

**IBM – NALAIYA THIRAN
PROJECT PLASMA DONOR
APPLICATION**

INDUSTRY MENTOR	NAVYA
FACULTY MENTOR	E. M. MALATHY
TEAM ID	PNT2022TMID53161
TEAM LEAD	ABHISHEK KUMAR YADAV
TEAM MEMBER	AMAN KHEMKA
TEAM MEMBER	JADAV RAJVEER
TEAM MEMBER	SAGAR SETH
TEAM MEMBER	RIDHAM VERMA

Project Report

INTRODUCTION

1.1 Project Overview

1.2 Purpose

LITERATURE SURVEY

1.3 Existing problem

1.4 References

1.5 Problem Statement Definition

IDEATION & PROPOSED SOLUTION

1.6 Empathy Map Canvas

1.7 Ideation & Brainstorming

1.8 Proposed Solution

1.9 Problem Solution fit

REQUIREMENT ANALYSIS

1.10 Functional requirement

1.11 Non-Functional requirements

PROJECT DESIGN

1.12 Data Flow Diagrams

1.13 Solution & Technical Architecture

1.14 User Stories

PROJECT PLANNING & SCHEDULING

1.15 Sprint Planning & Estimation

1.16 Sprint Delivery Schedule

1.17 Reports from JIRA

CODING & SOLUTIONING (Explain the features added in the project along with code)

1.18 Feature 1

1.19 Feature 2

1.20 Feature 3

1.21 Feature 4

TESTING

1.22 Test Cases

1.23 User Acceptance Testing

RESULTS

1.24 Performance Metrics

ADVANTAGES & DISADVANTAGES

CONCLUSION

FUTURE SCOPE

APPENDIX

Source Code

GitHub & Project Demo Link

1. INTRODUCTION

1.1 PROJECT OVERVIEW:

- Plasma is usually given to people who have experienced trauma, burns, or shock as well as people with severe liver disease or several clotting factor shortages. As a result, the patient's blood volume rises, aiding in blood coagulation and assisting in the prevention of shock. The need for recovered patients' plasma has grown along with the number of people with Covid-19 infection. Someone can fight against the virus with the help of the antibodies that are already present in their bodies.

- Plasma donation saves lives, and communication between donors and blood/plasma facilities is essential to this. Plasma donation could benefit the most from smart applications if they are developed with the users' needs and preferences in mind. Smart apps are increasingly seen as a critical communication tool.

1.2 PURPOSE:

This application's objective is It would be helpful to save the donor information and assist the less fortunate by informing the list of current donors. In response to the issue, an application that would collect donor information, store it, and notify donors upon request is being developed.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM:

- Plasma became significantly more necessary during the COVID 19 crisis. Plasma donation rates have dropped from an already pitiful 20% to a pitiful 11% on average. Any decrease in donations is concerning given that the labor-intensive manufacturing procedure required to fractionate plasma into the treatments patients depend on can take 7–12 months.

- Checking the donor history, including whether they had previously been infected and recovered as well as which donors are qualified to donate plasma, was a difficult task because it compounded the consequences of continuous decline. Additionally, it turned out to be a difficult task to save the information of healthy donors, contact interested patients, and connect donors with requestors.

