National College of Ireland

BSc in Business information Systems

2020/2021

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Community Aid

Technical Report

Contents

Executive Summary

The pandemic has affected every household in the world. Some have been affected more negatively than others. Currently covid-19 has killed 3.257.627 individuals and effected 155.888.958 individuals across the world. The individuals, who have not obtained covid-19 have also been affected daily due to lockdowns, lack of social interaction, lack of help in case of an emergency and all of this has led to the increase in mental health related issues across the world. The main individuals who are suffering are those who are vulnerable as not only are they living with a constant fear of catching this virus but there is also a lack of support available to them in their community.

Technology is constantly evolving and has helped solve many problems of the world threw new and innovative IT solution that have led to a better world we know today. In this report, I will be discussing my innovation to support communities during the pandemic and after we have overcome it. The main goal of this project is to develop an application that will assist users in finding help with issues and gaining help from individuals around their community. This project will allow individuals to gain assistance in a time of need.

In this report, I will be giving an in-depth view of my journey during the development of community aid application. I will be giving a brief overview of my application then describing the development process and facts taken into consideration during development. Also, I will be showing all documentation related to community aid and giving a conclusion on my thoughts how the project went and where it can go in the future.

1.0 Introduction

1.1. Background

The project that I have chosen is called Community Aid. There are a few reasons why I chose this project. These consist of personal and technological reasons.

My main personal inspiration for choosing this project was my neighbour who is an elderly woman that has been locked in her house during the time of Covid-19. I help her by doing her weekly shopping. After a few conversations with her I realised that it is exceedingly difficult for individuals in her position to receive help. Therefore, I wanted to build an application that will help others in her situation or anyone who needs assistance. Another personal reason is that I wanted a challenge as I am an individual that loves taking on new challenges. This project will challenge me on various aspects such as the use of new tools and technologies, trying to implement functionality that I have never implemented before, finding ways to make my application more appealing than my competitors and since my application targets both the young and elder generations identifying the perfect balance to make the application appealing and useful for both parties would be a challenge as the application cannot be to complex or simple.

The main technological reason for this project was to work with new technologies like React Native, languages like JavaScript and JavaScript XML, and tools such as Visual studios Code. The reason for this was to try something new and step out of my comfort zone. Another technological reason is that I wanted to create a mobile application as I felt it would be more suitable for my idea Community Aid as it is built for everyone in a community. Also, I have never created a mobile application without Android studios. Therefore, I wanted to gain experience creating a mobile application using other technologies. Another technological reason was my intern placement at LexisNexis Risk Solutions as I used a lot of opensource technologies during the placement. I was inspired to use as many opensource technologies as possible during this project.

1.2. Aims

Community Aid is a community based mobile application that can be used by users to ask for assistance when needed. This application original target audience was the elderly, vulnerable and individuals with any sort of disability or disadvantage. However, after a brief discussion with some lecturers and my supervisor I decided that it would be more beneficial to target everybody that needs assistance. Community Aid also allows volunteers to help these individuals. This application will lead to more helpful and collective communities.

The main functional aims of this project are:

- Develop a mobile application that is unique at what it does, responsive and has a simplistic modern lay out that is easy to use. This is because my application targets a wide audience of both young and elderly individuals. Therefore, the application will need be perfectly balanced to suit both the elderly and the younger generation.
- The application will enable users to create an account and use this this account to log in. Volunteers and people requiring assistance functionality will be accessible through one account because a volunteer can require assistance and a person who previously required assistance can also be a volunteer.
- The main functionality for the individuals requiring assistance will be an assistance request. This request can be created by completing a simple form about the type of assistance you require. They will also be able to manage these requests.
- The main functionality objective for the volunteers will be to pick up these requests in the application and manage the picked-up requests.
- Some other aims that I plan to achieve is implementing a map that displays all the requests and the user's location on the map. I want to make this map interactive for the volunteers so they can use the map by setting a radius ring on the map and picking up assistance requests. I also want to make a notification system that will notify users once a request has been picked up and completed.

1.3. Technology

In this section I will be discussing the technologies, languages and tools that I have used in my project.

Tools/Technologies:

- React Native is a framework that I will be using to create the front-end development of my application. There are plenty of resources available that will assist me with the development of my project.
- Expo will be used to assist with the development the deployment of my application and I will use it with React Native to accomplish this.
- Balsamiq is a tool that I will be used to develop my application wireframes.
- Visual Studios Code is the IDE that I will be used in this project. As it is the most used IDE out there. Therefore, there will be a lot of support available to me if needed. It accommodated plenty of languages and packages.
- GitHub is the source control I will use for my projects as it works greatly with Visual Studios Code and I have plenty of experience with this technology.

Languages:

- JavaScript and JSX also known as JavaScript XML will be used for the development of my application as the React Native framework is made for these languages. Also, these

languages have plenty of resources available for them online. Therefore, it will be beneficial for me to use these languages.

1.4. Structure

This section will describe the structure of this report. The report consists of the following sections:

- Executive summary focuses on the key aspects of the report such as what the objective of the report, what is the conclusion of the report, state the outcomes of the report and making recommendations based on the report.
- The Introduction section of the report focuses on the background, aims, technologies of the project. It briefly describes the project and its contents. It also has a section called structure that bring you through the structure of the technical report.
- System section focuses on the development of the project. In this section, we highlight our requirement such as functional, data, user, environmental and usability requirements. Here, the requirements are depicted using descriptions, used cases and diagram. This section also consists of information related to implementation, testing, evaluation, design and architecture. We can also see some graphical user interface examples of the project.
- Conclusion states information such as disadvantages, advantages, weaknesses and strengths of the project.
- Further development and research consist of information related to the topic of what effect would resources and time have on the project.
- References depicts all the references of the paper.
- Appendix consists of useful resources such as the proposal of the project, ethics forms, reflective journals and other materials that were used in the project.

2.0 System

2.1. Requirements

- **Submit Assistance Request:** This requirement consists of the user being able to create an Assistance Request. Once successful the request will be visible to volunteers to pick up and resolve.
- **Pick up assistance Request:** This requirement consists of the volunteer being able to pick up assistance requests or report them.
- **Notification:** This requirement consists of creating a notification system that will notify both types of users.
- **Manage Assistance Request:** This requirement consists of the user being able to manage their requirement. The user can delete of edit their created requests.
- **Manage Assistance Request Status:** This requirement consists of the volunteers being able to manage the status of the picked-up assistance requests.
- **Map:** This requirement consists of the volunteer being able to change the radius ring on the map, see their location on the map, see requests on the map and can report and pickup requests.

2.1.1. Functional Requirements

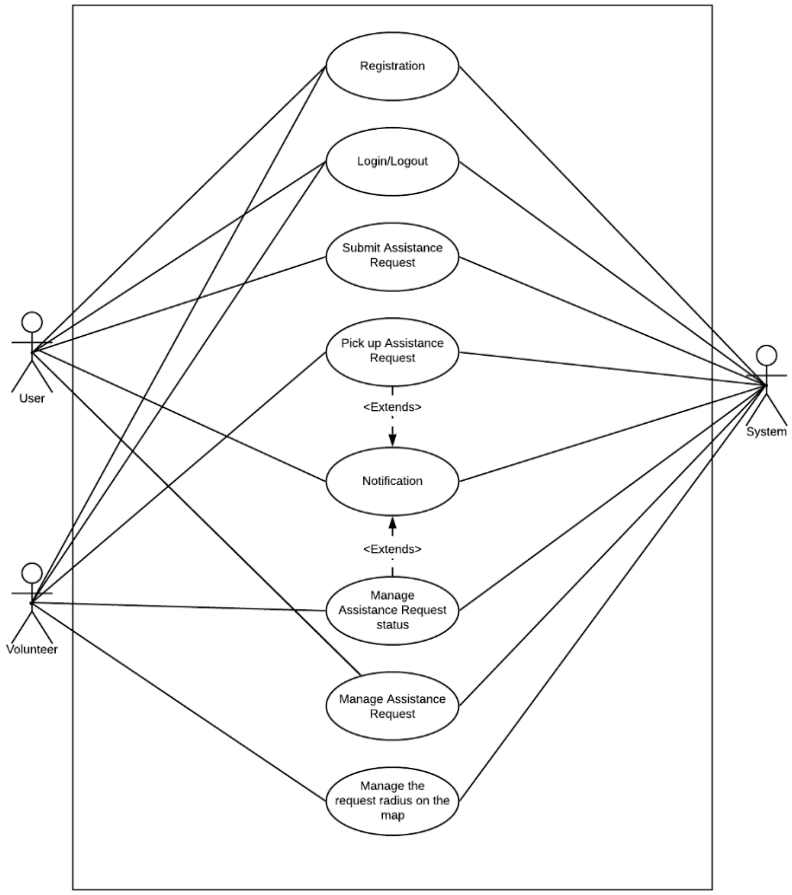
These requirements are in a ranked order.

1. **Submit Assistance Request:** This requirement holds the highest priority as the whole application is dedicated around it. The user will be able to fill out a form with valid

information based on the request they want to make, and they will be able to submit this form.

2. **Pick up assistance Request:** This requirement holds a high priority because this is how the volunteers help the users who need help. The volunteer fills out the assistance request number on a form. Once the system finds the assistance request it displays it to the volunteer and the volunteer can pick it up on a click of a button
3. **Notification:** This requirement is of high priority. It will notify both types of users if any interaction occurs to a request related to them. This will allow users to keep up to date with the requests they have made or they have picked up.
4. **Manage Assistance Request:** This requirement is of high priority. It will allow the users to access the manage assistance request page. This page will display all the user's requests and upon clicking a button the user will be able to edit or delete the request.
5. **Manage Assistance Request Status:** This requirement is of high to medium priority. The volunteer will be able to go to the manage assistance request page and from the picked-up requests that the volunteer has picked up they will be able to edit the status of the assistance request.
6. **Map:** This requirement is of High priority. The volunteer will be able to access the map page and they will be able to put a range in the input field and submit the radius they want to display, they will be able to pick up and report requests.

2.1.1.1. Use Case Diagram



2.1.2. Requirements

Submit assistance Requests

Description & Priority

This requirement is tremendously important for the application. Majority of other requirements depend on this requirement. The user can create an assistance request using this functionality.

Use Case

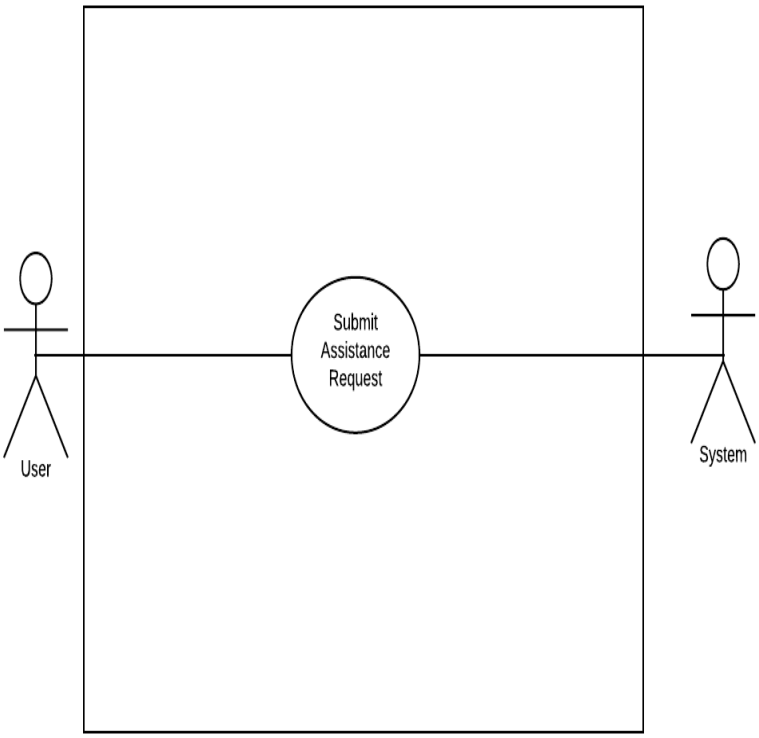
Scope

User can create an assistance request and this request is successfully created.

Description

The user fills out a request form to request for help. Once created the request will be visible to volunteers in the area.

Use Case Diagram



Flow Description

Precondition

The user must have registered and created an account for the application. The user must be logged in. The user must have access to the internet.

Activation

This use case begins when the user accesses the create assistance request section of the application.

Main flow

1. The user clicks the “Make Assistance Request” button.
2. The user fills in the assistance request form using valid information and submits the form.
3. The system stores the information to the database.
4. The system informs the user that the request has been created.

Alternate flow

A1: The user leaves blank fields in the request form.

1. The user leaves the request form incomplete and submits.
2. The system informs the user about blank fields.
3. The use case continues from step 2 of the main flow.

A2: The user fills incorrect information in the request form.

1. The user inputs incorrect information into the form and submits.
2. The system informs the user about invalid inputs.
3. The use case continues from step 2 of the main flow.

Exceptional flow

E1: Error may occur due a back-end issue.

Termination

The used case is terminated once the user has successfully created an assistance request.

Post condition

The user can carry out this used case again.

Pick up assistance Request

Description & Priority

In this requirement the volunteer can pick up assistance requests made by users and act upon it. This is an especially important requirement as this is one of the main functionalities of a volunteer and it holds a particularly important role in the application.

Use Case

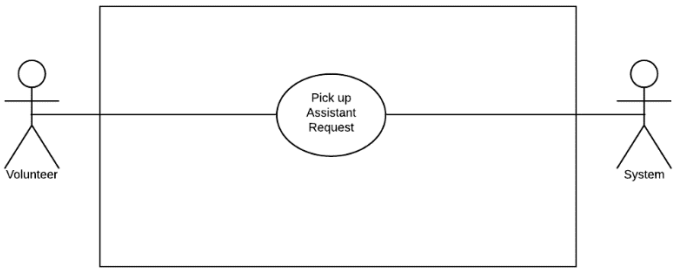
Scope

The Volunteer can pick up an assistance request.

Description

The volunteer uses the map or pick up assistance request page to pick up a request.

Use Case Diagram



Flow Description

Precondition

The volunteer must have registered and created an account for the application. The volunteer must be logged in. The volunteer must have access to the internet.

Activation

This use case begins when the volunteer accesses the pickup assistance request or map section of the application.

Main flow

1. The volunteer clicks the “Pick up Assistance Request” or “Map” button.
2. The volunteer searches for the request they want to pick up.
3. The user clicks the add request button.
4. The system checks the database for the request.
5. The system adds the volunteer to the database and links them to the request.
6. The system informs the user that the request has been picked up by sending a notification.

Alternate flow

A1: The volunteer accidently tries to add a request created by them.

1. The volunteer clicks the add request button on a request created by them.
2. The volunteer gets an alert informing them.
3. The request is not added.

Exceptional flow

E1: Error may occur due a back-end issue.

Termination

The used case is terminated once the volunteer has successfully picked up an assistance request.

Post condition

The user can carry out this used case again and access all their requests in assistance request management.

Notification

Description & Priority

This requirement allows the user to stay up to date with their requests. The user receives a notification once a volunteer picks up their request or changes the status on it. This is an important requirement as it keeps the users up to date with their requests. There are also other notification sent out to both user and the volunteer user roles.

Use Case

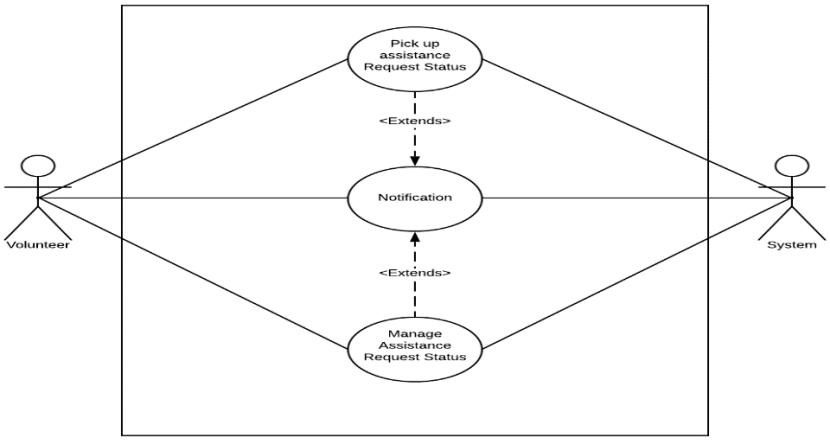
Scope

The user receives a notification.

Description

Both types of users will receive a notification if there is any interaction with the requests related to them.

Use Case Diagram



Flow Description

Precondition

The user must have registered and created an account for the application. The user must be logged in. The user must have access to the internet. The user has one or many assistance requests created which have not been resolved.

Activation

An example of activation is when the volunteer picks up a request or changes the status of the request.

Main flow

1. The volunteer picks up a request or changes the status of the request.
2. The system informs the user about the changes by creating a notification.
3. The user receives the notification and can view it in the notification section.

Alternate flow

Not Applicable

Exceptional flow

E1: Error may occur due a back-end issue.

Termination

The used case is terminated once the user has successfully received a notification once a change has been made.

Post condition

The user can view the notification in the notification section. This use case is repeated every time a change is made by a volunteer.

Manage assistance request status

Description & Priority

This requirement essential for this application as it keeps the user up to date with their requests and it also allows the volunteers to manage the request.

Use Case

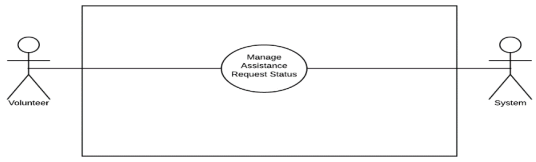
Scope

The Volunteer can update the status of picked up requests.

Description

The volunteer can update the status, complete or cancel the request that they have picked up.

Use Case Diagram



Flow Description

Precondition

The volunteer must have registered and created an account for the application. The volunteer must be logged in. The volunteer must have access to the internet. The volunteer has picked up an assistance request.

Activation

This use case begins when the volunteer accesses the Mange assistance request section of the application.

Main flow

1. The volunteer clicks the “Mange Assistance Request” button.
2. The volunteer clicks the “Requests Picked Up” button.
3. The volunteer changes the status of the request or clicks “Cancel” or “Complete” button.
4. The system updates the database.
5. The user is informed about the change.

Alternate flow

Not Applicable

Exceptional flow

E1: Error may occur due a back-end issue.

Termination

The used case is terminated once the volunteer has successfully changed the status of a request and the user has been informed.

Post condition

The Volunteer can carry out this use case again and a notification is received by the user.

Manage assistance Request

Description & Priority

Manging assistance requests is an important requirement for the user. It will allow the user to manage their created assistance requests by editing or deleting them.

Use Case

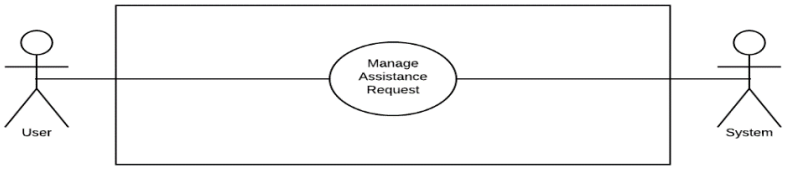
Scope

The user will can manage their requests.

Description

The user will be able to manage their created requests by editing and deleting their existing requests.

Use Case Diagram



Flow Description

Precondition

The user must have registered and created an account for the application. The user must be logged in. The user must have access to the internet and have per-existing assistance requests.

Activation

This use case begins when the user accesses the manage assistance request section of the application.

Main flow

1. The user clicks the “Manage Assistance Request” button.
2. The user clicks the “Request Made” button.
3. The system retrieves users’ requests from the database.
4. The user can edit or delete their request.
5. The system updates the database based on the changes.

Alternate flow

Not Applicable

Exceptional flow

E1: Error may occur due a back-end issue.
E2: The user has no existing requests.

Termination

The used case is terminated once the user edits or delete a request and the database is updated.

Post condition

The user can carry out this used case again and the request list is updated.

Map

Description & Priority

The volunteer will be able to see their location on the map, they can see requests in their area, they can edit there radius ring and pickup or report requests.

Use Case

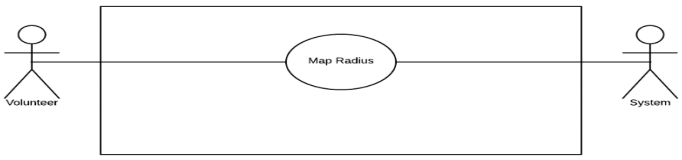
Scope

The volunteer will be able to choose their radius on the map.

Description

The volunteer will be able to choose their radius ring in kilometres.

Use Case Diagram



Flow Description

Precondition

The volunteer must have registered and created an account for the application. The volunteer must be logged in. The volunteer must have access to the internet.

Activation

This volunteer case begins when the user accesses the map section of the application.

Main flow

1. The volunteer clicks the “Manage Assistance Request” button.
2. The volunteer can carry out multiple functions such as to see their location on the map, they can see requests in their area, they can edit their radius ring and pickup or report requests.
3. The system updates the ring on the map.

Alternate flow

A1: The volunteer fills in an incorrect value.

1. The volunteer inputs incorrect value.
2. The system informs the volunteer about invalid inputs.
3. The use case continues from step 2 of the main flow.

Exceptional flow

E1: Error may occur due a back-end issue.

Termination

The used case is terminated once the radius is successfully updated.

Post condition

The user can carry out this used case again.

2.1.3. Data Requirements

The type of data we are dealing with here is personal data such as email address, phone number, address and name. Therefore, the data will be encrypted and stored in secure dataset. I will ensure that the data is secure. This is so the data is not exposed or damaged and the client's data is safe. I will be considering best practices when developing the database. The data of the user and the volunteer will be stored in a database in clean format. This is so it is easy to work with and no errors occur such as integrity problems. I will be storing user credentials and other information separately. This is because if an issue does occur in the database related to the security of the data. Not all data will be exposed or corrupted.

2.1.4. User Requirements

The aim of mobile application is to assist individuals by finding them assistance quickly and easily. The users of this application will be required to create an account on start. There after they will be able to log in straight away by using there created credentials. Users can use this application is two ways. The user, also known as the person requiring assistance and the volunteer who is helping the users. Upon login the user will be able to create an assistance request and manage their current requests. On the other hand, the volunteer will be able to pick up these assistance requests, change their status and they will also have a map that they can use to find the tickets in their area. A user will be able to access a volunteer's functionality and vice versa. The users will need a mobile device to access the application and they will need to be connected to the internet.

2.1.5. Usability Requirements

The target audience of the application is overly broad as it targets individuals of all ages including the elderly, vulnerable and individuals with disabilities. Therefore, the application will be easy and simple to use with not much fancy designs. The mobile application will avoid congestion and will not be to pact. The application will use colours that are appealing to the eye and not too bright or dull. This application will be a perfect blend of not to complex or simple. The aim is to find the perfect middle ground between easy to use for the elderly and not boring or too simple for the younger generations. The application will be neat and simple to navigate through. It will use clear big text and buttons. The application will be very user friendly as it will be easily accessible on smartphones. However, the application will not be useable without the internet and it will be difficult to access the app without internet. Some users such as the elderly might require some assistance using the application. Therefore, there will be an assistance section on the application that the elderly or anyone having difficulty with the application can use to become more familiar with it.

2.1.6. Environment Requirements

The mobile application will be available on all types of smartphones. This is because mobiles are the most used devices in the world. People of all ages use them and have a good understanding of them. The user will be able to access the application from anywhere if they are connected to decent internet source.

