GNG2101

Design Project User and Product Manual

Para-Solution

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12/06/2021
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Table 1. Glossary

Term	Acronym	Definition
Firebase		Firebase is a platform developed by Google enabling to store and manage the user's data through call-functions
functions or call-functions		Modules that accomplish a specific task in a program.
Hypertext Markup Language,	HTML	A standardized system for tagging text files to achieve font, color, graphic, and hyperlink effects on World Wide Web pages
open source		Denotes a freely accessible software

1 Introduction

This User and Product Manual (UPM) provides the information necessary for Para Transpo Users to effectively use the Para- Solution application and for prototype documentation.

The difficulty of using the Para Transpo service was brough to light and the unreliable platform is still being used today. Para- Solutions is an application formed that will allow Para Transpo users to book, modify and cancel trips based on their schedule as well as notify users with any changes. This is to provide more reliability in this service. For this project, we do not have access to the ParaTranspo Application Programming Interface (API). We will hardcode data to create a flexible system easily adaptable to Para Transpo booking system. Moreover, we assumed in the design that we will have access to the Para Transpo logo since the project is related to this company. Then, regarding our final budget the team cannot afford an iOS development kit and all team members do not own a MacBook. Thus, we decided to develop an android application since the development is free and the license of deployment is affordable. Finally, we assumed that our users would have access to an Android phone with a flashlight, vibrations, and ringtone working perfectly. The team has incorporated the ParaTranspo logo however, whether we are allowed to use the logo is to be determined. We hope that it is a possibility as the entire interface is based on the ParaTranspo service however it is not entirely determined.
This document will provide the reader with a detailed outline of the product formed and how it was formed. Our intended audience being our client one can hope this will provide enough information to that it can be replicated and improved for actual use. This document will start with an overview of the initial issue then getting into detail about the actual formation, features and needs intended for these applications. It will generally provide an outline of how this system works and what was done to create it. This document is reserved for out client and supervisors use only. Anyone else would have to contact the creators for permission of use.

2 Overview

Our client had introduced a reoccurring issue with ParaTranspo services and was seeking an ideal solution. The problem is that Para Transpo is lacking an efficient system to book and notify users and drivers of future bookings or cancellations. This is important because the client felt that the current system is unreliable and that when it comes to transportation those with disabilities generally rely on Para-Transpo as accessibility is prioritized. However, this unreliable system causes for the Para-Transpo users to not fully depend on the service. From this we determined the ideal solution would have to be an application that prioritizes accessibility and can clearly communicate bus information, while allowing for an easy booking process. Our target audience mainly being Para Transpo users and other companies facing a similar issue. Based on the information we gained speaking to our client the team identified 4 user needs. These being: the ability to schedule, modify and cancel trip, a simple easy-to-follow format with basic language, a system that will notify the user of any changes to their schedule immediately and finally the accessibility features. The team focused on creating an application that can incorporate all 4 of these aspects and provide reliable service to the client. What differentiates our product from other products is that our system is a notification system that will notify a user of any changes to their trip. And the notifications consist of accessibility features that could be adjusted specific to a disability. For example, an individual who may be hearing impaired may consider the flashing lights or vibration notification system to notify them of any changes to their ride.