2.2 REFERENCES:

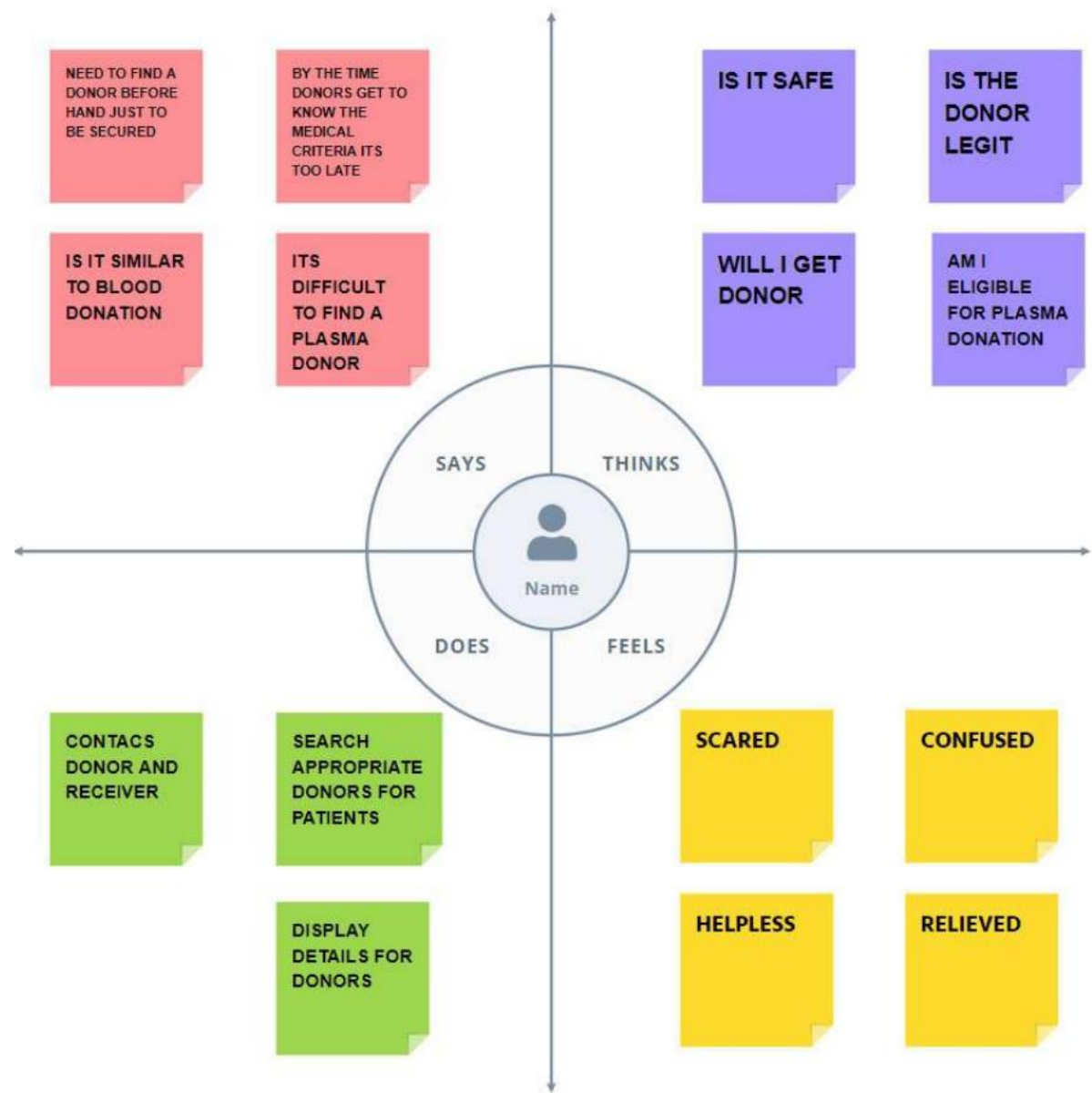
- T. Hilda Jenipha and R. Backiyalakshmi, "Android Blood Donor Life Saving Application in Cloud Computing" in American Journal of Engineering Research (AJER), 2014.
- 1]Javed Akhtar Khan and M. R. Alony, "A New Concept of Blood Bank Management System using Cloud Computing for Rural Area", International Journal of Electrical Electronics, vol. 4, no. 1, pp. 20-26, 2015 .
- Sagar Shrinivas, Vasaikar Vijay and Suresh Yennam, "Online Blood Bank Using Cloud Computing", International Journal of Advanced Research Ideas and Innovation In Technology, vol. 3, no. 1.
- Siva Shanmuga and N. Ch. S. N. Iyengar, "A Smart Application on Cloud-Based Blood Bank", Journal of Computer and Mathematical Sciences, vol. 7, no. 11, pp. 576-583, November 2016.
- P. Priya, V. Saranya, S. Shabana and Kavitha Subramani, "The Optimization of Blood Donor Information and Management System by Technopedia", International Journal of Innovative Research in Science Engineering and Technology An ISO 3297: 2007 Certified Organization, vol. 3, no. 1, 2014.

2.3 PROBLEM STATEMENT DEFINITION:

Plasma donation saves lives, and donors' and blood/plasma centres' 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. We intend to create an application that is user-friendly for those that require plasma. 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. The staff of the donation centre concentrated on the app's educational features and emphasised the value of its statistics, notifications, and reminders to donors.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS:



3.3 IDEATION & BRAINSTROMING:



3.4 PROPOSED SOLUTION:

- **Problem statement (problem to be solved)**

With the number of people affected by COVID-19 infection the demand for the plasma of recovered patients has gone up tremendously. This creates chaotic situation for everyone as this is very crucial because this may risk many lives. So, this situation needs a systematic and quick solution. Searching eligible donor would surely be strenuous job.

- **Idea/ Solution**

Smart application would be the perfect solution to manage donating and searching donors for plasma. So, this application searches perfect donor. The system works with the registration of a donor by providing the required details that gets stored in the database.

- **Novelty/ Uniqueness**

There exist applications that allow donors to register for donations. But our application also allow patients to register and the application searches the most eligible donor.

• Social impact/ Customer satisfaction

Due to Covid-19, supply to the plasma demand became a serious issue. This application aims to ease the procedure of finding the most eligible donor for the patient. Now the user will be able to donate and receive plasma donation with a lot of ease.

• Business model (revenue model)

1. Key partners: SSN and IBM both together will work to develop the application
2. Key resources: Resources for development are IDEs, IBM's database, several software, etc
3. Activities: The main activities include development of the application using flask, interfacing with IBM db2, SendGrid and hosting it on cloud.
4. Value proposition: Users will get a friendly GUI and will serve all the tasks. Data will be secure and privacy will be maintained.
5. Cost structure: No such cost is required. IBM provides the software. Except that, some software may require payments.
6. Revenue streams: NA
7. Customer segments: students, medical professionals, patients, donors
8. Customer relationships: There will be confidentiality within the users. All users will be treated with fair means.
9. Channels: The website application will be hosted on various social media platforms.

• Scalability of the solution

The application will be scalable in future also. This application could be used by NGOs and govt hospitals. Further, developers need to maintain and update the website for future requirements. New features will promote the application and will further attract more users.

