

COVID-Central

Abstract—This project is a study on the effects of different UX and UI decisions and how they can effect how the user uses a mobile COVID application. This app also targets two completely different audiences simultaneously (elderly, youth).

Keywords—HCI, Design, UI, UX, UserTesting

I. INTRODUCTION

This history of the problem as it relates to COVID-19 is obviously very recent, but since the introduction of the pandemic in North America near March 2020, many COVID-19 related applications have been released to target a wide variety of use-cases helping ease the effect of the pandemic on society. One of the most prominent apps released was COVID Alert, Canada's exposure notification app.

COVID Alert was primarily designed to improve contact tracing efforts in order to identify high risk areas as well as notify users of the app of whether they might have been exposed, so that they can get tested and get help before symptoms could set in.

COVID-Central was designed to interface with similar data by pulling tons of useful statistics and alert information as well as popular news stories that are local to the user. The primary focus of the app, however, was the additions of the volunteer help program which connects elderly or immunocompromised with volunteers who are ready to help out in tasks requested by the former.

II. PROTOTYPE DESIGN

A. Requirement Analysis (NeedFinding)

The requirements for this project were largely based on the process of needfinding analysis which allowed the discovery of new needs of users that may be different than what is currently available through popular existing solutions. This allowed the requirements gathering for an app that improved upon existing solutions with new innovative features that were scarcely available in the current market. Some of the questions I asked the target end-users of this app were, “As an elderly person, what are some of the things you

would like to see in a COVID assistance application?” As well as, “As a youth, what are some ways you would like to help out in your community during the COVID-19 pandemic that could be helped along with a companion app of some sort?”

B. Competitive Analysis

In my competitive analysis, I discovered a number of user experience issues and improvements that could be made, even on the most popular apps on the market for COVID-19 apps. The results of this investigation provided me with a number of key features these competitors have and what their main focuses could have been. I also got an insight into some of the techniques they used to create an engaging and satisfying user experience. I investigated COVID Alert, TraceTogether, COVID Symptom and Home Quarantine apps available on the app store. My notes and from my investigation can be found in **figures 1.1** and **1.2**. This investigation also allowed me to discover issues in my own prototype application, COVID-Central, as seen in **figure 1.3**.

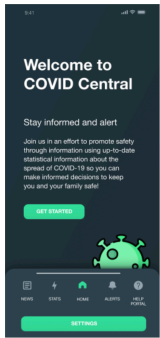
C. First Initial Prototype Alternatives

Git: <https://github.com/SystemFiles/HCI-COVID-Central-Prototype>

Fig: <https://www.figma.com/file/Ez5vnOBcNL3QjFA9gca3Mh/COVID-Stat-App?node-id=0%3A1>

Primarily, my design was about maximizing the amount of recognition vs recall. I tried to use common icons and button locations and design guides that people are used to and would recognize as opposed to subjecting them to an experimental design which may have been fine for the younger users of the app, but would be detrimental to the potential elderly users of the app for who this app was primarily designed for. My navigation menu was fairly successful for most users who tested my app through UserTesting (link below), though, some users

experienced issues with the navigation as it pertained to how I handled the UI transitions in the prototype for multiple types of users (volunteer/not) which I think is more of a limitation of the prototyping software as opposed to an actual design issue.



1. Initial Prototype with Navigation (full-prototype in Figma link)

III. PROTOTYPE EVALUATION

See **figure 2.1 and 2.2** for the details related to my UserTesting study on my prototype.

IV. USABILITY ANALYSIS

I performed an analysis of usability utilizing the following 3 metrics:

- Task Success Rate
- Time to Complete Task
- User Satisfaction (overall rating)

Metric	User 1 (Score)	User 2 (Score)	User 3 (Score)
Success Rate (x/6)	6/6	5/6	3/6
Average Time to Complete Task	1- 0:47 2- 0:40 3- 0:20 4- 1:36 5- 1:35 6- 0:54 7- 1:02	1- 2:17 2- 0:43 3- 1:08 4- 1:36 5- 2:29 6- 1:37 7- 2:16	1- 3:54 2- 1:00 3- 1:39 4- 2:16 5- 2:54 6- 2:05 7- 2:47
User Satisfaction (out of 10)	7	10	10

2. Metrics Gathered from test summary (source: [UserTesting.com](https://www.usertesting.com))

Followed by some average and other metric calculations to make the information more useful for analysis. Specific open-ended user feedback available in **figure 5**.

