Assignment #8: Usability Study Report

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Executive Summary

Our app, OnTime, aims to provide users with a list of medical centres near them that will help them access healthcare in the shortest time. They are able to see these medical centres in a list or map view and sort or filter through these options to fit their needs. They are able to sort or filter based on medical centre wait time, commute time, rating, and/or total wait + commute times. Users are also provided with information on medical centre services (clinic/hospital), hours of operation, directions to these locations via a map view and respective text instructions, as well as an option to receive location directions by an SMS.

Key Findings from User Testing:

- Users found the app very easy to use - 4.25/5 was the average rating for ease of use.
- Users found the app quite useful - 4.33/5 was the average rating for how useful the app was.
- Users found that they were very likely to use the app - 4.375/5 was the average rating for how likely it is they would use it.
- Users found the app concept very helpful. - 8.33/10 was the average rating for how likely they are to recommend the app to a friend.
- Generally, younger users had an easier time with the app. However, there was no one who had any major issues.
- Generally, users found the app straight-forward to use because of its familiar interface to Google Maps and other likewise apps.

Research Method

Communication Medium:

Our researchers used Zoom's video conferencing platform to reach out to our volunteer user participants. We chose Zoom because it has become a mainstream platform in Canada since the start of Canada's COVID-19 social distancing laws, and we wanted to ensure our participants' comfort by communicating through a trustable, familiar, and mainstream medium. Moreover, Zoom's platform allows for its users to share faces and/or audio and/or computer screen display, and furthermore allow us to record and save the Zoom call sessions.

Research Method:

We did one-on-one moderated usability testing through a Zoom call. Our researchers shared their computer screen with the prototype on display, and our user participants were able to request control of our screen and go through our prototype and user tasks. The zoom call was structured as follows:

- Research brief acknowledgement and participant verbal consent
- Pre-test survey
- Participant completed user tasks
- Post-test survey

Participant Recruitment:

We reached out to participants who reside in Ontario through social media (Facebook, Twitter, Reddit) and randomly recruited the participants so that we had six participants from different age groups and three identifying males and three identifying females. In the end, we completed user testing by six participants from ages: 21, 23, 24, 25, 31, 58. In other words, we had user tested young adults, middle-aged adults, and a senior. More information on these participants can be found under the *participants demographics summary* section.

User tasks & Data Obtained:

The tasks we assigned to our user testers and their respective solutions are summarized in table 1.1 below.

Table 1.1: User Tasks and Solutions

Questions	Can you navigate away from the homepage and find a list of medical centers near your current location that you can go to travelling by car if you leave at 5:30pm?	Can you show me how to change your starting location to 611 Savoline Rd and your departure time to 4 pm?	Can you show me how you would get directions to a medical center with the shortest commute time?	Please show how you would go about making the map take up the size of your screen	Can you show me how to make this page show directions and no map?	Can you show me how to make this page show both directions and map?	Please show me how you would get the route to your destination by walking?	Can you show me how would you change the medical center destination to something else?	Can you show me how to only see medical centers that are rated higher than 4 hearts?	Please show how you would get the directions of this medical center as a message to your phone?
Answers	User will need to click on **find clinics/hospitals near you** button on the homepage User will need to click on the **use current location** checkmark box User will need to set the **departure time** to the current time User will need to click on the **bus icon** as their method of commute User will need to find results by clicking on the **search** button	User will need to find the **departure time** button and change their departure time to 4 pm User will need to go to **starting point** and change their location to 611 Savoline Rd.	User will need to **sort** the medical centers and click on **wait times** to sort the results by shortest wait times User will need to click on the first result to get the directions of their map	User will click on the **fullscreen** button on the map to receive a full map view of the map	User will click on the **hide map** button on the map to receive a full-page view of the directions	User will click on the **show map** button on the top of the screen to receive a page view of a map and the directions	User will click on the **walk** icon at the top of the map to receive new directions that will be based on a walk	User will click on **back to results** on to go back to the results page User will click on a different **result**	User will click on **filter** and put the 4 on the text field of **ratings** option	User will click on **get directions by SMS** on the bottom of the directions page User will enter in their phone number and click on **submit**
P1	-He suggested we change the font for the slogan as he found it hard to read - He clicked on current location, licked on car and search fairly quickly - He found it confusing that there was no indication of chosen method	- He went back to search screen, didn't notice starting point tab on top - He did see the departure time at the top though	- He found the result with the shortest commute time manually - He used filter to find the results with only the shortest time	- He easily made the map fullscreen by tapping the fullscreen button	- He was confused by the get "directions by SMS" button, he wasn't sure about what it meant	- He knew he had to click on show map	- He easily found the walk icon and clicked it - He was confused if it worked because there was no indication that the	- He went back to search to change "destination" - Once he understood the task, he quickly went to results and click on a different	-He hesitated between choosing sort or filter. Took a while (~10 seconds) to eventually choose the correct	- Knew he had to click on a location first Clicked on get directions by text And knew he would enter his number and click submit