3.4 PROBLEM SOLUTION FIT

Problem-Solution fit canvas 2.0		Purpose / Vision	
Define CS, fit into CC	1. CUSTOMER SEGMENT(S) Who is your customer? <ul style="list-style-type: none"> All kind of people who wish to contribute and avail blood plasma Blood banks and blood camps that store different kinds of blood plasma 	6. CUSTOMER CONSTRAINTS What constraints prevent your customers from taking action or limit their choices of solutions? <ul style="list-style-type: none"> Network connection. Available devices. Blood group constraints. Location Constraints. Donors reputability. Donors availability at required time. 	5. AVAILABLE SOLUTIONS Which solutions are available to the customers when they face the problem or need to get the job done? In existing solution there is no means of connecting the Donor and acceptor without another entity like hospitals or blood banks. In case there is a lack of availability of the required blood plasma in the specified blood bank or hospital the acceptor is limited and is completely constrained by the resources available in the blood bank. What have they tried in the past? Tried to access existing system without the help of internet limiting the options given to the user and often resulting in a costly or unavailability constraint that is not suitable for the user. What pros & cons do these solutions have? Connects the Donors and Users 24/7 using internet always ensuring that the requests are completed and even if the required request is not completed immediately it is given utmost importance based on the PCPS bank and providing service as soon as the required constraints are met.
	2. JOBS-TO-BE-DONE / PROBLEMS Which jobs-to-be-done (or problems) do you address for your customer? <ul style="list-style-type: none"> Connecting the Donors and Acceptors over the internet. Allowing users to request any blood plasma types to all available donors. Sorting Timely help when in need of plasma by any user. <p>There could be more than one; explore different sides.</p>	9. PROBLEM ROOT CAUSE What is the real reason that this problem exists? <ul style="list-style-type: none"> Lack of information/awareness required based on the need to donate blood and due to this the scarcity created in the blood banks and other factors like Covid-19, lockdowns affect this drastically. All the blood groups are not available in all the blood banks at all the time so limiting the survival chances of patients during emergency. Cost also plays a role where due to the emergency situation some people can also take advantage of this not being fair to every user. What is the back story behind the need to do this job? Lack of technology and availability of timely service was not available in the required time leading to around 12000 people deaths in India die due to the sheer lack of donated blood in India.	7. BEHAVIOUR What does your customer do to address the problem and get the job done? Directly related: When the User requires a specific blood plasma type they request for that specific blood plasma type and any donor that are available with the suitable type are notified. Indirectly associated: Contribute to the Blood banks available offline as well to update and cater to needs in places where internet connection is not possible or stable.
Focus on J&P, fit into BE, understand RC	3. TRIGGERS What triggers customers to act? <ul style="list-style-type: none"> Customers are expected to existing services provided for our application ensuring the timely and effective service catering to their needs during emergency which enforce them to depend and rely in our services when they are facing the same issues. Creating awareness in social platforms which allows more people to know about the issue and allow them to contribute and also avail the services when needed. 	10. YOUR SOLUTION The application we create will be able to connect the user and donor where the user can also become a donor if he wishes. When the user requests a specific blood plasma all the suitable donors of the particular blood type are notified.	8. CHANNELS OF BEHAVIOUR 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7 Sign-up and create a profile to either be a donor or an acceptor. Contact Donors with multiple access including Phone number and email services. Request Blood plasma at any time on their needs. 8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. Access local blood banks which is powered by our application who connects and allows the blood banks to not be limited by the availability of the specified plasma group in that particular bank.
	4. EMOTIONS: BEFORE / AFTER How do customers feel when they face a problem or a job and afterwards? <ul style="list-style-type: none"> When customers face a problem or a job they are often lost, scared, helpless, unstable and are in a hurry to get the required blood group. When they use our application to avail the blood they help in they feel safe and feel assured that their needs will be definitely satisfied and feel relieved. 		Extract online & offline CH&RE

Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. Created by Daria Napierkova / Amaltama.com

AMALTAMA

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Access Website	An application browser or something similar should be able to allow software operators to access web applications.
FR-2	Software operator Registration	The online application should allow the software operator to register. User name, gender, blood/plasma group, location, and contact information are required from the donor software operator.
FR-3	Login/logout/update details	The database will store the login details for further use.
FR-4	Search for donor	You can view the search results as a list. Each item on the list corresponds to a particular donor, complete with donor information.
FR-5	User plasma request	Filling out the request form on the page will allow users to submit a request to donate plasma. They will receive an email once the request has been submitted.
FR-6	View distribution details	The plasma bank should have access to the distribution details status.

