An Intuitive Application for COVID-19 Education and Contact Tracing

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Abstract:

The grand challenge that the Pandemitrack team aimed to address was the management of disease outbreak, specifically the novel Coronavirus Disease 2019 (COVID-19). With the spread of COVID-19, there have been multiple resources providing information and as a result, people were misinformed. The proposed solution was to create an app to identify local cases in the user's area, identify symptoms, and provide resources for those who may have been exposed. By creating this app, users will be more informed regarding disease outbreaks in their area. Primarily the app focuses on combating the novel coronavirus, however its parameters can be reconfigured to manage other disease outbreaks such as the flu. Creation of the app was done in Unity Engine using #C. Prominent features of the app include contact tracing based on self reported cases, a symptom tracker, mental health resources, and treatment resources. Additionally, data was collected through a survey to determine how likely people are to use the app. Our app aims to manage, and hopefully eradicate, the outbreak of the novel coronavirus which lead to a global pandemic. Users who download the app will be better informed about disease outbreaks in their area.

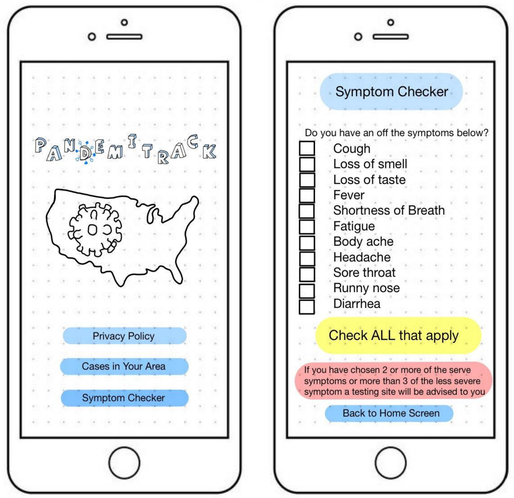

Figure 1: This image shows what the opening screen and symptom checker would look like for the app

Introduction:

- Manage disease outbreaks quickly and efficiently: COVID-19
  - Initial grand challenge from FFC100 was to create a disease management solution which ended up being vaccination education, but as COVID-19 cases began to reach the US and OC in February 2020, we decided to direct our focus there
- Current state of knowledge continues to change, so we aim to first identify symptoms and clinical characteristics
  - Clinical characteristics: SARS and MERS-Cov, incubation period: 2-14 days, average age affected: 47, human to animal spillover event, highest levels of viral RNA are detected in the first week of illness, Lymphopenia and elevated C reactive protein
  - Symptoms: Flu-like, respiratory issues, loss of smell or taste, kidney failure, pneumonia, death (WHO 2020)
- It is a novel coronavirus and new research is constantly being published, we need to stay up to date on new info and clinical studies
- Objectives: Create an app that provides various COVID-19 resources such as symptom checking, contact tracing, and general information
  - App development in Unity Engine using C#
  - Enhance accessibility by using contrasting colors and large text
  - Implement marketing techniques to improve reception of the app
- Different than other apps
  - Specifically target and implement at Chapman
  - Accessible for people who are not tech-savy
  - All COVID-19 info gathered in one place

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Methods:

- To solve our grand challenge, we created an application for a computer that will eventually be able to do contact tracing, symptom checking, and provide COVID-19 resources for the suspected to have the disease.
- The application was created using the Unity engine for interface implementation and the C# computer programming language for logic execution
- We will collect data from the CDC and manually enter the data into our app daily to keep it up to date.

Results:

- The framework of the app has been designed and coded for
- A survey has been sent out to peer our peers to get a sense of what people want
- The results from the survey tell us who and how people would use the app
- Made sure to make the app more supportive to the community that would be using it

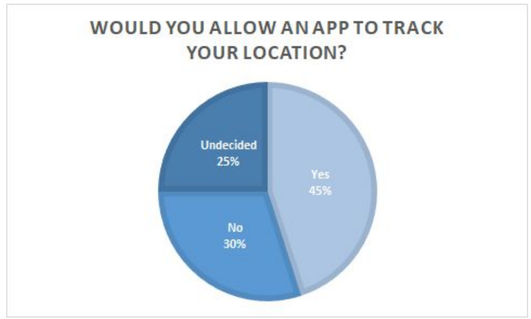

Figure 2: This graph shows the percentage of people that would allow for the app to use their location while using the app

