Plasma Donor Application

1. INTRODUCTION

1.1 Project Overview :

The application is designed to support both donors and recipients of plasma who are looking for it in any circumstance. This application encourages plasma donation through an internet job.The user creates an account on the programme by providing their donor information. IBM DB2 is used that contains all the information about the users. The donors will be notified when the user makes a request via an email sent using SendGrid. Kubernetes is used to deploy and scale the application.

1.2 Purpose :

The liquid component of blood is called plasma. Our blood contains about 55% plasma while the remaining 45% is made up of suspended red blood cells, white blood cells, and platelets. About 92% of plasma is water. Along with albumin, gamma globulin, and anti-hemophilic factor, it also contains 7% essential proteins, as well as 1% of mineral salts, carbohydrates, lipids, hormones, and vitamins.The need for plasma became a top concern during the COVID 19 crisis, and the donor count has increased.becoming low. Keeping the donor data and assisting the needy by informing the list of current donors,would be assistance.Manually determining whether a plasma donor is available is a laborious and time-consuming process. In response to the issue, a programme has been developed that will collect and keep donor information.upon request, they'll let the recipients know about them.

2. LITERATURE SURVEY

2.1 Existing Problem:

It can be challenging to gather real-time data using the location API, such as information on local hospitals, specialised specialists, and the facilities that are offered in the hospitals that have been chosen. The alternatives may depend on the programming language, processor, coding context, available trig processes (in various languages), etc. Accepting the requests may take longer in this scenario, which results in the death of patients who are in need. An equi-rectangular accuracy is to be preferred for all small distances. It's difficult to manage all of this data, and keeping it secure from hackers is a major problem.The suggested system consists of The Raspberry PI functions as a CPU and web server that makes it easier for the recipient and the blood bank to communicate using GPS. If the blood bank is close by, it only helps the receiver; if it is far away from the donors, it does no good.

2.2 References :

1. Sivakumar, P., C. Sivaganaes, U. Vimalpriyan, and K. Seranjivi. "Hospitals and blood donors finding system using android." In 2020 International Conference on System, Computation, Automation and Networking (ICSCAN), pp. 1-4. IEEE, 2020.

 2. Meiappane, A., K. Logavignesh, R. Prasanna, and T. Sakthivel. "D'WORLD: Blood donation app using Android." In 2019 IEEE International Conference on System, Computation, Automation and Networking (ICSCAN), pp. 1-5. IEEE, 2019.

3.Rahman, M.S., Akter, K.A., Hossain, S., Basak, A. and Ahmed, S.I., 2011, March. Smart blood query: a novel mobile phone based privacy-aware blood donor recruitment and management system for developing regions. In 2011 IEEE Workshops of International Conference on Advanced Information Networking and Applications (pp. 544-548). IEEE.

4.Fahim, M., Cebe, H.I., Rasheed, J. and Kiani, F., 2016, July. mHealth: Blood donation application using android smartphone. In 2016 Sixth International Conference on Digital Information and Communication Technology and its Applications (DICTAP) (pp. 35-38). IEEE.

5.Mittal, N. and Snotra, K., 2017, October. Blood bank information system using Android application. In 2017 Recent Developments in Control, Automation & Power Engineering (RDCAPE) (pp. 269-274). IEEE.
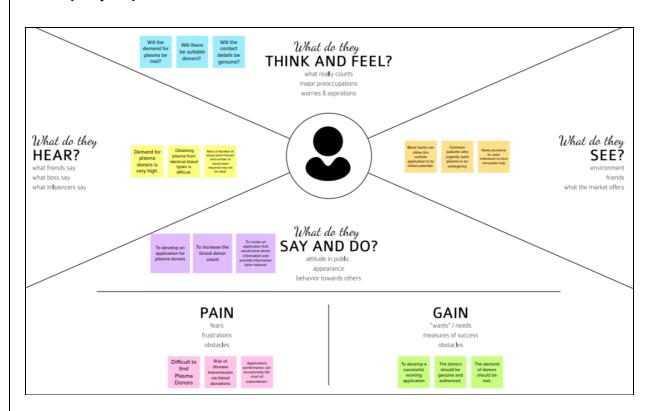
2.3 Problem Statement Definition :

Data processing and retrieval from databases and the cloud is a time-consuming process. This approach does not successfully collect and preserve donor health information appropriately in databases: It's difficult to manage all of this data, and keeping it secure from hackers is a major problem. The inability to protect personal information and the difficulty of processing an excessive amount of data are this application's two greatest drawbacks. This represents a failure of the process.