4.2 NON-FUNCTIONAL REQUIREMENTS:

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

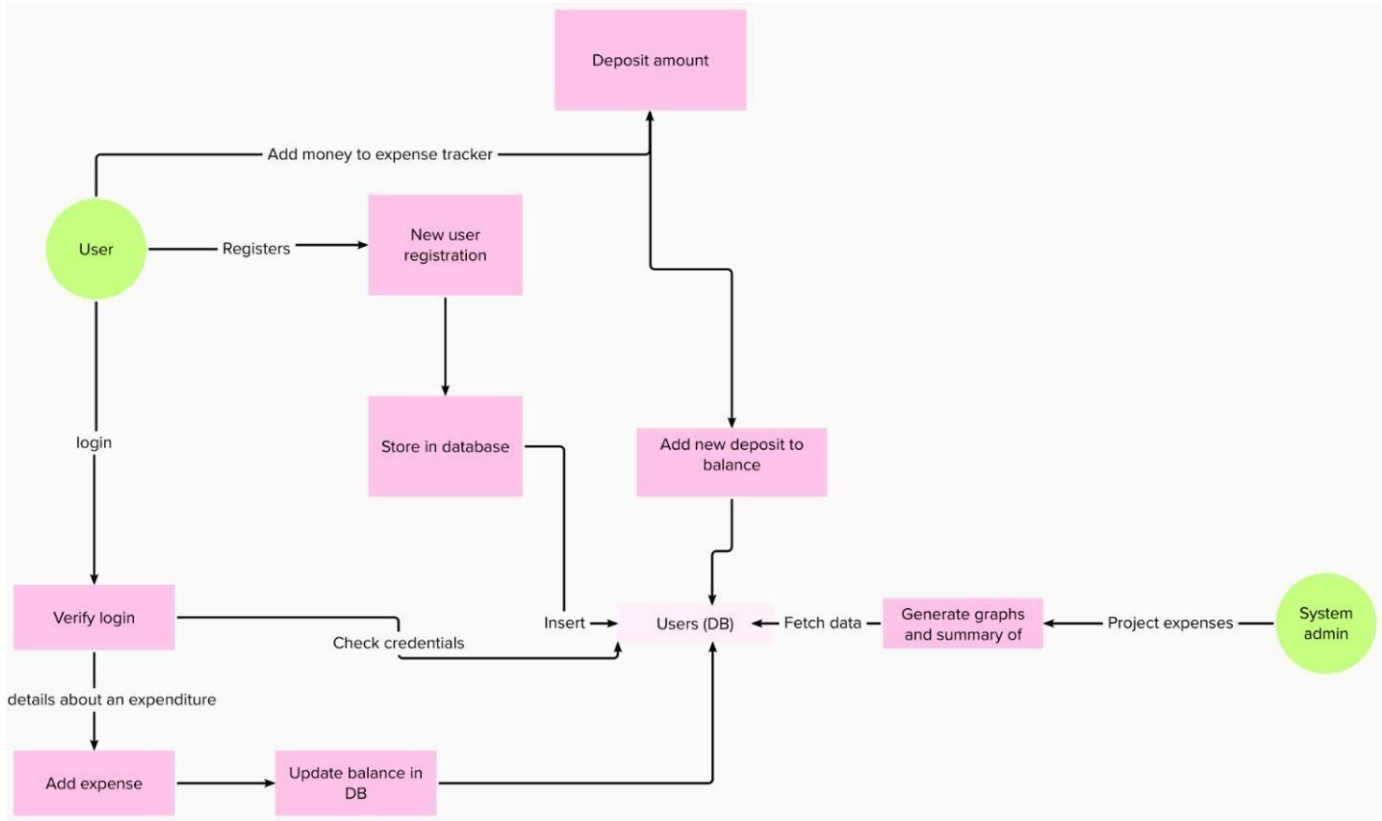
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The user interface of the plasma donor application needs to be attractive and functional.
NFR-2	Security	Proper user names and passwords must be used to safeguard the plasma donor application.
NFR-3	Reliability	Even when errors occur, the plasma donor application should function successfully.
NFR-4	Performance	The plasma donor application needs to function well under a variety of circumstances.
NFR-5	Availability	The plasma donor application needs to be accessible around-the-clock without any bandwidth problems.
NFR-6	Scalability	The performance and cost of the plasma donor application should be able to alter in response to modifications in the requirements for application and system processing.

5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can 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.

DFD-0



5.2 SOLUTION & TECHNICAL ARCHITECTURE:

S. No	Component	Description	Technology
1.	User Interface	The interaction between the user and application e.g., Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Bootstrap etc.
2.	Application Logic-1	Framework used for design the application.	Python, Python - Flask
3.	Application Logic-2	Accessing the cloud and storing the details of the users both donors and patients.	IBM Cloud, IBM DB2
4.	Application Logic-3	Docker is an open-source platform for building, deploying, and managing containerized applications.	Docker

5.	Database	Data Type, Configurations etc.	SQL.
6.	Cloud Database	Database Service on Cloud	IBM Cloud, IBM DB2 etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	They make it easier for developers to store, manage and deploy container images.	Container Registry
9.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud	Local, Cloud Foundry, Kubernetes, etc.