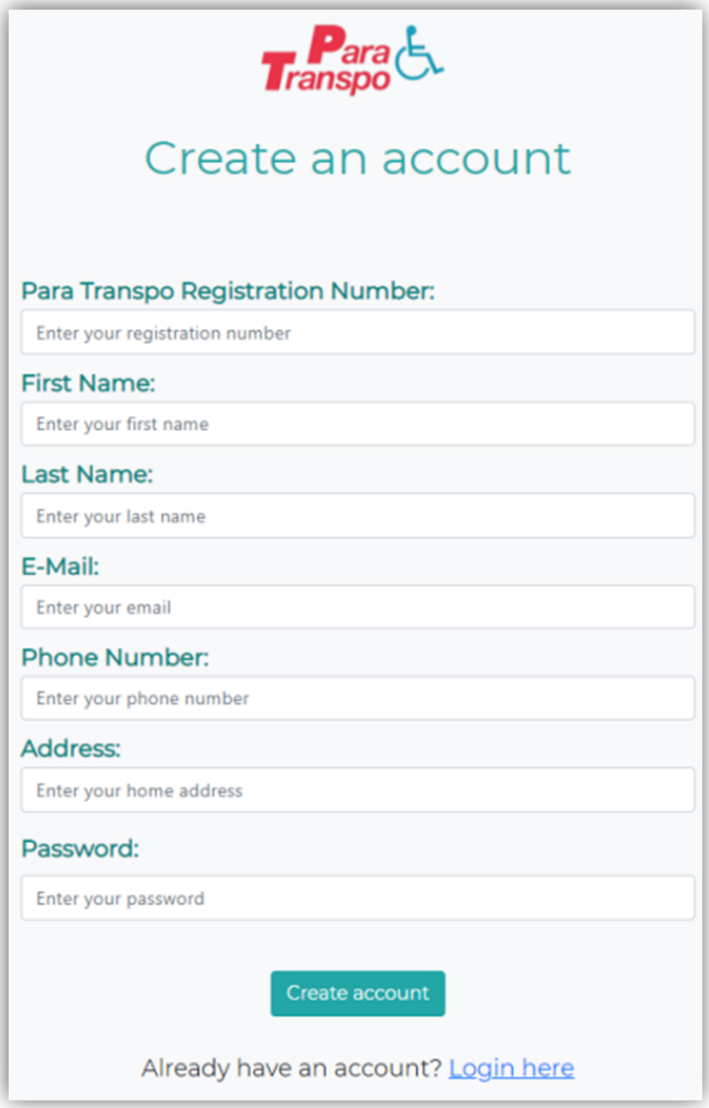

Figure 1: Account creation feature

For the user to create a new account they will see this interface that requires general information to create an account

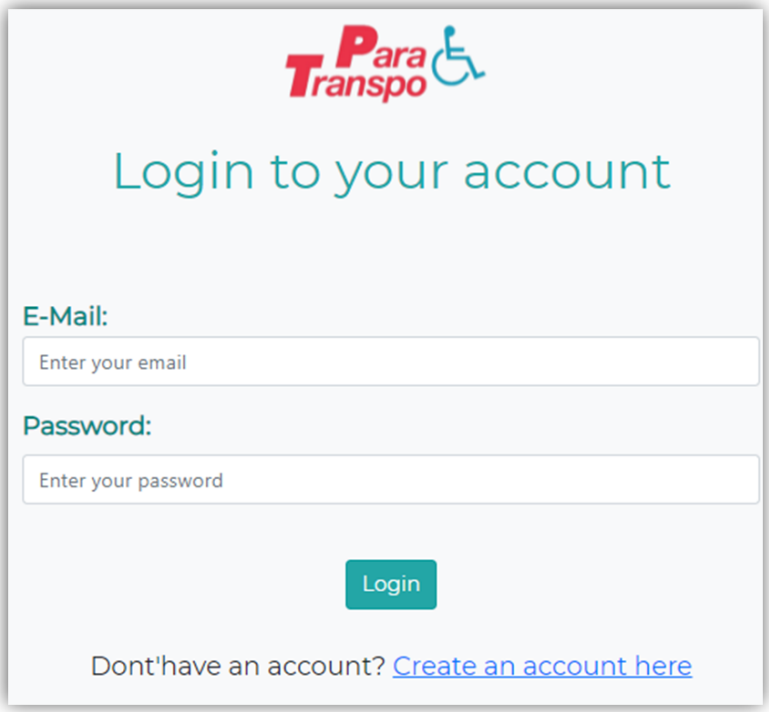

Figure 2: Login feature

Once creating an account users will input the email/username and password associated with their account.