							method of commute had changed		filter option	
P 2	- She noticed the website Url - Her reasoning to click the button on the homepage was “it’s the only button” - She found it odd that the button for commute doesn’t indicate when clicked	- Her first comment was “Wow thats a lot” - For departure time, she clicked on the dropdown - For changing starting point, initially thought that she could drag the “you are here” icon	- She could see commute time clearly and identify what it means - She was confused by “wait time” thinking it was the wait time for the bus/public transit	- She had no trouble doing this, found the fullscreen button with ease	- Like previous task, she had no trouble and found the buttons easily	- She completed this task easily as well, she noted that having the buttons in the same general are helpful for usability	- She knew she had to click on the walk icon - She found it confusing to know which method commute was currently selected	- She understood that this meant she had to go back to the results as select a new location - She did this with ease	- She knew what to do -She found that the buttons were too small and text was too small	- She had no trouble completing this task and clicked on the “get directions by SMS” button as expected
P 3	- She knew how to navigate away from the homepage - - She struggled with the dropdown menu for departure time as she would accidentally double click the dropdown arrow - After a few attempts she was able to select the time and method of commute and pressed “Search”	- She had no problem with changing the location - Like before she struggled with the departure time dropdown initially	- She decided to scroll through the results and find the one with the shortest wait time manually, rather than using the sorting options	- She understood what the task required - She initially struggled to find the fullscreen button as she wasn’t familiar with similar layouts	- She easily found the hide map button - She noted that the “x” on the hide map button helped her understand its functionality	- She was a bit confused with the wording of the task, but once she understood, she pressed the “show map” button as expected	- She easily pressed the “Walk” button	- She didn’t quite understand this task at first - After hearing it a couple of times, she managed to successfully go back to the results and select a different location	- She wasn’t sure about how to do this - She started looking through the sort and filter menus -Once she saw the min. rating she knew that she had to select the 4 hearts option	- She easily completed this task and noted that she found the labelling of the “Directions by SMS” button was helpful in completing this task

									from the dropdown and then successfully filtered the results.	
P4	- He knew how to navigate to the search page and successfully selected the current location checkbox. - He easily accessed the departure time dropdown menu by clicking on the arrow and selected the current time. - He clicked on the bus icon and was slightly confused as there was no indication that it was clicked	- He knew where to go to change the departure time and location	- He decided to sort by commute time so that he could easily find shortest commute time - He struggled to find the correct sort option	- He quickly found the fullscreen button and easily switched to the fullscreen map	- After hearing the task a couple of times, he managed to understand what to do and clicked the hide map button	- He struggled to find the show map button - He seemed to be strugglin g to read it due to size and colour	- He easily found the walk icon and explained that she would click on it	- He was stuck, couldn't find out how to change destinatio n for the current page (directions default) -He went all the way to the back to search screen	- He was unsure on how to show results that are greater than 4 hearts - He tried looking at sort first, before finally clicking on filter - He clicked on the rating dropdown first, rather than the checkbox for minimum rating	- Unsure of which medical center he was meant to select for the directions
P5	- She commented on the homepage saying its was very nice and straight forward - Selected the current location, departure time and method of commute with ease, noting that the layout of this page helped guide	- She mentioned that the positioning of the departure time and starting location fields made it easier for her to be able to	- She easily found the sort button and was able to select wait times easily - She then clicked sort as expected and selected the first result after sorting	- She found the fullscreen button easily and clicked it	- She had no trouble finding the hide map button and clicked it, noting how its positionin g made it easy to find	- Like the previous task, she found the show map button and clicked it with no assistanc e	- She easily clicked the walk icon and changed the method of commute	- Although she was confused at the beginning, once she understoo d the task she was easily able to switch to another location	- She understoo d that this task required filtering - She was able to select the 4 hearts option from the min rating dropdown	- She selected a result and pressed the directions by SMS button with ease

