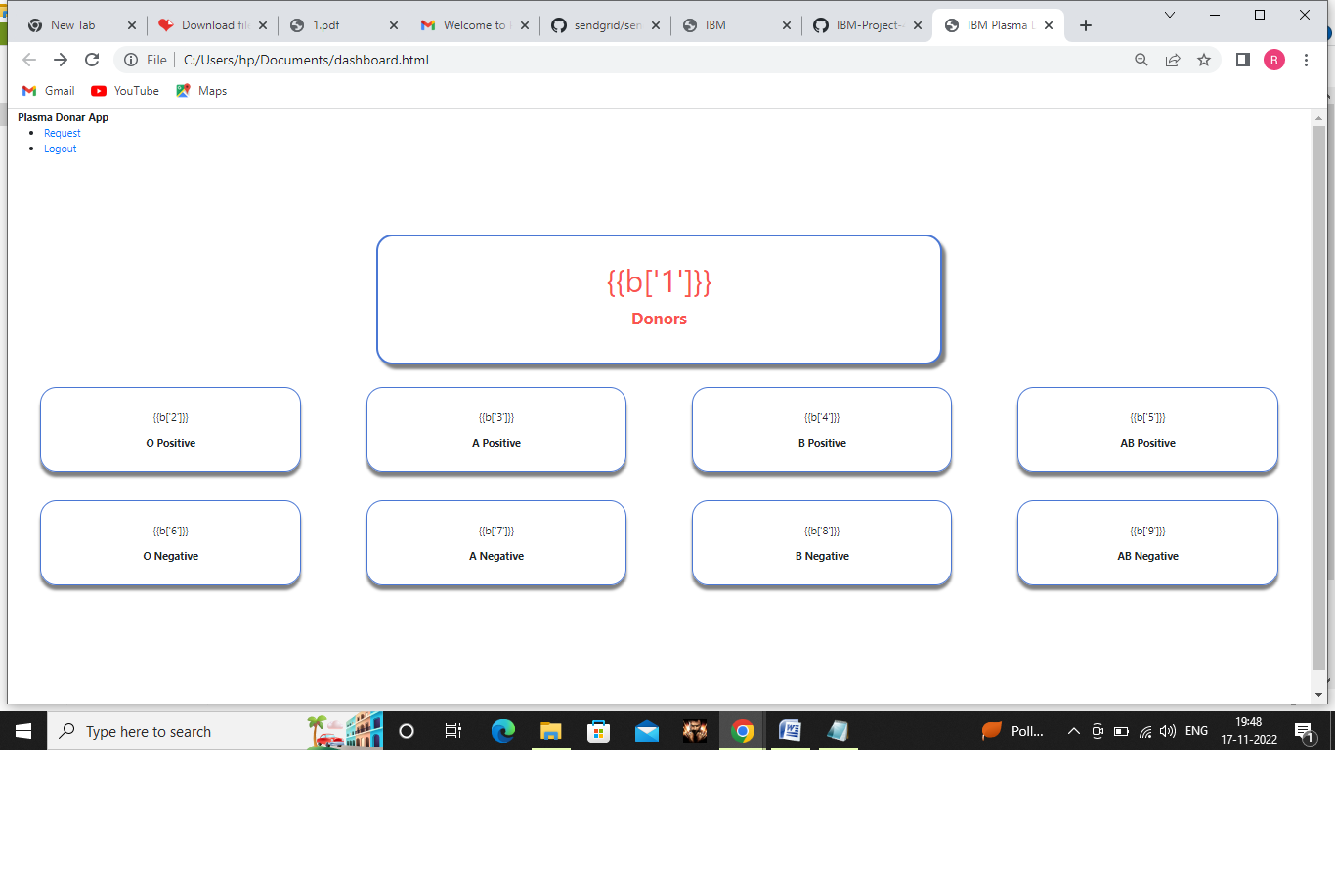
**Login page**

****

**Registration page**



**Home page**

****

The Donors can register their account using their email ID. Once registered, The Donor can sign-up by using his\her respective password. The login page for Plasma Donors is shown in the figure, which contains the E-mail and Password field. The profile of the Donor, where he/she needs to enter the required details. After registration Donor can maintain according to his availability. The registration page with Full Name, Email Address, Last donated date, Password, Contact Details, Blood Group, Location and all other details, which is illustrated. The details of the available donors can be displayed and viewed by other users.

# ADVANTAGES & DISADVANTAGES

#### Advantages

#### Speed

This website is fast and offers great accuracy as compared to manual registered keeping.

#### Maintenance

Less maintenance is required

#### User Friendly

It is very easy to use and understand. It is easily workable and accessible for everyone.

#### Fast Results

It would help you to provide plasma donors easily depending upon the availability of it.

## Disadvantages

#### Internet

It would require an internet connection for the working of the website.

#### Auto- Verification

It cannot automatically verify the genuine users.

# CONCLUSION

Although the government is carrying out Covid vaccination campaigns on a large scale, the number of vaccines produced is not enough for all the population to get vaccinated at present. And with the corona positive cases rising every day, saving lives has become the prime matter of concern. As per the data provided by WHO more than 3 million people have died due to the coronavirus. However, apart from vaccination, there is another scientific method by which a covid infected person can be treated and the death risk can be reduced. This plasma therapy is an experimental approach to treat corona- positive patients and help them recover. This plasma therapy is considered to be safe & promising. A person who has recovered from Covid can donate his/her plasma to a person who is infected with the coronavirus.

This system proposed here aims at connecting the donors & the patients by an online application. By using this application, the users can either raise a request for plasma donation or requirement. Both parties can Accept or Reject the request. User has to Upload a Covid Negative report to be able to Donate Plasma. This system is used if anyone needs a Plasma Donor Blood and Plasma donation is a kind of citizen's social responsibility in which an individual can willingly donate blood/plasma via our app. This Application has been created with the concept and has sought to make sure that the donor gives blood/plasma to community. This model is made user friendly so anybody can view and maintain his/her account. This application will break the chain of business through blood/plasma and help the poor to find donor at free of cost. This project will help new blood/plasma banks improve their services and progress from traditional to user-friendly frameworks.

# 11.FUTURE SCOPE

Plasma Application can be developed to further improve user accessibility via integrating this application with various social networks application program interfaces (APIs). Consequently, users can login and sign up using various social networks. This would increase number of donors and enhances the process of blood donation.

User interface (UI) can be improved in future to accommodate global audience by supporting different languages across countries. Data scraping can be done from different social networks and can be shown in the Blood/Plasma Request Feeds. Appointments can be synchronized with Google and Outlook calendars for the ease of users.

Donor and Beneficiary Stories feature aims to create a sense of belonging to the community. Donors will be able to view and share personal experiences about their donation; Beneficiaries can share their experiences of receiving blood transfusion which contributed to their improved health and lives.

Live Check-in Process feature aims to provide a better experience with regards to the waiting time when the user is in the process of donation. We hypothesise that a more efficient experience will help the user look forward to his blood/plasma donation appointments.

# 12.APPENDIX

***GitHub and Source code Link:*** [***https://github.com/IBM-EPBL/IBM-Project-45836-1660732630***](https://github.com/IBM-EPBL/IBM-Project-45836-1660732630)

***Project Demo Link*** ***:***

[***https://drive.google.com/file/d/12MAmFXfOQSMjX2tV-aOhlNE\_Ymdy1D9w/view?usp=drivesdk***](https://drive.google.com/file/d/12MAmFXfOQSMjX2tV-aOhlNE_Ymdy1D9w/view?usp=drivesdk)