2.2. Design & Architecture

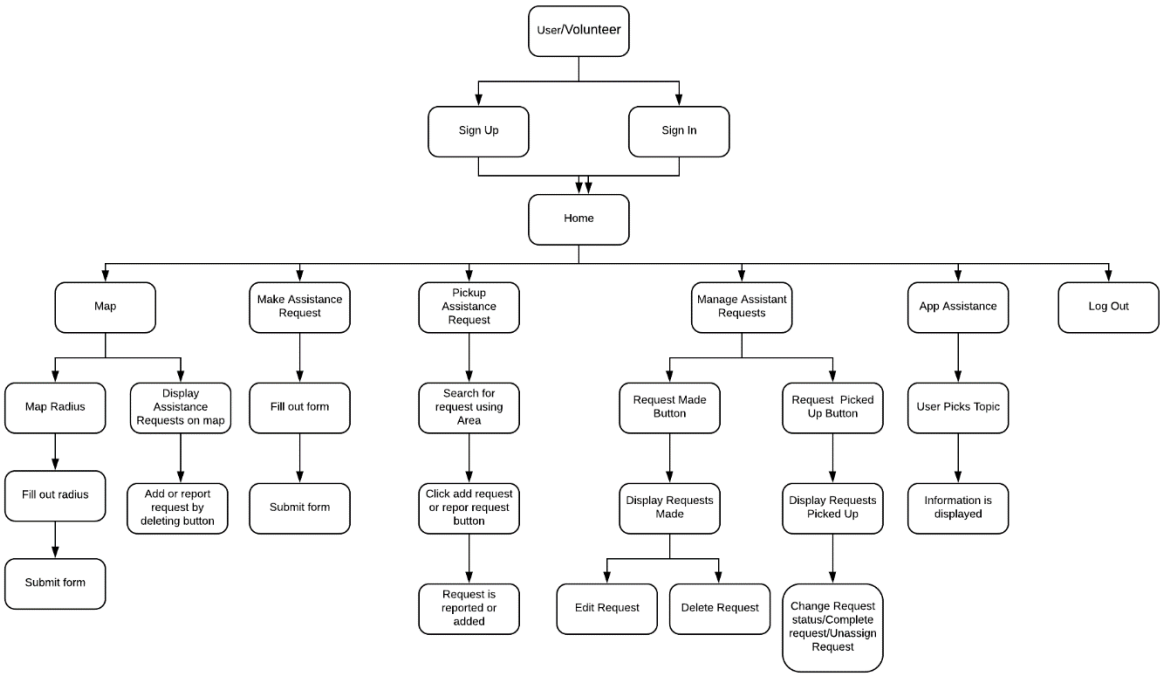


Fig 1. Block Diagram describing the structure of Community Aid.

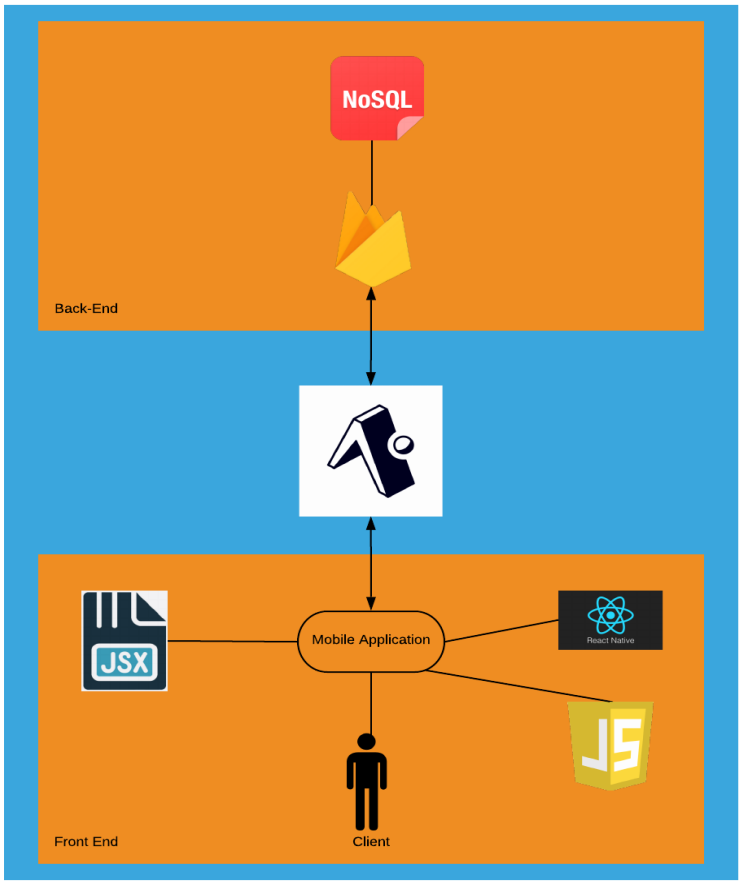


Fig 2. Diagram showing the overall infrastructure of Community Aid

The two diagrams above describe the design and architecture of the mobile application Community Aid.

The “Fig 1.” diagram was created using Lucid. The diagram gives an overview of all the functionalities that are available to users and volunteers of the application. The diagram shows all the functionality in a waterfall format. The user/volunteer starts by signing up to the application or signing in. Once logged in they are redirected to the home page from where they can access all the pages listed below the home block. For example, the “Map” block. Then the diagram clearly defines all the functionalities that page has and how the user/volunteer can interact with them in the blocks below. The main objective of this diagram is to give insight into how Community Aid is structured, how it will function and the tasks it will carry out. Basically, giving a whole overview of the application.

The “Fig 2.” diagram describes the overall infrastructure of the application. As seen in the diagram, the front end of the application will be developed using languages such as JavaScript, and JavaScript XML. Also, the framework that will be used is React Native. All of these will come together to develop the front end of the application. I chose these because they will help me develop a very responsive and clean front end to the application. The back end of the application will consist of firebase. I will be using firebase authentication for authentication and firebase cloud firestore for the backend storage of my device. I will be storing and reading data from cloud firestore.

2.3. Implementation

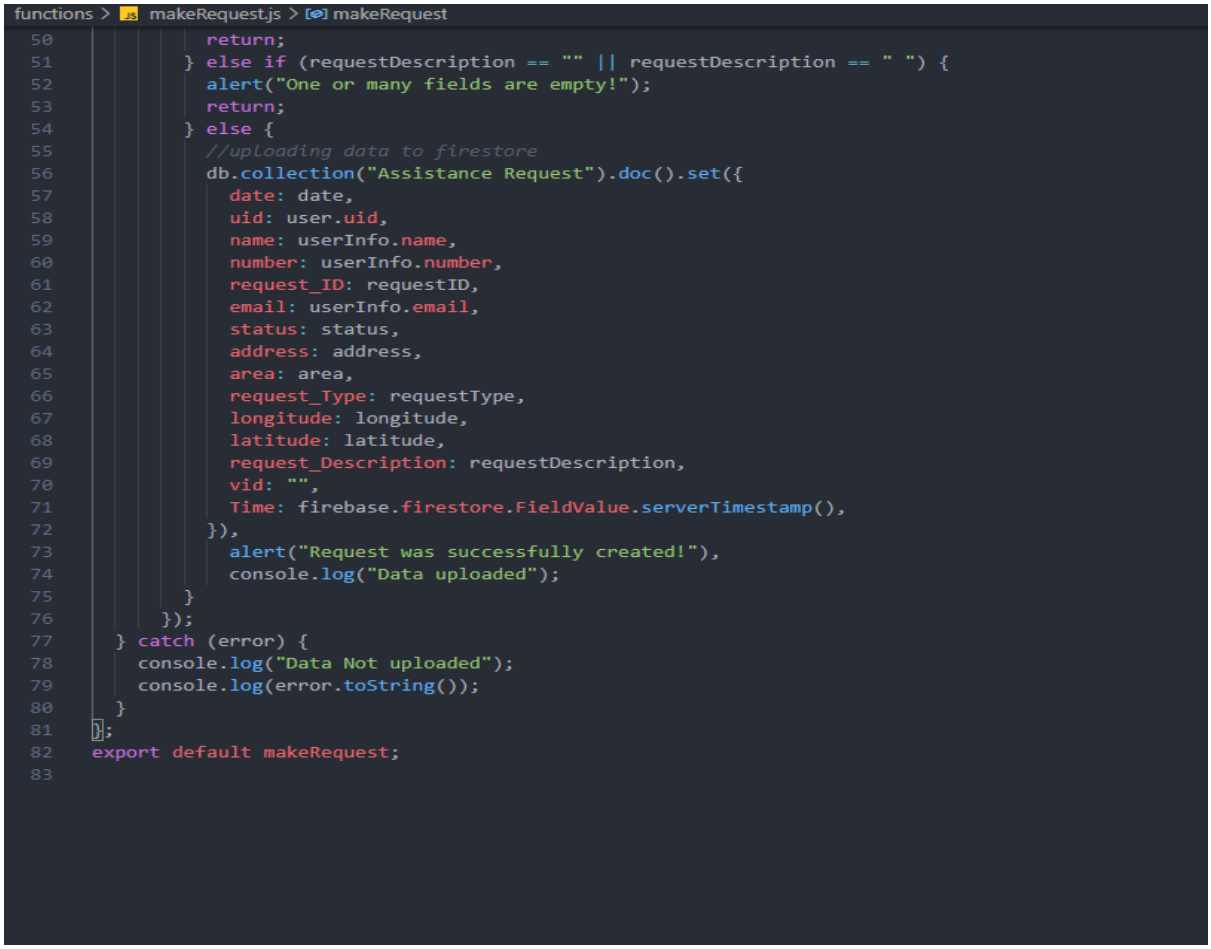
The main functionality of community aid relates to assistance requests. Assistance requests are the main selling point of community aid as this application is built around this functionality. In this section I will be providing information related to different functionalities which hold and important part in the application related to assistance requests.

Creating Assistance Request

The images below show the function that allows for the creation of assistance requests. This function is initiated when the user fills out the create assistance request form inputs and submits it. The function below receives all those inputs and carries out the following steps:

1. Validating all the inputs the user submitted. The function validates the inputs using an if else statement. If the inputs are valid the functions continue to progress. If one or more inputs are invalid the users is notified using an alert and the request is not submitted.
2. The inputs are taken and uploaded to firebase collection called “Assistance Request”. Once this occurs the request has successfully been created as the data was stored in the database.

```
/*
 *  ClassName: makeRequest.js
 *
 *  Date: 28/03/2021
 *
 * @author Piyush Sharma, X17342356
 *
 * @reference https://reactnative.dev/docs/activityindicator
 * @reference https://firebase.google.com/docs
 * @reference https://docs.expo.io/
 */

//The function below takes inputs from the MakeAssistanceRequestScreen.js and checks the ifromation for validity
//If all imputs are valid an assistance request is created by storing data to firebase collesction called "Assistance Request"
import * as firebase from "firebase";
import "firebase/firestore";

const makeRequest = (
  user,
  requestID,
  db,
  date,
  status,
  address,
  area,
  requestType,
  requestDescription,
  longitude,
  latitude
) => {
  try {
    //reading user values
    db.collection("users")
      .doc(user.uid)
      .get()
      .then((snapshot) => {
        const userInfo = snapshot.data();

        if (date == "" || date == " ") {
          alert("One or many fields are empty!");
          return;
        } else if (address == "" || address == " ") {
          alert("One or many fields are empty!");
          return;
        } else if (area == "" || area == " ") {
          alert("One or many fields are empty!");
          return;
        } else if (requestType == "" || requestType == " ") {
          alert("One or many fields are empty!");
```



Pick Up Assistance Request

The user can pick up assistance requests in two places which are from the pickup request page or the map page. Both functions are shown below.

Pick up assistance request from pickup request page.

The two images below show the function that allows the volunteer user to pick up an assistance request. This function is initiated when the volunteer tries to add a request from the pickup request page. The function below receives information in relation to the request the volunteer decided to add and carries out the following steps:

1. The function checks if the information passed to the function is not empty and can progress further.
2. The function reads the request from firebase using the “request_ID” of the assistance request.
3. The function checks if the volunteer is trying to add a request which is not created by him. This is to prevent the volunteer from picking up requests created by them.
4. The function then adds the “uid” of the volunteer to the assistance request and changes the status, so it is not available to anyone else to pick up.
5. Then using the “uid” of the user who created the request stored in the ticked. The functions read the user data from the “users” collection in firebase.
6. Then the function uses the expo Token stored in the user data which was retrieved to send an expo notification to the user. This informs the users that the request they have created has been picked up.

functions > addvidTwo.js > addVidTwo

```
/*
 *  ClassName: addvidTwo.js
 *
 *  Date: 28/03/2021
 *
 * @author Piyush Sharma, X17342356
 *
 * @reference https://reactnative.dev/docs/activityindicator
 * @reference https://firebase.google.com/docs
 * @reference https://www.udemy.com/course/react-native-the-practical-guide/
 * @reference https://docs.expo.io/
 */

/*
 * The function below carries out the following:
 * #1: Takes in inputs from the PickUpAssistanceRequest screen.js
 * #2: Reads request details from firebase
 * #3: Updates the firebase assistance request if it can be added
 * #4: Then a notification is sent to the user that created the assistance request using expo notifications and a post request
 */
const addVidTwo = (item, db, user) => {
  const addRequest = item.request_ID;

  if (addRequest == "" || addRequest == " ") {
    alert("issue has occured :(");
    return;
  } else {
    try {
      db.collection("Assistance Request")
        .where("request_ID", "==", addRequest)
        .get()
        .then((snapshot) => {
          snapshot.forEach((doc) => {
            const data = doc.data();
            const docID = doc.id;
            console.log(docID);
            console.log(data);

            if (user.uid == data.uid) {
              alert("This ticket was created by you!");
              return;
            } else {
              db.collection("Assistance Request").doc(doc.id).update({
                vid: user.uid,
                status: "Assigned to a Volunteer",
              }),
                db
                  .collection("users")
                  .doc(data.uid)
```

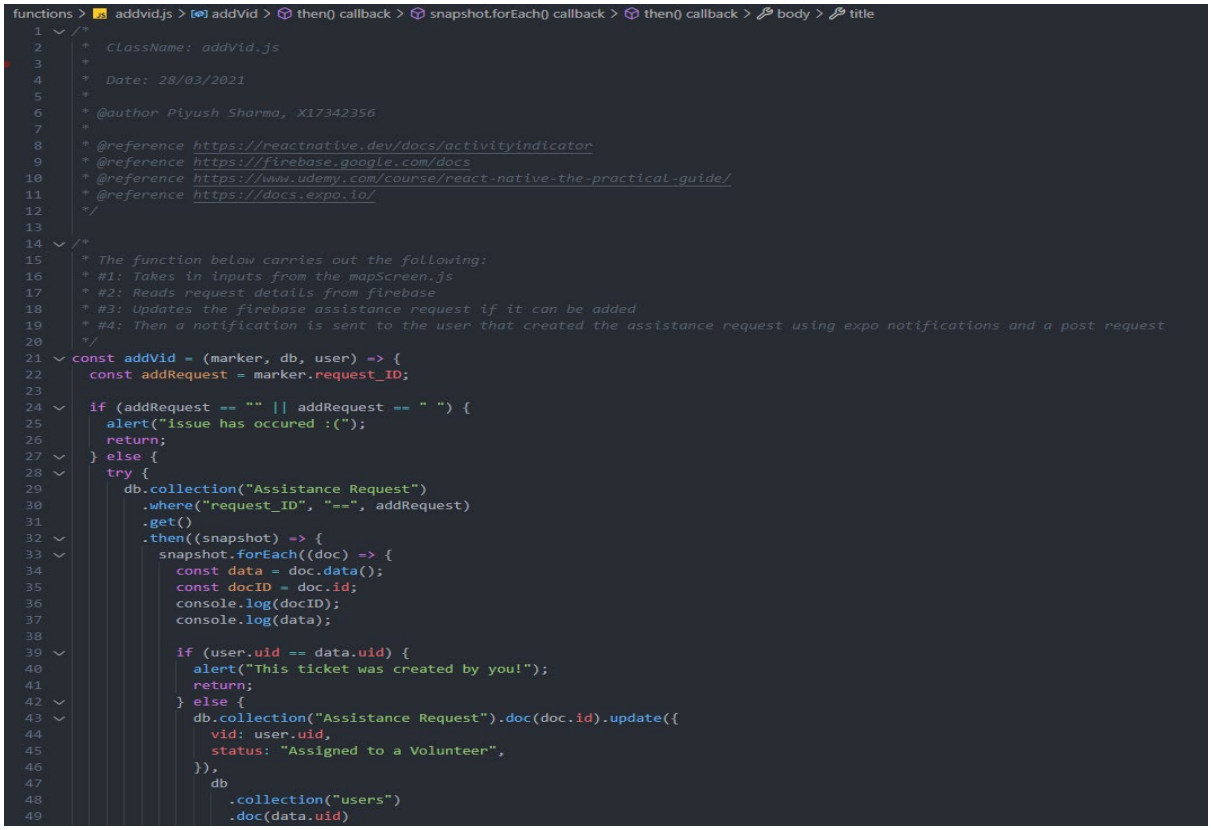
functions > addvidTwo.js > addVidTwo

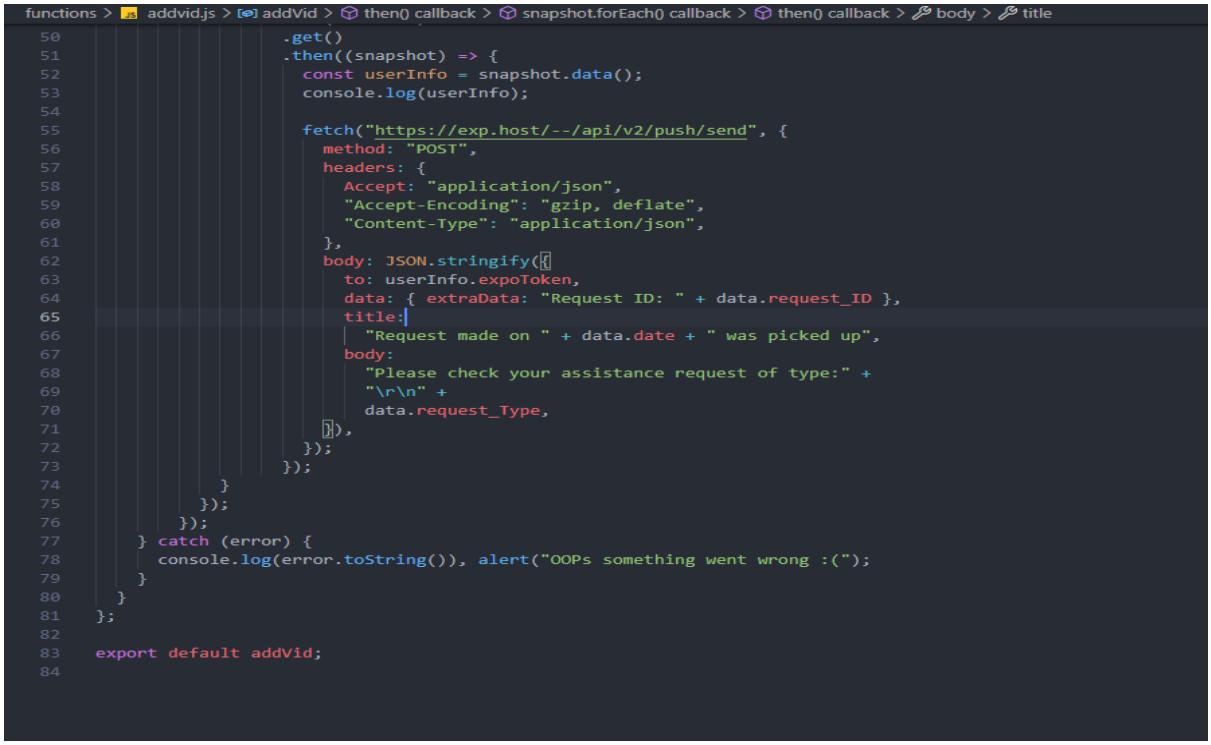
```
                  .get()
                  .then((snapshot) => {
                    const userInfo = snapshot.data();
                    console.log(userInfo);

                    fetch("https://exp.host/--/api/v2/push/send", {
                      method: "POST",
                      headers: {
                        Accept: "application/json",
                        "Accept-Encoding": "gzip, deflate",
                        "Content-Type": "application/json",
                      },
                      body: JSON.stringify({
                        to: userInfo.expoToken,
                        data: { extraData: "Request ID: " + data.request_ID },
                        title:
                          "Request made on " + data.date + " was picked up",
                        body:
                          "Please check your assistance request of type:" +
                          "\r\n" +
                          data.request_Type,
                      }),
                    });
                  });
              }
            });
          });
      } catch (error) {
        console.log(error.toString()), alert("OOPs something went wrong :(");
      }
    }
  };

  export default addVidTwo;
```

Pick up assistance request from map page.

The two images below show the function that allows the volunteer user to pick up an assistance request. This function is initiated when the volunteer tries to add a request from the map page. The map page allows the android users to add a request by typing in the request id provided on the map. The android add request function is the exact same as the one below however instead of receiving and item object it receives the request id as a string. The reason for android users having an additional functionality is mentioned in the GUI section of the report.The function below receives information in relation to the request the volunteer decided to add and carries out the following steps:

1. The function checks if the information passed to the function is not empty and can progress further.
2. The function reads the request from firebase using the “request_ID” of the assistance request.
3. The function checks if the volunteer is trying to add a request which is not created by him. This is to prevent the volunteer from picking up requests created by them.
4. The function then adds the “uid” of the volunteer to the assistance request and changes the status, so it is not available to anyone else to pick up.
5. Then using the “uid” of the user who created the request stored in the ticked. The functions read the user data from the “users” collection in firebase.
6. Then the function uses the expo Token stored in the user data which was retrieved to send an expo notification to the user. This informs the users that the request they have created has been picked up.

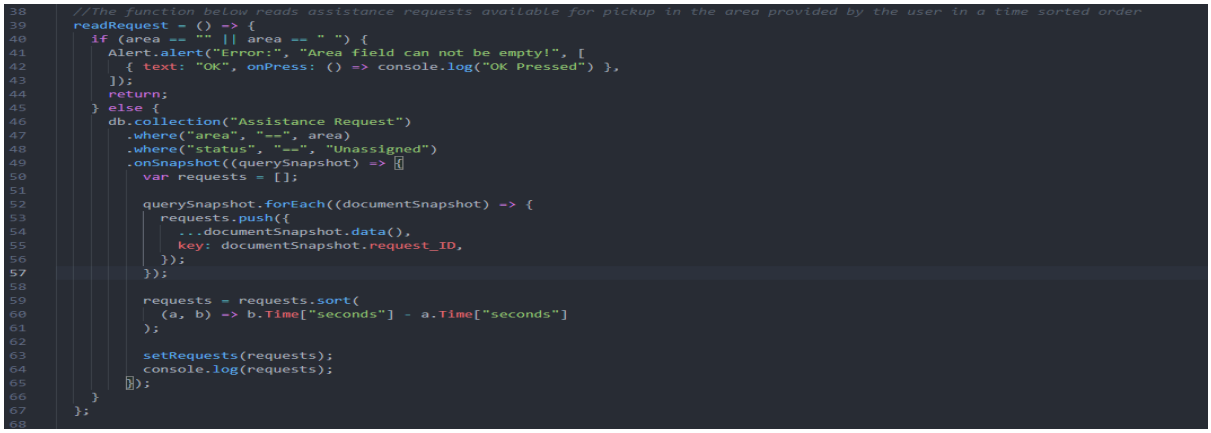




Search Assistance Request

The two images below show the function that allows the volunteer user to search for a request and displays it to the user. Here the function is initiated when the volunteer searches an area. The function below receives information in relation to the area the volunteer decided to search and carries out the following steps:

1. Firstly, the function receives the input of area and validates it by checking if it is empty or not.
2. Then a request is sent to firebase firestone database to read all requests from the "Assistance Request" collection that have the same area and the request status is "Unassigned".
3. Then the function sorts out the array of requests based on the second the request was created. The seconds field is obtained from the requests read and its whole purpose is to allow for requests to be sorted from new to old.



