BACKGROUND

- Blood Transfusion unit (BTU) often undetermined about the future stock from the donation request they gets
- In case of emergency blood request victims often fails to get help because of unable to reach a donor.

01 THE PROPOSITION

A system for the BTU which can resolve the issue and a Blood donation System

02 ABOUT THE PROJECT

An android application for the BTU and the donors

03 MAIN REQUIREMENTS

Android Phone running version 9 or above and internet connection

04 PROJECT GOALS

A Prediction Model for the Donor and blood donation request and donation system.

05 PROJECT STAGES

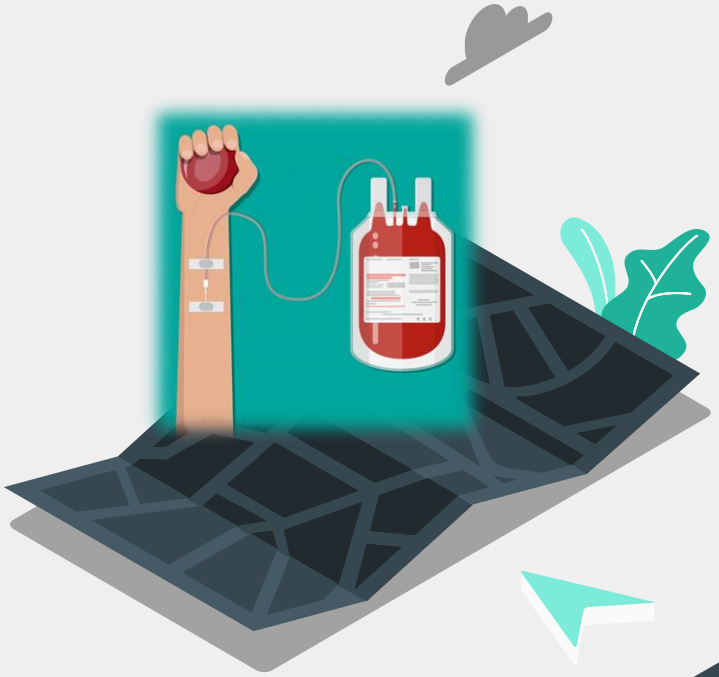
The project goal is achieved by following a Waterflow Model

06 OUR TEAM

Under the supervision of Dr M.M.A. Hashem the project is executed by Towsif Ahmed Labib and Md Nazrul Islam

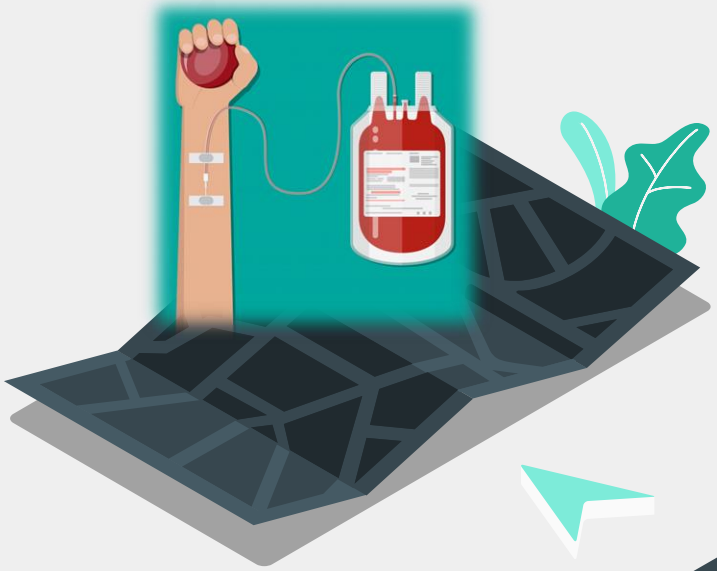
THE PROPOSITION

- Blood donation is voluntary work
- The uncertainty in supply, the short shelf life of blood products and voluntary donations becomes the main concern in the blood supply chain.
- The uncertainty cause the wastes of resources
- Many individuals signed up for volunteer blood donations during a blood donation event.
- Thus Blood Transfusion Unit(BTU) has to prepare for all possible donor to help them donating blood.



