**COVID Combat!:**

**Final Report**

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***Abstract*—This project was developed for the purpose of properly identifying and applying the recognized HCI concepts and guidelines in a mobile application prototype, and how such design and UI decisions affect its opinions of the general public about it. The App was design for the of being a helper app where it would be able to provide important information regarding the state of pandemic and the virus to those in need, or those who would want to be kept informed.**

***Keywords—HCI, COVID-19, Prototype, Design, Mobile (****5 keywords are enough****)***

# Introduction

The History of The Coronavirus, or more commonly known as COVID-19 virus, does not date back too far, as the World only became fully known of its presence not too long ago, around the month March in the year 2020. Many of Earth’s inhabitants have been living in what many are calling the “new norm”, that is staying indoors as much as possible, in an effort to flatten the curve of the virus. As a tactic to help citizens do their part in reducing the virus’ spread, many countries have developed their own contact tracing/exposure alert apps that allow citizens to stayed informed about the virus as well as make sure they stay safe as well. Many of these apps, such as Canada’s COVID Alert or Ireland’s COVID Tracker Ireland, are currently available to users on the Google’s Play Store, and Apple’s App Store.

COVID Tracker Ireland was developed with the purpose to provide users with an informed summary of the current statistics and information regarding the virus, from its number of cases to medical concerns and statistics varying periods of time and ongoing updates data on the vaccines available. The app was designed such that it would allow users to perform daily check-in to see if they are exhibiting any known symptoms, as notify the general public if they have been infected or not, or even if they have come into close with someone infected, the end result being everyone stays informed

COVID Combat was designed in a similar sense that it is able to show General Statistics, Tips, and COVID Guides that users can refer to, helping them stay informed and safe. One of the original motives of designing the app, however, was to provide a way for users, in particularly focusing on elders as well young people, to communicate with available volunteers to receive any needed help. As a result, the app has an Account and Chat management features that give users the option to become volunteers and help anyone in need and vice versa.

Prototype Design

## Requirement Analysis (NeedFinding)

After having created my first initial design of the COVID Combat Application Prototype, I began to observe and analyze other available COVID mobile apps, two of which I mentioned earlier. What resulted of the research on other similar apps that were available is that I had found out a list of effective UI modifications that had come from both what features users liked and disliked in the researched competitors, allowing me to design in response to what users are looking for.

## Competitive Analysis

As I was researching these competitor apps against mine, through either physically using the apps or analyzing what the users were saying about the apps, I had constructed a Competitor Analysis Matrix, that takes the features I am building in my prototype and compares them against the researched competitor apps, analyzing which of my features is in or is similar in each competitor app. What I had found is that majority of the competitor apps had shared the main features and UI features that my app had. The most significant detail I found from the analysis is that my COVID Combat! App was the only app that had features for user account and chat management, which, as stated above, was one of the original motives when initially designing the prototype, thus, giving my app that nice competitive edge against the research apps. The full matrix, with its details and key points, can be found at **Figure1.1**.