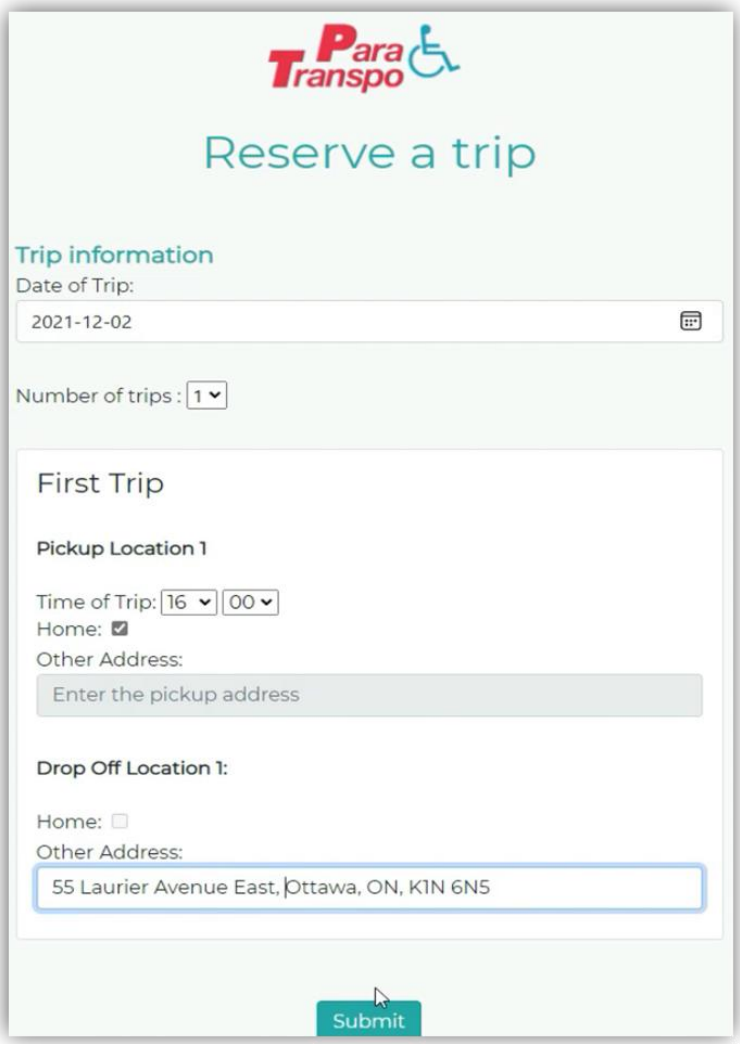

Figure 3. Trip reservation feature

This interface will allow users to input the information surrounding the trip they had booked with Para-Transpo. This includes location time and date of trip. The following picture illustrates the main page of the user after reserving a trip.

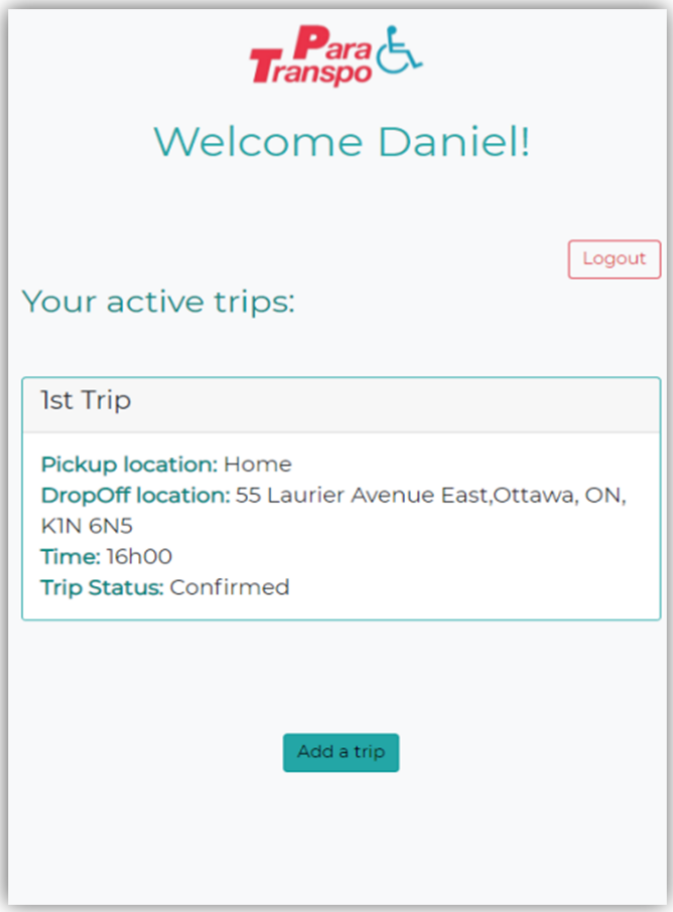

Figure 4. User profile page after reserving a trip

When the user reserves a trip, he will receive updates through notifications, as illustrated in the following picture.