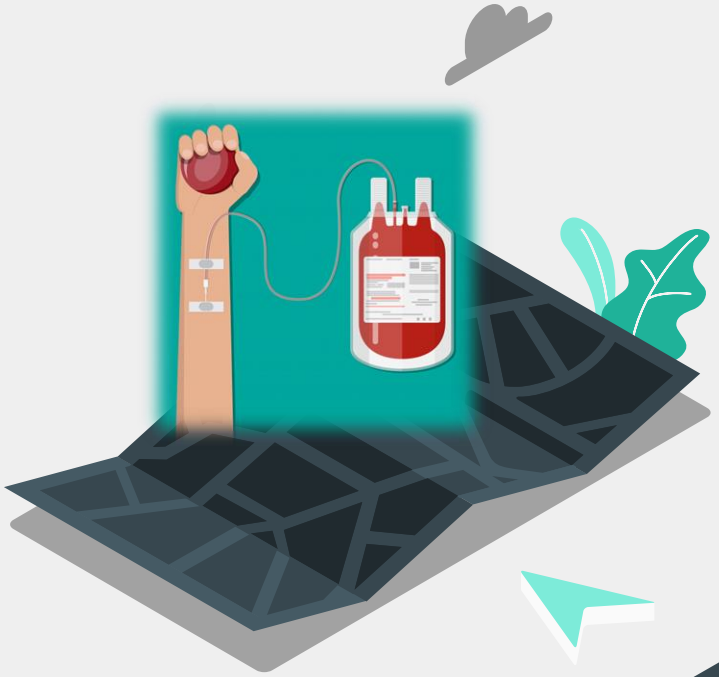
THE PROPOSITION

- If the BTUs can forecast the amount of the expected donor before the then it will help them to organize an event with more ease also resolving the wastage of resource.
- The ability to predict transfusions arising during hospital admission might enable economized blood supply management and might furthermore increase patient safety by ensuring a sufficient stock.
- Mostly in event of an emergency blood request, patients frequently do not receive assistance due to an inability to contact a donor.



THE PROPOSITION

- Donating blood is a noble gesture. The majority of individuals want to assist by donating blood, but they are not always aware of an emergency blood need.
- Also, if a person is unable to assist a patient through contribution, he or she might assist the sufferer by sharing the news of emergency.
- In an emergency, having a platform where a sufferer may request blood is quite beneficial.



WHAT WE ARE WORKING ON

FOR BTU

Making a predictor model to forecast the number of expected donor in an event from the register data by analyzing the previous records.

EMERGENCY BLOOD REQUEST

A platform where a person will able to request for emergency blood request.

DONOR

A platform where volunteer donor will able to check for emergency blood request.

BLOOD SUPPLY CHAIN

Creating an environment where the donor and the emergency blood requester have a communication.

ABOUT THE PROJECT

For solving the issues discussed previously an android application has been created that can perform the all the features.

AN ANDROID APPLICATION

Overview

FEATURES

Here is the list of the features which have been implemented in the application.

- A predictor model which runs on cloud for the organization member to forecast the possible number of the donors whom are expected to donate blood. This feature is only able to access by the organization members only.
- The application is also able to use by the users to sign up for voluntary blood donations and can keep track of his blood donation history.
- The application can also be used by the user to request for blood donation if any emergency case. To do so the user has to create an account.
- The application is implemented with OSM which is an open-source map service to fetch and show location information.

FEATURES

Here is the list of the features which have been implemented in the application.

- This application is implemented with an interactive notification system for the donors where they will find out the emergency case that happens near his/her location if he can donate blood.
- If one user accepts any emergency blood request then the notification will be automatically removed from the other users.
- A spam detection system is been added to the application if any users want to spam the application by requesting blood again and again.

TECHNICAL FEATURES

Technical requirement and features of the application.