## First Initial Prototype Alternatives

When Initially designing the first prototype, as my target audience was towards Elderly people along with young people, my focus was more on making the UI easier for elderly to use, rather than targeting on the functionalities of the app right away. To achieve this, I tried to design my buttons, sections, and any other UI element, including the text, to be large, bold, rounded to make them readable as well as make them pop out a bit. I made sure to make the images I used follow the small, rounded structure and clearly show their role to the user and made sure to make them large enough to see. Once I had this pattern to follow suit in my app, I then tried seeing how I can make the data, the screens, and even how to display the data in those screens more accessible to the user in a more efficient way. As a result, I had designed some of screens to scrollable to hold more data in one frame, as well implement tab navigation, as well as tab navigation bar, and title navigation bar and that would act as the central mediator between all my screens, in a way where it is clearly shown to the user which section they are at any given time. In all this, I had kept the pattern I constructed in regard to the UI elements in mind. The end result of the COVID Combat! first app prototype **[1]** was a tab-navigable app that had large, clear, bolded elements, and was able to hold several elements in one frame at a time. Where the app fell short though is in the color palette of the app as the initial color palette I had chosen made the app look dated and not too modern. Another fallout is the actual screen real estate as the original size I design the first prototype in was similar to a third or fourth generation phone size, reducing my overall screen real estate, thus, really squishing my elements, covering majority of the main scrollable frame. As I had developed Versions 2 and 3 of my prototype, I took into account the dated look of the app and reduced screen real estate and as I add more screens, made sure to keep the tab navigation intact and even providing alternative links to screens at screens via buttons of varying sizes on the main scrollable frame. The Second **[2]** and Third **[3]** prototype that reflect these changes clearly the incremental differences from the first protype. The update in UI Color Palettes in Second Prototype from the First Prototype can be clearly in **Figure 1.2.** The tab, modular navigation is more refined in the Third Prototype compared to the First or Second Protypes, as seen in **Figure 1.3**. The Main Figma files for all three protypes are all available from the COVID Combat! Application Prototype GitHub Repository **[4]**.

# Prototype evaluation

After my Third Prototype was developed, I had setup and conduct some user testing sessions for my COVID Combat! Mobile Application Prototype to see how well- designed and implemented users would find my app to be. I had specifically conduct two sessions with a participant each to test my app. Each participant had their own Consent Forms that outlined the what the app is about, why it was developed, how the session will go, and what about the participants will be used in the session, which having once read, had them and a witness sign their signatures at the bottom. Once that was done, each participant then filled out a Participant Profile, that present them a set of questions regarding basic information about them, their current knowledge about COVID matters, and their opinion on mobile apps helping people stay informed and safe in the pandemic. The First Participant and Second Participant Profiles can be seen in **Figure 1.4** and **Figure 1.5**, respectively. Once that was done, the user testing for each participant could commence. Each test had a screen recording of their actions in the app, but only include their voices and not their faces. I setup the tests where I generally told one participant various tasks to perform that would typically happen when being regular user, or a “citizen” as I called it, in which they were using the app as a non-signed in user. While for the other participant, I generally told them tasks to perform that would typically happen when being a volunteer, including having them, at one point, register a Volunteer Hero Account, as I called it, to continue with the rest of the tasks. Each participant started off with generally the same first half of questions, where I asked them to access the home and guides page. It is only in the second half of questions, specifically when accessing the chats, is where their tasks differ. The First Participant Task Script and the Second Participant Task Script are in **Figure 1.6** and **Figure 1.7**, respectively. The demo videos of each participants tests can be seen at **[5]** and **[6]**, respectively.

# Usability Analysis

Once each participant’s tests were completed, I had performed analysis on the usability for each participant testing demo video, where, to evaluate their results, I used the following metrics on each tasks:

* Time to Complete (In Seconds)
* Level of Difficulty

According to my observations in the usability table and during the tests, each participant performed many of the tasks fairly well. What I found significant, however, was that the task where I asked them to have a conversation in the chats took a much longer time for both participants compared to the other tasks. After having asked the participants for feedback on this task after the tests and considering what would have made this happen, I concluded that because Figma, the prototype design software I used to create the app, doesn’t allow micro-transactions within a single frame, I had to make the sample chat spread across multiple frames, accessing each with clicking, which made executing this task a bit confused for them. Despite this, each participant gave a generally low difficulty level for the task. Each participant told me that they were familiar with the interface for chatting, but as this was the first time using the app, they needed to get used to it, which justifies the longer time to compete and lower level of difficulty for this task. The full details of the usability metrics used for each participant’s test can be seen in **Figure 1.8**