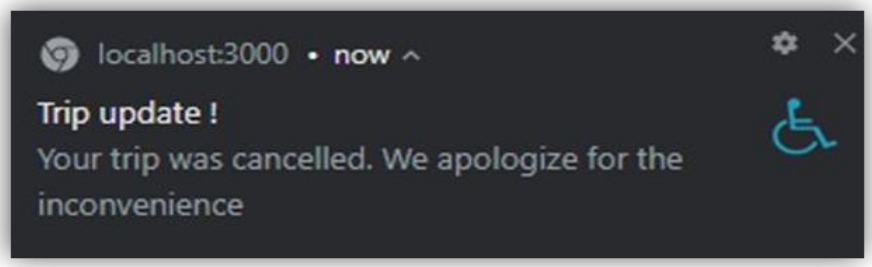

Figure 5. Example of a notification displayed on a computer

This banner format is how a notification may appear on a webpage for users.

The architecture of the system is made of three distinct parts:

- The client side represented by the different webpages illustrated in Figures 1 to 3.
- A server side handling the registration and the notifications of the users.
- A database to store the user's data (personal information and trips reserved)

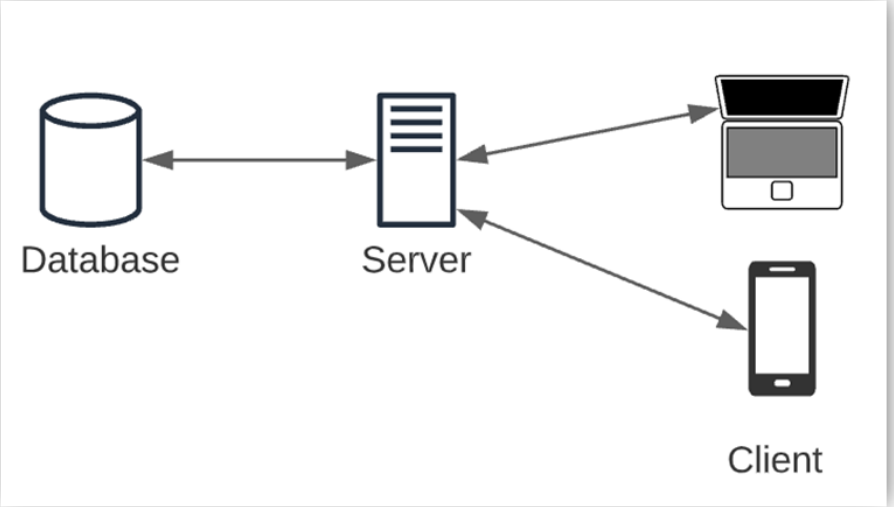

Figure 6. High level architecture of the system

2.1 Cautions & Warnings

The user will have to agree to the terms and conditions indicated during the processes of making an account this will basically state the rules and regulations the individual or user will have to comply with to use and access our product. As of right now the Terms and Conditions agreement has not been formed but it provided more time, we expect to include this as it will increase the control the company has over the business/platform, while providing users with the rules, requirements and restrictions involved. This will provide users with an idea of acceptable behaviour and other regulations the user will have to agree in. These terms and conditions will only need to be agreed to before the registration process. Sample terms include

- The ability to modify or replace terms and conditions at any time while providing user with a notice prior to any new terms taking effect. The material change is something that will be established under sole discretion

- Users will be required to provide personal information including, location, name, registration number to be notified by our product

Apart from this our client's data will be saved on our Database, if this is not appropriate for you, unfortunately there is no other way to use this system

3 Getting started

3.1 Set-up Considerations

The user must have internet access and a device enabling him to have access to a web browser and be registered to the system

3.2 User Access Considerations

Visually impaired users cannot use the system due to an absence of read out loud features. Nonetheless, the system sustains deaf users since the notifications are also sent with a vibration.

3.3 Accessing the System

The system allows access to the users that have signed up. In case of situations where a password or username is forgotten, the user can reach the team at the contact info seen at the bottom left of the webpage in order to request a reset link.