	her through the search process	change them - She completed the steps for this task with ease							fairly easily	
P6	- He clicked the button and navigated from home page easily - He had issues remembering the task (too long) - He was able to click on the bus icon - He ended of with clicking the Search button	- He found the starting location and departure time fields with some difficulty - He explained how he would type up the new starting point and would select the new departure time using the dropdown	- He understood that sorting would be the most efficient method to complete this task - He was able to locate the sort button fairly easily - He had no trouble in selecting the wait time checkbox in the sort menu	- He easily found and clicked the fullscreen button on the map	- He was able to hide the map successfully, however he needed to hear the tasks a few times to understand what to do	- He easily found the show map button and clicked it	- He clicked the walk icon multiple times, confused as to why there was no indication of it being selected as the method of commute	- He went back to the results and chose a new location easily	- He knew he had to filter for this task - He clicked on the filter button, and had some trouble reading the options - Once he located the min. rating option, he was able to choose four hearts easily	- He was able to press the directions by SMS button with no complications

Data Analysis:

From the above tests, we found that most users found our app to be straightforward, as they were all able to complete the tasks with some or limited difficulty. The biggest issue that seemed to reoccur amongst the majority of tests was the button and text sizes for certain parts of our app. Specifically, our older participants had some issues with the text sizes for the “Departure Time” and “Starting Location” fields on the result pages, as well as the options for the “Sort” and “Filter” popups. They found that these components were too small and struggled when a task required actions regarding them. Some users also found the results page to be a bit overwhelming, with the plethora of information found on the page. Another issue

brought up by all participants was the fact that there was no indication of what method of commute was currently selected.
Overall, the participants found the design easy to follow as our design matched the layouts they were familiar with. Many of the participants appreciated the fact that the layout of our map matched the layout of google maps, as it helped them quickly find the buttons they were looking for.

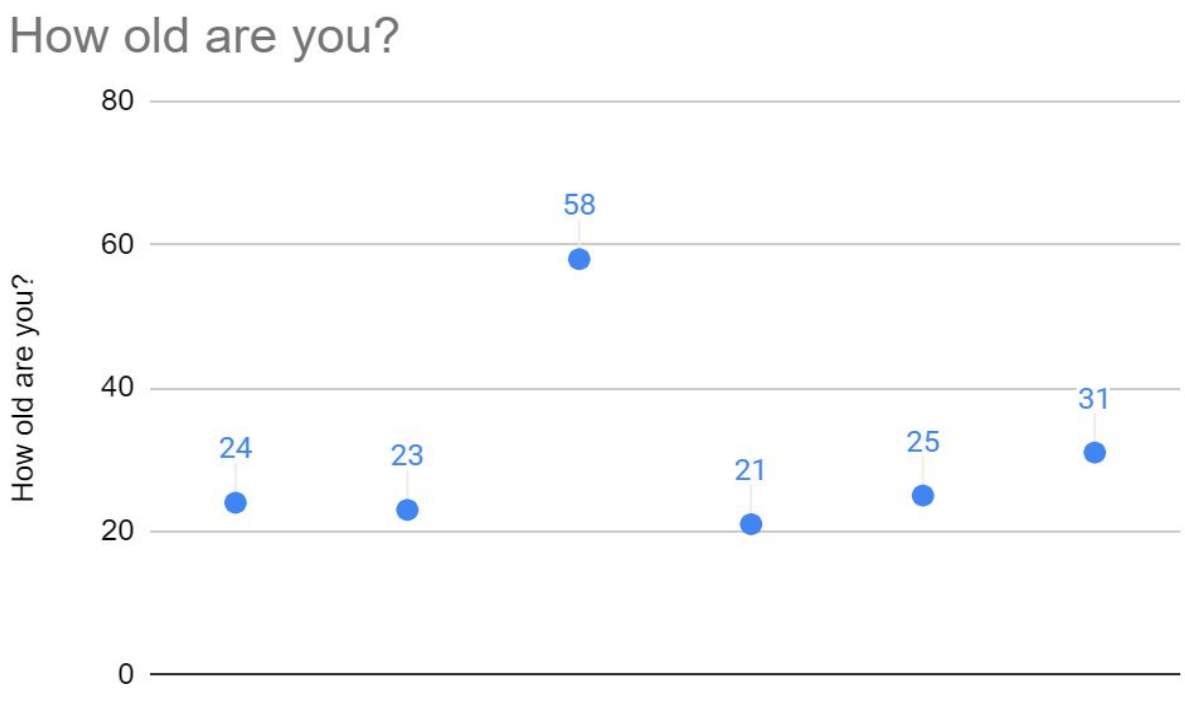
Participants Demographics Summary

Summary:

Table 2.1: Background Questionnaire Summary

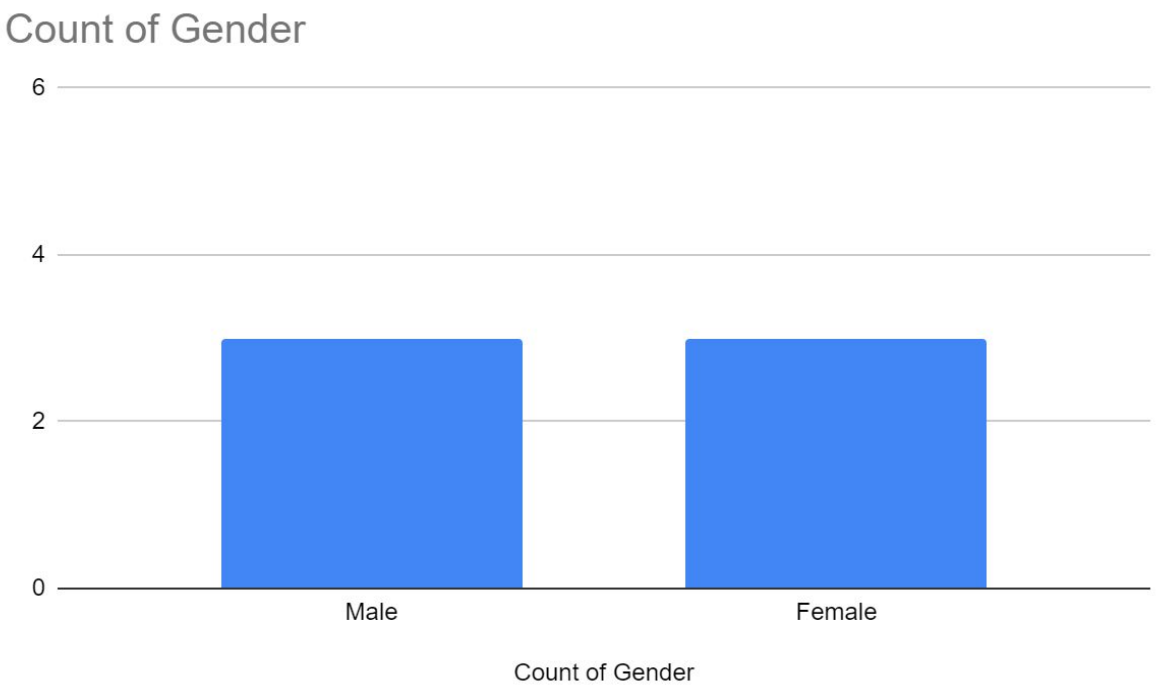
Participant Name	How old are you?	Gender	What is your occupation?	Were you born in Canada?	Do you have any children ?	How often do you visit clinics/hospitals in a year?
P1	24	Male	Student	No	No	1-2
P2	23	Female	Student	No	No	3-4
P3	58	Female	Grandma	No	Yes	8-9
P4	21	Male	Student	Yes	No	1-2
P5	25	Female	Student	No	No	7-8
P6	31	Male	Accountant	No	Yes	14-15

Table 2.2: Age Demographics



Average Age = 30.33 years

Table 2.3: Gender Demographics



Participant Profiles

P1

- 24-year old male student at UTSC
- In his third year of university studying computer science
- Loves being around people and going clubbing
- Doesn't visit the hospital or clinic often

P2

- 23-year old female student at OCAD university
- In her first year studying arts
- Very good artist of the abstract arts
- Loves helping disadvantaged people - philanthropist

P3

- 58-year old mother of 5 and grandmother of 2
- Loves gardening and interior design
- Spends weekends with grandkids
- Visits the clinic often for monthly check-ups and prescription drugs

P4

- 21-year old male student at the University of Waterloo
- Enjoys hanging out with friends
- Fan of classical music
- Rarely visits the hospital or clinic

P5

- 25-year old female student at the University of Toronto Mississauga
- Double Majoring in English and French
- Loves languages
- Often visits the clinic for herself or siblings

P6

- 31-year old accountant
- Likes to spend his time with his kids
- Avid gardener of tomatoes
- Makes frequent trips to the hospital for his wife and kids