- The application needs minimum SDK of 28 to run.
- Must give the permission to access the storage and location to run the application.
- Must have a touch screen input to run the application
- Must have the internet connection to use the features of the application
- Must have a GPS sensor
- Must have a 64bit architecture processor

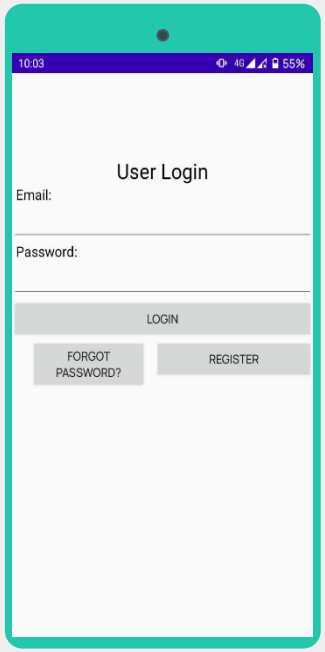
GUI DESIGN

Graphical Design of the Implemented Application

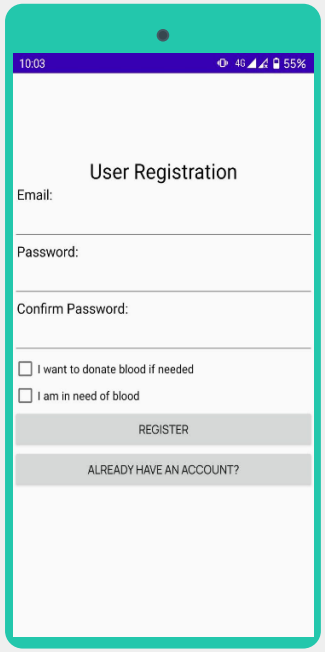
GRAPHICAL USER INTERFACE

User Login Page

Requires email and password to log in



User Registration Page

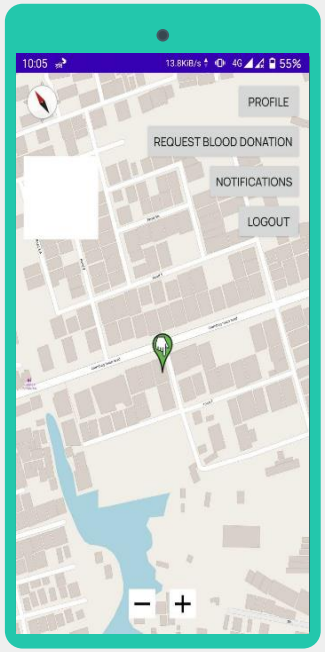


Requires email and password to register

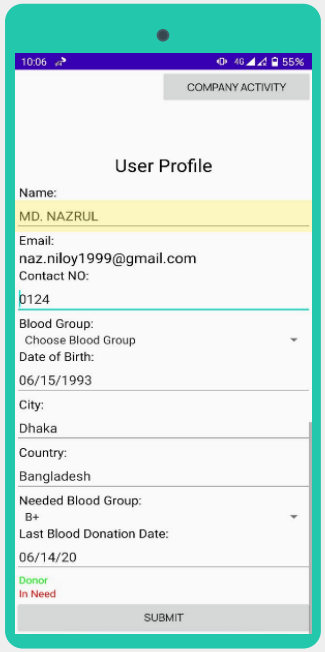
GRAPHICAL USER INTERFACE

Use of OSM for fetching and showing location of donor and requester.