# Future works & Conclusions

The participants overall found the app very well designed, saying they like the large icons, large screens, and very colorful and vibrant palettes, with their overall opinion saying the app was simple, clear, and easy to use. The main important feedback I got, however, from them was they said that the icons themselves were not very clear and times, and some of them they need some time getting used to, and suggested having some descriptions or tooltips added with each of the icons so they could have a better understanding of each’s icons role. I considered this feedback, and, in the future, I could add some kind of tooltip to the icons for clear understanding, but in this context, in order to not interfere with the layout, the tooltips would have to be seen when hovering above the icons. This is really only possible in web apps rather than mobile apps, where the interaction medium is the user’s finger. So, to still accommodate the feedback about the icons, in the future, I can develop an app tutorial guide for guiding the user through the function of the app that executes on the initial install of the app, and that would still be access to view again in the app when needed. This way, the user will clearly see and understand what the purpose of each function or icon in the app is, and as the images were designed to be easily recognizable by users, this would eliminate much quicker the need for them to recall what each function or icon does. I do believe that, with a refactoring, this app has potential, and can greatly benefit not only the targeted groups, but the whole of society at large. Additionally, and as already seen in the user tests, if the concepts and guidelines of Human Computer Interaction in mobile devices are continually considered and applied in future prototypes as they have been in these first three, the possibility of the app being to provide users with an optimal designed user interface as well as an optimal user experience can soon become a reality.

##### References

***COVID Combat! First Application Prototype Figma File:***

**[1]** J. Gnanasekaram, “Figma COVID Combat! First Application Prototype,” *Figma*, Feb. 26, 2021. https://www.figma.com/file/kpT0H9F9L7ScT4y2B1XWkw/COVID-Combat?node-id=0%3A1 (accessed Apr. 16, 2021).

***COVID Combat! Second Application Prototype Figma File:***

**[2]** J. Gnanasekaram, “Figma COVID Combat! Second Application Prototype,” *Figma*, Mar. 15, 2021. https://www.figma.com/file/7BPt40Jbfl1clcgPZsuNPl/COVID-Combat-V2?node-id=0%3A1 (accessed Apr. 17, 2021).

***COVID Combat! Third Application Prototype Figma File:***

**[3]** J. Gnanasekaram, “Figma COVID Combat! Third Application Prototype,” *Figma*, Apr. 07, 2021. https://www.figma.com/file/JAG0H5BryPs5EJdQrpGP5z/COVID-Combat-V3?node-id=0%3A1 (accessed Apr. 17, 2021).

***COVID Combat! Application Prototype GitHub Repository:***

**[4]** gnanaJoel, “GitHub - gnanaJoel/COVID\_Combat,” *GitHub*, Apr. 09, 2021. https://github.com/gnanaJoel/COVID\_Combat (accessed Apr. 17, 2021).

***Participant 1 User Testing Video:***

**[5]** J. Gnana, “Participant 1 User Testing Video,” *YouTube*, Apr. 10, 2021. https://www.youtube.com/watch?v=OvePcv5uaa0 (accessed Apr. 17, 2021).

***Participant 2 User Testing Video:***

**[6]** J. Gnana, “Participant 2 User Testing Video,” *YouTube*, Apr. 10, 2021. https://www.youtube.com/watch?v=3aEdUErsX2A (accessed Apr. 17, 2021).

##### Appendix

Table

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**Figure 1.1**: Competitor Analysis Matrix

Graphical user interface, application

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**Figure 1.2**: Screenshot of Set of some UI Screens of

COVID Combat! Second Application Prototype

Graphical user interface

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**Figure 1.3**: Screenshot of Set of some UI Screens of

COVID Combat! Third Application Prototype

Table

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**Figure 1.4**: User Testing : First Participant Profile

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**Figure 1.5**: User Testing : Second Participant Profile

Graphical user interface, text, application

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**Figure 1.6**: User Testing : First Participant Task Script

Graphical user interface, text, application

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**Figure 1.7**: User Testing : Second Participant Task Script

Table

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**Figure 1.8:** Usability Metrics Table Report for First Participant and Second Participant Tests