5.3 USER STORIES:

User Type	Functional Requirement (Epic)	User Story Number	User Story/ Task	Acceptance Criteria	Priority	Release
Recipient	Registration	USN-1	I can sign up for the application as a user by providing my email address, a password, and a password confirmation.	I can access my account / dashboard	High	Sprint-1
Recipient	Verification	USN-2	I will receive a confirmation email as a user once I've signed up for the application.	I can receive confirmation email.	High	Sprint-1
Recipient	Notification	USN-3	The application will let me know whether there is a matching donor, as a user.	The app allows me to get notifications.	Medium	Sprint-2

Recipient	Notification	USN-4	In a nearby hospital, I'll be able to get plasma.	I'll be able to contact the Donor.	High	Sprint-2
Donor	Registration	USN-5	I can sign up for the application as a user by providing my email address, a password, and a password confirmation.	I can access my account / dashboard	High	Sprint-3
Donor	Verification	USN-6	I will receive a confirmation email as a user once I've signed up for the application.	I can receive confirmation email.	High	Sprint-3
Donor	Notification	USN-7	I will receive notification of a plasma request through the application as a user.	The app allows me to get notifications.	Medium	Sprint-4
Donor	Notification	USN-8	I will be informed as a user of any nearby plasma blood banks.	I'll be able to contact the Recipient.	Medium	Sprint-4

6. PROJECT PLANNING & SCHEDULE

6.1 SPRINT PLANNING & ESTIMATION:

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

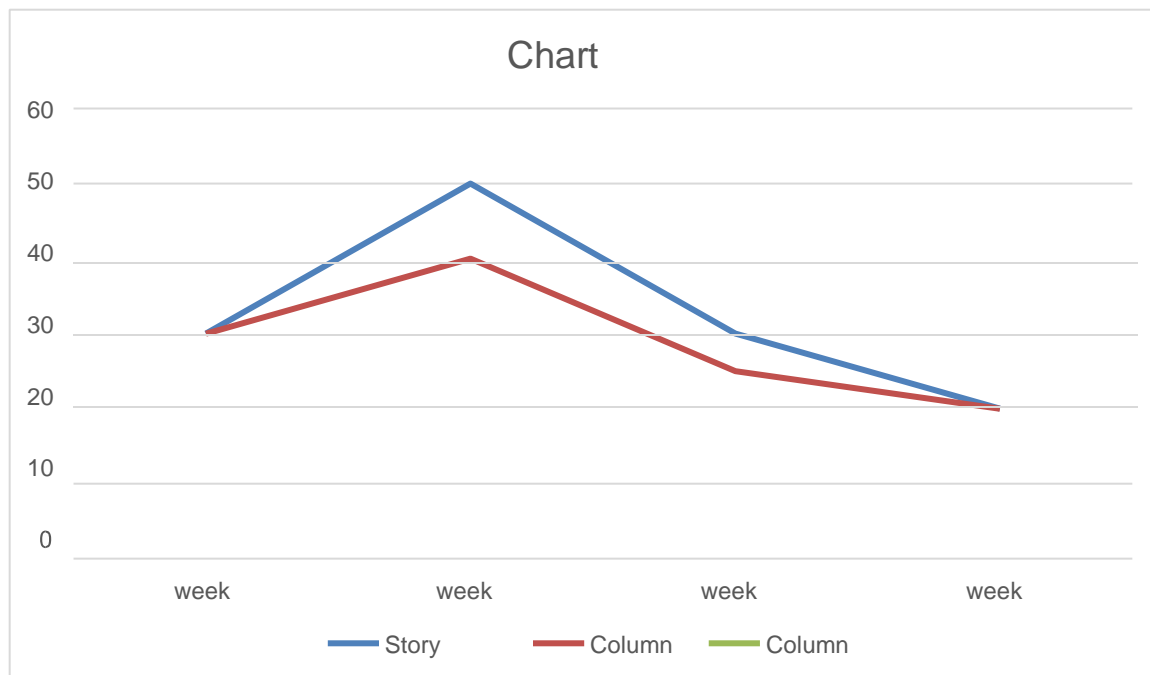
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

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)

$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

Burndown Chart:

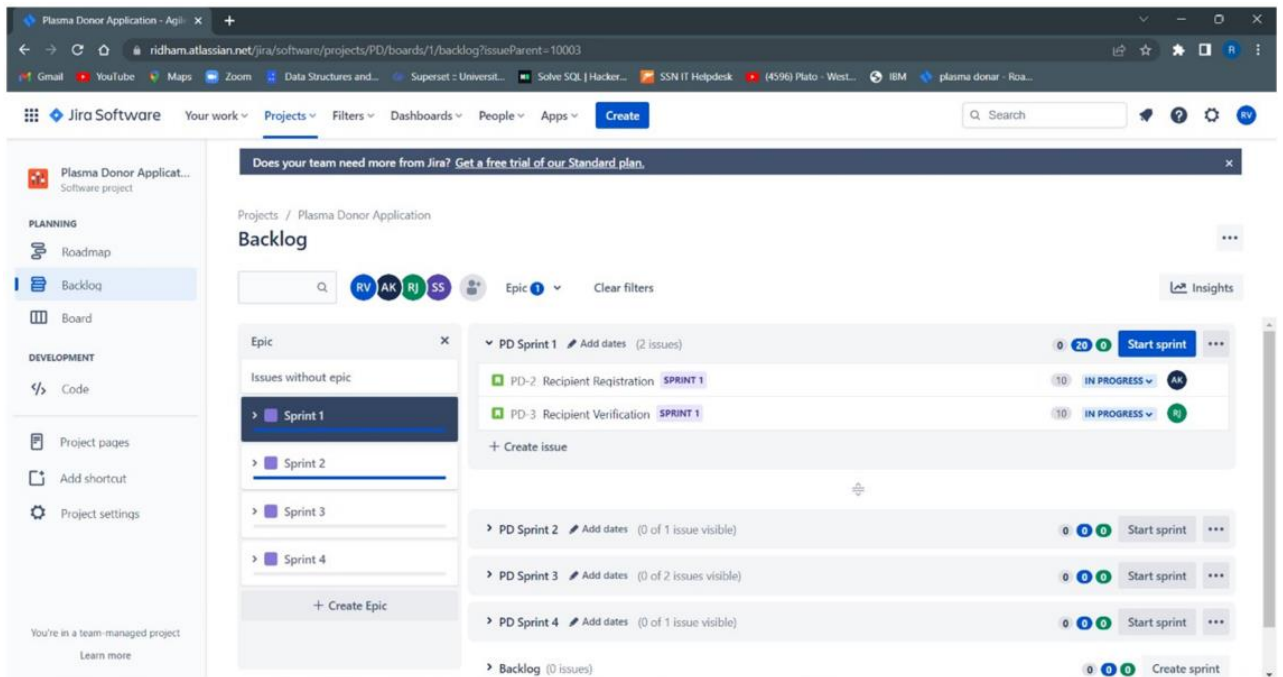
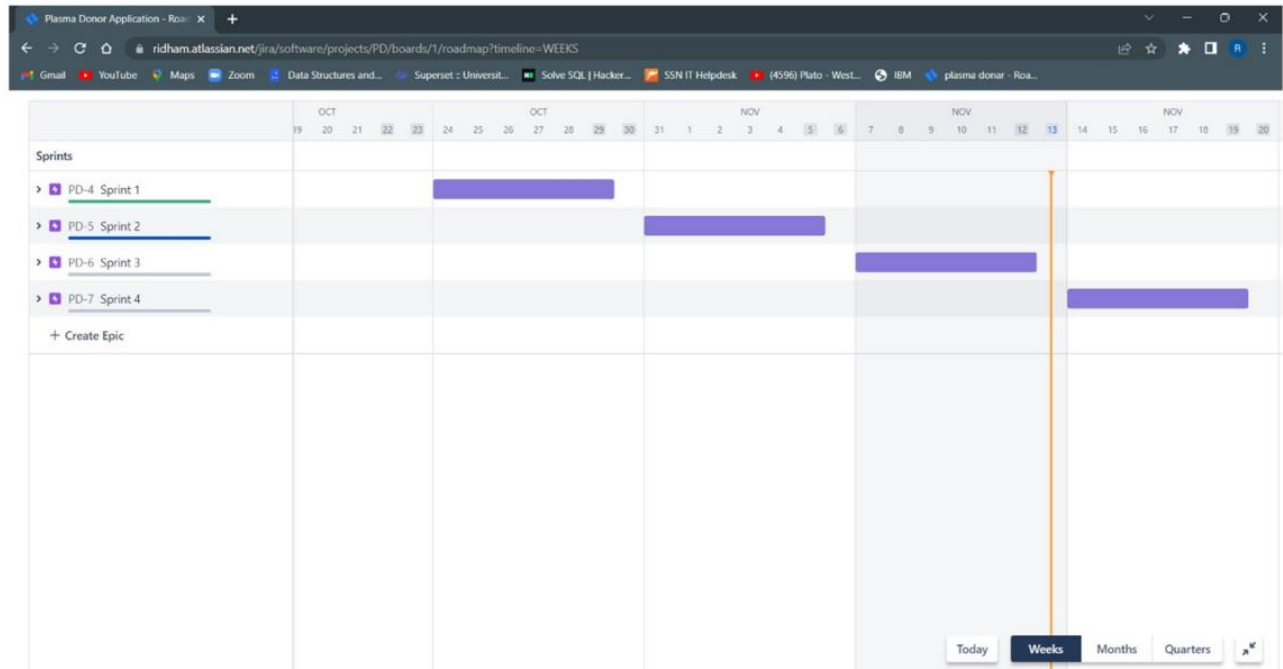