3.4 System Organization & Navigation.

The figures 1 to 5 illustrates the general use of the application. First, the user registers to the application or logs in if an account has already been created (Figure1 and Figure 2). If the user's credentials are valid, the system will display the main page which is illustrated in the following picture.

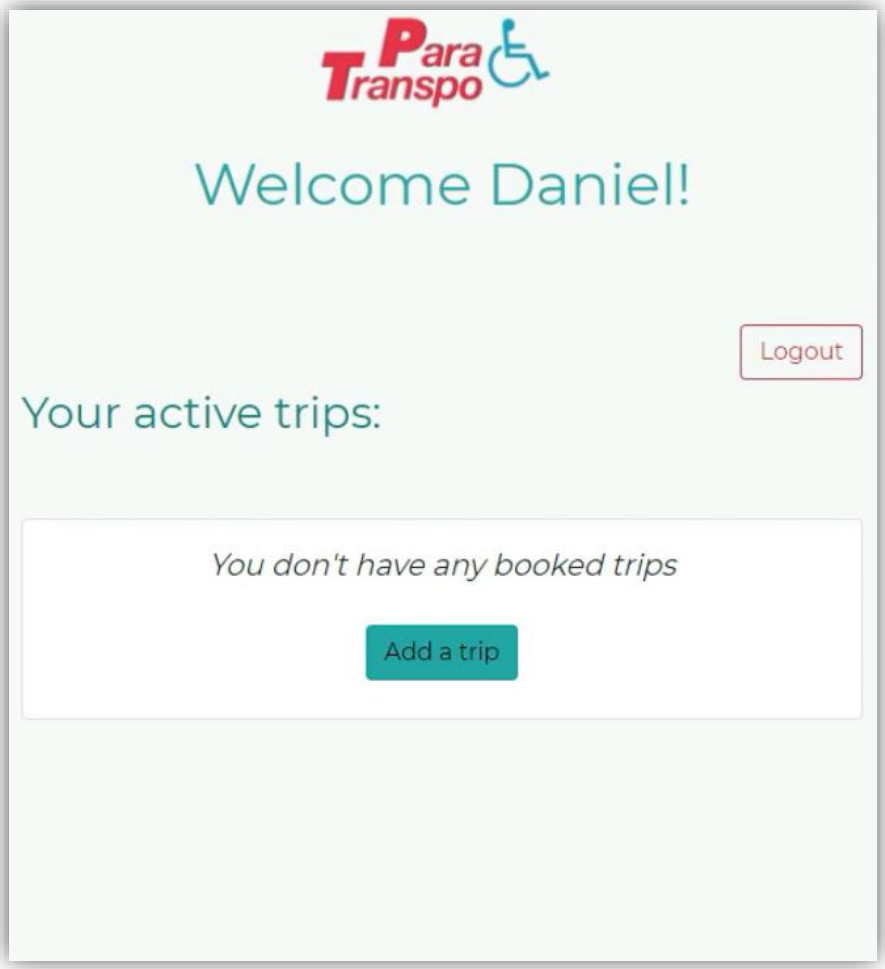

Figure 7. User main page before booking a trip

After clicking the "Add trip" button the user will have access to the reservation page shown in Figure 3. Once the reservation form is submitted the user's main page will be updated accordingly (Figure 4).

3.5 Exiting the System

To exit the system, the user needs to click the logout button seen at the top right of the webpage. When clicked, they will be logged out from the system and will be required to login again to gain access to the system. Nonetheless, the user will be notified if there is an update regarding his trip as shown in Figure 5.

4 Using the System

The following sub-sections provide detailed, step-by-step instructions on how to use the various functions or features of the Para-Transpo System

4.1 Create an account

In this section, the server displays an HTML page with a form that needs to be filled in to create an account. When the form is correctly filled, the server stores the data entered inside of the Firebase database and sign in the user.

4.2 Login to an account

In this section, the server displays an HTML page with a form that needs to be filled in to sign in. When the user credentials are correctly entered the server gives access to the main page, where the user can book a trip.

4.3 Book a trip

In this section, the server displays an HTML page with a form that needs to be filled in to book a trip. When the form is submitted the server creates a new trip and associates it with the user's personal information by communicating with the databases through internal functions. Once the trip is reserved the server updates the user main page displaying the user's trip information.