The image below uses the array of requests previously requested and sorted in the function above and displays them to the user using a flat list.

```
//The function below takes data previously read above and displays it using the structure below in a flatlist format
const renderRequest = ({ item }) => (
  <View style={styles.screen2}>
    <Card style={styles.cardView2}>
      <View>
        <Text style={styles.text2}>Request Time/Date:</Text>
        <Text style={styles.text3}>{item.date}</Text>
        <Text style={styles.text2}>Request Type:</Text>
        <Text style={styles.text3}>{item.request_Type}</Text>
        <Text style={styles.text2}>Request Description:</Text>
        <Text style={styles.text3}>{item.request_Description}</Text>
        <Text style={styles.text2}>Request Status:</Text>
        <Text style={styles.text3}>{item.status}</Text>
      </View>

      <View>
        <TouchableOpacity
          style={styles.Btn}
          onPress={() => addVid(item, db, user)}
        >
          <Text style={styles.Text}>ADD</Text>
        </TouchableOpacity>
      </View>

      <View>
        <TouchableOpacity
          style={styles.Btn}
          onPress={() => report(item, db, user)}
        >
          <Text style={styles.Text}>REPORT</Text>
        </TouchableOpacity>
      </View>
    </Card>
  </View>
);
```

Display Assistance Request on Map

The image below shows the function that reads requests of firebase. Here the function is initiated automatically when the map page is accessed. The function below reads all requests from the collection of “Assistance Request” with the status “Unassigned”.

```
/*
 * The useEffect function below carries out the following:
 * #1: Reads the firebase database for "Unassigned requests"
 * #2: Stores them in a array known as request for use later
 */
useEffect(() => {
  db.collection("Assistance Request")
    .where("status", "==", "Unassigned")
    .onSnapshot((querySnapshot) => {
      const requests = [];

      querySnapshot.forEach((documentSnapshot) => {
        requests.push({
          ...documentSnapshot.data(),
          key: documentSnapshot.request_ID,
        });
      });
      console.log(requests);
      setRequest(requests);
    });
}, []);
```

The image below shows the function is initiated as the user accesses the map page and it carries out the following tasks:

1. Using an async function we check if the user has allowed his location permissions. If not, the user is given a prompt to enable location permissions. If location permissions are already allowed the function continues progressing.
2. Then the user's current location latitude and longitude is stored to be displayed on the map.

```
/*
 * The useEffect function below carries out the following:
 * #1: Using the expo location library it asks checks users location permissions
 * #2: User is provided with a prompt to allow or deny location services
 * #3: If user allows location services there location is stored
 */
useEffect(() => {
  (async () => {
    let { status } = await Location.requestPermissionsAsync();
    if (status !== "granted") {
      setErrorMsg("Permission to access location was denied");
      return;
    }

    let location = await Location.getCurrentPositionAsync({});
    setLocation(location);
  })();
}, []);

// Setting default lat and long for the map
let text = "Waiting..";
let latitude = -9.062691;
let longitude = 53.270962;

//Pulling and storing users lat and long
if (errorMsg) {
  text = errorMsg;
} else if (location) {
  text = JSON.stringify(location);
  longitude = location.coords.longitude;
  latitude = location.coords.latitude;
}
console.log(longitude);
console.log(latitude);
```

The image below shows the mapping function that allows the requests previously stored to be displayed on the map using the latitude and longitude of the request which is stored upon creating the ticket. We also use callout to show a popup to the user when they click on the request marker on the map. Then the user can use the callout to pick up or report the request.

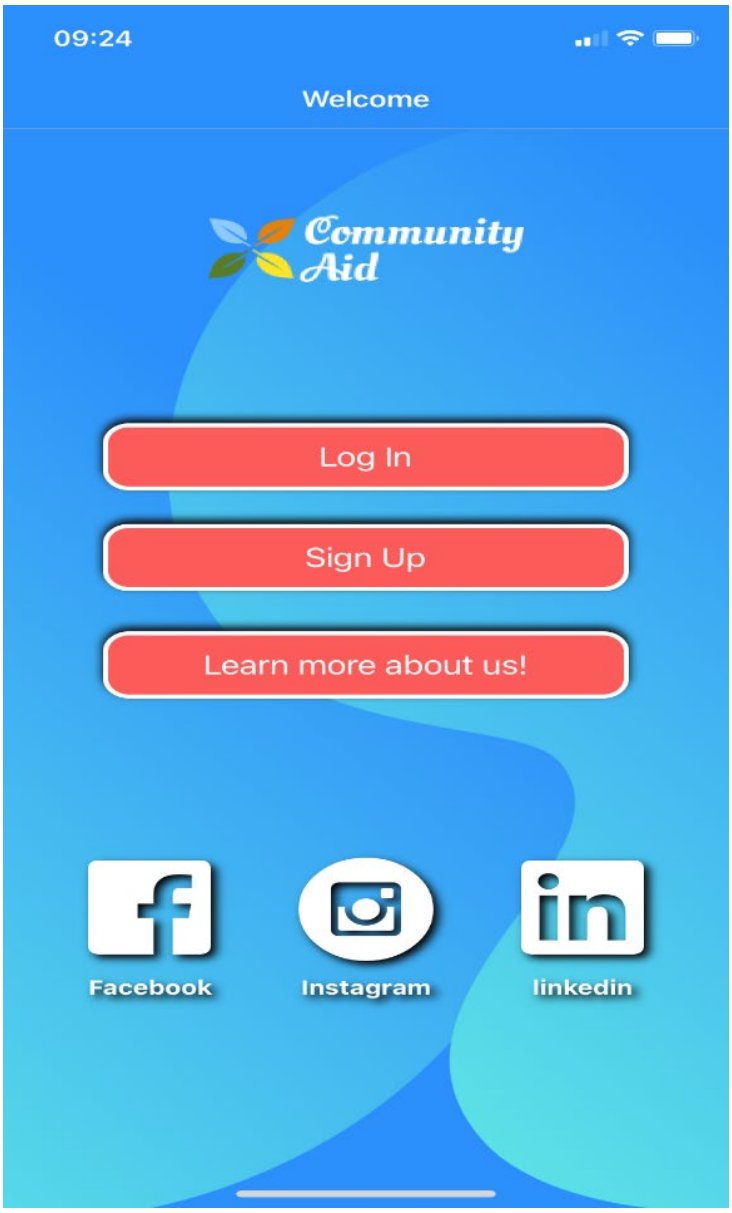
```
{
  /*
   * The mapping function below carries out the following:
   * #1: Displaying all request as marker previously read from firebase above
   * #2: Displaying information once these markers are interacted with
   * #3: Displaying a report button per request to report the assistance request
   * #4: Displaying a add button per request to add an the assistance request
   */
  request.map((marker) => (
    <Marker
      key={marker.request_ID}
      coordinate={{
        latitude: marker.latitude,
        longitude: marker.longitude,
      }}
    >
      <MaterialCommunityIcons
        name="map-marker-remove-variant"
        size={30}
        color="red"
      />
      <Callout style={styles.callOut}>
        <Text>{"Request Type: " + marker.request_Type}</Text>
        <Text>{"Area: " + marker.area}</Text>
        <Text>{"Description: " + marker.request_Description}</Text>
        <TouchableOpacity
          style={styles.BtnTwo}
          onPressIn={() => addVid(marker, db, user)}
        >
          <Text style={styles.subText}>Add request</Text>
        </TouchableOpacity>
        <TouchableOpacity
          style={styles.BtnTwo}
          onPressIn={() => reportRequestTwo(marker, db, user)}
        >
          <Text style={styles.subText}>Report request</Text>
        </TouchableOpacity>
      </Callout>
    </Marker>
  ))
}
```

2.4. Graphical User Interface (GUI)

In this section of the report, I will be going through the GUI of my application and how it works. All screenshots were taken on an IOS device. My main aim when creating this application was to give the application simplistic modern look with big icons and text. The reason for this was to keep the perfect balance to attract individuals of all ages including young and the elderly.

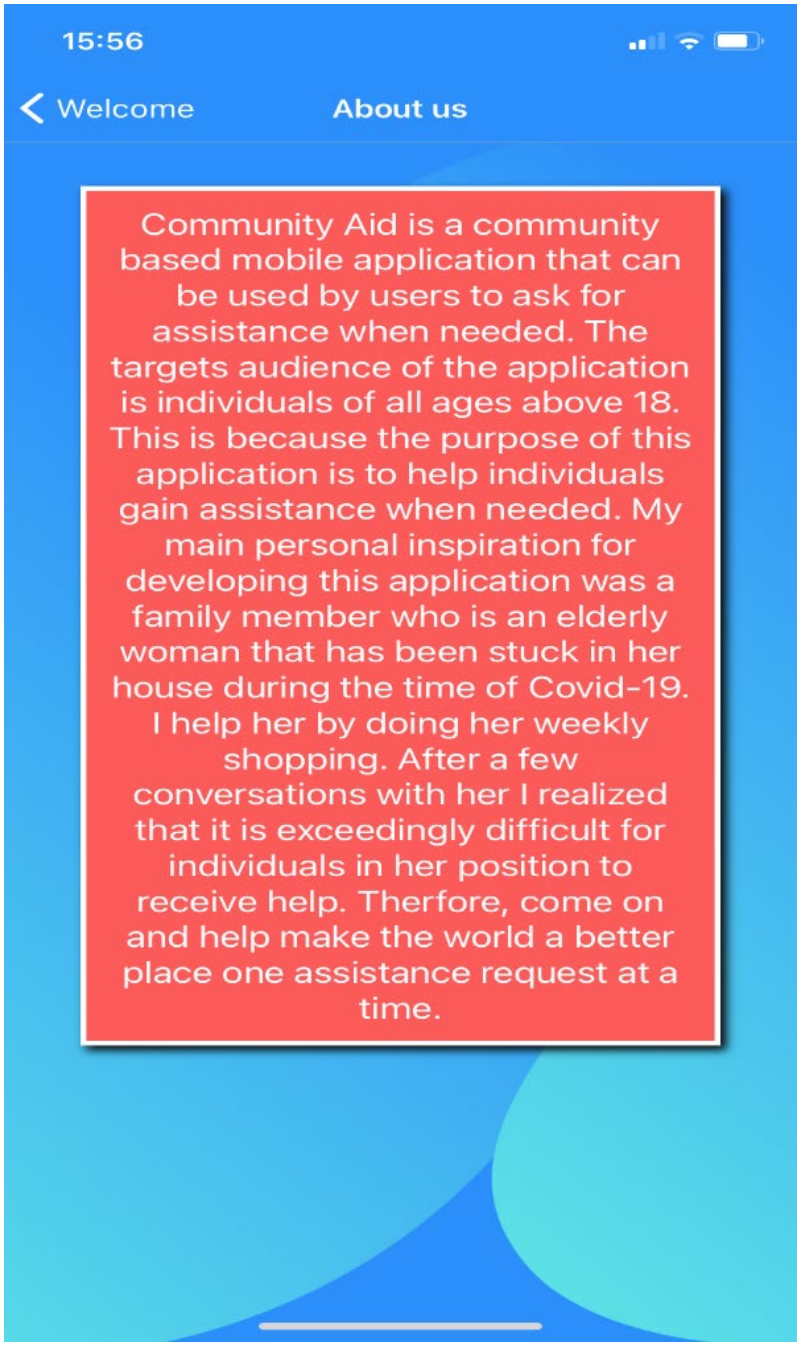
Welcome Page

The Image below shows the welcome page of community aid. This is the page that first loads when a user launches the application. The welcome page allows the user to access functionality like the log in page, about us page, sign up page and all community aid social handles by the click of buttons and icons. This page allows for easy navigation to the introduction pages of community aid application.



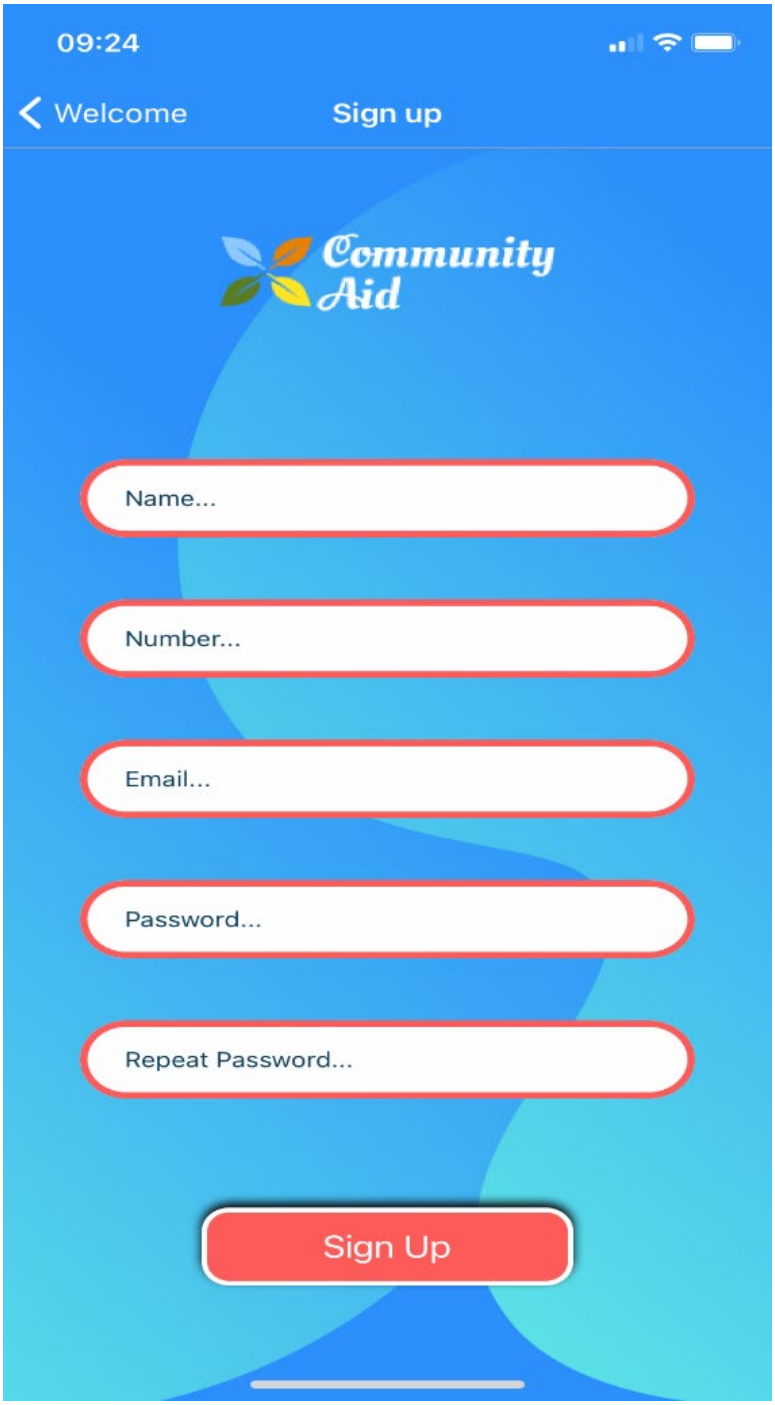
About Us Page

The image below displays the about us page which is accessed from by clicking the “Learn more about us!” button on the welcome page. This page consists of information about community aid, what we stand for, reasons behinde the creation of community aid and much more. Main aim of this page is to be transparet with out users and imform them about what we do.



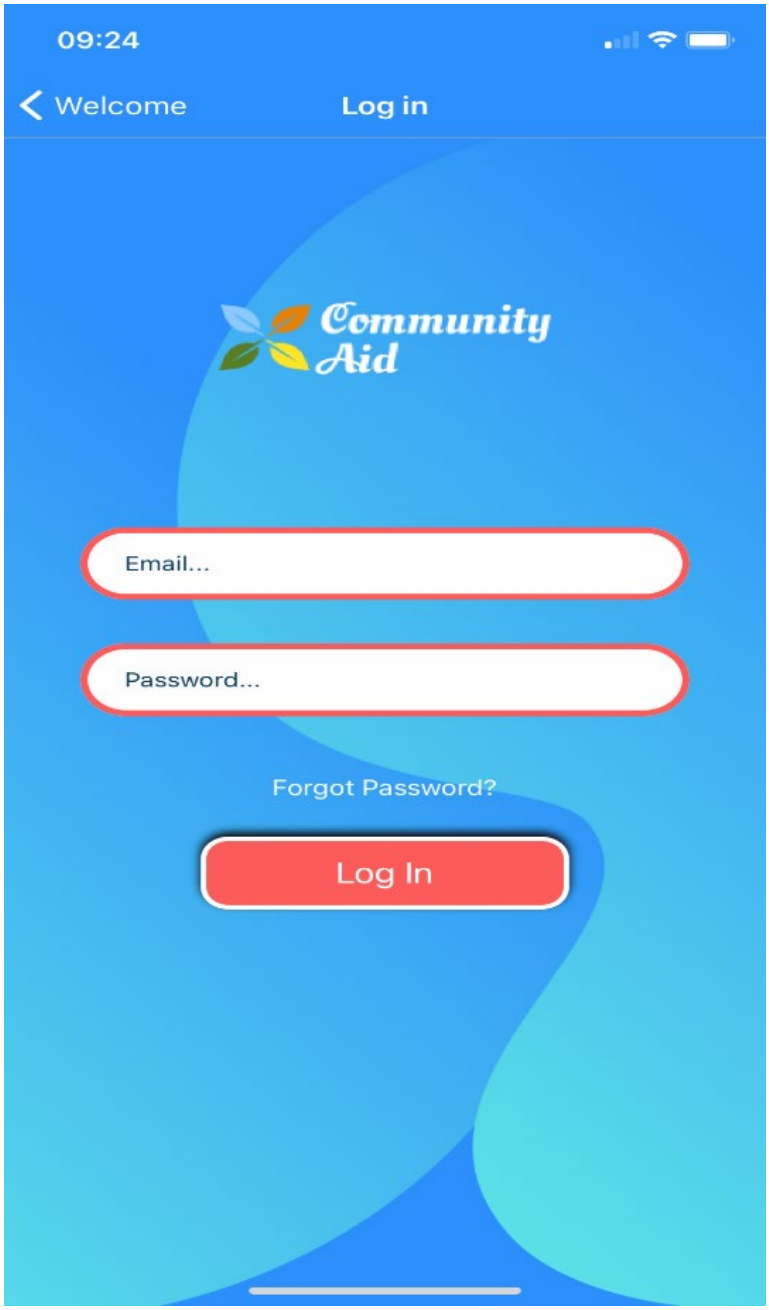
Sign Up Page

The image below shows the sign up page. The user is able to create an account by filling in the form shown. All inputs must be valid. Once the user has filled in all fields correctly they can create an account by clicking the “Sign Up” button. This page is accessed by clicking the “Sign Up” button on the welcome page.



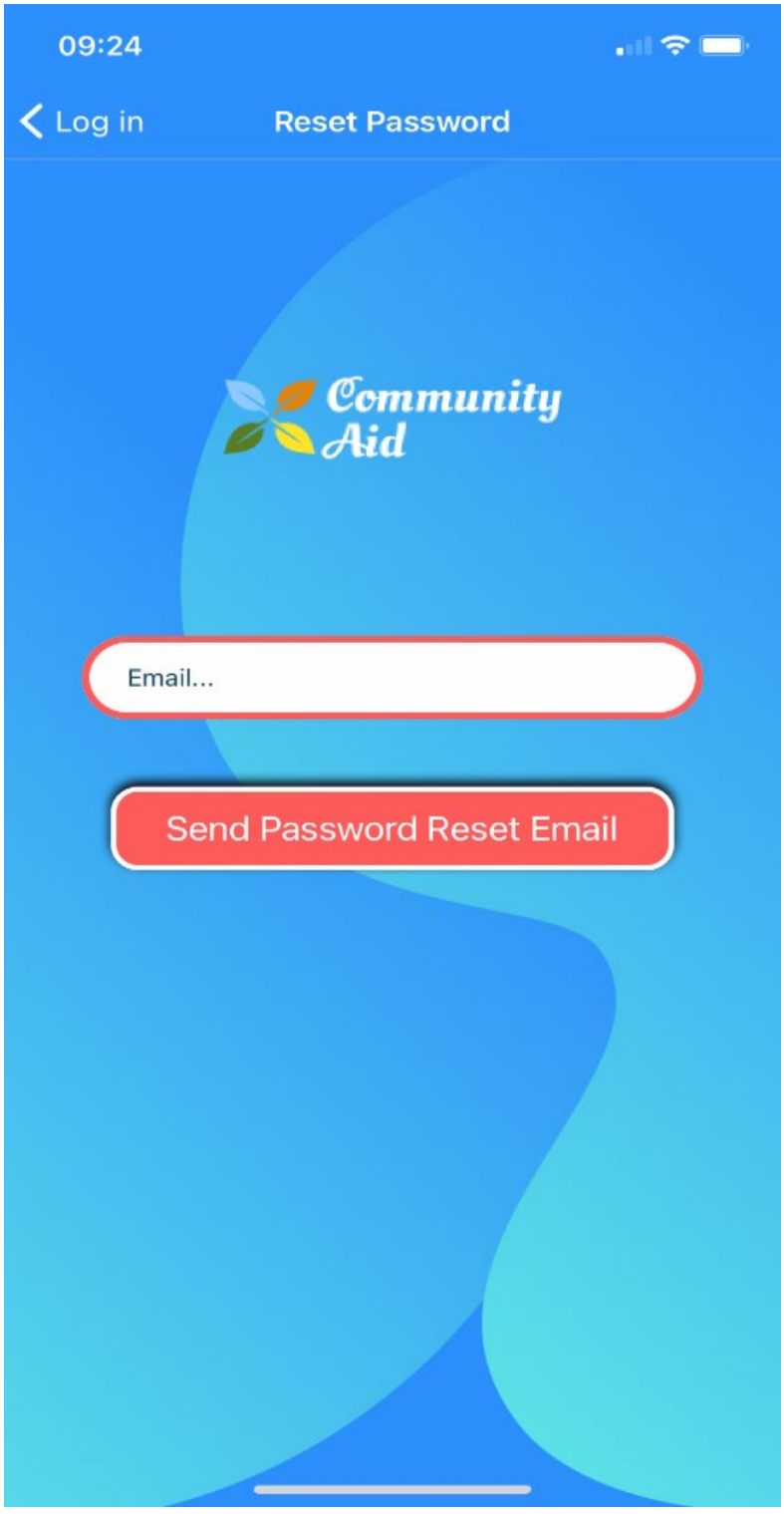
Log In Page

The image below shows the log in page. The user is able to log in to there previously created account by filling in the form shown. All inputs must be valid. Once the user has filled in all fields correctly they can log in to their account by clicking the “Log In” button. The user can also use this page to access the forgot password page by clicking “Forgot Password?”. This page is accessed by clicking the “Log In” button on the welcome page.



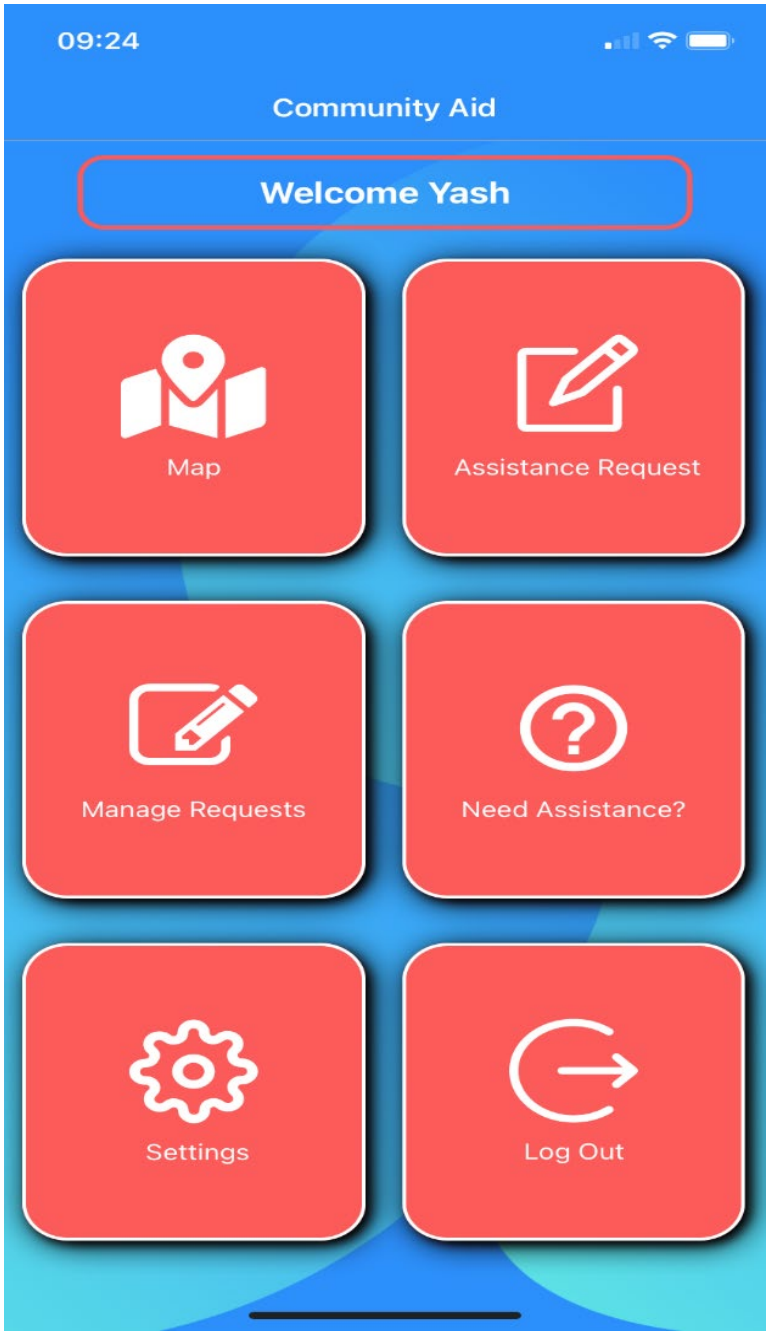
Forgot Password Page

The image below shows the forgot password page. The user is able to change there password here by typing their email for there account. If a user with that email exists they receive an email which allows them to change the password. This page is accesable from the log in page by clicking “Forgot Password?”.