Metric	Average
Success Rate	$(6+5+3) / 3 = \sim 78\%$
Task Completion Time	0:59 (MM:SS) + 1:43 (MM:SS) + 2:22 (MM:SS) = 1:41 (MM:SS)
User Satisfaction (out of 10)	9

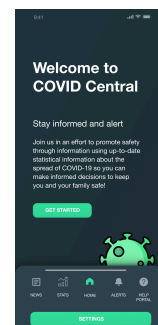
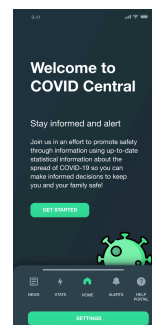
3. Metric calculations (averages) to put metrics into perspective for analysis

V. REVISED PROTOTYPE

One of the biggest problems identified with my prototype was the distinction of whether you were signed in as a user(non-volunteer) or as a volunteer. Based on feedback provided by the participants at [UserTesting.com](https://www.usertesting.com), I identified some icons in the navigation, namely the stats and help icons that could be interchanged with more appropriate, recognizable icons such as, for example, the stats icon could be replaced with a graph icon instead of the lightning bolt icon which could be confusing.

One user also mentioned that she did not see an option on the sign-up page to sign-up using an email address. This was a simple oversight that can be resolved by simply adding an email field in the sign-up form.

The app had no real usability issues beyond those mentioned based on the 3 participants I had, however, with more participants and an extended study combined with a more functional prototype,



I might identify more.

4. Before and After approach to navigation bar in prototype (Home page, specifically) Full-Size in **figure 4.1 and 4.2**

VI. FUTURE WORKS & CONCLUSIONS

The major struggle for users didn't seem to actually be using the features for the app (prototype), but rather finding the right path to navigate to areas of the app that they wanted to get to. I think the addition of an expandable menu which includes a single click to get to anywhere in the app might be the preferred solution for an app of this size (it being relatively small, so it won't get cluttered). The second thing is to add the navigation menu to every single page instead of only the main pages so that users have a way to get to any part of the app from anywhere in the app with less taps. This would speed up and simplify the navigation and allow users to actually get proper use out of the functional requirements of the app. Adding some more tooltips and hints may also be useful for elderly users to help explain the "why" of certain operations or inputs. Overall, I think with further iterations of this design/concept, an app with a great user experience and design is definitely attainable if the same HCI principles are applied in each iteration as it was in the first 3 iterations of this design as presented.

/ APP / CATEGORY	COVID Central	COVID Alert	TraceTogether	ABTraceTogether	COVID Symptom	Kwarantana Dommowa (Home Quarantine)
Owner	Me	Health Canada	Government Technology Agency	Government of the Province of Alberta	New Jersey Technology Council Inc.	Ministerstwo Cyfryzacji
Users/Downloads (estimated)	N/A	4,051,648	2.4+ million users by 4 Sept. 2020	~1000+ by September 30th 2020	Unknown	~500,000+ by October 9th 2020
Age of Product	N/A	2+ Months	7+ Months	5+ Months	Unknown	8+ months
Key Features	Statistics Tracking, COVID News, Alerts with Map showing location of possible outbreak location, Data Sharing, Volunteer/ Elder support program with GPS tracking and map data for volunteer tasks	Contact Tracing, Alerts, Integration with healthcare system, Available to many provinces in Canada, COVID News History	Support for Physical TraceTogether Token for better performance, Alerts	Support for Physical TraceTogether Token for better performance, Alerts	User-friendly symptom quiz, History of previous self-assessments, Date symptoms by the day, Track previous COVID tests at testing facilities, Cloud sync your data across web and mobile, Share your health data for research, Clean UI Design	Tips to remind you how to stay safe when leaving home
Cost (\$CAD)	0	0	0	0	0	0
Overall App Rating on the App Store	N/A	4.5/5 (3.6k)	3.5/5 (2)	2.6/5 (529)	4.5/5 (18)	1/5 (3)