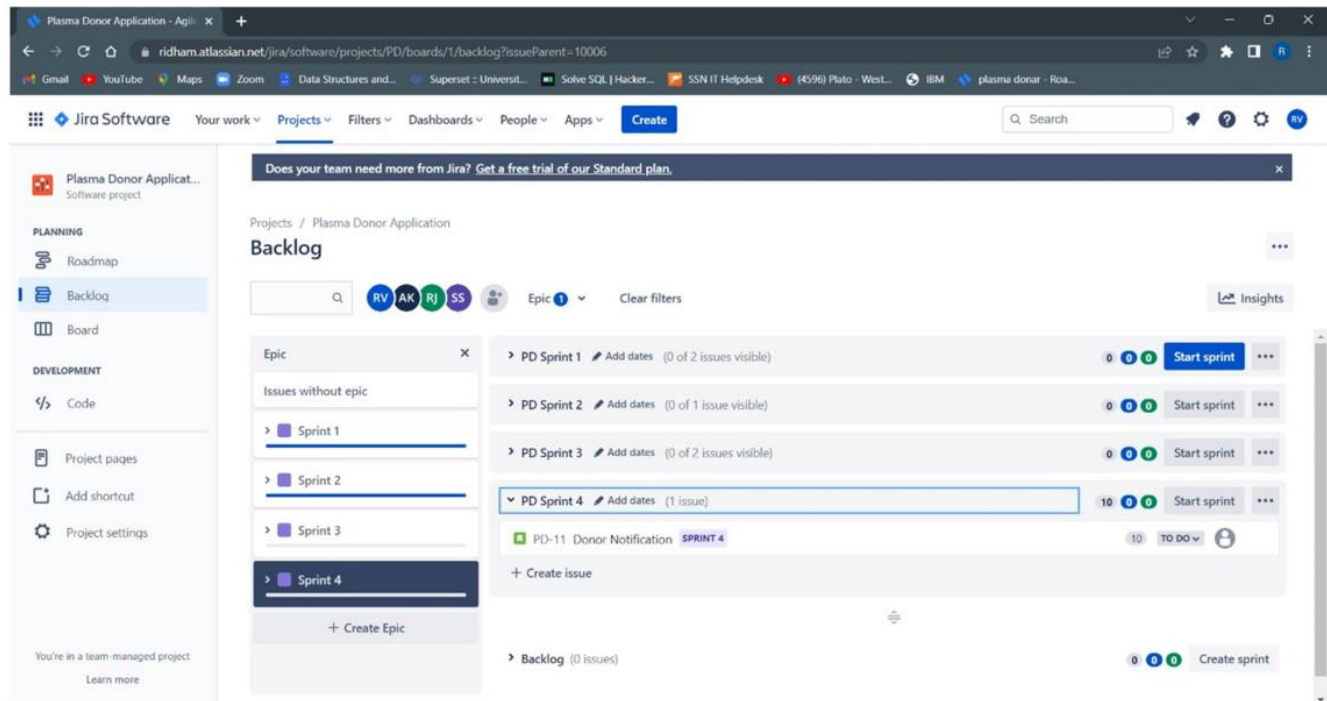
6.2 SPRINT DELIVERY SCHEDULE:

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Recipient Registration ⁹	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	10	High	Abhishek, Sagar Seth, Aman khemka
Sprint-1	Recipient Verification	USN-2	As a user, I will receive confirmation email once I have registered for the application	10	High	Sagar Seth and Rajveer
Sprint-2	Recipient Notification	USN-3	The application will let me know whether there is a matching donor, as a user.	10	Medium	Ridham and Rajveer
Sprint-2	Recipient Notification	USN-4	In a nearby hospital, I'll be able to get plasma.	10	High	Abhisekh, Ridham, Aman khemka
Sprint-3	Donor Registration	USN-5	I can sign up for the application as a user by providing my email address, a password, and a password confirmation.	10	High	Sagar Seth and Rajveer
Sprint-3	Donor Verification	USN-6	I will receive a confirmation email as a user once I've signed up for the application.	10	High	Ridham and Abhisek
Sprint-4	Donor Notification	USN-7	I will receive notification of a plasma request through the application as a user.	10	Medium	Ridham, Rajveer, Aman khemka
Sprint-4	Donor Notification	USN-8	I will be informed as a user of any nearby plasma blood banks.	10	Medium	Abhisekh and Sagar Seth

6.3 REPORTS FROM JIRA:





7. CODING & SOLUTIONING

7.1 FEATURE 1:

URL for Sprint – 1

<https://github.com/IBM-EPBL/IBM-Project-14305-1659551269/tree/main/Project%20Development%20Phase/Sprint%201/Code>

7.2 FEATURE 2:

URL for Sprint – 2

<https://github.com/IBM-EPBL/IBM-Project-14305-1659551269/tree/main/Project%20Development%20Phase/Sprint%202/Code>

7.3 FEATURE 3:

URL for Sprint – 3

<https://github.com/IBM-EPBL/IBM-Project-14305-1659551269/tree/main/Project%20Development%20Phase/Sprint%203/Code>

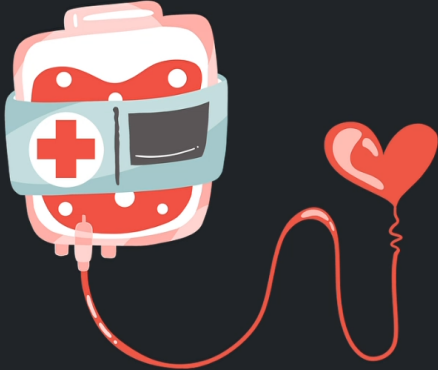
7.4 FEATURE 4:

URL for Sprint – 4

<https://github.com/IBM-EPBL/IBM-Project-14305-1659551269/tree/main/Project%20Development%20Phase/Sprint%204/Code>

8. TESTING

Register Page:



Register!

Full Name

Phone Number

Blood Group


Address

Pincode

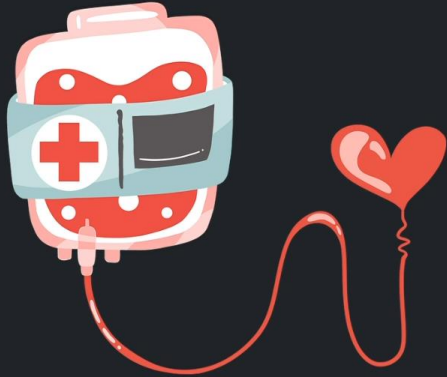
Email

Password

[Already have an Account? SignIn](#)



Login Page:



Login!