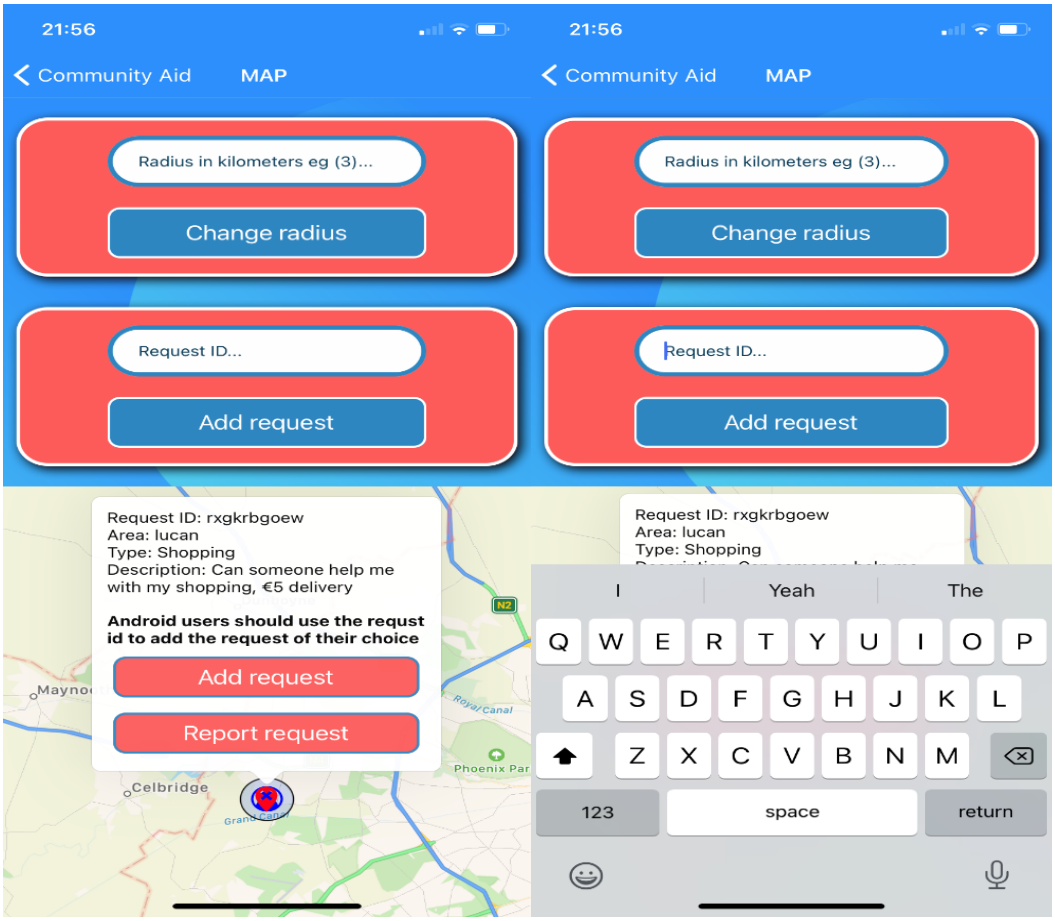
Home Page

After loging in or signing up successfully. The user is greated by the home screen which deisplay the users name and icons with text that the user can click in order to access different pages of community aid application. These pages include the map, assistance request, manage request, need assistance and settings page. The user is also able to log out of their of account by clicking “Log Out”. The main purpose of this page is to provide easy navigation for the user. The user can play both types of users as a person who needs assistance or as a volunteer easily through this clear navigation.



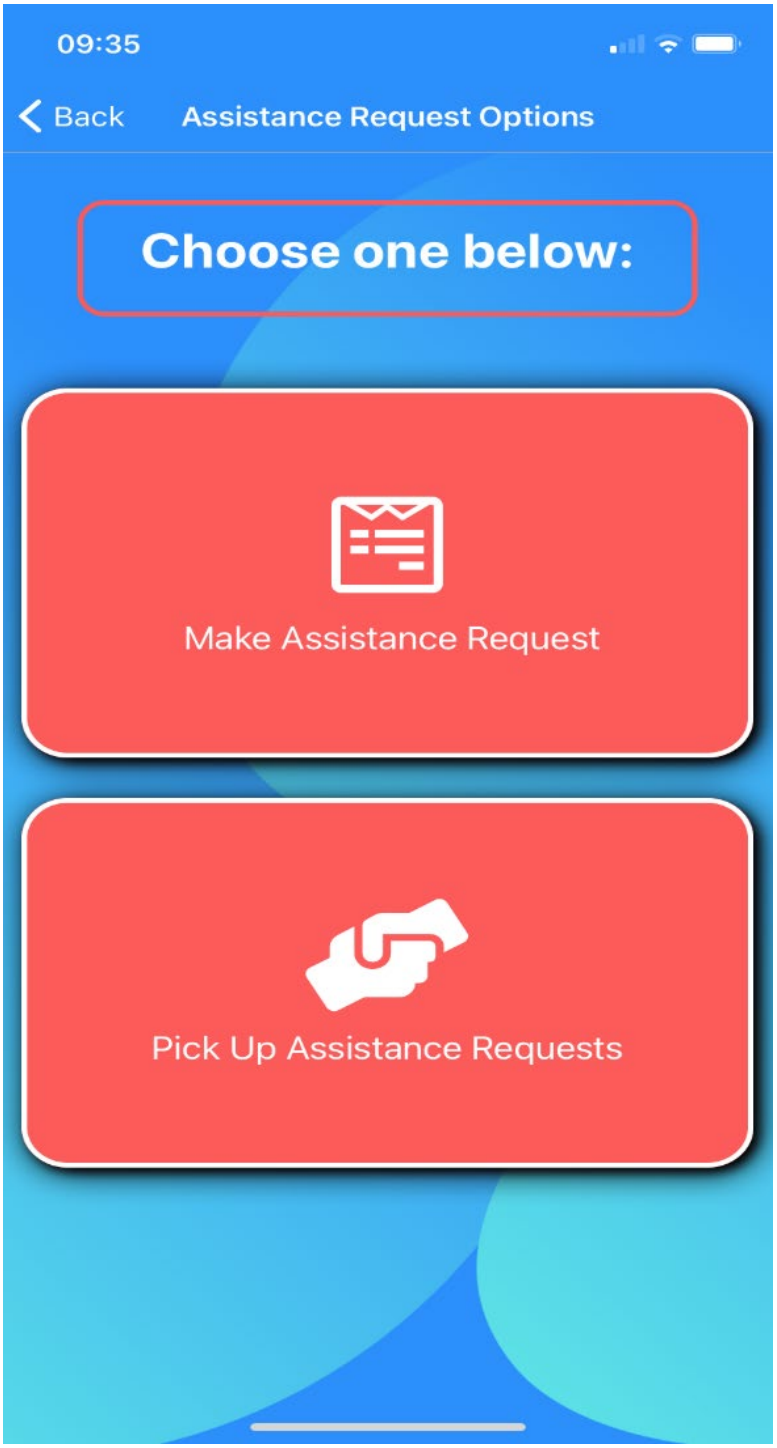
Map Page

The map page can be accessed by clicking “Map” selection on the home page. This page is designed for the the users that wanna help others (volunteers). This page displays the users location on the map as a blue user logo and it also displays assistance request made by there location as a red marker. The user is also able to change the map radius ring by typing a number into the “Radius in kilometers” field and clicking “Change radius” button. The user acting as a volunteer will be able to pick up an assistance request to complete by clicking “Add request”. They can also report requests by clicking “Report requsest. If a assistance request is picked up or reported they will dissapear from the map in real time. Due to a google map bug that cant be resolved which was identified during testing the “Add request” and “Report request” buttons on the map do not function and are not clickable for android users. Therefore, android users must use the special add request functionality where they type the request id of the request they want to add into the field “Request ID…” and click the ”Add request” button to add the request. In order to report the request android users are pushed to use the pick up assistance request page. Each request on the map informs android users about use the request id to add the request.



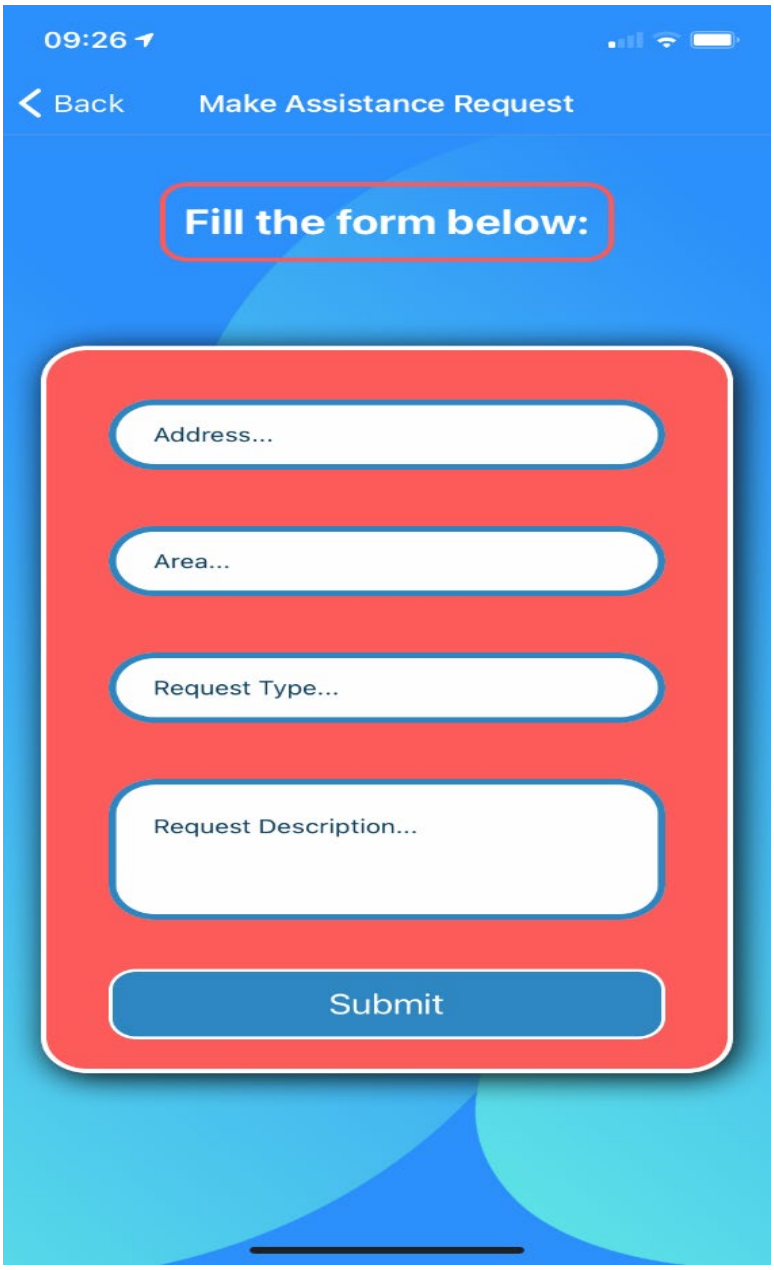
Assistance Request Options Page

The assistance request option page can be accessed by clicking “Assistance Request” selection on the home page. The main aim of this page is to provide simple navigation in relation to Assistance requests. A user can use this page to access the make assistance request page to create an assistance request or the pick up assistance requests page to help a person in need.



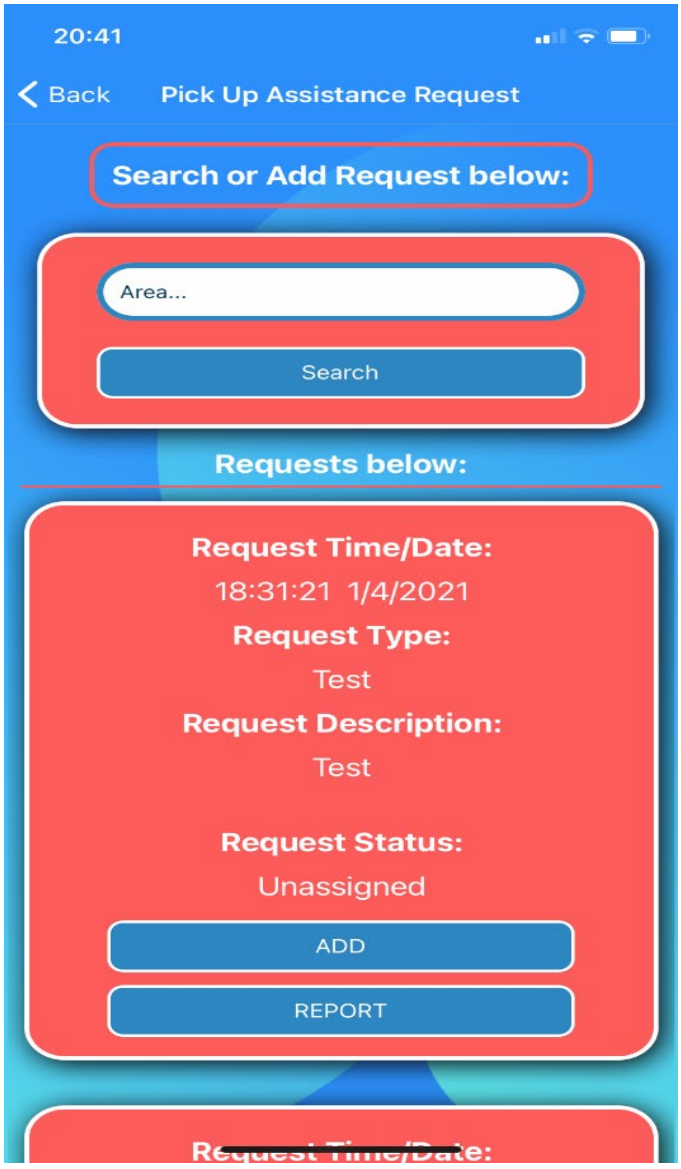
Make Assistance Request Page

The make assistance request page can be accessed by clicking “Make Assistance Request” selection on the assistance request option page. The purpose of this page is to create an assistance request. This page is for users who are looking to request help. The user fills out the form shown below and clicks the submit button below to create a request. The user does not need to fill out information such as name, email and phone number because the system uses the users firebase details to fill that out saving the user who needs assistance some time. The use must make sure that all inputs put in are valid and not abusive because this can lead to the form not submitting (error alert will be shown). There is a higher chance of the request getting reported.



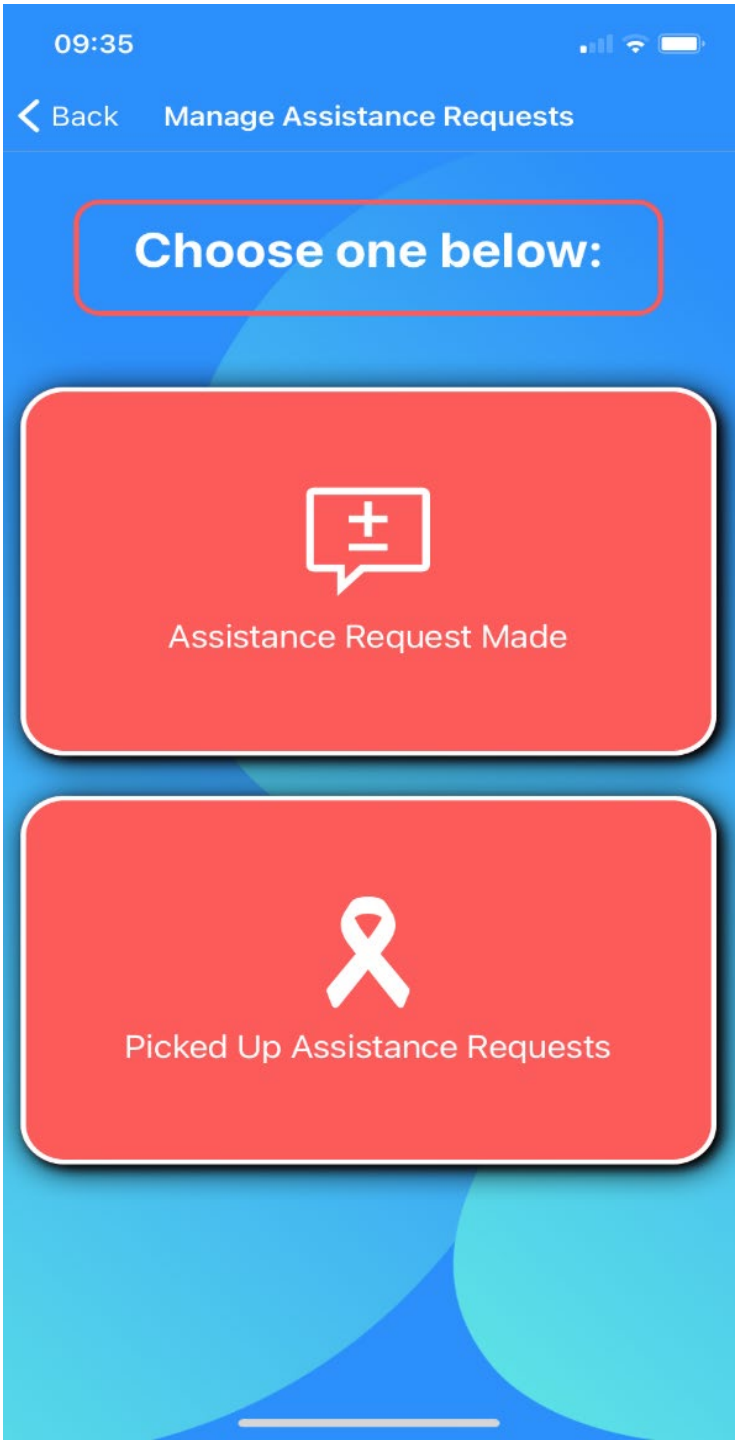
Pick Up Assistance Request Page

The pick up assistance request page can be accessed by clicking “Pick Up Requests” selection on the assistance request option page. This page is for the users who want to help other and are not looking for help in the current moment of time. The user once on the page can search for requests within his area. In order to do this they type an area name in the imput field labled “Area…” and click the “Search” button. If any requests exist in the area they will appear below the “Request below:” title. The user can then scroll throught the requests and choose the one they think is doable for them. The user also has the power to report requests. The user can pick up the request by clicking “ADD”. This will then add the users identification key to the ticket and assign it to them. If the user reports the request by clicking “REPORT” the request will be removed and will be added to a new collection in firebase for review purposes.



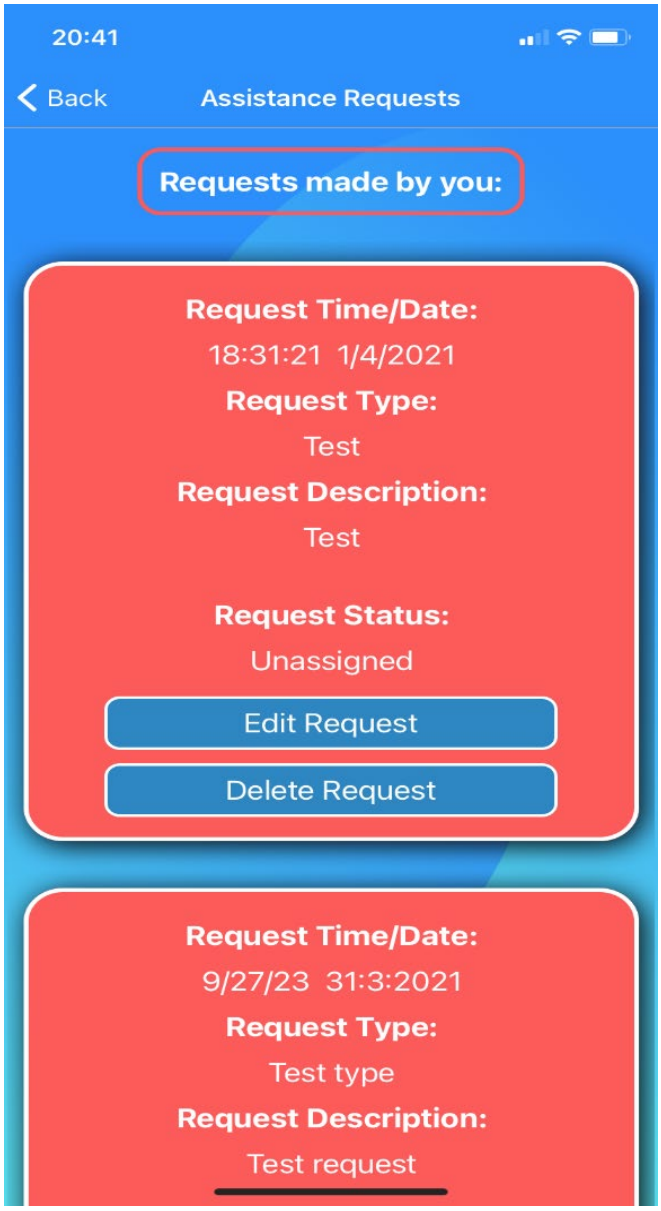
Manage Assistance Requests Page

The manage assistance requests page can be accessed by clicking “Manage Assistance Request” selection on the home page. The main aim of this page is to provide simple navigation in relation to managing Assistance requests. A user can use this page to access the assistance request made page to manage requests created by them or the picked up assistance request page to manage their assistance requests which were picked up.