Figure 1.1 — Competitive Analysis Overview

Competitor	UI/UX Issues / Notes
Covid Alert	Not many UX issues since the design teams main focus was accessibility based on my research. They have included contrast options for colour blind, voice control and navigation for blind. They included responsive design in cooperation with Mozilla's Mobile Accessibility Checklist. One of the key disadvantages in terms of User Experience and accessibility from my perspective is the fact they do not support anything but the newest OS versions making the app only accessible to the fraction of the population that has the newest OS version currently. In terms of design choices, I think the app is made simple and easy to follow and use but with this it comes with a very bland, uninteresting, dry visual experience. Nothing particularly pops out and the color scheme is boring. The calls to action are highlighted in a primary or accent color which helps bring the eyes to meet those elements, however. COVID Alert's focus on data privacy did win the app some points when comparing to other similar apps on the market.
TraceTogether	TraceTogether supports 8 languages and has a very simple, clean and modern interface design that is welcomed with warm colours to draw the user in. The data use is very transparent making the app trustworthy and feel uninvasive. The navigation can be a little bit confusing at times and the wizard you must complete at the registration is longer than I would prefer, but this is done to ensure process completion. Overall the user interface design is easy on the eyes and makes you want to use the app, although when compared to Covid Alert, the app loses some points for accessibility since supporting 8 languages is kind of where the accessibility features stopped.
ABTraceTogether	Similar to TraceTogether (by the name you can expect this), but this app has some much more informative pages although the use of white space needs to be reconsidered since it does, at times, feel very cluttered. The functionality and accessibility suffers from the same problems as TraceTogether costing it some UX points, although the UI is actually very clean and modern as well. Different color scheme but the sharp edges and use of color to highlight important items as well as the cute illustrations make the app joyful to use. There are reports that the app suffers from stability issues however, which hinders its UX score greatly.
COVID Symptom	Since the COVID Symptom app does not have the exact same purpose as the other app on this list, it's audience will also be different. For this reason the need for accessibility is not as urgent beyond the standard accessibility practices (language locals, text-to-speech, etc...). The app has done a great job at embracing a simplistic old-school look for most of their interfaces which in terms of user experience is welcomed. The experience right from the get go when you are asked "how you are feeling" is made so straight forward thanks to the use of familiar images enforcing recognition instead of real so people who may not even be too familiar with the text would understand which is bad and which is good. After this you get to select your symptoms in a question answer format which makes the app feel very conversational and all of this is done with a clean, mostly uncluttered interface. Some downsides however would be the plethora of information on the home page since this can be very overwhelming for the user and may cause them to stop use of the app right from the get go. Splitting this information into multiple hidden tabs or separate pages would be one way of reducing this clutter.

Figure 1.2 — UI/UX Investigation of Competitor Apps.

UX Issues in Covid Central (my app)

- Icons chosen for navigation may not be the most clear way of describing to the user where they will end up (solution: Expand nav menu for names under icons)
- There is no indication of color blind, blind, or language support for accessibility purposes (solution: options in settings page)
- The Home page of the app is almost entirely useless since it does not provide realtime information or any actions other than to go to the recent news (solution: make home page more of a overview of other pages like a dashboard)
- Simpler sign in and sign up options with their added convenience and security using SSO like Google would be much better than only offering a specific account for the service as shown in the prototype. (Solution: Added SSO options)
 - Should use Google or Facebook SSO sign in/up options
- No indication that alerts will be available as notifications outside of the app meaning that alerts may be noticed too late (partially defeating the purpose) (solution: add iOS notification example)
- No open requests section for elderly to track their request status (solution: Open requests page)
- No Settings page for customizing anything about the app such as notification preferences or color settings. (Solution: settings page)
- No way to manage profile (solution: account management page)
- No indication besides app name on app store (potentially) that the name of the app is Covid Central

Figure 1.3 — UI/UX problems identified in COVID-Central

Target Audience The demographics breakdown that you have set up for this specific test. Please note that if the test has been edited, these may not be completely accurate.	Senior Mobile Participants using computers
	Age 59 - 65+ years old
	Household Income Any
	Gender Any
	Employment Status Any
	Industry Any
	Company Size Any
	Job Role Any
	Job Level Any
	Countries Any
	Web Expertise Average
	Operating System Macintosh
	Web Browsers Chrome, Firefox, Safari
	Social Networks Any
	Children Any
	Last Test Any
	Screener
	1. When was the last time you used a mobile application on your phone? <ul style="list-style-type: none">• Last week [Accept]• Within the past year [Accept]• Never [Reject]
	2. How often do you use your phone for things other than texting, browsing, or calling? <ul style="list-style-type: none">• Never [Reject]• Sometimes [Accept]• Frequently [Accept]• Every single day [Reject]

Figure 2.1 — Study Test Audience ([UserTesting.com](https://www.userTesting.com))

Introduction

We are going into lockdown, you realize that it might be difficult and dangerous to even go shop for groceries in a store. You remember someone telling you about this COVID-19 app. Imagine you have just downloaded it. You are running the Covid-central application...you want to sign up as a normal user (not volunteer) and find any current COVID Alerts in your area. After this, you want to create a new task for a volunteer to assist you with.