Email address

Password

Login As? ☐ Donor ☒ Receiver

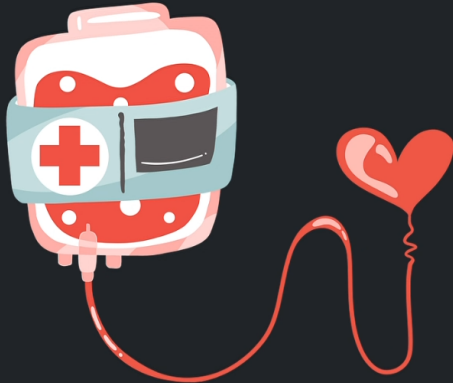
[SIGN IN](#)

[Don't have Account? SignUp](#)



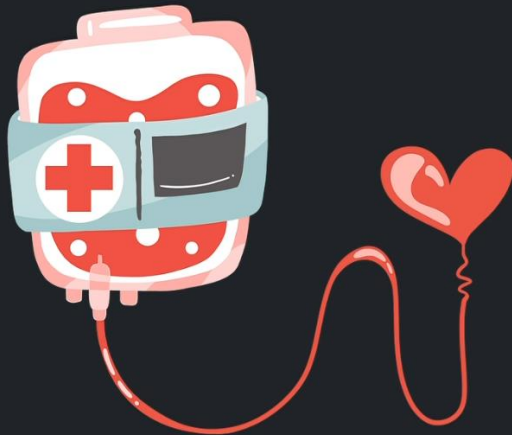
Recipient Page:

Receiver Dashboard



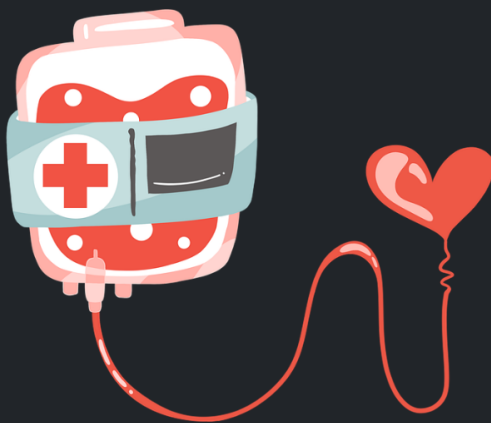
[Request for Plasma](#)

Receiver Dashboard



We have received your request for plasma, We have found 2 eligible donors. They will contact you as soon as possible

Donating Plasma Page:



Donor Dashboard

We have received your request for donation, We will let you know as soon as someone needs your plasma.

IBM Db2 on Cloud

Load DataLoad History**Tables**ViewsIndexesAliasesMQTsSequencesApplication objects

DKD40012.RECIPIENT

Back

Export to CSV

NAME	EMAIL	BLOOD_GROUP	PINCODE
Abcd	abc@gm.com	O+	603110
Rahul	rahul@gmail.com	O+	603110
Ram	formcafee00@gmail.com	O+	603110
Rohit	quakq04@gmail.com	O+	603110
sagar	sagar@gm.com	O+	456123
sagar	sagar@gm.com	O+	456123

9. RESULTS

9.1 PERFORMANCE METRICS:

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	5	2	1	1	9
Duplicate	1	0	1	0	1
External	1	0	0	0	1
Fixed	7	2	2	1	12
Not Reproduced	0	0	0	0	0
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	14	4	4	2	24

10. 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.

11. CONCLUSION

Utilizing the plasma donor website, which is housed on the IBM Cloud platform, is the most effective approach for infected individuals to discover plasma donors.

to guarantee the efficient running of the website. In order to ensure that the operations are going smoothly, I have hosted the website in an IBM Db2 and Kubernetes Cluster. In order to deploy the application, IBM Db2 service is employed together with cloud lambda function.

12. FUTURE SCOPE

By combining Plasma Application with different social network application programme interfaces, this application may be created to further increase user accessibility (APIs). As a result, users can login and register using different social networks. This would improve the blood donation process and increase the number of donors.

In the future, user interface (UI) can be enhanced to serve a worldwide audience by supporting many national languages. Data extraction from several social networks is possible, and results are displayed in the Blood/Plasma Request Feeds. For the convenience of users, appointments can be synced with Google and Outlook calendars.

The purpose of the Donor and Beneficiary Stories feature is to foster a sense of community. Beneficiaries can share their experiences of getting blood transfusions that helped improve their health and quality of life, while donors can view and share personal experiences regarding their donations.

The Live Check-in Process feature aims to give users a better experience in terms of waiting times while they are making donations. We believe that making the process more effective will make the user look forward to his blood/plasma donation appointments.

13. APPENDIX

GITHUB & PROJECT DEMO LINK

GITHUB LINK:

<https://github.com/IBM-EPBL/IBM-Project-14305-1659551269>

VIDEO LINK:

<https://drive.google.com/file/d/1zmdk-ZKz-cq1cFYyCf54VqdC1oMRKLhA/view>