Home Page



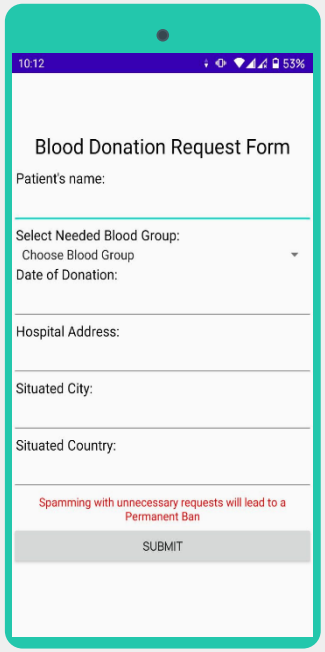
User Profile page



User Profile Page which shows the information of the User Data

GRAPHICAL USER INTERFACE

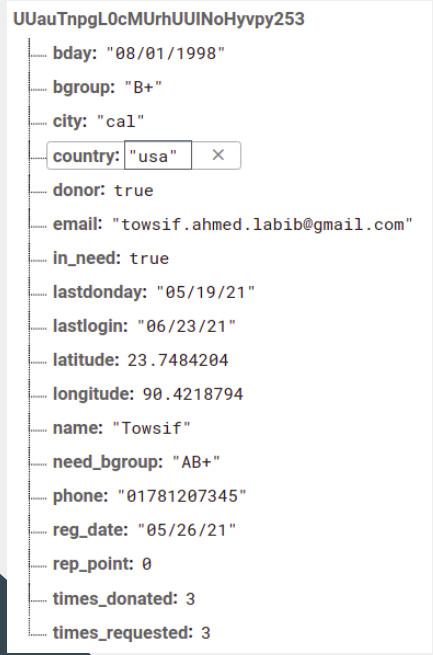
Blood Request Form



This is a blood requested form where one can able to request for blood donation in case of emergency and the record will be circulated to the nearby volunteer phone as an interactive notification.

FIREBASE DATABASE

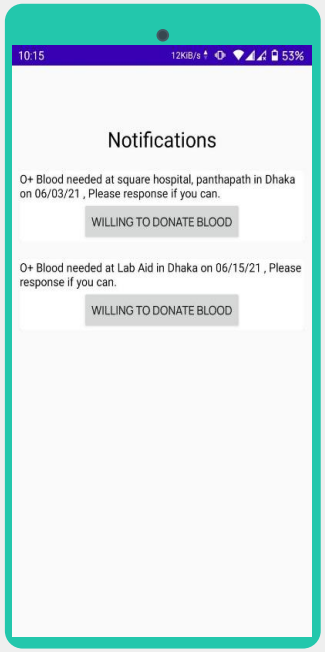
Sample User Data



Sample Form Data

GRAPHICAL USER INTERFACE

Notification Center

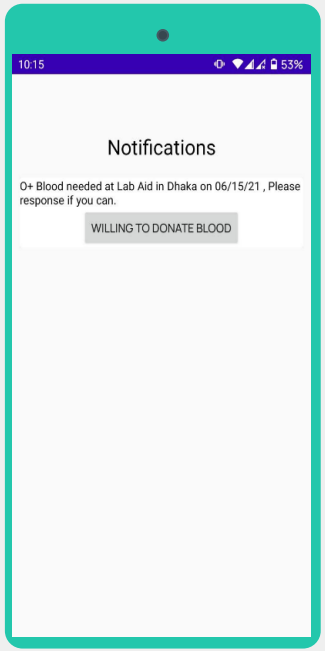


When any one request for the blood a notification will be send to the all the nearby donor. If someone responds to some notification then the notification will be get deleted from the other application user. Thus, the notification of the application will not create any bloat.