Findings & Design Implications

Table 3.1: Successes and Challenges in our Design

Successful Areas of our Design	Challenges in our design (Severity)
Being able to change search criteria from results/directions page	Method of transport isn't obvious when selected (High)
Sorting and filtering options	Text Size/Button Size - hard to click (Medium)
Similar interface to google maps made it easy to understand and follow	Location and spacing between various buttons (Medium)
Getting directions by SMS	Too much content (Low)

Here's an example video of a user struggling due to the small buttons and small text: https://drive.google.com/file/d/1-FtowLJ_q3bJZovD7MtfRk1c9tLVPy1b/view?usp=sharing

Table 3.2: Task Completion Rate

	Percentage of Participants
Task Completion Rate (Fast time)	50%
Task Completion Rate (Medium time)	33%
Task Completion Rate (Slow time)	17%

Table 3.3: Post-Test Questionnaire Summary

	Average Score
Likeliness to recommend to family/friends	8.33
Ease of use	4.25
Usefulness	4.33
Likely to use	4.375

NPS Score = Percentage of Promoters - Percentage of Detractors

NPS Score = 66.66

An NPS Score above 50 is considered great!

Recommendations

Users recommended increasing the size of buttons/text, making it shaded when you select a transportation method, and spacing out the page more/moving certain buttons into different spots.

Before and After Usability Issues

Table 3.4: Before and After (Method of Transport)

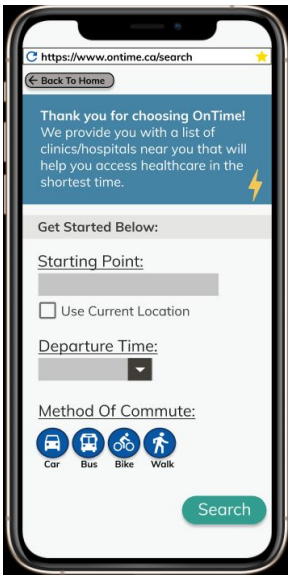
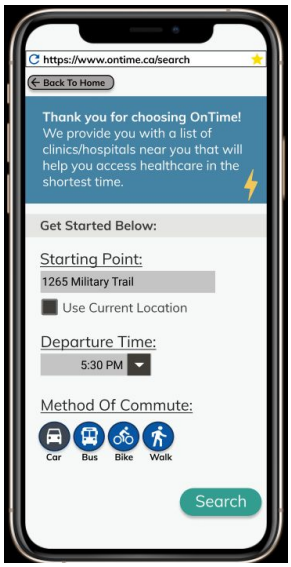
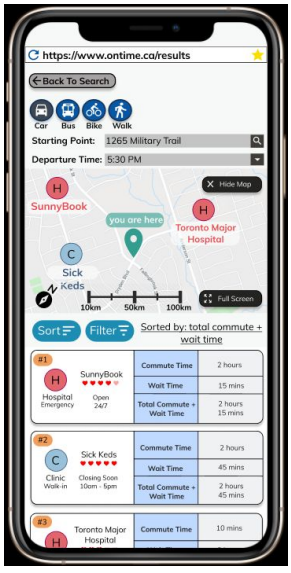
Before: Pages without method of transport shaded	Issues	After: Pages with method of transport shaded	Design Updates
	- When the user clicked on a method of transport, it wouldn't show that it was selected. The user did not know if their click was successful.		- When the user selects a method of transport, it becomes shaded to show that it was selected. Now the user will know that their cick was successful (or unsuccessful).
	- When the user was on the results or directions page before, it wouldn't show what method of transport they had selected (in case they forgot for example). So if they wanted to change the method of transport they'd have to remember the one they selected initially		- Now, if the user is on the results or directions page, they'd know that they selected a certain method of transport because it is shaded. It is now easier for them to easily change it to something that isn't shaded.