The suggested system consists of The Raspberry PI functions as a CPU and web server that makes it easier for the recipient and the blood bank to communicate using GPS. Only if the blood bank is nearby will it help the receiver.
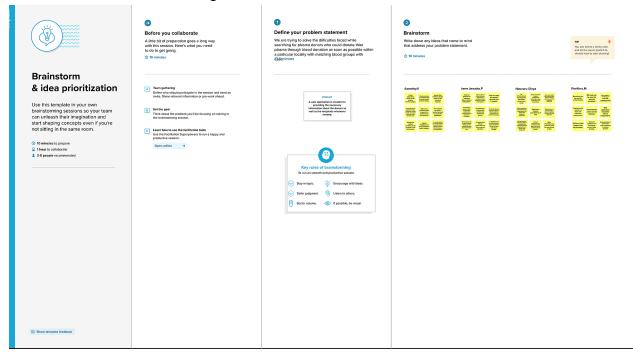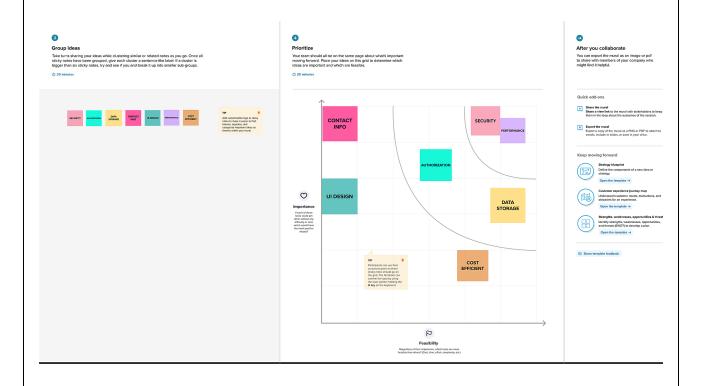
3.IDEATION AND PROPOSED SOLUTION

3.1 Empathy Map Canvas:

3.2 Ideation And Brainstorming:

Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

- 10 minutes to prepare
- 1 hour to collaborate
- 2-8 people recommended

Share template feedback

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⏱ 10 minutes

Team gathering
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

Set the goal
Think about the problem you'll be focusing on solving in the brainstorming session.

Learn how to use the facilitation tools
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

① Define your problem statement

We are trying to solve the difficulties faced while searching for plasma donors who could donate their plasma through blood donation as soon as possible within a particular locality with matching blood groups with ease.

⏱ 10 minutes

PROBLEM
A web application is created for providing the necessary information about the donors as well as the recipients whenever needed.

Key rules of brainstorming
To run an smooth and productive session

- Stay in topic.
- Defer judgment.
- Go for volume.
- Encourage wild ideas.
- Listen to others.
- If possible, be visual.

② Brainstorm

Write down any ideas that come to mind that address your problem statement.

⏱ 10 minutes

TIP
You can select a sticky note and hit the pencil (switch to sketch) icon to start drawing!

Aswathy.V   Irene Jerusha.P   Navvaru Divya   Pavithra.M

③ Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

⏱ 20 minutes

SECURITY   AUTHORIZATION   DATA STORAGE   CONTACT INFO   UI DESIGN   PERFORMANCE   COST EFFICIENT

TIP
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

④ Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⏱ 20 minutes

Importance
If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

CONTACT INFO
SECURITY
PERFORMANCE
AUTHORIZATION
UI DESIGN
DATA STORAGE
COST EFFICIENT

TIP
Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the H key on the keyboard.

Feasibility
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

Share the mural
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

Export the mural
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.
Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

Share template feedback

3.3 Proposed Solution:

Finding accurate contact information for patients and plasma donors is difficult. User and application communication occurs. registers by providing the information for a donation. The repository will have all the information, and the concerned blood group donors will be contacted whenever a user files a request.Donors are only able to access the application after properly registering with their contact information.If plasma is required for their blood group, donors will be contacted through email. If the donors agree to the patient's request, the patient can get in touch with them personally. Plasma will be available to meet the enormous demand and assist those in need.Any hospital can use the programme, and it can have proper communication amongst its branches in a specific geographic area. The application makes use of IBM DB2 and IBM object storage, a relational database management system designed to efficiently store and retrieve the data of plasma donors and capable of handling enormous amounts of data.Kubernetes is employed, which is economical and able to function on any type of infrastructure.It is an easy-to-use application, and the donors are genuine and authorised.