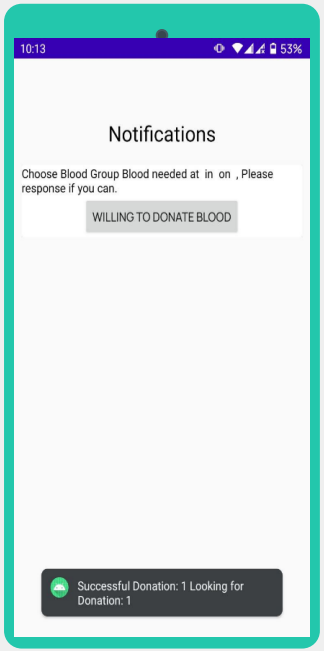
GRAPHICAL USER INTERFACE

Notification arrives

Notification Center



Notification Center

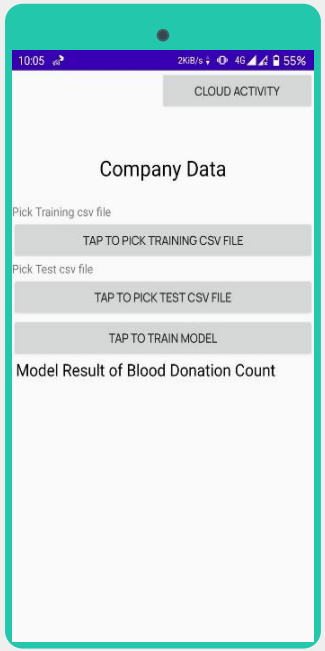


Respond to the Notification

GRAPHICAL USER INTERFACE

Here the BTU authority able to predict the expected donor from the registration data. To do that they have to import the previous record of the donor registration data and blood donation success and forecast the expected blood donor before an event.

Model run page

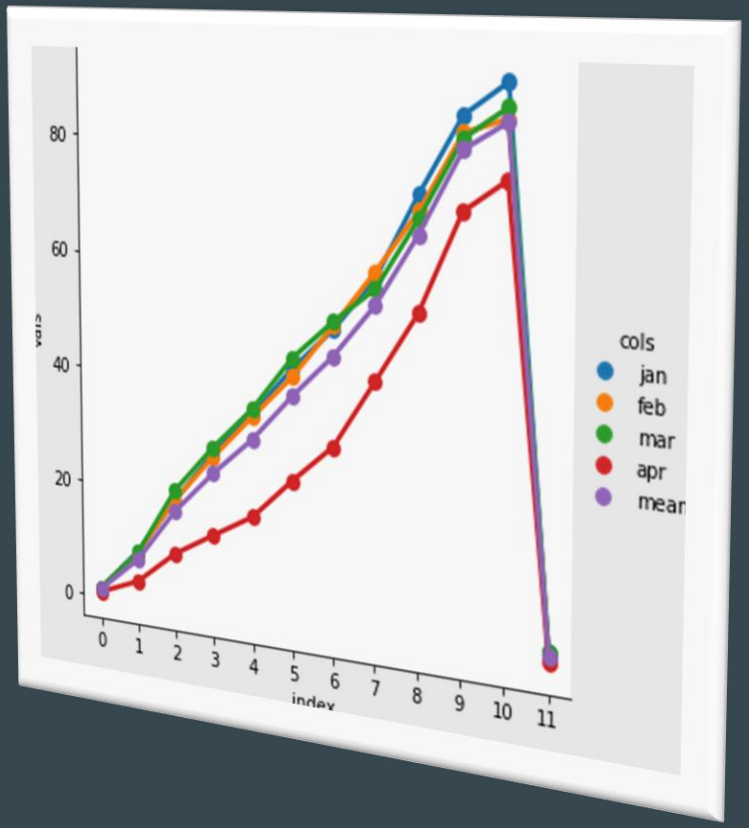


KEY FEATURES

Summary

A Decision tree based regressor model has been integrated for the prediction

A DECISION TREE BASED FORECASTING MODEL



The model is run on the cloud to do the heavy calculation and sends the result of the prediction to their devices.

CLOUD IMPLEMENTATION FOR THE PREDICTOR MODEL

Integration of the Open Source Map Service

OPENSTREETMAP

User authentication and interactive notification system has been implemented which notification will contain the information of the victims.

INTERACTIVE NOTIFICATION

Detecting the fake or spam blood donation request based on the request frequency and own algorithm.