4.4 Notify the user

Once a change is detected in the database, the server notifies the user through the notification token saved when he signed in.

5 Troubleshooting & Support

For support, please use the contact button at the button of the page or contact us by email at jeangaster@B21.com

5.1 Error Messages or Behaviors

Our system right now does not show any error codes, but due to high traffic the servers may become slow. If this is the case, it would be best to wait for some time before attempting to book a trip.

5.2 Maintenance

Daily maintenance check will be done to avoid any technical issues involved. As well as testing to receive detailed feedback on how to improve the system.

5.3 Support

Users that require emergency assistance and system support can rely on the project manager Jean Gaster to voice concerns as she will contact the required individuals to solve the issues. Please wait about 2-6 business days for response. Any issues, questions or concerns can be reported to her email: jeangaster@B21.com . Just send a detailed explanation of the issue and she will get back to you on how the issue will be handled.

6 Product Documentation

6.1 BOM (Bill of Materials), Equipment List and Instructions

6.1.1 BOM (Bill of Materials)

Due to limited budget the team hasn't purchased anything towards this system.

6.1.2 Equipment list

The application was developed on a computer using Node.js and Firebase.

6.1.3 Instructions

The system requires to have a knowledge of basic front-end development and back end. In this manual a simple description of the system will be exposed. The code for this project can be found on GitHub. The link can be found in the Appendix I.

The first step is to create a node.js project. The designer will then, create four simple HTML forms to create an account, login the user, book a trip and finally a simple main page to display the user profile. Secondly, the database needs to be created on Firebase. Finally, the server side needs to be implemented in order to perform the actions which are signing in, signing out, read from database and write to database. These actions can be done using the Firebase call functions which are *createUserWithEmailAndPassword*, *signInUserWithEmailAndPassword*, *set* and *get*. In order to send the notifications, one must follow the precise sequence illustrated in the following graph.

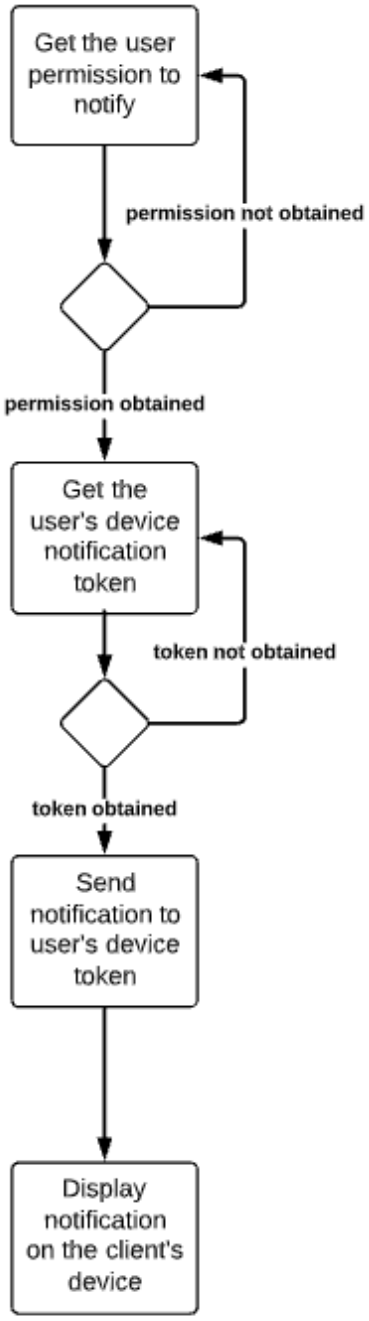

Figure 8. Steps to send a notification from a web application to a user's device

6.2 Testing and Validation

Due to lack of time and resources the testing process was not as extensive as one could hope. Due to Covid-19 restriction one could not necessarily test the app with a diverse group of ParaTranspo users. However, in the limited time given the application was tested often for functionality in general. This was done by registering 8 users. Below is a graph displaying the amount of reads in total for those 8 users.