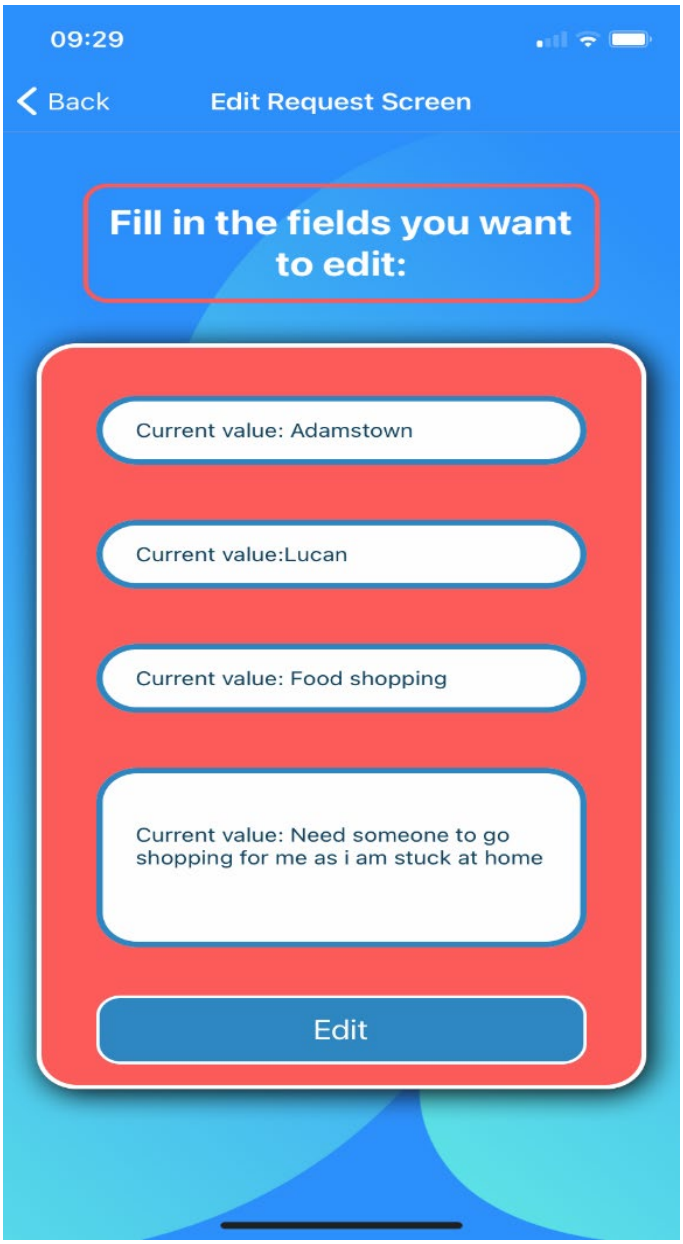
Assistance Request Made Page

The assistance request made page can be accessed by clicking “Assistance Requests Made” selection on the manage assistance requests page. The purpose of this page is to display all of the requests made by a user to be completer by other helping users. The page as seen below displays all requests and the user is able to delete the request and edit it. If the user clicks the “Edit Request” button. They will be navigated to the edit request page where they can edit the details of there request. If the user clicks the “Delete Request” button. They will be given a promt to select if they are sure. If the user still delets the request the request will dissapear from the page and will be removed from the user. Notifiactions will be sent to individuals who have picked up the request. It will inform them about if the request has been edited or deleted.



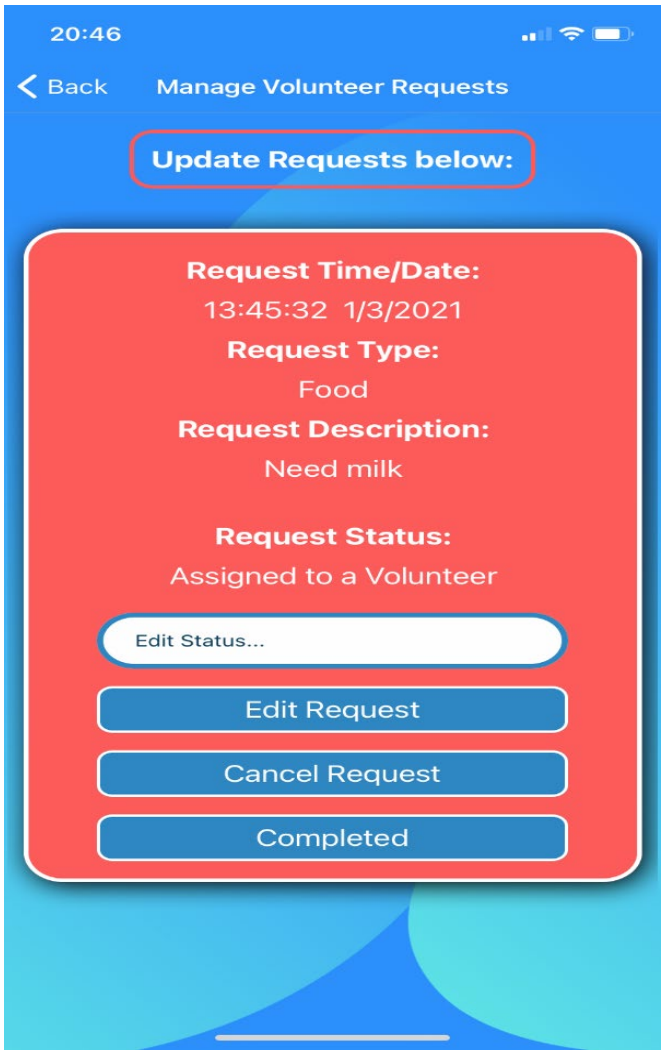
Edit Request Page

The edit request made page can be accessed by clicking “Edit Request” selection on the assistance request made page. This page as shown below will display a form that consists of editable fields of the request. The user is able to edit their request by inputing new inputs in any of the fields. Leaving a fields blank will lead to those fields not updating the records in the data. This saves the user time as they only need to fill in fields they want to change. Also the placeholders of the field display the current values of the tickets to the user can see what they are changing. Once the user has filled in valid inputs and clicked the “Edit” button. The request will be updated in the database and the edited request will display on the requests made by you page.



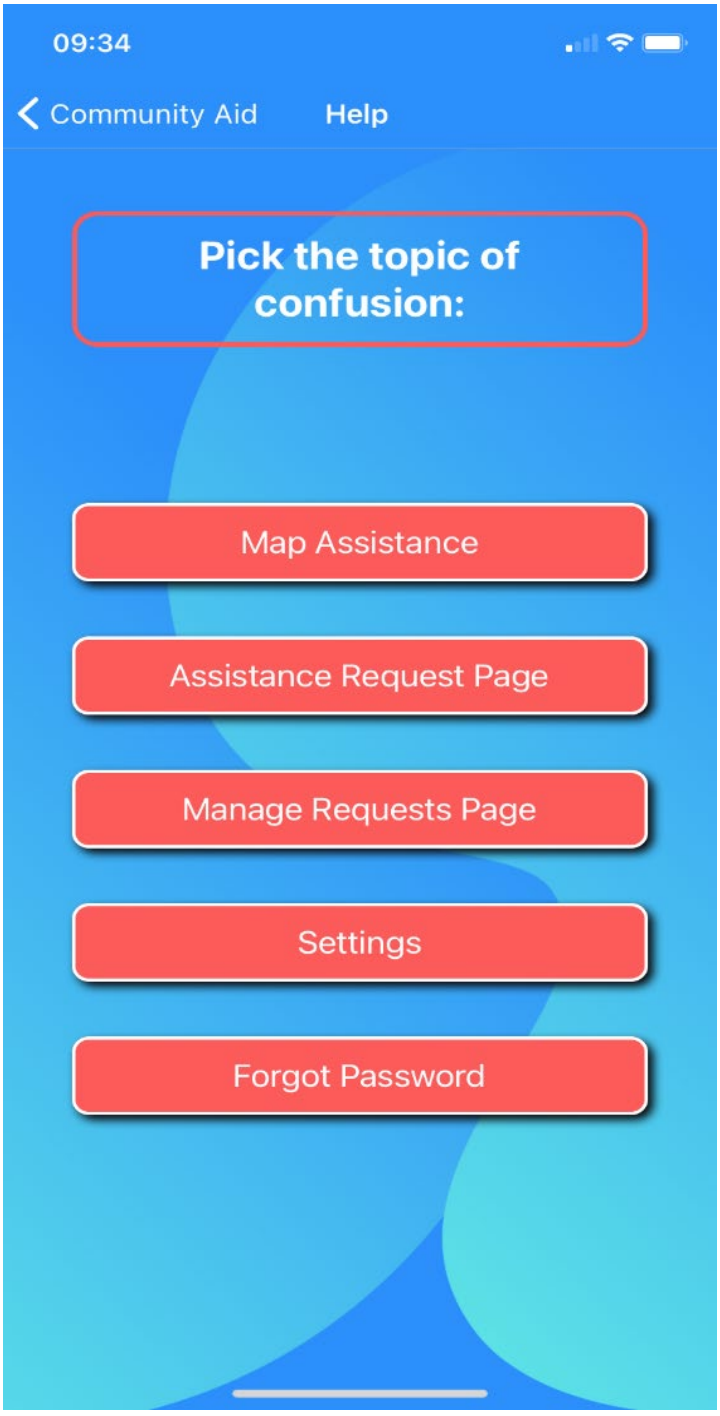
Picked Up Assistance Requests Page

The picked up assistance request page can be accessed by clicking “Picked Up Assistance Requests” selection on the manage assistance requests page. The purpose of this page is to display all of the requests picked up by a user to be completed and help other users. The page as seen below displays all requests. The user is able to click the “Complete” button to complete the request and this will send a notification to the person who has created the request stating request was completed. Then the request will be removed from the page. The user can click the “Cancel Request” button to cancel a previously picked up request. This will sent a notification to the user informing them about there request being dropped, the request can be picked up again and will be visible to other users now. The request will be removed from the users page. Finally the user can edit the status of the request by typing a valid input into the “Edit Status…” field and pressing the “Edit Request” button. This will notify the user. All the updates will update the page in real time and update the database.



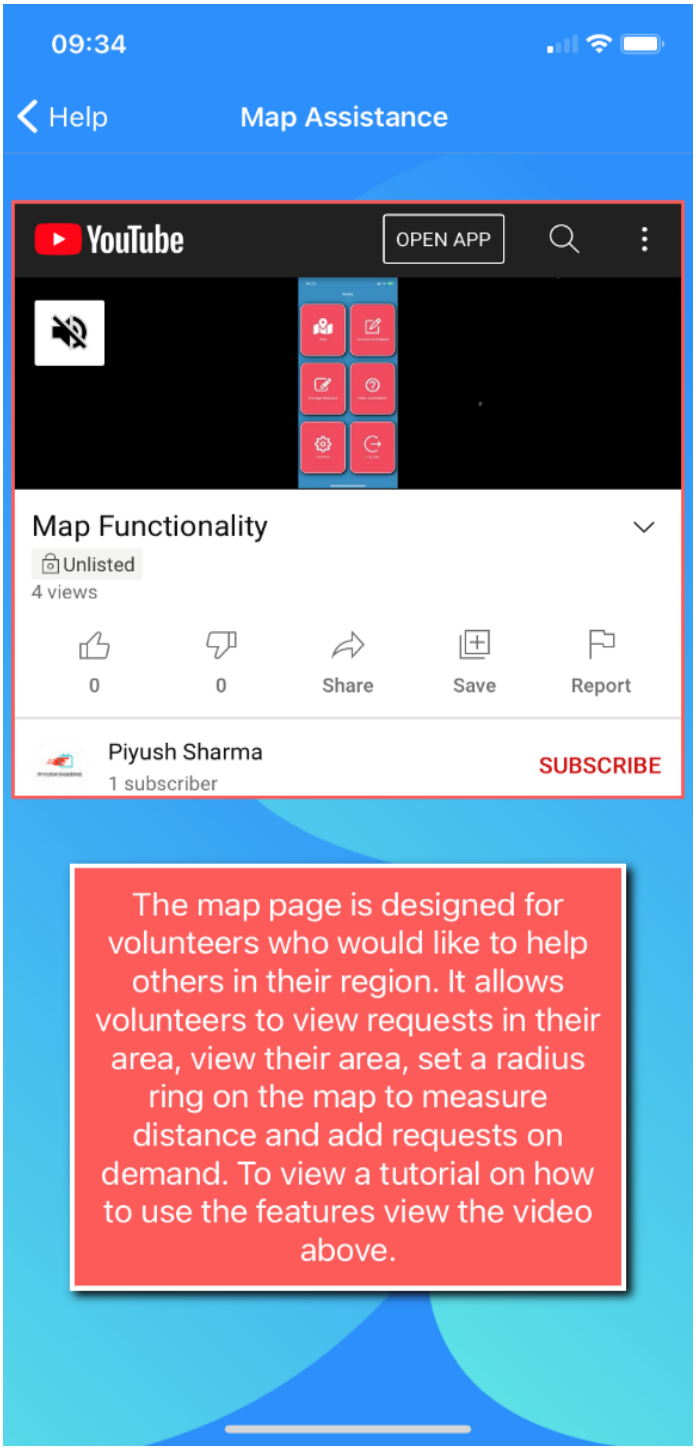
Manage Assistance Requests Page

The help page can be accessed by clicking “Need Assistance?” selection on the home page. The main aim of this page is to provide simple navigation in relation to aplication assistance. A user can use this page to access different topics they may need help with. The user can interact with the page by selecting a topic by pressing any of the buttons as shown below. This will navigate them to the following page.



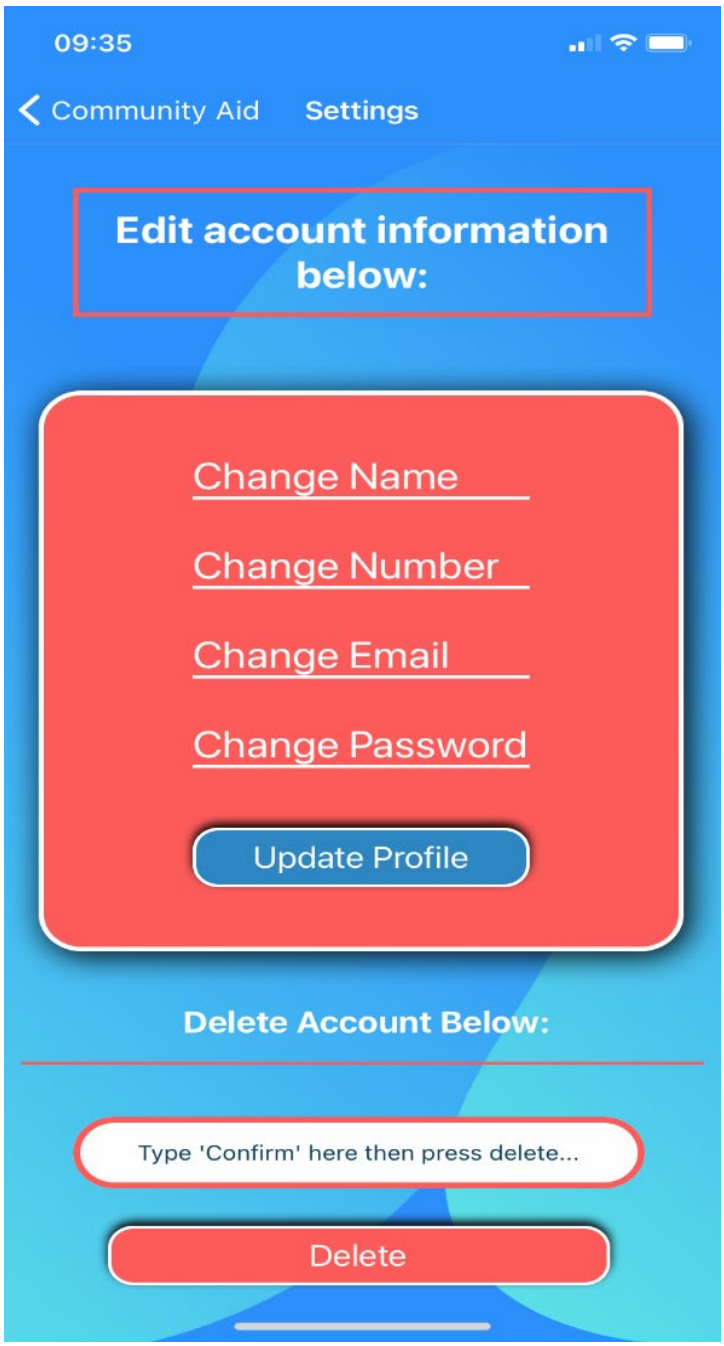
Example of An Assistance Page

The help page can be accessed by clicking “Map Assistance” selection on the help page. The main aim of this page is to provide help in relation to the topic of the map page. This page consists describes the map page and all its functionality for the users who may be facing difficulty. The user can also watch a video that brings them through the map page and how to use it. All other help pages consist of the same layout but for different topics.



Settings Page

The settings page can be accessed by clicking “Settings” on the home page. The main objective of this page is to allow the user to change their profile details or delete their account. The user can edit their details by filling in the fields provided on the edit form. They must fill out the fields they want to change with valid inputs and click “Update Profile”. This will lead to a prompt which will provide information to the user about what will happen if they submit the form. The user can leave fields they do not want to change. The user can delete their account by typing “Confirm” and pressing “Delete”. All information is updated on the database.



2.5. Testing

Testing is an especially important part of the development process as it allows the developers to ensure all their features in the application are working properly and efficient testing allows for better experience for the application users. To test this application, I used two methods. The first method is the use of jest. This is a testing framework that uses JavaScript. The second method of testing I used is some manual usability testing. This allowed me to test my application by letting future users interact with it to identify any flaws in the application.

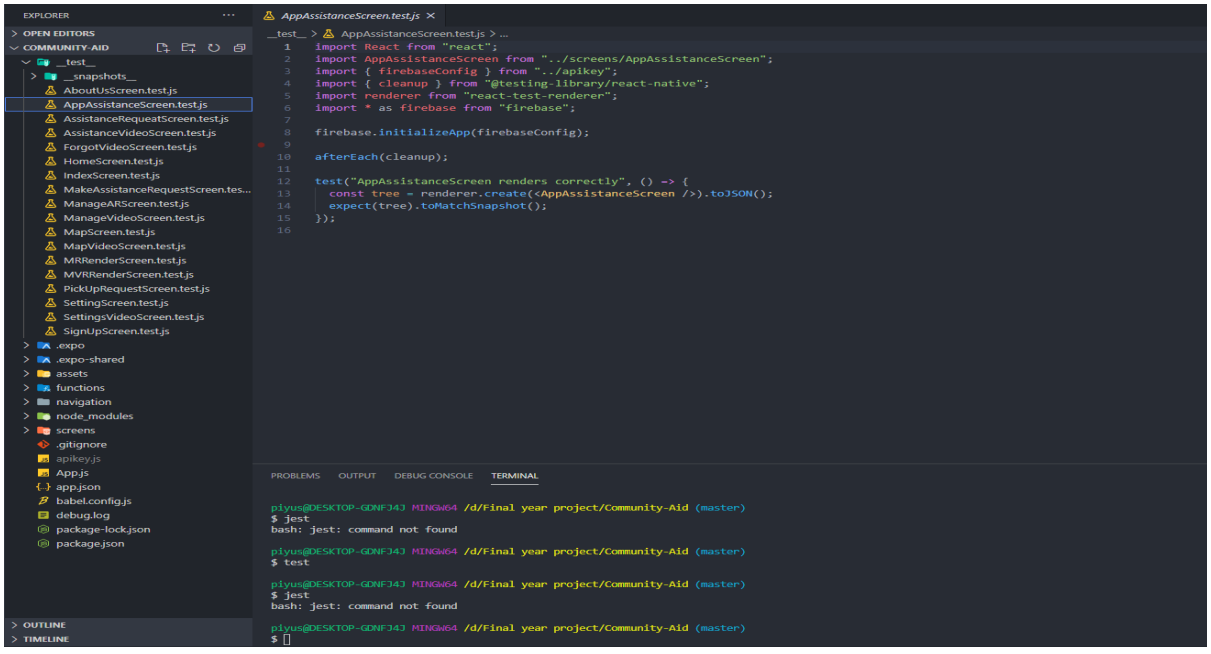
Jest Testing

The main purpose behind using jest was to allow for unit testing. The main type of unit tests I used were render tests which is a snapshot test. Render tests check if the pages were rendering components as expected. My lack of experience using jest limited the how in-depth the unit testing was. With no prior experience using jest I was able to produce render tests to check all the components of my application. The evidence and the result of my tests is provided below. Also, I faced some firebase related issues which would prevent the tests from passing due to firebase not being initialised. Therefore, I resolved this problem by initialising firebase per test.

Evidence:

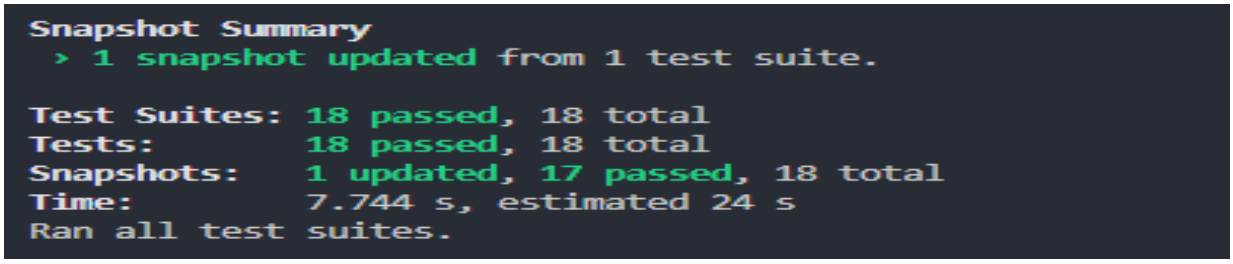
The first image underneath shows the "_test_" folder of my application. This folder consists of eighteen test suites. One for each page of my application. The second image shows some examples of test suites running and passing when the tests are launched. Each test suite consists of a render test which checks if the components of the page are rendering as expected. The render tests work in the following steps:

1. A snapshot of the page being tested is taken from the screens folder which is in a json format and stored in the "tree" constant.
2. The test compares the json within the "tree constant" to the json returned when the application is booted for the test.
3. If the "tree" constant matches the json returned test is passed. If they do not match test is failed.



Result:

The results of my tests can be seen below. All my testing suites and their tests are passing which can be seen below in the first image below where eighteen suites have passes. This means that all the pages were rendering as expected. Also, no issues were identified. Also, to prove the tests were functioning properly the second image below shows an example of a json snapshot that the test took.