SPAM DETECTION

PROJECT MANAGEMENT

Project management plan

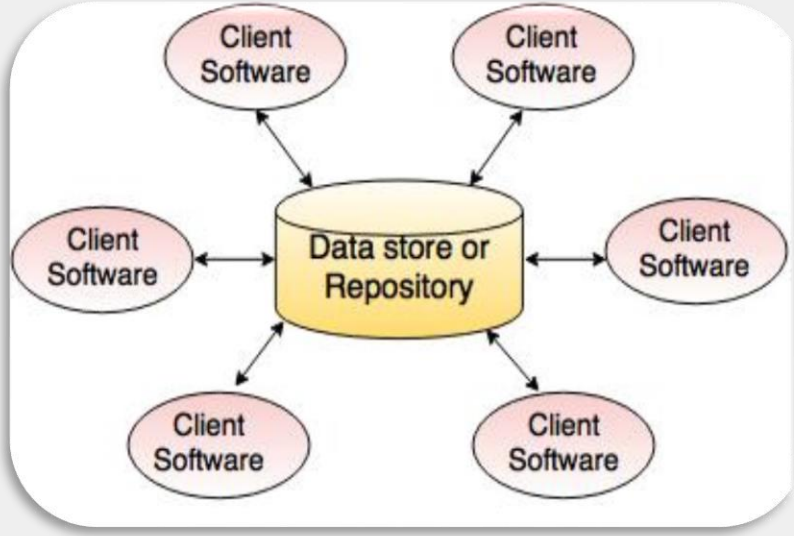
LIFECYCLE MODEL USED

To achieve the goals and a successful implementation of the program **a water flow model** has been used.

The sequential phases in Waterfall model are

- ❑ Requirement Gathering and analysis
- ❑ System Design
- ❑ Implementation
- ❑ Integration and Testing
- ❑ Deployment of system
- ❑ Maintenance