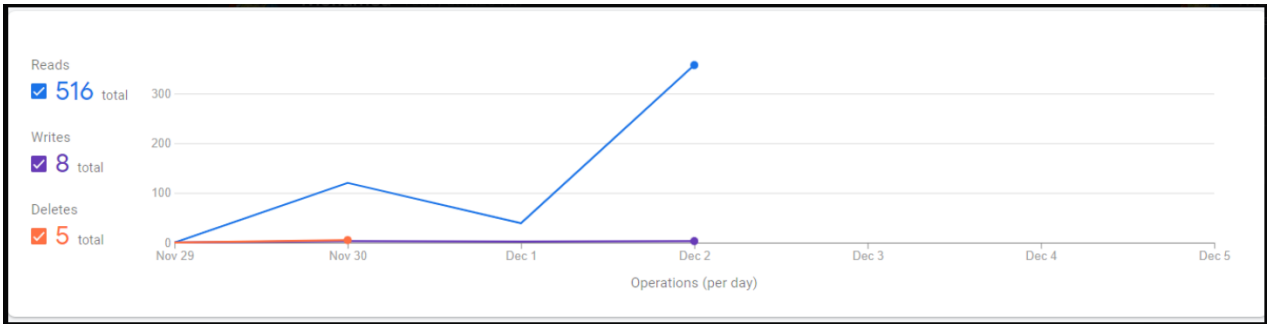

Figure 9. Application tested on 8 users and resulted in a total of 516 reads altogether.

If given extra time and less limitations the application should be tested with various Para Transpo users with different disabilities to see the actual usefulness of this application to them. A survey would also be useful to have qualitative feedback from a diverse group of Para Transpo users.

7 Conclusions and Recommendations for Future Work

Through this process the team created a product that we believe has successfully implemented the clients needs especially with the limited resources and time. Through this process many lessons were learned on product development, team management, conflict management etc. Refer to table below for a summary of the major lessons learned.

Lesson	**Explanation**
Start with a simple concept that can easily be adjusted early on.	It was after the third client meeting that my team was able to get a clear understanding of what our prototype must include. We were hit with obstacles like being unable to use Android Studios as our client has an iPhone. Starting with a simple concept and layout made it easier to make changes early on.
Delegate tasks according to strengths and weaknesses.	Due to limited time and resources delegating tasks was crucial in order to meet deadlines. This includes understanding who can program the best and who can document finding the best. This was the quality of work improves as well.
Extensive testing with diverse audience.	We were unable to conduct extensive testing on individuals with different disabilities to truly test our accessibility features so we learned that it is important in the future to gather a diverse group that can test the product and provide valuable feedback.
Importance of creating multiple prototypes	Based on a customer needs you cannot expect that one prototype will be accepted by the client. Options will provide you with better knowledge on the clients needs and gives the client the opportunity to choose a style they prefer. The more ideas the better.

For future work the team would suggest focusing on the programming of the accessibility features especially for a product like this one. The accessibility features are necessary for this application as our targeted audience may have a wide range of disabilities. It is important that the application incorporates accessibility features so a wide range of Para Transpo users can access the applications and use it with little difficulty. For future work we suggest on expanding the layout of the interfaces and simplifying the format more. In addition, this application remains on a web page however it will be practical to expand this application into an app to encourage use of applications.

If provided more time and resources, the application could include:

Function	**Purpose**
iOS and Android application	Allows more versatility in the features it could offer for example: ringer notification or text notification
Colour contrast feature	Able to adjust contrast according to colour-blind individuals
Read-aloud feature	For the visually impaired this will help them navigate around the application
Terms and Conditions	Provides rules and regulations for the user explaining things like appropriate behaviour
Contact Para Transpo to access their database	This will improve the accuracy of the scheduled trips, so the user is better informed. Also, must ask Para Transpo for permission to use logo.

Overall, this application will hopefully improve the reliability of the trips altogether and encourage more users to use Para Transpo for their travel. In addition, the system will hopefully encourage those will disabilities to trust in our application to provide accurate and reliable data.

8 Bibliography

User Agreement. (n.d.). Retrieved from https://www.linkedin.com/legal/user-agreement

APPENDICES

9 APPENDIX I: Design Files

Table 2. Referenced Documents

Document Name	Document Location and/or URL	Issuance Date
Github repository	Mkona055/GNG2101_PROTOTYPE2: Notification System on a web application (github.com)	Oct 30th 2021
MakerRepo link	ParaTranspo solution B21 | MakerRepo (makerepo.com)	