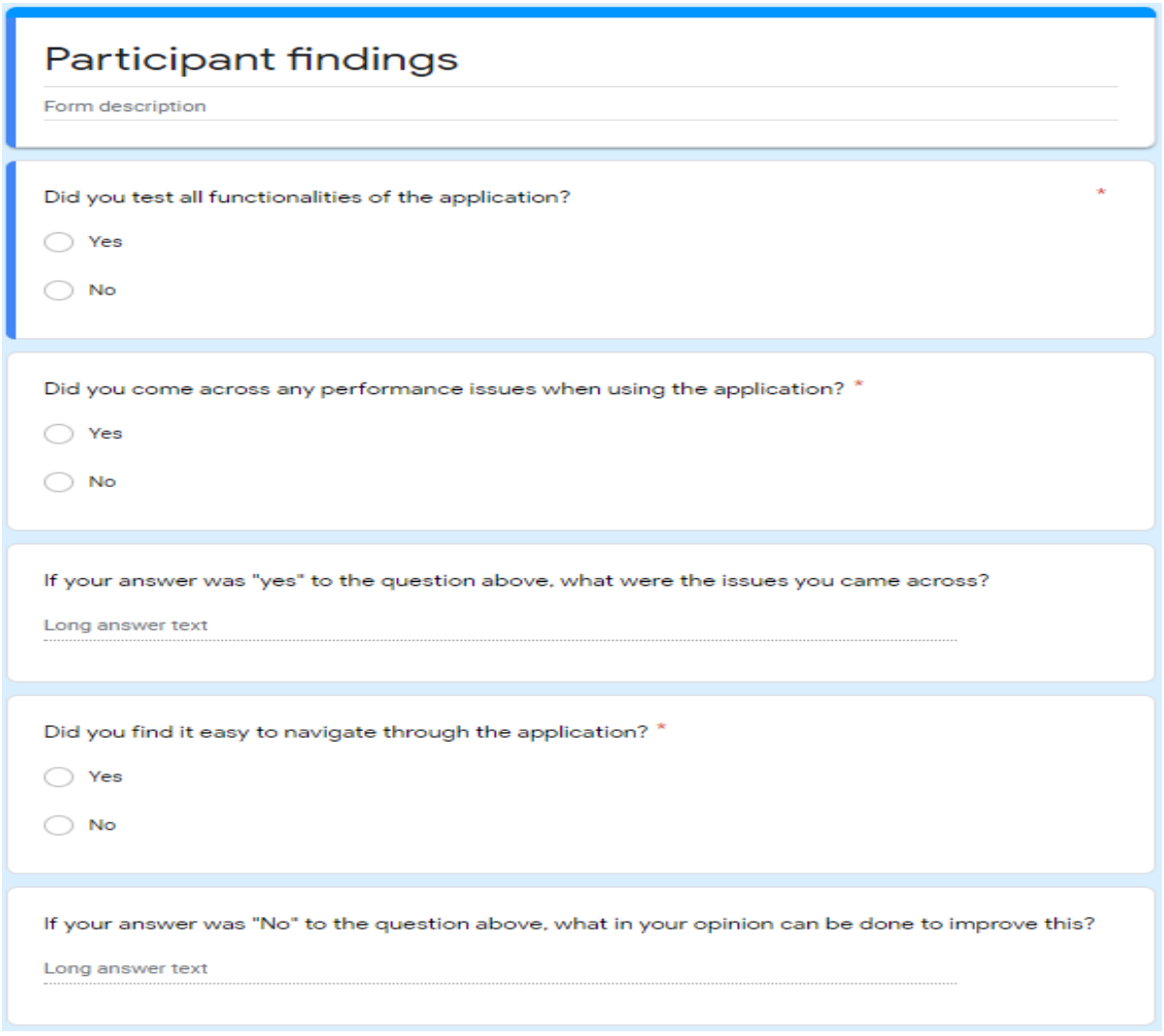


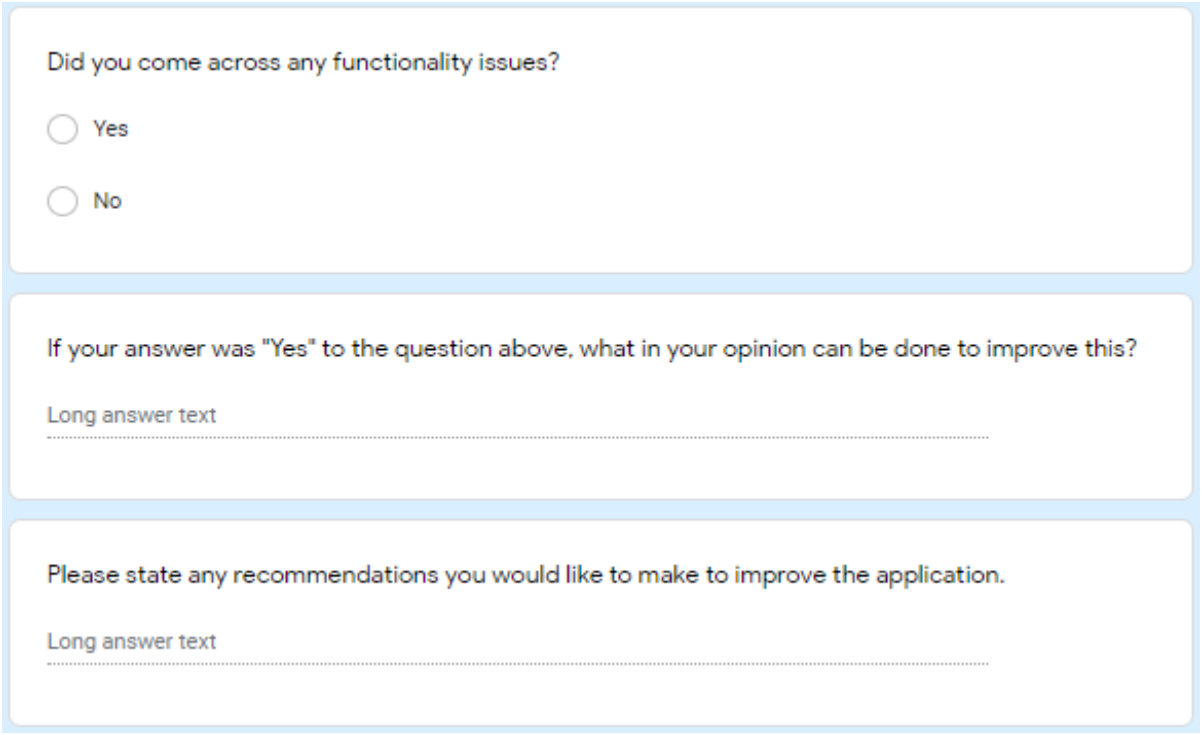
Manual Usability Testing

I decided to carry out some manual usability testing to allow potential users of the application to test the application. The purpose behind this was to identify any bugs, faulty features of the application and gain recommendations for the users. By the help of usability testing, I gained great insight into my application.

Evidence:

The two images underneath show the form that users were required to fill out after testing. This form consisted a wide range of questions which relate to application performance, bugs encountered, functionality issues and recommendations. I made sure that that the tester could not be identified by the form which ensured testers were giving honest feedback and without any pressure. To create the form, I used Google form. Before carrying out manual testing the testers signed a consent form and were provided a check list for the users of the features that needed to be tested. This checklist can be seen in the third image below. After the user was provided all this material, they were given access to the application and I was there to observe them.





Feature/Test name	Task Completed Y/N	Comments/Observations
Log In	Y	
Sign Up	Y	
Forgot Password	Y	
Create a request	Y	
Pick up a request	Y	
Edit Map radius	Y	
Use map to pick up a request	Y	
Report request	Y	
Edit request	Y	
Delete request	Y	
Edit status	Y	
Cancel request	Y	
Assistance page	Y	
Update profile	Y	
Complete request	Y	
Access social links	Y	
Notifications	Y	
Log out	Y	
Delete account	N	Issue encountered with deleting my account, wouldn't delete for me

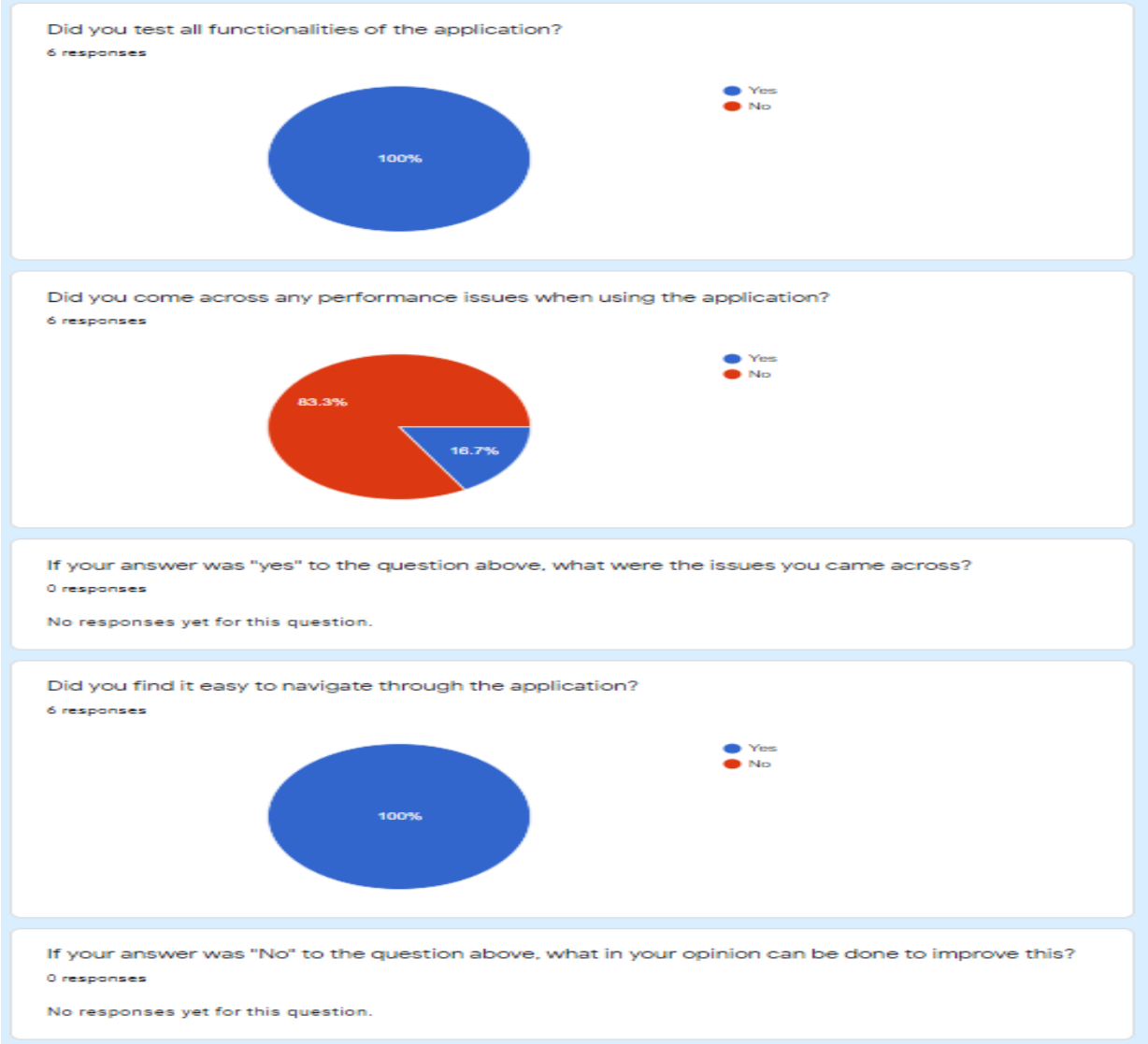
Result:

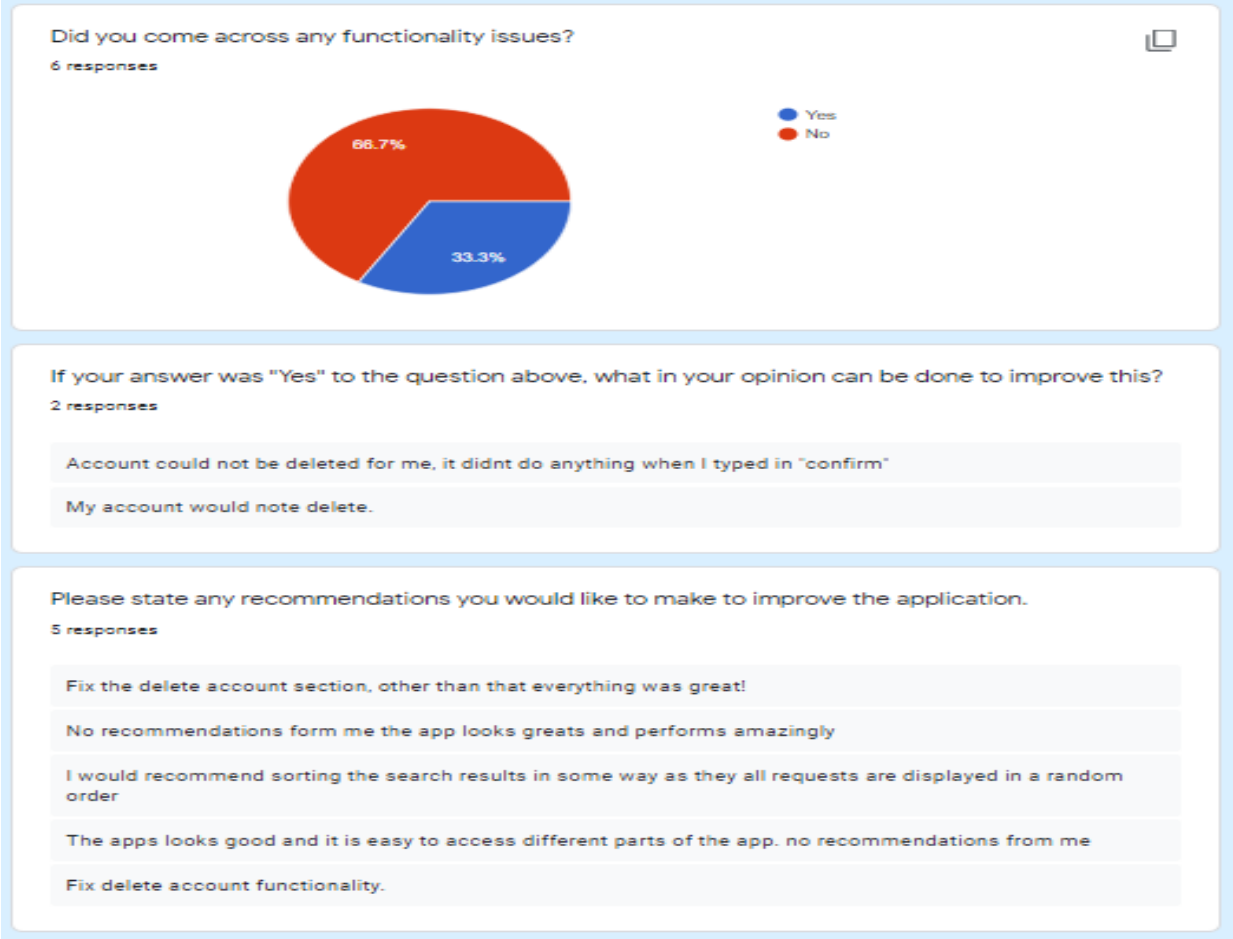
The image below shows the results of the form submissions after testing. From the results seen below, I was able to identify some bugs and gained some great recommendations. These include:

1. *Delete account functionality bug:* This bug did not allow users to successfully delete their account. Once the user had carried out all the necessary steps to delete their account nothing would happen. After research, I realised this bug was caused by the latest react native patch. Therefore, I made the necessary syntax changes to fix the bug. Once the bug was fixed the functionality retested the functionality with all the testers again.
2. *Logout functionality bug:* This bug was related to the navigation of the application. The user once logged would be provided an option to go back to the home screen. The user could not carry out any functions once on the home screen after logging out. However, this still needed a fix. I fixed this issue by fixing the navigation of my application to not

display a back button on the index screen which came after a user had logged out. Once the bug was fixed the functionality retested the functionality with all the testers again.

3. *Android map callout buttons bug:* This issue did not allow android users to use the map callout buttons to add or report a request on android. However, on IOS this worked fine as IOS uses apple maps. After research, I identified this was a known issue with google maps with no solution at the time of development. I decided to add another way that android users can add a request by filling out the id of the request they want to add on a form. All of this can be seen in the GUI section of the report. I ensured all users on android were informed by each callout that they had to use the new add request functionality. Once the bug was fixed the functionality retested the functionality with all the testers again and I received some great feedback for the solution.
4. *Recommendation of sorting requests*: This recommendation related to the displaying of requests on the manage request pages and pick up request page. The requests were displaying in a mixed order with no pattern. To resolve this, I decided to use a firebase server timestamp with allowed me to sort the request from earliest to oldest before displaying. This led to requests displaying from newest to oldest. Once recommendation was satisfied, I retested the functionality with all the testers again and I received some great feedback for the solution.

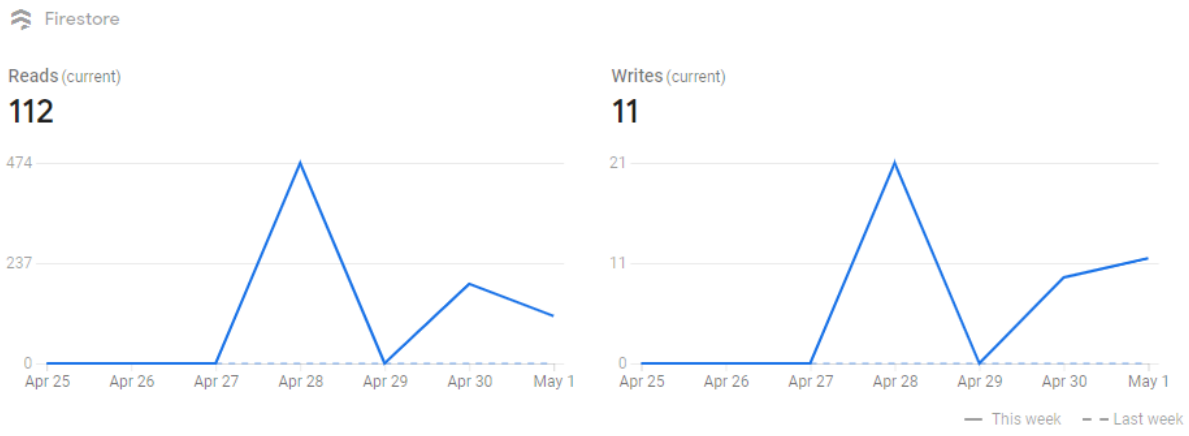




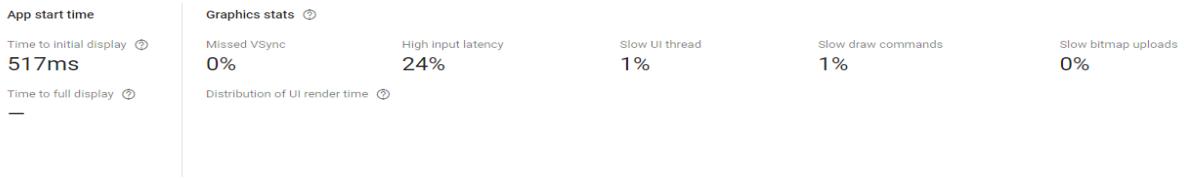
2.6. Evaluation

To evaluate this project, I used tools such as firebase read and write metrics, firebase test labs and developers monitor. For the evaluation of this project, I will be focusing on data usage, performance evaluation and scalability of the projects.

The image below shows the reads and writes to the database post manual testing. Firebase firestone allows for unlimited reads and writes to the database while providing on demand storage. This boosts scalability of the project. The number of reads and writes below are based of five testers. The average read and writes per user should not affect the performance of the application. Therefore, boosting the performance of the application.



The image below was taken from firebase test lab. Which was used to carry out a performance test on the project post testing. From the image below, we can see that the initial time for display of the application was 517ms which is relatively quick, slow draw commands and slow UI threads sit at 1% and the input latency is at 24%. All these values and percentages are relatively low. This means the application is performing better than expected and performance has been boosted within the application.



To further evaluate the performance of the application I used firebase test lab. The image below shows the results related to CPU, graphic and memory usage when the app was running. The CPU usage is mainly below 15 percent which is great as the application is not putting much pressure on the mobile device, the fps has been relatively stable as seen from the image below with not many sudden drops which is good as the application is not producing any sudden drops leading to a smooth experience and the memory is average sitting at 160 KB which is low in comparison to what phones today are capable of handling. This evaluates that the application is performing well, majority of devices should be able to handle running that application and it should also perform smoothly.

The image below shows the developer monitor when running the application using expo go application. As we can see the UI and JS max out at 60 hertz and do not show many sudden drops stating good and smooth UI and JS performance when running the application. Also, the ram is sitting at 220.94 MB which low in comparison to what mobile devices can handle. Therefore, stating good and smooth performance.

To conclude evaluation, the application is showing great performance results, it allows for backend scalability and shows great data usage stats.

3.0 Conclusions

Overall, in my opinion I have achieved what I set out to do which was to create an application that can be used by users of all ages to come together as a community and help each other in a time of need. I managed to meet all my requirements from a functional and user perspective. I also added an extra functionality that were never part of the requirements. However, in my opinion there is still room for improvement as there can be a few more functionalities that can take this application to the next level. In this part of the report, I will be discussing the limitation of the project and the identified advantages and disadvantages.

Advantages:

- *Meeting requirements:* The project meets all the requirements from a functional and a user perspective that were highlighted earlier in the report. Also, some additional functionalities that were not part of the requirements originally were added as a bonus. All requirements work efficiently and as expected.
- *Efficiency:* The project has led to the creation of a very efficient application that is to the point and allows users to carry out tasks efficiently. Features like navigation of the application is efficient as the application is easy to navigate through. Overall, the application highlights its efficiency.
- *Scalable:* The application is very scalable. This is because its structure allows it to adapt to multiple markets in the future such as the services sector or the food delivery sector. The flexibility of the application idea makes it flexible enough to adapt easily to multiple markets by the introduction of minor functionalities.
- *Low competition*: Currently the project is incredibly unique as it is a non-profitable application mainly targeting the idea of increasing connectivity within a community by allowing individuals in the community to help each other. Since, there are not many applications carryings this out makes my project unique and standout.

Disadvantages:

- *React native and expo issues:* This disadvantage was caused due to issues caused by react native and expo during the development of my project. React native and expo are still relatively new technologies. Therefore, they are constantly updated and improved over time which led to some features of my project breaking and not working. This will potentially keep happening for a while due to them being relatively new. Therefore, potentially causing issues in the future if the application is not tested regularly and monitored. An example of this the delete profile functionality of my application which stopped functioning due to an update to react native.
- *Competition:* Competition can be a major disadvantage of this application in the future. This is because as mentioned before that the application is scalable and can enter markets easily which can lead to a dramatic increase in competition. It will be hard to compete against applications already ruling the market.
- *Complexity:* The application has multiple features which may take users a little time to learn. This may turn users to use other applications if there is a less complex application on the market.

Limitations:

- *GUI:* There are limitations to the graphical user interface of the application. The main limitation of the application is related to the GUI messing up across different sized mobile

devices. This limitation could be resolved with more time and investment into the design of the application and testing across different types of devices.

- *Incentive for users playing the volunteer role:* When a user helps someone there is no incentive there other than good will. This can turn of helpers in the future who would like to pursue helping fulltime. Therefore, there is need for some sort of incentive program for these individual or including things like payment methods allowing users to pay for the service they received from the helper.
- *Automated testing:* The project currently does not take advantage of in-depth level of automated testing. This could lead to issues in the future such as poor user experience due to bugs that were not identified due to human error.

4.0 Further Development or Research

For the future development and research of the project I would mainly focus on improving the limitations mentioned in the previous section of the report. With additional resources and time, I would improve the GUI of the application to look the same across all mobile devices to attract more users and make the application more appealing to all users. I would also invest time into coming up with an incentive program for the helpers to motivate them to help more users. This includes things like payment method integration for tips or delivery fees or some sort of way to earn money for the helpers by using the application. I would also research into integrate an in-depth level of automated testing to the project. This is because this will lead to a better user experience over time as bugs and issues will be identified before the user is able to identify them. Overall, If I was provided with resources and time, I would just try to integrate more functionality which will be appealing to the user and scale the application over time.

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6.0 Appendices

6.1. Project Proposal

Project Overview

In this part of the report, I will be giving an overview of my 4th software project called Community Aid. The objective of this project is to develop a fully functional mobile app

that can be used to bring our communities together and help each other. Community Aid will help the elderly, vulnerable, people with a disability and any individual requiring assistance. The focus of this app is to help communities become more collective and assisting each other at a time of need.

Technology is more popular and useful then ever and its usage is constantly increasing. However, most apps and websites are built with the focus of making a profit of the users rather than the focused on helping the users. Even though every house has technologies like laptops, computers, smartphones and tablets. We have never been more disconnected with each other.

Some of us are coping fine in the current times with the pandemic. However, plenty of us are not. People like the elderly, vulnerable and people with disability or illness. For these groups of people carrying out some day-to-day tasks was already difficult and it has only gotten worse. The pandemic has also had an awfully bad effect to everybody's mental health.

Community Aid will help resolve these issues by providing a platform where all individuals can go and ask for assistance. These requests can be anything from shopping help to just needing someone to talk with. This will be a great app for people who want to make a difference in their community as they will be able to become volunteers and help anybody in their area that requires assistance. It will be a platform where our communities can come together to help one another and tackle some major world problems like mental health.

Functionality

- The mobile app will have a neat and easy to use layout.
- The mobile app will allow users to register and log in.
- The mobile app will allow the target audience to make an assistance request by filling out a simple form.
- Assistance requests include grocery shopping help, helping build something in free time, guidance requests and more.
- The mobile app will allow volunteers to pick up an assistance request and complete it.
- It will have a map display that will show assistance requests as markers on the map and the volunteers will be able to interact with these markers.
- The map will show the current location of the volunteer and a radius around the location that will allow them to identify assistance requests close to them.

Original idea

The idea of Community Aid started with the aim to create a website and the target audience was smaller as it was aimed to only help the vulnerable, elderly, people with disability or illness.

I got some great feedback from the lecturers I emailed about my idea. They gave me some great recommendations such as creating a hybrid application and broadening my target audience as my current target audience were not great with technologies and may suffer with a website.

Therefore, I decided to change my idea and create a hybrid mobile application instead of a website as majority of my target audience were more inclined to use a mobile application than a website. I also broadened my target audience by making that application for anyone who needed assistance rather than targeting specific groups of people.