3.4 Problem Solution Fit:

1.Customer Segment :
   ✓ Donor
   ✓ Beneficial{Patient)

2.Jobs To Be Done/Problems:
   ✓ Wouldn't be notified about the needs and other details
   ✓ It is difficult to find the matching plasma donor within short span of time.

3.Triggers:
   ✓ The scarcity of plasma during the COVID-19 outbreak caused numerous deaths
   ✓ A significant shortage of donated blood results in 12,000 fatalities each day in India.This causes lack of plasma extractions.

4.Emotions: Before/After:
   ✓ Prior beneficial will be having lower expectations for timely delivery of blood or plasma
   ✓ Since the emergence of sophisticated applications,patients can now look for alternative donors because they are aware of availability and quantity.

5.Available Solutions:

    ✓ Increase the number of donors through awareness

    ✓ The plasma can be checked tharoughly for prevention of diseases

    ✓ The donors can be verified if authorized or not through doctors

6.Customer Constraints:

    ✓ Shortage of plasma donors

    ✓ Non availability of required blood

    ✓ Risk of disease transmission through plasma donation

    ✓ Shortage of authorized and geniuine donors

7.Behaviour:

    ✓ User interacts with the application

    ✓ The user then registers by providing information as a donor

    ✓ All the information will be in the database,and the concerned

    ✓ All the information will be in the database,and the concerned blood group donors will be contacted whenever a user files a request

8.Channels of Behaviour:

8.1 Online:

    ✓ Donors can register by providing their details such as contact details and blood group details

    ✓ Patients can post their requirements in the form of a request which notifies the donors.

8.2 Offline:

    ✓ Donors can volunteer to donate plasma by seeing the request in person

    ✓ The patients can be benefitted by the donated blood from the donor to save their lives.

9.Problem Root Cause:

    ✓ Unavailability of proper database management system

    ✓ There is no sufficient information to contact donors

10.Your Solution:

    ✓ Both the donors and patients will be able to contact each other as per the requirements

    ✓ The difficulty od searching for plasma donors within a short span could be resolved as the donors would register along with their contact details

✓ The donors would be notified about the request for plasma of a particular blood group so that it could be accepted by them eventually.
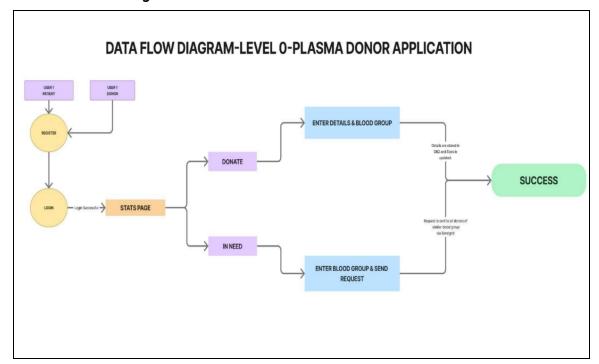
4.REQUIREMENT ANALYSIS

4.1 Functional Requirements :

1. Registration through Website
2. Authentication will be done through OTP
3. Login through Login Id and Password
4. Displays the blood units and the number of donors available for each unit
5. A donor gets notification when there is a need for plasma
6. Contact donor directly using email id or phone numbers

4.2 Non-Functional Requirements:
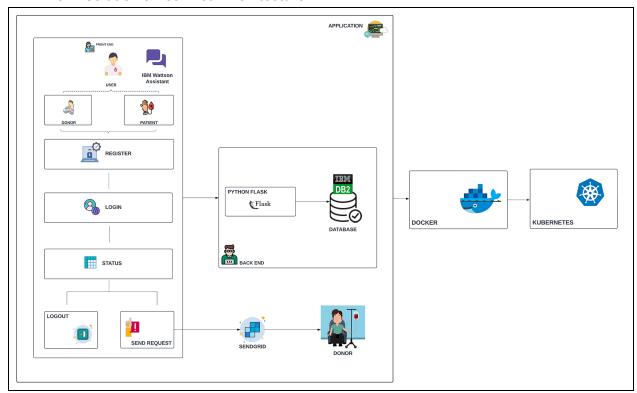
1. The application is user friendly and easy to access and get benefitted
2. It is simple to understand the interface,buttons, etc. Also chatbots can be used for clarifying doubt
3. Plasma donor application is portable to use in any OS or Any browser
4. Application can give responses with minimal latency which helps users to make use of this application even in any emergency situation
5. The application works well in every emergency situation since load is maintained to be minimum.
6.The application offers multiple users to use the application with the help of Kubernetes.