Tasks

1. **Read all tasks out loud and remember to share your thoughts as you perform each task.**
2. First navigate to the "sign up" page [Success: Yes, No]
3. Sign up with a Google+ Account [Success: Yes, No]
4. Check alerts in your area through the app and describe which alert is currently showing on the screen. [Success: Yes, No]
5. Now navigate to the volunteer help portal and create a task for a volunteer to assist you with. [Success: Yes, No]
6. Locate your profile page [Success: Yes, No]
7. Finally, find any COVID news and statistics you would be interested in on the app and describe what you found. [Success: Yes, No]
8. What did you think of the overall experience in terms of navigating the app? [5-point Rating Scale: Poor to Excellent]

Questions

1. Share your final comments or thoughts on the app.
2. How likely are you to recommend this app to a friend or colleague (0=Not At All Likely, and 10=Very Likely)?

Figure 2.2 — Study Test Plan ([UserTesting.com](https://www.usertesting.com))




SENIOR UX Test				Edit screener
Participants using computers				
59-65+ Average Chrome, Firefox, Safari				
<input type="checkbox"/>	 18:35	terramps ★★★★★ Add to panel	59 - Female - \$80,000 - \$99,999 - United States 0 Notes 0 Clips See Answers	<input type="text" value="Summarize this session"/>
<input type="checkbox"/>	 11:16	Honalsar1 ★★★★★ Add to panel	60 - Female - \$40,000 - \$59,999 - United States 0 Notes 0 Clips See Answers	<input type="text" value="Summarize this session"/>
<input type="checkbox"/>	 14:32	Kwoliti ★★★★★ Add to panel	59 - Female - \$80,000 - \$99,999 - United Kingdom 0 Notes 0 Clips See Answers	<input type="text" value="Summarize this session"/>

Figure 3.1 — Responses from test with 3 participants ([UserTesting.com](https://www.usertesting.com))

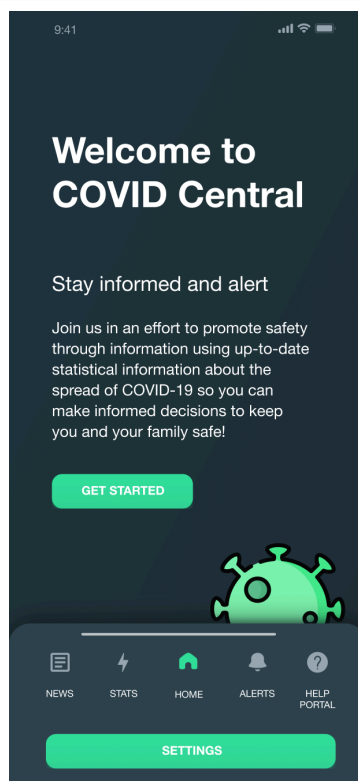


Figure 4.1 — Before prototype revision (based on feedback from [UserTesting.com](https://www.usertesting.com))

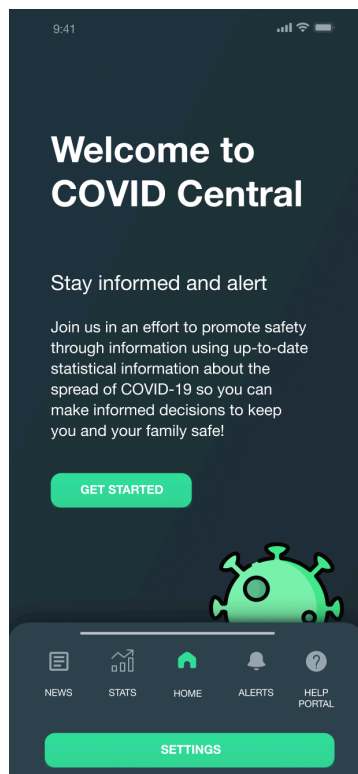


Figure 4.2 — After prototype revision (based on feedback from [UserTesting.com](https://www.usertesting.com))

User	Question	Answer
1	Final Comments	I think the bottom navigation icons can be a bit confusing, i.e. stats & ? icons. I thought the sign-up page was a bit limiting as it appears you can't sign up with e-mail. I was confused that the Volunteer request was under the '?'. 7/10
1	Likelihood of recommendation	
2	Final Comments	I had trouble with the prototype, but what I saw looked very useful. 10/10
2	Likelihood of recommendation	
3	Final Comments	Good app, makes me feel safe, informed and protected. 10/10
3	Likelihood of recommendation	

Figure 5 — Usertesting open-feedback about the overall experience of using the prototype.