Inspiration

There are a few factors that inspired me to come up with this idea. One of them is an elderly woman that lives around the corner of my house. I have had many conversations with her, and these conversations made me realise there is lack of help in the community for the elderly, vulnerable and people with disability or illness. This is because she would mention how she finds it hard to go shopping, she does not have many people to talk to during the pandemic and that she is finding it hard to get help when she is looking for some guidance. Example: she has a plumbing issue and does not have much knowledge on the topic and need advice.

Also, I wanted to create something that can relieve people of daily stress, bring the community closer and benefit their mental health. I think this idea achieves this because it will relieve people of tasks that they find difficult to do and can also be used as a place where individuals can go help others even if it is as simple as talking to them. Given the current times a good conversation is all some people need.

Another reason I chose this idea is because, personally I like facing new challenges. This project consists of a few challenges (listed later in this report) and these encouraged me to pick this idea.

Finally, my 3rd year internship at LexisNexis Risk Solution inspired me to create something unique and that can benefit people. As one of the services include finding children gone missing using their big data. Therefore, I wanted to create something beneficial to the community rather than profitable.

Challenges

Some of the potential challenges that I can face are:

- Working with new technologies like React Native.
- Implementation of new functionality such as displaying a map with markers.
- Building an application that is suitable for the elderly.
- Finding the balance between simple to use and yet interesting for volunteers.

- How I will differ from my competitors.

Competition

When searching for competitors. I realised that there are not many applications like Community Aid out there. After thorough analysis, I was able to find some competitors. These competitors could only compete with the aspect of food delivery assistance in my application.

The main competitor was Buymie. This is a food delivery application that people can use to order groceries. However, the deliveries were awfully expensive, there application layout was complex and not user friendly for the elderly as I was finding it hard to operate. Community Aid will be a better option as it will be free as it is an assistance application and my aim are to make the user experience simple and friendly.

Some other competitors include Postmates and stores that provide online food ordering services. Postmates is based in America and it is like Buymie as it is complex to use and not user friendly. Other online grocery shopping stores are way too expensive and given the current time where people are already struggling with day-to-day spending.

Technical Approach

Research

When researching about the project I realised that there are not many apps out there that can compare to the idea of Community Aid. To research for my competition I used google, apple app store and android app store. However, as mentioned before I was only able to find competition related to certain aspects of my application.

Another thing I researched about, is technologies that I could potentially use to bring my idea to life. I researched technologies such as React Native. I used resources like google to gain a better understand of these technologies and I used Udemy courses to gain a better understand of how the technologies can be implemented.

Technology

After my research, I decided upon a few technologies that I will be using. These technologies are React Native for development, Firebase or build a custom authentication system and GitHub for source control. I have worked with technologies such as Firebase and GitHub in past projects. But most of the technologies I am using will be a new experience to me.

Requirement

In this part of the report, I will be discussing the requirements of Community aid. The project is designed with two roles in mind. The volunteer and the person who requires assistance. However, a volunteer can also be a person who needs assistance and a person

a person who required assistance can be a volunteer. I will not have to implement role-based authentication.

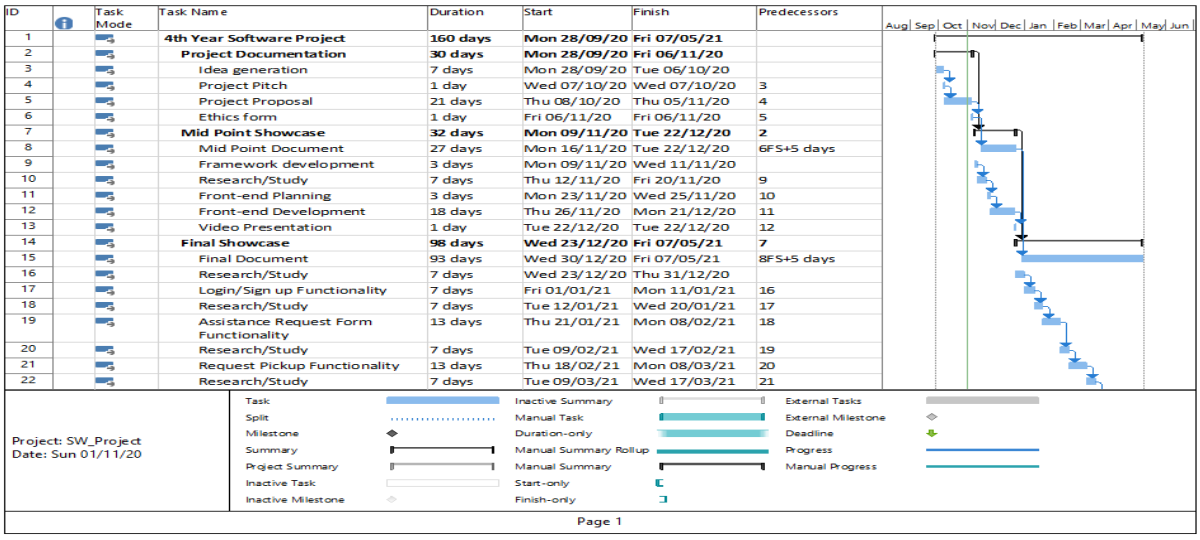
The volunteer will be able to create an account and have access to basic functionality like login and sign out. They will be able to pick up assistance requests and complete them. They will also have a map display to help them identify the assistance requests in their area and they will be able to interact with this map. The volunteer role will have access to all the functionality of an individual requiring assistance.

Any individual requiring assistance will be able login, sign up and sign out. They will be able to put in an assistance request when required by filling out a simple form. An individual requiring assistance will have access to all the functionality of a volunteer.

Project Plan

For my project plan I created a Gantt chart shown below to help me keep track of my deadlines. The Gantt chart list all the tasks that need to complete over the course of this project. This Gant chart can be seen below.

Gantt Chart



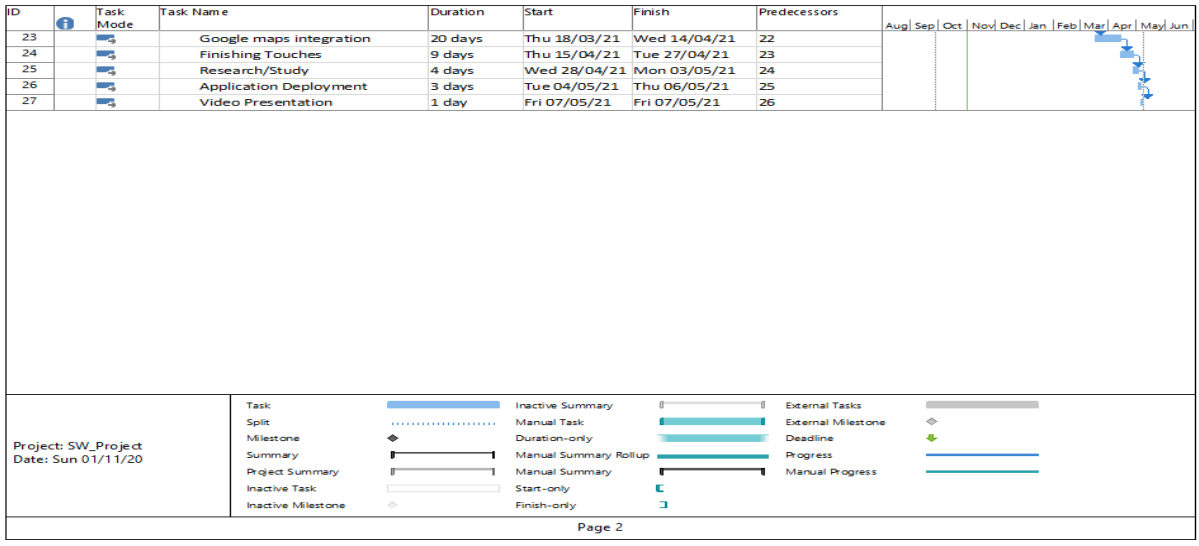
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**4th Year Software Project**	**160 days**	**Mon 28/09/20**	**Fri 07/05/21**	
2		**Project Documentation**	**30 days**	**Mon 28/09/20**	**Fri 06/11/20**	
3		Idea generation	7 days	Mon 28/09/20	Tue 06/10/20	
4		Project Pitch	1 day	Wed 07/10/20	Wed 07/10/20	3
5		Project Proposal	21 days	Thu 08/10/20	Thu 05/11/20	4
6		Ethics form	1 day	Fri 06/11/20	Fri 06/11/20	5
7		**Mid Point Showcase**	**32 days**	**Mon 09/11/20**	**Tue 22/12/20**	**2**
8		Mid Point Document	27 days	Mon 16/11/20	Tue 22/12/20	6FS+5 days
9		Framework development	3 days	Mon 09/11/20	Wed 11/11/20	
10		Research/Study	7 days	Thu 12/11/20	Fri 20/11/20	9
11		Front-end Planning	3 days	Mon 23/11/20	Wed 25/11/20	10
12		Front-end Development	18 days	Thu 26/11/20	Mon 21/12/20	11
13		Video Presentation	1 day	Tue 22/12/20	Tue 22/12/20	12
14		**Final Showcase**	**98 days**	**Wed 23/12/20**	**Fri 07/05/21**	**7**
15		Final Document	93 days	Wed 30/12/20	Fri 07/05/21	8FS+5 days
16		Research/Study	7 days	Wed 23/12/20	Thu 31/12/20	
17		Login/Sign up Functionality	7 days	Fri 01/01/21	Mon 11/01/21	16
18		Research/Study	7 days	Tue 12/01/21	Wed 20/01/21	17
19		Assistance Request Form Functionality	13 days	Thu 21/01/21	Mon 08/02/21	18
20		Research/Study	7 days	Tue 09/02/21	Wed 17/02/21	19
21		Request Pickup Functionality	13 days	Thu 18/02/21	Mon 08/03/21	20
22		Research/Study	7 days	Tue 09/03/21	Wed 17/03/21	21

Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun

Project: SW_Project
Date: Sun 01/11/20

Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Progress, Manual Progress

Page 1



ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
23		Google maps integration	20 days	Thu 18/03/21	Wed 14/04/21	22
24		Finishing Touches	9 days	Thu 15/04/21	Tue 27/04/21	23
25		Research/Study	4 days	Wed 28/04/21	Mon 03/05/21	24
26		Application Deployment	3 days	Tue 04/05/21	Thu 06/05/21	25
27		Video Presentation	1 day	Fri 07/05/21	Fri 07/05/21	26

Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun

Project: SW_Project
Date: Sun 01/11/20

Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Progress, Manual Progress

Page 2

Technical Detail

Languages & Tools

I have some languages and tools picked for my project. In this section I will be mentioning my proposed tools and languages.

Proposed Tools:

- React Native – I will use this framework to help with front end development of my project.
- Balsamiq – I will use this tool to develop wireframes of my application.
- Visual Studios Code – The IDE I will be using is Visual Studios Code. This is where my project will come to life and all my coding will be done. I am relatively new to this as I have not had many experiences where I have had the chance to use it.
- Firebase – My plan is to use Firebase for authentication purpose. I have good experience using Firebase as I have used it in other projects. However, I am not totally sure as I want to try something new for authentication.
- GitHub – I will be using GitHub as a source control tool as I already have plenty of experience with it and should be easy to implement it.

Proposed languages:

- JSX – JavaScript XML will be used in correlation with React Native. It will allow us to write HTML in react.
- JavaScript – JavaScript will be used as the scripting language of the project. It will be needed to work with React.
- Some Other languages I may need to use are Java, SQL and python. These languages are optional as I will use them if any of my requirements change in terms of what technologies I am using.

Evaluation

Testing and Evaluation is one of the most important parts of any development life cycle. It is particularly important for any developer or company to continuously test their work and evaluate any problems that occur. The errors or problems should be fixed as soon as possible. This is because this can lead to a project with various issue being marked as complete when it is infested with bugs. Incorrect evaluation and testing can also lead to delays in the project plan. Therefore, it is best resolves when possible.

Usability testing will be used in my project as it will allow my potential customers to use the application and provide feedback that could help fix exiting bugs, prodding new ideas for the application and allowing the customer to make recommendations.

Proposed tools

- Jest – I will be using this tool for JavaScript testing. As jest is a framework used for testing JavaScript.

- Usability testing – Usability testing will be carried out by the user manually to test the application in real time.

6.1. Ethics Approval Application

Ethical Guidelines and Procedures for Research involving Human Participants

1. Introduction

All research involving human participants that is conducted by students or staff at the National College of Ireland should be done so in an ethical manner. The college has therefore developed an Ethics Committee, which acts as a sub-committee of the Research Committee, to ensure that ethical principles pertaining to research involving human participants are upheld and adhered to. All researchers intending to use human participants as part of their projects are thus required to reflect upon any potential ethical issues and submit their research proposals for ethical review before commencing data collection.

This document gives an overview of the core ethical principles guiding research in NCI, while also documenting the procedures required for seeking ethical approval of research involving human participants.

Am I conducting research?

Research is defined as "the attempt to derive generalisable new knowledge by addressing clearly-defined questions with systematic and rigorous methods" (NHS Health Research Authority). Sometimes, we collect data in order to evaluate a service or practice we are engaged in ("service evaluation"). The main difference between research and service evaluation is in the aim: research is trying to create new generalisable knowledge, and service evaluation is trying to evaluate whether a delivered service/practice is working well. One project may have both aims included in it. It can be confusing if a service or intervention is involved, whether or not research is being conducted. If new or competing interventions are being evaluated, then it is likely to be research, whereas if an existing service is being conducted anyway, with an evaluative component, then it is likely to be a service evaluation. Research requires consideration of the below guiding principles, whereas service evaluation does not require approval from an ethics committee.

2. Guiding Principles

In line with other research institutions, there are three core guiding principles governing the ethical conductance of research involving human participants at NCI. These principles stem from the *Belmont Report* (1979) published by the National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research. While it is recognised that these principles may be operationalised differently depending on the specific research discipline, it is recommended that these are consulted as a starting point for any research involving human participants.

2.1 Principle 1: Respect for Persons

This principle entails recognition that participants should be treated as autonomous individuals and hence should never be coerced or swayed into participating in a research project against their will. The participant's right to withdraw from a research study at any time should be respected, as well as their right to dignity and protection from harm.

Respect for individuals can often be implemented in practice via the process of informed consent, whereby potential participants are made fully aware of the requirements involved in participation. While it is recognised that in certain cases deception (i.e. the withholding of certain information from participants) may take place, this should only occur when it is robustly justified for the validity of the research. In cases where deception is justified, researchers should ensure that any potential risk resulting from this measure is minimised. Participants should also be fully debriefed on the nature of the research after it has taken place.

The principle of respect also requires researchers to protect individuals from vulnerable groups who may have diminished autonomy (see section 4.2 for more detail as to what constitutes vulnerable groups). Where full informed consent is not possible for such population groups, consent may instead be sought from their guardians. In all cases however clear assent, or willingness to participate, should be demonstrated from participants.

2.2 Principle 2: Beneficence and non-maleficence

This principle specifically focuses on the need to protect the well-being of participants. Any potential risk to participants should be minimised, whether that be risk of physical discomfort or of any psychological, emotional or social distress, while possible benefits should be maximised. Researchers adhering to this principle should thus ensure that any potential benefits derived from carrying out the study (e.g. in terms of knowledge gained) should outweigh potential risks. Even in cases where there is only a slight potential risk of harm, participants should be provided with appropriate support to alleviate this.

2.3 Principle 3: Justice

This principle emphasises the need to employ fairness in the distribution of benefits and risks to participants. The way in which participants are selected to take part in research should relate to the purpose of the study, as opposed to other factors such as availability or manipulability of participants. The exploitation of vulnerable populations should be avoided.

Where applicable, researchers are encouraged to consult guidelines stemming from their own professional bodies (e.g. The Psychological Society of Ireland) in addition to the general guiding principles above when planning their research. Researchers should also be sensitive to those issues which are specific to the

population under investigation and the methodology that is employed in the project (e.g. qualitative methodologies involving the recording of data may raise issues relating to participants' right to anonymity, as well as the ethical management and use of data). Detailed consideration should be given to all these issues when planning research and when completing the Ethical Review Application form.

3. Ethics Committee

The NCI Ethics Committee was established by the Academic Council in 2012. Acting as a sub-committee to the Research Committee, its role is to oversee ethical issues arising from all research involving human participants that is conducted by students and staff of the college. The key purpose of this committee is to safeguard against any potential harm to participants, and to ensure that their rights are recognised in line with the guiding principles outlined above.

The Ethics Committee reviews all research proposals posing ethical risk to the participants involved, however the decision as to whether projects pose ethical risk is firstly made via the appropriate Filter Committee which operates at School level (see organisational structure in Figure 1 below). The Filter Committees may review and approve research proposals which are of low ethical risk, while referring those of high ethical risk to be considered by the Ethics Committee (see categories of ethical risk in section 4.1).

While the Filter Committees are made up of staff members with subject-specific knowledge, membership of the Ethics Committee should comprise of no less than five representatives from both the School of Computing and the School of Business, including representatives from the Research Committee.

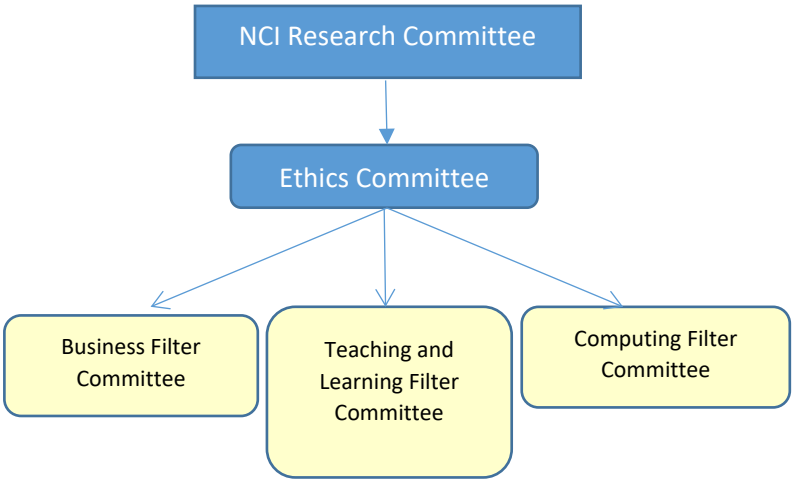


Figure 1: Committee Structures.

4. Review Process

Any staff or student of NCI wishing to conduct a study involving human participants should first submit the Ethical Review Application Form (included at the end of this document), to the relevant School Filter Committee at proposal stage. This initial review will result in a graded categorisation of ethical risk, as outlined below.

4.1 Categorisation of Ethical Risk

Research category A
Research in this category poses little ethical risk to the participants involved. Specifically, it refers to research involving human volunteers, but **excluding** studies involving:

- therapeutic interventions
- new research methodologies
- vulnerable populations (see section 4.2)
- deception of the participants
- any other significant physical, social or psychological risk to participants

Research category B
Research in this category involves human volunteers **including** studies involving:

- therapeutic interventions
- new research methodologies
- vulnerable populations (see section 4.2)
- deception of the participants
- any potentially significant risk to participants

Research Category C
This specifically refers to research involving human volunteers who are service users, patients, staff, records, etc., within the sphere of the HSE or similar setting (but not including clinical trials of investigative medicinal products).

4.2 Vulnerable groups

There are a number of participant populations that may fall under the heading of 'vulnerable groups'. These groups require consideration of unique ethical challenges regardless of the nature of the project. Research involving such populations should therefore always be reviewed by the Ethics Committee.

Groups that may be classed as vulnerable include, but are not limited to:

- Children (under 18 years of age)
- The older old (aged 85+)
- People with an intellectual or learning disability
- Individuals or groups receiving help through the voluntary sector
- Those in a subordinate position to the researcher (e.g. employees)
- Any other groups who might not understand the research and consent process

Note: in addition to the Ethical Review process, any researchers intending to work directly with children will be required to undergo Garda Vetting in advance of the proposed research.

4.3 Exemption from Full Ethical Review

In certain limited cases, researchers can apply for an exemption from full ethical review. In such cases, the Ethical Review Exemption form should be completed, explicitly detailing why the exemption is sought.

In completing this form, researchers must declare that the research does not involve any of the following:

- Vulnerable groups
- Sensitive topics
- Risk of psychological or mental distress
- Risk of physical stress or discomfort
- Any other risk to participants
- Use of drugs or invasive procedures (e.g. blood sampling)
- Deception or withholding of information from participants
- Conflict of interest issues
- Access to data by individuals or organisations other than the researchers
- Any other ethical dilemmas

4.4 Outcomes of Review Process

Following consideration of research projects submitted for Ethical Review, each Filter Committee will submit a report to the Ethics Committee summarising the applications considered and the decisions made.

For research that is deemed to fall under Research Category A (low ethical risk), a favourable outcome at the relevant Filter Committee will be sufficient to secure ethical approval. Research falling under the other two categories must however be considered by the Ethics Committee before approval may be granted.

On the basis of this review, four key outcomes may arise:

1. Research proposal approved (no recommendations)
2. Research proposal approved pending minor revisions (to be accepted by the Chair and Research Supervisor)
3. Research proposal approved pending major revisions (to be resubmitted and approved by the Ethics Committee)
4. Research proposal rejected (resubmission necessary)

A summary of the processes involved in applying for ethical approval can be seen in Figure 2.

Appeals

Appeals against the Committee's decision may be made within ten working days. In this case, at least three members of the Ethics Committee, none of whom will have reviewed the initial application, may review this along with any additional information submitted by the applicant.

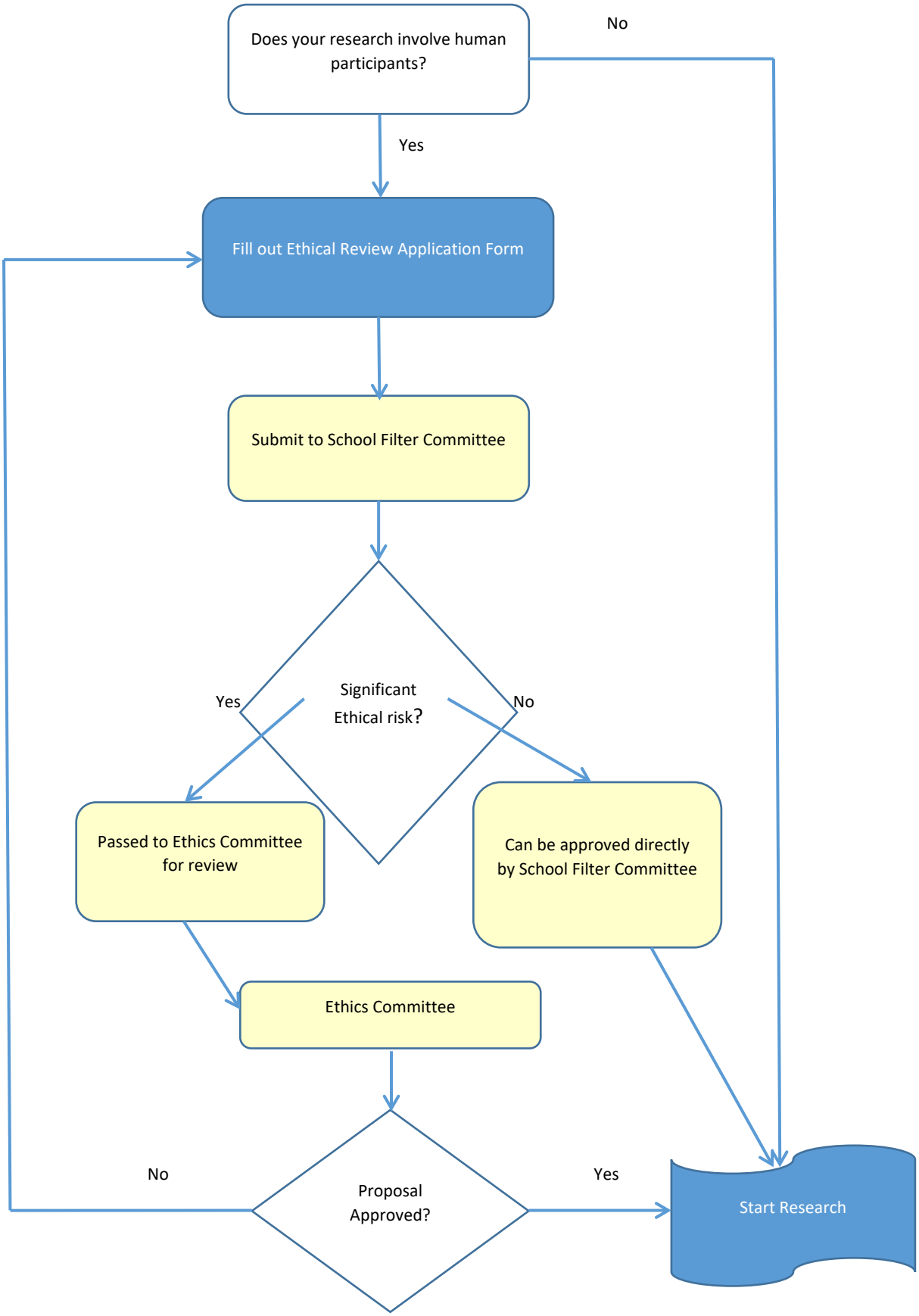


Figure 2: Process chart for seeking Ethical Approval

Ethics Application Checklist

To be submitted alongside the ethics application.