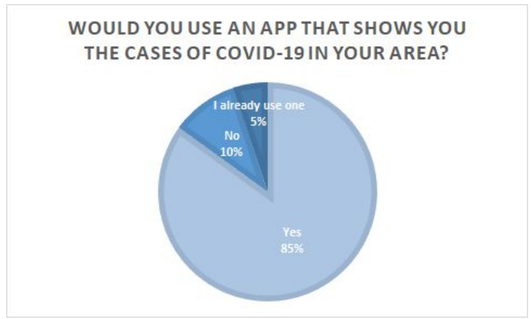

Figure 3: This figure shs how likely the people are that took the survey are to use this app to see the number of COVID-19 cases in the area

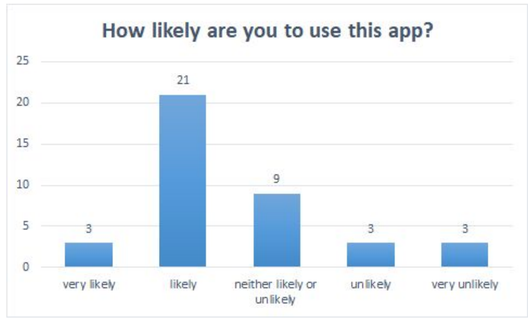

Figure 4: This graph shows how likely people are to use this app as a symptom checker as well as a way to track COVID-19 cases

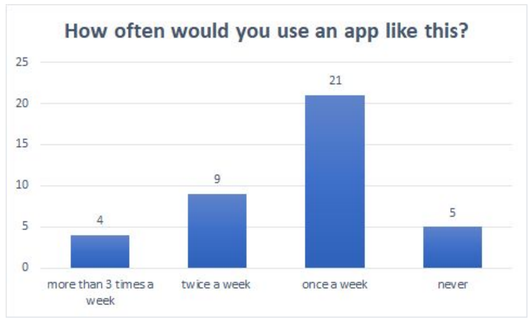

Figure 5: This graph shows how often people would look at this app to track the number of COVID-19 cases in their area

Conclusion:

- Using C# and the Unity engine, we created an app that uses user inputted information to create a map of COVID-19 cases locally, as well as utilizing online resources and a symptom tracker to help diagnose users and direct them to help
- User feedback from a variety of age groups indicate interest, and a high likelihood that it would be downloaded and used frequently (Figure 2-5)
- Many countries, such as Poland, Korea, Singapore, and a collaboration of 130 scientists across the globe have been developing apps for COVID-19 tracking (OECD 2020)
- Direct user interaction with COVID-19 information and local perspectives could be the key to controlling the virus and keeping the public engaged for long periods of tme
- In the future, apps like these could help seasonal viruses like the flu stay relevant and remain under control

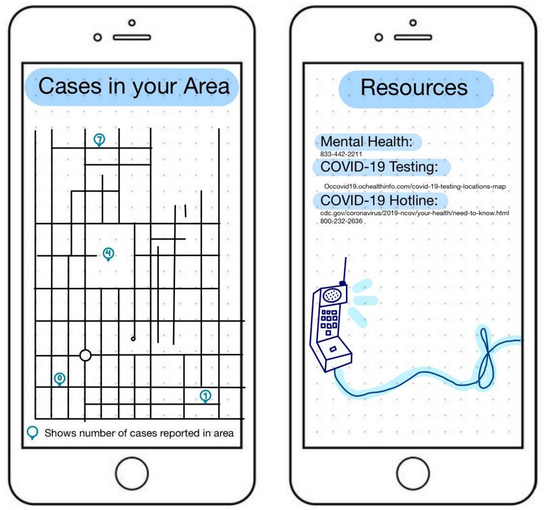

Figure 5: This image shows the page of the app that would show the number of cases in the area as well as COVID-19 resource page

Acknowledgements:

The Pandemitrack team would like to thank Professor Harrison and Professor Hoover who have advised us throughout the creation of our project. We would also like to thank Mona Gross, an expert in the marketing field, who proposed ideas regarding marketing of the app.

Literature Cited:

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