5.PROJECT DESIGN

5.1 Data Flow Diagram

5.2 Solution & Technical Architecture

Domain:Cloud Application Development   Project:Plasma Donor Application

5.3 User Stories :

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Home Page	USN-1	I can sign up for the application as a new user. I'm able to log into the application as a registered user.	1	Medium	Aswathy vijayakumar
Sprint-1	Registration Page	USN-2	I will be taken to a registration page as a new user where I must provide information such as my name, phone number, email address, home address, blood type, new password, and confirm password.	2	High	Irene Jerusha
Sprint-1	login page	USN-3	Already registered users (or) old users can login through this page.	1	Medium	Nuvvuru Divya
Sprint-1	Requirement Page	USN-4	The user must decide if they are intending to donate plasma or need to obtain plasma..	1	Low	Pavithra.M
Sprint-1	stats page	USN-5	Donors can give plasma according to the number of units that are available for a specific blood type. Requests can be made by patients who require plasma to donors.	2	Medium	Aswathy vijayakumar
Sprint-1	Request page	USN-6	A patient can enter their personal and contact details and send requests to donors.Donors can contact the patients or recipients.	2	High	Irene Jerusha

Team Id: PNT2022TMID25781   Team Name:Syntax Squids

Sprint-1	Success page	USN-7	After email notifications is sent successfully then the control navigates to success page.	1	Medium	Nuvvuru Divya
Sprint-2	Creating IBM DB2 database	USN-8	Database is the one where we store the information of both the Donor and the user.Also we need to store the availability of Plasma Donors.	2	High	Irene Jerusha
Sprint-2	Chatbot	USN-9	Chatbot is available in the homepage.Whenever a donor or user is facing an issue they can solve it by using chatbot.It interacts with them and resolves the problem. It uses IBM Watson Assistant.	2	Medium	Nuvvuru Divya
Sprint-2	Inserting Sendgrid function	USN-10	Sendgrid is applied to send email notifications to donors about the requirement of plasma along with the contact details of the recipient..	2	High	Pavithra.M
Sprint-3	Applying flask technology	USN-11	Backend handlings such as client requests,server responses,database information management are controlled by using Python Flask.	1	High	Irene Jerusha
Sprint-3	Integration	USN-12	Developing connectivity between frontend and backend of the application.	2	Medium	Nuvvuru Divya

| Sprint-4 | deployment using docker | USN-13 | Deploying and testing all the frontend,backend and databases in single go using docker. | 1 | High | Nuvvuru Divya |
| Sprint-4 | Application Orchestration | USN-14 | Handling the application at heavy traffic and handling loads of data using kubernetes. | 2 | Medium | Nuvvuru Divya |

6.PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning And Estimation:

Sprint 1: UI Designs
1. Home Page
2. Register Page
3. Login Page
4. Requirement Phase
5. Stats Page
6. Request Page
7. Success Page

Sprint 2: IBM DB2 & Other servers
8. Creating Database DB2
9. Creating Chatbot
10. Creating Email Alert Using Sendgrid

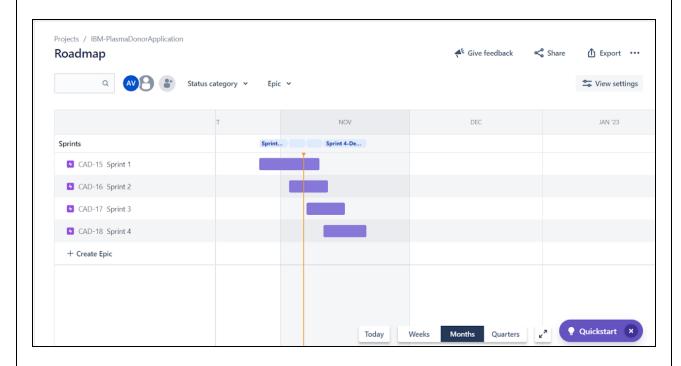#### Sprint 3: Integration
11. Creating a flask program
12. Integrating

Sprint 4: Deployment
13. Developement using Docker
14. Orchestration using kubernets

6.2 Sprint Delivery Schedule :

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	13 Days	27 Oct 2022	09 Nov 2022	20	09 Nov 2022
Sprint-2	20	8 Days	03 Nov 2022	11 Nov 2022	20	11 Nov 2022
Sprint-3	20	8 Days	07 Nov 2022	15 Nov 2022	20	15 Nov 2022
Sprint-4	20	8 Days	11 Nov 2022	19 Nov 2022	20	19 Nov 2022