Please complete the below checklist, ticking each item to confirm that it has been addressed.

1. I agree to obtain informed written consent from all human participants aged over 18 who are involved in this research (or if circulating digitally, I will ensure that informed consent is completed, and will have the participants indicate their informed consent by continuing with their study engagement).	□ □
2. I agree to obtain informed written consent from the parents of anyone aged under 18 in this research (or from the schools if appropriate), and informed written assent from those under 18 in this research.	□
3. I include a letter of agreement from a clinically responsible individual agreeing to (where appropriate) help me recruit/provide clinical support in the event that participants become distressed/host the study data collection.	□
4. I append a letter of agreement from an external institution or organisation agreeing to host the study.	□
5. I agree to comply with NCI's Data Retention Policy.	
6. I have appended a) information sheet, b) consent form/assent form, c) debriefing sheet.	□
7. I have provided details of how non-anonymised data will be stored, in a safe and encrypted manner.	□ □
8. I have included my contact details and those of my supervisor (where appropriate). I have only included my NCI email address and not included any personal contact information.	□
9. I have given sufficient details on the proposed study design, methodology, and data collection procedures, to allow a full ethical review, and I understand that my failure to give sufficient detail may result in a resubmission being required.	□ □
10. I understand that if I make changes to my study following ethical approval, it is my responsibility to seek an ethics amendment if the change merits ethical consideration.	

National College of Ireland

Human Participants Ethical Review Application Form

All parts of the below form must be completed. However in certain cases where sections are not relevant to the proposed study, clearly mark NA in the box provided.

Part A: Title of Project and Contact Information

Name

Piyush Sharma

Student Number (if applicable)

X17342356

Email

X17342356@student.ncirl.ie

Status:

Undergraduate ☐
Postgraduate ☐
Staff ☐

Supervisor (if applicable)

Anu Sahni

Title of Research Project

Community Aid

Category into which the proposed research falls (see guidelines)

Research Category A ☐
Research Category B ☐
Research Category C ☐

Have you read the NCI Ethical Guidelines for Research with Human Participants?

Yes ☐
No ☐

Please indicate any other ethical guidelines or codes of conduct you have consulted

NA

Has this research been submitted to any other research ethics committee?

Yes ☐
No ☐

If yes please provide details, and the outcomes of this process, if applicable:

NA

Is this research supported by any form of research funding?

Yes □
No □

If yes please provide details, and indicate whether any restrictions exist on the freedom of the researcher to publish the results:

NA

Part B: Research Proposal

Briefly outline the following information (not more than 200 words in any section).

Proposed starting date and duration of project

1/05/2021 – 20/01/2020

The rationale for the project

Community Aid is a community based mobile application allowing aid seekers to ask for assistance when needed and allowing volunteers to help aid seekers in a time of need. The inspiration for this project were the elderly who were stuck at home during the time of Covid-19.

The research aims and objectives

The aim of this research is to determine if the application is functioning properly or not. Also, another aim is to identify any issues in relation to the application and gain an insight from the participants in relation to project improvements if any.

The research design

The research will be carried out in the following steps:

Step One:

Participant will sign the consent form.

Step Two:

A meeting will be set with the participant to carry out testing activities.

Step Three:

The participant will be accompanied by the tester while testing to ensure user has a full understanding of the application.

Step Four:

The participant will be given a demo of the application by the tester.

Step Five:

The participant will test the application.

Step Six:

Participants will fill out a google docs form to inform the tester about their findings.

Step Seven:

If further information is required from the participant a meeting will be arranged.

Step Eight:

Once the tester is satisfied with the findings the research process will end.

App Testing: 15 Minutes

Survey: 10 Minutes

The research sample and sample size
Please indicate the sample size and your justification of this sample size. Describe the age range of participants, and whether they belong to medical groups (those currently receiving medical treatment, those not in remission from previous medical treatment, those recruited because of a previous medical condition, healthy controls recruited for a medical study) or clinical groups (those undergoing non-medical treatment such as counselling, psychoanalysis, in treatment centres, rehabilitation centres, or similar, or those with a DSM disorder diagnosis).

The sample size will be no more than 5 users of age 18+

If the study involves a MEDICAL or CLINICAL group, the following details are required:

a) Do you have approval from a hospital/medical/specialist ethics committee?
   If YES, please append the letter of approval. Also required is a letter from a clinically responsible authority at the host institution, supporting the study, detailing the support mechanisms in place for individuals who may become distressed as a result of participating in the study, and the potential risk to participants.
   If NO, please detail why this approval cannot or has not been saught.
b) Does the study impact on participant's medical condition, wellbeing, or health?
   If YES, please append a letter of approval from a specialist ethics committee.
   If NO, please give a detailed explanation about why you do not expect there to be an impact on medical condition, wellbeing, or health.

The nature of any proposed pilot study. Pilot studies are usually required if a) a new intervention is being used, b) a new questionnaire, scale or item is being used, or c) established interventions or questionnaires, scales or items are being

used on a new population. If no such study is planned, explain why it is not necessary.

NA

The methods of data analysis. Give details here of the analytic process (e.g. the statistical procedures planned if quantitative, and the approach taken if qualitative. It is not sufficient to name the software to be used).

NA

Study Procedure

Please give as detailed an account as possible of a participant's likely experience in engaging with the study, from point of first learning about the study, to study completion. State how long project participation is likely to take, and whether participants will be offered breaks. Please attach all questionnaires, interview schedules, scales, surveys, and demographic questions, etc. in the Appendix.

NA

Part C: Ethical Risk

Please identify any ethical issues or risks of harm or distress which may arise during the proposed research, and how you will address this risk. Here you need to consider the potential for physical risk, social risk (i.e. loss of social status, privacy, or reputation), outside of that expected in everyday life, and whether the participant is likely to feel distress as a result of taking part in the study. Debriefing sheets must be included in the appendix if required. These should detail the participant's right to withdraw from the study, the statutory limits upon confidentiality, and the obligations of the researcher in relation to Freedom of Information legislation. Debriefing sheets should also include details of helplines and avenues for receiving support in the event that participants become distressed as a result of their involvement in this study.

Participants are welcome to leave when they want with out any penalty.

Do the participants belong to any of the following vulnerable groups?
(Please tick all those involved).

- □ Children;
- □ The older old (85+)
- □ People with an intellectual or learning disability
- □ Individuals or groups receiving help through the voluntary sector
- □ Those in a subordinate position to the researchers such as employees
- □ Other groups who might not understand the research and consent process
- □ Other vulnerable groups

How will the research participants in this study be selected, approached and recruited? From where will participants be recruited? If recruiting via an institution or organisation other than NCI please attach a letter of agreement from the host institution agreeing to host the study and circulate recruitment advertisements/email etc.

The participants will be friends, family and other NCI students.

What inclusion or exclusion criteria will be used?

Must be over the age of 18.

How will participants be informed of the nature of the study and participation?

They will be informed in person and by the method of contact used to communicate such as email.

Does the study involve deception or the withholding of information? If so, provide justification for this decision.

Only survey data will be used, and users will not be identified when carrying out the survey.

What procedures will be used to document the participants' consent to participate?

The participant will be provided with a consent form.

Can study participants withdraw at any time without penalty? If so, how will this be communicated to participants?

Yes, the participant can withdraw at any time without penalty. This will be stated on the consent form the participant will sign.

If vulnerable groups are participating, what special arrangements will be made to deal with issues of informed consent/assent?

A customer consent form will be created for them if the research is not affected by it.

Please include copies of any information letters, debriefing sheets, and consent forms with the application.

Part D: Confidentiality and Data Protection

Please indicate the form in which the data will be collected.

□ Identified □ Potentially Identifiable □ **De-Identified**

What arrangements are in place to ensure that the identity of participants is protected?

Participant information will not be displayed in any documentation and will not be revealed to anyone other then myself.

Will any information about illegal behaviours be collected as part of the research process? If so, detail your consideration of how this information will be treated.

Nor

Please indicate any recording devices being used to collect data (e.g. audio/video).

None

Please describe the procedures for securing specific permission for the use of these recording devices in advance.

NA

Please indicate the form in which the data will be stored.

□ Identified □ Potentially Identifiable □ **De-Identified**

Who will have responsibility for the data generated by the research?

Piyush sharma will be responsible.

Is there a possibility that the data will be archived for secondary data analysis? If so, has this been included in the informed consent process? Also include information on how and where the data will be stored for secondary analytic purposes.

Yes, the data will be archived to be used in the final documentation of the project. The consent form covers this.

If not to be stored for secondary data analysis, will the data be stored for 5 years and then destroyed, in accordance with NCI policy?

□ Yes □ No

Dissemination and Reporting

Please describe how the participants will be informed of dissemination and reporting (e.g. submission for examination, reporting, publications, presentations)?

Participants will be contatced by email or other methods of contact.

If any dissemination entails the use of audio, video and/or photographic records (including direct quotes), please describe how participants will be informed of this in advance.

Not applicable

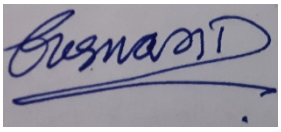
Part E: Signed Declaration

I confirm that I have read the NCI Ethical Guidelines for Research with Human Participants and agree to abide by them in conducting this research. I also confirm that the information provided on this form is correct (Electronic signature is acceptable).

Signature of Applicant

Date 08/11/2020

Signature of Supervisor (where appropriate): Dr Anu Sahni



Date 12/04/2021

Any other information the committee should be aware of?

Consent/Debrief/Information form:

https://form.jotform.com/210992880591364

Participant survey form:

https://docs.google.com/forms/d/e/1FAIpQLSc1YJF6TkO9mn-3ki-v0xzbOdSE4bn3arL0mPnTOReFb9tWSQ/viewform?usp=sf_link

6.2. Ethics Declaration form

National College of Ireland

DECLARATION OF ETHICS CONSIDERATION

School of Computing

Student Name: Piyush Sharma

Student ID: X1742356

Programme BSc Business Information Systems **Year:** 4

Module: Software Project

Project Title: Community Aid

Please circle (or highlight) as appropriate

This project involves human participants	**Yes** / No

Introduction

Secondary data refers to data that is collected by someone other than the current researcher. Common sources of secondary data for social science include censuses, information collected by government departments, organizational records and data originally collected for other research purposes. Primary data, by contrast, is collected by the investigator conducting the research.

A project that does not involve human participants requires ONLY completion of Declaration of Ethics Consideration Form and submission of the form on module's Moodle page

A project that involves human participants requires ethical clearance and an Ethics Application Form must be submitted through the module's Moodle page. Please refer to and ensure compliance with the ethical principles stated in NCI Ethics Form available on the Moodle page.

The following decision table will assist you in deciding if you have to complete the Declaration of Ethics Consideration Form or/and the Ethics Application Form.

Public Data	Y	Y	Y	Y	N	N	N	N
Private Data	Y	Y	N	N	Y	Y	N	N
Human Participants	Y	N	Y	N	Y	N	Y	N
Declaration of Ethics Consideration Form	x	X	x	X	X	X	x	
Ethics Application Form	X		X		X		X	

Please circle (or highlight) as appropriate

The project makes use of secondary dataset(s) created by the researcher	Yes / **No**
The project makes use of public secondary dataset(s)	Yes / **No**
The project makes use of non-public secondary dataset(s) Approval letter from non-public secondary dataset(s) owner received	Yes / **No** Yes / **No**

Sources of Data:

It is students' responsibility to ensure that they have the correct permissions/authorizations to use any data in a study. Projects that make use of data that does not have authorization to be used, will not be graded for that portion of the study that makes use of such data.

Public Data

A project that makes use of public secondary dataset(s) ***does not need ethics permission*** *but* ***needs a letter/email from the copyright holder*** *regarding potential use.*

Some websites and data sources allow their data sets to be used under certain conditions. In these cases, a letter/email from the copyright holder is NOT necessary, but the researcher should cite the source of this permission and indicate under what conditions the data can be used. See Appendix I for examples of permissions granted by Fingal Open Data, and Eurostat website.

Where websites or data sources indicate that they do not grant permission for data to be used, you will still need a letter/email from the copyright holder. For example, see Appendix II for an example from the Journal of Statistics Education.

Private Data

A project that makes use of non-public (private) secondary dataset(s) must receive data usage permission from School of Computing.

An approval letter/email from the owner *(e.g. institution, company, etc.)* ***of the non-public secondary dataset must be attached to the Declaration of Ethics Consideration****. The letter/email must confirm that the dataset is anonymised and permission for data processing, analysis and public dissemination is granted.*

Evidence for use of secondary dataset(s)

Include dataset(s) owner letter/email or cite the source for usage permission

CHECKLIST

Non-public/private secondary dataset(s) -Owner letter/email is attached to this form ***OR*** Citation and link to the web site where permission is granted – provided in this form	Yes / **No** Yes / **No**

ETHICS CLEARANCE GUIDELINES WHEN HUMAN PARTICIPANTS ARE INVOLVED

The Ethics Application Form must be submitted on Moodle for approval prior to conducting the work.

<u>Considerations in data collection</u>

- Participants will not be identified, directly or through identifiers linked to the subjects in any reports produced by the study
- Responses will not place the participants at risk of professional liability or be damaging to the participants' financial standing, employability or reputation

- No confidential data will be used for personal advantage or that of a third party

Informed consent

- Consent to participate in the study has been given freely by the participants
- participants have the capacity to understand the project goals.
- Participants have been given information sheets that are understandable
- Likely benefits of the project itself have been explained to potential participants
- Risks and benefits of the project have been explained to potential participants
- Participants have been assured they will not suffer physical stress or discomfort or psychological or mental stress
- The participant has been assured s/he may withdraw at any time from the study without loss of benefit or penalty
- Special care has been taken where participants are unable to consent for themselves (e.g children under the age of 18, elders with age 85+, people with intellectual or learning disability, individuals or groups receiving help through the voluntary sector, those in a subordinate position to the researcher, groups who do not understand the consent and research process)
- Participants have been informed of potential conflict of interest issues
- The onus is on the researcher to inform participants if deception methods have to be used in a line of research

I have read, understood, and will adhere to the ethical principles described above in the conduct of the project work.

Signature:

Date: 07/11/2020

Appendix I

1) Fingal Open Data: http://data.fingal.ie/About

Licence

Citizens are free to access and use this data as they wish, free of charge, in accordance with the Creative Commons Attribution 4.0 International License (CC-BY).

Note: From November 2010 to July 2015, data on Fingal Open Data was published in accordance with the PSI general licence

Use of any published data is subject to Data Protection legislation.

Licence Statement

Under the CC-BY Licence, users must acknowledge the source of the Information in their product or application by including or linking to this attribution statement: "Contains Fingal County Council Data licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence".

Multiple Attributions

If using data from several Information Providers and listing multiple attributions is not practical in a product or application, users may include a URI or hyperlink to a resource that contains the required attribution statements.

2) Eurostat: https://ec.europa.eu/eurostat/about/policies/copyright

COPYRIGHT NOTICE AND FREE RE-USE OF DATA

Eurostat has a policy of encouraging free re-use of its data, both for non-commercial and commercial purposes. All statistical data, metadata, content of web pages or other dissemination tools, official publications and other documents published on its website, with the exceptions listed below, can be reused without any payment or written licence provided that:

- the source is indicated as Eurostat
- when re-use involves modifications to the data or text, this must be stated clearly to the end user of the information

Appendix II

Journal of Statistics Education: http://jse.amstat.org/jse_users.htm

JSE Copyright and Usage Policy

Unlike other American Statistical Association journals, the Journal of Statistics Education (JSE) does not require authors to transfer copyright for the published material to JSE. Authors maintain copyright of published material. Because copyright is not transferred from the author, permission to use materials published by JSE remains with the author. Therefore, to use published material from a JSE article the requesting person must get approval from the author.

6.3. Reflective Journals

National College of Ireland

Reflective Journal

Student Name: Piyush Sharma Student Number: X17342356

Course: BSc Business Information Systems Month: October

What?
During the month of October, I was provided the project description by the lecturer. I was also notified of all the deadlines and what is required of me during the year. I created a planning document that consisted of all the deadlines and what need to be submitted. I started researching and thinking of an idea for my 4th year software project. I got in touch with a few lecturers to get some feedback on my ideas and researched the technologies I could use to make the idea a reality. Once I had finalized an idea, I recorded a five-minute Project pitch video and uploaded it to stream. I worked on my project proposal. I got a good chunk of the project proposal finished. Also, I attended all my lectures to keep up to date with the requirements of the module. I started researching on different technologies, I could use to make my idea come to life. I attended a few courses to learn all the new technologies that I will be working with. I received some guidance from my fellow classmates in relation to project ideas. They provided me with some important feedback that helped me. In my opinion, this was a great month for me as I got a lot of work done and I am up to date with all my tasks.

So What?
Overall, I believe the month of October was a good month for me as I was productive, and I was not behind on any deadlines. I was able to get plenty of tasks completed without any blockers or issues. Although, one thing I could have improved was my time management skills. Even though I was able to complete everything I wanted to complete. I believe, I could have managed my time better and got more done. This was a very messy month for me as I gained a lot of work from different modules. This drastically effected my time management skills.

Now What?
After reflecting on the month of October, I learned that I need to focus on managing my time better to get more out of my time. I could have prevented my time management issue by

either planning better or using tools to improve time management. In the coming months I will use tools such as Notion to plan my days/months to resolve this problem. One of my key objectives for the next month is to solve this issue.

National College of Ireland

Reflective Journal

Student Name: Piyush Sharma Student Number: X17342356

Course: BSc Business Information Systems Month: November

What?
November was a very productive month for me when referring to the project. At the start of the month I completed my project proposal and ethics form. Along with this, I was informed who my supervisor for the project was. Also, I attended a meeting with my supervisor in which I received some great feedback in relation to my project technology choices. Based on this feedback I was able to change my choices to more suitable technology for my project. In November, I started my technical report and got a good chunk of it done. This also allowed me to focus some time into Udemy courses related to React native and other technologies. This allowed me to gain some knowledge about the technologies related to my project and prepare myself for next month as I plan to start developing my application. Overall, I feel that I was able to make a good amount of progression in the project.

So What?
After reviewing my progress in the month of November, I realized that my time management problem from last month has improved. This is because I was able to get all my target tasks completed. Also, I submitted both my project proposal and ethics form a few days before the deadline. However, I believe my time management still needs to improve as I did not make as much progress as I had hoped in my Udemy courses. Along with that I had a minor setback in relation to the technologies I was using for my project as I was advised to change some of them. This caused a bit of a delay.

Now What?
After thoroughly reviewing the month of November. I realized that my time management skills were still causing an issue. To prevent this issue, I have decided to plan my week every Sunday in terms of work I want to complete. This will allow me to better manage my time and improve my time management skills. Also, I will be considering requirement change in relation to the project. As when I was advised to change my technologies for the project by the supervisor. It caused me a bit of delay as I had to fix my project proposal and carry out research in relation to the new technologies. I will plan for this my getting my work reviewed early and leaving room for requirement change by getting tasks finished early.

National College of Ireland

Reflective Journal

Student Name: Piyush Sharma Student Number: X17342356

Course: BSc Business Information Systems Month: December

What?
In the month of December, I felt I was very productive in terms of work. This month I focused mainly preparing myself for the middle point presentation. My plan for this month was to get all the front end of my application developed, complete the required amount of technical report for the middle point presentation, create a presentation for my middle point presentation and record a video of myself presenting the application. I was successfully able to complete all these tasks efficiently and on time. To finish the month, I had all my above tasks done and submitted on time. I was also up to date and working according to my project plan.

So What?
For the month of December, I realized that my time management had dramatically improved in the month of December. This is because I was able to juggle work for other modules with my software project work. I did not miss any submissions and submitted all my work on time. Also, I kept up to date with my project plan. I struggled to do this last month.

Now What?
My plan for the next month is to mainly focus on completing other modules and then starting the implementation of the back-end functionality for my application. Also, I plan to follow my project plan and continue to improve/maintain my time management skills.

National College of Ireland

Reflective Journal

Student Name: Piyush Sharma Student Number: X17342356

Course: BSc Business Information Systems Month: January

What?
This month my main objective was to get all of authentication features finished such as sign in, login, forgot password and auth flow. However, I was able to get much more done than that such as I finished majority of firebase firestone implementation. Along, with this I was able to finish all authentication features, map radius and current location features. These features were difficult but once I got the hang to firebase integration into react native. Rest of the features were simple to implement. Along with this I implemented CRUD functionality in my app. Along with this I was able to develop a plan for the coming months on how I plan to target the rest of the project productively.

So What?
January was a great start for the project for me. I was able to implement majority of the functionality. Therefore, I will have more time at a later stage to prefect my app, focus on minor details and implement new functionality that previously were not requirements. Overall, in my opinion I believe I targeted this month very efficiently and productively. I plan to keep this mind set moving on.

Now What?
My plan for the next month consists of finishing of all major functionality of my application. There for in the coming months I will have time to focus on the minor details of the application such as better designing and tweaking features to make them even better.

National College of Ireland

Reflective Journal

Student Name: Piyush Sharma Student Number: X17342356

Course: BSc Business Information Systems Month: February

What?
In February, I completed a good amount of my application functionality such as notifications, add request feature for the map page, cleaning up code, implementing alerts, validation of inputs, edit requests, further firebase development, help page structured, better design and started researching jest testing for my application.

So What?
February was an exceptionally amazing month for me. I was able to get plenty of tasks completed of my project pipeline. I am currently ahead of schedule which will give me plenty of time to reflect on my project to see what could be improved and any new functionality I would like to add.

Now What?
In March, I plan to make further progression on my project pipeline and continue to stay ahead of schedule. I also plan to brainstorm about any new functionality I plan to add or anything I want to fix.

National College of Ireland

Reflective Journal

Student Name: Piyush Sharma Student Number: X17342356

Course: BSc Business Information Systems Month: March

What?
In March, my main aim was to complete my application by finishing all of the left-over functionality, fixing any bugs, making sure my application was functional across both iOS and android. Also, I focused on redesigning the interface of my application by changing the background, other designs/usability features. Also, I planned to start testing my application by performing some unit tests.

So What?
In the month of March, I was able to finish my application by implementing all left-over functionality. I successfully redesigned my application by adding new easier usability features such as buttons to add requests without typing. I also made some user interface changes to make the application look more appealing to the user. Also, I was able to start jest unit testing.

Now What?
In April, I plan to mainly focus of testing the application and making changes to the application based on testing if needed. I also plant to focus on resubmitting the ethics forum and complete other documentation work.

National College of Ireland

Reflective Journal

Student Name: Piyush Sharma Student Number: X17342356

Course: BSc Business Information Systems Month: April

What?
In April, I mainly tested my application to make sure there were no bugs going into deployment. Thanks to testing I was able to identify a few bugs and resolve them. I also mainly focused of finishing my app this month and starting all other work such as documentation, poster and presentation. I started all of this and am at a good point at the end of my project.

So What?
In the month of April, I was able to start studying jest and usability testing and carry them out for my application. I was also able to make a start on all the documentation work and other material needed for final submission. I was able to fix any bugs that arise during testing and use testing participant input to add better new features to the application.

Now What?
In May, I plat to deploy my application and finish all my document work to make sure I submit all my work on time.