Table 3.5: Before and After (Button/Text Sizes)

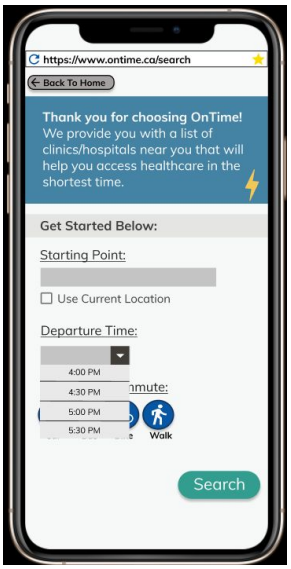
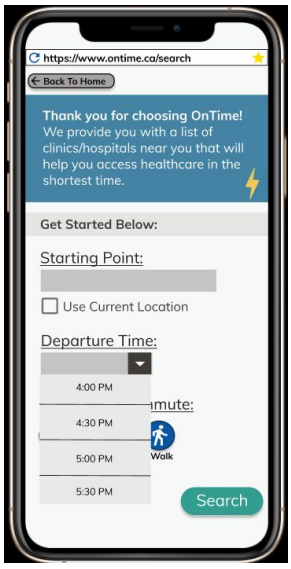
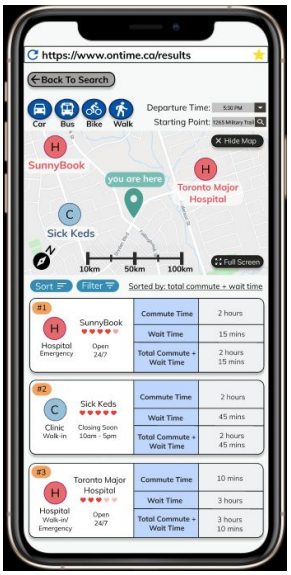
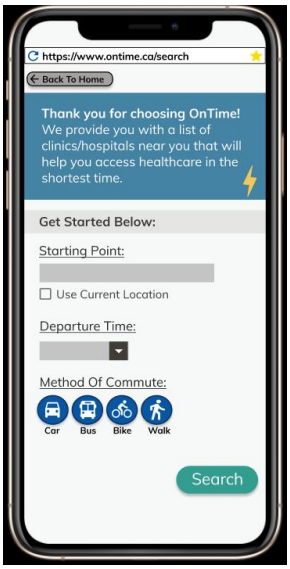
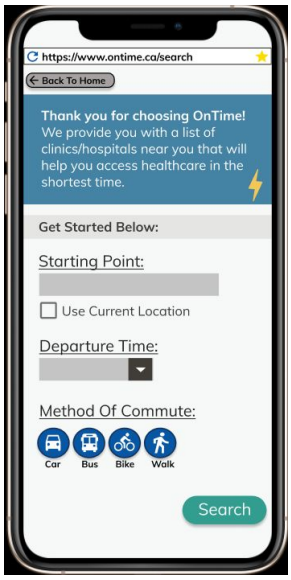
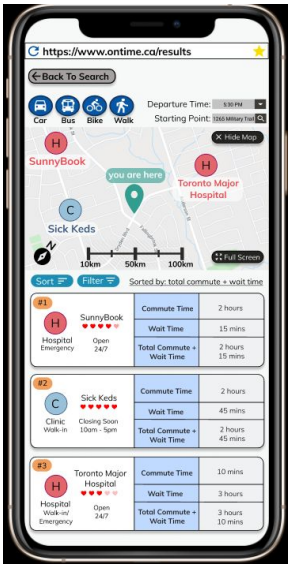
Before: Pages with small buttons/text	Issues	After: Pages with bigger buttons/text	Design Updates
	- Headers underneath the 'Get Started Below' section were too small, making the text on this page not proportioned to its importance (The brief introduction to OnTime is larger than the commute instructions, which is more important to the user experience) - Text fields (starting point, departure time) were too small and easy to miss when clicking		- Headers underneath the 'Get Started Below' section are now easier to see and larger than the brief introduction to the app. This draws the user's attention directly to the commute instructions rather than the app brief - Text fields have increased height and width and are thus easier to click on
	- Text on the 'Departure Time' and 'Starting Point' text fields is very small to see and almost unreadable. Its size is also unproportional to the text under the method of commute icons - The text and buttons in the row beneath the map is too small		- The text on 'Departure Time' and 'Starting Point' is now very readable and proportional to the font size of the text under the method of commute icons. This shows that these two components share roughly the same importance - The text and buttons in the row beneath the map is a size now proportional to the size of the method of commute components. This shows consistency and is also much more readable for the users

Table 3.6: Before and After (Location/Spacing of buttons)

Before: Pages with bad spacing and button location	Issues	After: Pages with better spacing and button location	Design Updates
	- Dropdown menu text is very cramped and hard to see, very easy to accidentally click on the wrong departure time - Lots of empty whitespace on bottom of page that isn't being used		- Dropdown menu has increased font size and padding so that each field is now the size of an average thumb print - Spaced out header fields more to use the whitespace and make the page look cleaner
	- The location of the "Departure Time" and "Starting Point" fields is not very obvious to see. It is also very cramped and makes this page overwhelming to look at.		- The positioning of the "Departure Time" and "Starting Point" fields was changed to make them more visible to the user. They were spaced out more and the page was elongated vertically to accommodate this change. The user can now easily see and click the two fields.