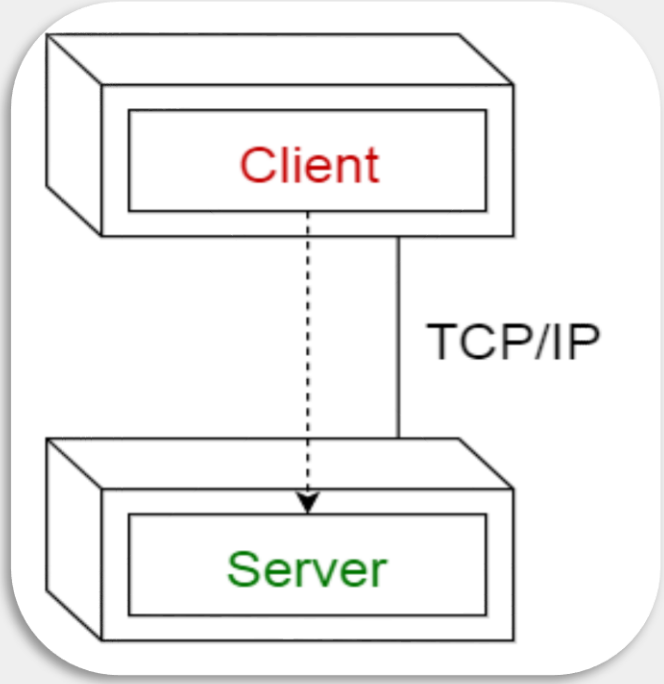
ARCHITECTURE STYLE

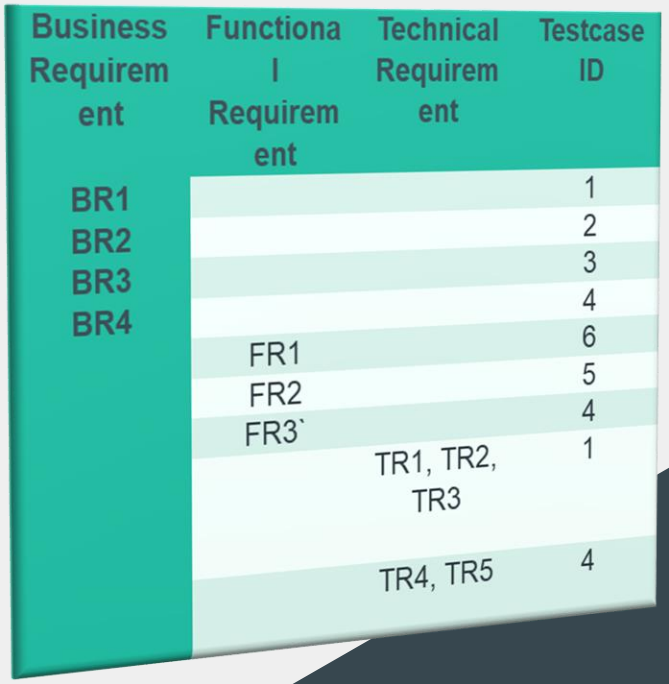


For the project **a Data Centered Architecture** has been followed

ARCHITECTURAL PATTERN

A **Client-server pattern** based architectural patter has bee used for the application .





Business Requirement	Functional Requirement	Technical Requirement	Testcase ID
BR1			1
BR2			2
BR3			3
BR4			4
	FR1		6
	FR2		5
	FR3`		4
		TR1, TR2, TR3	1
		TR4, TR5	4

THE TEST PLAN

The testing of the application is done with **the requirement traceability matrix**

TEST PLAN

BUSINESS REQUIREMENT

BR#	Module	Application Role	Description
BR1	Login Logout	Members of the BTU and Users	Member: Member will able to login and will have the access to the Company Activity page User: User will able to see own profile.
BR2	Forecast Donor number	Members of the BTU	Member of the BTU will able to forecast the possible donor number before an event based on the registration
BR3	Respond to the Interactive Nonfiction	Users	Users will able to respond the emergency notification
BR4	Blood Request Form	Users	Users will be able to request for the emergency blood request

TEST PLAN

FUNCTIONAL REQUIREMENT

FR#	Module	Application Role	Description
FR1	Detect Spam Request	Automatic	If any users tries to spam blood request automatically system will detect
FR2	Show OSM	Users	User's current location will be auto sync up
FR3	Interactive Notification	Users	Show the nearby emergency blood request

TEST PLAN

TECHNICAL REQUIREMENT

TR #	Description
TR 1	Email must not be blanked
TR 2	Password must not be blanked
TR 3	If email and password are valid login
TR 4	Notification will not be sent to a donor if s/he cannot able to donate blood
TR 5	Automatically the notification will be removed if someone respond to it

TEST PLAN

TRACEABILITY OF TEST CASES TO USE CASES

Testcase#	BR#	FR#	TR#	Testcase	Test Data	Expected	Remark
1	BR1	---	TR1, TR2, TR3	Verify Log in	Email=naz.niloy1999@gmail.com Password=123456789	Successful log in	Success
2	BR2	---	---	Forecasting	Train Data=January Test Data=February	47389(with an acc of 99.7)	Success
3	BR3	---	---	Blood Request Form	User=YY User Group=In need	Submit a blood request Form	Success
4	BR4	FR3	TR4, TR 5	Interactive Nonfiction	User=XX User Group=Donor User=AA User Group=Donor	See notification of emergency blood request And after responding the notification get removed from everyone	Success
5		FR2		Show OSM	User=XX User Group=Donor	Fetch current location information	Success
6		FR1		Spamming detection	User=ZZ User Group=In Need	The account gets suspended	Success

TEST PLAN

REQUIREMENT TRACEABILITY MATRIX

Business Requirement	Functional Requirement	Technical Requirement	Testcase ID
BR1			1
BR2			2
BR3			3
BR4			4
	FR1		6
	FR2		5
	FR3`		4
		TR1, TR2, TR3	1
		TR4, TR5	4

Observing the requirement traceability we can see all the requirements to check if the requirements have been fulfilled

ALL INITIAL REQUIREMENTS FULFILLED

APPENDIX

Here is the list of the additional documents which have been created when making the projects.

- The first proposal of the document is here *the initial proposal*
- The requirements analysis here *detailed requirement*
- The use case analysis of the system here *developing user case*
- The report of the project is here *project report*
- The BTU in the presentation refers to the BLOOD TRANSFUSION UNIT
- To manage the workflow in the quarantine **Notion** workspace has been used