6.3 Reports from JIRA

7. CODING & SOLUTIONING

7.1 Feature 1

- Well defined chatbot using Whatson Assistant through which users can get help. The chatbot is integrated in all the web pages of the application to help the users to get a user friendly experience**.**

  CODE

```
<script>
 window.watsonAssistantChatOptions = {
   integrationID: "0c1c036d-fbfc-44a2-a39f-cc6499ebedb0",
    // The ID of this integration.
   region: "au-syd",
   // The region your integration is hosted in.
   serviceInstanceID: "1550a48f-f64b-4d94-8721-e6d2c76a1fec",
   // The ID of your service instance.
   onLoad: function(instance) { instance.render(); }
 };
 setTimeout(function(){
   const t=document.createElement('script');
    t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" +
(window.watsonAssistantChatOptions.clientVersion    ||    'latest')    +
"/WatsonAssistantChatEntry.js";
   document.head.appendChild(t);
 });
</script>
```

7.2 Feature 2

● Stats page is included in the web application through which donors and the receipent can get updated about the available blood units. This is especially useful the donor. The donors can donate the blood group which has high demand.

Available Blood Units

Blood Group	Available Units
A+	05
B+	12
O+	15
AB+	04
A-	06
B-	11
AB-	07
O+	23

SEND REQUEST

LOG OUT

8. TESTING

8.2 User Acceptance Testing
Defect Analysis

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Sub total
By Design	15	5	2	4	26
Duplicate	2	0	1	1	4
External	3	2	0	0	5
Fixed	17	1	3	25	46
Not Reproduced	0	0	3	0	3
Skipped	0	0	2	2	4
Won't Fix	0	3	0	1	4
Totals	37	14	11	33	92

Test Case Analysis

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	9	0	0	7
Client Application	63	0	0	63
Security	3	0	0	3
Outsource Shipping	4	0	0	4
Exception Reporting	13	0	0	13
Final Report Output	3	0	0	3
Version Control	1	0	0	1

9. RESULTS

9.1 Performance Metrics

S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Volume Changes	Risk Score	Justification
					NFT - Risk Assessment				
1	Plasma Donor	Existing	Recipient can send request to the do	No Changes	High	The UI designing would be feasi	>5 to 10%	ORANGE	As we have seen the UI Designs have exceeded too.

	S.No	Project Overview	NFT Test Approach		Assumptions/Dependencies/Risks	
			NFT - Detailed Test Plan			
	1	Plasma Donor	usability,scalability,intutiveness,performance,porta		The application is user friendly,easily understandable ,portable and works well in emergency situations	

S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approvals/SignOff
				End Of Test Report				
	1	Usability	Yes	Application is user friendly and easy to access and use t	GO		Closed	
	2	Intutiveness	Yes	It is easy to understand the interface,buttons,etc.,	GO		Closed	
	3	Portability	Yes	It is portable to use in any OS or Any brower.	GO		Closed	
	4	Leisure	Yes	The application can give acceptance with required inputs	GO		Closed	
	5	Performance	Yes	The application works well in every emergency situation	GO		Closed	
	6	Scalability	Yes	The application often multiple scaling to run the applicat	GO			

10.ADVANTAGES AND DISADVANTAGES
Advantages

- ✓ Well defined chatbot using Whatson Assistant through which users can get help.
- ✓ Stats page is included in the web application through which donors and the receipent can get updated about the available blood units.Donors can donate the blood group whic is in need.
- ✓ Sendgrid is applied to send email notifications to donors about the requirement of plasma along with the contact details of the recipient

Disadvantages

- ✓ Security of the users data and privacy can be improved.
- ✓ Performance can be improved.

11. CONCLUSION

During the COVID 19 crisis, the requirement of plasma became a high priority and the donor count has become low. Saving the donor information and helping the needy by notifying the current donors list, would be a helping hand. In regard to the problem faced, an application is been built which would take the donor details, store them and inform the recipients upon a request.The user registers themselves in the application by giving their details as donor.IBM DB2 is used that will have all the necessary details. When the user poses a request the donors will be notified through an Email sent by using SendGrid. The application is deployed and scaled using Kubernetes.

12.FUTURE SCOPE

The web application can be improved by emabling a chat fetaure begween the donor and recepient. This would help both the donors and recepient to contact each other.

13.APPENDIX

        Source Code----[URL]
        GitHub ---[URL]
        Project Demo Link---[URL]