Discussion: Research Limitations

There were many research limitations we faced that had to do with the quality of our prototype, how we executed the usability tests, the people we did the usability tests on, and the sample size of our participants.

With our prototype, a major limitation we had was that we had too many combinations of options for our prototype to work with every combination. We would need at least 50 more screens to be able to consider all the combinations in our prototype. These combinations arised from our multiple sorting and filtering options, as well as both our results and directions page allowing the user to change location/departure time/method of transport. It simply wasn't feasible to consider all these cases in the time we had. We tackled this limitation by ensuring the tasks in our usability tests only used functionalities that our implemented screens were capable of handling. For example, you can see in this video linked below how we were very specific in our task description about starting location, departure time, and method of transport. https://drive.google.com/file/d/1eCqqNVj5V-6P1OfK0iDME0kPbz7bK0Yt/view?usp=sharing

Despite being asked to do a pretty long task above, the user still had very positive feedback from the usability test: https://drive.google.com/file/d/1XrcB6OYWqNdg6Q-BaDccZ2oKWLXu7tEs/view?usp=sharing

When executing our usability tests, a barrier we encountered was not being able to record the whole test. Some participants agreed to let us record parts of the test, as seen above, but the majority of the test was not reviewable by us. For this reason we found it difficult to catch everything the users said. However, we were able to overcome this limitation by adding more "observers" and "note takers" to each of our usability tests. In some of the tests we had 4 note-takers to ensure we didn't miss anything the users mentioned.

When selecting participants for our usability tests, we found it difficult to find people that we did not know personally, especially due to the covid-19 situation. We ended up having to use our family and friends network. We expected there to be a cultural/personal bias due to the relationships we had with the participants, so that's why we ensured the facilitator for those tests did not know the participant directly. For example, our group member Jenisha was the facilitator for the usability test with another group member's (Osman's) mom.

Lastly, the sample size of our participants (6) made it so that our findings from the tests weren't necessarily generalizable to a larger population. However, as Ilona mentioned in the lecture, even 5 participants is enough to catch ~80% of usability issues. We actually had around 10 people who agreed to participate, but 4 of them weren't able to do it last minute. This prevented us from performing statistical analysis on our data, because 6 isn't a large enough sample size.

Reflections

Each time we progressed through our prototypes, we'd notice more instances where our prototype didn't align with Neilsen's 10 usability heuristics for user interface design. Rigorously Iterating through our interface using Neilsen's 10 usability heuristics allowed us to see our prototype like a factory of very small parts coming together to form a functioning system. We structured our iterations by running the 10 usability heuristics for some components of our prototype, doing user tasks on the page/prototype, running the 10 usability heuristics on the page/prototype, and then a repeat of these steps. These self iterations changed our assumptions that our prototype being able to function meant that we are done with our assignment, because we realized that we can not just freestyle a system, there is a procedure to follow and rules to meet.

Iterating through our prototypes with our users in user testing also reinforced the lessons we learnt from our group iteration sessions. We had made multiple changes to our final prototype based on user input, despite having iterated over our own prototype countless times. Feedback such as "small buttons/writing, hard to see" (from P3's post-test survey; more detail on this under *Appendix: Usability testing - post test questionnaires*), prompted us to increase our font size and our button size by roughly three times the previous amount. A key finding we realized during user testing is that familiarity is better for users from a user's perspective. This was common feedback we received during our post-test surveys. For example, P1 and P6 post-test survey feedback, respectively being "I liked how it was a common interface to other apps…", and "It's like Google Maps, so I knew where to look" (more under *Appendix: Usability testing - post test questionnaires*). Hence, we learnt a very valuable lesson through iterations that familiarity and not uniqueness is key to a user's experience. Please also check out the link below for P5's post-test survey results for how we came to this conclusion. Around the 0:08 mark, P5 says "one word I would say it's clear, straight-forward and easy to use especially because it has a similar interface to Google Maps".

https://drive.google.com/file/d/1-weAyT79sFbPe2pVdZ5wuGzo2BQAzRQl/view?usp=sharing

As a group, we are pleased with our ultimate ability to solve our users' main problems. Thanks to feedback from several iterations we were able to increase the font size, minimize the whitespace, change certain wording to become more universally understandable ('text' to 'SMS', as noted by P2), add clearer icons that illustrate button

functionalities, and many other changes that are noted under *Findings & Design Implications*. Please check that out, to see how we started from (Drake's version of) the bottom and made it here.

Appendix - Supplementary Materials

Usability Testing - Scenario

You are a 1st-year student at UTSC, living on campus. You are fairly new to Toronto, so you don't know much about where everything is. One day you start feeling slightly ill and start feeling worse as the day goes on. By the time you decide to go to the doctors, the medical facilities on campus have already closed. You have a lot of assignments due soon, so you don't want to spend a lot of time waiting for treatment. Desperately, you go on google and find an app that gives you a list of waiting times of nearby clinics/hospitals and decide to try it out.

By using this system, please complete the following tasks:
This new table will make it easier to take notes for each participant. In class, our usability testing notes were all over the place, so this should help with that.
We also updated some testing questions for clarity. Answers were updated to reflect the names of buttons we changed in A7b.

Usability Testing - Post Test Questionnaire

	How was your overall experience with the prototype? Describe it in only one word	**Explain this product/experience to your friend**	**From a scale of 1-10, how likely are you to recommend this to your friends and family?**	**What did you dislike about the prototype?**	**What did you like about the prototype?**	**On a scale of 1 to 5 how easy was it to use this system**	**On a scale of 1 to 5 how useful was this system**	**On a scale of 1 to 5 how likely are you to use this system**
p1	Satisfactory	"Ik an app that can help you find clinics with less/no waiting times"	7/10 because I don't go to clinic often	Departure time and starting point could be bigger (they were hard to click) Buttons were a bit to small Font on front map	I liked how it had a common interface to other apps, so it was easy to understand	4	3 - not sure if waiting times are accurate	3 - I don't trust the waiting times

p2	Good	Very good and convenient, app purpose was clear	10/10	Just would have preferred the ability to use this with Uber	liked how it was clear and easy to follow	4.5	4	4
p3	Advanced	A little hard to use for people who don't use phone that much	7/10	Small buttons/writing, hard to see	Likes how the hospitals are listed, times were listed nicely	3.5	5	5
p4	Useful	Faster to find clinics/hospitals to go to	7/10	Transport method didn't show when it was selected	Labels help a lot, like how the text is labelled	4	4	4.25
p5	Clear	Great way to save time going to hospital	10/10	Amount of content felt overwhelming at first. Took time to get used to	Liked the filter and sort options. Liked the ratings for service quality	4.5/5 because it was quite easy to use	5/5 definitely	5/5 because I make frequent trips to the clinics with my family
p6	Straightforward	Nice app that is easy to use and user friendly	9/10	Change where we put the buttons, Move departure time and starting point	Its like google maps, so I knew where to look	5	5	5

Pilot Test Participants in class vs Target Audience

There were both similarities and differences in the usability test workshop we did in class and the usability tests we conducted outside of class.

A common issue users in both groups faced was that our buttons were too small. We had actually made our buttons bigger from A7a to A7b, but they were still a bit too small. Another common issue both kinds of participants faced was that there was a lot to take in on our pages. This made our pages seem cluttered to the users. However, users in our target audience who we performed usability tests on outside of class actually found the content on each page was useful enough to warrant it being

cluttered. I think in-class we were shorter on time, so participants didn't have the time to take in each page's content, whereas outside of class, the participants were given more time to think and understand the pages. Similarly, some of our users in class found our prototype confusing to understand and so did the users outside of class, but once they were given time to take it in, they all mentioned that it was pretty straightforward to use.

In general, the feedback we received from both groups of participants was mostly similar. However, our participants outside of class had more positive feedback because they were given more time to learn and understand our prototype. Since the feedback was similar, the results (changes to make) from the feedback were easily generalizable, where we could say "this is an issue an average user would face" and fix it.

Appendix - Assignment Attribution

Executive summary
- Sumuhash, Riyasat

Description of Research Method
- Sheeza, Jenisha

Summary of participant demographics
- Osman, Jawad

Detailed report of findings and implications
- Jenisha, Osman

Discussion of limitations of research
- Jawad, Sumuhash

Reflections on the project evolution
- Riyasat, Sheeza

Appendices
- Everyone